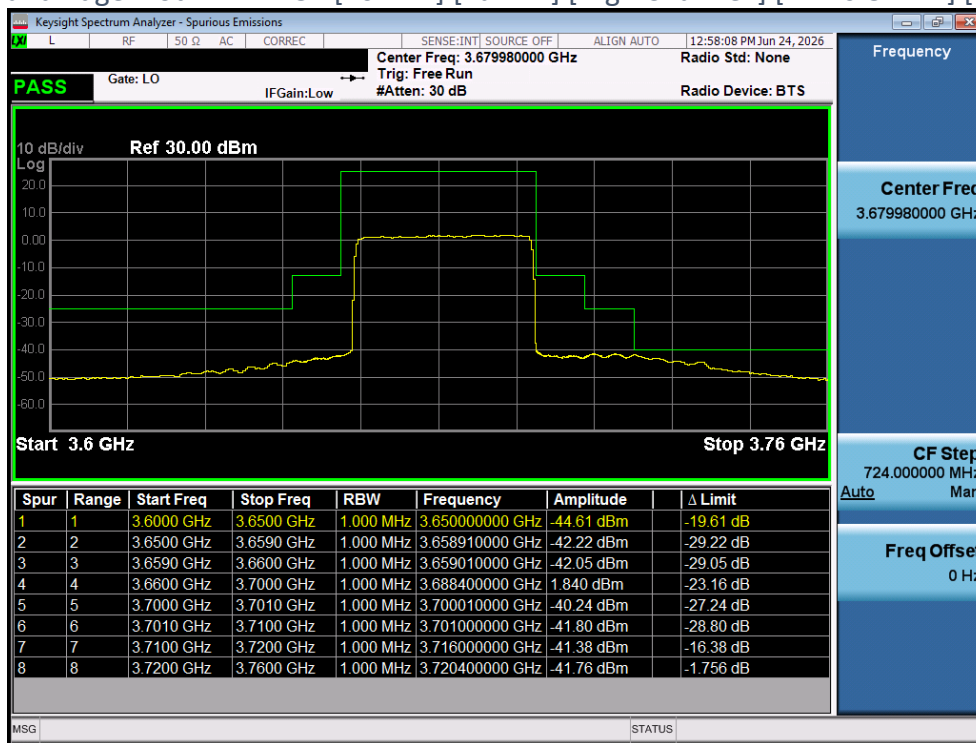
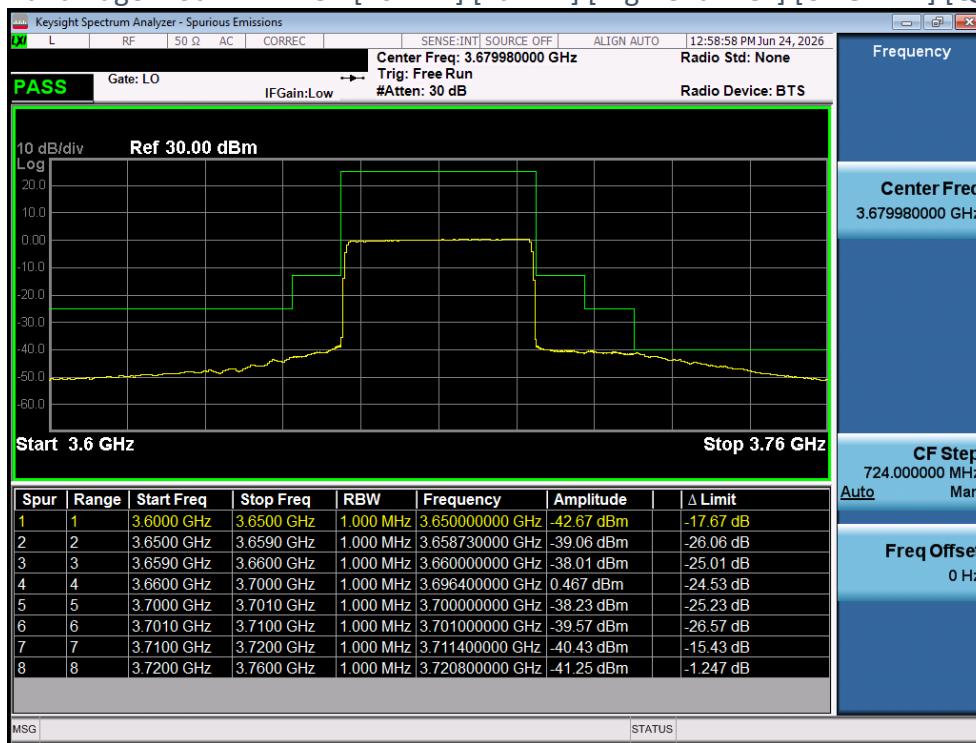


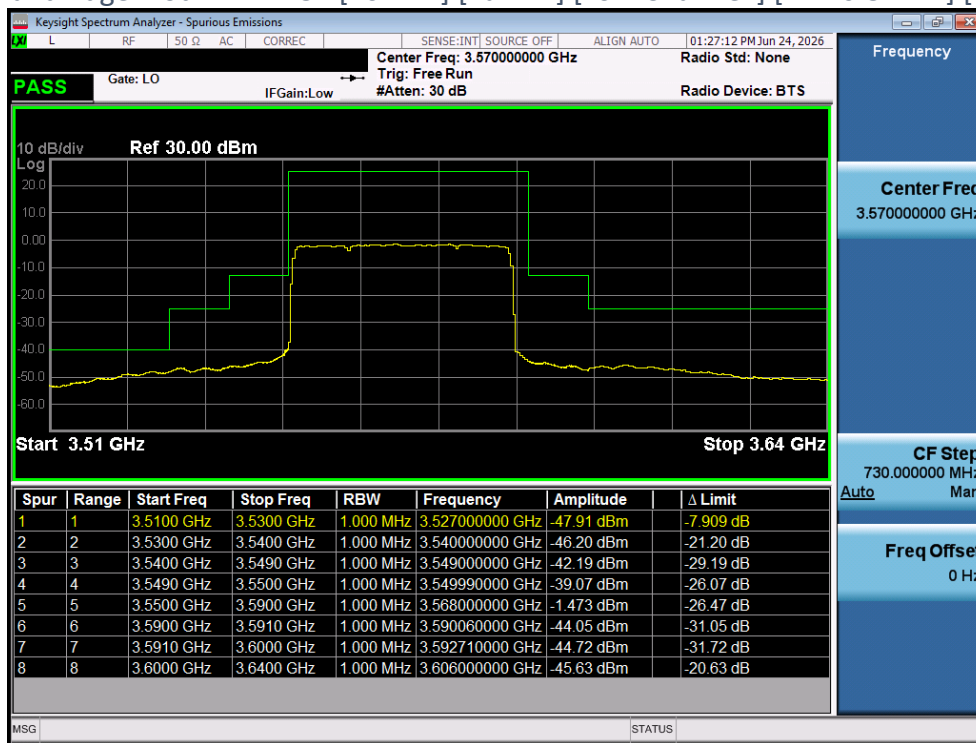
Plot 4-114 Band Edge Plot – NR n48 - [40MHz] [Full RB] [High Channel] [DFT-s OFDM] [QPSK] [SRS 1]



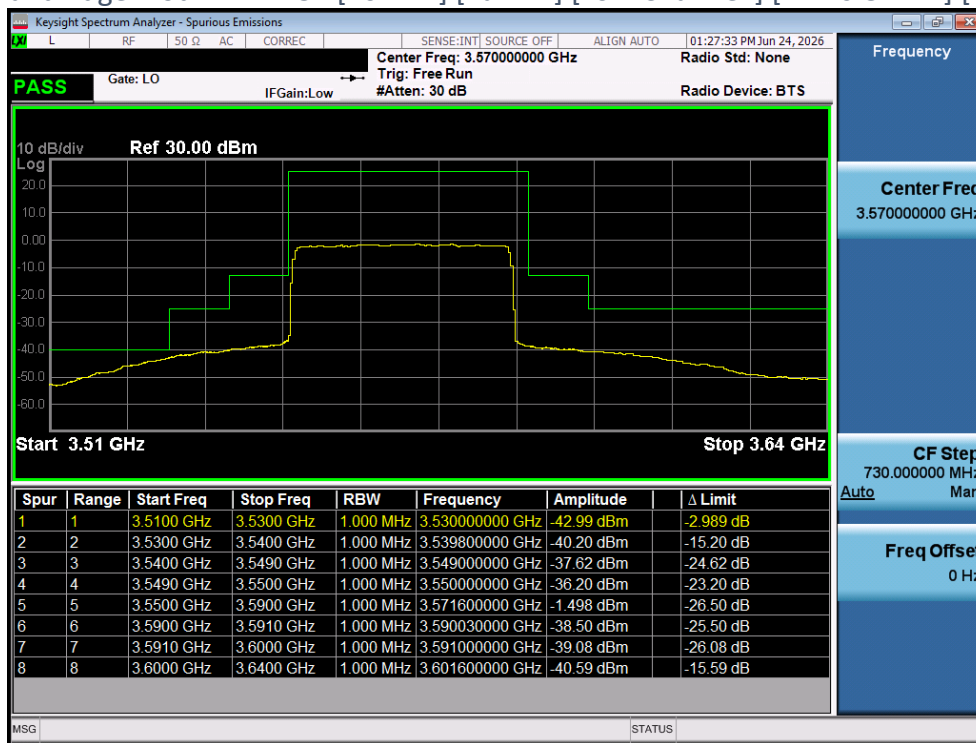
Plot 4-115 Band Edge Plot – NR n48 - [40MHz] [Full RB] [High Channel] [CP OFDM] [QPSK] [SRS 1]



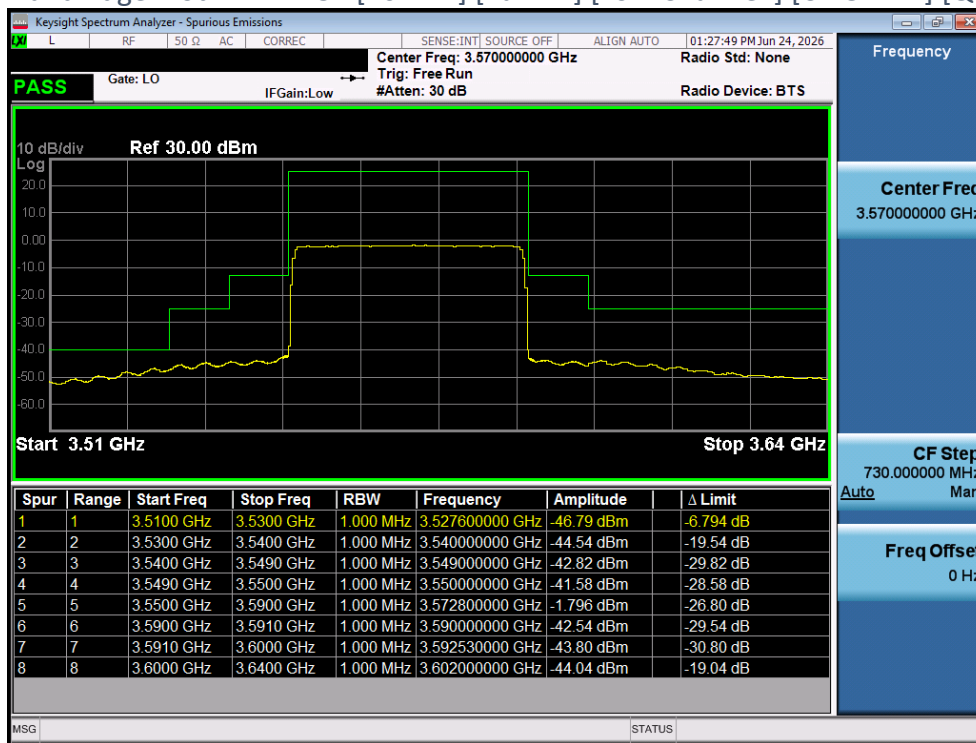
Plot 4-116 Band Edge Plot – NR n48 - [40MHz] [Full RB] [Low Channel] [DFT-s OFDM] [BPSK] [SRS 2]



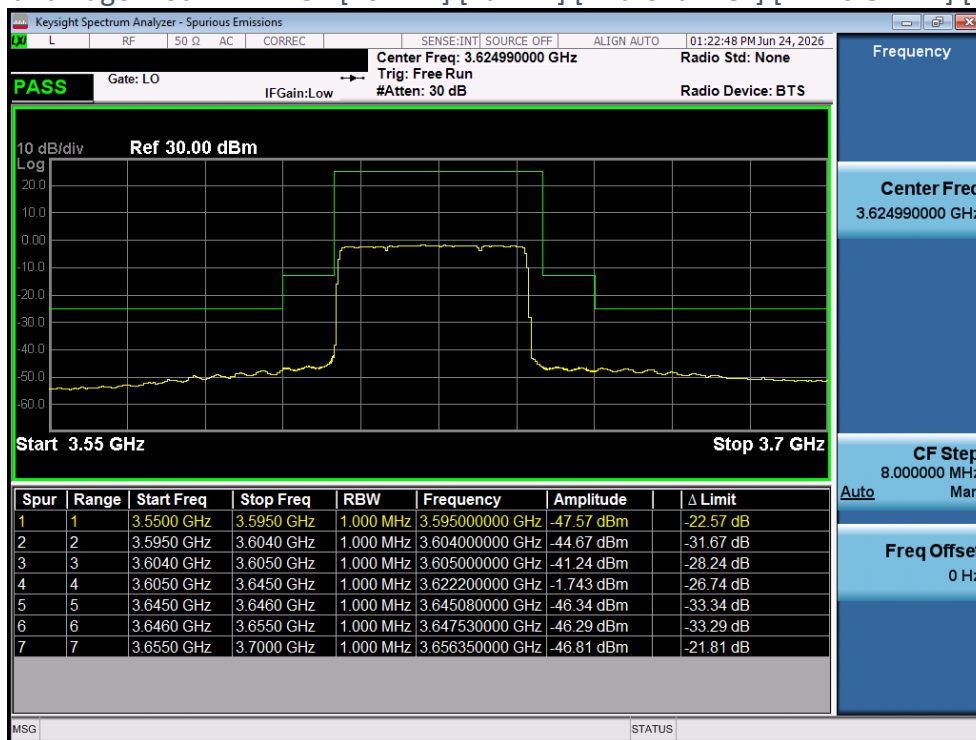
Plot 4-117 Band Edge Plot – NR n48 - [40MHz] [Full RB] [Low Channel] [DFT-s OFDM] [QPSK] [SRS 2]



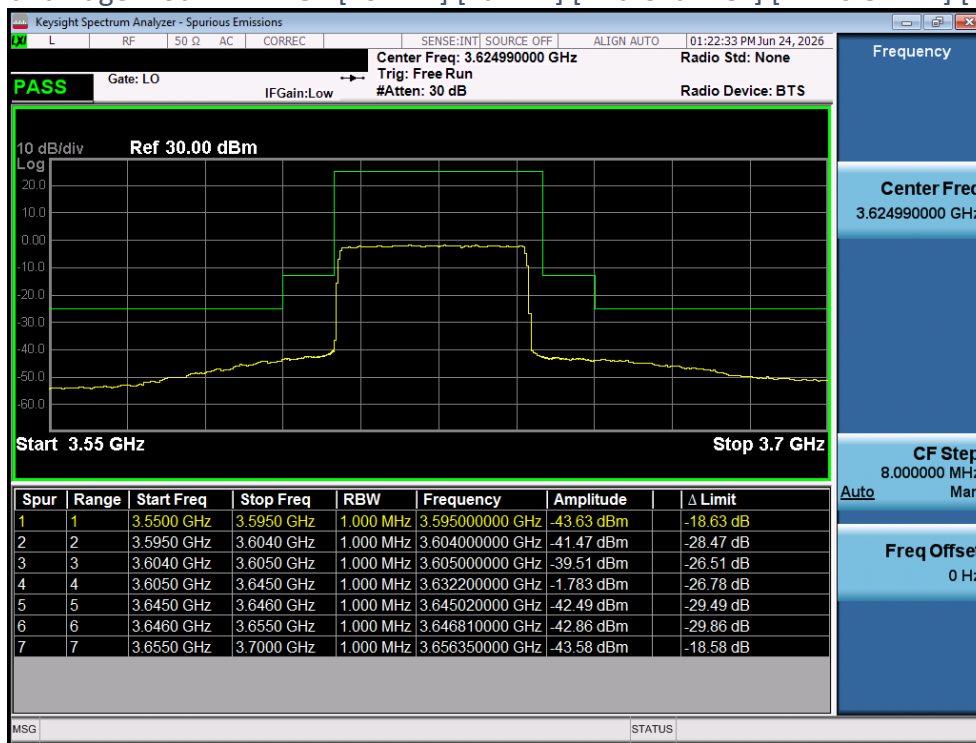
Plot 4-118 Band Edge Plot – NR n48 - [40MHz] [Full RB] [Low Channel] [CP OFDM] [QPSK] [SRS 2]



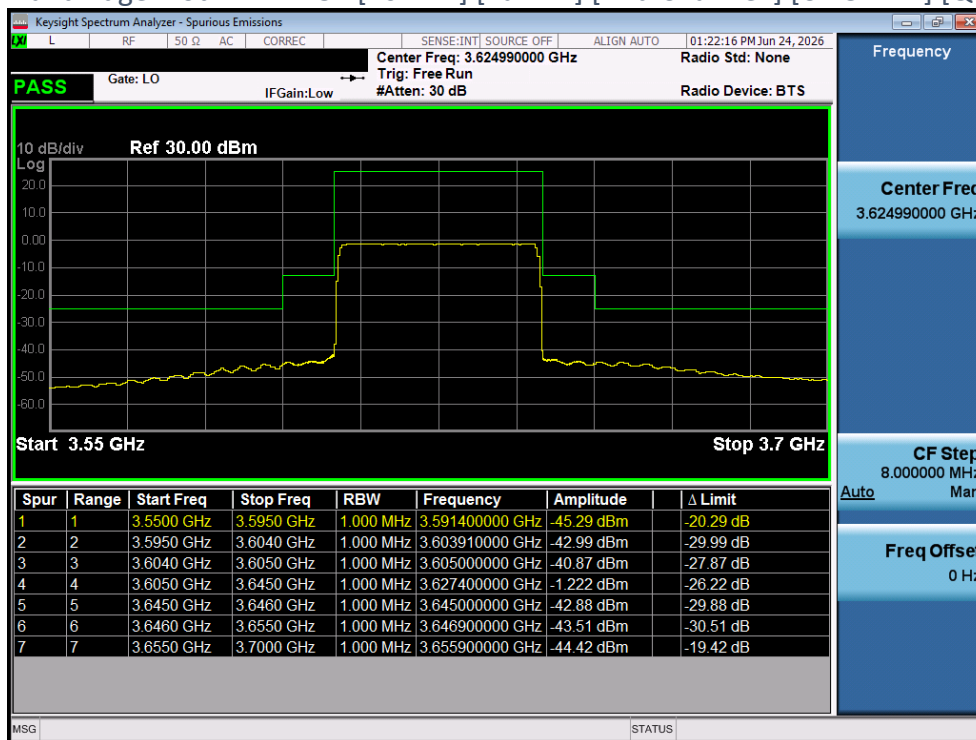
Plot 4-119 Band Edge Plot – NR n48 - [40MHz] [Full RB] [Mid Channel] [DFT-s OFDM] [BPSK] [SRS 2]



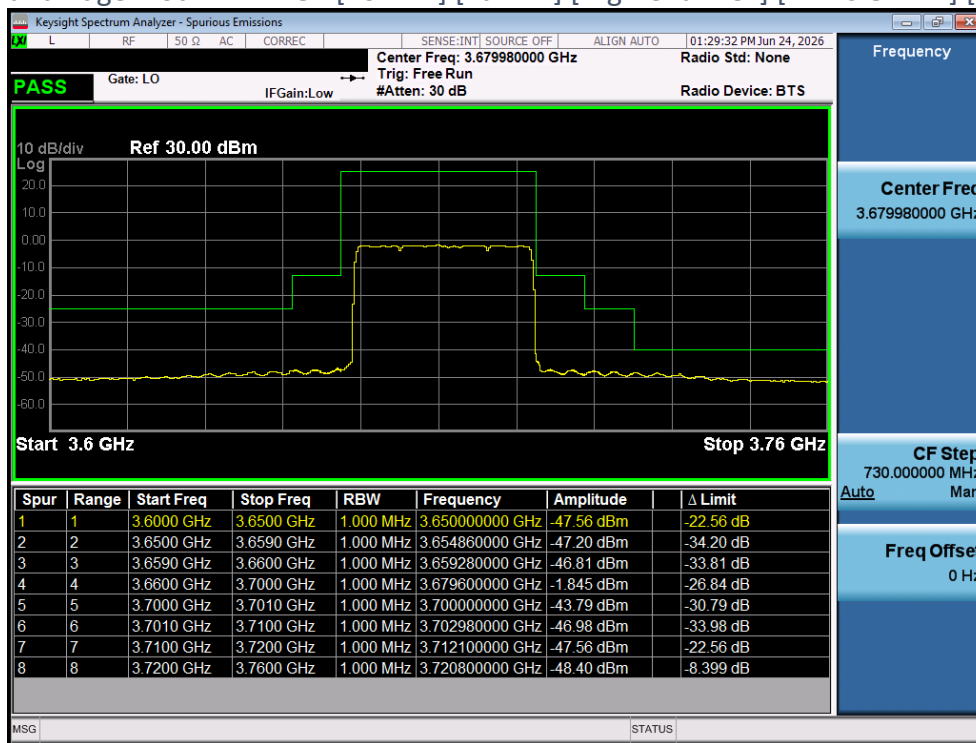
Plot 4-120 Band Edge Plot – NR n48 - [40MHz] [Full RB] [Mid Channel] [DFT-s OFDM] [QPSK] [SRS 2]



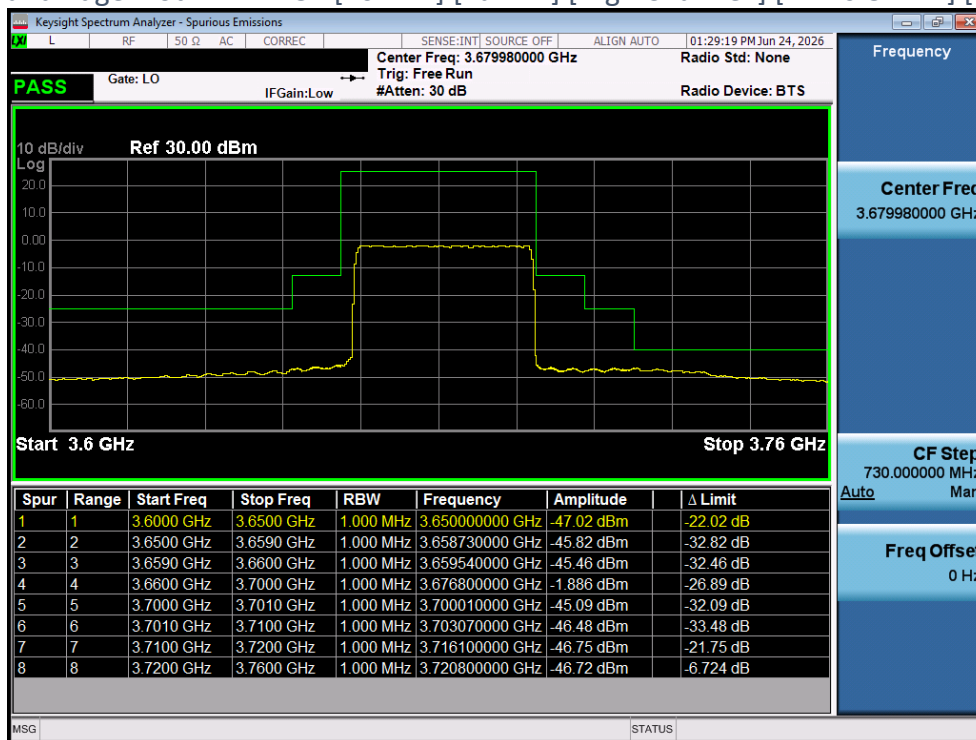
Plot 4-121 Band Edge Plot – NR n48 - [40MHz] [Full RB] [Mid Channel] [CP OFDM] [QPSK] [SRS 2]



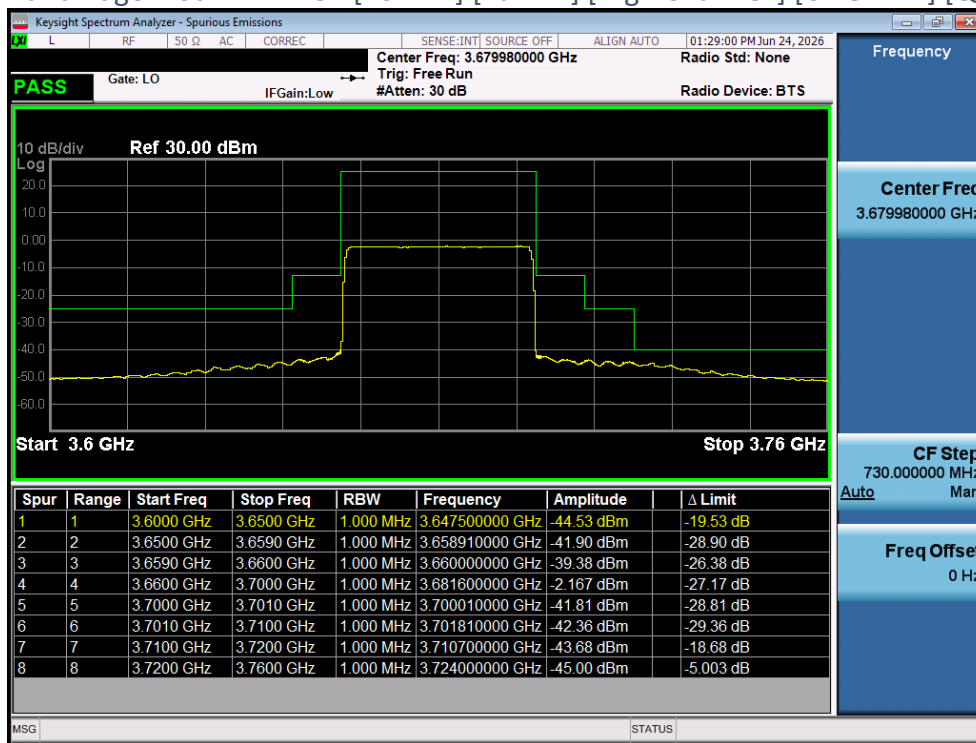
Plot 4-122 Band Edge Plot – NR n48 - [40MHz] [Full RB] [High Channel] [DFT-s OFDM] [BPSK] [SRS 2]



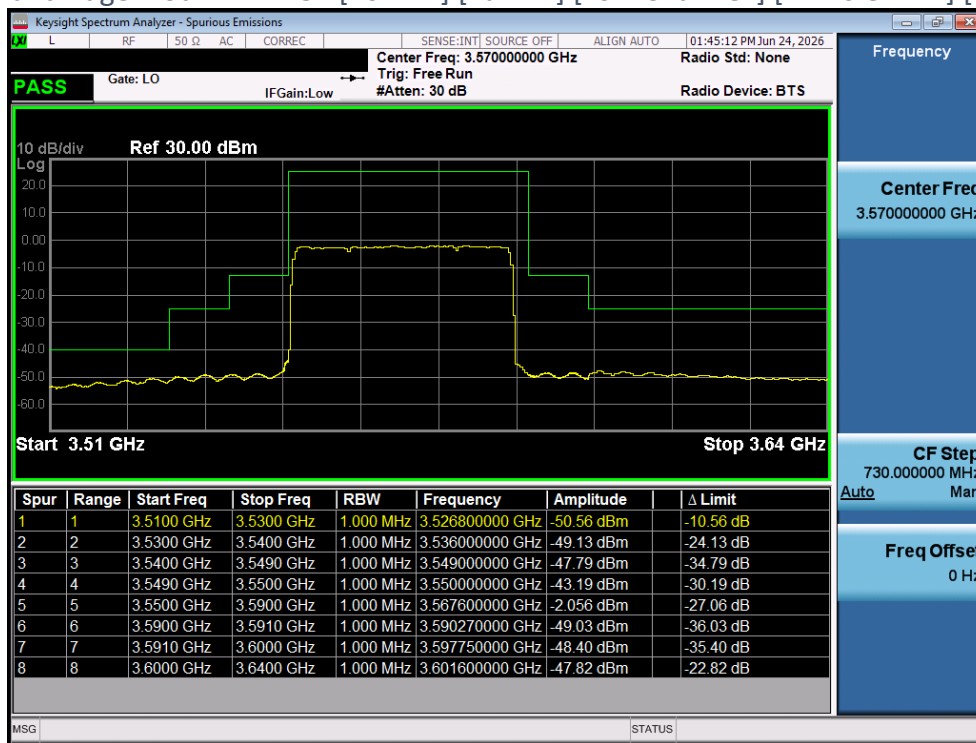
Plot 4-123 Band Edge Plot – NR n48 - [40MHz] [Full RB] [High Channel] [DFT-s OFDM] [QPSK] [SRS 2]



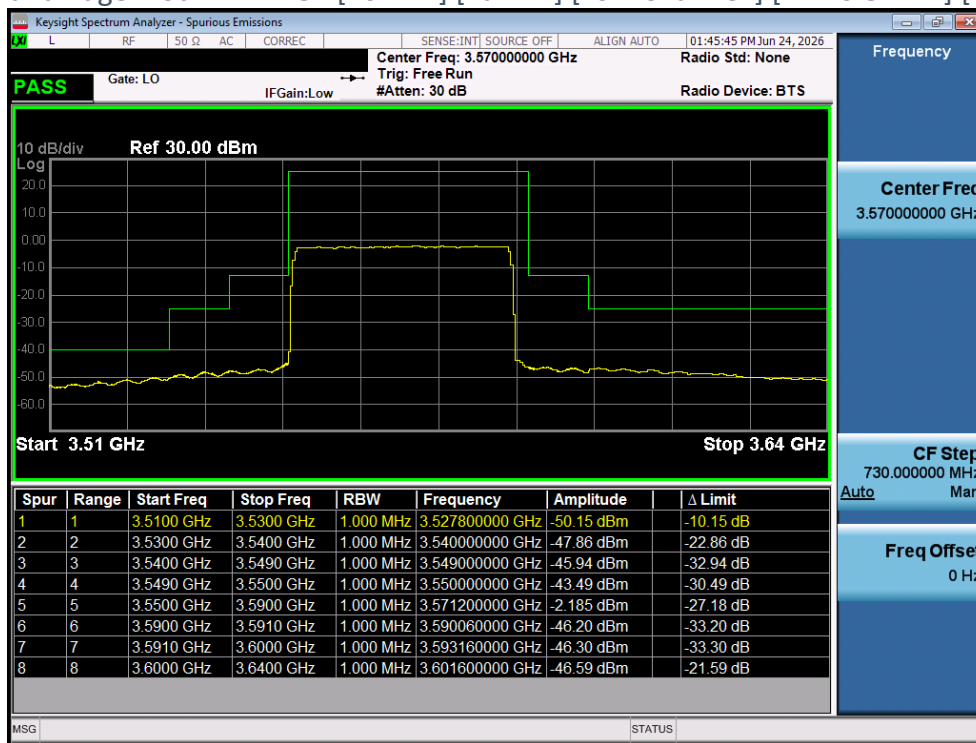
Plot 4-124 Band Edge Plot – NR n48 - [40MHz] [Full RB] [High Channel] [CP OFDM] [QPSK] [SRS 2]



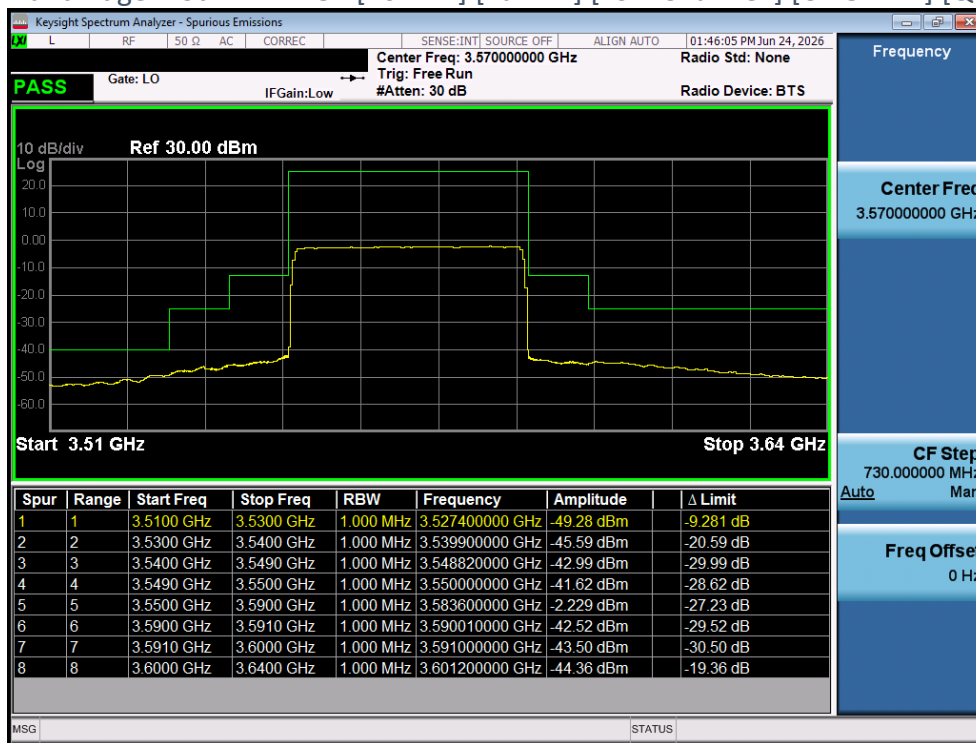
Plot 4-125 Band Edge Plot – NR n48 - [40MHz] [Full RB] [Low Channel] [DFT-s OFDM] [BPSK] [SRS 3]



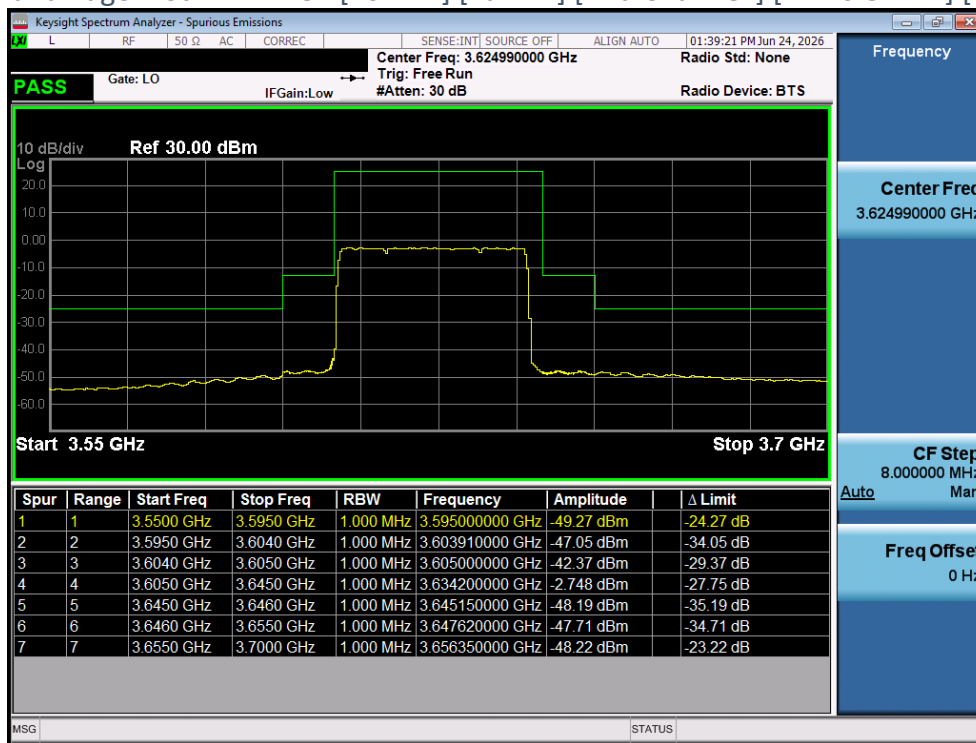
Plot 4-126 Band Edge Plot – NR n48 - [40MHz] [Full RB] [Low Channel] [DFT-s OFDM] [QPSK] [SRS 3]



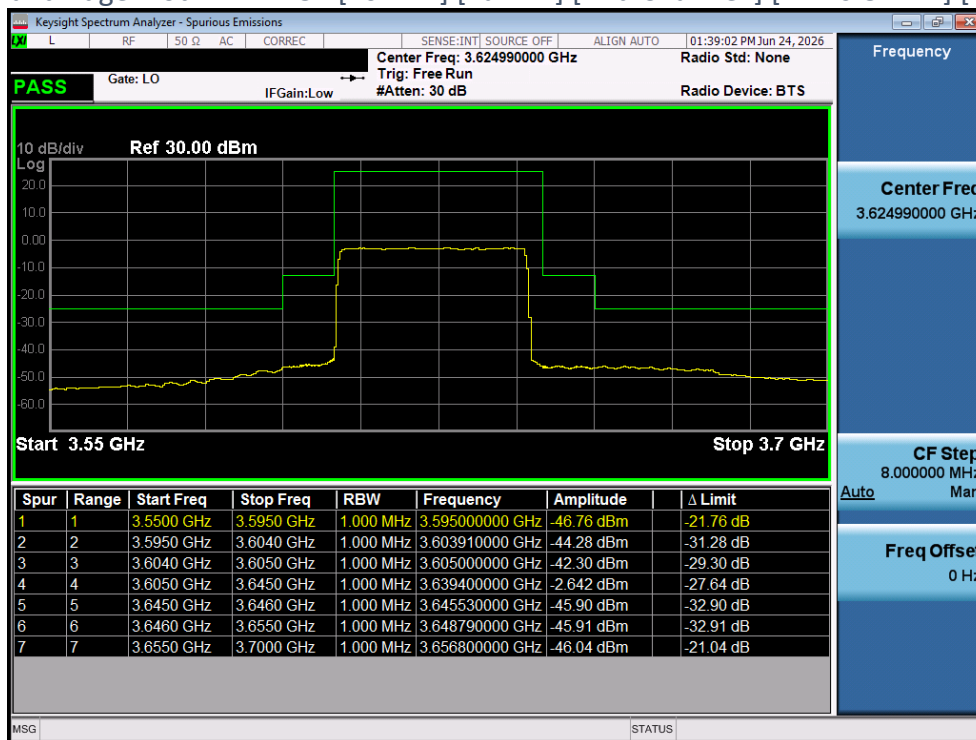
Plot 4-127 Band Edge Plot – NR n48 - [40MHz] [Full RB] [Low Channel] [CP OFDM] [QPSK] [SRS 3]



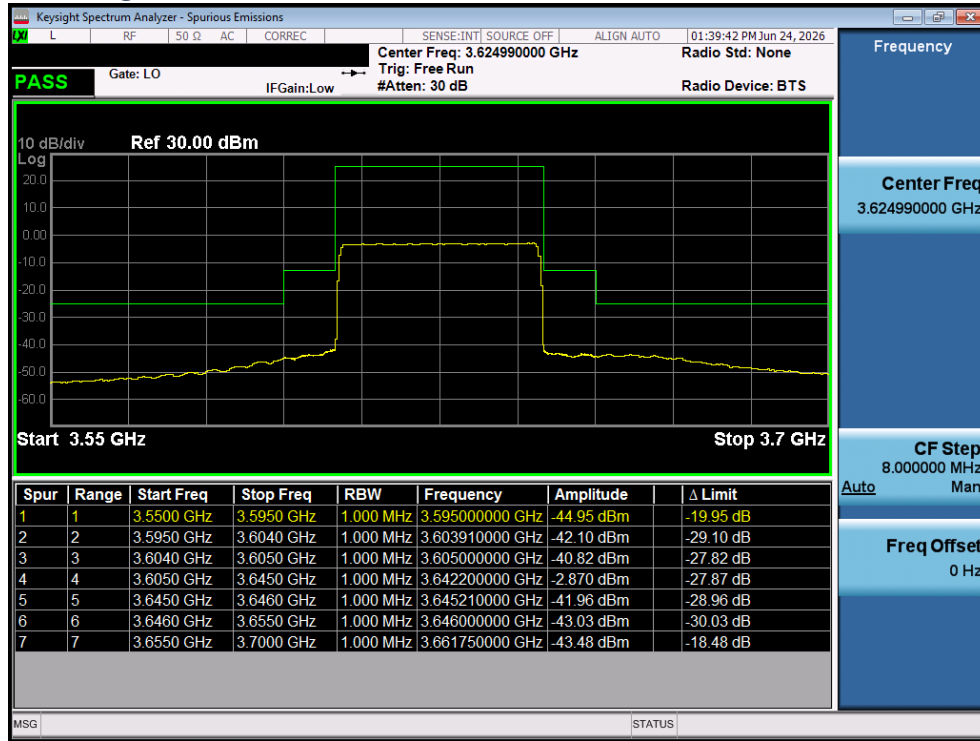
Plot 4-128 Band Edge Plot – NR n48 - [40MHz] [Full RB] [Mid Channel] [DFT-s OFDM] [BPSK] [SRS 3]



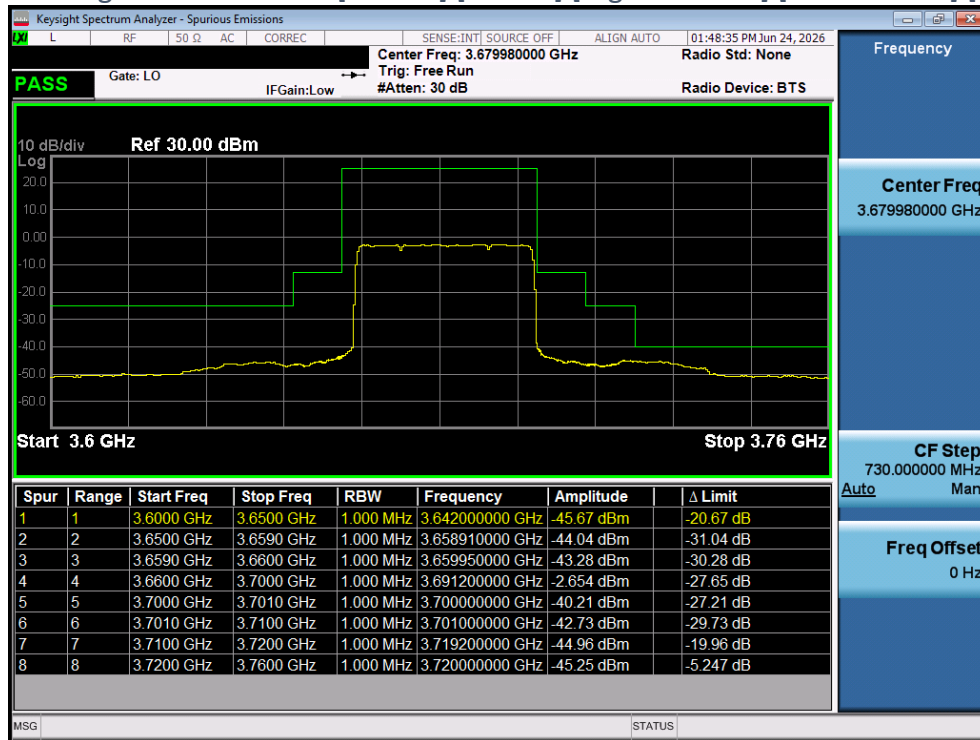
Plot 4-129 Band Edge Plot – NR n48 - [40MHz] [Full RB] [Mid Channel] [DFT-s OFDM] [QPSK] [SRS 3]



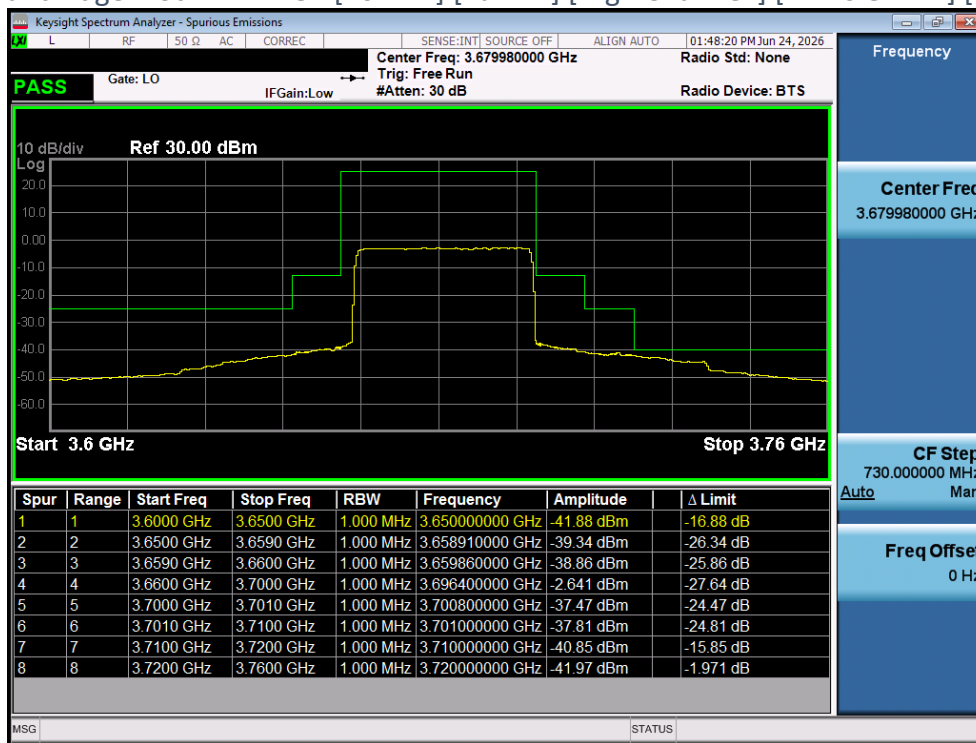
Plot 4-130 Band Edge Plot – NR n48 - [40MHz] [Full RB] [Mid Channel] [CP OFDM] [QPSK] [SRS 3]



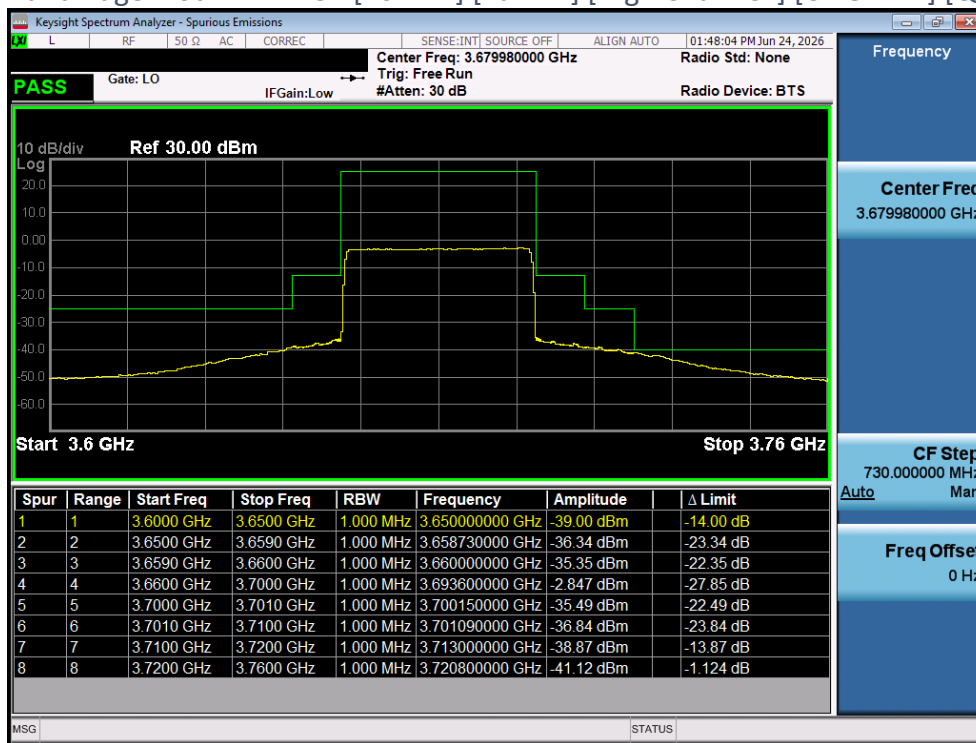
Plot 4-131 Band Edge Plot – NR n48 - [40MHz] [Full RB] [High Channel] [DFT-s OFDM] [BPSK] [SRS 3]



Plot 4-132 Band Edge Plot – NR n48 - [40MHz] [Full RB] [High Channel] [DFT-s OFDM] [QPSK] [SRS 3]



Plot 4-133 Band Edge Plot – NR n48 - [40MHz] [Full RB] [High Channel] [CP OFDM] [QPSK] [SRS 3]



4.6. Conducted Spurious Emissions

4.6.1. Regulatory Limit

§Part. 96.41(e)

(2) for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

4.6.2. Test Method

ANSI C63.26-2015, clause 5.7.4

4.6.3. Test Procedure

The measurement range defined by the start and stop frequencies was subdivided based on the frequency block requirements. The procedure for this method is follows:

- a) Set RBW = 1 MHz
- b) Set the VBW $\geq 3 \times$ RBW.
- c) Detector = RMS.
- d) Trace mode = Max hold.
- e) Set Number of points Sweep $\geq 2 \times$ (span / RBW)
- f) When unwanted noise or emissions are detected close to the limit, the sweep time is increased to perform a detailed measurement and capture the accurate signal level. (sweep time > number of points in sweep $\times$ symbol period)

Test Note

- ✓ All out of band spurious emissions were measured up to more than the 10th harmonic.
- ✓ Tests were conducted under QPSK modulation, which represents the worst-case scenario with the highest power level across all bandwidths.
- ✓ Although all transmission bandwidths and RB allocations including Full RB and 1 RB were evaluated, only the worst-case results are reported herein.
- ✓ Frequency Ranges A, B, C and D represent separate out-of-band emission frequency ranges for each operating band.

4.6.4. Test Results

Table 4-13 Conducted Spurious Emissions Data LTE Band 48 Ant 1

Band	Band Width [MHz]	Channel	Frequency [MHz]	Earfcn UL	RB Size/Offset	Modulation	Range	Level [dBm]	Limit [dBm]	Margin [dB]
LTE Band 48	20	Low	3560	55340	1/50	QPSK	A	-43.07	-40	-3.07
							B	-44.52	-40	-4.52
							C	-48.73	-40	-8.73
							D	-43.36	-40	-3.36
		Mid	3625	55990	1/50	QPSK	A	-44.86	-40	-4.86
							B	-44.73	-40	-4.73
							C	-48.61	-40	-8.61
							D	-48.33	-40	-8.33
		High	3690	56640	1/50	QPSK	A	-44.68	-40	-4.68
							B	-44.49	-40	-4.49
							C	-48.66	-40	-8.66
							D	-43.16	-40	-3.16

Table 4-14 Conducted Spurious Emissions Data LTE Band 48 ULCA 48C Ant 1

Band	Band Width [MHz]	Channel	Frequency [MHz]	RB Size/Offset	Modulation	Range	Level [dBm]	Limit [dBm]	Margin [dB]
LTE Band 48 ULCA	20+20	Low	3560+3579.8	1/99+1/1	QPSK	A	-45.85	-40	-5.85
						B	-46.18	-40	-6.18
						C	-47.34	-40	-7.34
						D	-44.50	-40	-4.50
		Mid	3625+3644.8	1/99+1/1	QPSK	A	-44.66	-40	-4.66
						B	-46.04	-40	-6.04
						C	-47.27	-40	-7.27
						D	-44.40	-40	-4.40
		High	3670.2+3690	1/99+1/1	QPSK	A	-45.04	-40	-5.04
						B	-45.32	-40	-5.32
						C	-47.27	-40	-7.27
						D	-43.94	-40	-3.94

Table 4-15 Conducted Spurious Emissions Data NR n48 Ant 1

Band	Band Width [MHz]	Channel	Frequency [MHz]	NR-Arfcn UL	RB Size/Offset	Waveform	Modulation	Range	Level [dBm]	Limit [dBm]	Margin [dB]
NR n48	40	Low	3570.00	638000	1/50	DFT-s-OFDM	QPSK	A	-43.19	-40	-3.19
						DFT-s-OFDM		B	-44.00	-40	-4.00
						DFT-s-OFDM		C	-48.22	-40	-8.22
						DFT-s-OFDM		D	-43.01	-40	-3.01
		Mid	3624.99	641666	1/50	DFT-s-OFDM	QPSK	A	-45.87	-40	-5.87
						DFT-s-OFDM		B	-48.50	-40	-8.50
						DFT-s-OFDM		C	-47.71	-40	-7.71
						DFT-s-OFDM		D	-43.24	-40	-3.24
		High	3679.98	645332	1/50	DFT-s-OFDM	QPSK	A	-44.62	-40	-4.62
						DFT-s-OFDM		B	-46.51	-40	-6.51
						DFT-s-OFDM		C	-48.54	-40	-8.54
						DFT-s-OFDM		D	-43.29	-40	-3.29

Table 4-16 Conducted Spurious Emissions Data NR n48 SRS 1

Band	Band Width [MHz]	Channel	Frequency [MHz]	NR-Arfcn UL	RB Size/Offset	Waveform	Modulation	Range	Level [dBm]	Limit [dBm]	Margin [dB]
NR n48	40	Low	3570.00	638000	1/50	DFT-s-OFDM	QPSK	A	-44.41	-40	-4.41
						DFT-s-OFDM		B	-44.72	-40	-4.72
						DFT-s-OFDM		C	-47.80	-40	-7.80
						DFT-s-OFDM		D	-43.52	-40	-3.52
		Mid	3624.99	641666	1/50	DFT-s-OFDM	QPSK	A	-45.42	-40	-5.42
						DFT-s-OFDM		B	-47.04	-40	-7.04
						DFT-s-OFDM		C	-48.28	-40	-8.28
						DFT-s-OFDM		D	-43.41	-40	-3.41
		High	3679.98	645332	1/50	DFT-s-OFDM	QPSK	A	-45.40	-40	-5.40
						DFT-s-OFDM		B	-47.61	-40	-7.61
						DFT-s-OFDM		C	-48.40	-40	-8.40
						DFT-s-OFDM		D	-43.02	-40	-3.02

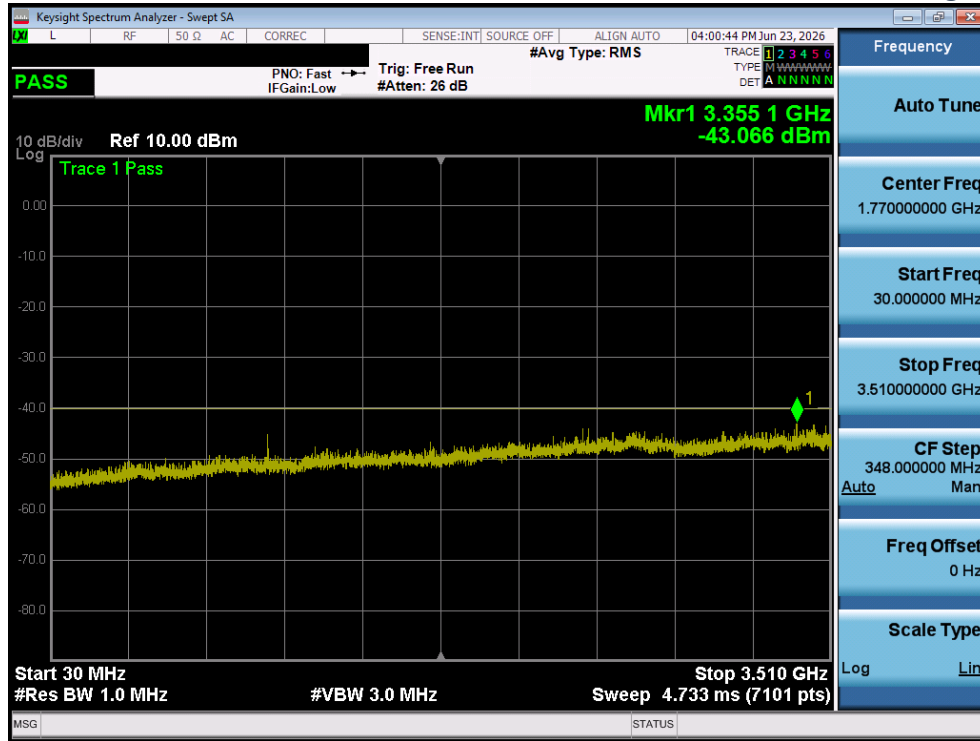
Table 4-17 Conducted Spurious Emissions Data NR n48 SRS 2

Band	Band Width [MHz]	Channel	Frequency [MHz]	NR-Arfcn UL	RB Size/Offset	Waveform	Modulation	Range	Level [dBm]	Limit [dBm]	Margin [dB]
NR n48	40	Low	3570.00	638000	1/50	DFT-s-OFDM	QPSK	A	-44.75	-40	-4.75
						DFT-s-OFDM		B	-44.88	-40	-4.88
						DFT-s-OFDM		C	-47.77	-40	-7.77
						DFT-s-OFDM		D	-43.28	-40	-3.28
		Mid	3624.99	641666	1/50	DFT-s-OFDM	QPSK	A	-45.28	-40	-5.28
						DFT-s-OFDM		B	-47.03	-40	-7.03
						DFT-s-OFDM		C	-48.03	-40	-8.03
						DFT-s-OFDM		D	-43.25	-40	-3.25
		High	3679.98	645332	1/50	DFT-s-OFDM	QPSK	A	-44.79	-40	-4.79
						DFT-s-OFDM		B	-46.68	-40	-6.68
						DFT-s-OFDM		C	-47.85	-40	-7.85
						DFT-s-OFDM		D	-43.17	-40	-3.17

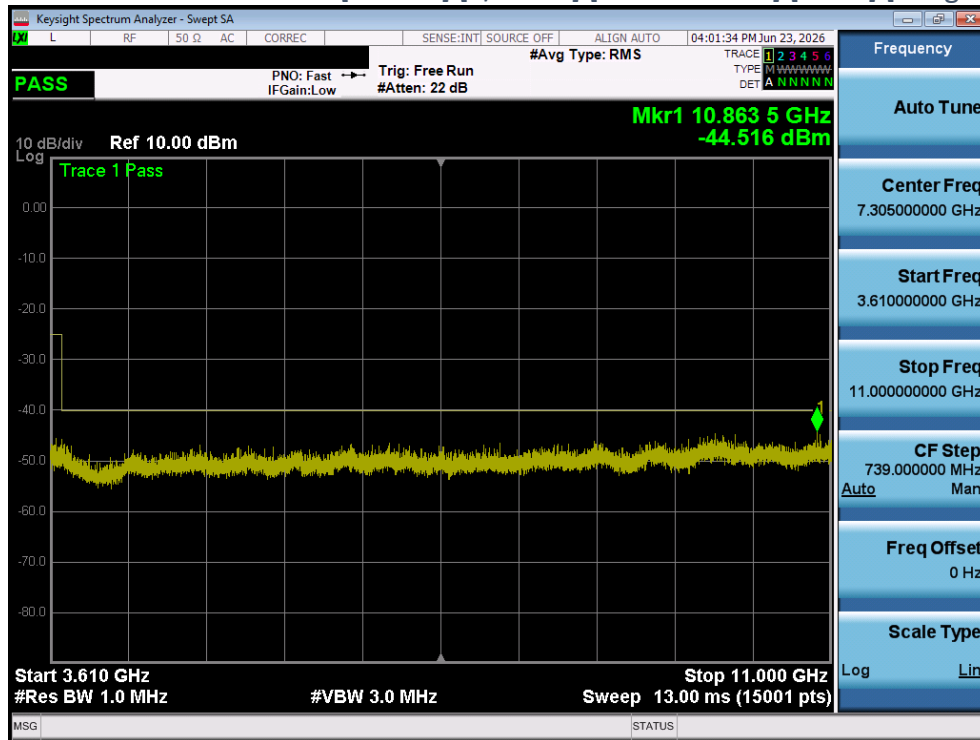
Table 4-18 Conducted Spurious Emissions Data NR n48 SRS 3

Band	Band Width [MHz]	Channel	Frequency [MHz]	NR-Arfcn UL	RB Size/Offset	Waveform	Modulation	Range	Level [dBm]	Limit [dBm]	Margin [dB]
NR n48	40	Low	3570.00	638000	1/50	DFT-s-OFDM	QPSK	A	-44.56	-40	-4.56
						DFT-s-OFDM		B	-45.30	-40	-5.30
						DFT-s-OFDM		C	-48.33	-40	-8.33
						DFT-s-OFDM		D	-43.32	-40	-3.32
		Mid	3624.99	641666	1/50	DFT-s-OFDM	QPSK	A	-45.63	-40	-5.63
						DFT-s-OFDM		B	-47.09	-40	-7.09
						DFT-s-OFDM		C	-48.21	-40	-8.21
						DFT-s-OFDM		D	-43.05	-40	-3.05
		High	3679.98	645332	1/50	DFT-s-OFDM	QPSK	A	-45.64	-40	-5.64
						DFT-s-OFDM		B	-46.74	-40	-6.74
						DFT-s-OFDM		C	-48.29	-40	-8.29
						DFT-s-OFDM		D	-43.05	-40	-3.05

Plot 4-134 CSE Plot - LTE Band48 - [20MHz] [1/50 RB] [Low Channel] [QPSK] [Range A] [Ant 1]



Plot 4-135 CSE Plot - LTE Band48 - [20MHz] [1/50 RB] [Low Channel] [QPSK] [Range B] [Ant 1]



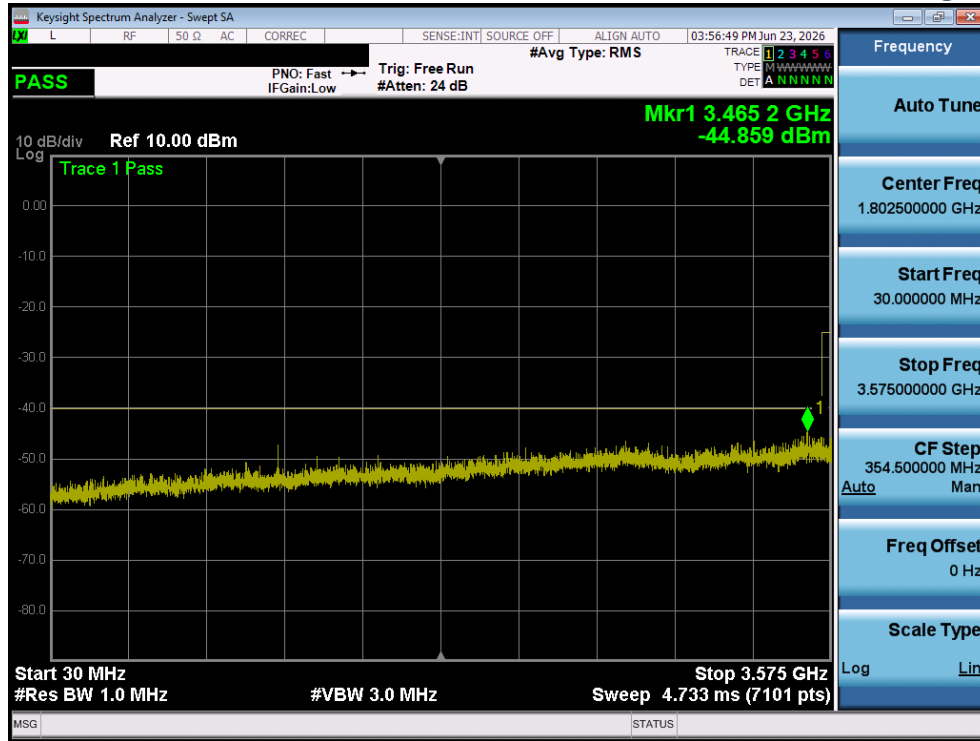
Plot 4-136 CSE Plot - LTE Band48 - [20MHz] [1/50 RB] [Low Channel] [QPSK] [Range C] [Ant 1]



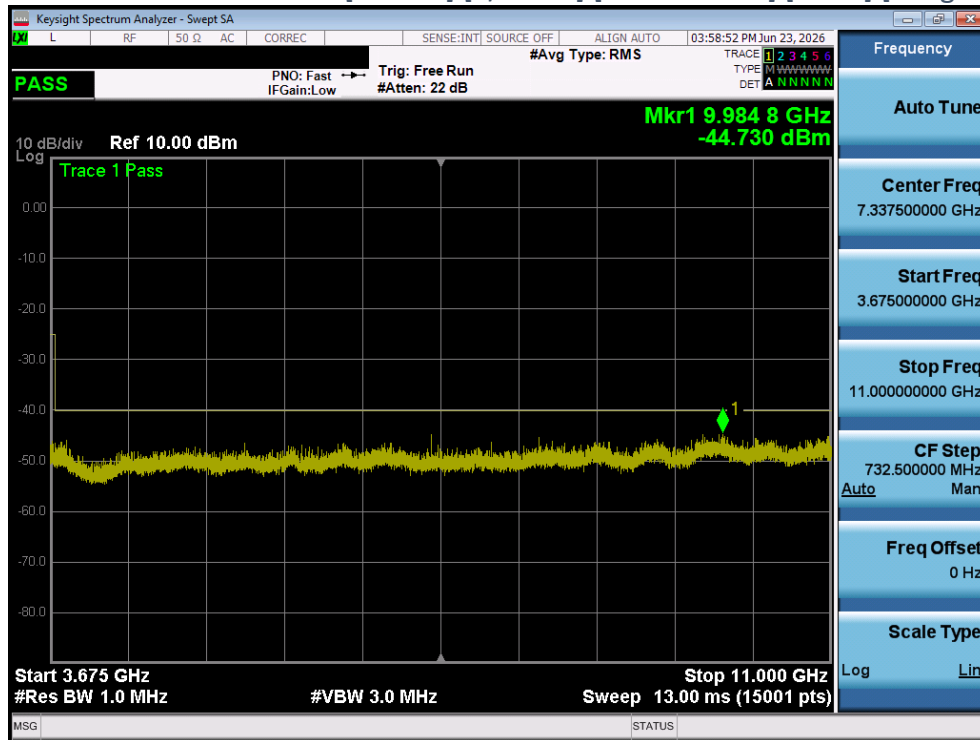
Plot 4-137 CSE Plot - LTE Band48 - [20MHz] [1/50 RB] [Low Channel] [QPSK] [Range D] [Ant 1]



Plot 4-138 CSE Plot - LTE Band48 - [20MHz] [1/50 RB] [Mid Channel] [QPSK] [Range A] [Ant 1]



Plot 4-139 CSE Plot - LTE Band48 - [20MHz] [1/50 RB] [Mid Channel] [QPSK] [Range B] [Ant 1]



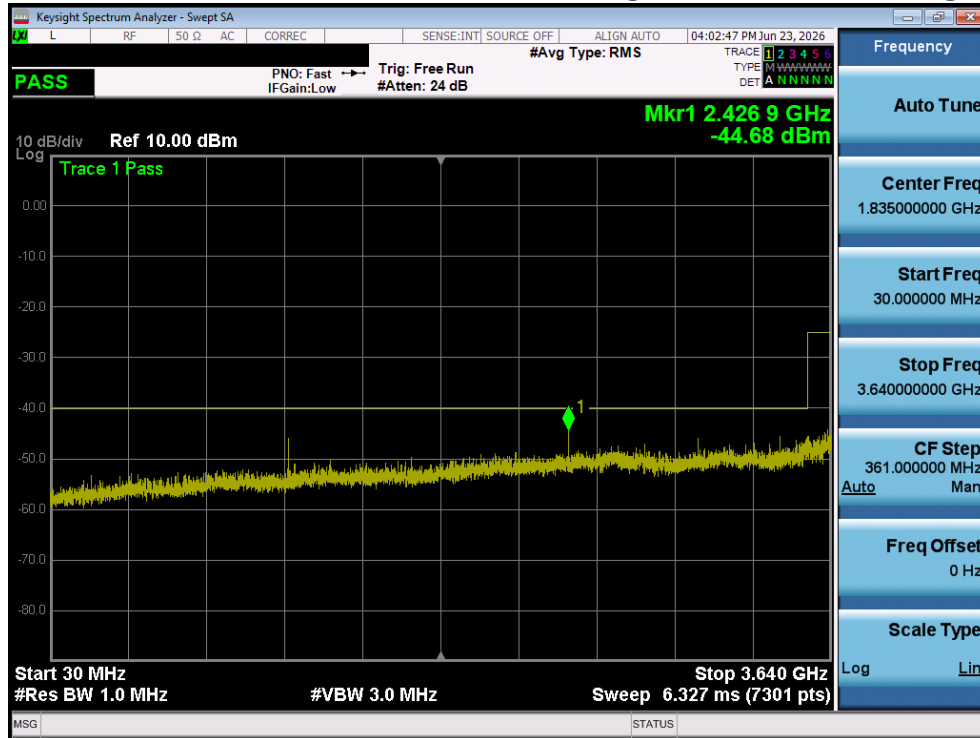
Plot 4-140 CSE Plot - LTE Band48 - [20MHz] [1/50 RB] [Mid Channel] [QPSK] [Range C] [Ant 1]



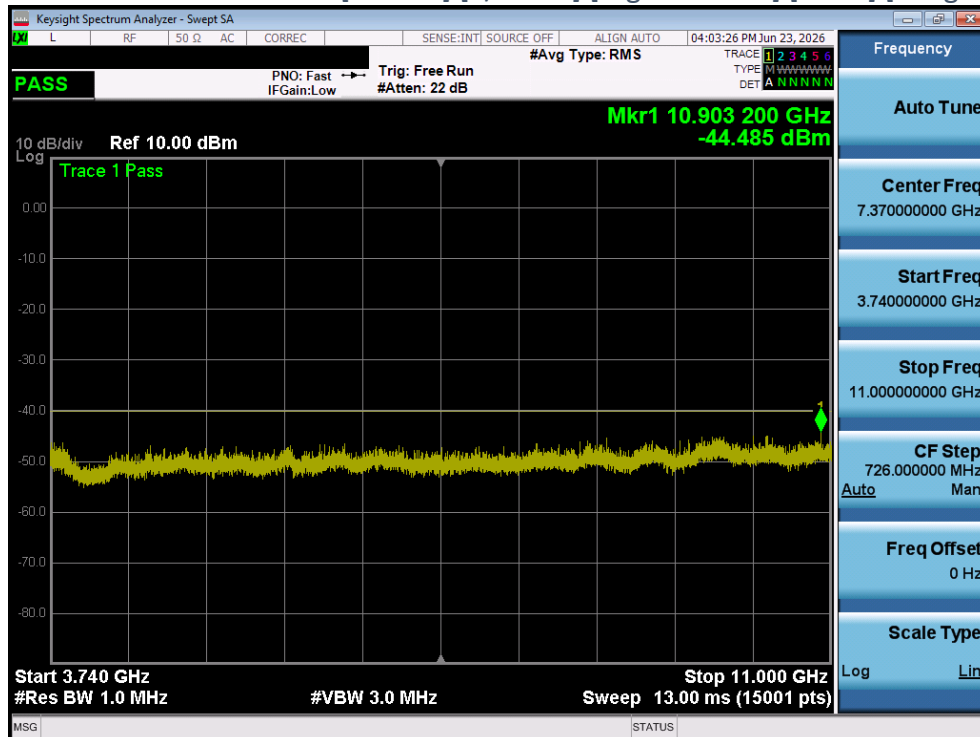
Plot 4-141 CSE Plot - LTE Band48 - [20MHz] [1/50 RB] [Mid Channel] [QPSK] [Range D] [Ant 1]



Plot 4-142 CSE Plot - LTE Band48 - [20MHz] [1/50 RB] [High Channel] [QPSK] [Range A] [Ant 1]



Plot 4-143 CSE Plot - LTE Band48 - [20MHz] [1/50 RB] [High Channel] [QPSK] [Range B] [Ant 1]



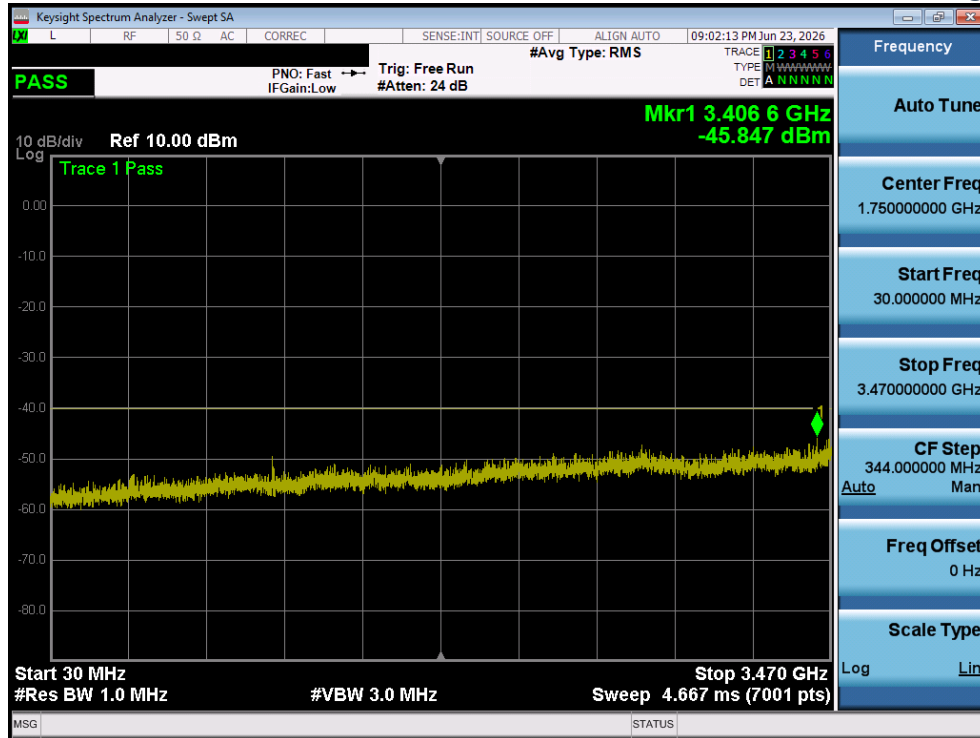
Plot 4-144 CSE Plot - LTE Band48 - [20MHz] [1/50 RB] [High Channel] [QPSK] [Range C] [Ant 1]



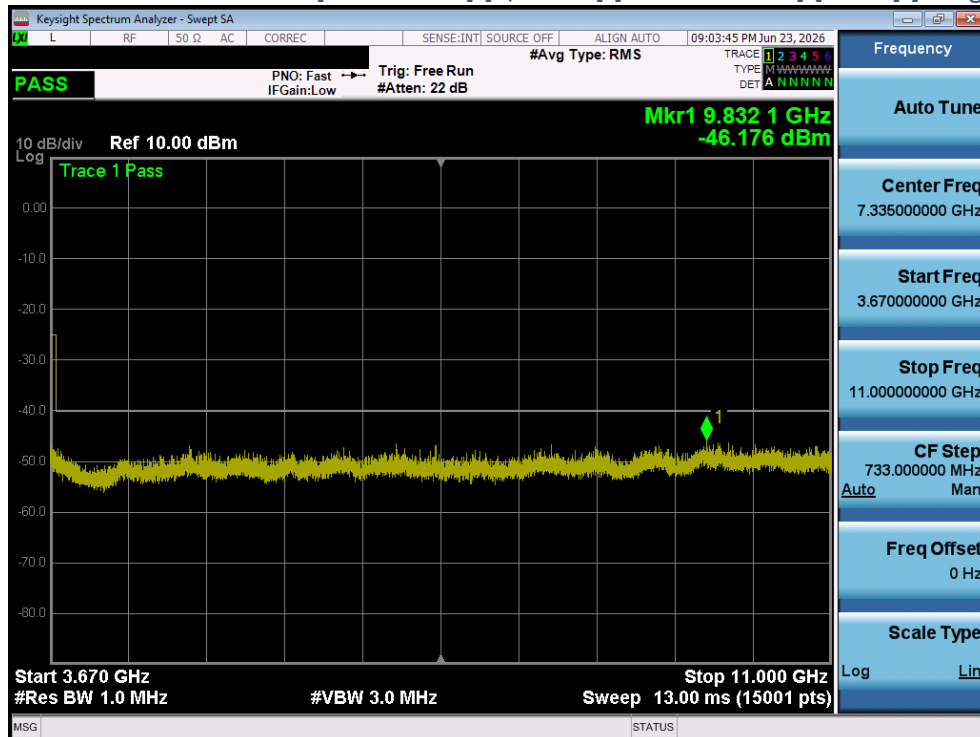
Plot 4-145 CSE Plot - LTE Band48 - [20MHz] [1/50 RB] [High Channel] [QPSK] [Range D] [Ant 1]



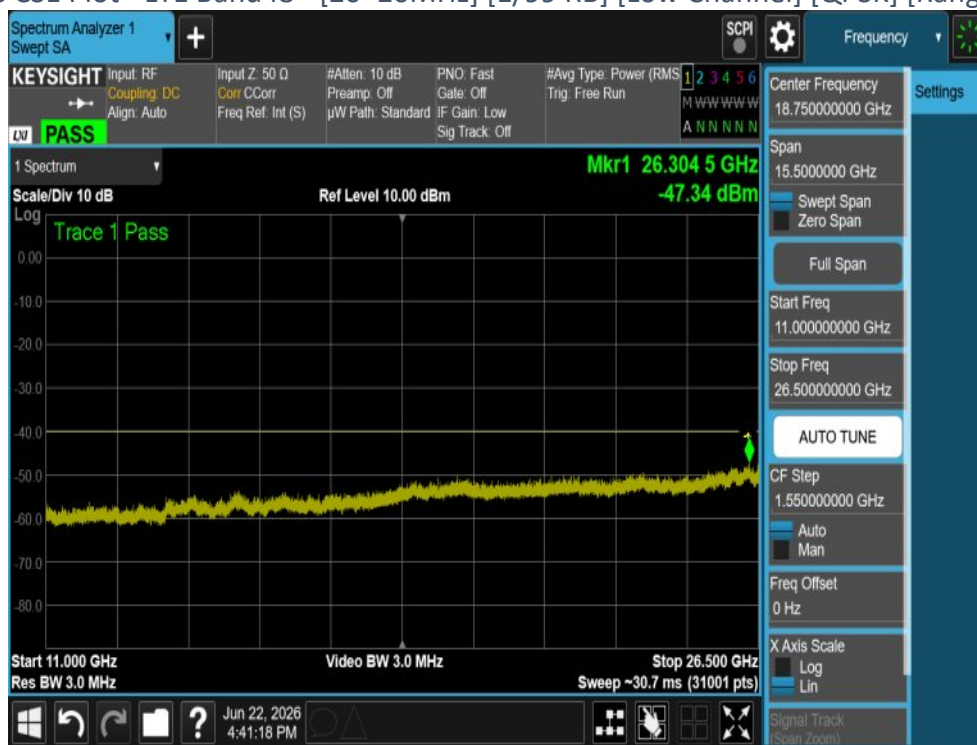
Plot 4-146 CSE Plot - LTE Band48 - [20+20MHz] [1/99 RB] [Low Channel] [QPSK] [Range A] [Ant 1]



Plot 4-147 CSE Plot - LTE Band48 - [20+20MHz] [1/99 RB] [Low Channel] [QPSK] [Range B] [Ant 1]



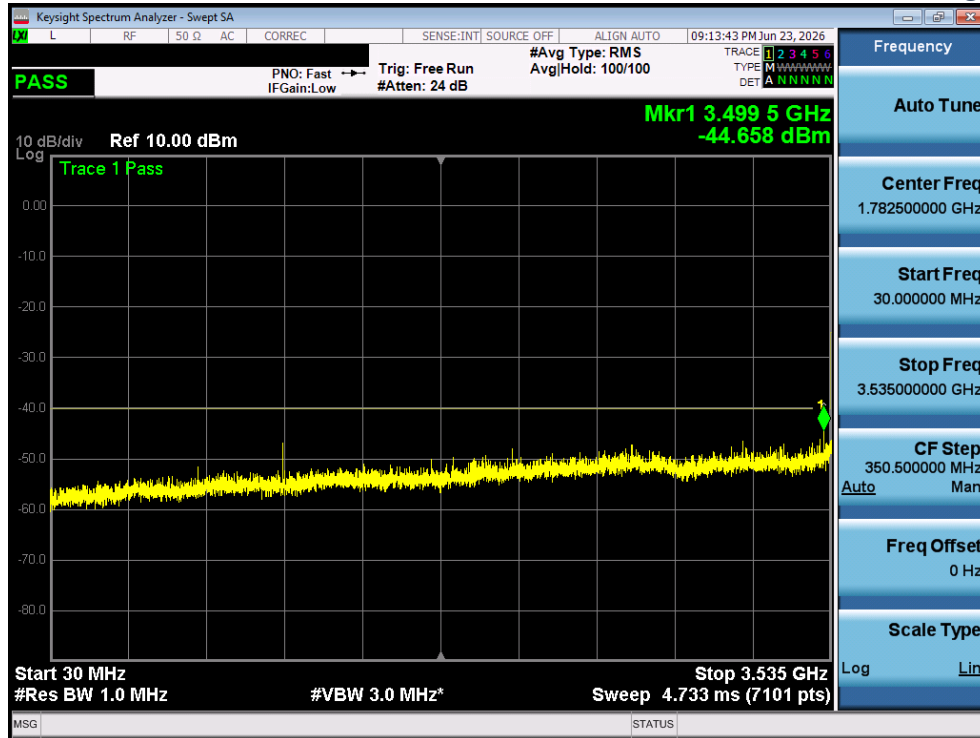
Plot 4-148 CSE Plot - LTE Band48 - [20+20MHz] [1/99 RB] [Low Channel] [QPSK] [Range C] [Ant 1]



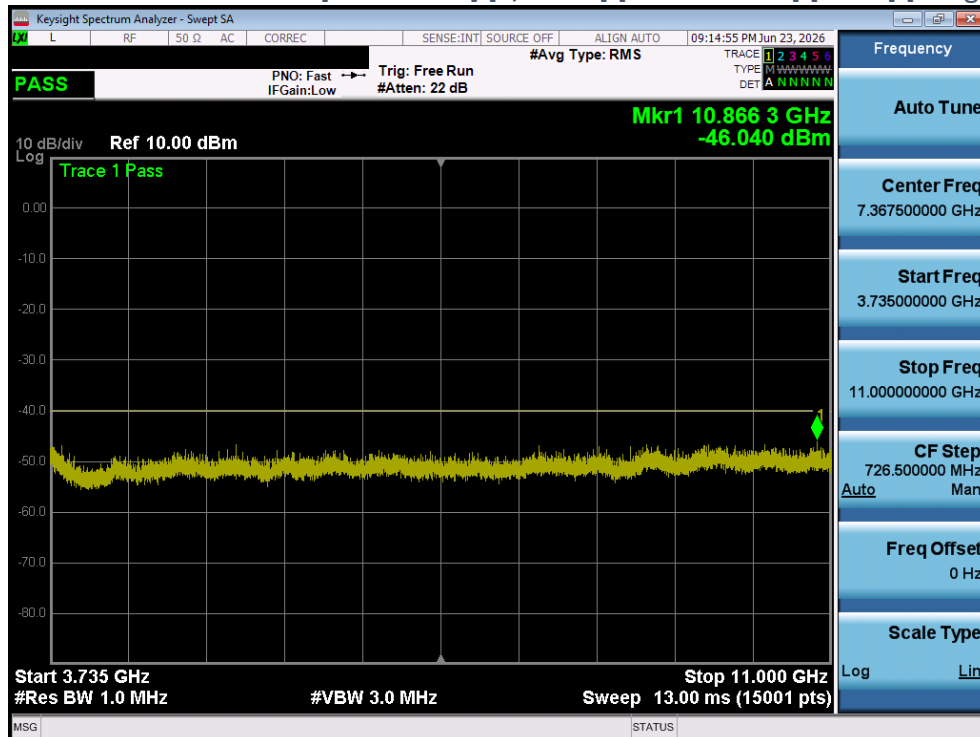
Plot 4-149 CSE Plot - LTE Band48 - [20+20MHz] [1/99 RB] [Low Channel] [QPSK] [Range D] [Ant 1]



Plot 4-150 CSE Plot - LTE Band48 - [20+20MHz] [1/99 RB] [Mid Channel] [QPSK] [Range A] [Ant 1]



Plot 4-151 CSE Plot - LTE Band48 - [20+20MHz] [1/99 RB] [Mid Channel] [QPSK] [Range B] [Ant 1]



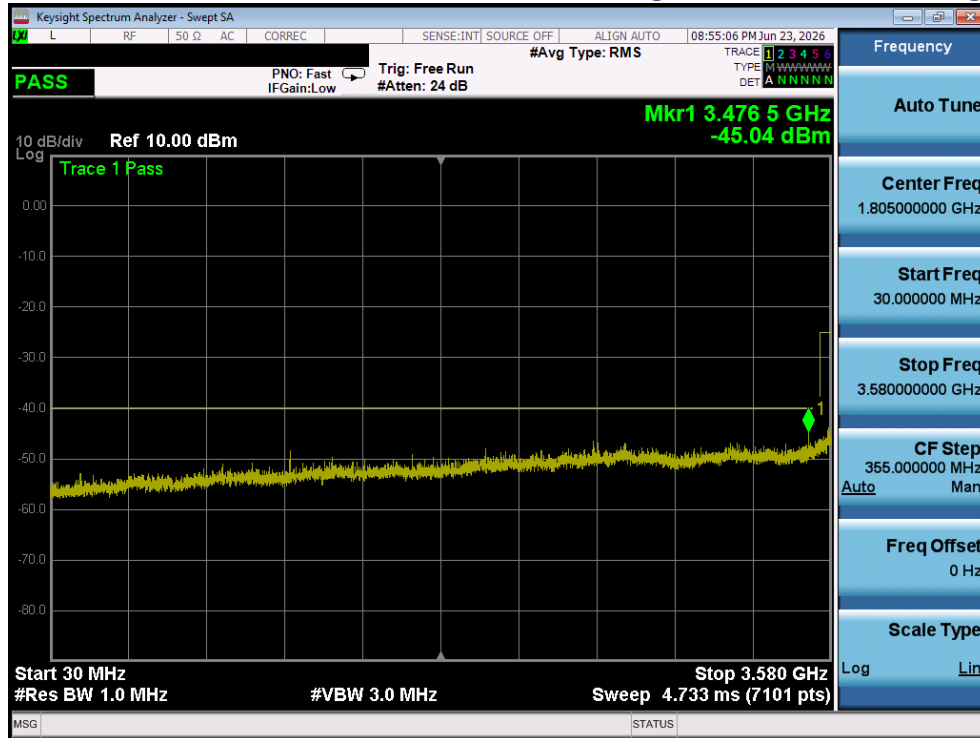
Plot 4-152 CSE Plot - LTE Band48 - [20+20MHz] [1/99 RB] [Mid Channel] [QPSK] [Range C] [Ant 1]



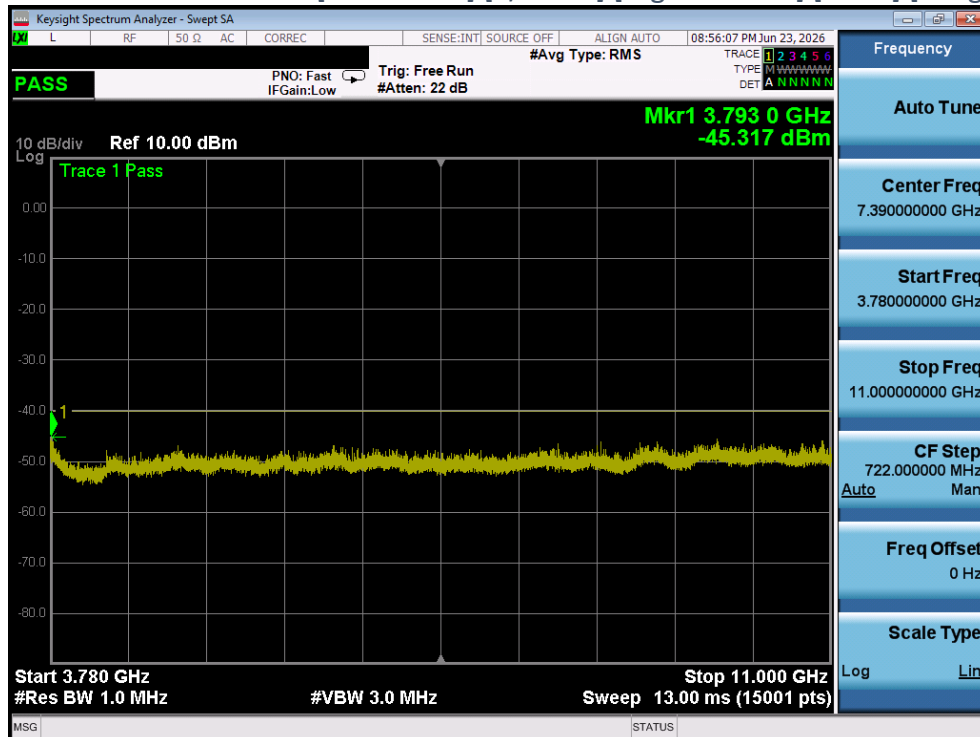
Plot 4-153 CSE Plot - LTE Band48 - [20+20MHz] [1/99 RB] [Mid Channel] [QPSK] [Range D] [Ant 1]



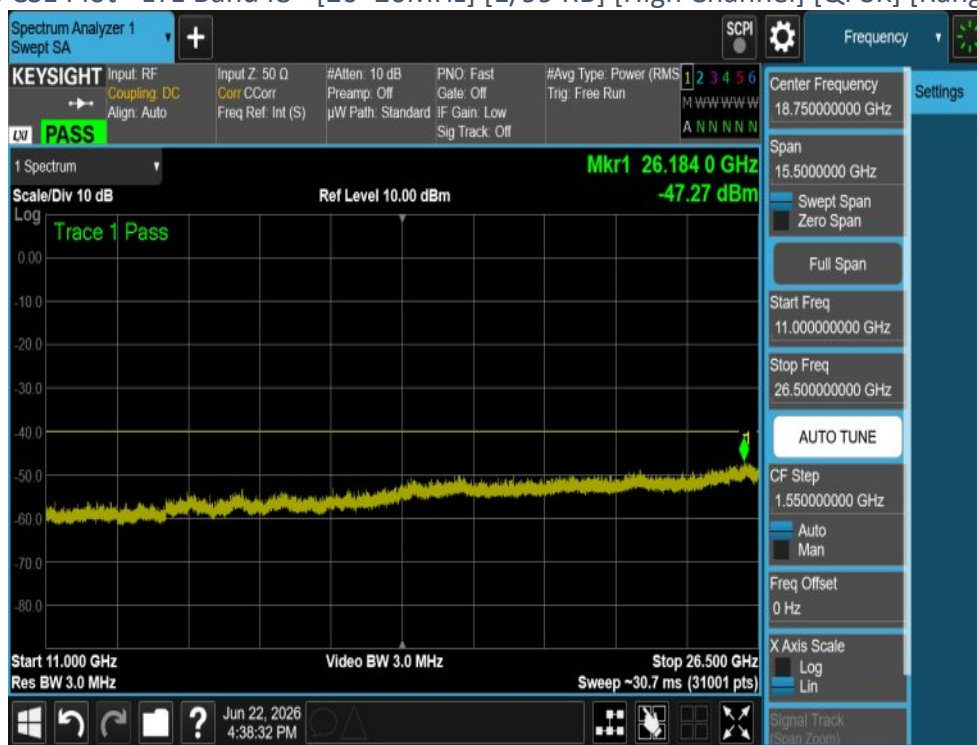
Plot 4-154 CSE Plot - LTE Band48 - [20+20MHz] [1/99 RB] [High Channel] [QPSK] [Range A] [Ant 1]



Plot 4-155 CSE Plot - LTE Band48 - [20+20MHz] [1/99 RB] [High Channel] [QPSK] [Range B] [Ant 1]



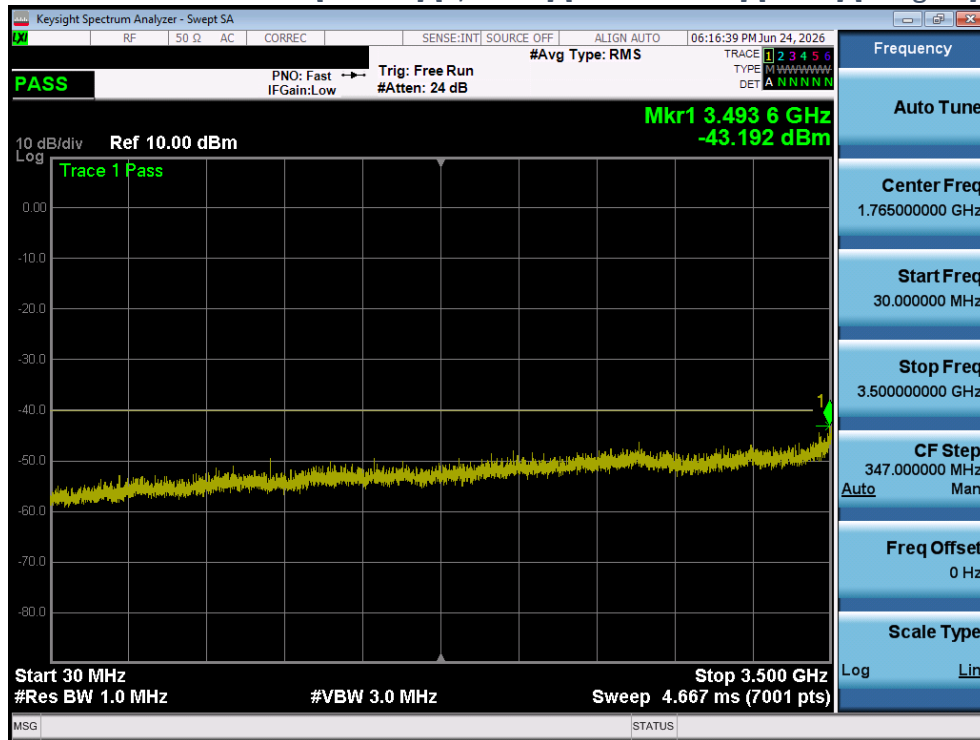
Plot 4-156 CSE Plot - LTE Band48 - [20+20MHz] [1/99 RB] [High Channel] [QPSK] [Range C] [Ant 1]



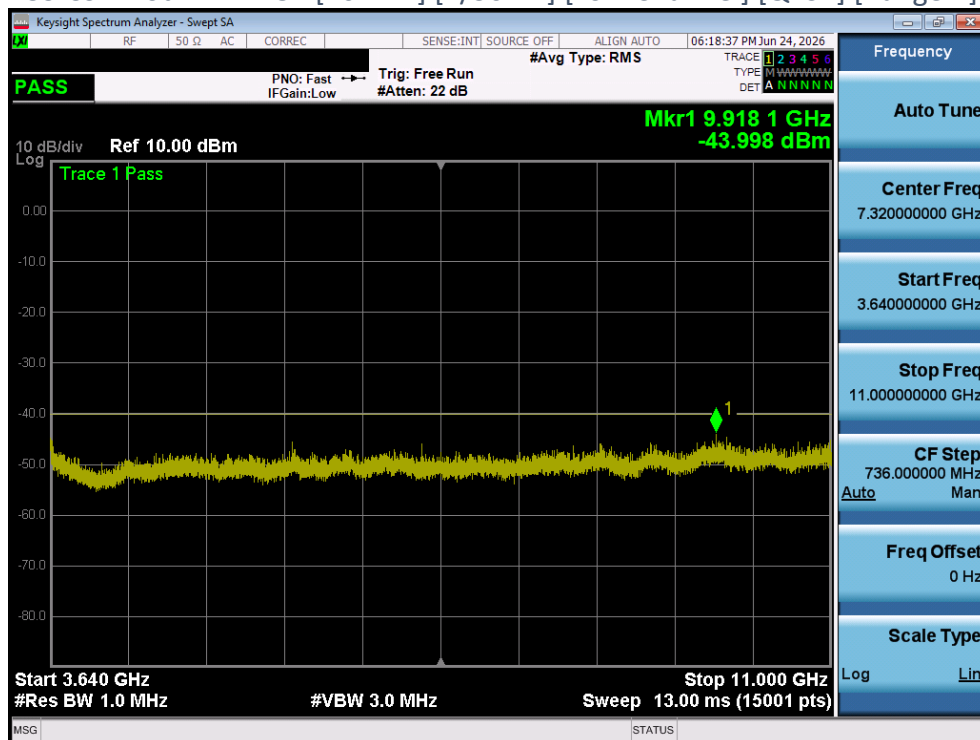
Plot 4-157 CSE Plot - LTE Band48 - [20+20MHz] [1/99 RB] [High Channel] [QPSK] [Range D] [Ant 1]



Plot 4-158 CSE Plot - NR n48 - [40MHz] [1/50 RB] [Low Channel] [QPSK] [Range A] [Ant 1]



Plot 4-159 CSE Plot - NR n48 - [40MHz] [1/50 RB] [Low Channel] [QPSK] [Range B] [Ant 1]



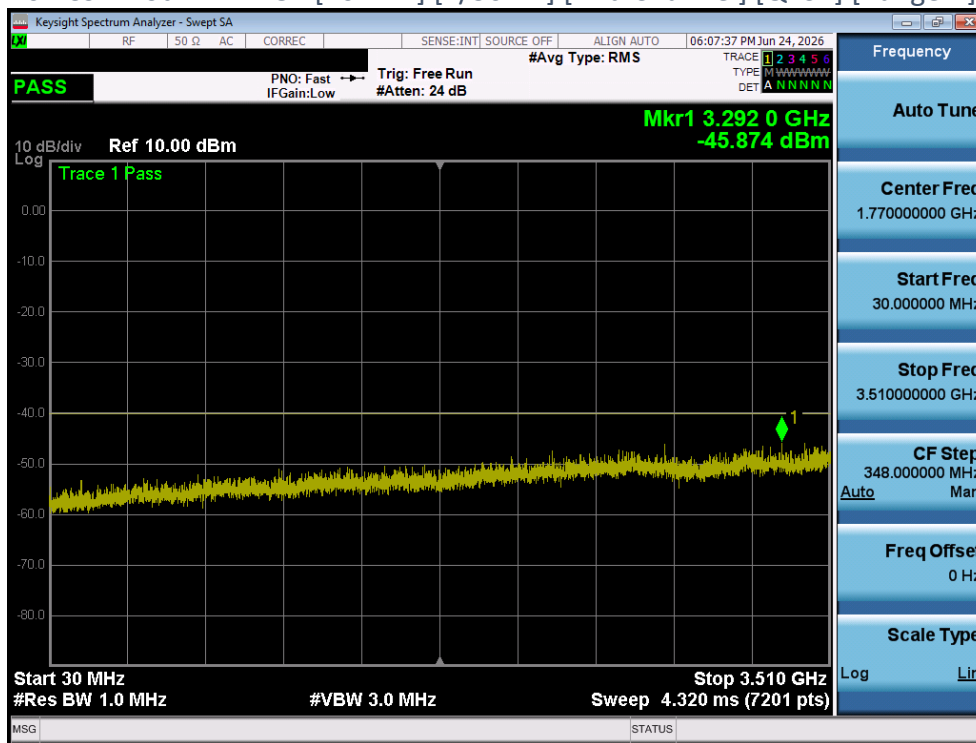
Plot 4-160 CSE Plot - NR n48 - [40MHz] [1/50 RB] [Low Channel] [QPSK] [Range C] [Ant 1]



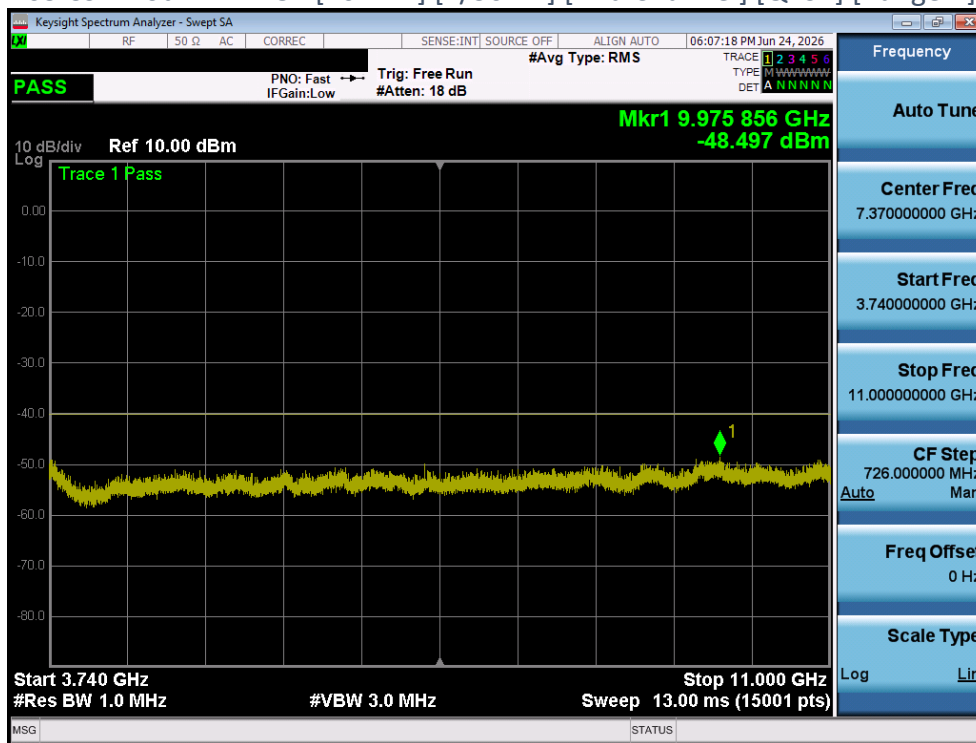
Plot 4-161 CSE Plot - NR n48 - [40MHz] [1/50 RB] [Low Channel] [QPSK] [Range D] [Ant 1]



Plot 4-162 CSE Plot - NR n48 - [40MHz] [1/50 RB] [Mid Channel] [QPSK] [Range A] [Ant 1]



Plot 4-163 CSE Plot - NR n48 - [40MHz] [1/50 RB] [Mid Channel] [QPSK] [Range B] [Ant 1]



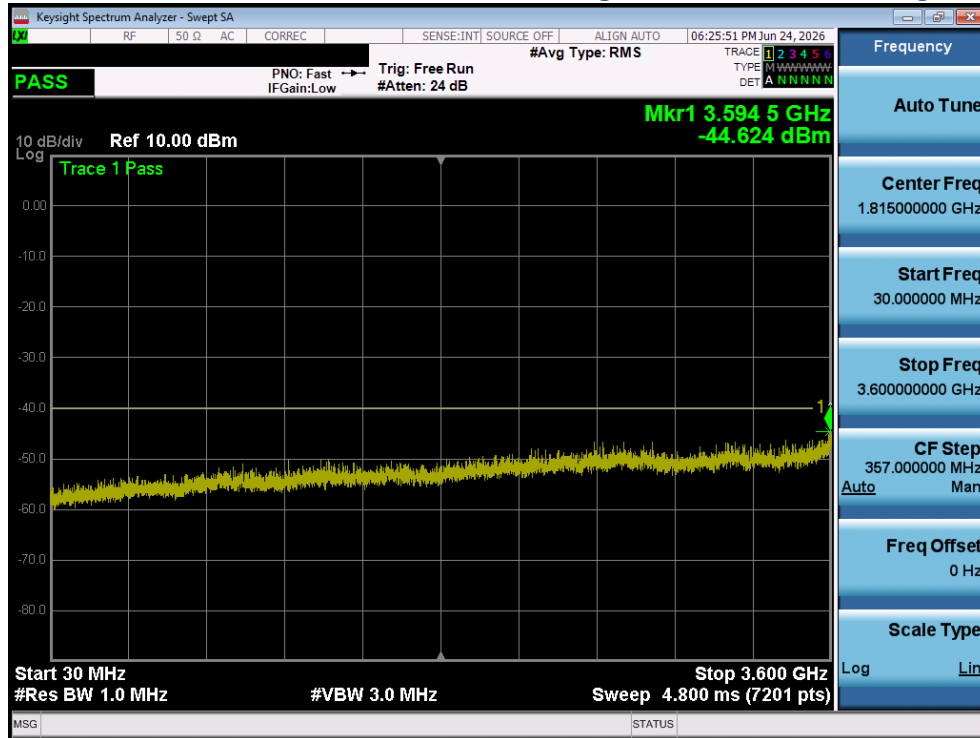
Plot 4-164 CSE Plot - NR n48 - [40MHz] [1/50 RB] [Mid Channel] [QPSK] [Range C] [Ant 1]



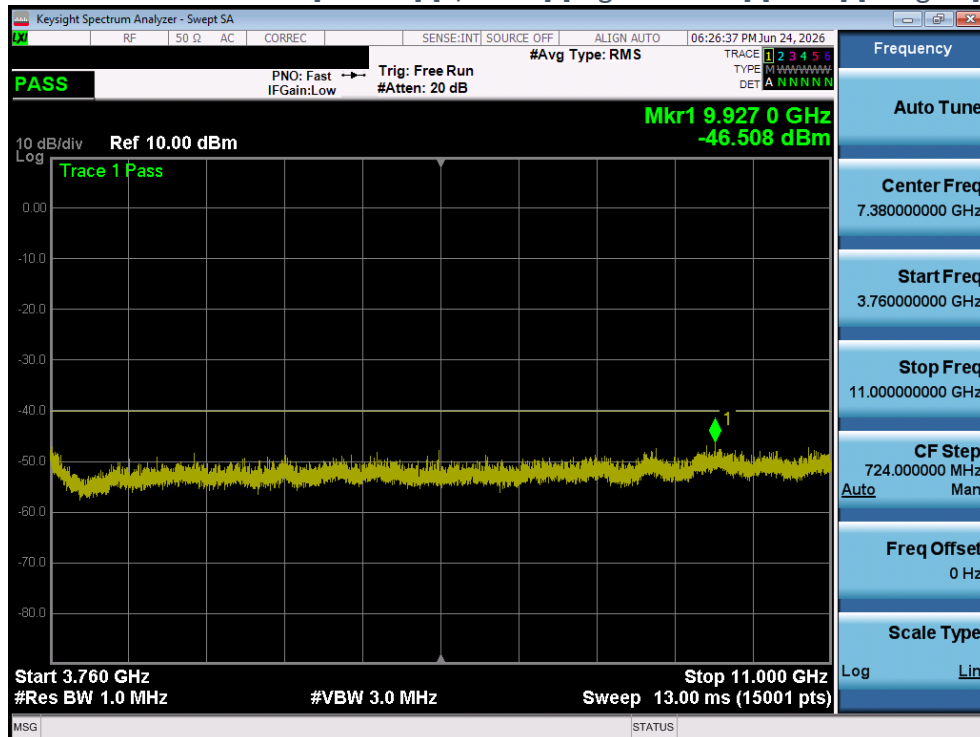
Plot 4-165 CSE Plot - NR n48 - [40MHz] [1/50 RB] [Mid Channel] [QPSK] [Range D] [Ant 1]



Plot 4-166 CSE Plot - NR n48 - [40MHz] [1/50 RB] [High Channel] [QPSK] [Range A] [Ant 1]



Plot 4-167 CSE Plot - NR n48 - [40MHz] [1/50 RB] [High Channel] [QPSK] [Range B] [Ant 1]



Plot 4-168 CSE Plot - NR n48 - [40MHz] [1/50 RB] [High Channel] [QPSK] [Range C] [Ant 1]



Plot 4-169 CSE Plot - NR n48 - [40MHz] [1/50 RB] [High Channel] [QPSK] [Range D] [Ant 1]



4.7. Frequency Stability

4.7.1. Regulatory Limits

§Part. 2.1055(a)

The frequency stability of the transmitter shall be measured while varying the ambient temperatures and supply voltages over the ranges specified in Section 2.1055.

4.7.2. Test Method

ANSI C63.26-2015, clause 5.6

4.7.3. Test Procedure

The frequency error function of the call simulator was used.

The procedure for this method is follows:

- a) Place the test sample (EUT) inside the temperature chamber
- b) Reference Measurement - Set the chamber to +20°C and wait until both the chamber and the EUT internal components are completely stabilized under the nominal voltage condition.
- c) Connect the dummy load provided by the client and perform the measurement at the battery operating end point voltage.
- d) High-Temperature - increase the chamber temperature to +50°C .
- e) Incremental Temperature - lower the chamber temperature in 10°C (+50°C ~ -30°C)

Test Note

- ✓ The supply voltage was varied using the dummy load provided by the customer, and the battery operating end point voltage was verified.
- ✓ Sufficient time was allowed for the EUT to stabilize under all temperature conditions.
- ✓ Frequency stability was evaluated at both the low and high operating channels to verify that the transmitter remains within the authorized frequency block across the operating frequency range.
- ✓ Nominal voltage – 3.89 VDC, Endpoint – 2.85 VDC

4.7.4. Test Results

Table 4-19 Frequency Stability Data – LTE Band 48

Band	Channel	Voltage Condition	Temp [°C]	Frequency [Hz]	Dev [Hz]	Dev [ppm]
LTE Band 48	Low	Nominal	+50	3,553,074,085	-15	-0.004
			+40	3,553,074,087	-13	-0.004
			+30	3,553,074,088	-12	-0.003
			+20	3,553,074,100	0	0.000
			+10	3,553,074,107	7	0.002
			0	3,553,074,107	7	0.002
			-10	3,553,074,109	9	0.003
			-20	3,553,074,112	12	0.003
			-30	3,553,074,107	7	0.002
		Endpoint	+20	3,553,074,106	6	0.002
	Channel	Voltage Condition	Temp [°C]	Frequency [Hz]	Dev [Hz]	Dev [ppm]
	High	Nominal	+50	3,698,714,305	5	0.001
			+40	3,698,714,309	9	0.003
			+30	3,698,714,311	11	0.003
			+20	3,698,714,300	0	0.000
			+10	3,698,714,285	-15	-0.004
			0	3,698,714,282	-18	-0.005
			-10	3,698,714,289	-11	-0.003
			-20	3,698,714,302	2	0.000
			-30	3,698,714,309	9	0.003
		Endpoint	+20	3,698,714,306	6	0.002

Table 4-20 Frequency Stability Data – NR n48

Band	Channel	Voltage Condition	Temp [°C]	Frequency [Hz]	Dev [Hz]	Dev [ppm]
NR n48	Low	Nominal	+50	3,551,085,089	-11	-0.003
			+40	3,551,085,088	-12	-0.003
			+30	3,551,085,082	-18	-0.005
			+20	3,551,085,100	0	0.000
			+10	3,551,085,115	15	0.004
			0	3,551,085,113	13	0.004
			-10	3,551,085,112	12	0.003
			-20	3,551,085,107	7	0.002
			-30	3,551,085,089	-11	-0.003
		Endpoint	+20	3,551,085,086	-14	-0.004
	Channel	Voltage Condition	Temp [°C]	Frequency [Hz]	Dev [Hz]	Dev [ppm]
	High	Nominal	+50	3,696,745,500	9	0.003
			+40	3,696,752,700	5	0.001
			+30	3,696,742,300	7	0.002
			+20	3,696,724,500	0	0.000
			+10	3,696,758,300	-1	0.000
			0	3,696,776,600	-6	-0.002
			-10	3,696,707,000	-12	-0.003
			-20	3,696,746,800	-9	-0.002
			-30	3,696,787,100	-18	-0.005
		Endpoint	+20	3,696,771,500	-14	-0.004

5. Radiated Test Results

5.1. Test Configuration

Radiated Test Facilities & Setup

Radiated emissions testing was conducted in an indoor 3-meter semi-anechoic chamber (SAC). For all frequency ranges, the turntable was rotated 360° and the receive antenna height was varied from 1 m to 4 m to maximize emissions. The specific test setups and calibrated, linearly polarized antennas utilized are as follows:

- 9 kHz to 30 MHz : DUT height at 0.8 m / Active Loop Antenna
- 30 MHz to 1 GHz : DUT height at 0.8 m / No floor absorbers / Broadband Bi-log Antenna
- 1 GHz to 18 GHz : DUT height at 1.5 m / Floor absorbers deployed / Broadband Double-Ridge Horn Antenna
- Above 18 GHz : DUT height at 1.5 m / Floor absorbers deployed / Standard Gain Horn Antenna

Test Orientations

The DUT was investigated in three orthogonal orientations (X, Y, and Z) for each band. Since the equipment transmits below 10 GHz, Radiated Spurious Emissions testing was performed from 9 kHz up to the lower of the tenth harmonic of the highest fundamental frequency or 40 GHz. Testing from 1 GHz to 18 GHz was performed on the low, mid, and high channels. Testing below 1 GHz and above 18 GHz was conducted only under the worst-case configuration. In accordance with ANSI C63.26, measurement results for the 9 kHz to 30 MHz range and frequencies above 18 GHz are included in the report only when emissions are detected within 20 dB of the applicable limit.

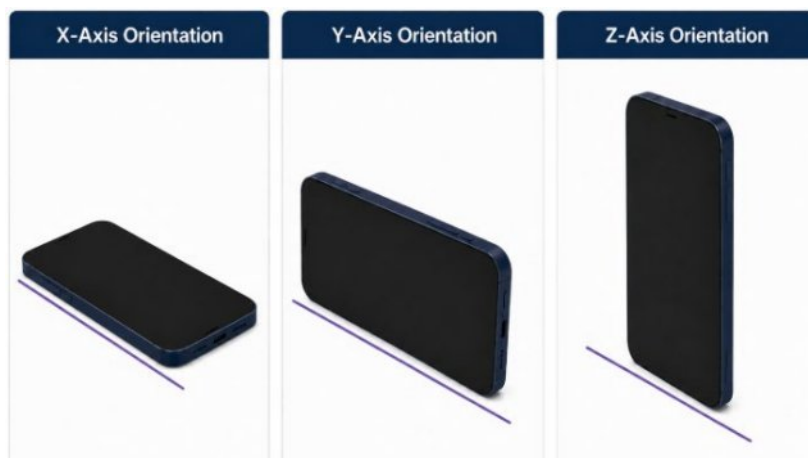


Figure 5-1 Three orthogonal orientations.

Radiated emissions were captured using automated test software 'NGTL ATE' Ver. 0.00.

5.2. Radiated Measurement Setup

Figure 5-2 Radiated Measurement Setup Below 30 MHz

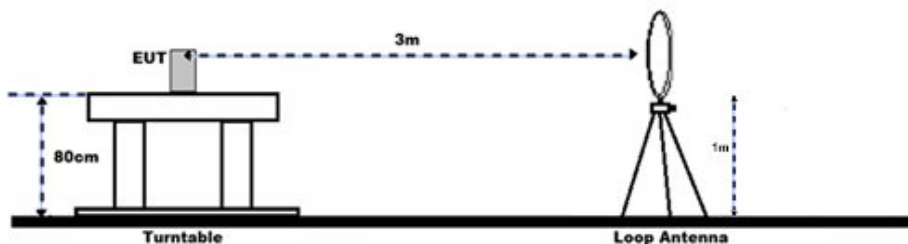


Figure 5-3 Radiated Measurement Setup Below 1GHz

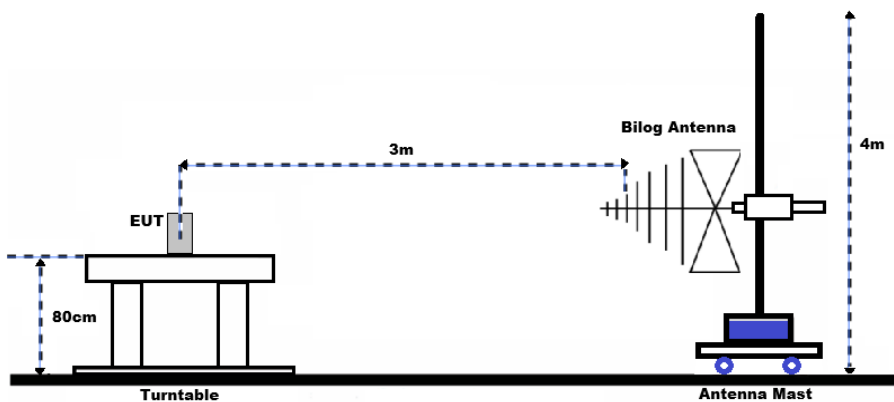
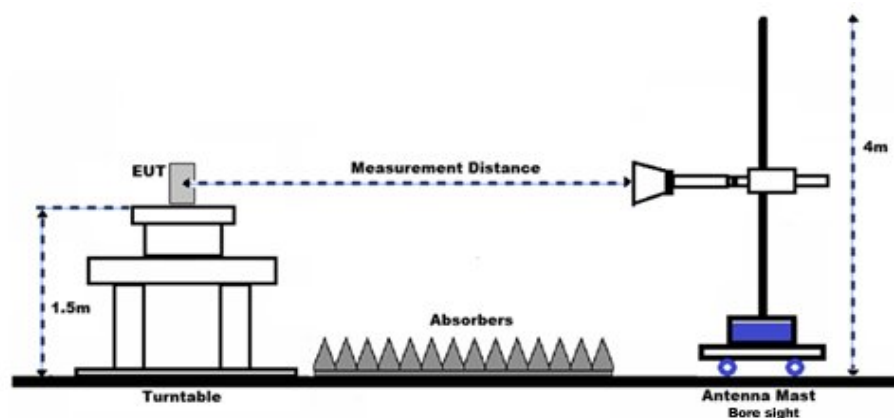


Figure 5-4 Radiated Measurement Setup Above 1GHz



5.3. Radiated Measurement Sample

Serial Number(s) :

ZF50735M, ZEE0154M, ZDR0217M

5.4. Radiated Power

5.4.1. Regulatory Limit

§ Part 96.41(b)

The maximum EIRP for the End User Device shall not exceed 23 dBm / 10 MHz.

5.4.2. Test Method

ANSI C63.26 – 2015, clause 5.2.4.2

5.4.3. Test Procedure

The procedure for Average measurement is follows:

- a) Connect the power sensor to the EMI receiver, and then perform zeroing and calibration.
- b) Connect the DUT to a wideband gated RF power sensor.
- c) Configure the DUT to transmit at its maximum power control level.
- d) Record the maximum power level
- e) When the burst duty cycle is below 98%, a trigger/gate is utilized to ensure power is measured only during active full-power transmission bursts.

Test Note

- ✓ For this test, substitution measurements were performed in a 3m semi-anechoic chamber that meets both normalized site attenuation (NSA) and SVWSR requirements.
- ✓ For the test in this section, a power sensor was connected to the EMI receiver. Signal maximizing was performed using the receiver, while the power measurement was conducted using the sensor. A splitter was placed at the input of the receiver to distribute the signal to both the receiver and the sensor, and the resulting loss was compensated as an offset in the power sensor.

5.4.4. Test Results

Table 5-1 Effective Isotropic Radiated Power (EIRP) Data – LTE Band 48 ANT 1

BW [MHz]	Modulation	Ant. Pol.	Antenna Height [m]	Turntable Azimuth [deg °]	RB Size	RB Offset	Frequency [MHz] / Earfcn / EIRP [dBm/10MHz]			Limit [dBm/10MHz]	Margin at Max Power [dB]
							3560	3625	3690		
							55340	55990	56640		
20	QPSK	H	1.16	46	1	0	21.17	20.96	21.29	23	-1.71
		H	1.19	46	1	50	20.88	20.98	21.16		-1.84
		H	1.18	44	1	99	20.96	20.78	21.17		-1.83
		H	1.15	48	100	0	20.53	20.47	20.76		-2.24
	16QAM	H	1.16	46	1	0	20.21	20.44	20.68		-2.32
		H	1.19	46	1	50	20.40	20.75	20.78		-2.22
		H	1.18	44	1	99	20.38	20.34	20.35		-2.62
		H	1.15	48	100	0	19.55	19.43	19.69		-3.31
BW [MHz]	Modulation	Ant. Pol.	Antenna Height [m]	Turntable Azimuth [deg °]	RB Size	RB Offset	Frequency [MHz] / Earfcn / EIRP [dBm/10MHz]			Limit [dBm/10MHz]	Margin at Max Power [dB]
							3557.5	3625	3692.5		
							55315	55990	56665		
15	QPSK	H	1.16	46	1	0	21.14	20.78	21.11	23	-1.86
		H	1.19	46	1	36	20.82	20.79	21.19		-1.81
		H	1.18	44	1	74	20.77	20.69	21.13		-1.87
		H	1.15	48	75	0	20.48	20.41	20.55		-2.45
	16QAM	H	1.16	46	1	0	20.01	20.20	20.74		-2.26
		H	1.19	46	1	36	20.19	20.48	20.95		-2.05
		H	1.18	44	1	74	20.25	20.10	20.47		-2.53
		H	1.15	48	75	0	19.56	19.40	19.50		-3.44
BW [MHz]	Modulation	Ant. Pol.	Antenna Height [m]	Turntable Azimuth [deg °]	RB Size	RB Offset	Frequency [MHz] / Earfcn / EIRP [dBm/10MHz]			Limit [dBm/10MHz]	Margin at Max Power [dB]
							3555	3625	3695		
							55290	55990	56690		
10	QPSK	H	1.16	46	1	0	21.19	20.77	21.25	23	-1.75
		H	1.19	46	1	25	20.97	20.97	20.96		-2.03
		H	1.18	44	1	49	20.71	20.76	21.08		-1.92
		H	1.15	48	50	0	20.66	20.48	20.64		-2.34
	16QAM	H	1.16	46	1	0	20.17	20.28	20.70		-2.30
		H	1.19	46	1	25	20.63	20.51	20.68		-2.32
		H	1.18	44	1	49	20.38	20.23	20.52		-2.48
		H	1.15	48	50	0	19.74	19.51	19.60		-3.26
BW [MHz]	Modulation	Ant. Pol.	Antenna Height [m]	Turntable Azimuth [deg °]	RB Size	RB Offset	Frequency [MHz] / Earfcn / EIRP [dBm/10MHz]			Limit [dBm/10MHz]	Margin at Max Power [dB]
							3552.5	3625	3697.5		
							55265	55990	56715		
5	QPSK	H	1.16	46	1	0	21.11	20.86	20.96	23	-1.89
		H	1.19	46	1	12	20.90	20.95	20.91		-2.05
		H	1.18	44	1	24	20.80	20.61	21.14		-1.86
		H	1.15	48	25	0	20.63	20.48	20.56		-2.37
	16QAM	H	1.16	46	1	0	20.30	20.46	20.75		-2.25
		H	1.19	46	1	12	20.79	20.91	20.62		-2.09
		H	1.18	44	1	24	20.54	20.24	20.34		-2.46
		H	1.15	48	25	0	19.71	19.48	19.50		-3.29

Table 5-2 Effective Isotropic Radiated Power (EIRP) Data – LTE Band 48 ULCA ANT 1

BW [MHz]	Modulation	Ant. Pol.	Antenna Height [m]	Turntable Azimuth [deg °]	RB Size / RB Offset	RB Size / RB Offset	Frequency [MHz] / Earfcn / EIRP [dBm/10MHz]			Limit [dBm/10MHz]	Margin at Max Power [dB]
							3560+3579.8	3625+3644.8	3670.2+3690		
							55340+55538	55990+56188	56442+56640		
20+20	QPSK	H	1.16	46	1 / 99	1 / 0	16.69	16.89	16.57	23	-6.11
		H	1.15	48	100 / 0	100 / 0	10.23	10.25	10.14		-12.75
	16QAM	H	1.16	46	1 / 99	1 / 0	16.02	15.97	15.75		-6.98
		H	1.15	48	100 / 0	100 / 0	9.84	9.82	9.69		-13.16
BW [MHz]	Modulation	Ant. Pol.	Antenna Height [m]	Turntable Azimuth [deg °]	RB Size	RB Offset	Frequency [MHz] / Earfcn / EIRP [dBm/10MHz]			Limit [dBm/10MHz]	Margin at Max Power [dB]
							3557.5+3574.6	3625+3642.1	3672.9+3690		
							55315+55486	55990+56161	56469+56640		
15+20	QPSK	H	1.16	46	1 / 74	1 / 0	16.61	16.26	16.36	23	-6.39
		H	1.15	48	75 / 0	100 / 0	9.98	10.17	10.03		-12.83
	16QAM	H	1.16	46	1 / 74	1 / 0	16.09	15.59	15.70		-6.91
		H	1.15	48	75 / 0	100 / 0	9.71	9.83	9.57		-13.17
BW [MHz]	Modulation	Ant. Pol.	Antenna Height [m]	Turntable Azimuth [deg °]	RB Size	RB Offset	Frequency [MHz] / Earfcn / EIRP [dBm/10MHz]			Limit [dBm/10MHz]	Margin at Max Power [dB]
							3555+3569.4	3625+3639.4	3675.6+3690		
							55290+55434	55990+56134	56496+56640		
10+20	QPSK	H	1.16	46	1 / 50	1 / 0	16.23	16.13	15.72	23	-6.77
		H	1.15	48	50 / 0	100 / 0	9.97	10.11	9.90		-12.89
	16QAM	H	1.16	46	1 / 50	1 / 0	15.98	15.55	15.06		-7.02
		H	1.15	48	50 / 0	100 / 0	9.70	9.89	9.54		-13.11
BW [MHz]	Modulation	Ant. Pol.	Antenna Height [m]	Turntable Azimuth [deg °]	RB Size	RB Offset	Frequency [MHz] / Earfcn / EIRP [dBm/10MHz]			Limit [dBm/10MHz]	Margin at Max Power [dB]
							3552.5+3564.2	3625+3636.7	3678.3+3690		
							55265+55382	55990+56107	56523+56640		
5+20	QPSK	H	1.16	46	1 / 25	1 / 0	16.78	16.48	15.85	23	-6.22
		H	1.15	48	25 / 0	100 / 0	9.93	9.84	9.84		-13.07
	16QAM	H	1.16	46	1 / 25	1 / 0	16.50	15.84	15.27		-6.50
		H	1.15	48	25 / 0	100 / 0	9.58	9.62	9.48		-13.38

Table 5-3 Effective Isotropic Radiated Power (EIRP) Data – NR n48 ANT 1

BW [MHz]	Modulation	Ant. Pol.	Antenna Height [m]	Turntable Azimuth [deg °]	Frequency [MHz]		3570	3625	3680	Limit [dBm/10MHz]	Margin at Max Power [dB]
					NR-Arfcn UL		638000	641666	645332		
					RB Size	RB Offset	EIRP [dBm/10MHz]				
40	BPSK	H	1.11	46	1	1	20.51	20.57	21.19	23	-1.81
		H	1.13	46	1	50	20.35	20.85	21.17		-1.83
		H	1.17	44	1	104	20.44	20.65	20.83		-2.17
		H	1.16	48	100	0	20.43	20.55	21.07		-1.93
	QPSK	H	1.11	46	1	1	20.38	20.50	21.08		-1.92
		H	1.13	46	1	50	20.31	20.65	21.17		-1.83
		H	1.17	44	1	104	20.37	20.72	20.94		-2.06
		H	1.16	48	100	0	20.39	20.56	20.84		-2.16
	16QAM	H	1.11	46	1	1	20.48	20.07	20.84		-2.16
		H	1.13	46	1	50	20.42	20.76	21.05		-1.95
		H	1.17	44	1	104	20.04	20.72	20.98		-2.02
		H	1.16	48	100	0	19.41	19.55	20.15		-2.85
BW [MHz]	Modulation	Ant. Pol.	Antenna Height [m]	Turntable Azimuth [deg °]	Frequency [MHz]		3565	3625	3685	Limit [dBm/10MHz]	Margin at Max Power [dB]
					NR-Arfcn UL		637666	641666	645666		
					RB Size	RB Offset	EIRP [dBm/10MHz]				
30	BPSK	H	1.11	46	1	1	20.58	20.47	21.15	23	-1.85
		H	1.13	46	1	36	20.32	20.96	21.14		-1.86
		H	1.17	44	1	76	20.79	20.41	20.60		-2.21
		H	1.16	48	75	0	20.44	20.51	21.09		-1.91
	QPSK	H	1.11	46	1	1	20.54	20.40	21.05		-1.95
		H	1.13	46	1	36	20.31	20.55	21.13		-1.87
		H	1.17	44	1	76	20.64	20.69	20.83		-2.17
		H	1.16	48	75	0	20.31	20.55	20.81		-2.19
	16QAM	H	1.11	46	1	1	20.32	20.21	20.74		-2.26
		H	1.13	46	1	36	20.36	20.97	21.00		-2.00
		H	1.17	44	1	76	20.26	20.49	20.89		-2.11
		H	1.16	48	75	0	19.24	19.62	20.15		-2.85
BW [MHz]	Modulation	Ant. Pol.	Antenna Height [m]	Turntable Azimuth [deg °]	Frequency [MHz]		3560	3625	3690	Limit [dBm/10MHz]	Margin at Max Power [dB]
					NR-Arfcn UL		637334	641666	646000		
					RB Size	RB Offset	EIRP [dBm/10MHz]				
20	BPSK	H	1.11	46	1	1	20.54	20.05	21.01	23	-1.99
		H	1.13	46	1	25	20.13	20.41	20.88		-2.12
		H	1.17	44	1	49	20.61	20.28	20.25		-2.39
		H	1.16	48	50	0	20.23	20.30	20.84		-2.16
	QPSK	H	1.11	46	1	1	20.44	20.10	20.95		-2.05
		H	1.13	46	1	25	20.08	20.35	20.98		-2.02
		H	1.17	44	1	49	20.47	20.48	20.59		-2.41
		H	1.16	48	50	0	20.15	20.34	20.52		-2.48
	16QAM	H	1.11	46	1	1	20.32	19.55	20.57		-2.43
		H	1.13	46	1	25	20.12	20.68	21.02		-1.98
		H	1.17	44	1	49	20.07	20.09	20.66		-2.34
		H	1.16	48	50	0	19.12	19.37	19.86		-3.14
BW [MHz]	Modulation	Ant. Pol.	Antenna Height [m]	Turntable Azimuth [deg °]	Frequency [MHz]		3557.5	3625	3692.5	Limit [dBm/10MHz]	Margin at Max Power [dB]
					NR-Arfcn UL		637166	641666	646166		
					RB Size	RB Offset	EIRP [dBm/10MHz]				
15	BPSK	H	1.11	46	1	1	20.42	20.05	21.17	23	-1.83
		H	1.13	46	1	18	20.09	20.56	20.94		-2.06
		H	1.17	44	1	36	20.45	20.20	20.38		-2.55
		H	1.16	48	36	0	20.20	20.30	20.90		-2.10
	QPSK	H	1.11	46	1	1	20.32	19.96	21.09		-1.91
		H	1.13	46	1	18	20.05	20.29	21.02		-1.98
		H	1.17	44	1	36	20.36	20.43	20.63		-2.37
		H	1.16	48	36	0	20.13	20.41	20.56		-2.44
	16QAM	H	1.11	46	1	1	20.30	19.47	20.75		-2.25
		H	1.13	46	1	18	20.12	20.67	21.10		-1.90
		H	1.17	44	1	36	19.91	20.26	20.83		-2.17
		H	1.16	48	36	0	19.09	19.38	19.92		-3.08
BW [MHz]	Modulation	Ant. Pol.	Antenna Height [m]	Turntable Azimuth [deg °]	Frequency [MHz]		3555	3625	3695	Limit [dBm/10MHz]	Margin at Max Power [dB]
					NR-Arfcn UL		637000	641666	646332		
					RB Size	RB Offset	EIRP [dBm/10MHz]				
10	BPSK	H	1.11	46	1	1	20.46	19.99	20.83	23	-2.17
		H	1.13	46	1	18	20.15	20.54	20.62		-2.38
		H	1.17	44	1	36	20.28	20.04	20.03		-2.72
		H	1.16	48	36	0	20.17	20.01	20.49		-2.51
	QPSK	H	1.11	46	1	1	20.36	19.97	20.72		-2.28
		H	1.13	46	1	18	20.02	20.22	20.63		-2.37
		H	1.17	44	1	36	20.20	20.25	20.39		-2.61
		H	1.16	48	36	0	20.12	20.12	20.19		-2.81
	16QAM	H	1.11	46	1	1	20.32	19.53	20.52		-2.48
		H	1.13	46	1	18	20.09	20.47	20.58		-2.42
		H	1.17	44	1	36	19.82	20.19	20.44		-2.56
		H	1.16	48	36	0	19.07	19.15	19.52		-3.48

Table 5-4 Effective Isotropic Radiated Power (EIRP) Data – NR n48 SRS 1

BW [MHz]	Modulation	Ant. Pol.	Antenna Height [m]	Turntable Azimuth [deg °]	Frequency [MHz]		3570	3625	3680	Limit [dBm/10MHz]	Margin at Max Power [dB]
					NR-Arfcn UL		638000	641666	645332		
					RB Size	RB Offset	EIRP [dBm/10MHz]				
40	BPSK	H	1.05	128	1	1	20.84	20.54	20.59	23	-2.16
		H	1.05	123	1	50	20.83	20.57	19.76		-2.17
		H	1.06	127	1	104	20.80	20.80	19.81		-2.20
		H	1.07	124	100	0	20.85	20.45	19.96		-2.15
	QPSK	H	1.05	128	1	1	20.85	20.59	20.58		-2.15
		H	1.05	123	1	50	20.80	20.52	19.71		-2.20
		H	1.06	127	1	104	20.83	20.77	19.85		-2.17
		H	1.07	124	100	0	20.84	20.53	19.96		-2.16
	16QAM	H	1.05	128	1	1	20.77	20.28	20.37		-2.23
		H	1.05	123	1	50	20.66	20.25	19.55		-2.34
		H	1.06	127	1	104	20.63	20.57	19.61		-2.37
		H	1.07	124	100	0	20.75	20.16	19.69		-2.25

Table 5-5 Effective Isotropic Radiated Power (EIRP) Data – NR n48 SRS 2

BW [MHz]	Modulation	Ant. Pol.	Antenna Height [m]	Turntable Azimuth [deg °]	Frequency [MHz]		3570	3625	3680	Limit [dBm/10MHz]	Margin at Max Power [dB]
					NR-Arfcn UL		638000	641666	645332		
					RB Size	RB Offset	EIRP [dBm/10MHz]				
40	BPSK	H	2.24	137	1	1	14.02	14.71	16.24	23	-6.76
		H	2.22	140	1	50	14.46	14.98	16.25		-6.75
		H	2.33	138	1	104	14.34	15.42	16.08		-6.92
		H	2.27	136	100	0	14.31	14.95	16.24		-6.76
	QPSK	H	2.24	137	1	1	14.04	14.67	16.22		-6.78
		H	2.22	140	1	50	14.44	14.93	16.28		-6.72
		H	2.33	138	1	104	14.32	15.38	16.09		-6.91
		H	2.27	136	100	0	14.32	14.86	16.19		-6.81
	16QAM	H	2.24	137	1	1	14.12	14.75	16.10		-6.90
		H	2.22	140	1	50	14.60	15.10	16.11		-6.89
		H	2.33	138	1	104	14.39	15.45	15.97		-7.03
		H	2.27	136	100	0	14.25	14.86	16.00		-7.00

Table 5-6 Effective Isotropic Radiated Power (EIRP) Data – NR n48 SRS 3

BW [MHz]	Modulation	Ant. Pol.	Antenna Height [m]	Turntable Azimuth [deg °]	Frequency [MHz]		3570	3625	3680	Limit [dBm/10MHz]	Margin at Max Power [dB]
					NR-Arfcn UL		638000	641666	645332		
					RB Size	RB Offset	EIRP [dBm/10MHz]				
40	BPSK	V	1.11	180	1	1	12.23	12.90	14.80	23	-8.20
		V	1.18	185	1	50	12.79	12.92	14.55		-8.45
		V	1.31	183	1	104	12.60	12.83	14.73		-8.27
		V	1.26	181	100	0	12.54	12.98	14.68		-8.32
	QPSK	V	1.11	180	1	1	12.25	12.93	14.78		-8.22
		V	1.18	185	1	50	12.79	12.94	14.59		-8.41
		V	1.31	183	1	104	12.58	13.84	14.74		-8.26
		V	1.26	181	100	0	12.58	12.96	14.64		-8.36
	16QAM	V	1.11	180	1	1	12.32	12.97	14.58		-8.42
		V	1.18	185	1	50	12.84	12.95	14.35		-8.65
		V	1.31	183	1	104	12.63	13.86	14.48		-8.52
		V	1.26	181	100	0	12.56	12.95	14.34		-8.66

5.5. Radiated Spurious Emissions

5.5.1. Regulatory Limit

§ Part 96.41(e)

Radiated unwanted emissions shall not exceed -40 dBm/MHz

5.5.2. Test Method

ANSI C63.26 – 2015, clause 5.5.4

5.5.3. Test Procedure

The procedure for this method is follows:

- a) Set RBW = 1 MHz
100 kHz if the authorized frequency band/block is at or below 1 GHz
1 MHz if the authorized frequency band/block is above 1 GHz
- b) Set the VBW $\geq 3 \times$ RBW.
- c) Detector = RMS.
- d) Trace mode = Average.
- e) Set Number of points Sweep $\geq 2 \times$ (span / RBW)

5.5.4. Sample Calculation

Where relevant, the following sample calculation is provided:

$E \text{ (dB } \mu\text{V/m)} = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}.$

$\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8;$

where D is the measurement distance (in the far field region) in m.

Test Note

- ✓ The DUT incorporates an integral antenna, and testing was performed in a radiated configuration
- ✓ Radiated Unwanted emissions were measured using the direct radiated field strength method on a validated test site in accordance with the requirements of ANSI C63.4.
- ✓ The EUT was oriented in three orthogonal axes (X, Y, and Z), and only the worst-case emissions are reported.
- ✓ In accordance with ANSI C63.26 Section 5.5.2.5, a pre-scan was performed, and the final compliance tests were conducted using the designated detector at the worst-case parameters.

5.5.5. Test Results

Plot 5-1 RSE Below 1GHz PLOT – [LTE Band 48] [20MHz] [1/50RB] [Mid Channel] [QPSK] [ANT 1]

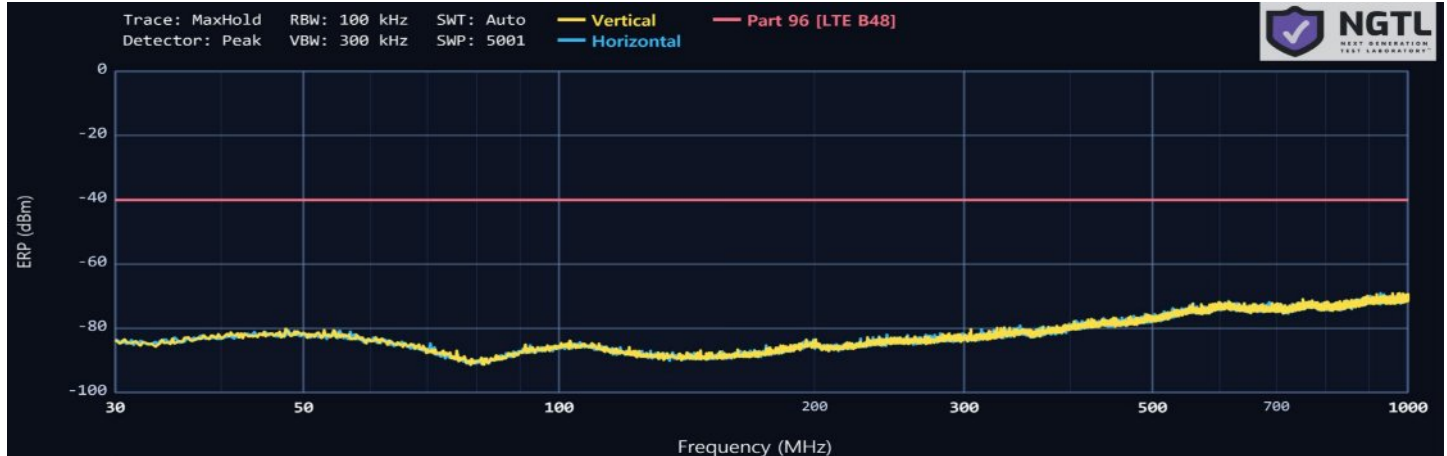


Table 5-7 Radiated Spurious Emissions Below 1GHz DATA – LTE Band 48 ANT 1

Test mode	Tested Frequency [MHz]	Frequency [MHz]	Reading Value [dBuV]	Pol [H/V]	Detector Mode	AFCL [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
LTE Band 48 ANT 1	3625.0	959.43	54.93	H	PK	-21.59	-61.86	-40.00	-21.86
		941.08	55.27	V	PK	-21.02	-60.95	-40.00	-20.95

Table 5-8 Radiated Spurious Emissions Below 1GHz DATA – LTE Band 48 ULCA ANT 1

Test mode	Tested Frequency [MHz]	Frequency [MHz]	Reading Value [dBuV]	Pol [H/V]	Detector Mode	AFCL [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
LTE Band 48 ANT 1 ULCA	3625+3644.8	959.73	54.77	H	PK	-21.59	-62.02	-40.00	-22.02
		962.51	53.28	V	PK	-21.65	-63.57	-40.00	-23.57

Table 5-9 Radiated Spurious Emissions Below 1GHz DATA – NR n48 ANT 1

Test mode	Tested Frequency [MHz]	Frequency [MHz]	Reading Value [dBuV]	Pol [H/V]	Detector Mode	AFCL [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
NR n48 ANT 1	3625.0	978.04	54.91	H	PK	-20.66	-60.95	-40.00	-20.95
		976.94	54.86	v	PK	-20.69	-61.03	-40.00	-21.03