



Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position M





Configuration A

Maximum Output Power 22 dBm / Port.

Antenna	Modulation	Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position T		
			PAR (dB)	Average Power	
			dBm	dBm/MHz	
A	LTE: QPSK	5.0 MHz	9.17	20.12	14.66
B	LTE: QPSK	5.0 MHz	-	20.18	14.66
C	LTE: QPSK	5.0 MHz	-	19.74	14.66
D	LTE: QPSK	5.0 MHz	-	20.13	14.66
Total			-	26.07	20.68
A	LTE: QPSK	10.0 MHz	9.35	20.14	11.82
B	LTE: QPSK	10.0 MHz	-	20.11	11.82
C	LTE: QPSK	10.0 MHz	-	19.69	11.82
D	LTE: QPSK	10.0 MHz	-	20.00	11.82
Total			-	26.01	17.84
A	LTE: QPSK	15.0 MHz	9.55	20.22	10.21
B	LTE: QPSK	15.0 MHz	-	20.26	10.21
C	LTE: QPSK	15.0 MHz	-	19.67	10.21
D	LTE: QPSK	15.0 MHz	-	20.12	10.21
Total			-	26.09	16.23
A	LTE: QPSK	20.0 MHz	9.44	20.37	9.05
B	LTE: QPSK	20.0 MHz	-	20.39	9.05
C	LTE: QPSK	20.0 MHz	-	19.79	9.05
D	LTE: QPSK	20.0 MHz	-	20.23	9.05
Total			-	26.22	15.07
A	NR: QPSK	5.0 MHz	9.33	20.63	15.43
B	NR: QPSK	5.0 MHz	-	20.69	15.43
C	NR: QPSK	5.0 MHz	-	20.31	15.43
D	NR: QPSK	5.0 MHz	-	20.59	15.43
Total			-	26.58	21.45
A	NR: QPSK	10.0 MHz	9.24	20.37	11.85
B	NR: QPSK	10.0 MHz	-	20.37	11.85
C	NR: QPSK	10.0 MHz	-	19.98	11.85
D	NR: QPSK	10.0 MHz	-	20.17	11.85
Total			-	26.25	17.87
A	NR: QPSK	15.0 MHz	9.27	20.49	10.64
B	NR: QPSK	15.0 MHz	-	20.42	10.64
C	NR: QPSK	15.0 MHz	-	19.83	10.64
D	NR: QPSK	15.0 MHz	-	20.21	10.64
Total			-	26.27	16.66
A	NR: QPSK	20.0 MHz	9.33	20.58	9.05
B	NR: QPSK	20.0 MHz	-	20.52	9.05
C	NR: QPSK	20.0 MHz	-	19.98	9.05
D	NR: QPSK	20.0 MHz	-	20.31	9.05
Total			-	26.37	15.07

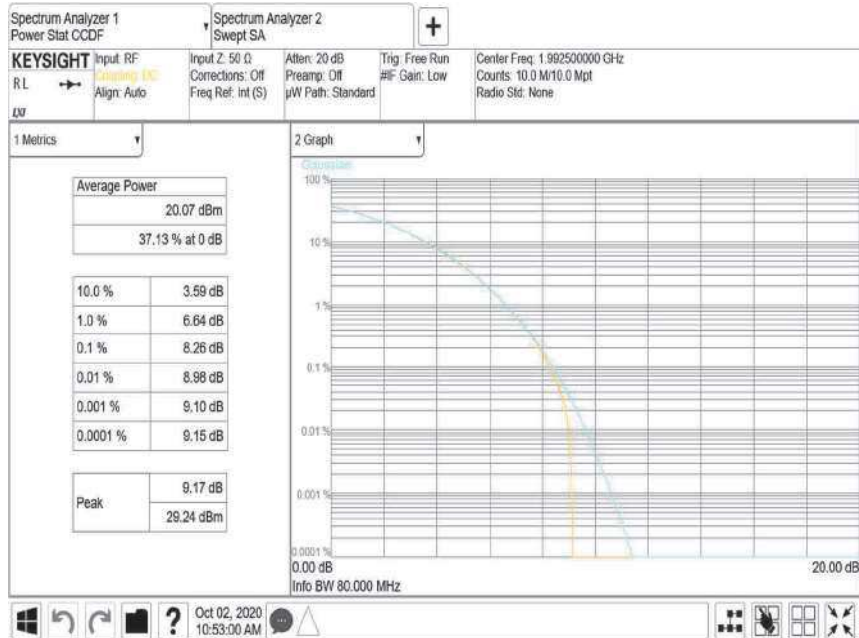


Antenna Port A Carrier Power - Modulation LTE: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position 1

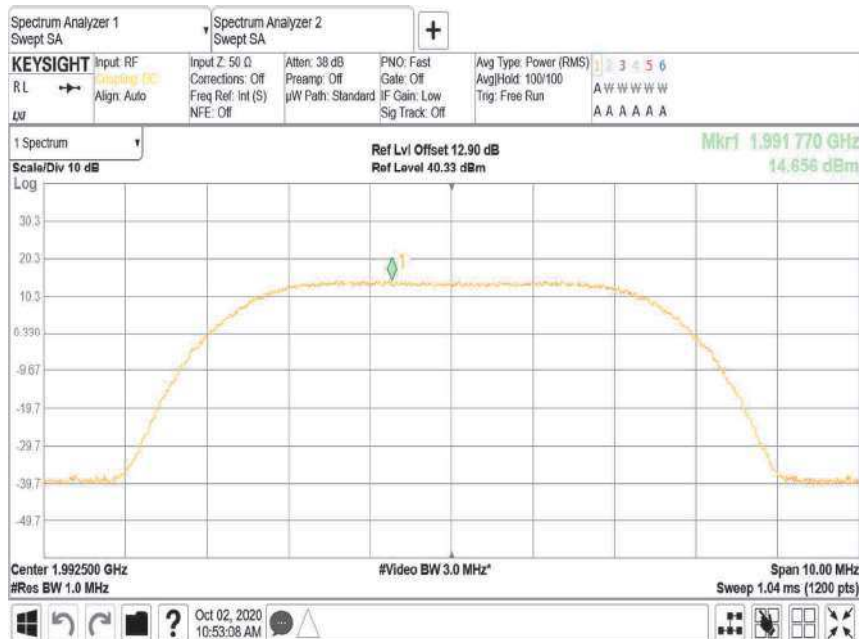




Antenna Port A Pk-Av Ratio - Modulation LTE: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position I

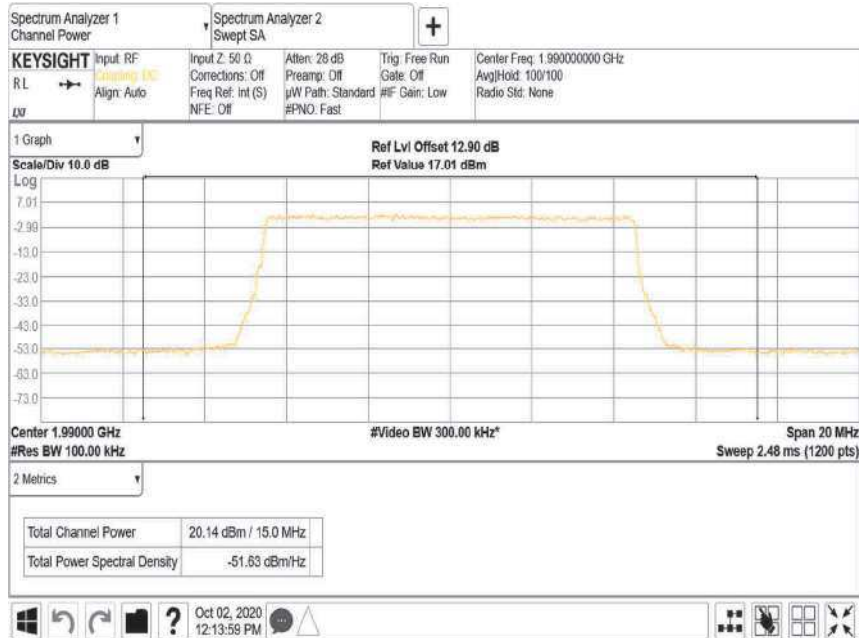


Antenna Port A PSD - Modulation LTE: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position I

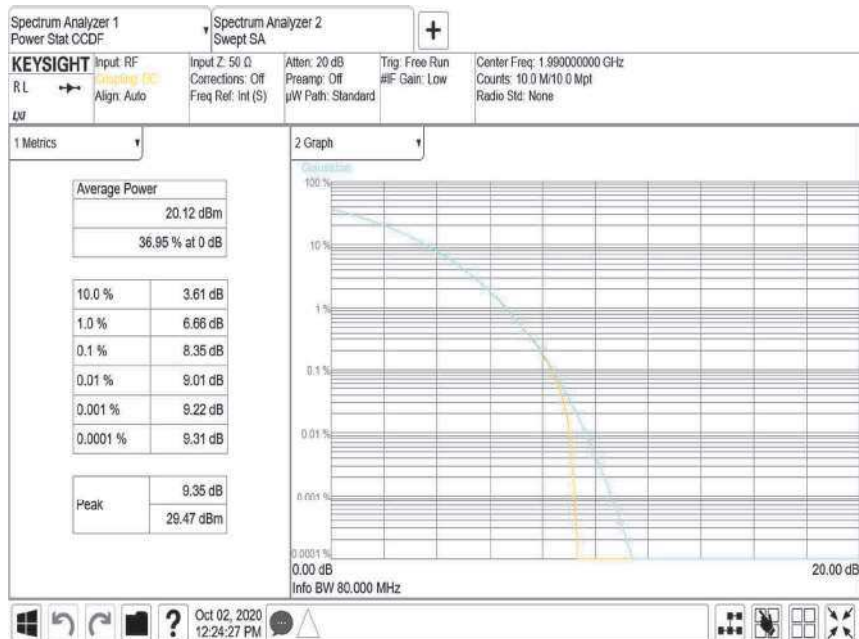




Antenna Port A Carrier Power - Modulation LTE: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position 1



Antenna Port A Pk-Av Ratio - Modulation LTE: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position 1

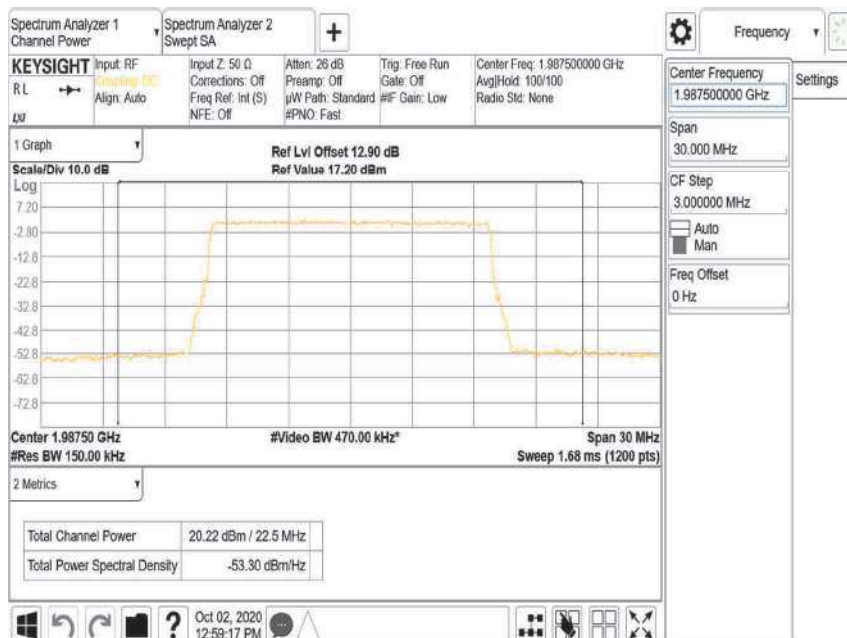




Antenna Port A PSD - Modulation LTE: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position I



Antenna Port A Carrier Power - Modulation LTE: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position I





Antenna Port A Pk-Av Ratio - Modulation LTE: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position I

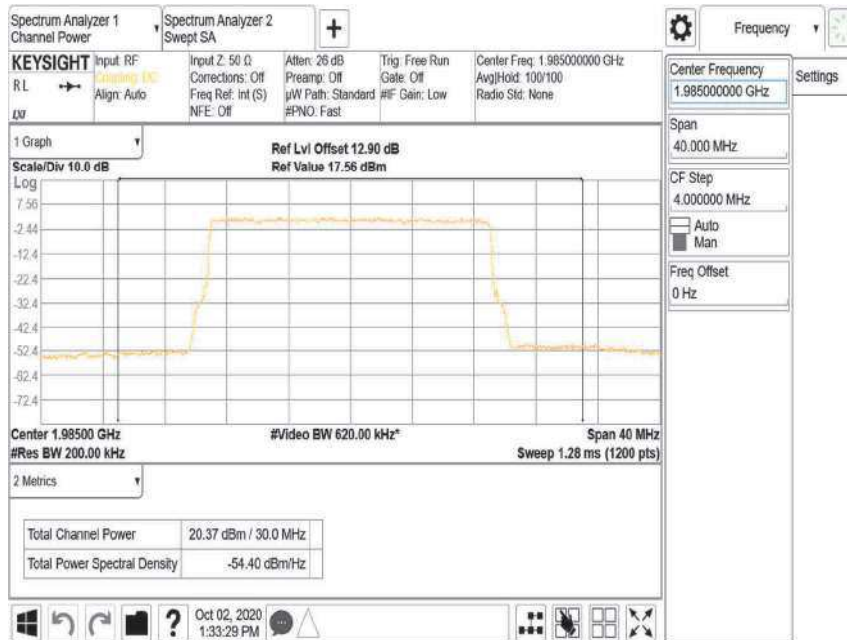


Antenna Port A PSD - Modulation LTE: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position I

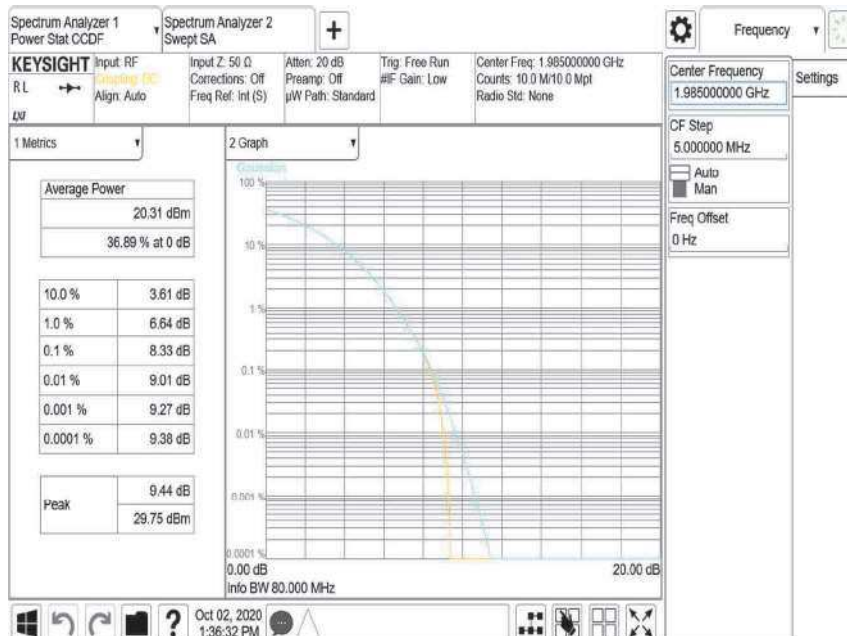




Antenna Port A Carrier Power - Modulation LTE: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position I



Antenna Port A Pk-Av Ratio - Modulation LTE: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position I

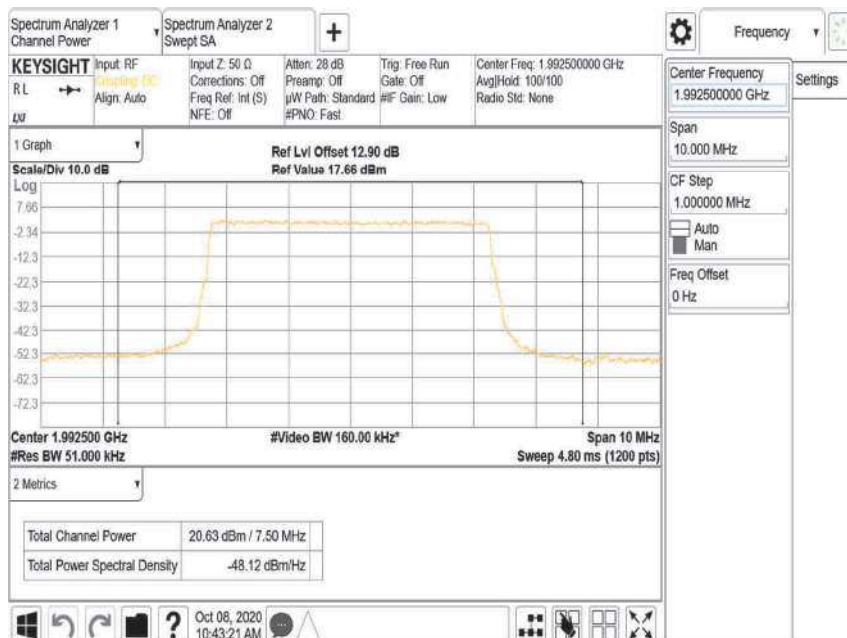




Antenna Port A PSD - Modulation LTE: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position I

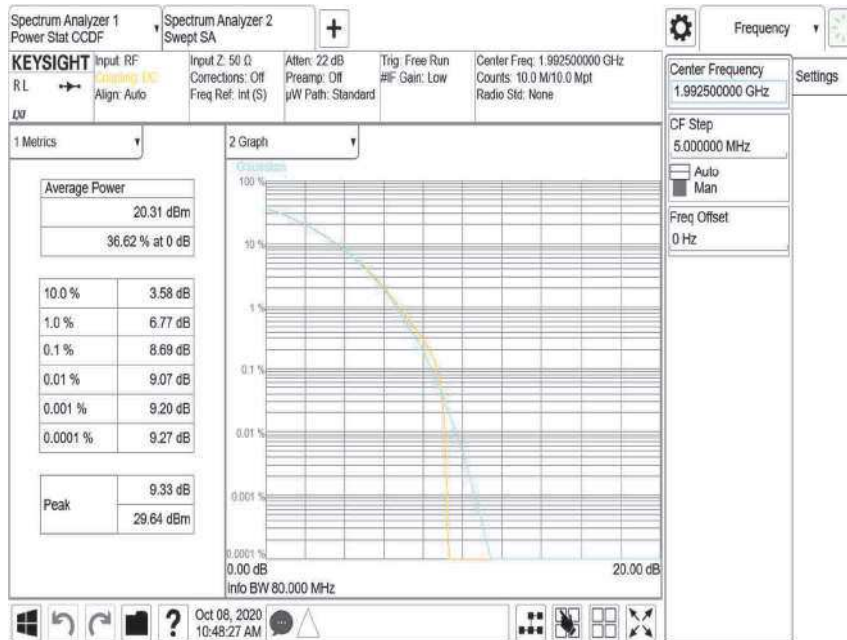


Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position I





Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position T

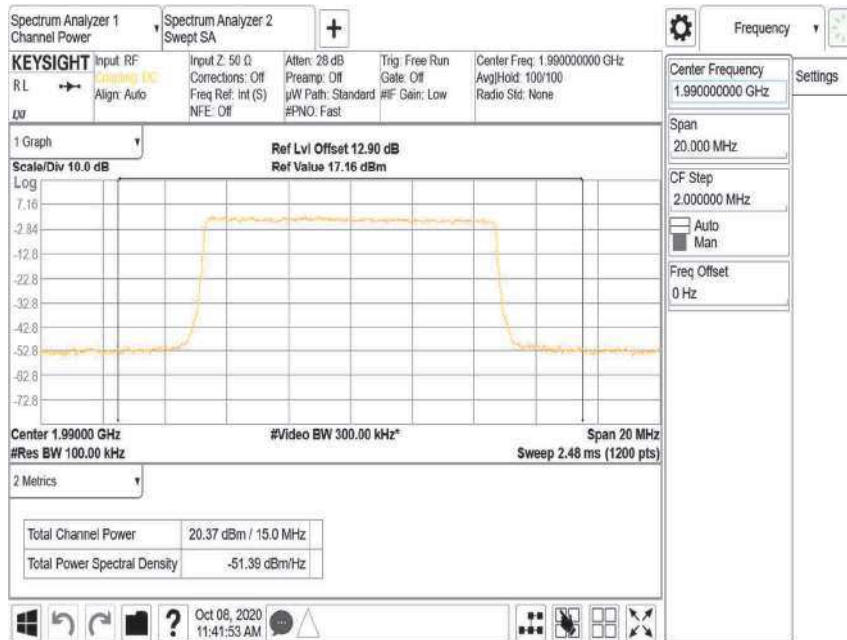


Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position T





Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position I



Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position I

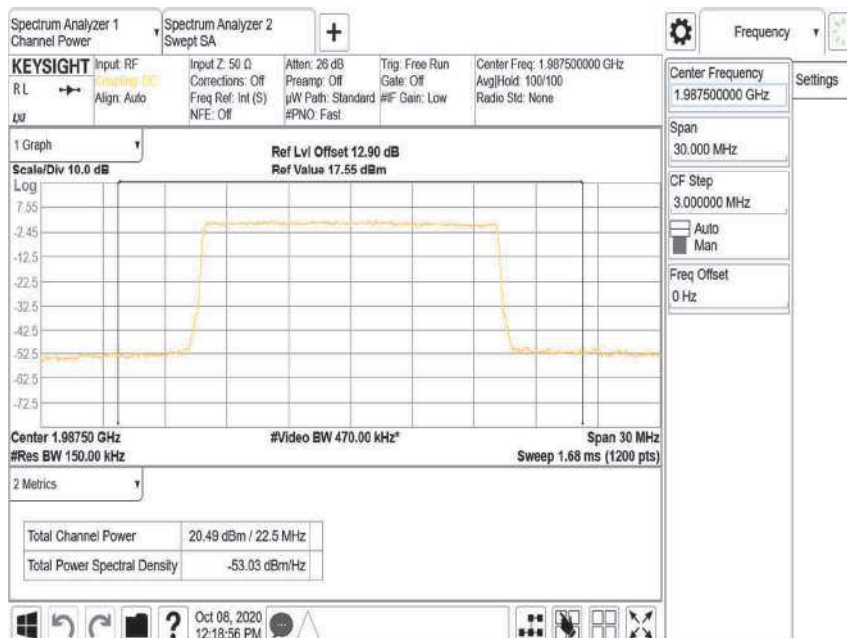




Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position I



Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position I





Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position I

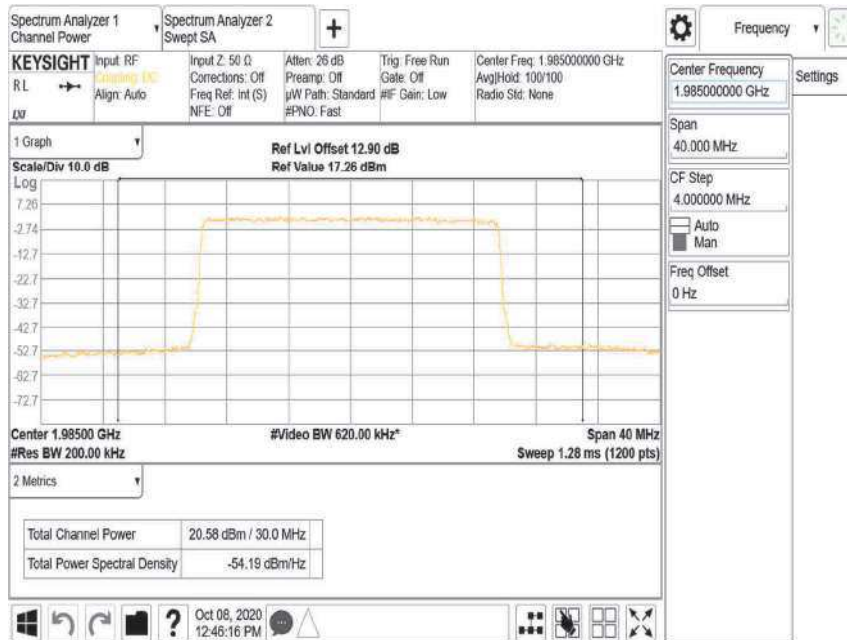


Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position I

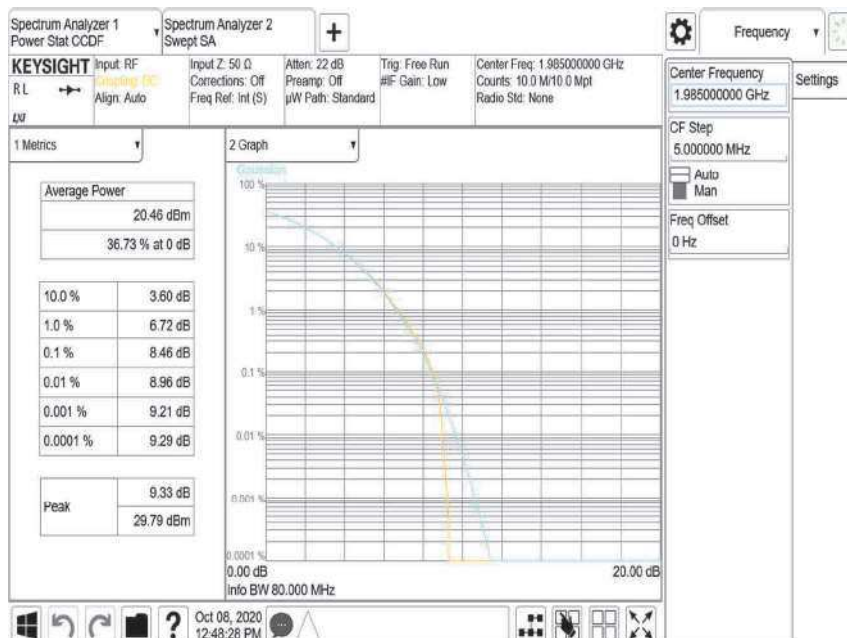




Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position I



Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position I





Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position I





Configuration B

Maximum Output Power 22 dBm / Port.

Antenna	Modulation	Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position B		
			PAR (dB)	Average Power	
			dBm	dBm/MHz	
A	LTE: QPSK	5.0+5.0+5.0 MHz	-	21.04	-
B	LTE: QPSK	5.0+5.0+5.0 MHz	-	20.90	-
C	LTE: QPSK	5.0+5.0+5.0 MHz	-	20.22	-
D	LTE: QPSK	5.0+5.0+5.0 MHz	-	21.05	-
Total			-	26.84	-
A	LTE: QPSK	10.0+10.0+10.0 MHz	-	20.79	-
B	LTE: QPSK	10.0+10.0+10.0 MHz	-	20.77	-
C	LTE: QPSK	10.0+10.0+10.0 MHz	-	20.34	-
D	LTE: QPSK	10.0+10.0+10.0 MHz	-	20.76	-
Total			-	26.69	-
A	LTE: QPSK	15.0+15.0+15.0 MHz	-	20.64	-
B	LTE: QPSK	15.0+15.0+15.0 MHz	-	20.59	-
C	LTE: QPSK	15.0+15.0+15.0 MHz	-	20.28	-
D	LTE: QPSK	15.0+15.0+15.0 MHz	-	20.50	-
Total			-	26.53	-
A	LTE: QPSK	20.0+20.0+20.0 MHz	-	20.49	-
B	LTE: QPSK	20.0+20.0+20.0 MHz	-	20.48	-
C	LTE: QPSK	20.0+20.0+20.0 MHz	-	20.15	-
D	LTE: QPSK	20.0+20.0+20.0 MHz	-	20.38	-
Total			-	26.40	-
A	NR: QPSK	5.0+5.0+5.0 MHz	-	21.17	-
B	NR: QPSK	5.0+5.0+5.0 MHz	-	21.01	-
C	NR: QPSK	5.0+5.0+5.0 MHz	-	20.16	-
D	NR: QPSK	5.0+5.0+5.0 MHz	-	21.13	-
Total			-	26.91	-
A	NR: QPSK	10.0+10.0+10.0 MHz	-	20.84	-
B	NR: QPSK	10.0+10.0+10.0 MHz	-	20.81	-
C	NR: QPSK	10.0+10.0+10.0 MHz	-	20.39	-
D	NR: QPSK	10.0+10.0+10.0 MHz	-	20.82	-
Total			-	26.74	-
A	NR: QPSK	15.0+15.0+15.0 MHz	-	20.70	-
B	NR: QPSK	15.0+15.0+15.0 MHz	-	20.63	-
C	NR: QPSK	15.0+15.0+15.0 MHz	-	20.28	-
D	NR: QPSK	15.0+15.0+15.0 MHz	-	20.63	-
Total			-	26.58	-
A	NR: QPSK	20.0+20.0+20.0 MHz	-	19.93	-
B	NR: QPSK	20.0+20.0+20.0 MHz	-	19.90	-
C	NR: QPSK	20.0+20.0+20.0 MHz	-	19.49	-
D	NR: QPSK	20.0+20.0+20.0 MHz	-	19.75	-
Total			-	25.79	-
A	LTE + NR: QPSK	5.0+5.0+5.0 MHz	-	21.01	-
B	LTE + NR: QPSK	5.0+5.0+5.0 MHz	-	20.94	-
C	LTE + NR: QPSK	5.0+5.0+5.0 MHz	-	20.16	-
D	LTE + NR: QPSK	5.0+5.0+5.0 MHz	-	21.05	-
Total			-	26.83	-
A	LTE + NR: QPSK	10.0+10.0+10.0 MHz	-	20.80	-
B	LTE + NR: QPSK	10.0+10.0+10.0 MHz	-	20.75	-



C	LTE + NR: QPSK	10.0+10.0+10.0 MHz	-	20.28	-
D	LTE + NR: QPSK	10.0+10.0+10.0 MHz	-	20.75	-
Total			-	26.67	-
A	LTE + NR: QPSK	15.0+15.0+15.0 MHz	-	20.79	-
B	LTE + NR: QPSK	15.0+15.0+15.0 MHz	-	20.70	-
C	LTE + NR: QPSK	15.0+15.0+15.0 MHz	-	20.31	-
D	LTE + NR: QPSK	15.0+15.0+15.0 MHz	-	20.55	-
Total			-	26.61	-
A	LTE + NR: QPSK	20.0+20.0+20.0 MHz	-	20.63	-
B	LTE + NR: QPSK	20.0+20.0+20.0 MHz	-	20.60	-
C	LTE + NR: QPSK	20.0+20.0+20.0 MHz	-	20.19	-
D	LTE + NR: QPSK	20.0+20.0+20.0 MHz	-	20.46	-
Total			-	26.49	-

Remarks

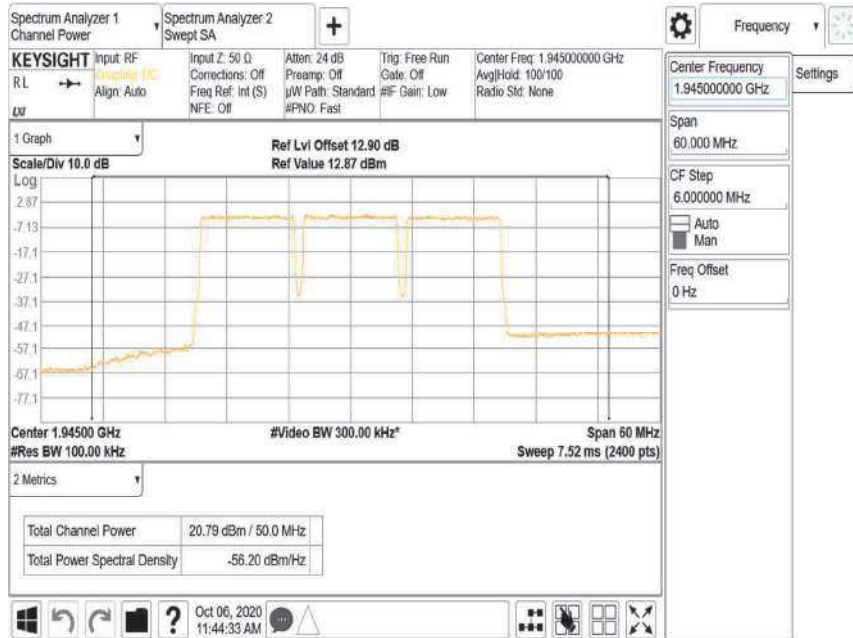
1. Three carrier transmitter performance is presented.
2. The plot results represent typical radio performance across all channels.
3. The highest power transmitter configuration is presented for compliance.
4. Plot data performance for all transmitter ports and channels are on file and available on request.

Antenna A - Modulation LTE: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position B

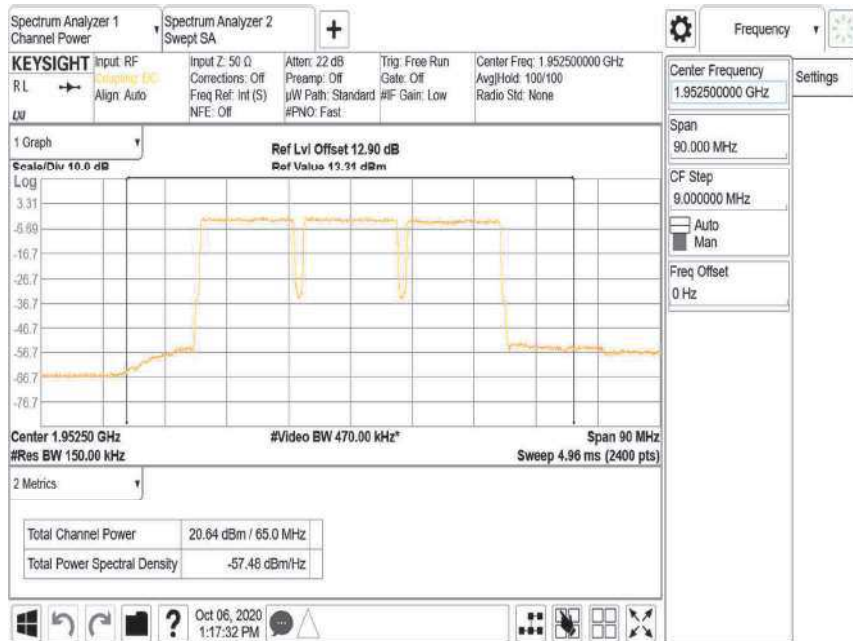




Antenna A - Modulation LTE: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B

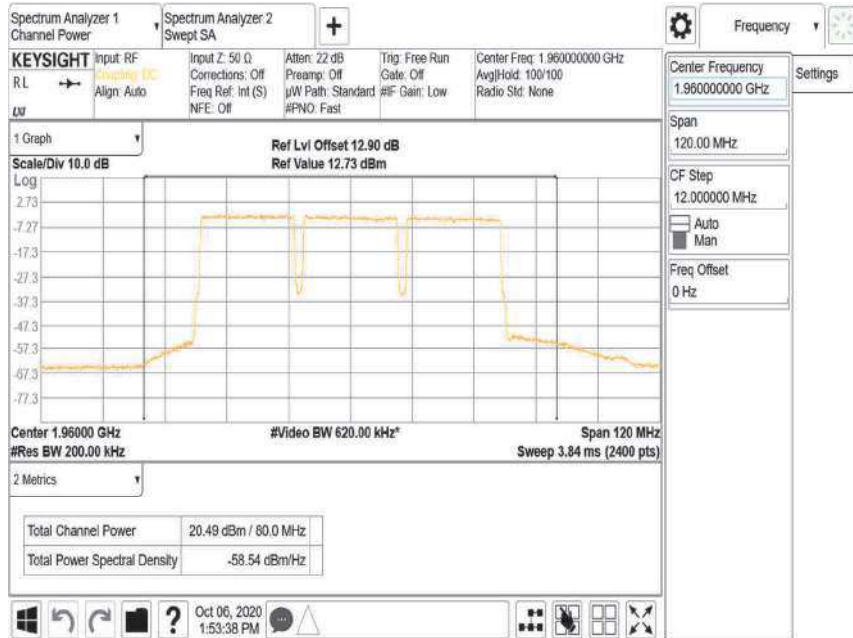


Antenna A - Modulation LTE: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position B

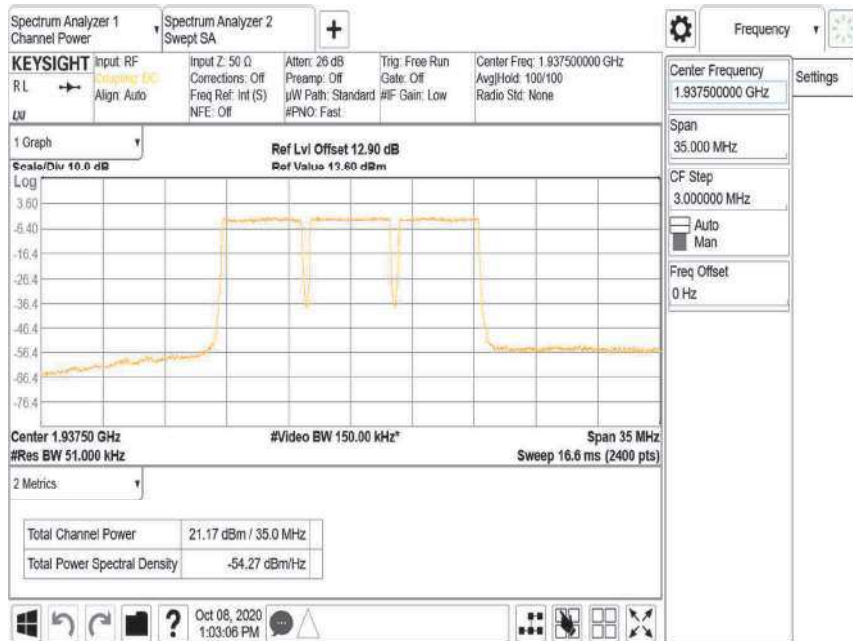




Antenna A - Modulation LTE: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position B

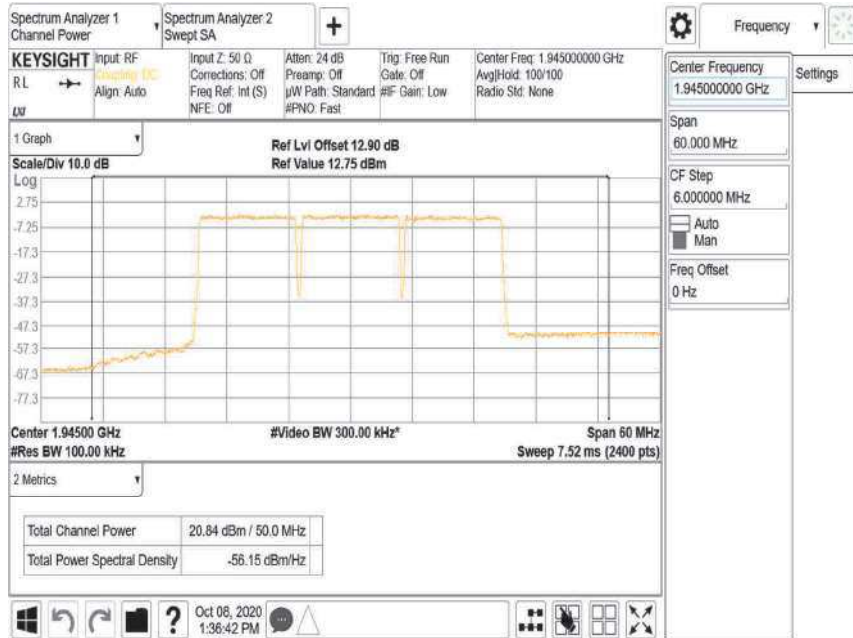


Antenna A - Modulation NR: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position B

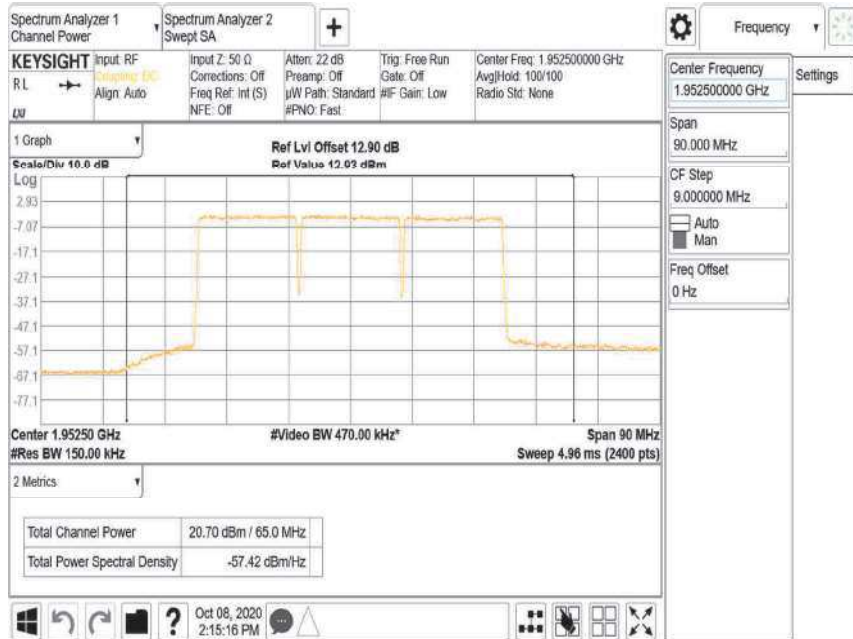




Antenna A - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B

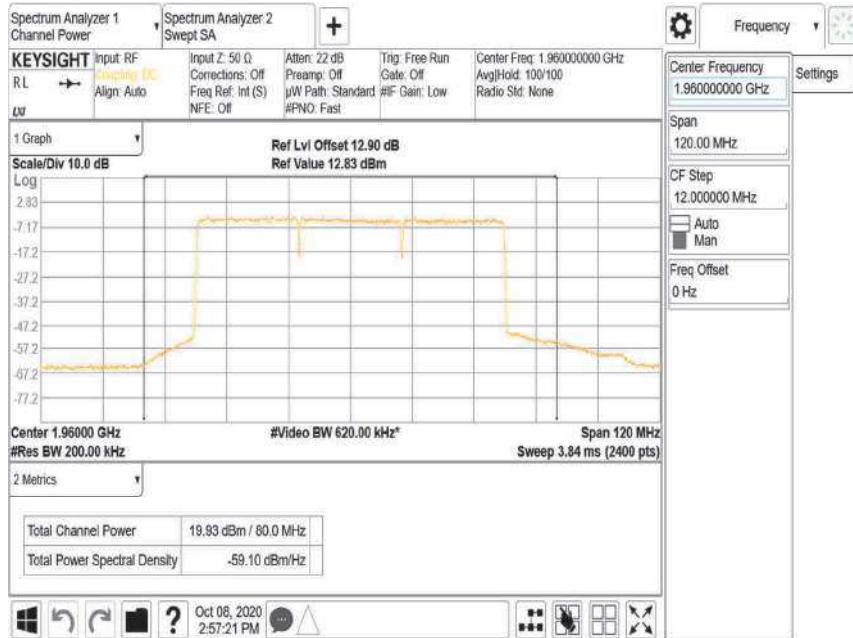


Antenna A - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position B

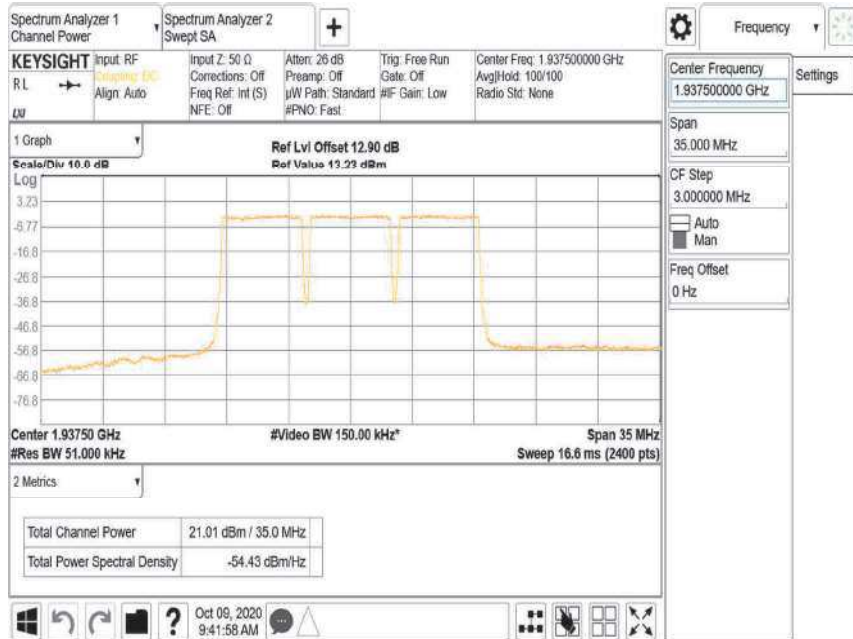




Antenna A - Modulation NR: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position B



Antenna A - Modulation LTE+NR: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position B

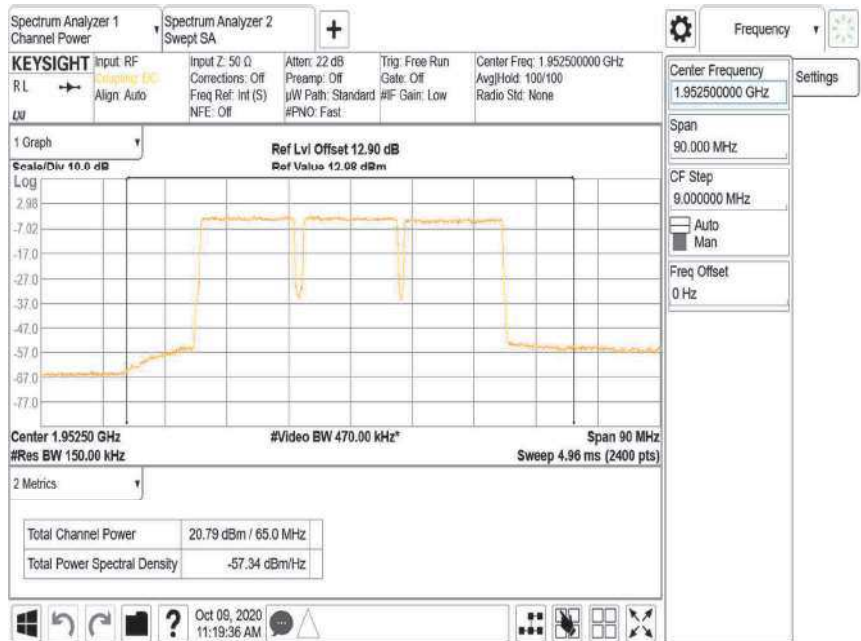




Antenna A - Modulation LTE+NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B

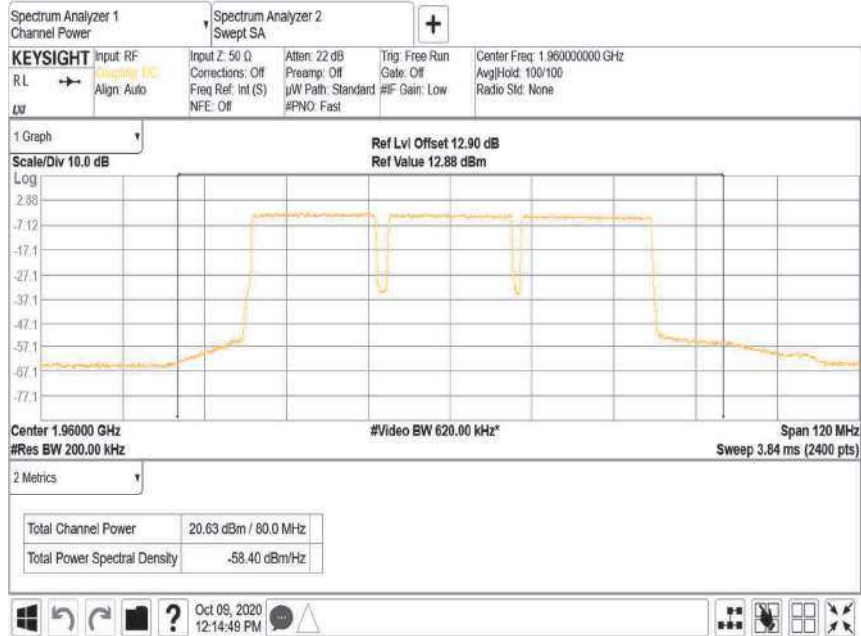


Antenna A - Modulation LTE+NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position B





Antenna A - Modulation LTE+NR: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position B



Limit	
Peak Power	≤ 1640 W/MHz or $\leq +62.15$ dBm RSS-133 1930-1995 MHz ≤ 100 W
Peak to Average Ratio	13 dB



2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049
 FCC CFR 47 Part 24, Clause 24.238 (b)
 Industry Canada RSS-GEN, Clause 6.7
 Industry Canada RSS-133, Clause 6.5

2.2.2 Date of Test and Modification State

07 October 2020 - Modification State 0

2.2.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.4 Environmental Conditions

Ambient Temperature 23.5°C
 Relative Humidity 31.3%

2.2.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01.
 The Spectrum Analyser RBW was configured to be at least 1% of the channel bandwidth of the carrier to be measured.

2.2.6 Test Results

Configuration A

Maximum Output Power 22 dBm / Port.

Modulation	Carrier Bandwidth	Result (MHz)	
		Channel Bandwidth	
		Occupied Bandwidth	-26 dB Bandwidth
LTE: QPSK	LTE: 5.0 MHz	4.48	4.69
LTE: QPSK	LTE: 10.0 MHz	8.93	9.34
LTE: QPSK	LTE: 15.0 MHz	13.40	13.92
LTE: QPSK	LTE: 20.0 MHz	17.90	18.51
NR: QPSK	NR: 5.0 MHz	4.46	4.72
NR: QPSK	NR: 10.0 MHz	9.28	9.61
NR: QPSK	NR: 15.0 MHz	14.09	14.57
NR: QPSK	NR: 20.0 MHz	18.93	19.56

Remarks

Representative occupied bandwidth performance results presented. Plot data performance for all transmitter ports and channel positions are on file and available on request.



2.3 BAND EDGE

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
 FCC CFR 47 Part 24, Clause 24.238 (b)
 Industry Canada RSS-133, Clause 6.5

2.3.2 Date of Test and Modification State

01 October 2020 - Modification State 0

2.3.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.4 Environmental Conditions

Ambient Temperature 24.1°C
 Relative Humidity 31.7%

2.3.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01.

Each of the 2 bands of the EUT has 4 transmit ports, therefore, the test limits used were calculated on a worst-case basis accounting for an effective 4 port MIMO configuration. Testing was performed on this port with a test limit of $43+10\log(P) - 10\log(4) = -19$ dBm

2.3.6 Test Results

Configuration A

Maximum Output Power 22 dBm

Modulation	Carrier Bandwidth	Band Edge (MHz)	
		Channel Position B	Channel Position T
LTE: QPSK	LTE: 5.0 MHz	1,932.5	1,992.5
LTE: QPSK	LTE: 10.0 MHz	1,935.0	1,990.0
LTE: QPSK	LTE: 15.0 MHz	1,937.5	1,987.5
LTE: QPSK	LTE: 20.0 MHz	1,940.0	1,985.0
NR: QPSK	NR: 5.0 MHz	1,932.5	1,992.5
NR: QPSK	NR: 10.0 MHz	1,935.0	1,990.0
NR: QPSK	NR: 15.0 MHz	1,937.5	1,987.5
NR: QPSK	NR: 20.0 MHz	1,940.0	1,985.0

Remarks

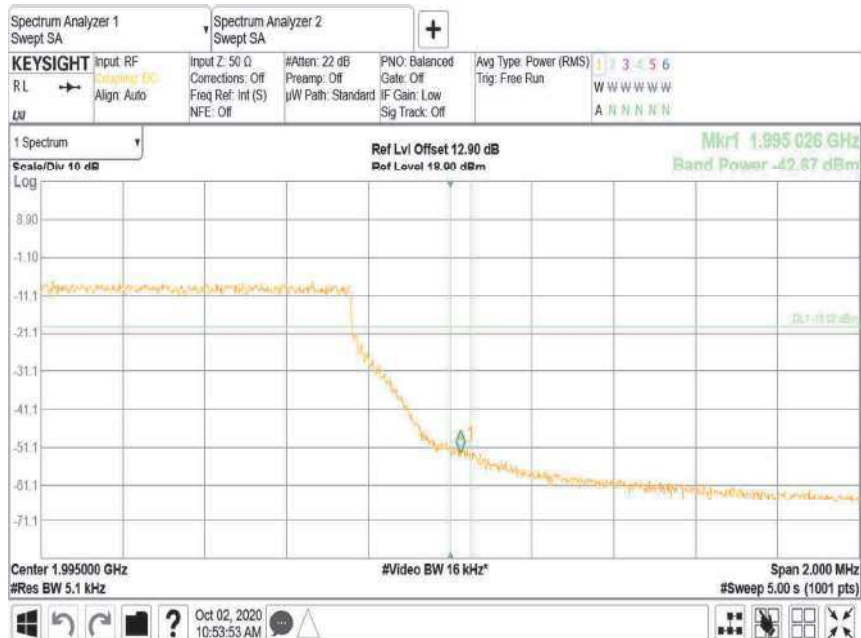
1. Band edge data was captured from the transmit port with maximum measured power.
2. Worst case band edge data presented.



Modulation LTE: QPSK - Carrier Bandwidth LTE: 5.0 MHz - Channel Position B



Modulation LTE: QPSK - Carrier Bandwidth LTE: 5.0 MHz - Channel Position T





Modulation LTE: QPSK - Carrier Bandwidth LTE: 10.0 MHz - Channel Position B



Modulation LTE: QPSK - Carrier Bandwidth LTE: 10.0 MHz - Channel Position T

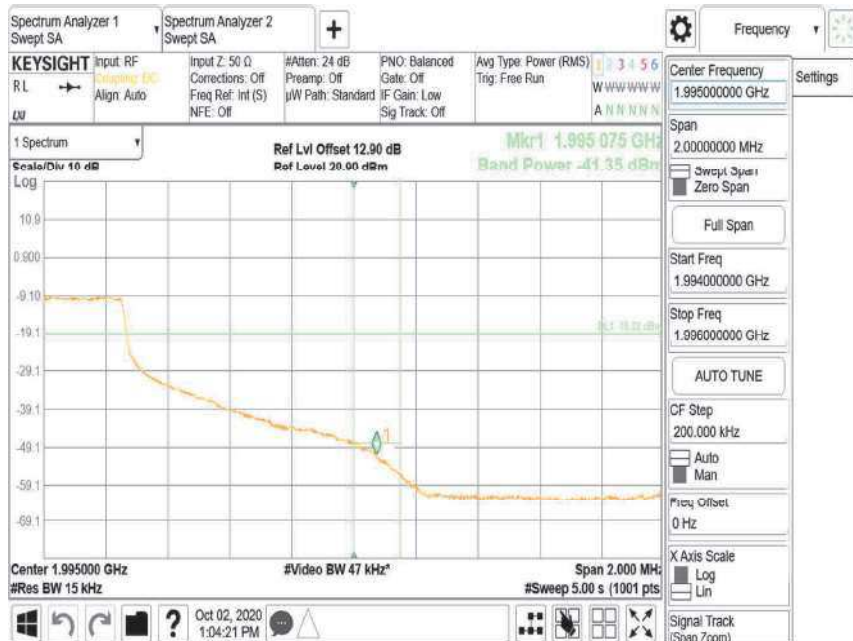




Modulation LTE: QPSK - Carrier Bandwidth LTE: 15.0 MHz - Channel Position B

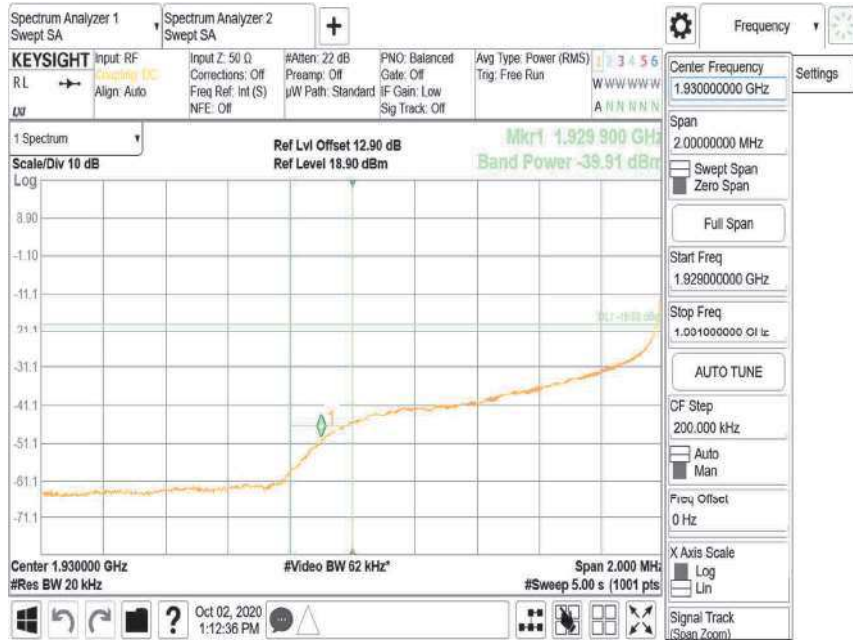


Modulation LTE: QPSK - Carrier Bandwidth LTE: 15.0 MHz - Channel Position T

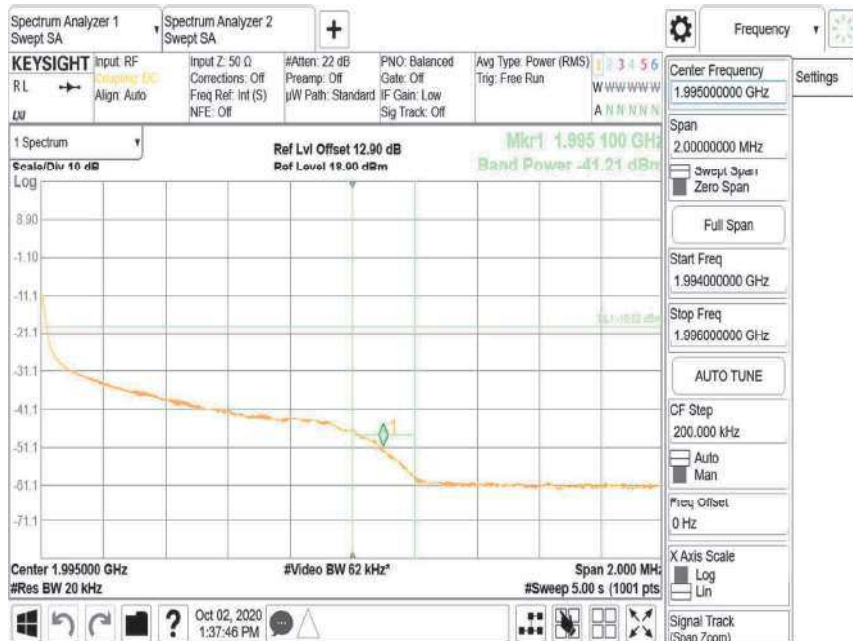




Modulation LTE: QPSK - Carrier Bandwidth LTE: 20.0 MHz - Channel Position B

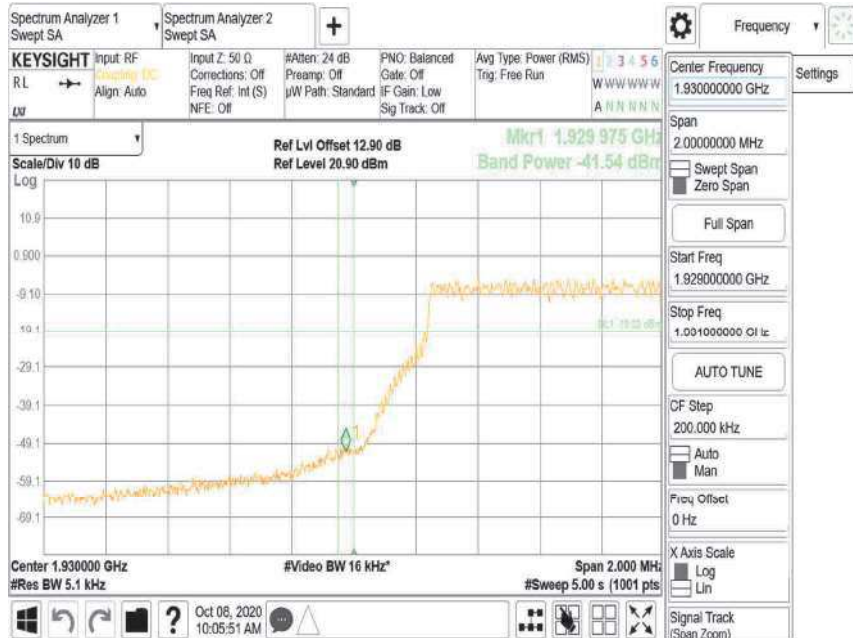


Modulation LTE: QPSK - Carrier Bandwidth LTE: 20.0 MHz - Channel Position T





Modulation NR: QPSK - Carrier Bandwidth NR: 5.0 MHz - Channel Position B



Modulation NR: QPSK - Carrier Bandwidth NR: 5.0 MHz - Channel Position T

