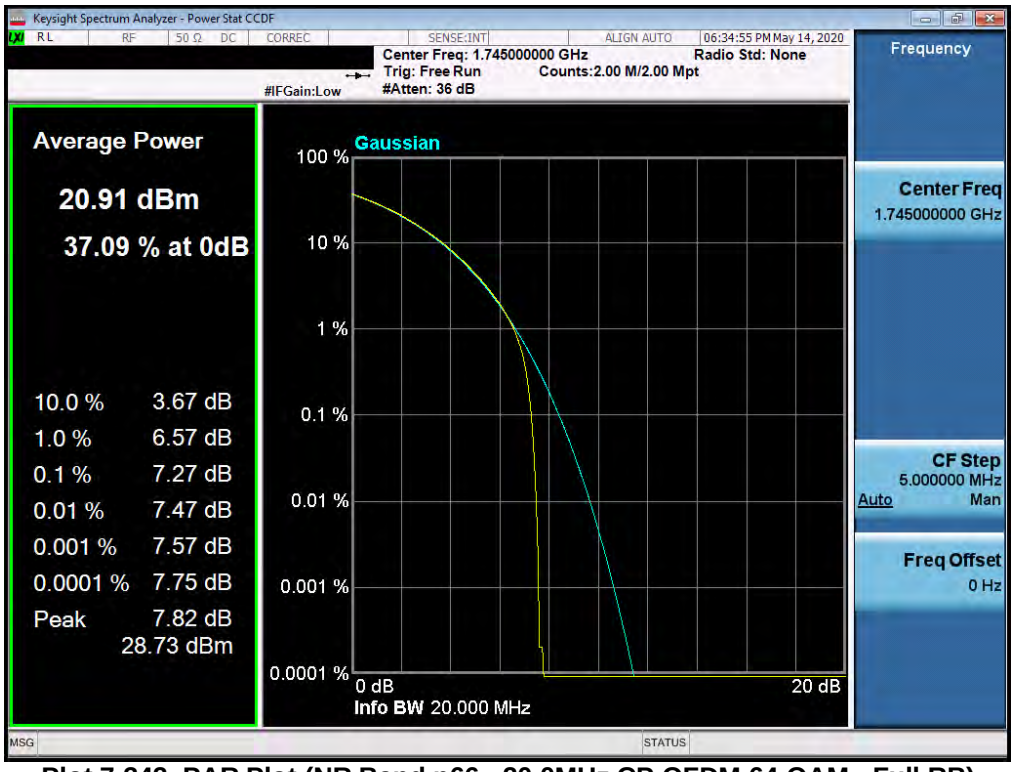
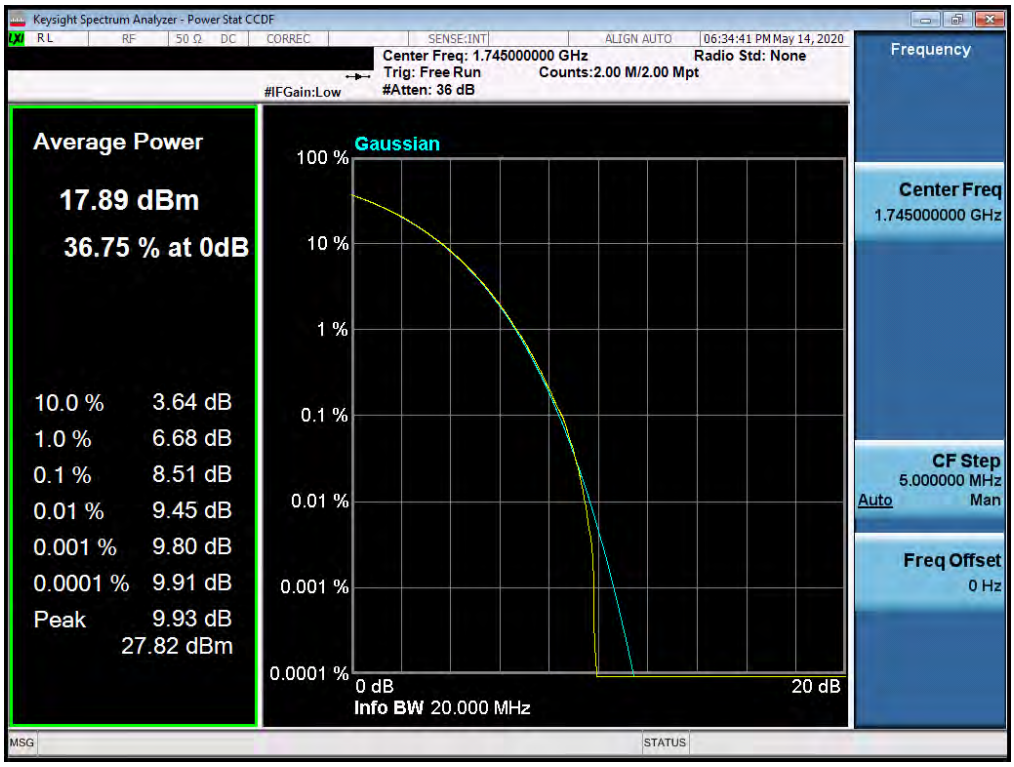
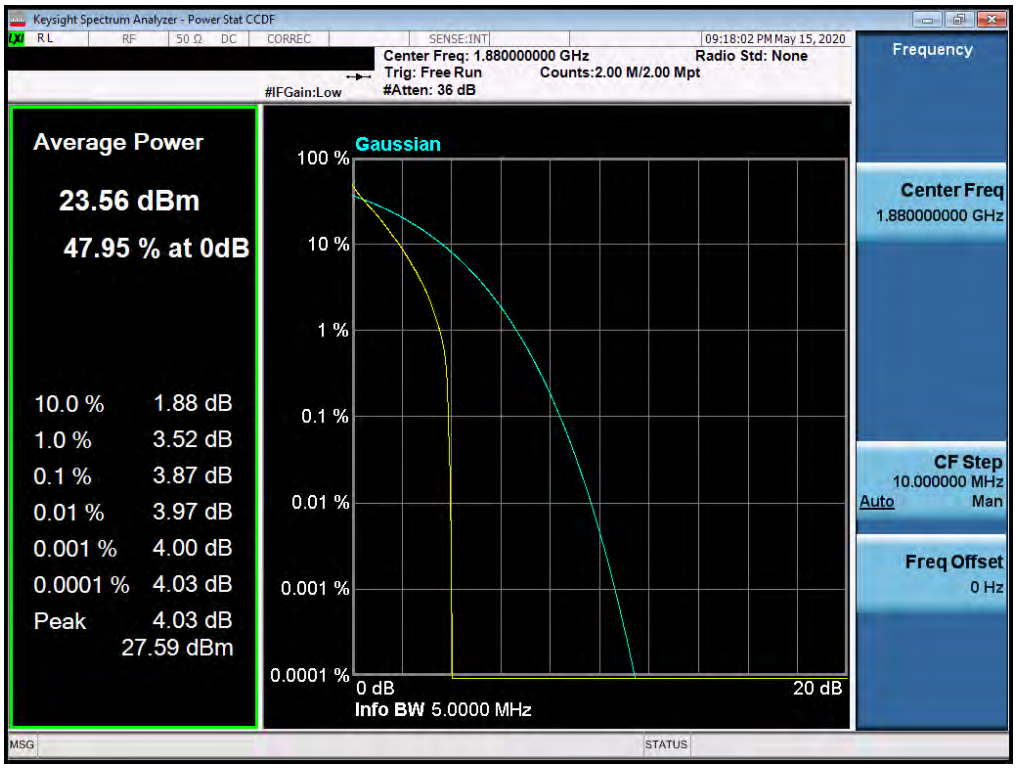


Plot 7-342. PAR Plot (NR Band n66 - 20.0MHz CP-OFDM 64-QAM - Full RB)

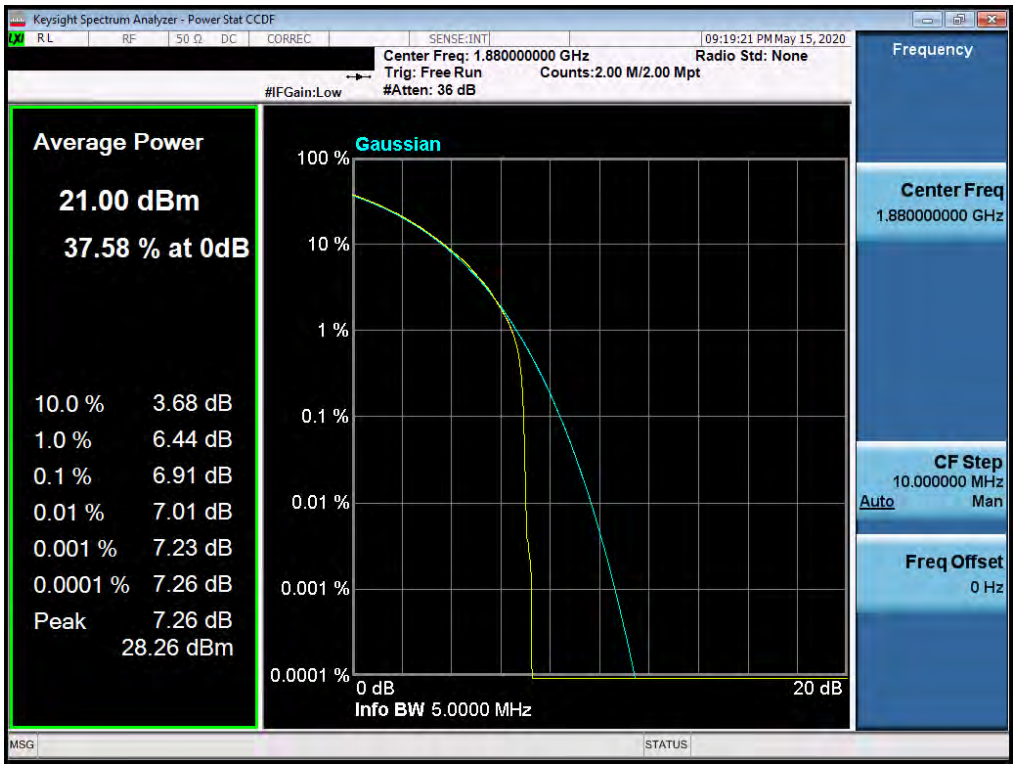


Plot 7-343. PAR Plot (NR Band n66 - 20.0MHz CP-OFDM 256-QAM - Full RB)

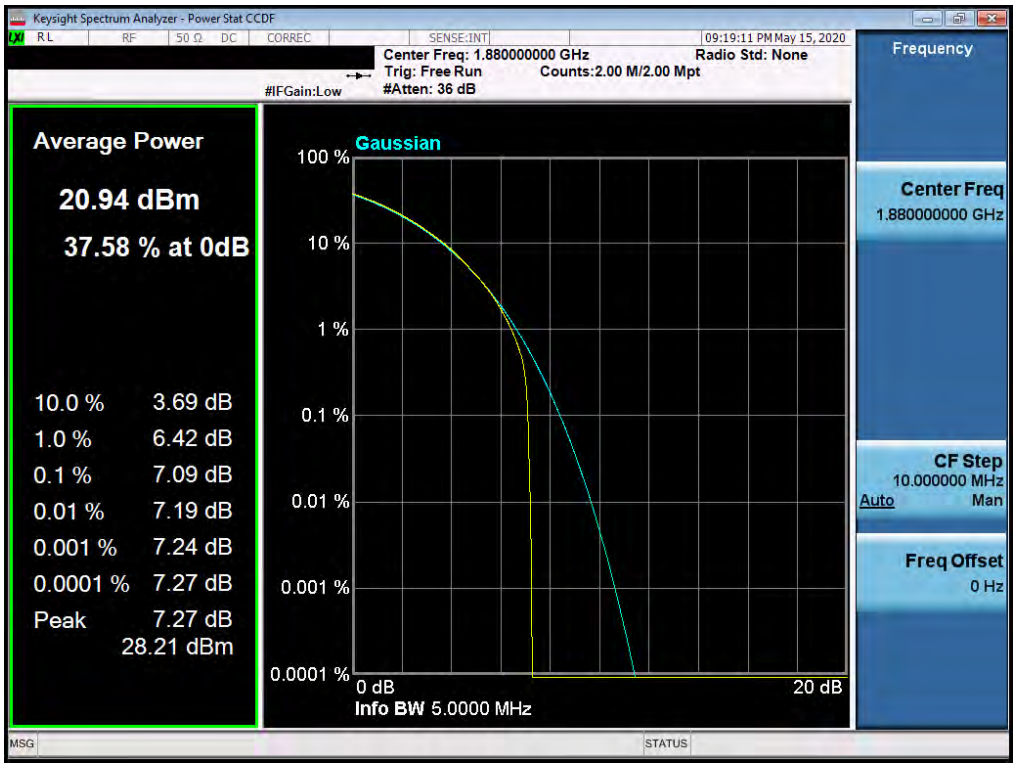
NR Band n2



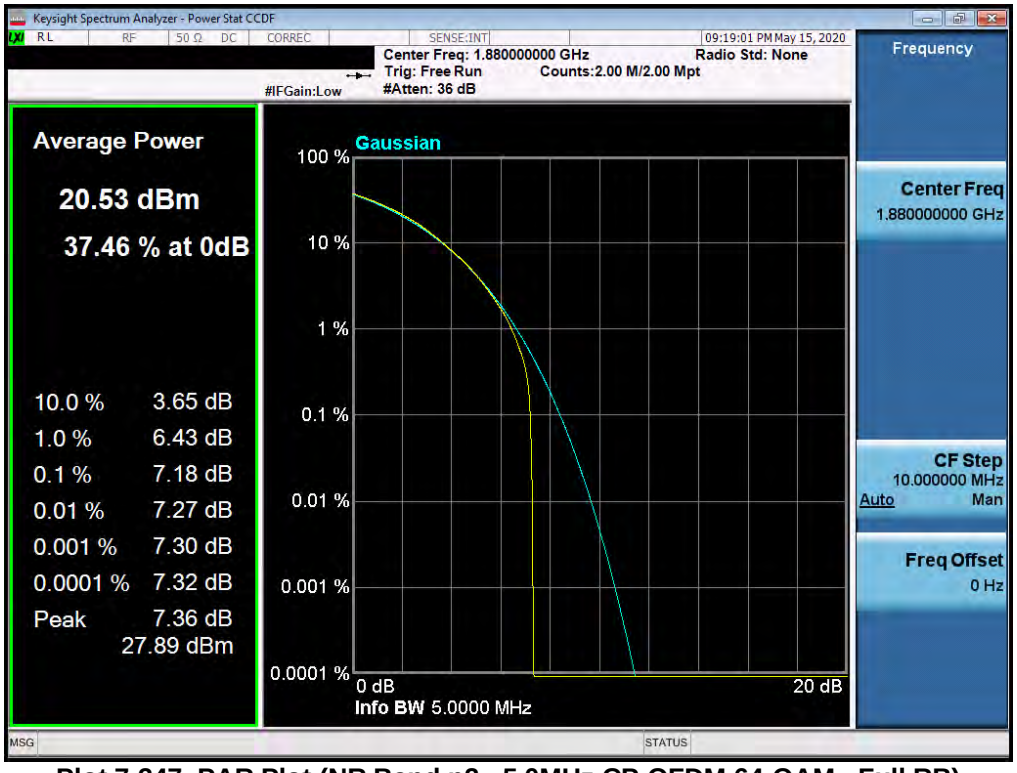
Plot 7-344. PAR Plot (NR Band n2 - 5.0MHz DFT-s-OFDM π/2 BPSK - Full RB)



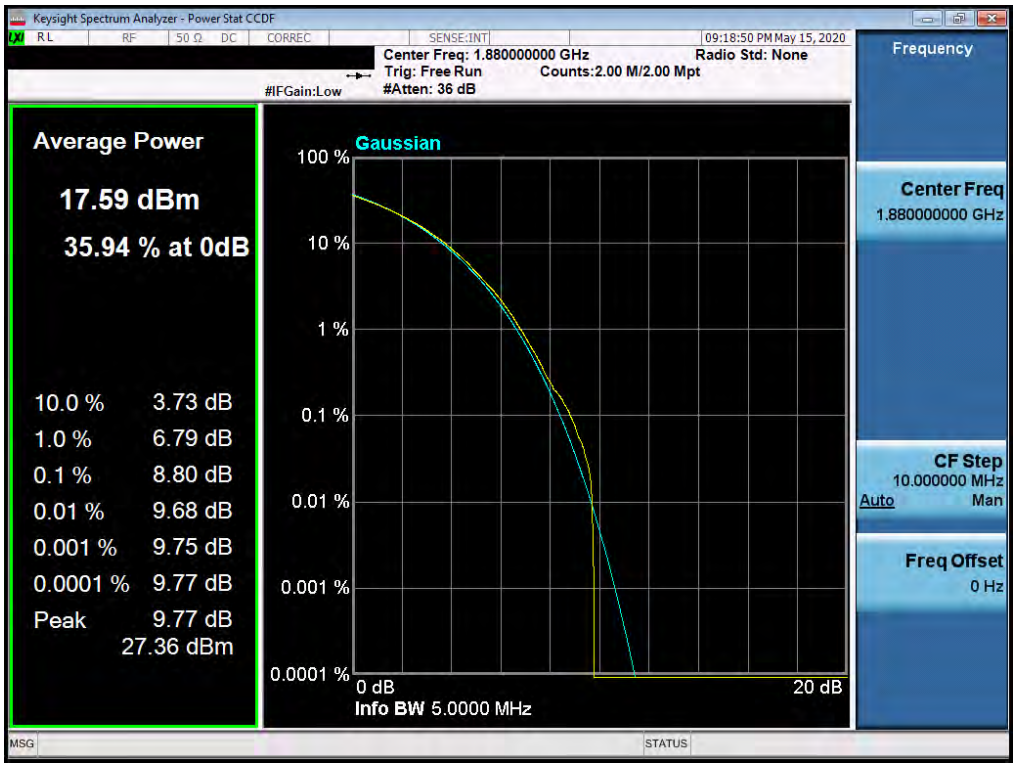
Plot 7-345. PAR Plot (NR Band n2 - 5.0MHz CP-OFDM QPSK - Full RB)



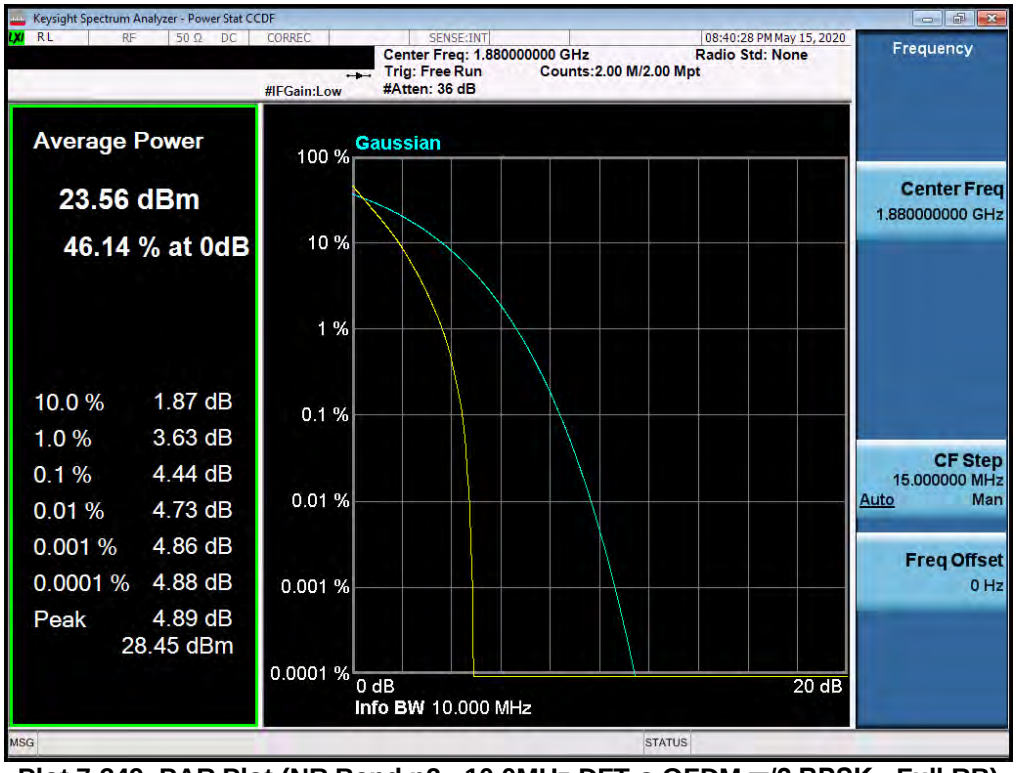
Plot 7-346. PAR Plot (NR Band n2 - 5.0MHz CP-OFDM 16-QAM - Full RB)



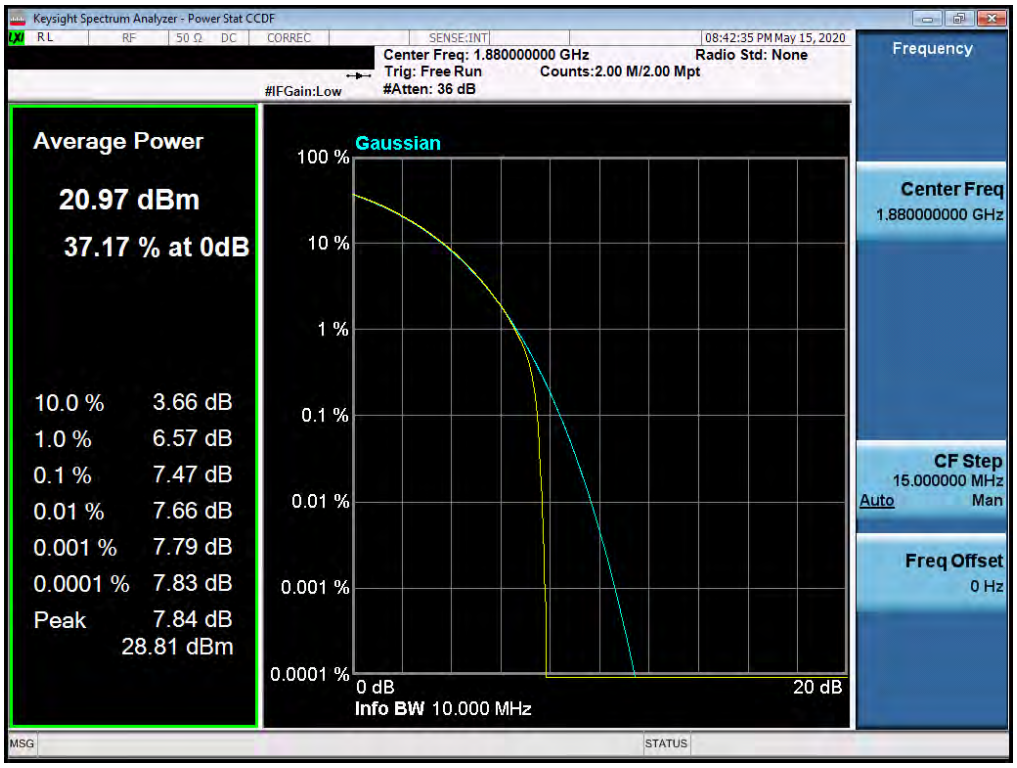
Plot 7-347. PAR Plot (NR Band n2 - 5.0MHz CP-OFDM 64-QAM - Full RB)



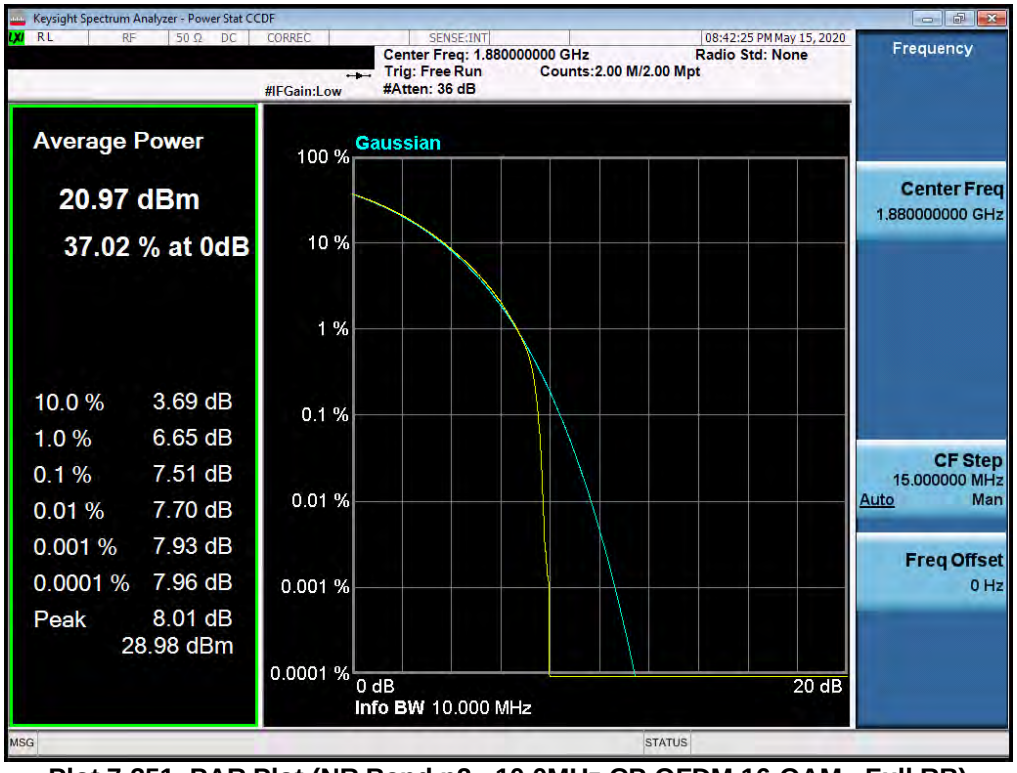
Plot 7-348. PAR Plot (NR Band n2 - 5.0MHz CP-OFDM 256-QAM - Full RB)



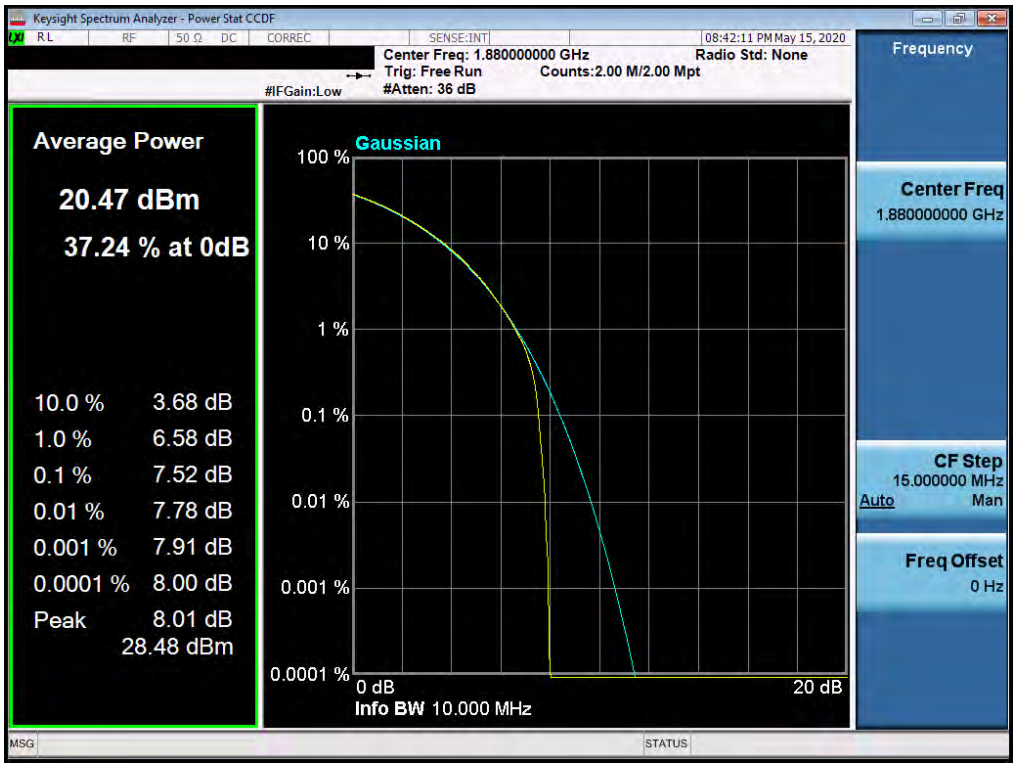
Plot 7-349. PAR Plot (NR Band n2 - 10.0MHz DFT-s-OFDM π/2 BPSK - Full RB)



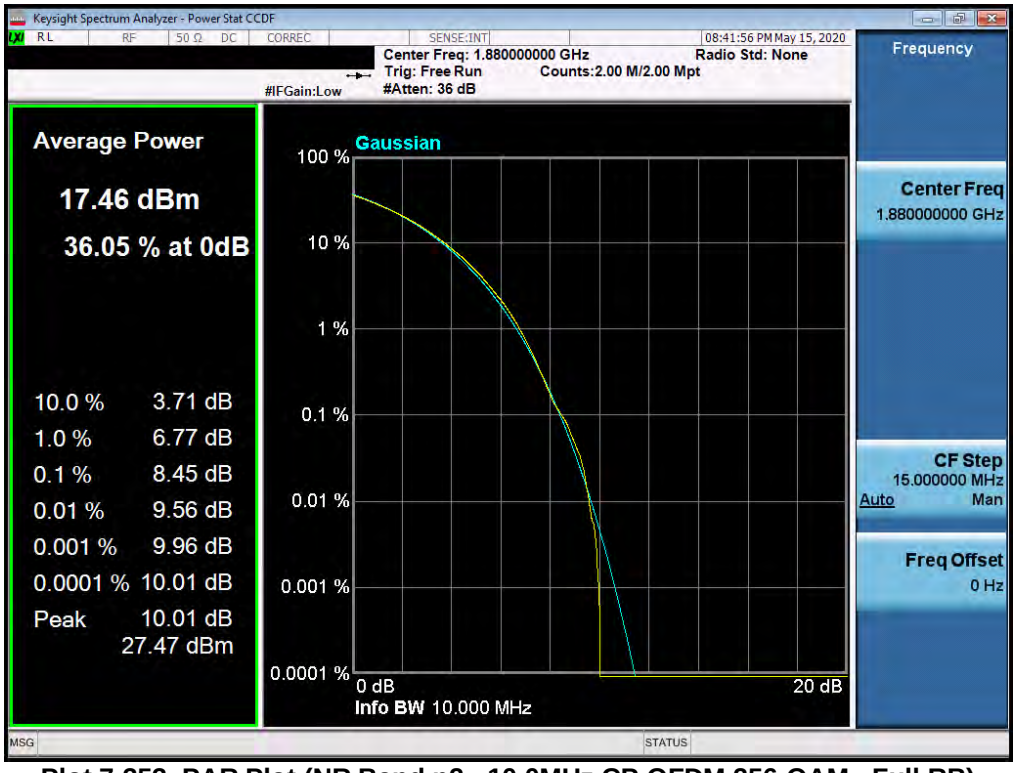
Plot 7-350. PAR Plot (NR Band n2 - 10.0MHz CP-OFDM QPSK - Full RB)



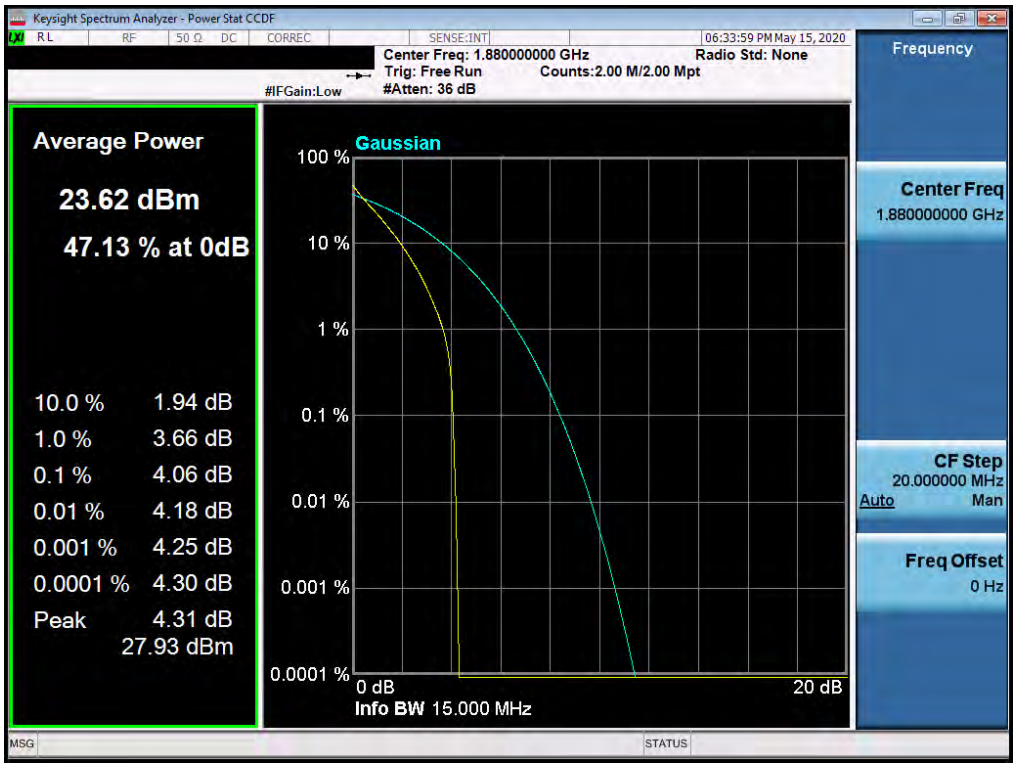
Plot 7-351. PAR Plot (NR Band n2 - 10.0MHz CP-OFDM 16-QAM - Full RB)



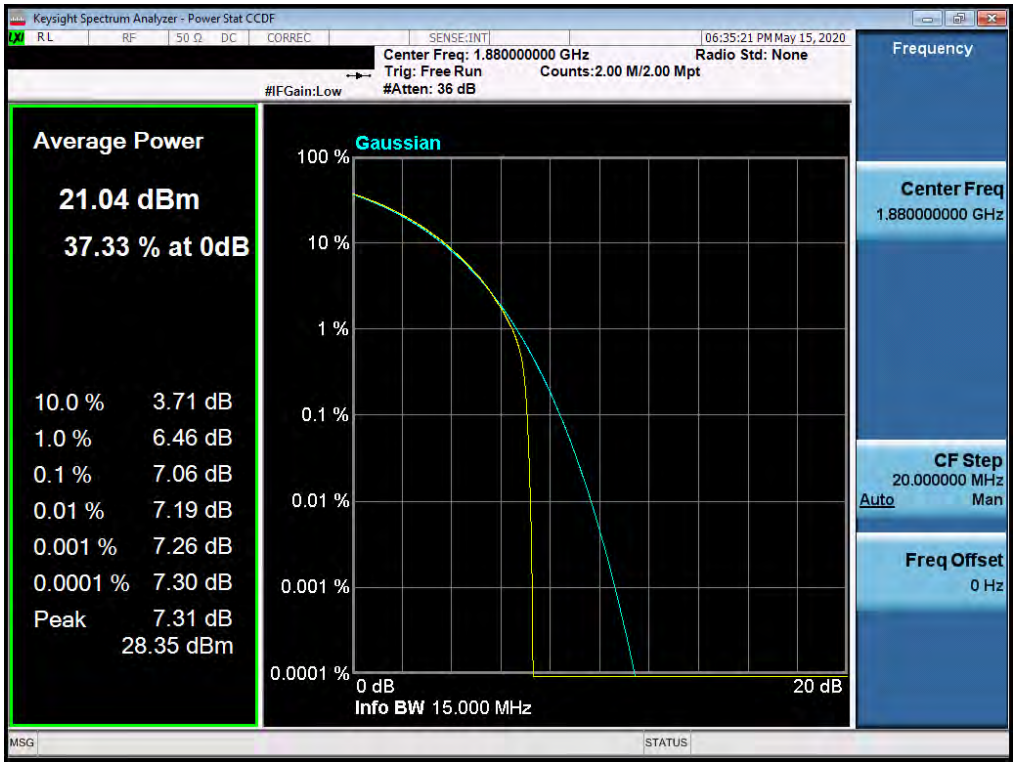
Plot 7-352. PAR Plot (NR Band n2 - 10.0MHz CP-OFDM 64-QAM - Full RB)



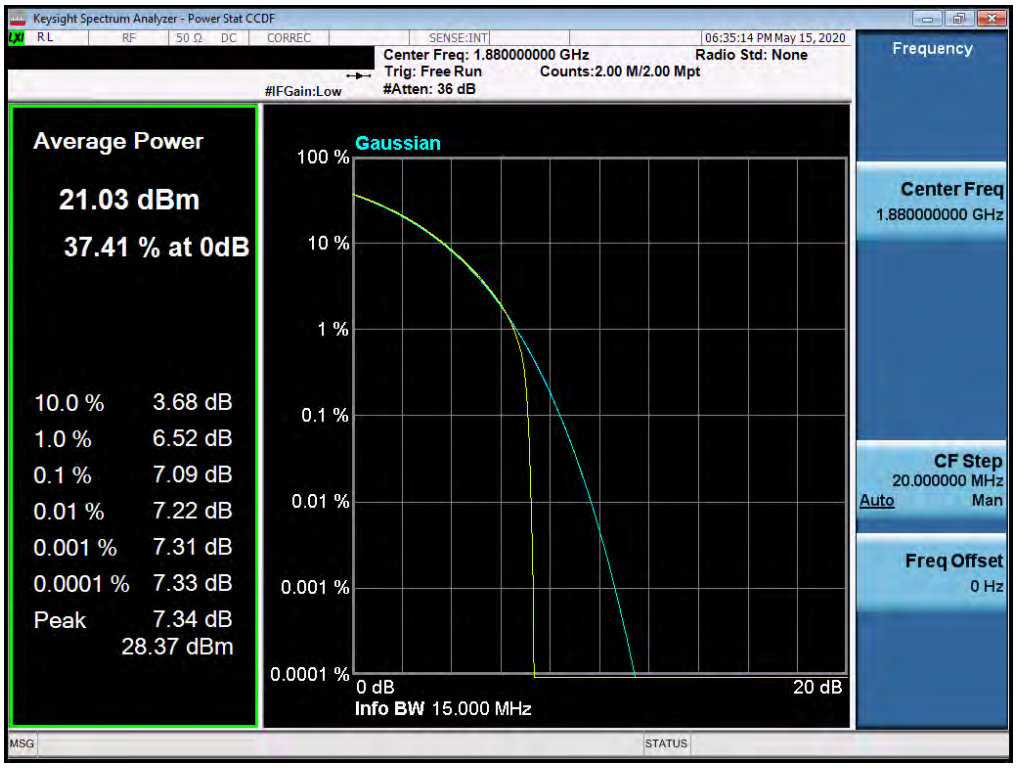
Plot 7-353. PAR Plot (NR Band n2 - 10.0MHz CP-OFDM 256-QAM - Full RB)



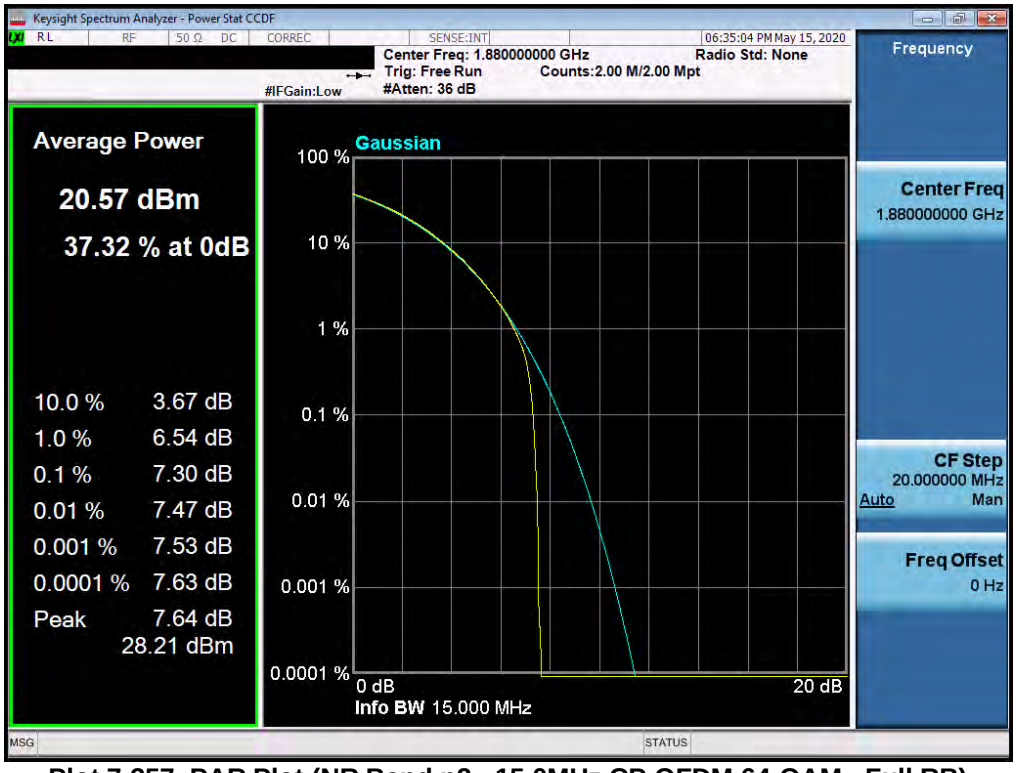
Plot 7-354. PAR Plot (NR Band n2 - 15.0MHz DFT-s-OFDM π/2 BPSK - Full RB)



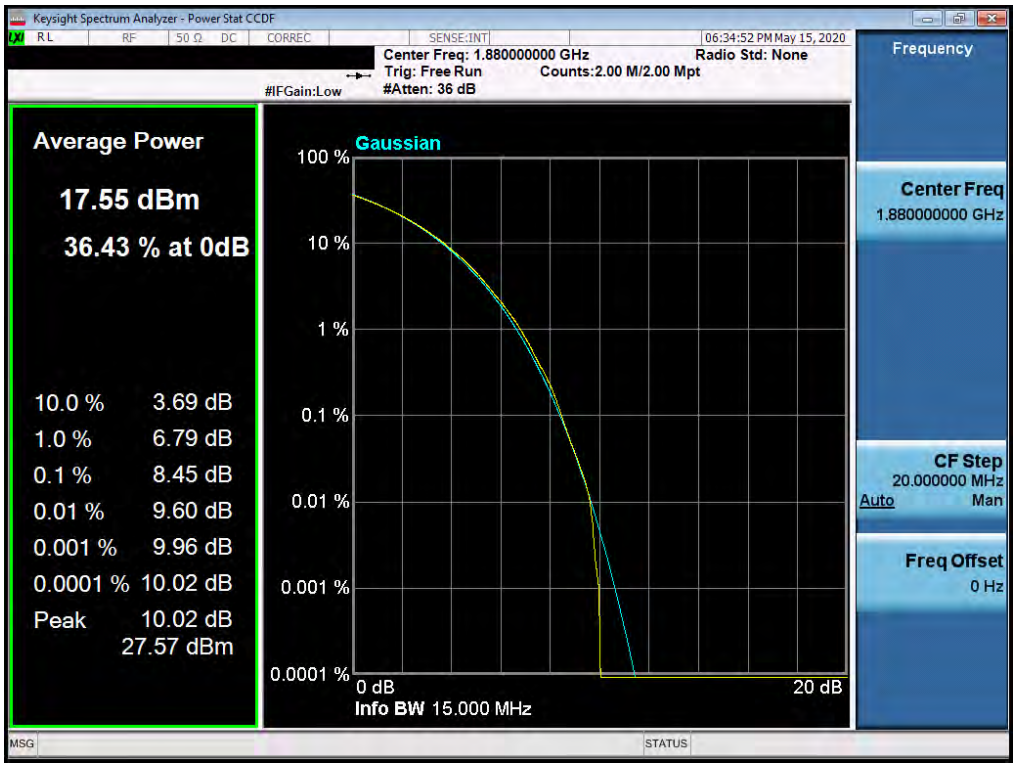
Plot 7-355. PAR Plot (NR Band n2 - 15.0MHz CP-OFDM QPSK - Full RB)



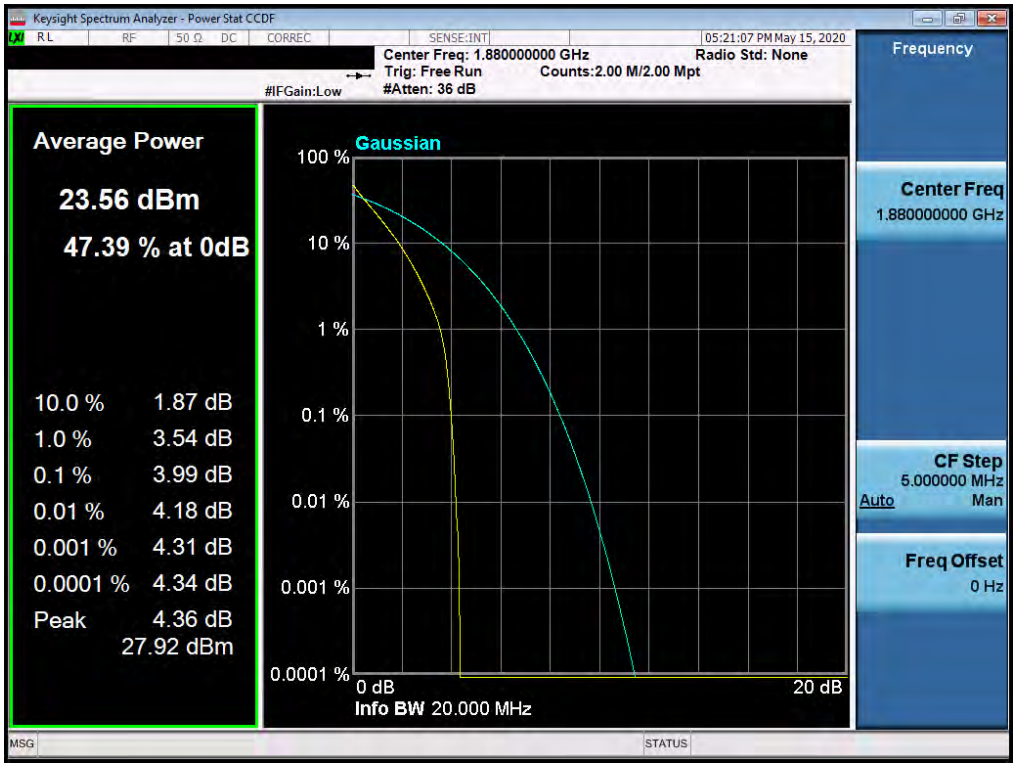
Plot 7-356. PAR Plot (NR Band n2 - 15.0MHz CP-OFDM 16-QAM - Full RB)



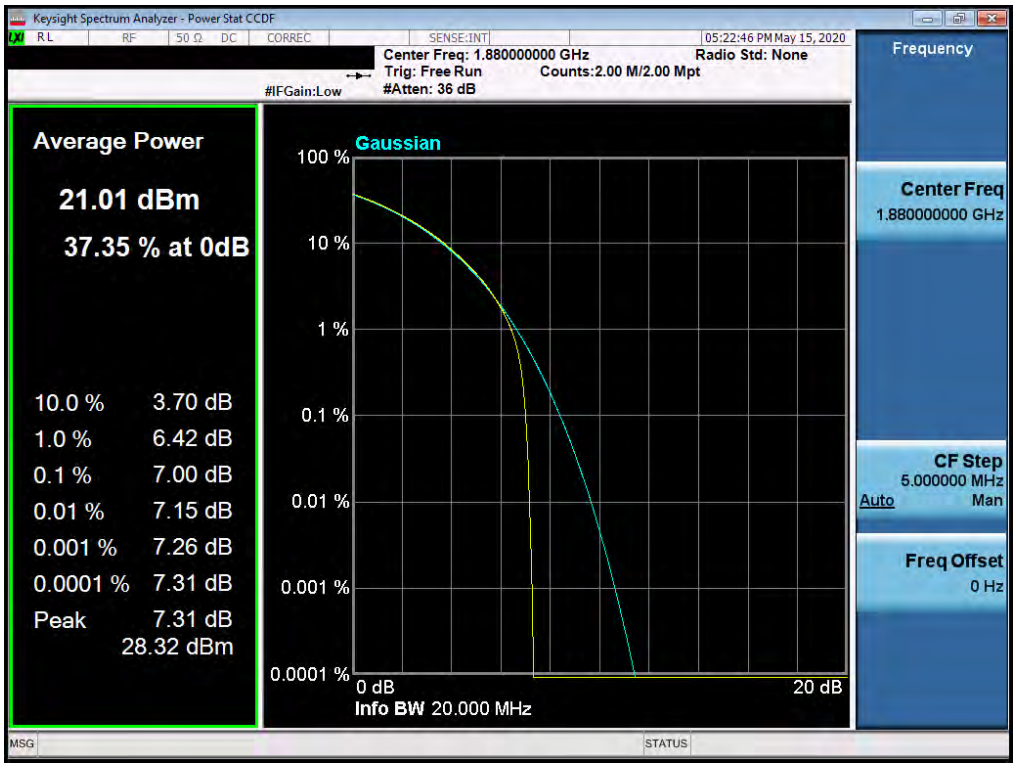
Plot 7-357. PAR Plot (NR Band n2 - 15.0MHz CP-OFDM 64-QAM - Full RB)



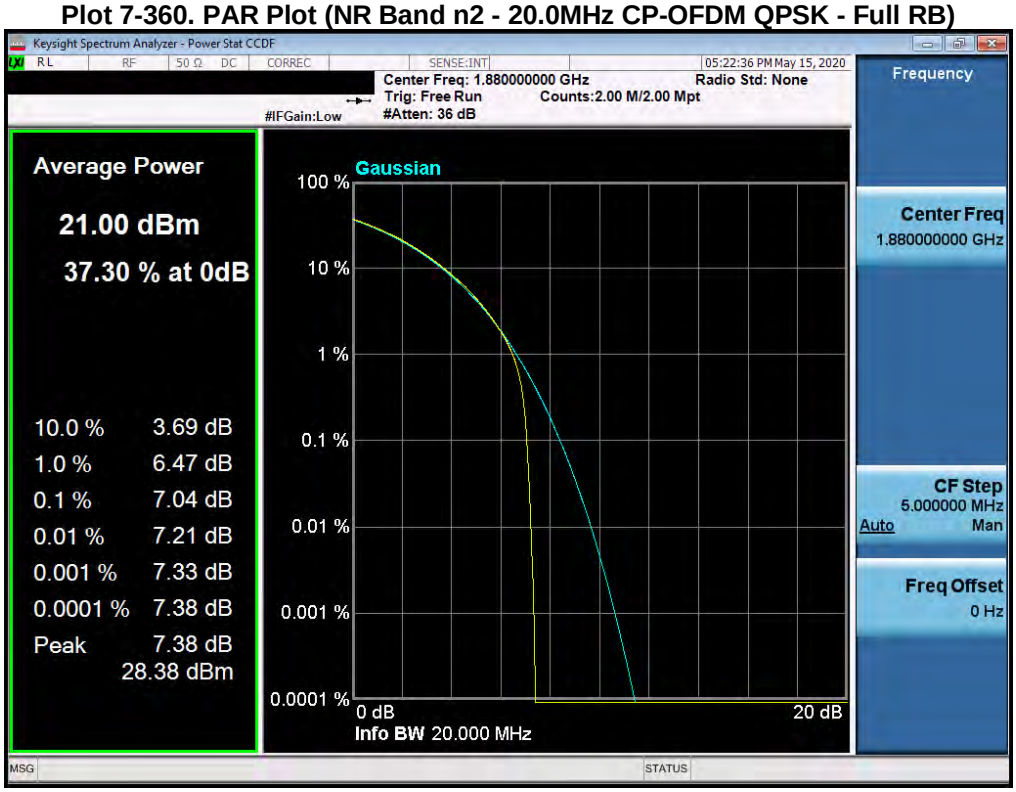
Plot 7-358. PAR Plot (NR Band n2 - 15.0MHz CP-OFDM 256-QAM - Full RB)



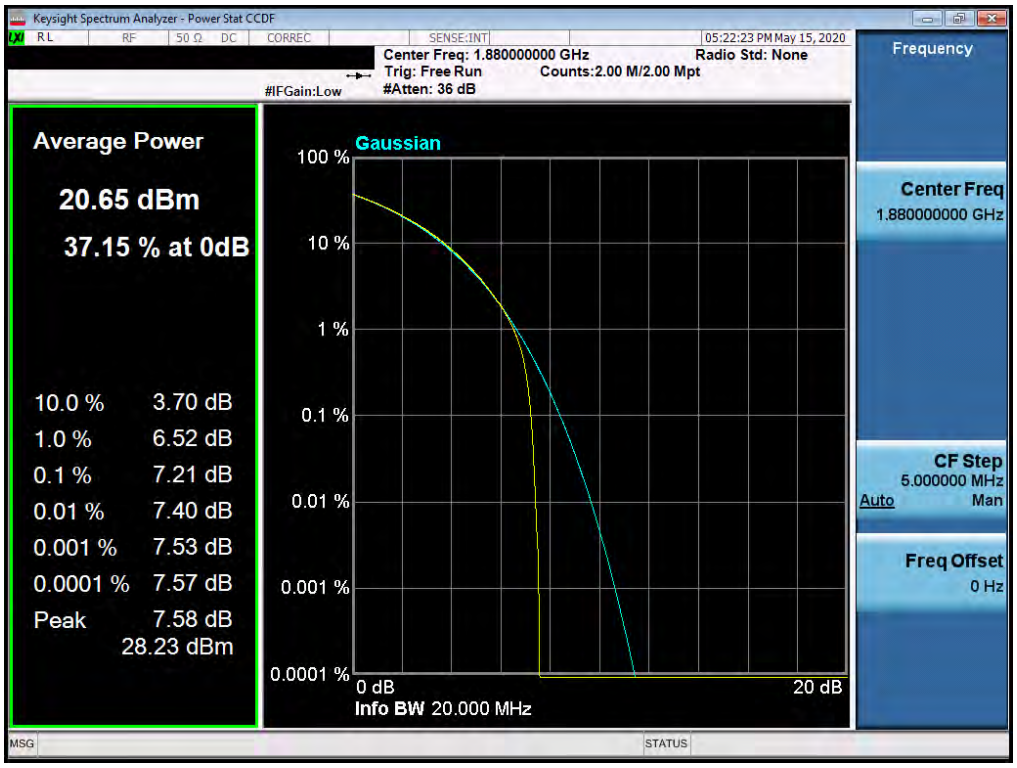
Plot 7-359. PAR Plot (NR Band n2 - 20.0MHz DFT-s-OFDM π/2 BPSK - Full RB)



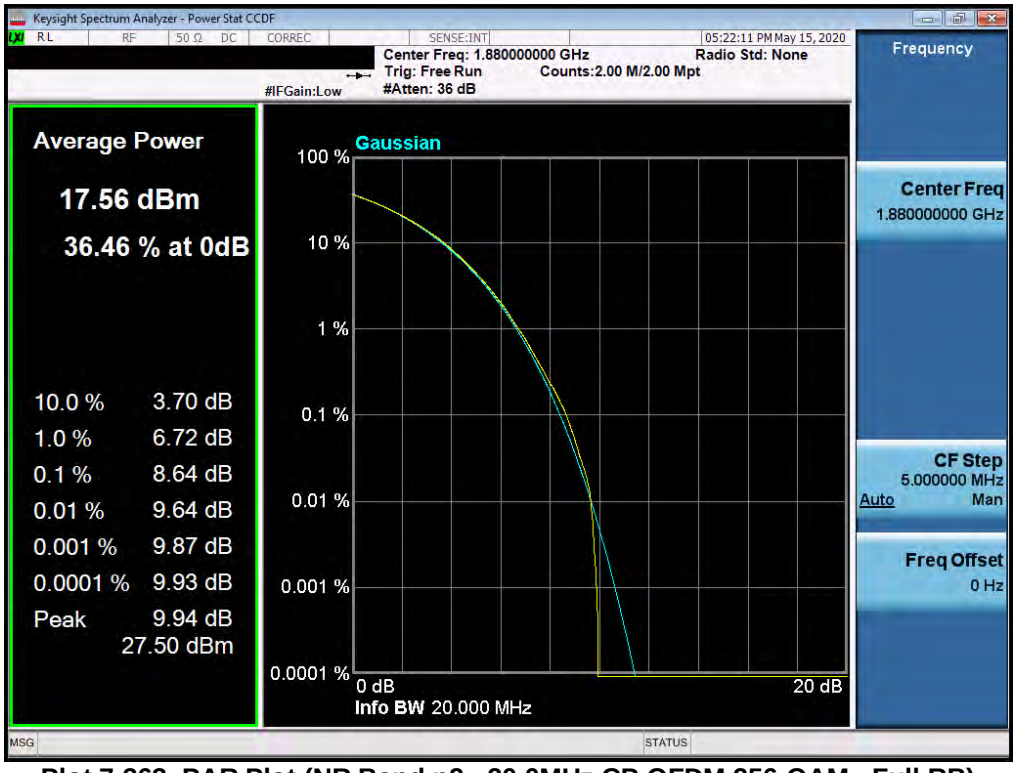
Plot 7-360. PAR Plot (NR Band n2 - 20.0MHz CP-OFDM QPSK - Full RB)



Plot 7-361. PAR Plot (NR Band n2 - 20.0MHz CP-OFDM 16-QAM - Full RB)



Plot 7-362. PAR Plot (NR Band n2 - 20.0MHz CP-OFDM 64-QAM - Full RB)



Plot 7-363. PAR Plot (NR Band n2 - 20.0MHz CP-OFDM 256-QAM - Full RB)

7.6 Transmitter Conducted Output Power

Test Overview and Limit

A transmitter port of EUT is connected to the input of a signal analyzer while also connected to a base station simulator to enabe the LTE link. For Sub-6GHz NR measurements, manufacturer provided software was used to establish the NR transmission and the power measurements are measured on the spectrum analyzer. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.2.2
ANSI/TIA-603-E-2016 – Section 2.2.17
KDB 662911 D01 v02r01 – Section E)1) In-Band Power Measurements

Test Settings

1. Conducted power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW ≥ 3 x RBW
4. Span = 2 times the OBW
5. No. of sweep points > 2 x span / RBW
6. Detector = RMS
7. Trace mode = Trace-Averaging (RMS) set to average over 100 sweeps
8. The trace was allowed to stabilize

Test Setup

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

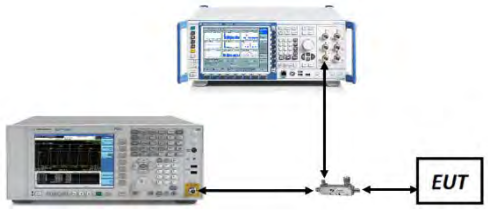


Figure 7-5. Test Instrument & Measurement Setup

Test Notes

None

LTE Band 13

LTE Band 13 10 MHz Bandwidth			
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]
QPSK	1	0	**24.57**
	1	25	24.36
	1	49	24.33
	50	0	23.58
16QAM	1	0	23.87
	1	25	23.89
	1	49	23.65
	50	0	22.66
64QAM	1	0	22.78
	1	25	22.84
	1	49	22.48
	50	0	21.18

Table 7-3. Conducted Powers (B13, 5MHz)

LTE Band 13 10 MHz Bandwidth			
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]
QPSK	1	0	**24.57**
	1	25	24.36
	1	49	24.33
	50	0	23.58
16QAM	1	0	23.87
	1	25	23.89
	1	49	23.65
	50	0	22.66
64QAM	1	0	22.78
	1	25	22.84
	1	49	22.48
	50	0	21.18

Table 7-4. Conducted Powers (B13, 10MHz)

LTE Band 5

LTE Band 5 (Cell) 1.4 MHz Bandwidth					
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel
			20407 (824.7 MHz)	20525 (836.5 MHz)	20643 (848.3 MHz)
			Conducted Power [dBm]		
QPSK	1	0	23.47	23.62	23.54
	1	2	23.61	23.74	**23.76**
	1	5	23.62	23.68	23.47
	6	0	22.67	22.71	22.54
16QAM	1	0	22.94	22.67	22.91
	1	2	22.67	22.61	22.47
	1	5	22.81	22.81	22.63
	6	0	21.74	21.67	21.48
64QAM	1	0	21.76	21.74	21.98
	1	2	21.66	21.79	21.59
	1	5	21.97	22.01	21.84
	6	0	20.69	20.91	20.44

Table 7-5. Conducted Powers (B5, 1.4MHz)

LTE Band 5 (Cell) 3 MHz Bandwidth					
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel
			20415 (825.5 MHz)	20525 (836.5 MHz)	20635 (847.5 MHz)
			Conducted Power [dBm]		
QPSK	1	0	23.64	23.51	23.61
	1	7	23.49	23.66	**23.77**
	1	14	23.67	23.74	23.37
	15	0	22.81	22.74	22.61
16QAM	1	0	22.83	22.51	22.49
	1	7	22.71	22.67	22.51
	1	14	22.84	22.89	22.92
	15	0	21.61	21.37	21.54
64QAM	1	0	21.81	21.63	21.93
	1	7	21.64	21.84	21.61
	1	14	21.84	22.18	21.88
	15	0	20.41	20.84	20.31

Table 7-6. Conducted Powers (B5, 3MHz)

LTE Band 5 (Cell) 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Low Channel 20425 (826.5 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20625 (846.5 MHz)
			Conducted Power [dBm]		
QPSK	1	0	23.56	23.57	23.64
	1	12	23.45	23.80	23.71
	1	24	23.65	**23.86**	23.52
	25	0	22.73	22.69	22.62
16QAM	1	0	22.90	22.71	22.66
	1	12	22.72	22.84	22.90
	1	24	22.84	22.64	22.54
	25	0	21.69	21.71	21.67
64QAM	1	0	21.84	21.61	22.07
	1	12	21.79	21.73	21.96
	1	24	22.01	21.89	21.97
	25	0	20.71	20.67	20.65

Table 7-7. Conducted Powers (B5, 5MHz)

LTE Band 5 (Cell) 10 MHz Bandwidth			
Modulation	RB Size	RB Offset	Mid Channel 20525 (836.5 MHz) Conducted Power [dBm]
QPSK	1	0	23.57
	1	25	23.80
	1	49	**23.86**
	50	0	22.69
16QAM	1	0	22.71
	1	25	22.84
	1	49	22.64
	50	0	21.71
64QAM	1	0	21.61
	1	25	21.73
	1	49	21.89
	50	0	20.67

Table 7-8. Conducted Powers (B5, 10MHz)

LTE Band 66

LTE Band 66 (AWS) 1.4 MHz Bandwidth					
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel
			131979 (1710.7 MHz)	132322 (1745.0 MHz)	132665 (1779.3 MHz)
			Conducted Power [dBm]		
QPSK	1	0	23.98	24.13	24.13
	1	2	24.06	**24.22**	24.19
	1	5	24.04	24.13	24.10
	6	0	23.22	23.24	23.06
16QAM	1	0	23.13	23.09	22.88
	1	2	23.21	23.18	22.96
	1	5	23.17	23.08	22.87
	6	0	22.23	22.21	22.32
64QAM	1	0	21.32	21.76	21.71
	1	2	21.38	21.85	21.81
	1	5	21.39	21.82	21.64
	6	0	20.40	21.37	20.52

Table 7-9. Conducted Powers (B66, 1.4MHz)

LTE Band 66 (AWS) 3 MHz Bandwidth					
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel
			131987 (1711.5 MHz)	132322 (1745.0 MHz)	132657 (1778.5 MHz)
			Conducted Power [dBm]		
QPSK	1	0	24.06	**24.22**	24.04
	1	7	24.10	24.20	23.94
	1	14	24.16	24.11	23.95
	15	0	23.29	23.33	23.16
16QAM	1	0	23.13	23.33	22.96
	1	7	23.17	23.31	22.87
	1	14	23.19	23.26	22.84
	15	0	22.40	22.44	22.16
64QAM	1	0	20.96	22.18	21.82
	1	7	21.04	22.28	21.84
	1	14	21.06	22.36	21.79
	15	0	20.47	21.15	20.82

Table 7-10. Conducted Powers (B66, 3MHz)

LTE Band 66 (AWS) 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel
			131997 (1712.5 MHz)	132322 (1745.0 MHz)	132647 (1777.5 MHz)
			Conducted Power [dBm]		
QPSK	1	0	23.97	**24.27**	24.15
	1	12	24.12	24.26	24.14
	1	24	24.08	24.11	24.00
	25	0	23.30	23.32	23.13
16QAM	1	0	23.18	23.49	23.22
	1	12	23.33	23.37	23.14
	1	24	23.26	23.27	23.03
	25	0	22.48	22.36	22.25
64QAM	1	0	21.45	22.22	21.97
	1	12	21.61	22.37	22.02
	1	24	21.55	22.46	21.89
	25	0	20.43	21.24	20.76

Table 7-11. Conducted Powers (B66, 5MHz)

LTE Band 66 (AWS) 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel
			132022 (1715.0 MHz)	132322 (1745.0 MHz)	132622 (1775.0 MHz)
			Conducted Power [dBm]		
QPSK	1	0	24.08	24.00	23.84
	1	25	**24.36**	24.20	24.01
	1	49	23.92	23.94	23.78
	50	0	23.40	23.28	23.12
16QAM	1	0	23.29	23.06	23.31
	1	25	23.46	23.24	23.47
	1	49	23.13	22.97	23.28
	50	0	22.47	22.24	22.13
64QAM	1	0	21.20	21.48	20.94
	1	25	21.49	22.18	21.82
	1	49	20.97	21.93	21.48
	50	0	20.56	21.10	20.82

Table 7-12. Conducted Powers (B66, 10MHz)

LTE Band 66 (AWS) 15 MHz Bandwidth					
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel
			132047 (1717.5 MHz)	132322 (1745.0 MHz)	132597 (1772.5 MHz)
			Conducted Power [dBm]		
QPSK	1	0	24.28	24.37	23.87
	1	36	24.46	**24.48**	24.28
	1	74	24.11	24.28	24.11
	75	0	23.49	23.50	23.30
16QAM	1	0	23.30	23.31	23.26
	1	36	23.38	23.45	23.49
	1	74	23.18	23.33	23.44
	75	0	22.41	22.48	22.39
64QAM	1	0	21.75	22.12	20.98
	1	36	21.80	22.41	21.68
	1	74	21.40	22.45	21.67
	75	0	20.74	21.15	20.76

Table 7-13. Conducted Powers (B66, 15MHz)

LTE Band 66 (AWS) 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel
			132072 (1720.0 MHz)	132322 (1745.0 MHz)	132572 (1770.0 MHz)
			Conducted Power [dBm]		
QPSK	1	0	24.24	24.22	24.01
	1	50	24.36	**24.38**	24.23
	1	99	23.99	24.10	24.11
	100	0	23.48	23.48	23.21
16QAM	1	0	23.41	23.41	23.30
	1	50	23.46	23.47	23.27
	1	99	23.49	23.40	23.45
	100	0	22.41	22.50	22.19
64QAM	1	0	21.84	21.70	21.68
	1	50	21.83	22.46	22.16
	1	99	21.41	22.30	22.42
	100	0	20.80	21.48	20.52

Table 7-14. Conducted Powers (B66, 20MHz)

LTE Band 2

LTE Band 2 (PCS) 1.4 MHz Bandwidth					
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel
			18607 (1850.7 MHz)	18900 (1880.0 MHz)	19193 (1909.3 MHz)
			Conducted Power [dBm]		
QPSK	1	0	24.15	24.25	24.23
	1	2	24.23	**24.27**	24.21
	1	5	24.11	24.22	24.16
	6	0	23.32	23.22	23.18
16QAM	1	0	22.97	23.08	22.92
	1	2	23.02	23.11	22.97
	1	5	22.94	23.02	22.94
	6	0	22.37	22.12	22.28
64QAM	1	0	21.35	22.05	21.49
	1	2	21.47	22.12	21.59
	1	5	21.51	21.98	21.39
	6	0	20.51	21.48	20.41

Table 7-15. Conducted Powers (B2, 1.4MHz)

LTE Band 2 (PCS) 3 MHz Bandwidth					
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel
			18615 (1851.5 MHz)	18900 (1880.0 MHz)	19185 (1908.5 MHz)
			Conducted Power [dBm]		
QPSK	1	0	24.19	**24.21**	24.15
	1	7	24.18	24.14	24.03
	1	14	24.12	24.11	23.90
	15	0	23.30	23.31	23.26
16QAM	1	0	23.29	23.22	23.21
	1	7	23.42	23.23	23.13
	1	14	23.48	23.13	23.04
	15	0	22.38	22.30	22.33
64QAM	1	0	21.49	22.49	22.08
	1	7	21.63	22.46	21.95
	1	14	21.75	22.38	21.82
	15	0	20.59	21.34	20.48

Table 7-16. Conducted Powers (B2, 3MHz)

LTE Band 2 (PCS) 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel
			18625 (1852.5 MHz)	18900 (1880.0 MHz)	19175 (1907.5 MHz)
			Conducted Power [dBm]		
QPSK	1	0	24.03	24.17	24.17
	1	12	24.10	**24.28**	24.27
	1	24	24.01	24.18	24.15
	25	0	23.37	23.29	23.29
16QAM	1	0	23.22	23.22	23.21
	1	12	23.32	23.31	23.25
	1	24	23.27	23.18	23.19
	25	0	22.31	22.43	22.38
64QAM	1	0	21.43	22.34	21.82
	1	12	21.79	22.42	21.76
	1	24	21.91	22.31	21.54
	25	0	20.57	21.25	20.61

Table 7-17. Conducted Powers (B2, 5MHz)

LTE Band 2 (PCS) 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel
			18650 (1855.0 MHz)	18900 (1880.0 MHz)	19150 (1905.0 MHz)
			Conducted Power [dBm]		
QPSK	1	0	23.67	23.75	24.19
	1	25	**24.22**	24.07	24.12
	1	49	23.84	23.88	24.02
	50	0	23.30	23.16	23.22
16QAM	1	0	22.83	22.91	23.21
	1	25	23.35	23.22	23.28
	1	49	22.85	23.01	23.23
	50	0	22.31	22.17	22.23
64QAM	1	0	21.15	22.08	22.47
	1	25	21.89	22.49	22.05
	1	49	21.49	22.17	21.71
	50	0	20.69	21.24	20.86

Table 7-18. Conducted Powers (B2, 10MHz)

LTE Band 2 (PCS) 15 MHz Bandwidth					
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel
			18675 (1857.5 MHz)	18900 (1880.0 MHz)	19125 (1902.5 MHz)
			Conducted Power [dBm]		
QPSK	1	0	23.96	24.06	24.09
	1	36	24.10	**24.22**	24.09
	1	74	24.12	24.10	24.13
	75	0	23.17	23.14	23.15
16QAM	1	0	23.17	23.22	23.39
	1	36	23.29	23.31	23.33
	1	74	23.31	23.35	23.38
	75	0	22.23	22.03	22.20
64QAM	1	0	21.28	22.09	22.04
	1	36	21.54	22.02	21.99
	1	74	21.44	21.98	21.74
	75	0	20.58	21.09	20.99

Table 7-19. Conducted Powers (B2, 15MHz)

LTE Band 2 (PCS) 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel
			18700 (1860.0 MHz)	18900 (1880.0 MHz)	19100 (1900.0 MHz)
			Conducted Power [dBm]		
QPSK	1	0	24.08	24.03	23.88
	1	50	24.07	24.05	24.05
	1	99	**24.11**	**24.11**	24.09
	100	0	23.13	22.94	23.10
16QAM	1	0	23.37	23.48	23.15
	1	50	23.35	23.35	23.20
	1	99	23.36	23.38	23.31
	100	0	22.10	22.15	22.22
64QAM	1	0	22.27	22.16	22.46
	1	50	22.25	22.33	22.30
	1	99	22.47	22.36	22.04
	100	0	20.57	21.10	20.93

Table 7-20. Conducted Powers (B2, 20MHz)

NR Band 5

Bandwidth	Transmission Scheme	Modulation	Channel	Frequency [MHz]	100/0 RB	1/26 RB	1/53 RB	1/79 RB
					Conducted Power [dBm]			
20 MHz	DFT-s-OFDM	π/2 BPSK	166800	834.0	23.11	23.64	23.74	23.63
			167300	836.5	23.08	23.71	**23.80**	23.71
			167800	839.0	23.11	23.67	23.59	23.65
		QPSK	166800	834.0	22.68	23.60	23.63	23.59
			167300	836.5	22.63	23.64	23.67	23.59
			167800	839.0	22.65	23.63	23.62	23.54
		16-QAM	166800	834.0	21.59	22.82	22.85	22.84
			167300	836.5	21.55	22.76	23.08	22.93
			167800	839.0	21.55	22.91	22.92	22.84
		64-QAM	166800	834.0	21.24	21.37	21.64	21.54
			167300	836.5	21.27	21.41	22.80	21.50
			167800	839.0	21.25	21.50	21.49	21.53
		256-QAM	166800	834.0	19.24	19.33	19.34	19.52
			167300	836.5	19.23	19.18	22.98	19.31
			167800	839.0	19.22	19.25	19.41	19.10

Bandwidth	Transmission Scheme	Modulation	Channel	Frequency [MHz]	106/0 RB	1/26 RB	1/53 RB	1/79 RB
					Conducted Power [dBm]			
20 MHz	CP-OFDM	QPSK	166800	834.0	20.78	**22.07**	22.02	21.75
			167300	836.5	20.77	21.99	21.86	22.14
			167800	839.0	20.73	21.73	21.84	22.10
		16-QAM	166800	834.0	20.82	21.52	21.57	21.42
			167300	836.5	20.79	21.53	21.33	21.63
			167800	839.0	20.74	21.29	21.70	21.31
		64-QAM	166800	834.0	20.13	20.15	20.30	20.23
			167300	836.5	20.17	20.02	20.18	20.36
			167800	839.0	20.13	20.19	20.49	19.96
		256-QAM	166800	834.0	17.16	17.18	17.17	16.94
			167300	836.5	17.11	17.19	17.39	17.23
			167800	839.0	17.13	17.14	17.16	17.43

Table 7-21. Conducted Powers (n5, 20MHz)

Bandwidth	Transmission Scheme	Modulation	Channel	Frequency [MHz]	75/0 RB	1/20 RB	1/39 RB	1/58 RB
					Conducted Power [dBm]			
15 MHz	DFT-s-OFDM	π/2 BPSK	166300	831.5	23.03	23.50	23.59	23.50
			167300	836.5	22.93	23.48	23.41	22.93
			168300	841.5	22.91	23.46	23.53	23.54
		QPSK	166300	831.5	22.60	23.43	23.57	23.53
			167300	836.5	22.55	23.51	**23.63**	22.63
			168300	841.5	22.47	23.47	23.45	23.52
		16-QAM	166300	831.5	21.55	22.43	22.52	22.43
			167300	836.5	21.47	22.55	22.66	21.27
			168300	841.5	21.38	22.55	22.33	22.15
		64-QAM	166300	831.5	21.06	21.25	21.37	21.22
			167300	836.5	21.06	21.26	21.10	21.13
			168300	841.5	21.10	21.31	21.22	21.05
		256-QAM	166300	831.5	19.12	18.92	19.20	19.17
			167300	836.5	19.08	19.22	19.17	19.28
			168300	841.5	19.06	19.06	19.13	18.98

Bandwidth	Transmission Scheme	Modulation	Channel	Frequency [MHz]	79/0 RB	1/20 RB	1/39 RB	1/58 RB
					Conducted Power [dBm]			
15 MHz	CP-OFDM	QPSK	166300	831.5	20.65	**21.94**	21.87	22.02
			167300	836.5	20.59	21.80	21.77	21.82
			168300	841.5	20.59	21.76	21.83	21.85
		16-QAM	166300	831.5	20.59	21.13	21.00	21.04
			167300	836.5	20.59	20.78	21.22	21.10
			168300	841.5	20.49	21.18	21.27	21.24
		64-QAM	166300	831.5	19.94	20.12	20.08	20.30
			167300	836.5	19.93	20.34	20.35	20.00
			168300	841.5	19.98	20.21	20.37	19.79
		256-QAM	166300	831.5	16.97	17.23	17.38	17.29
			167300	836.5	17.02	17.40	17.36	17.33
			168300	841.5	16.96	17.60	17.44	17.22

Table 7-22. Conducted Powers (n5, 15MHz)

Bandwidth	Transmission Scheme	Modulation	Channel	Frequency [MHz]	50/0 RB	1/13 RB	1/26 RB	1/38 RB
					Conducted Power [dBm]			
10 MHz	DFT-s-OFDM	π/2 BPSK	165800	829.0	22.84	23.39	23.43	23.49
			167300	836.5	22.89	23.45	23.57	23.47
			168800	844.0	22.94	23.44	**23.59**	23.44
		QPSK	165800	829.0	22.50	23.37	23.38	23.45
			167300	836.5	22.52	23.27	23.39	23.26
			168800	844.0	22.62	23.47	23.41	23.38
		16-QAM	165800	829.0	21.21	22.32	22.24	22.32
			167300	836.5	21.37	22.33	22.37	22.32
			168800	844.0	21.46	22.80	22.82	22.75
		64-QAM	165800	829.0	20.91	21.02	21.05	21.03
			167300	836.5	21.11	21.19	21.08	21.39
			168800	844.0	21.18	21.44	21.31	21.49
		256-QAM	165800	829.0	18.98	18.85	19.10	19.07
			167300	836.5	19.15	19.18	19.29	19.05
			168800	844.0	19.17	19.09	19.38	19.33

Bandwidth	Transmission Scheme	Modulation	Channel	Frequency [MHz]	52/0 RB	1/13 RB	1/26 RB	1/38 RB
					Conducted Power [dBm]			
10 MHz	CP-OFDM	QPSK	165800	829.0	20.49	21.68	21.60	21.45
			167300	836.5	20.55	**21.83**	21.69	21.55
			168800	844.0	20.68	21.48	21.47	21.37
		16-QAM	165800	829.0	20.48	21.13	20.87	20.83
			167300	836.5	20.59	20.93	21.23	21.07
			168800	844.0	20.62	21.43	21.55	21.57
		64-QAM	165800	829.0	19.88	20.18	19.94	20.12
			167300	836.5	20.02	20.14	20.23	20.15
			168800	844.0	20.12	20.17	20.37	19.90
		256-QAM	165800	829.0	16.90	17.20	16.58	17.45
			167300	836.5	16.98	17.24	17.63	16.82
			168800	844.0	17.04	17.33	17.48	17.30

Table 7-23. Conducted Powers (n5, 10MHz)

Bandwidth	Transmission Scheme	Modulation	Channel	Frequency [MHz]	25/0 RB	1/6 RB	1/12 RB	1/18 RB
					Conducted Power [dBm]			
5 MHz	DFT-s-OFDM	π/2 BPSK	165300	826.5	22.83	23.51	23.18	23.27
			167300	836.5	22.93	23.43	23.49	23.45
			169300	846.5	22.91	**23.61**	23.47	23.43
		QPSK	165300	826.5	22.42	23.35	23.37	23.31
			167300	836.5	22.48	23.45	23.42	23.48
			169300	846.5	22.55	23.51	23.25	23.51
		16-QAM	165300	826.5	21.32	22.33	22.33	22.18
			167300	836.5	21.44	22.26	22.33	22.53
			169300	846.5	21.41	22.63	22.49	22.21
		64-QAM	165300	826.5	21.04	21.29	21.06	21.04
			167300	836.5	21.21	21.30	21.10	21.23
			169300	846.5	21.24	21.15	21.14	21.08
		256-QAM	165300	826.5	18.93	19.04	18.81	19.07
			167300	836.5	19.11	19.19	19.02	19.10
			169300	846.5	19.17	19.30	19.02	19.16

Bandwidth	Transmission Scheme	Modulation	Channel	Frequency [MHz]	25/0 RB	1/6 RB	1/12 RB	1/18 RB
					Conducted Power [dBm]			
5 MHz	CP-OFDM	QPSK	165300	826.5	20.32	21.84	21.82	21.47
			167300	836.5	20.51	21.82	21.77	21.81
			169300	846.5	20.58	**21.95**	21.75	21.79
		16-QAM	165300	826.5	20.31	20.73	21.04	20.98
			167300	836.5	20.56	20.79	20.89	20.95
			169300	846.5	20.54	21.21	21.06	21.08
		64-QAM	165300	826.5	19.86	20.06	20.10	19.89
			167300	836.5	20.02	20.07	20.01	20.09
			169300	846.5	20.05	20.25	20.15	20.32
		256-QAM	165300	826.5	16.78	16.93	16.81	17.38
			167300	836.5	16.96	17.77	17.26	17.20
			169300	846.5	16.94	17.62	17.04	17.35

Table 7-24. Conducted Powers (n5, 5MHz)

NR Band 66

NR Band n66 20 MHz Bandwidth					
			Channel		
Modulation	RB Size	RB Offset	344000 (1720 MHz)	349000 (1745 MHz)	354000 (1770 MHz)
			Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	23.46	23.28	23.32
	1	53	**23.55**	23.47	23.35
	1	104	23.35	23.37	23.18
	50	0	22.99	22.92	22.78
	50	28	23.38	23.27	23.10
	50	56	23.01	22.83	22.69
	100	0	22.47	22.86	22.73
DFT-s-OFDM QPSK	1	1	23.40	23.34	23.05
	1	53	23.52	23.41	23.29
	1	104	23.43	23.40	23.16
	50	0	22.52	22.40	22.33
	50	28	23.38	23.28	23.16
	50	56	22.45	22.41	22.21
	100	0	22.51	22.40	22.24
DFT-s-OFDM	1	1	22.21	22.25	22.01
CP-OFDM	1	1	21.77	21.93	21.71

Table 7-25. Conducted Powers (n66, 20MHz)

NR Band n66 15 MHz Bandwidth					
			Channel		
Modulation	RB Size	RB Offset	343500 (1717.5 MHz)	349000 (1745 MHz)	354500 (1772.5 MHz)
			Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	**23.51**	23.38	23.23
	1	40	23.37	23.29	23.06
	1	77	23.47	23.32	23.14
	36	0	23.06	22.89	22.74
	36	22	23.39	23.27	23.15
	36	43	22.93	22.92	22.71
	75	0	23.04	22.92	22.74
DFT-s-OFDM QPSK	1	1	23.49	23.40	23.20
	1	40	23.36	23.32	23.12
	1	77	23.51	23.38	23.18
	36	0	22.52	22.45	22.31
	36	22	23.40	23.30	23.14
	36	43	22.53	22.44	22.28
	75	0	22.52	22.38	22.28
DFT-s-OFDM	1	1	22.36	22.44	22.03
CP-OFDM	1	1	22.02	21.80	21.71

Table 7-26. Conducted Powers (n66, 15MHz)

NR Band n66 10 MHz Bandwidth					
			Channel		
Modulation	RB Size	RB Offset	343000 (1715 MHz)	349000 (1745 MHz)	355000 (1775 MHz)
			Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	23.52	23.39	23.27
	1	26	**23.68**	23.52	23.34
	1	50	23.31	23.31	23.00
	25	0	23.04	22.84	22.75
	25	14	23.40	23.26	23.05
	25	27	22.95	22.86	22.65
	50	0	22.93	22.85	22.68
DFT-s-OFDM QPSK	1	1	23.17	23.47	22.83
	1	26	23.59	23.49	23.26
	1	50	23.20	23.36	22.95
	25	0	22.61	22.35	22.34
	25	14	23.35	23.29	23.07
	25	27	22.43	22.37	22.17
	50	0	22.45	22.31	22.22
DFT-s-OFDM	1	1	22.42	22.29	22.05
CP-OFDM	1	1	22.06	21.77	21.60

Table 7-27. Conducted Powers (n66, 10MHz)

NR Band n66 5 MHz Bandwidth					
			Channel		
Modulation	RB Size	RB Offset	342500 (1712.5 MHz)	349000 (1745 MHz)	355500 (1777.5 MHz)
			Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	**23.55**	23.18	23.02
	1	13	23.47	23.20	23.08
	1	23	23.47	23.24	23.06
	12	0	22.98	22.79	22.63
	12	7	23.44	23.33	23.07
	12	13	23.00	22.76	22.60
	25	0	22.97	22.82	22.65
DFT-s-OFDM QPSK	1	1	23.54	23.25	23.08
	1	13	23.54	23.37	23.19
	1	23	23.37	23.35	23.04
	12	0	22.50	22.33	22.12
	12	7	23.39	23.20	23.02
	12	13	22.47	22.25	22.13
	25	0	22.56	22.34	22.14
DFT-s-OFDM	1	1	22.32	22.07	22.23
CP-OFDM	1	1	21.91	21.58	21.55

Table 7-28. Conducted Powers (n66, 5MHz)

NR Band 2

NR Band n2 20 MHz Bandwidth					
			Channel		
Modulation	RB Size	RB Offset	372000 (1860 MHz)	376000 (1880 MHz)	380000 (1900 MHz)
			Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	23.59	23.82	23.58
	1	53	23.80	23.92	23.13
	1	104	23.89	23.45	22.94
	50	0	23.21	23.42	22.90
	50	28	23.66	23.93	23.09
	50	56	23.37	23.36	22.53
	100	0	23.31	23.41	22.80
DFT-s-OFDM QPSK	1	1	23.62	23.85	23.53
	1	53	23.81	**23.99**	23.05
	1	104	23.91	23.65	22.89
	50	0	22.73	22.91	22.32
	50	28	23.70	23.89	23.05
	50	56	22.90	22.88	22.10
	100	0	22.83	22.93	22.26
DFT-s-OFDM	1	1	22.25	22.94	22.60
CP-OFDM	1	1	21.83	22.03	21.91

Table 7-29. Conducted Powers (n2, 20MHz)

NR Band n2 15 MHz Bandwidth					
			Channel		
Modulation	RB Size	RB Offset	371500 (1857.5 MHz)	376000 (1880 MHz)	380500 (1902.5 MHz)
			Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	23.58	**23.97**	23.25
	1	40	23.77	23.96	22.94
	1	77	23.82	23.71	22.92
	36	0	23.17	23.45	22.74
	36	22	23.70	23.92	23.06
	36	43	23.23	23.34	22.55
	75	0	23.16	23.45	22.69
DFT-s-OFDM QPSK	1	1	23.60	23.82	23.37
	1	40	23.85	23.80	23.01
	1	77	23.87	23.60	22.93
	36	0	22.73	22.97	22.25
	36	22	23.69	23.88	23.06
	36	43	22.85	22.89	22.09
	75	0	22.68	22.97	22.14
DFT-s-OFDM	1	1	22.63	22.93	22.44
CP-OFDM	1	1	21.66	22.13	21.59

Table 7-30. Conducted Powers (n2, 15MHz)

NR Band n2 10 MHz Bandwidth					
			Channel		
Modulation	RB Size	RB Offset	371000 (1855 MHz)	376000 (1880 MHz)	381000 (1905 MHz)
			Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	23.42	23.85	23.02
	1	26	23.64	23.93	22.81
	1	50	23.56	23.71	22.90
	25	0	23.19	23.43	22.63
	25	14	23.57	23.93	22.91
	25	27	23.18	23.47	22.47
	50	0	23.19	23.46	22.48
DFT-s-OFDM QPSK	1	1	23.57	23.92	23.12
	1	26	23.72	**24.00**	23.07
	1	50	23.61	23.77	22.89
	25	0	22.68	22.93	22.06
	25	14	23.61	23.93	22.94
	25	27	22.73	22.94	22.01
	50	0	22.72	22.93	22.00
DFT-s-OFDM	1	1	22.52	22.80	22.01
CP-OFDM	1	1	21.91	22.27	21.32

Table 7-31. Conducted Powers (n2, 10MHz)

NR Band n2 5 MHz Bandwidth					
			Channel		
Modulation	RB Size	RB Offset	370500 (1852.5 MHz)	376000 (1880 MHz)	381500 (1907.5 MHz)
			Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	23.51	23.64	22.84
	1	13	23.56	23.91	22.82
	1	23	23.61	23.73	22.86
	12	0	23.02	23.42	22.43
	12	7	23.63	23.88	22.86
	12	13	23.16	23.35	22.42
	25	0	23.19	23.45	22.37
DFT-s-OFDM QPSK	1	1	23.45	23.87	22.86
	1	13	23.63	**23.99**	22.94
	1	23	23.62	23.82	22.95
	12	0	22.52	22.97	21.96
	12	7	23.64	23.94	22.80
	12	13	22.76	22.91	21.97
	25	0	22.71	22.96	21.93
DFT-s-OFDM	1	1	22.54	22.79	21.81
CP-OFDM	1	1	21.91	22.12	21.15

Table 7-32. Conducted Powers (n2, 5MHz)

7.7 Uplink Carrier Aggregation

§22.917(a), 27.53(h)

Test Overview

The EUT is set up to transmit two contiguous LTE channels. The power level of both carriers 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.

For Band 5 & 66, the minimum permissible attenuation level of any spurious emission is 43 + 10 $log_{10}(P_{[Watts]})$.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

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 = trace average for continuous emissions, max hold for pulse emissions
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.

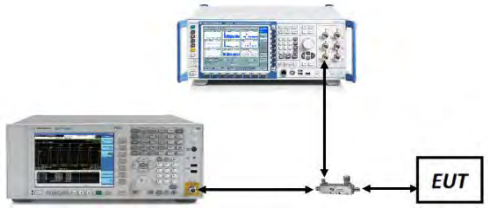


Figure 7-6. Test Instrument & Measurement Setup

Test Notes

1. Conducted power and spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device. The worst case (highest) powers were found while operating with QPSK modulation, as shown in Table 7-503 and 7-504 below, with both carriers set to transmit using 1RB.

2. Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

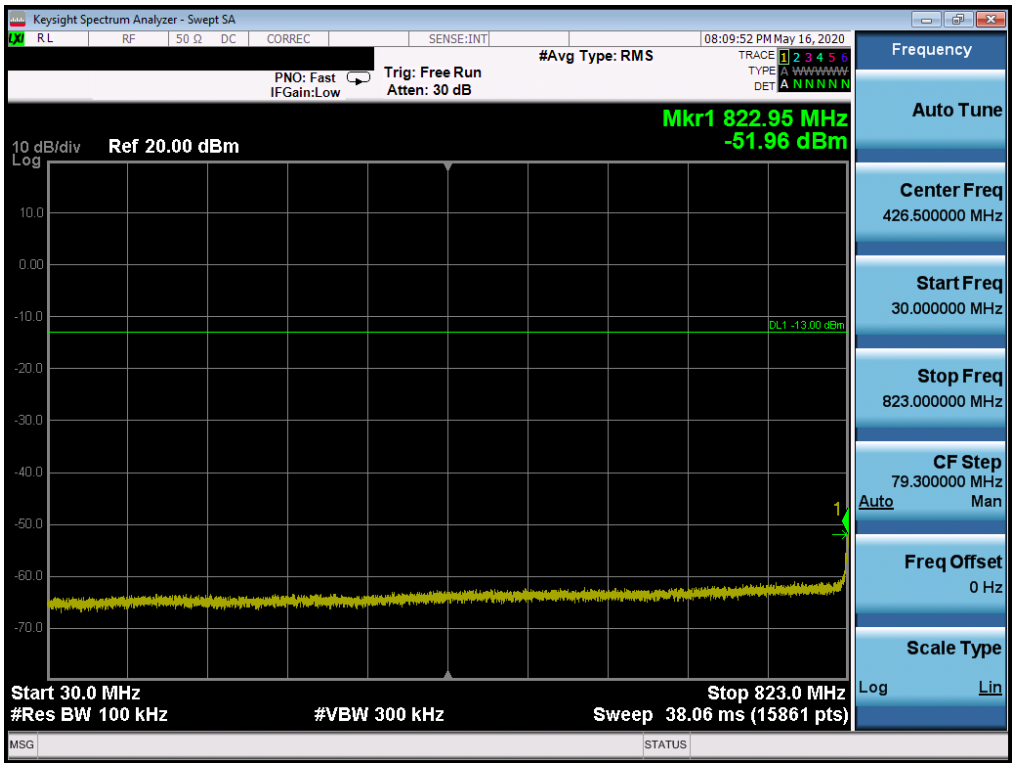
ULCA Band 5

PCC						SCC						
Channel	Frequency [MHz]	BW [MHz]	Mod.	RB Size	RB Offset	Channel	Frequency [MHz]	BW [MHz]	Mod.	RB Size	RB Offset	ULCA Tx.Power (dBm)
20525	836.5	10	QPSK	50	0	20597	843.7	10	QPSK	50	0	23.39
20525	836.5	10	16-QAM	50	0	20597	843.7	10	16-QAM	50	0	22.50
20525	836.5	10	64-QAM	50	0	20597	843.7	10	64-QAM	50	0	22.14

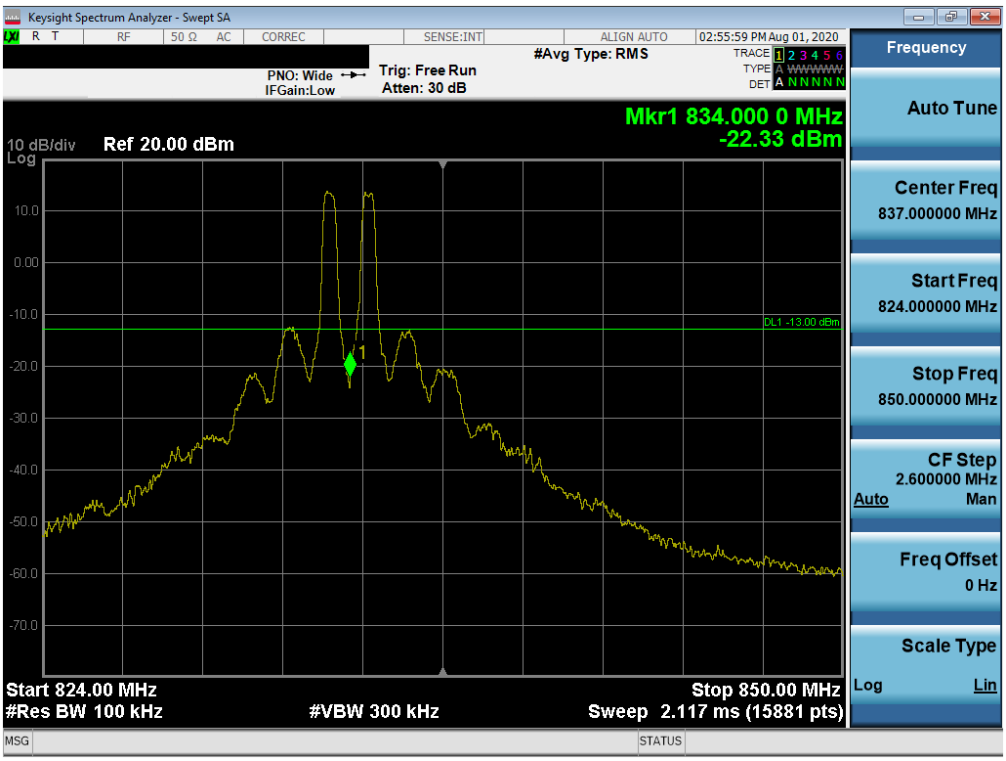
Table 7-33. Conducted Powers (B5)

PCC						SCC						
Channel	Frequency [MHz]	BW [MHz]	Mod.	RB Size	RB Offset	Channel	Frequency [MHz]	BW [MHz]	Mod.	RB Size	RB Offset	ULCA Tx.Power (dBm)
20450	829.0	10	QPSK	1	49	20549	838.9	10	QPSK	1	0	22.52
20525	836.5	10	QPSK	1	49	20597	843.7	5	QPSK	1	0	23.46
20600	844.0	10	QPSK	1	0	20501	834.1	10	QPSK	1	49	21.88

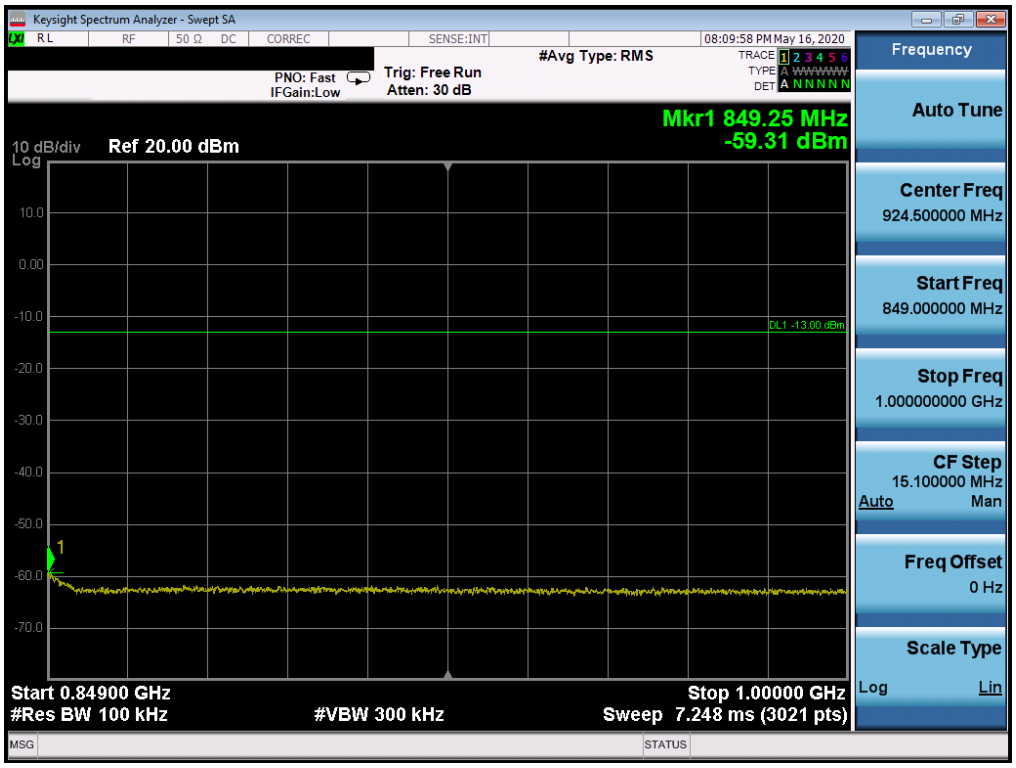
Table 7-34. Conducted Powers (B5 with Various Combinations for 10MHz Channel Bandwidth)



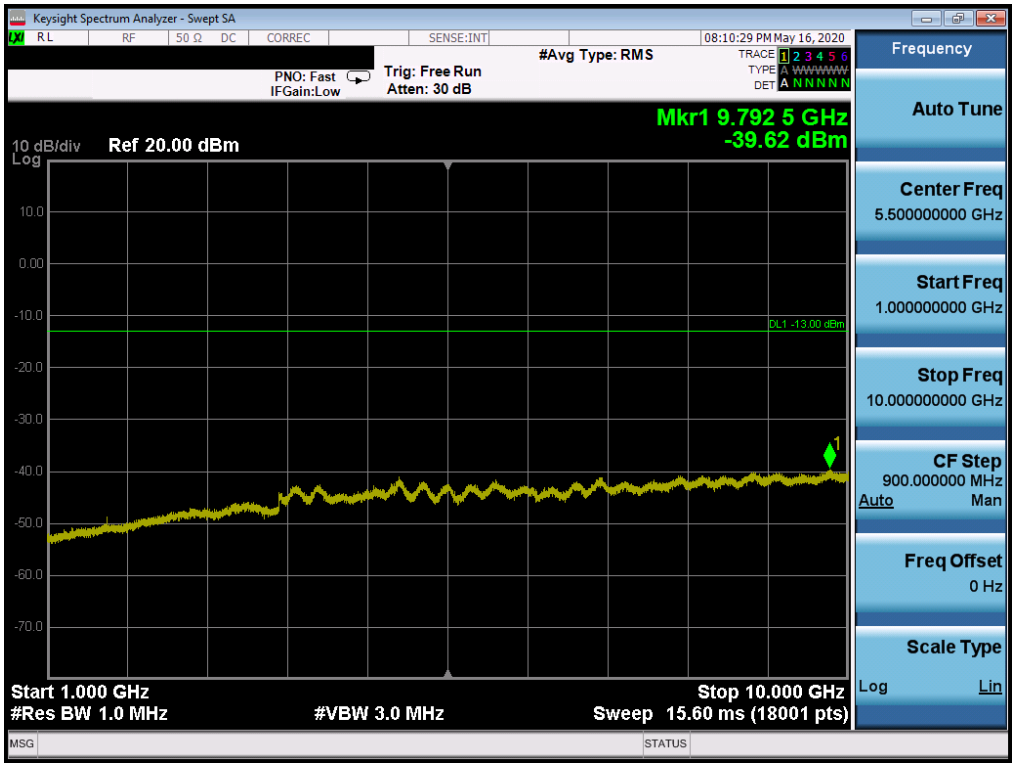
Plot 7-364. Conducted Spurious Plot (Band 5 – 10 + 10 MHz QPSK – PCC 1/0 SCC 1/45 – Low Channel)



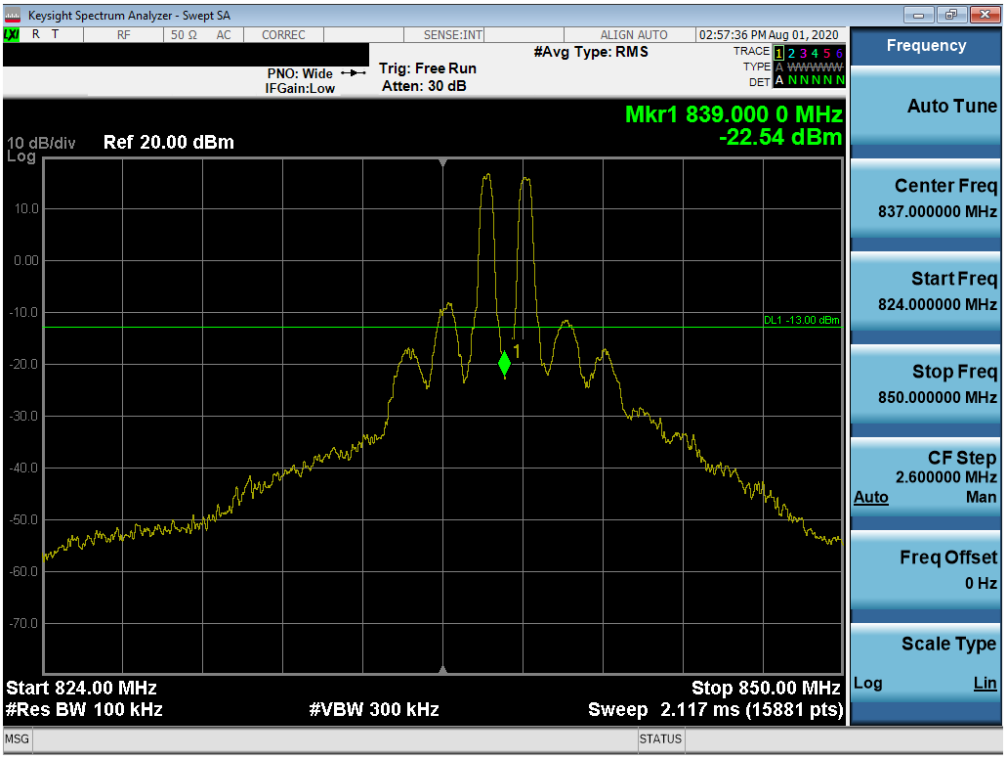
Plot 7-365. Conducted Spurious Plot (Band 5 – 10 + 10 MHz QPSK – PCC 1/0 SCC 1/45 – Low Channel)



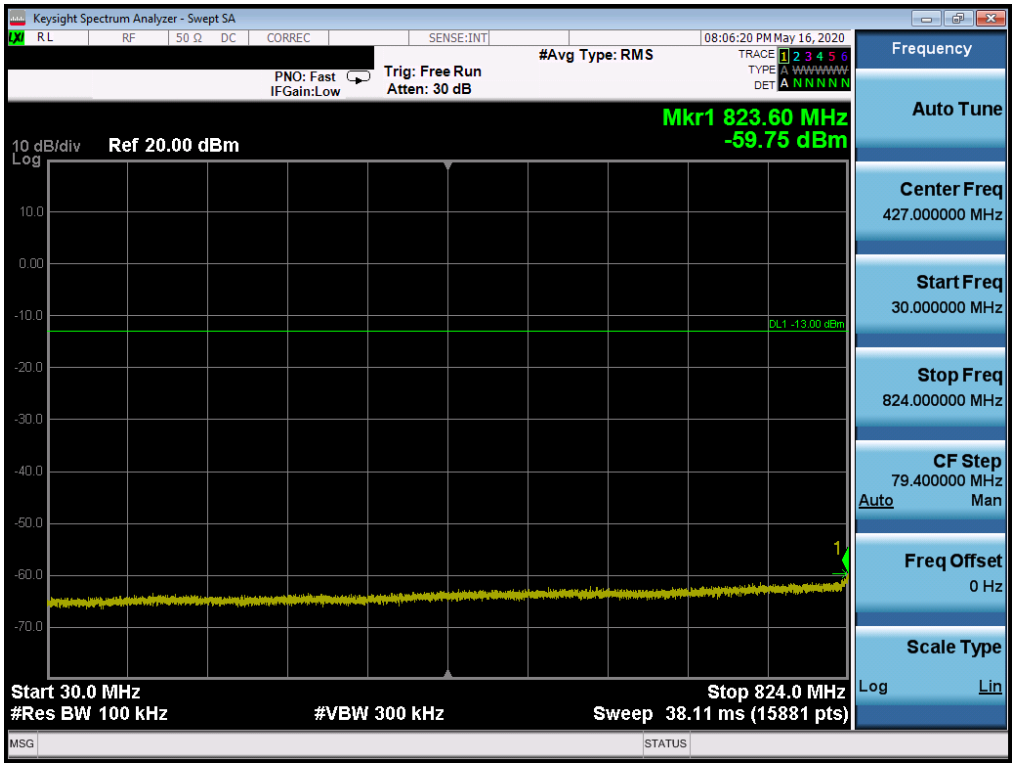
Plot 7-366. Conducted Spurious Plot (Band 5 – 10 + 10 MHz QPSK – PCC 1/0 SCC 1/45 – Low Channel)



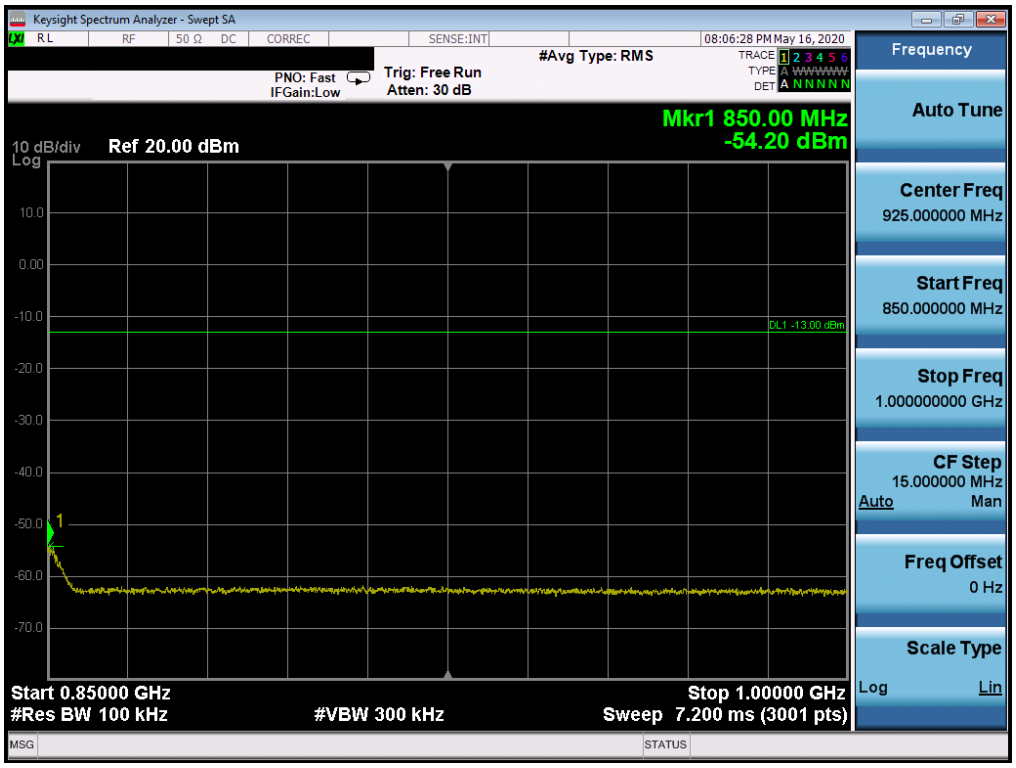
Plot 7-367. Conducted Spurious Plot (Band 5 – 10 + 10 MHz QPSK – PCC 1/0 SCC 1/45 – Low Channel)



Plot 7-368. Conducted Spurious Plot (Band 5 – 10 + 10 MHz QPSK – PCC 1/49 SCC 1/0 – High Channel)



Plot 7-369. Conducted Spurious Plot (Band 5 – 10 + 10 MHz QPSK – PCC 1/49 SCC 1/0 – High Channel)



Plot 7-370. Conducted Spurious Plot (Band 5 – 10 + 10 MHz QPSK – PCC 1/49 SCC 1/0 – High Channel)

Plot 7-371. Conducted Spurious Plot (Band 5 – 10 + 10 MHz QPSK – PCC 1/49 SCC 1/0 – High Channel)

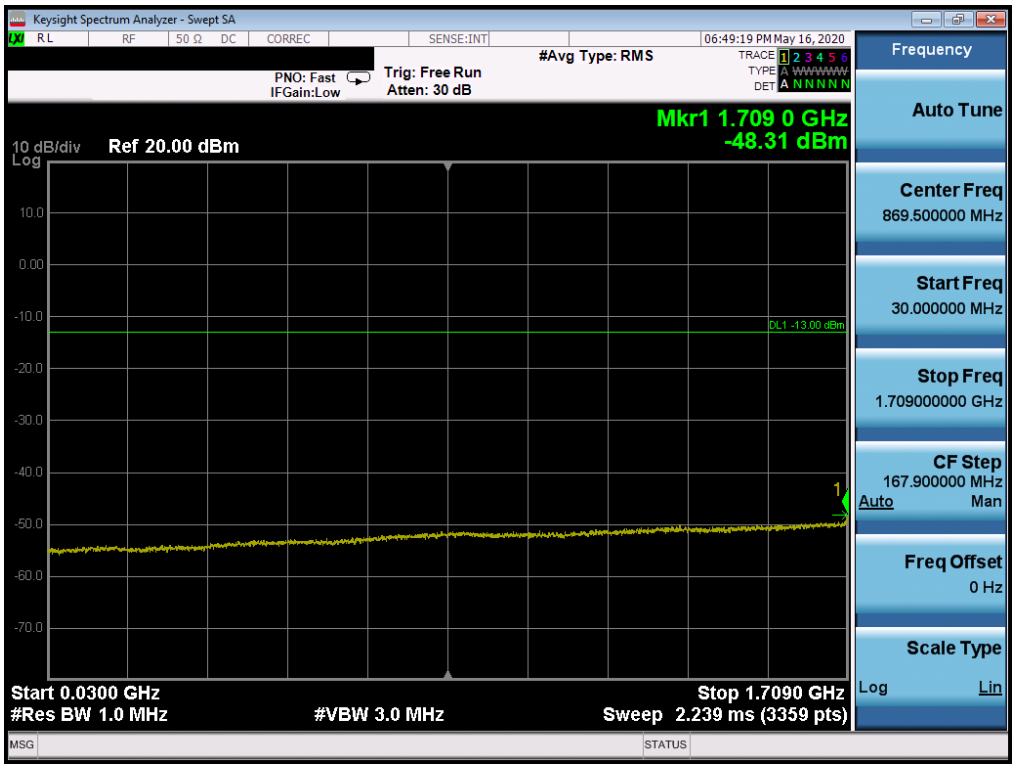
ULCA Band 66

PCC						SCC						
Channel	Frequency [MHz]	BW [MHz]	Mod.	RB Size	RB Offset	Channel	Frequency [MHz]	BW [MHz]	Mod.	RB Size	RB Offset	ULCA Tx.Power (dBm)
132072	1720.0	20	QPSK	1	99	132270	1739.8	20	QPSK	1	0	23.44
132322	1745.0	20	QPSK	1	99	132520	1764.8	20	QPSK	1	0	23.24
132572	1770.0	20	QPSK	1	0	132374	1750.2	20	QPSK	1	99	23.28

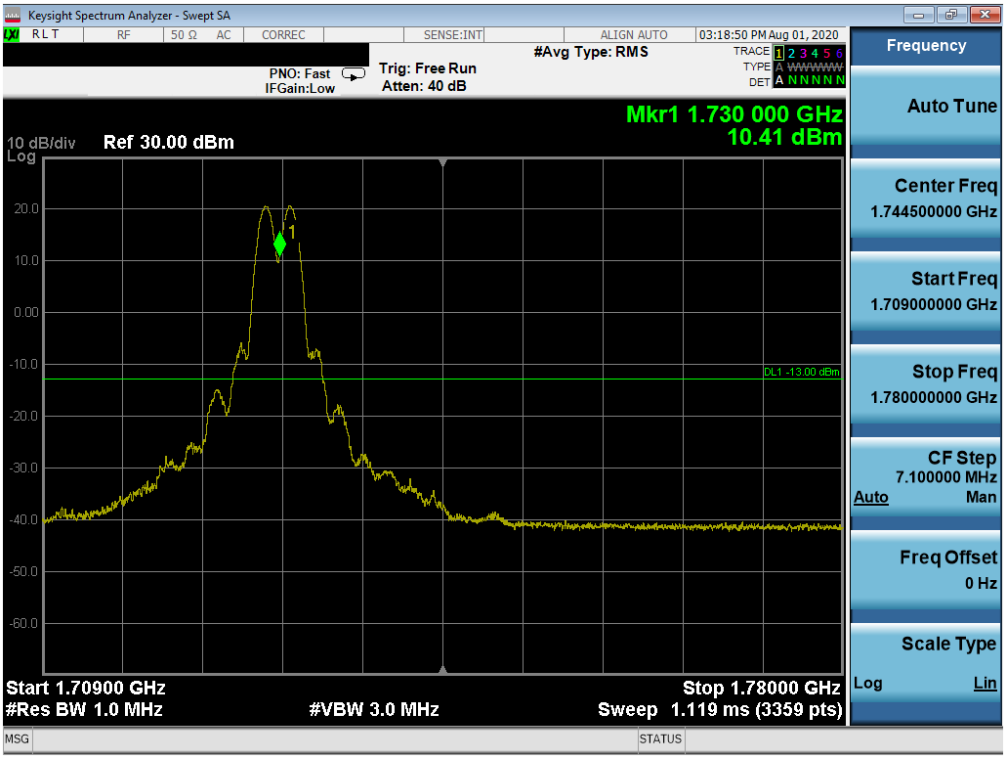
Table 7-35. Conducted Powers (B66)

PCC						SCC						
Channel	Frequency [MHz]	BW [MHz]	Mod.	RB Size	RB Offset	Channel	Frequency [MHz]	BW [MHz]	Mod.	RB Size	RB Offset	ULCA Tx.Power (dBm)
132072	1720.0	20	QPSK	100	0	132270	1739.8	20	QPSK	100	0	22.45
132072	1720.0	20	16-QAM	100	0	132270	1739.8	20	16-QAM	100	0	21.43
132072	1720.0	20	64-QAM	100	0	132270	1739.8	20	64-QAM	100	0	21.42

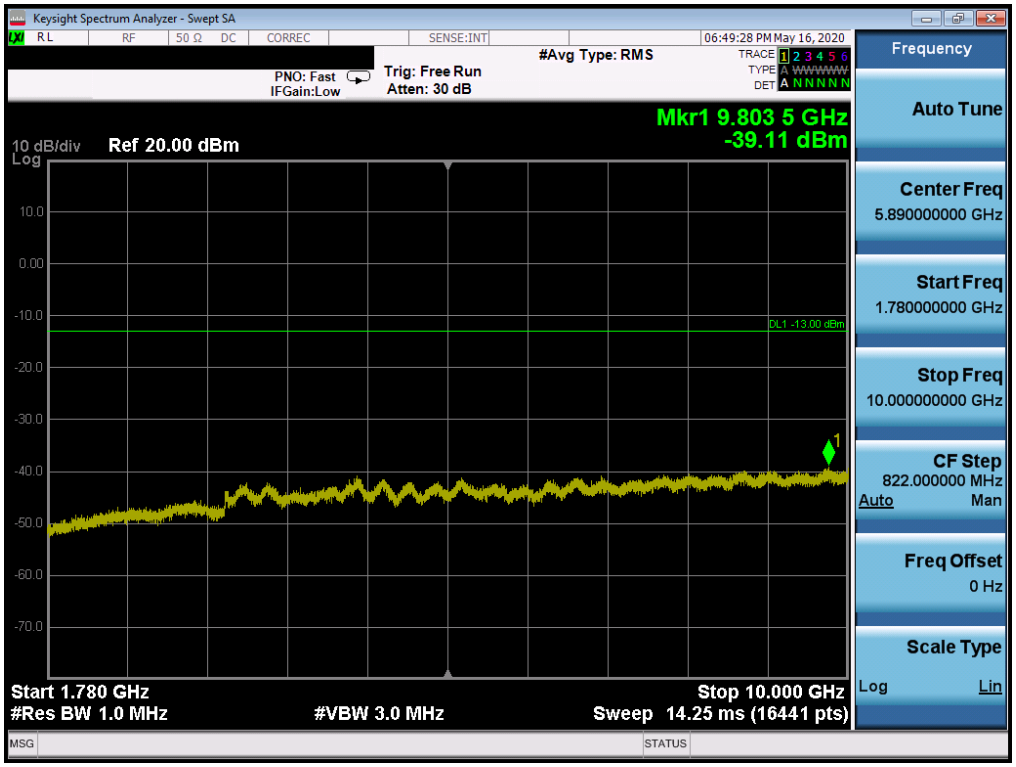
Table 7-36. Conducted Powers (B66 with Various Combinations for 20MHz Channel Bandwidth)



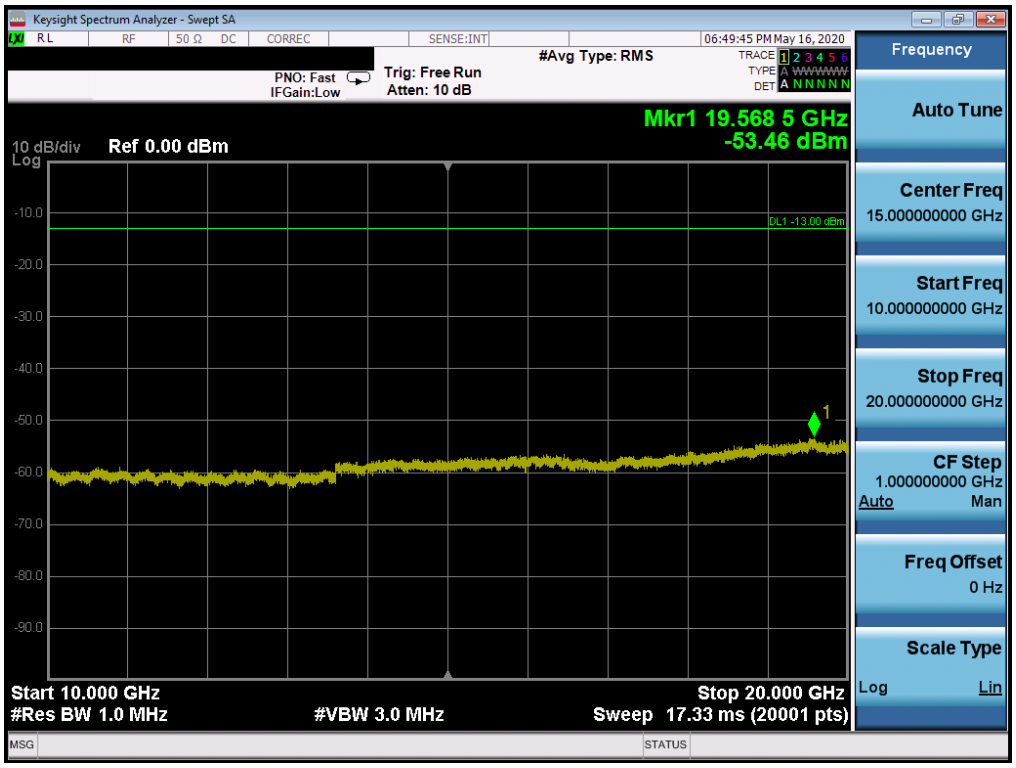
Plot 7-372. Conducted Spurious Plot (Band 66 – 20 + 20 MHz QPSK – PCC 1/0 SCC 1/99 – Low Channel)



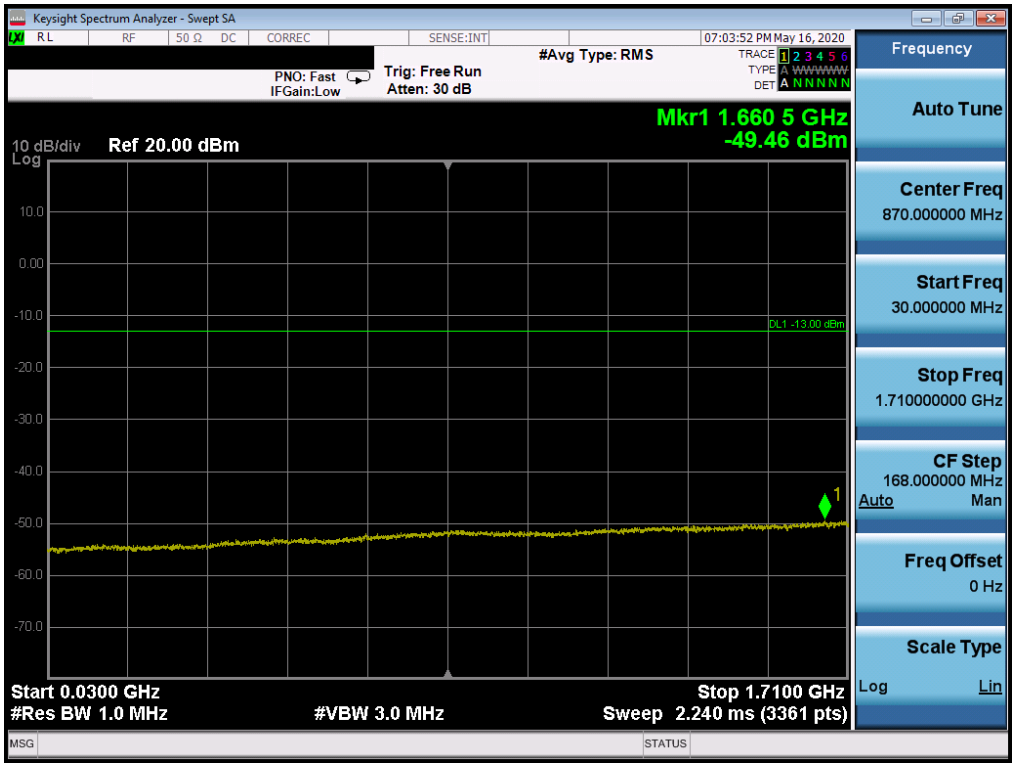
Plot 7-373. Conducted Spurious Plot (Band 66 – 20 + 20 MHz QPSK – PCC 1/0 SCC 1/99 – Low Channel)



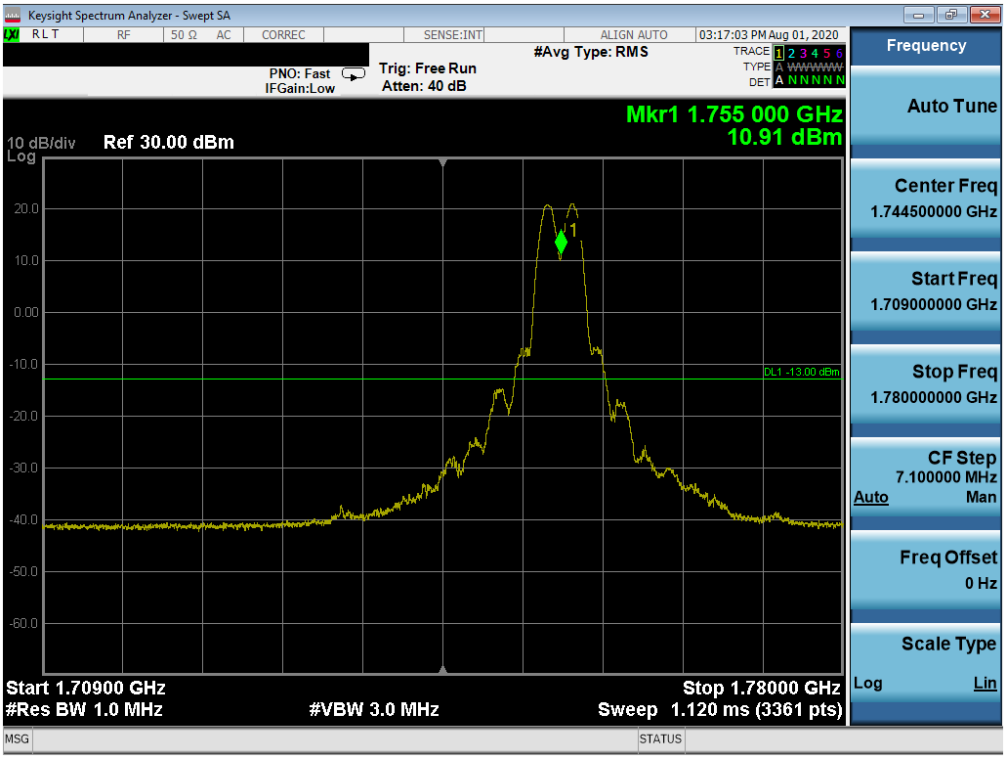
Plot 7-374. Conducted Spurious Plot (Band 66 – 20 + 20 MHz QPSK – PCC 1/0 SCC 1/99 – Low Channel)



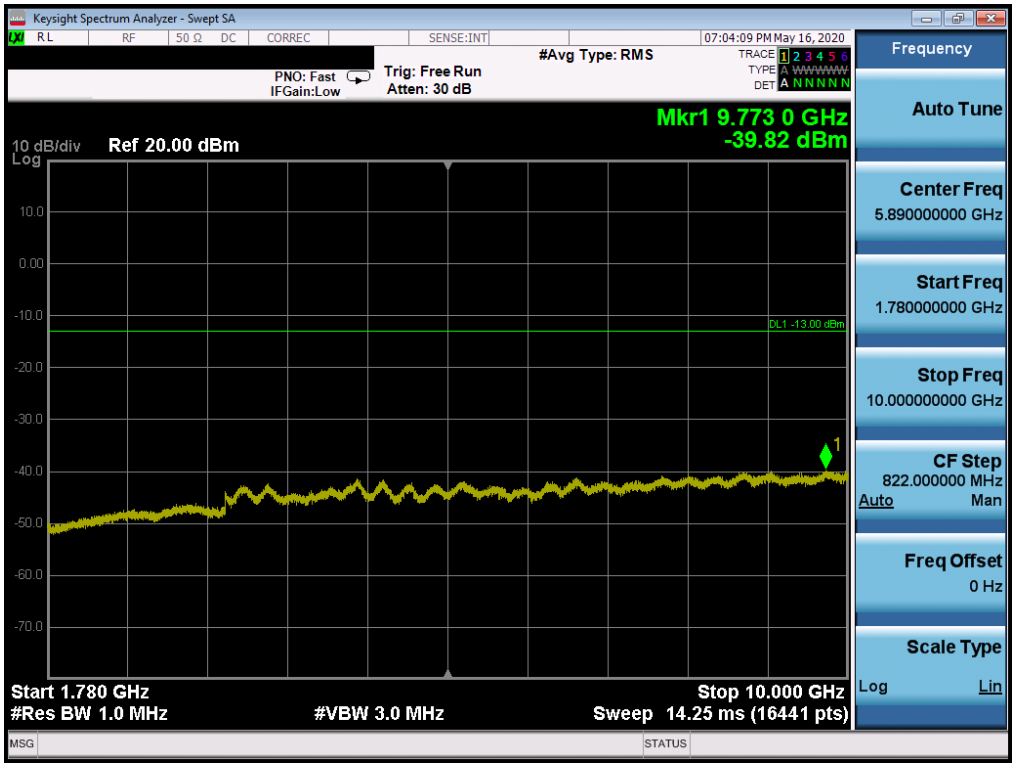
Plot 7-375. Conducted Spurious Plot (Band 66 – 20 + 20 MHz QPSK – PCC 1/0 SCC 1/99 – Low Channel)



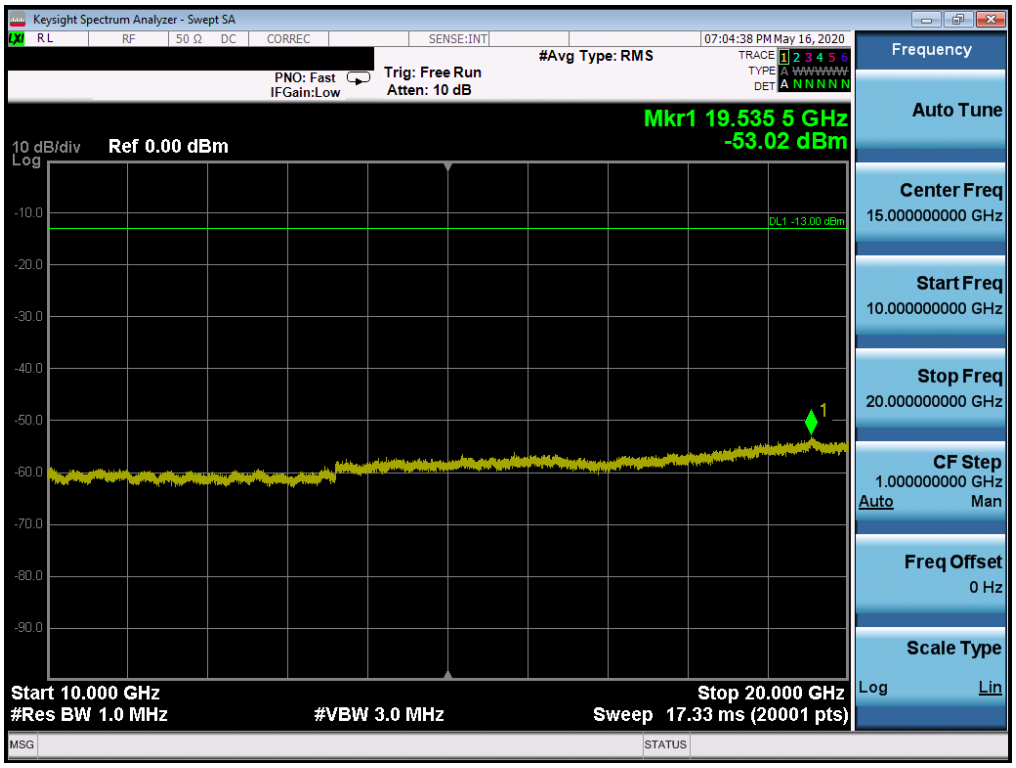
Plot 7-376. Conducted Spurious Plot (Band 66 – 20 + 20 MHz QPSK – PCC 1/0 SCC 1/99 – Mid Channel)



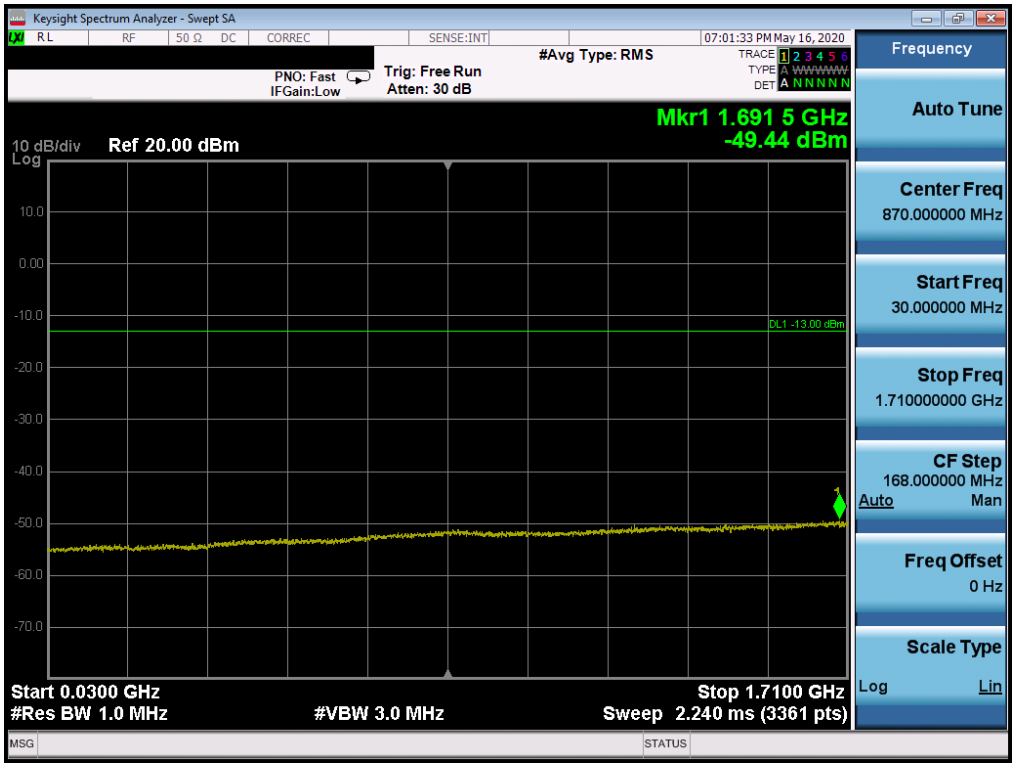
Plot 7-377. Conducted Spurious Plot (Band 66 – 20 + 20 MHz QPSK – PCC 1/0 SCC 1/99 – Mid Channel)



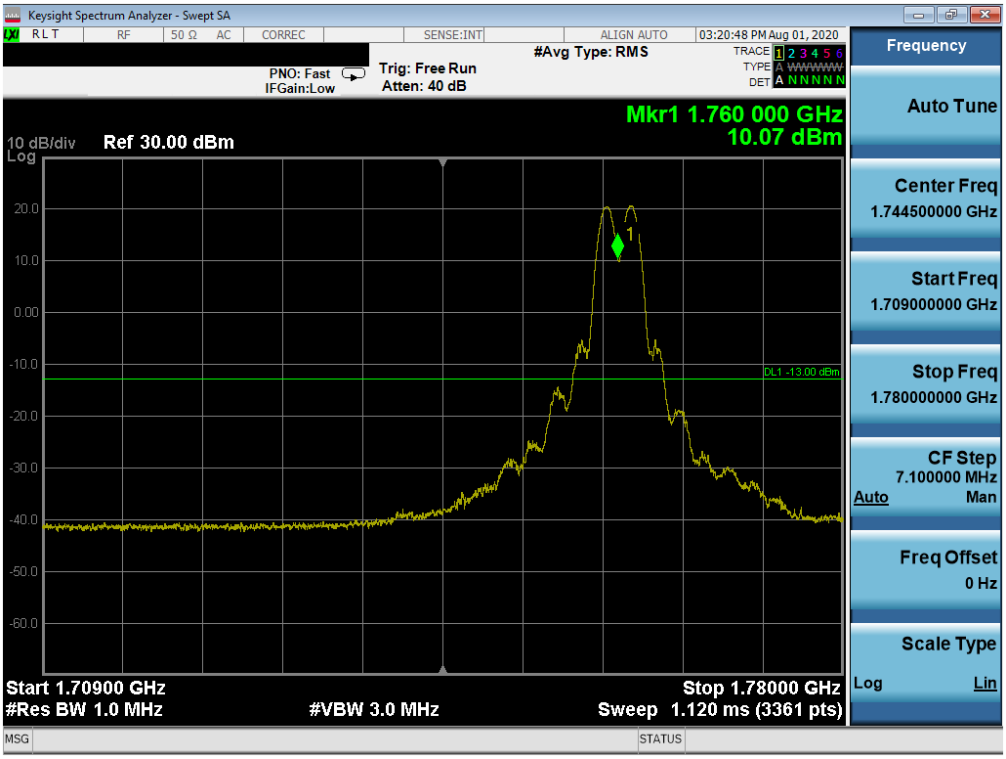
Plot 7-378. Conducted Spurious Plot (Band 66 – 20 + 20 MHz QPSK – PCC 1/0 SCC 1/99 – Mid Channel)



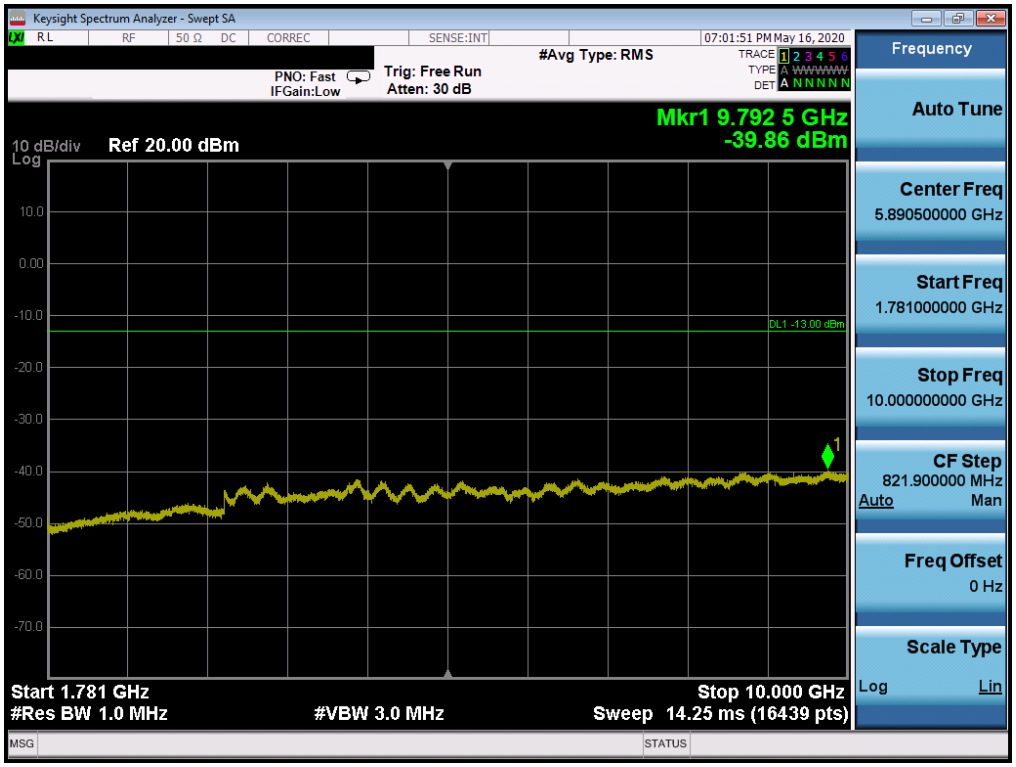
Plot 7-379. Conducted Spurious Plot (Band 66 – 20 + 20 MHz QPSK – PCC 1/0 SCC 1/99 – Mid Channel)



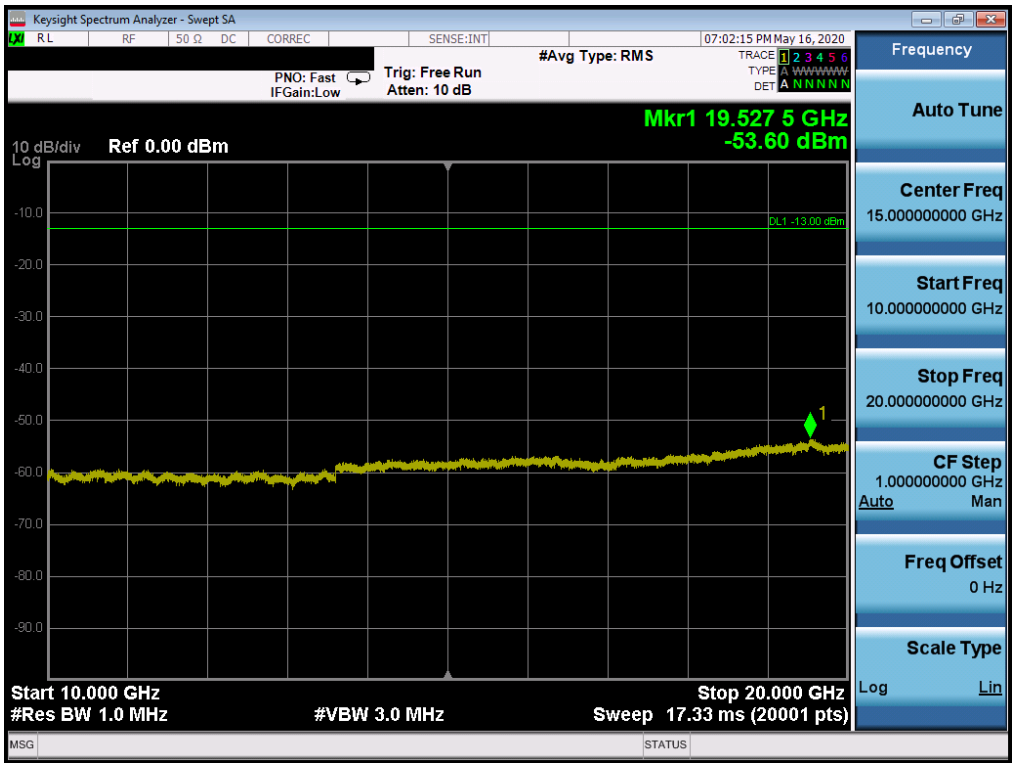
Plot 7-380. Conducted Spurious Plot (Band 66 – 20 + 20 MHz QPSK – PCC 1/99 SCC 1/0 – High Channel)



Plot 7-381. Conducted Spurious Plot (Band 66 – 20 + 20 MHz QPSK – PCC 1/99 SCC 1/0 – High Channel)



Plot 7-382. Conducted Spurious Plot (Band 66 – 20 + 20 MHz QPSK – PCC 1/99 SCC 1/0 – High Channel)



Plot 7-383. Conducted Spurious Plot (Band 66 – 20 + 20 MHz QPSK – PCC 1/99 SCC 1/0 – High Channel)

7.8 Radiated Power (ERP/EIRP)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points ≥ 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

Test Setup

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

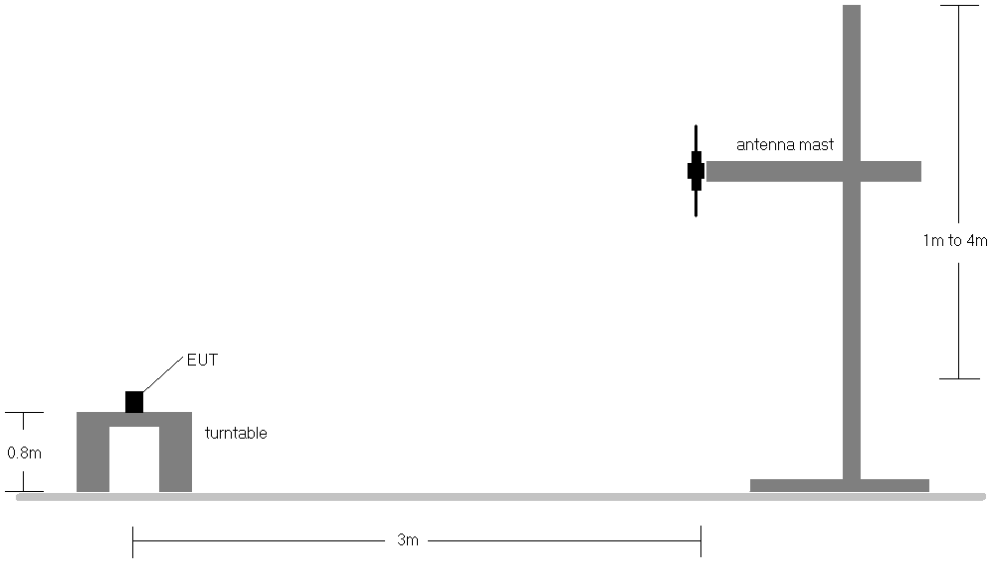


Figure 7-7. Radiated Test Setup <1GHz

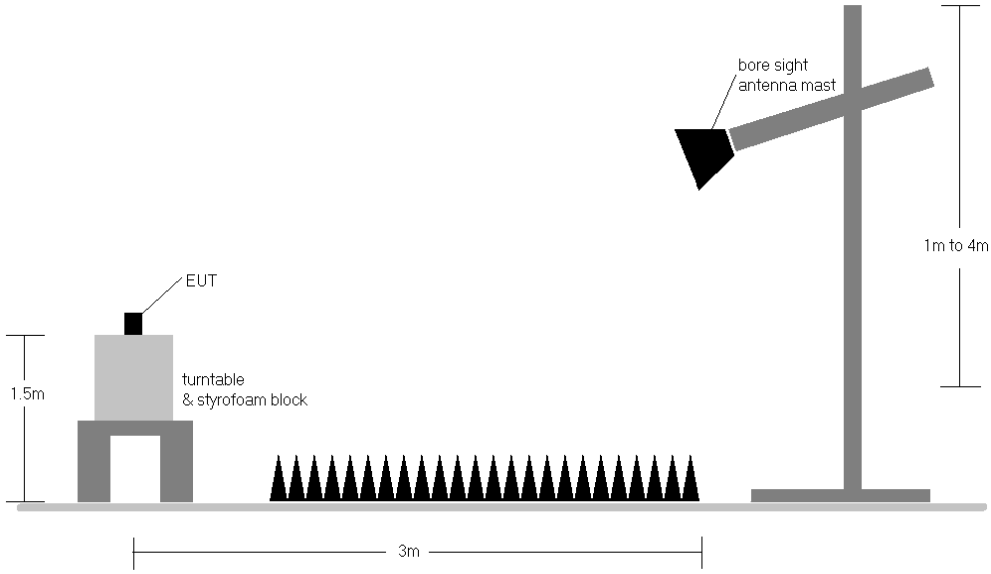


Figure 7-8. Radiated Test Setup >1GHz

Test Notes

1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.

2) This unit was tested while powered by an DC power source.

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
779.50	5	QPSK	V	154	215	1 / 24	14.74	5.77	18.36	0.068	34.77	-16.42
782.00	5	QPSK	V	152	216	1 / 24	17.34	5.79	**20.98**	**0.125**	34.77	-13.79
784.50	5	QPSK	V	152	215	1 / 0	14.16	5.82	17.83	0.061	34.77	-16.94
782.00	5	16-QAM	V	152	216	1 / 24	16.43	5.79	**20.07**	0.102	34.77	-14.70
782.00	5	64-QAM	V	152	216	1 / 0	14.91	5.79	**18.55**	0.072	34.77	-16.22
782.00	10	QPSK	V	152	216	1 / 49	13.04	5.79	**16.68**	0.047	34.77	-18.09
782.00	10	16-QAM	V	152	216	1 / 49	12.01	5.79	**15.65**	0.037	34.77	-19.12
782.00	10	64-QAM	V	152	216	1 / 49	9.86	5.79	**13.50**	0.022	34.77	-21.27
782.00	5	QPSK	H	146	150	1 / 24	11.69	5.89	15.43	0.035	34.77	-19.34

Table 7-37. ERP Data (Band 13)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	V	142	232	1 / 5	14.91	6.36	19.12	0.082	38.45	-19.34
836.50	1.4	QPSK	V	131	230	1 / 5	14.91	6.38	**19.14**	0.082	38.45	-19.31
848.30	1.4	QPSK	V	144	239	1 / 0	14.50	6.50	18.85	0.077	38.45	-19.60
824.70	1.4	16-QAM	V	142	232	1 / 0	14.35	6.36	**18.56**	0.072	38.45	-19.90
824.70	1.4	64-QAM	V	142	232	1 / 0	13.29	6.36	**17.50**	0.056	38.45	-20.96
825.50	3	QPSK	V	149	243	1 / 14	14.96	6.36	19.17	0.083	38.45	-19.28
836.50	3	QPSK	V	131	234	1 / 14	14.97	6.38	**19.20**	0.083	38.45	-19.25
847.50	3	QPSK	V	143	236	1 / 0	14.57	6.49	18.91	0.078	38.45	-19.54
825.50	3	16-QAM	V	149	243	1 / 14	14.25	6.36	**18.46**	0.070	38.45	-19.99
836.50	3	64-QAM	V	131	234	1 / 0	13.25	6.38	**17.48**	0.056	38.45	-20.97
826.50	5	QPSK	V	138	232	1 / 24	14.94	6.37	19.16	0.082	38.45	-19.29
836.50	5	QPSK	V	127	231	1 / 24	15.09	6.38	**19.32**	**0.085**	38.45	-19.13
846.50	5	QPSK	V	131	226	1 / 0	14.60	6.48	18.93	0.078	38.45	-19.52
826.50	5	16-QAM	V	138	232	1 / 0	14.31	6.37	**18.53**	0.071	38.45	-19.92
826.50	5	64-QAM	V	138	232	1 / 0	13.33	6.37	**17.55**	0.057	38.45	-20.90
829.00	10	QPSK	V	143	238	1 / 49	14.91	6.40	19.16	0.082	38.45	-19.29
836.50	10	QPSK	V	133	236	1 / 0	15.09	6.38	**19.32**	0.085	38.45	-19.13
844.00	10	QPSK	V	137	233	1 / 0	14.78	6.46	19.09	0.081	38.45	-19.36
829.00	10	16-QAM	V	143	238	1 / 49	14.06	6.40	**18.31**	0.068	38.45	-20.14
829.00	10	64-QAM	V	143	238	1 / 49	12.95	6.40	**17.20**	0.052	38.45	-21.25
836.50	5	QPSK	H	162	202	1 / 24	11.22	6.68	15.75	0.038	38.45	-22.70

Table 7-38. ERP Data (Band 5)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	H	300	210	1 / 5	16.54	9.47	26.01	0.399	30.00	-3.99
1745.00	1.4	QPSK	H	290	215	1 / 0	17.18	9.26	26.44	0.441	30.00	-3.56
1779.30	1.4	QPSK	H	293	209	1 / 0	19.02	9.29	**28.31**	0.677	30.00	-1.69
1779.30	1.4	16-QAM	H	293	209	1 / 0	17.67	9.29	**26.96**	0.496	30.00	-3.04
1779.30	1.4	64-QAM	H	293	209	1 / 5	16.17	9.29	**25.46**	0.351	30.00	-4.54
1711.50	3	QPSK	H	312	199	1 / 14	16.66	9.47	26.13	0.410	30.00	-3.87
1745.00	3	QPSK	H	301	209	1 / 0	17.27	9.26	26.53	0.450	30.00	-3.47
1778.50	3	QPSK	H	280	207	1 / 0	18.93	9.28	**28.21**	0.663	30.00	-1.79
1778.50	3	16-QAM	H	280	207	1 / 0	17.75	9.28	**27.03**	0.505	30.00	-2.97
1778.50	3	64-QAM	H	280	207	1 / 14	16.28	9.28	**25.56**	0.360	30.00	-4.44
1712.50	5	QPSK	H	298	205	1 / 24	16.58	9.46	26.04	0.402	30.00	-3.96
1745.00	5	QPSK	H	295	214	1 / 0	17.32	9.26	26.58	0.455	30.00	-3.42
1777.50	5	QPSK	H	286	202	1 / 0	19.04	9.28	**28.32**	0.680	30.00	-1.68
1777.50	5	16-QAM	H	286	202	1 / 0	18.01	9.28	**27.29**	0.536	30.00	-2.71
1777.50	5	64-QAM	H	286	202	1 / 24	16.43	9.28	**25.71**	0.373	30.00	-4.29
1715.00	10	QPSK	H	300	207	1 / 0	16.58	9.44	26.02	0.400	30.00	-3.98
1745.00	10	QPSK	H	301	207	1 / 0	17.05	9.26	26.31	0.428	30.00	-3.69
1775.00	10	QPSK	H	292	211	1 / 0	18.73	9.28	**28.01**	0.632	30.00	-1.99
1775.00	10	16-QAM	H	292	211	1 / 0	18.10	9.28	**27.38**	0.547	30.00	-2.62
1775.00	10	64-QAM	H	292	211	1 / 0	15.94	9.28	**25.22**	0.332	30.00	-4.78
1717.50	15	QPSK	H	299	202	1 / 0	16.78	9.43	26.21	0.418	30.00	-3.79
1745.00	15	QPSK	H	298	209	1 / 0	17.42	9.26	26.68	0.466	30.00	-3.32
1772.50	15	QPSK	H	291	205	1 / 74	19.00	9.27	**28.27**	0.672	30.00	-1.73
1772.50	15	16-QAM	H	291	205	1 / 74	18.23	9.27	**27.50**	0.563	30.00	-2.50
1772.50	15	64-QAM	H	291	205	1 / 0	16.13	9.27	**25.40**	0.347	30.00	-4.60
1720.00	20	QPSK	H	305	204	1 / 99	16.86	9.41	26.27	0.424	30.00	-3.73
1745.00	20	QPSK	H	295	209	1 / 99	17.43	9.26	26.69	0.467	30.00	-3.31
1770.00	20	QPSK	H	287	208	1 / 99	19.12	9.27	**28.39**	**0.690**	30.00	-1.61
1770.00	20	16-QAM	H	287	208	1 / 99	18.24	9.27	**27.51**	0.563	30.00	-2.49
1770.00	20	64-QAM	H	287	208	1 / 99	16.88	9.27	**26.15**	0.412	30.00	-3.85
1770.00	20	QPSK	V	115	54	1 / 99	16.79	9.27	26.06	0.403	30.00	-3.94

Table 7-39. EIRP Data (Band 66/4)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	H	334	220	1 / 0	18.36	9.51	27.87	0.613	33.01	-5.14
1880.00	1.4	QPSK	H	328	224	1 / 0	18.60	9.93	28.53	0.712	33.01	-4.48
1909.30	1.4	QPSK	H	325	213	1 / 5	18.85	10.28	**29.13**	0.818	33.01	-3.88
1880.00	1.4	16-QAM	H	328	224	1 / 0	18.22	9.93	**28.15**	0.653	33.01	-4.86
1880.00	1.4	64-QAM	H	328	224	1 / 0	17.37	9.93	**27.30**	0.537	33.01	-5.71
1851.50	3	QPSK	H	335	217	1 / 0	18.32	9.52	27.84	0.609	33.01	-5.17
1880.00	3	QPSK	H	329	223	1 / 14	18.61	9.93	28.54	0.714	33.01	-4.47
1908.50	3	QPSK	H	332	212	1 / 0	18.86	10.27	**29.13**	0.819	33.01	-3.88
1880.00	3	16-QAM	H	329	223	1 / 0	18.19	9.93	**28.12**	0.648	33.01	-4.89
1880.00	3	64-QAM	H	329	223	1 / 0	17.17	9.93	**27.10**	0.512	33.01	-5.91
1852.50	5	QPSK	H	335	215	1 / 24	18.31	9.54	27.85	0.609	33.01	-5.16
1880.00	5	QPSK	H	333	217	1 / 24	18.63	9.93	28.56	0.717	33.01	-4.45
1907.50	5	QPSK	H	335	212	1 / 0	19.01	10.26	**29.27**	0.846	33.01	-3.74
1907.50	5	16-QAM	H	335	212	1 / 0	17.96	10.26	**28.22**	0.664	33.01	-4.79
1880.00	5	64-QAM	H	333	217	1 / 24	17.28	9.93	**27.21**	0.526	33.01	-5.80
1855.00	10	QPSK	H	341	207	1 / 49	17.76	9.57	27.33	0.541	33.01	-5.68
1880.00	10	QPSK	H	324	224	1 / 49	18.59	9.93	28.52	0.711	33.01	-4.49
1905.00	10	QPSK	H	339	221	1 / 0	19.26	10.24	**29.50**	0.892	33.01	-3.51
1905.00	10	16-QAM	H	339	221	1 / 0	18.28	10.24	**28.52**	0.712	33.01	-4.49
1905.00	10	64-QAM	H	339	221	1 / 0	17.09	10.24	**27.33**	0.541	33.01	-5.68
1857.50	15	QPSK	H	341	214	1 / 0	17.86	9.61	27.47	0.558	33.01	-5.54
1880.00	15	QPSK	H	328	212	1 / 74	19.03	9.93	28.96	0.786	33.01	-4.05
1902.50	15	QPSK	H	339	224	1 / 0	19.23	10.22	**29.45**	0.882	33.01	-3.56
1902.50	15	16-QAM	H	339	224	1 / 0	18.33	10.22	**28.55**	0.717	33.01	-4.46
1902.50	15	64-QAM	H	339	224	1 / 0	17.64	10.22	**27.86**	0.611	33.01	-5.15
1860.00	20	QPSK	H	338	213	100 / 0	18.61	9.64	28.25	0.669	33.01	-4.76
1880.00	20	QPSK	H	329	217	100 / 0	19.05	9.93	28.98	0.790	33.01	-4.03
1900.00	20	QPSK	H	332	218	100 / 0	19.32	10.20	**29.52**	**0.896**	33.01	-3.49
1900.00	20	16-QAM	H	332	218	1 / 0	18.50	10.20	**28.70**	0.742	33.01	-4.31
1900.00	20	64-QAM	H	332	218	1 / 99	17.33	10.20	**27.53**	0.567	33.01	-5.48
1900.00	20	QPSK	V	102	124	100 / 0	18.65	10.13	28.78	0.756	33.01	-4.23

Table 7-40. EIRP Data (Band 2)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
20 MHz	π/2 BPSK	834.0	V	156.0	69.0	6.35	1 / 53	13.30	17.50	0.056	38.45	-20.95	19.65	0.092	40.61	-20.95
		836.5	V	157.0	63.0	6.38	1 / 53	14.27	**18.50**	0.071	38.45	-19.95	**20.65**	0.116	40.61	-19.96
		839.0	V	158.0	73.0	6.40	1 / 53	13.50	17.75	0.060	38.45	-20.70	19.90	0.098	40.61	-20.70
	QPSK	834.0	V	156.0	69.0	6.35	1 / 53	12.12	16.32	0.043	38.45	-22.13	18.47	0.070	40.61	-22.13
		836.5	V	157.0	63.0	6.38	1 / 53	13.07	**17.30**	0.054	38.45	-21.15	**19.45**	0.088	40.61	-21.16
		839.0	V	158.0	73.0	6.40	1 / 53	12.23	16.48	0.045	38.45	-21.97	18.63	0.073	40.61	-21.97
	16-QAM	836.5	V	157.0	63.0	6.38	1 / 53	11.81	**16.04**	0.040	38.45	-22.41	**18.19**	0.066	40.61	-22.42
	64-QAM	836.5	V	157.0	63.0	6.38	100 / 0	9.88	**14.11**	0.026	38.45	-24.34	**16.26**	0.042	40.61	-24.35
	256-QAM	836.5	V	157.0	63.0	6.38	1 / 53	8.54	**12.77**	0.019	38.45	-25.68	**14.92**	0.031	40.61	-25.69
15 MHz	π/2 BPSK	831.5	V	156.0	69.0	6.43	1/53	8.78	15.20	0.033	38.45	-23.25	15.20	0.033	40.61	-25.40
		836.5	V	157.0	63.0	6.38	1/26	9.65	**16.03**	0.040	38.45	-22.42	**16.03**	0.040	40.61	-24.58
		841.5	V	158.0	73.0	6.43	1/58	9.05	15.48	0.035	38.45	-22.97	15.48	0.035	40.61	-25.13
	QPSK	831.5	V	156.0	69.0	6.43	1/53	7.68	14.11	0.026	38.45	-24.34	14.11	0.026	40.61	-26.50
		836.5	V	157.0	63.0	6.38	1/53	8.73	**15.11**	0.032	38.45	-23.34	**15.11**	0.032	40.61	-25.50
		841.5	V	158.0	73.0	6.43	1/58	7.79	14.22	0.026	38.45	-24.23	14.22	0.026	40.61	-26.39
	16-QAM	836.5	V	157.0	63.0	6.38	1/53	7.09	**13.47**	0.022	38.45	-24.98	**13.47**	0.022	40.61	-27.14
	64-QAM	841.5	V	158.0	73.0	6.43	1/26	4.74	**11.17**	0.013	38.45	-27.28	**11.17**	0.013	40.61	-29.44
	256-QAM	841.5	V	158.0	73.0	6.43	1/53	2.93	**9.36**	0.009	38.45	-29.09	**9.36**	0.009	40.61	-31.25
10 MHz	π/2 BPSK	829.0	V	156.0	69.0	6.40	1/20	6.90	13.30	0.021	38.45	-25.15	13.30	0.021	40.61	-27.31
		836.5	V	157.0	63.0	6.38	1/26	9.75	**16.12**	0.041	38.45	-22.33	**16.12**	0.041	40.61	-24.48
		844.0	V	158.0	73.0	6.46	1/26	9.07	15.53	0.036	38.45	-22.92	15.53	0.036	40.61	-25.08
	QPSK	829.0	V	156.0	69.0	6.40	1/38	7.59	13.99	0.025	38.45	-24.46	13.99	0.025	40.61	-26.62
		836.5	V	157.0	63.0	6.38	1/26	8.49	**14.87**	0.031	38.45	-23.58	**14.87**	0.031	40.61	-25.74
		844.0	V	158.0	73.0	6.46	1/20	7.72	14.17	0.026	38.45	-24.28	14.17	0.026	40.61	-26.43
	16-QAM	836.5	V	157.0	63.0	6.38	1/26	6.80	**13.18**	0.021	38.45	-25.27	**13.18**	0.021	40.61	-27.43
	64-QAM	844.0	V	158.0	73.0	6.46	1/38	4.89	**11.35**	0.014	38.45	-27.10	**11.35**	0.014	40.61	-29.26
	256-QAM	844.0	V	158.0	73.0	6.46	1/26	3.14	**9.60**	0.009	38.45	-28.85	**9.60**	0.009	40.61	-31.01
5 MHz	π/2 BPSK	829.0	V	156.0	69.0	6.37	1/6	7.08	13.45	0.022	38.45	-25.00	13.45	0.022	40.61	-27.16
		836.5	V	157.0	63.0	6.38	1/12	9.67	**16.04**	0.040	38.45	-22.41	**16.04**	0.040	40.61	-24.56
		844.0	V	158.0	73.0	6.48	1/6	9.06	15.54	0.036	38.45	-22.91	15.54	0.036	40.61	-25.06
	QPSK	829.0	V	156.0	69.0	6.37	1/12	7.54	13.91	0.025	38.45	-24.54	13.91	0.025	40.61	-26.70
		836.5	V	157.0	63.0	6.38	1/18	8.58	**14.96**	0.031	38.45	-23.49	**14.96**	0.031	40.61	-25.65
		844.0	V	158.0	73.0	6.48	1/18	7.74	14.22	0.026	38.45	-24.23	14.22	0.026	40.61	-26.39
	16-QAM	836.5	V	157.0	63.0	6.38	1/18	6.96	**13.34**	0.022	38.45	-25.11	**13.34**	0.022	40.61	-27.27
	64-QAM	844.0	V	158.0	73.0	6.48	1/18	4.62	**11.10**	0.013	38.45	-27.35	**11.10**	0.013	40.61	-29.51
	256-QAM	844.0	V	158.0	73.0	6.48	1/6	3.04	9.52	0.009	38.45	-28.93	9.52	0.009	40.61	-31.09
20 MHz	QPSK (CP-OFDM)	836.5	V	157.0	63.0	6.38	1 / 53	9.32	**15.70**	0.037	38.45	-22.76	**17.85**	0.061	40.61	-22.76
20 MHz	QPSK (Opposite Pol.)	836.5	H	152.0	62.0	6.38	1 / 53	11.35	17.73	0.059	38.45	-20.72	19.88	0.097	40.61	-20.73

Table 7-41. EIRP Data (NR n5)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
20 MHz	π/2 BPSK	1720.0	H	128.0	215.0	9.41	1 / 1	14.78	24.19	0.263	30.00	-5.81
		1745.0	H	121.0	218.0	9.26	1 / 1	15.39	24.65	0.292	30.00	-5.35
		1770.0	H	252.0	212.0	9.27	1 / 53	15.60	**24.87**	0.307	30.00	-5.13
	QPSK	1720.0	H	128.0	215.0	9.41	1 / 1	14.91	24.32	0.271	30.00	-5.68
		1745.0	H	121.0	218.0	9.26	1 / 1	15.46	24.72	0.296	30.00	-5.28
		1770.0	H	252.0	212.0	9.27	1 / 53	15.92	**25.19**	0.330	30.00	-4.81
	16-QAM	1770.0	H	252.0	212.0	9.27	1 / 53	15.13	**24.40**	0.275	30.00	-5.60
	64-QAM	1770.0	H	252.0	212.0	9.27	1 / 53	13.04	**22.31**	0.170	30.00	-7.69
	256-QAM	1770.0	H	252.0	212.0	9.27	1 / 53	11.11	**20.38**	0.109	30.00	-9.62
15 MHz	π/2 BPSK	1717.5	H	128.0	215.0	9.43	1/20	15.05	24.48	0.280	30.00	-5.52
		1745.0	H	121.0	218.0	9.26	1/58	15.45	24.71	0.296	30.00	-5.29
		1772.5	H	252.0	212.0	9.27	1/39	15.67	**24.95**	0.312	30.00	-5.05
	QPSK	1717.5	H	128.0	215.0	9.43	1/39	14.94	24.37	0.273	30.00	-5.63
		1745.0	H	121.0	218.0	9.26	1/58	15.53	24.79	0.301	30.00	-5.21
		1772.5	H	252.0	212.0	9.27	1/39	15.98	**25.25**	0.335	30.00	-4.75
	16-QAM	1772.5	H	252.0	212.0	9.27	1/58	15.42	**24.70**	0.295	30.00	-5.30
	64-QAM	1772.5	H	252.0	212.0	9.27	1/20	13.23	**22.50**	0.178	30.00	-7.50
	256-QAM	1772.5	H	252.0	212.0	9.27	1/39	10.94	**20.22**	0.105	30.00	-9.78
10 MHz	π/2 BPSK	1715.0	H	128.0	215.0	9.44	1/26	14.87	24.32	0.270	30.00	-5.68
		1745.0	H	121.0	218.0	9.26	1/26	15.57	24.83	0.304	30.00	-5.17
		1775.0	H	252.0	212.0	9.28	1/13	15.58	**24.86**	0.306	30.00	-5.14
	QPSK	1715.0	H	128.0	215.0	9.44	1/26	15.28	24.72	0.297	30.00	-5.28
		1745.0	H	121.0	218.0	9.26	1/26	15.71	24.97	0.314	30.00	-5.03
		1775.0	H	252.0	212.0	9.28	1/26	15.95	**25.23**	0.333	30.00	-4.77
	16-QAM	1775.0	H	252.0	212.0	9.28	1/26	15.30	**24.58**	0.287	30.00	-5.42
	64-QAM	1775.0	H	252.0	212.0	9.28	1/26	13.26	**22.53**	0.179	30.00	-7.47
	256-QAM	1745.0	H	121.0	218.0	9.26	1/13	10.90	**20.16**	0.104	30.00	-9.84
5 MHz	π/2 BPSK	1712.5	H	128.0	215.0	9.46	1/12	15.36	24.82	0.303	30.00	-5.18
		1745.0	H	121.0	218.0	9.26	1/18	15.42	24.68	0.294	30.00	-5.32
		1777.5	H	252.0	212.0	9.28	1/12	15.62	**24.90**	0.309	30.00	-5.10
	QPSK	1712.5	H	128.0	215.0	9.46	1/12	15.22	24.68	0.294	30.00	-5.32
		1745.0	H	121.0	218.0	9.26	1/12	15.64	24.90	0.309	30.00	-5.10
		1777.5	H	252.0	212.0	9.28	1/12	16.26	**25.55**	0.359	30.00	-4.45
	16-QAM	1777.5	H	252.0	212.0	9.28	1/12	15.23	**24.51**	0.283	30.00	-5.49
	64-QAM	1777.5	H	252.0	212.0	9.28	1/12	13.20	**22.48**	0.177	30.00	-7.52
	256-QAM	1777.5	H	252.0	212.0	9.28	1/12	11.73	21.02	0.126	30.00	-8.98
20 MHz	QPSK (CP-OFDM)	1770.0	H	252.0	212.0	9.27	1 / 53	14.37	**23.64**	0.231	30.00	-6.36
20 MHz	QPSK (Opposite Pol.)	1770.0	V	100.0	35.0	9.17	1 / 53	15.07	24.24	0.265	30.00	-5.76

Table 7-42. EIRP Data (NR n66)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
20 MHz	π/2 BPSK	1860.0	H	250.0	215.0	9.64	1 / 53	18.15	27.79	0.602	33.01	-5.22
		1880.0	H	334.0	211.0	9.93	1 / 104	17.81	27.74	0.594	33.01	-5.27
		1900.0	H	283.0	216.0	10.20	1 / 53	17.62	**27.82**	0.606	33.01	-5.19
	QPSK	1860.0	H	250.0	215.0	9.64	1 / 53	18.23	27.87	0.613	33.01	-5.14
		1880.0	H	334.0	211.0	9.93	1 / 104	18.09	**28.02**	0.633	33.01	-4.99
		1900.0	H	283.0	216.0	10.20	1 / 53	17.67	27.87	0.613	33.01	-5.14
	16-QAM	1880.0	H	334.0	211.0	9.93	1 / 104	16.92	**26.85**	0.484	33.01	-6.16
	64-QAM	1900.0	H	283.0	216.0	10.20	1 / 53	15.37	**25.57**	0.361	33.01	-7.44
	256-QAM	1860.0	H	250.0	215.0	9.64	1 / 53	13.67	**23.31**	0.215	33.01	-9.70
15 MHz	π/2 BPSK	1857.5	H	250.0	215.0	9.61	1/39	18.42	28.03	0.635	33.01	-4.98
		1880.0	H	334.0	211.0	9.93	1/39	17.66	27.59	0.574	33.01	-5.42
		1902.5	H	283.0	216.0	10.22	1/20	17.99	**28.22**	0.663	33.01	-4.79
	QPSK	1857.5	H	250.0	215.0	9.61	1/58	18.35	27.96	0.625	33.01	-5.05
		1880.0	H	334.0	211.0	9.93	1/20	18.10	28.03	0.635	33.01	-4.98
		1902.5	H	283.0	216.0	10.22	1/20	18.63	**28.85**	0.768	33.01	-4.16
	16-QAM	1902.5	H	283.0	216.0	10.22	1/20	17.73	**27.95**	0.624	33.01	-5.06
	64-QAM	1902.5	H	283.0	216.0	10.22	1/20	15.64	**25.87**	0.386	33.01	-7.14
	256-QAM	1857.5	H	250.0	215.0	9.61	1/58	13.77	**23.38**	0.218	33.01	-9.63
10 MHz	π/2 BPSK	1855.0	H	250.0	215.0	9.57	1/26	18.24	27.81	0.604	33.01	-5.20
		1880.0	H	334.0	211.0	9.93	1/26	17.95	**27.87**	0.613	33.01	-5.14
		1905.0	H	283.0	216.0	10.24	1/38	17.43	27.67	0.585	33.01	-5.34
	QPSK	1855.0	H	250.0	215.0	9.57	1/38	18.28	27.85	0.610	33.01	-5.16
		1880.0	H	334.0	211.0	9.93	1/26	18.08	**28.01**	0.632	33.01	-5.00
		1905.0	H	283.0	216.0	10.24	1/38	17.62	27.86	0.611	33.01	-5.15
	16-QAM	1880.0	H	334.0	211.0	9.93	1/26	17.82	**27.74**	0.595	33.01	-5.27
	64-QAM	1905.0	H	283.0	216.0	10.24	1/38	15.19	**25.43**	0.349	33.01	-7.58
	256-QAM	1905.0	H	283.0	216.0	10.24	1/38	13.14	**23.38**	0.218	33.01	-9.63
5 MHz	π/2 BPSK	1852.5	H	250.0	215.0	9.54	1/12	19.75	**29.29**	0.848	33.01	-3.72
		1880.0	H	334.0	211.0	9.93	1/12	18.20	28.13	0.650	33.01	-4.88
		1907.5	H	283.0	216.0	10.26	1/12	18.36	28.62	0.727	33.01	-4.39
	QPSK	1852.5	H	250.0	215.0	9.54	1/12	19.35	28.89	0.775	33.01	-4.12
		1880.0	H	334.0	211.0	9.93	1/12	18.33	28.26	0.670	33.01	-4.75
		1907.5	H	283.0	216.0	10.26	1/12	19.04	**29.30**	0.851	33.01	-3.71
	16-QAM	1852.5	H	250.0	215.0	9.54	1/12	18.60	**28.13**	0.651	33.01	-4.88
	64-QAM	1907.5	H	283.0	216.0	10.26	1/6	15.31	**25.57**	0.360	33.01	-7.44
	256-QAM	1852.5	H	250.0	215.0	9.54	1/18	14.09	23.63	0.231	33.01	-9.38
20 MHz	QPSK (CP-OFDM)	1880.0	H	334.0	211.0	9.93	1 / 104	16.25	**26.18**	0.415	33.01	-6.83
20 MHz	QPSK (Opposite Pol.)	1880.0	V	100.0	139.0	10.13	1 / 104	15.28	25.41	0.348	33.01	-7.60

Table 7-43. EIRP Data (NR n2)

7.9 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

ANSI C63.26-2015 – Section 5.5.4

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
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 = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

Test Setup

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

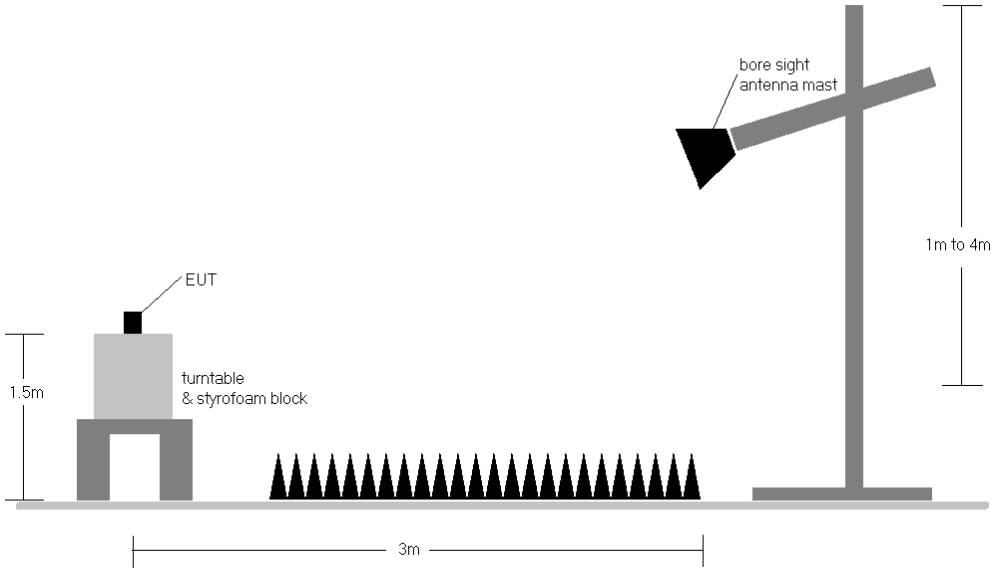


Figure 7-9. Test Instrument & Measurement Setup

Test Notes

1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.

2) This unit was tested while powered by an DC power source.

3) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.

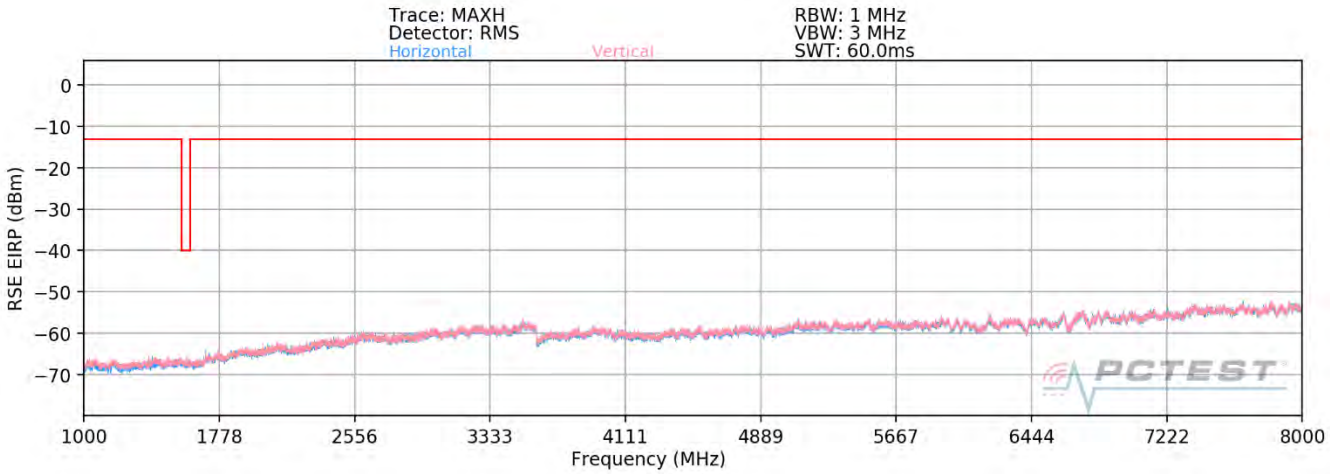
4) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

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

6) Per KDB 971168, Field Strength Level (dBµV/m) is converted to EIRP Spurious Emission Level (dBm) using the formula in Section 5.8.4 (d):

$$EIRP\ (dBm) = E\ (dB\mu V/m) + 20 \log D - 104.8;\ \text{where D is the measurement distance in meters}$$

Band 13



Plot 7-384. Radiated Spurious Plot above 1GHz (Band 13)

OPERATING FREQUENCY:	779.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2338.50	H	389	97	-61.00	3.61	-57.39	-44.4
3118.00	H	-	-	-67.12	5.71	-61.41	-48.4
3897.50	H	-	-	-68.54	7.25	-61.29	-48.3
4677.00	H	-	-	-69.04	8.47	-60.57	-47.6

Table 7-44. Radiated Spurious Data (Band 13 – Low Channel)

OPERATING FREQUENCY:	782.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	H	393	103	-53.80	3.64	-50.17	-37.2
3128.00	H	237	114	-64.11	5.73	-58.37	-45.4
3910.00	H	-	-	-67.67	7.25	-60.42	-47.4
4692.00	H	-	-	-68.97	8.47	-60.50	-47.5
5474.00	H	-	-	-70.22	9.15	-61.07	-48.1

Table 7-45. Radiated Spurious Data (Band 13 – Mid Channel)

OPERATING FREQUENCY:	784.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2353.50	H	9	90	-50.82	3.66	-47.16	-34.2
3138.00	H	239	108	-64.49	5.76	-58.73	-45.7
3922.50	H	-	-	-67.34	7.26	-60.09	-47.1
4707.00	H	-	-	-69.25	8.47	-60.78	-47.8

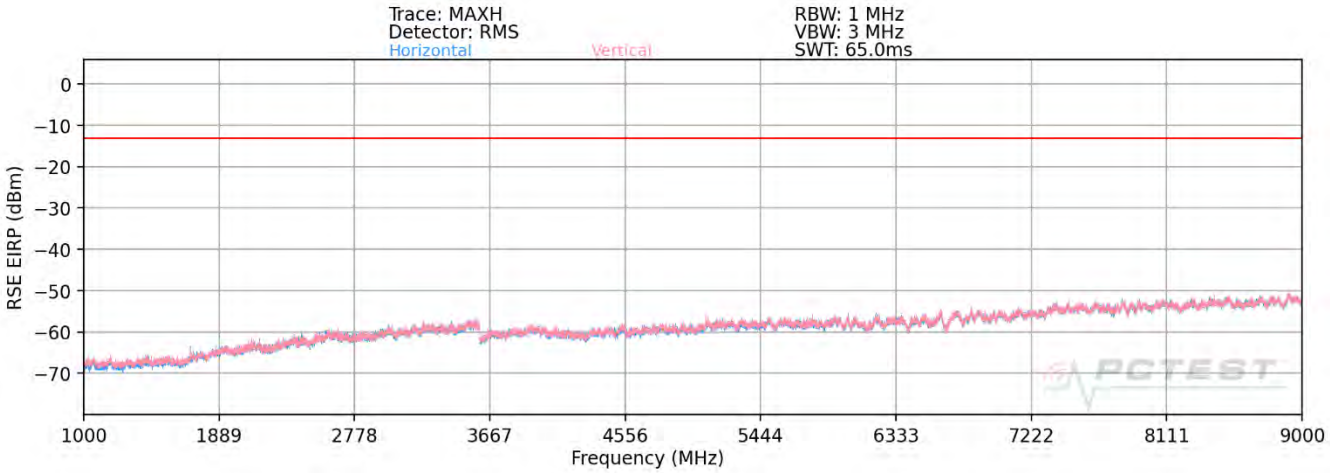
Table 7-46. Radiated Spurious Data (Band 13 – High Channel)

MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.00	MHz
DISTANCE:	3	meters
NARROWBAND EMISSION LIMIT:	-50	dBm
WIDEBAND EMISSION LIMIT:	-40	dBm/MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1559.00	H	334	101	-67.92	3.00	-64.93	-24.9
1564.00	H	327	100	-64.14	2.93	-61.21	-21.2
1569.00	H	-	-	-68.51	2.86	-65.65	-25.6

Table 7-47. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

Band 5



Plot 7-385. Radiated Spurious Plot above 1GHz (Band 5)

OPERATING FREQUENCY:	826.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1653.00	V	245	57	-66.64	3.12	-63.52	-50.5
2479.50	V	398	32	-52.78	3.87	-48.91	-35.9
3306.00	V	-	-	-67.54	6.01	-61.53	-48.5
4132.50	V	-	-	-69.10	7.77	-61.33	-48.3
4959.00	V	-	-	-68.33	8.72	-59.61	-46.6

Table 7-48. Radiated Spurious Data (Band 5 – Low Channel)

OPERATING FREQUENCY:	836.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	V	396	44	-67.41	3.10	-64.31	-51.3
2509.50	V	100	10	-53.63	4.02	-49.61	-36.6
3346.00	V	-	-	-67.48	6.03	-61.45	-48.5
4182.50	V	-	-	-68.79	7.79	-61.00	-48.0
5019.00	V	-	-	-68.90	8.78	-60.12	-47.1

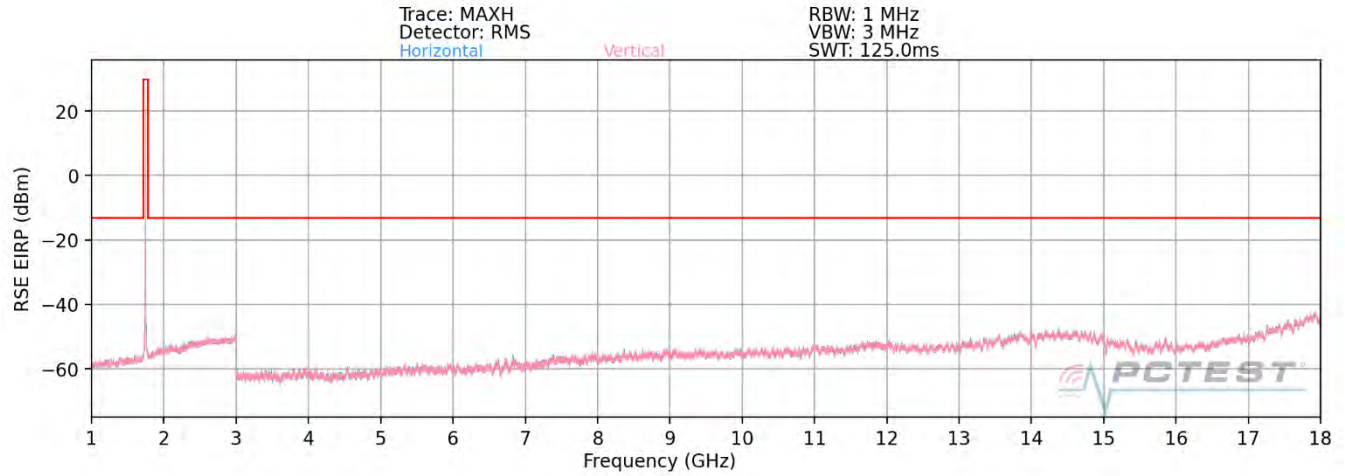
Table 7-49. Radiated Spurious Data (Band 5 – Mid Channel)

OPERATING FREQUENCY:	846.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1693.00	V	101	233	-68.80	3.18	-65.62	-52.6
2539.50	V	283	320	-55.11	4.10	-51.01	-38.0
3386.00	V	-	-	-62.59	6.15	-56.44	-43.4
4232.50	V	-	-	-69.10	7.88	-61.22	-48.2
5079.00	V	-	-	-69.31	8.89	-60.42	-47.4

Table 7-50. Radiated Spurious Data (Band 5 – High Channel)

Band 66



Plot 7-386. Radiated Spurious Plot above 1GHz (Band 66)

OPERATING FREQUENCY:	1717.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3435.00	H	-	-	-67.68	6.28	-61.40	-48.4
5152.50	H	-	-	-70.86	8.98	-61.88	-48.9
6870.00	H	-	-	-70.47	9.42	-61.05	-48.1

Table 7-51. Radiated Spurious Data (Band 66 – Low Channel)

OPERATING FREQUENCY:	1745.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3490.00	H	-	-	-68.66	6.47	-62.19	-49.2
5235.00	H	-	-	-69.54	8.97	-60.57	-47.6
6980.00	H	-	-	-69.40	9.23	-60.18	-47.2

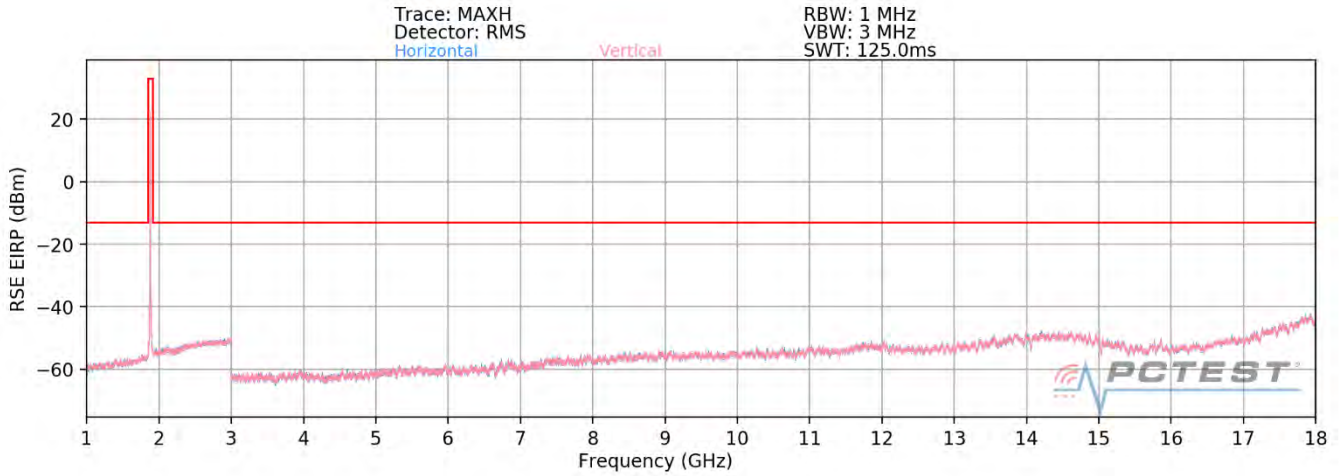
Table 7-52. Radiated Spurious Data (Band 66 – Mid Channel)

OPERATING FREQUENCY:	1772.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3545.00	H	-	-	-68.51	6.45	-62.06	-49.1
5317.50	H	-	-	-70.77	9.09	-61.68	-48.7
7090.00	H	-	-	-69.47	9.17	-60.30	-47.3

Table 7-53. Radiated Spurious Data (Band 66 – High Channel)

Band 2



Plot 7-387. Radiated Spurious Plot above 1GHz (Band 2)

OPERATING FREQUENCY:	1860.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3720.00	V	-	-	-68.46	6.90	-61.56	-48.6
5580.00	V	-	-	-69.70	9.06	-60.63	-47.6
7440.00	V	-	-	-68.90	9.26	-59.63	-46.6

Table 7-54. Radiated Spurious Data (Band 2 – Low Channel)

OPERATING FREQUENCY:	1880.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.00	V	-	-	-69.25	6.93	-62.32	-49.3
5640.00	V	-	-	-70.65	9.15	-61.50	-48.5
7520.00	V	-	-	-69.10	9.31	-59.79	-46.8

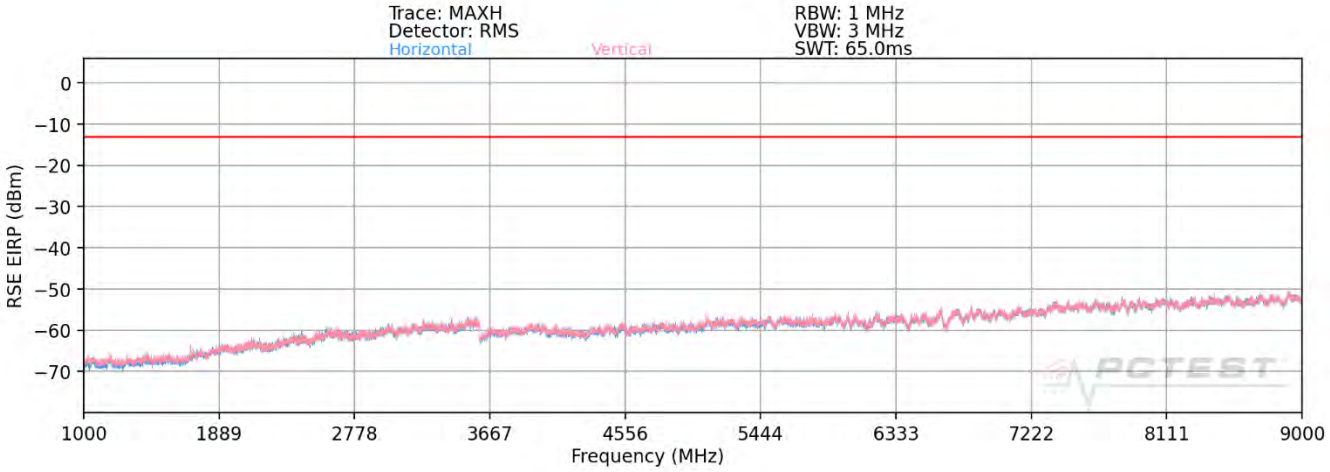
Table 7-55. Radiated Spurious Data (Band 2 – Mid Channel)

OPERATING FREQUENCY:	1900.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3800.00	V	-	-	-68.90	7.02	-61.88	-48.9
5700.00	V	-	-	-70.60	9.05	-61.55	-48.6
7600.00	V	-	-	-68.08	9.25	-58.83	-45.8

Table 7-56. Radiated Spurious Data (Band 2 – High Channel)

NR Band n5



Plot 7-388. Radiated Spurious Plot (NR Band n5 Standalone)

Bandwidth (MHz):	20
Frequency (MHz):	834.0
RB / Offset:	1 / 53
Mode:	EN-DC
Anchor Band:	Standalone

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]
1668.0	V	-	-	-77.04	-0.32	29.64	-65.62	-13.00	-52.62
2502.0	V	-	-	-78.15	3.37	32.22	-63.03	-13.00	-50.03
3336.0	V	-	-	-78.69	4.97	33.28	-61.98	-13.00	-48.98

Table 7-57. Radiated Spurious Data (NR Band n5 Standalone – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	836.5
RB / Offset:	1 / 53
Mode:	EN-DC
Anchor Band:	Standalone

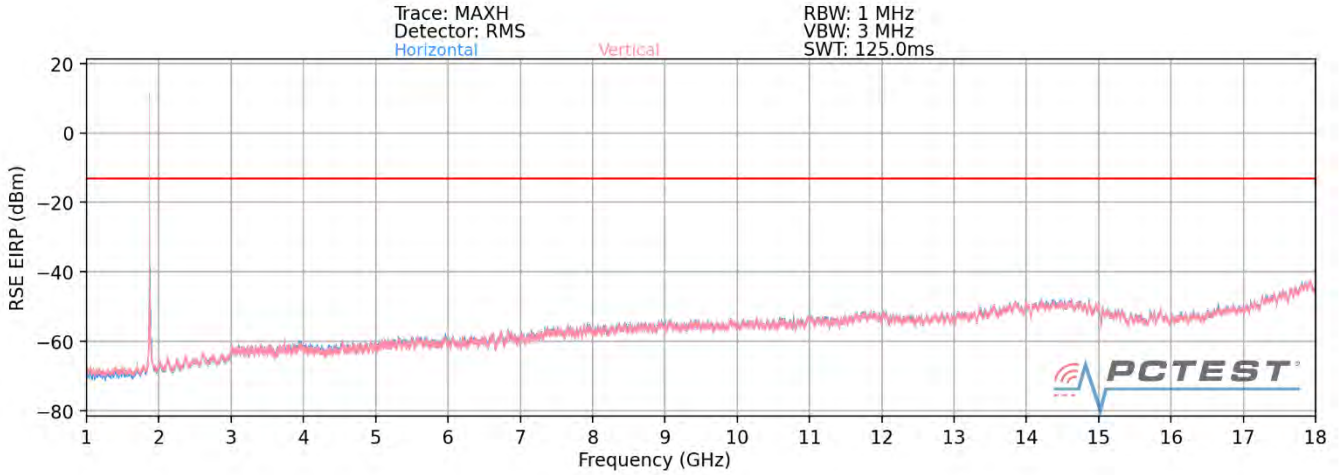
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1673.0	V	-	-	-77.40	-0.31	29.29	-65.96	-13.00	-52.96
2509.5	V	-	-	-78.19	3.45	32.26	-62.99	-13.00	-49.99
3346.0	V	-	-	-78.67	5.05	33.38	-61.88	-13.00	-48.88
4182.5	V	-	-	-78.90	5.42	33.52	-61.74	-13.00	-48.74

Table 7-58. Radiated Spurious Data (NR Band n5 Standalone – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	839.0
RB / Offset:	1 / 53
Mode:	EN-DC
Anchor Band:	Standalone

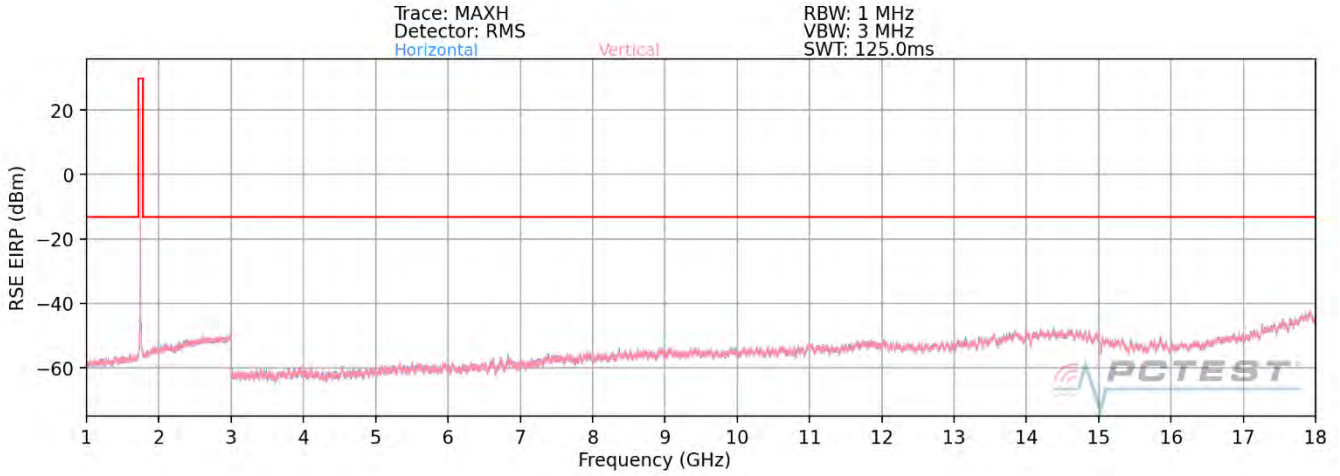
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1678.0	V	-	-	-77.17	-0.29	29.54	-65.72	-13.00	-52.72
2517.0	V	-	-	-78.22	3.51	32.29	-62.97	-13.00	-49.97
3356.0	V	-	-	-78.55	5.10	33.55	-61.71	-13.00	-48.71

Table 7-59. Radiated Spurious Data (NR Band n5 Standalone – High Channel)



Plot 7-389. Radiated Spurious Plot (ENDC n5-LB2)

NR Band n66



Plot 7-390. Radiated Spurious Plot (NR Band n66 Standalone)

Bandwidth (MHz):	20
Frequency (MHz):	1720.0
RB / Offset:	1 / 53
Mode:	EN-DC
Anchor Band:	Standalone

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]
3440.0	V	136	152	-77.98	5.16	34.18	-61.08	-13.00	-48.08
5160.0	V	-	-	-79.77	7.77	35.00	-60.25	-13.00	-47.25
6880.0	V	-	-	-81.06	11.95	37.89	-57.36	-13.00	-44.36
8600.0	V	-	-	-81.00	14.11	40.10	-55.15	-13.00	-42.15

Table 7-60. Radiated Spurious Data (NR Band n66 Standalone – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1745.0
RB / Offset:	1 / 53
Mode:	EN-DC
Anchor Band:	LTE Band 30

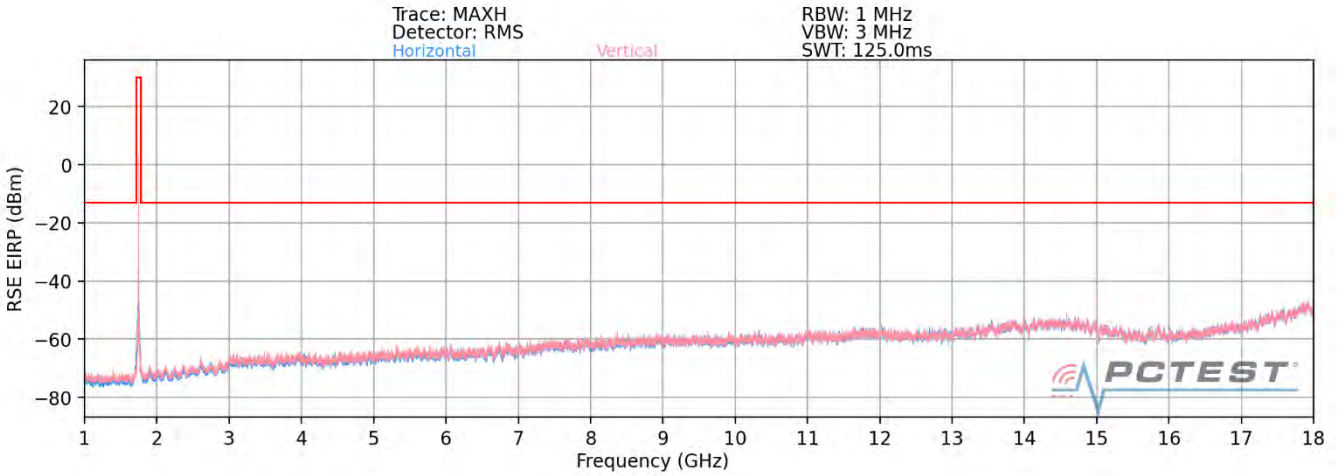
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3490.0	V	118	150	-77.60	5.97	35.37	-59.89	-13.00	-46.89
5235.0	V	-	-	-79.50	8.02	35.52	-59.74	-13.00	-46.74
6980.0	V	-	-	-80.07	12.27	39.20	-56.05	-13.00	-43.05
8725.0	V	-	-	-81.25	14.24	39.99	-55.26	-13.00	-42.26

Table 7-61. Radiated Spurious Data (NR Band n66 Standalone – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1770.0
RB / Offset:	1 / 53
Mode:	EN-DC
Anchor Band:	LTE Band 30

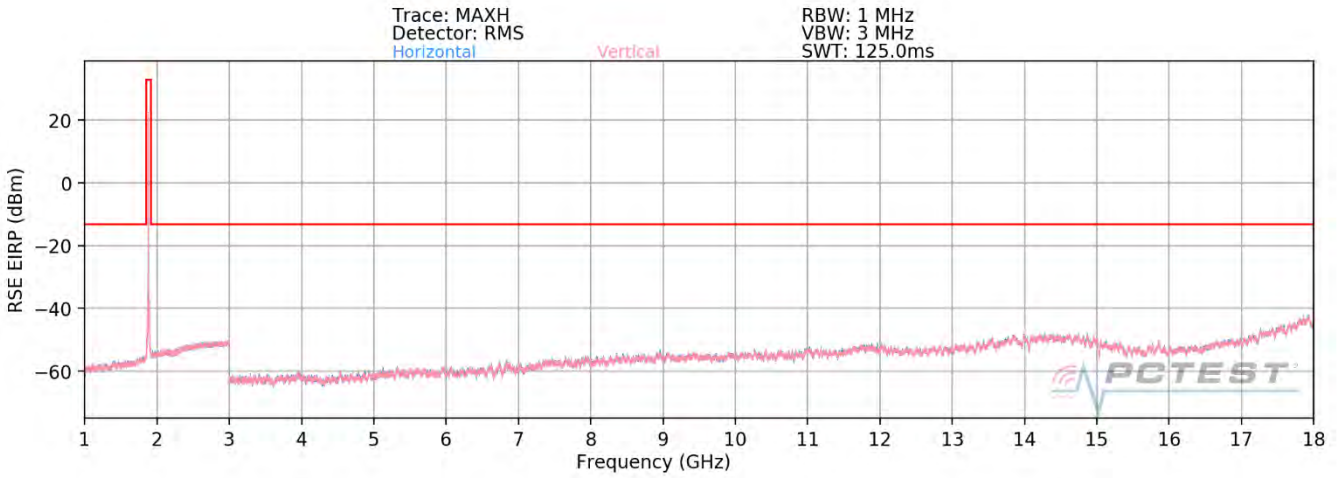
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3540.0	V	133	135	-78.10	5.92	34.82	-60.44	-13.00	-47.44
5310.0	V	-	-	-79.52	8.01	35.49	-59.77	-13.00	-46.77
7080.0	V	-	-	-80.47	12.79	39.32	-55.94	-13.00	-42.94
8850.0	V	-	-	-81.01	13.87	39.86	-55.40	-13.00	-42.40

Table 7-62. Radiated Spurious Data (NR Band n66 Standalone – High Channel)



Plot 7-391. Radiated Spurious Plot (ENDC n66-LB13)

NR Band n2



Plot 7-392. Radiated Spurious Plot (NR Band n2 Standalone)

Bandwidth (MHz):	20
Frequency (MHz):	1860.0
RB / Offset:	1 / 53
Mode:	EN-DC
Anchor Band:	Standalone

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]
3720.0	V	-	-	-78.79	6.83	35.04	-60.22	-13.00	-47.22
5580.0	V	-	-	-79.21	9.69	37.48	-57.78	-13.00	-44.78
7440.0	V	-	-	-80.76	11.82	38.06	-57.19	-13.00	-44.19

Table 7-63. Radiated Spurious Data (NR Band n2 Standalone – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1880.0
RB / Offset:	1 / 53
Mode:	EN-DC
Anchor Band:	Standalone

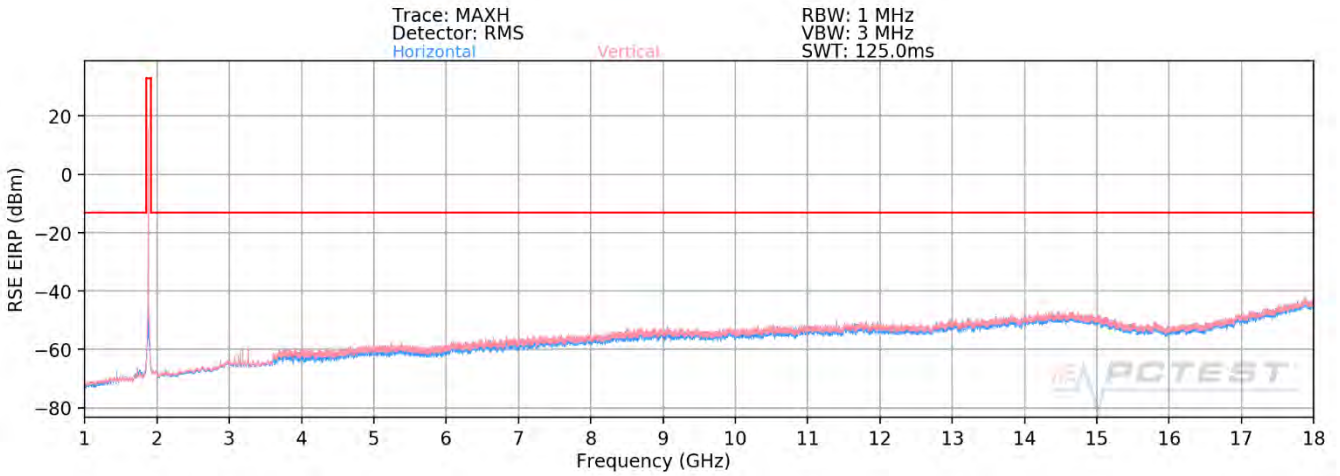
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3760.0	V	-	-	-79.29	6.36	34.07	-61.18	-13.00	-48.18
5640.0	V	-	-	-79.71	8.55	35.84	-59.42	-13.00	-46.42
7520.0	V	-	-	-80.54	11.89	38.35	-56.91	-13.00	-43.91
9400.0	V	-	-	-81.89	14.62	39.73	-55.52	-13.00	-42.52

Table 7-64. Radiated Spurious Data (NR Band n2 Standalone – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1900.0
RB / Offset:	1 / 53
Mode:	EN-DC
Anchor Band:	LTE Band 30

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]
3800.0	V	-	-	-78.91	6.93	35.02	-60.24	-13.00	-47.24
5700.0	V	-	-	-79.53	8.28	35.75	-59.51	-13.00	-46.51
7600.0	V	-	-	-80.83	12.74	38.91	-56.35	-13.00	-43.35

Table 7-65. Radiated Spurious Data (NR Band n2 Standalone – High Channel)



Plot 7-393. Radiated Spurious Plot (ENDC n2-LB13)

7.10 Uplink Carrier Aggregation Radiated Measurements

§2.1053,

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v02r02 – Section 5.8

ANSI/TIA-603-D-2010 – Section 2.2.12

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW ≥ 3 x RBW
3. No. of sweep points ≥ 2 x span / RBW
4. Detector = RMS
5. Trace mode = trace average for continuous emissions, max hold for pulse emissions
6. The trace was allowed to stabilize

Test Setup

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

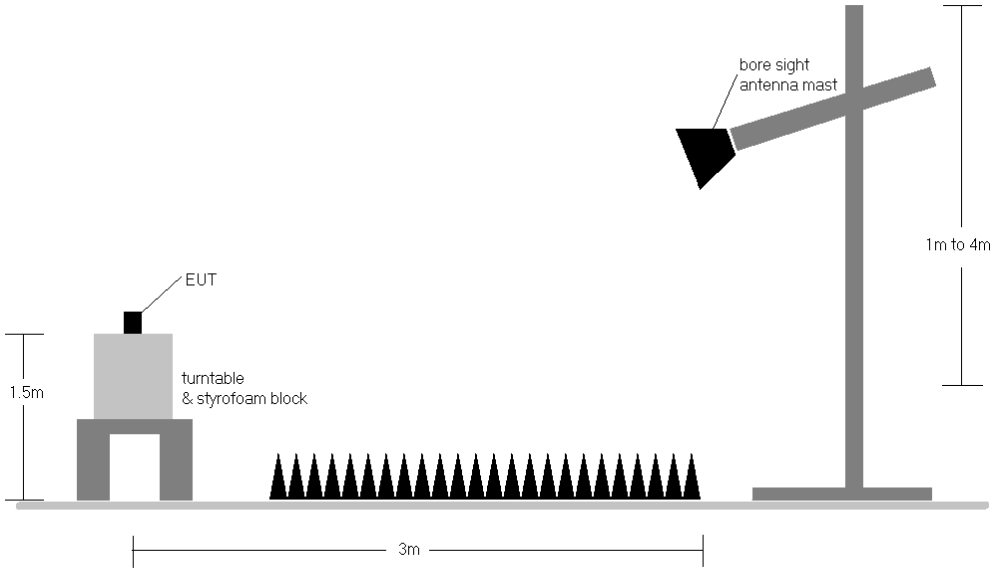


Figure 7-10. Test Instrument & Measurement Setup

Test Notes

1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.

2) This unit was tested while powered by an DC power source.

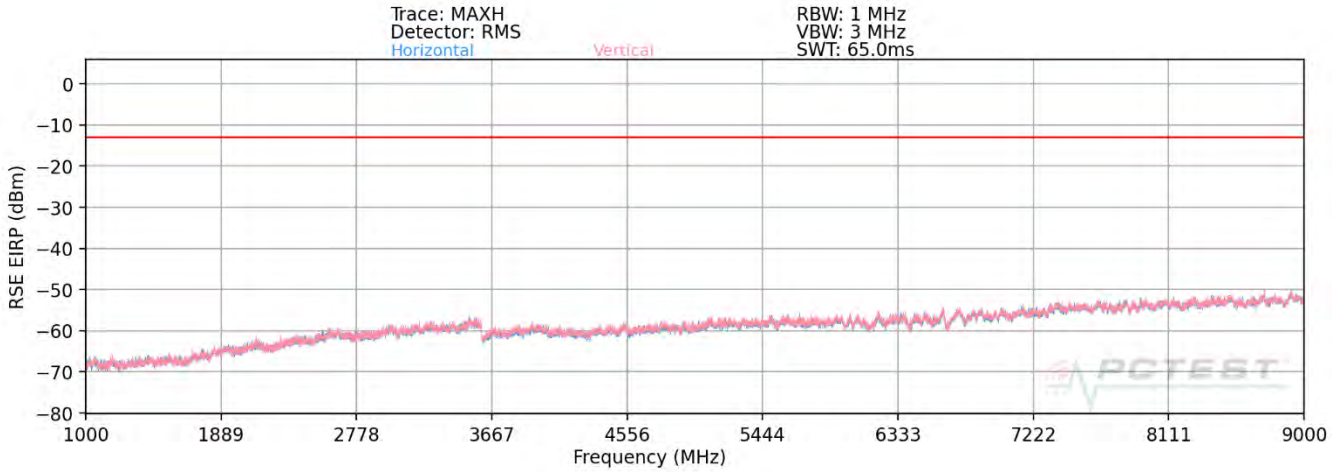
3) Radiated spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. The worst case (highest) emissions were found while operating with QPSK modulation with both carriers set to transmit using 1RB.

4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.

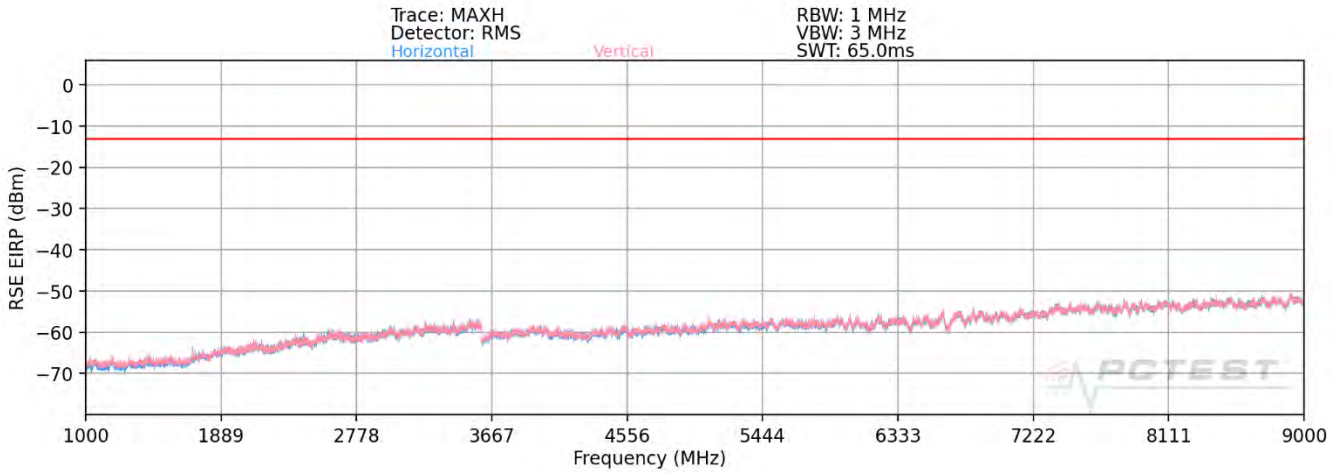
5) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

6) No significant emissions were found as a result of two uplink carriers operating contiguously.

LTE Band 5B ULCA



Plot 7-66. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 5 Low Channel)



Plot 7-67. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 5 High Channel)

OPERATING FREQUENCY (PCC):	829.00	MHz
OPERATING FREQUENCY (SCC):	838.90	MHz
CHANNEL (PCC):	20450	
CHANNEL (SCC):	20549	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

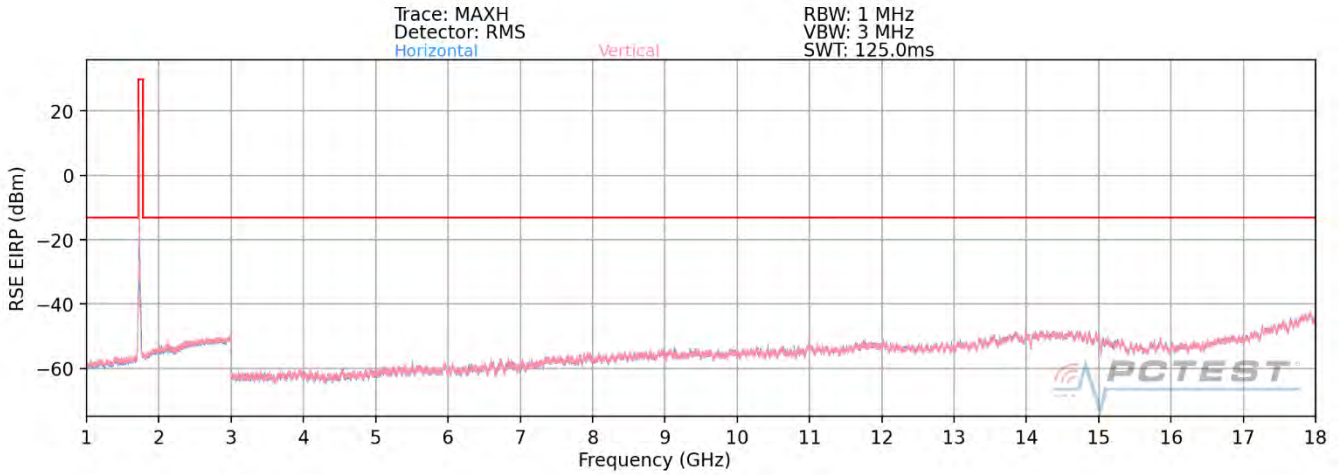
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1658.00	H	179	183	-72.28	3.61	-68.67	-55.7
2487.00	H	398	49	-71.77	4.25	-67.53	-54.5
3316.00	H	-	-	-78.15	5.83	-72.32	-59.3
4145.00	H	-	-	-72.91	7.66	-65.24	-52.2
4974.00	H	-	-	-74.03	8.56	-65.47	-52.5

Plot 7-68. Radiated Spurious Plot (B5)

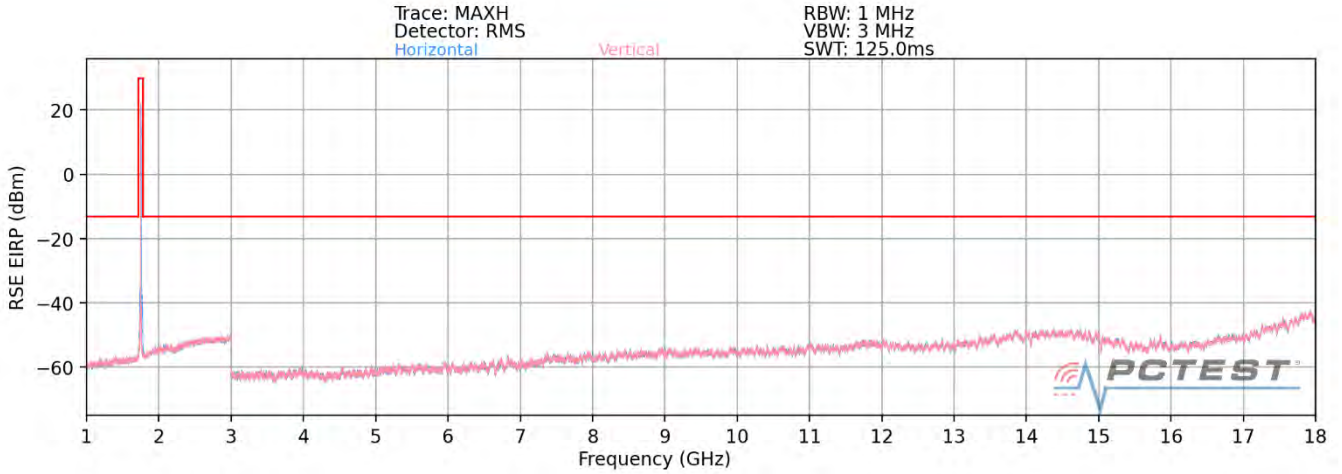
OPERATING FREQUENCY (PCC):	844.00	MHz
OPERATING FREQUENCY (SCC):	834.10	MHz
CHANNEL (PCC):	20600	
CHANNEL (SCC):	20501	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1688.00	H	392	186	-70.05	3.63	-66.42	-53.4
2532.00	H	-	-	-72.43	4.47	-67.96	-55.0
3376.00	H	-	-	-72.33	6.05	-66.28	-53.3
4220.00	H	-	-	-73.72	7.75	-65.97	-53.0
5064.00	H	-	-	-73.04	8.59	-64.45	-51.4

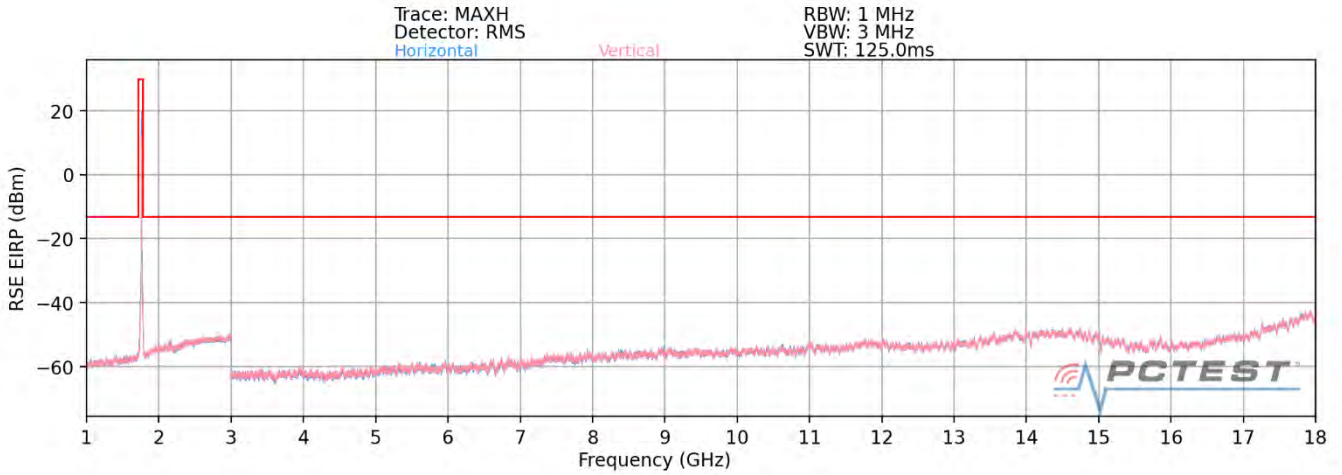
Plot 7-69. Radiated Spurious Data (B5)



Plot 7-70. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 66 Low Channel)



Plot 7-71. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 66 Mid Channel)



Plot 7-72. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 66 High Channel)

OPERATING FREQUENCY (PCC):	1720.00	MHz
OPERATING FREQUENCY (SCC):	1739.80	MHz
CHANNEL (PCC):	132072	
CHANNEL (SCC):	132270	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3440.00	V	172	32	-67.42	6.22	-61.20	-48.2
5160.00	V	-	-	-68.47	8.68	-59.79	-46.8
6880.00	V	-	-	-66.33	8.76	-57.58	-44.6
8600.00	V	-	-	-66.01	9.17	-56.84	-43.8

Plot 7-73. Radiated Spurious Plot (B66)

OPERATING FREQUENCY (PCC):	1745.00	MHz
OPERATING FREQUENCY (SCC):	1764.80	MHz
CHANNEL (PCC):	132322	
CHANNEL (SCC):	132520	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3490.00	V	100	32	-67.22	6.32	-60.90	-47.9
5235.00	V	-	-	-69.24	8.71	-60.53	-47.5
6980.00	V	-	-	-66.29	8.74	-57.55	-44.6
8725.00	V	-	-	-66.18	9.42	-56.76	-43.8

Plot 7-74. Radiated Spurious Plot (B66)

OPERATING FREQUENCY (PCC):	1770.00	MHz
OPERATING FREQUENCY (SCC):	1750.20	MHz
CHANNEL (PCC):	132572	
CHANNEL (SCC):	132374	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3540.00	V	-	-	-67.85	6.31	-61.54	-48.5
5310.00	V	-	-	-69.34	8.74	-60.60	-47.6
7080.00	V	-	-	-66.11	8.66	-57.45	-44.4
8850.00	V	-	-	-65.98	9.53	-56.45	-43.4

Plot 7-75. Radiated Spurious Data (B66)

7.11 Frequency Stability / Temperature Variation

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 22, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency. For Part 24, Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

9. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
10. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
11. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

Test Notes

None

Band 13 Frequency Stability Measurements

OPERATING FREQUENCY:	782,000,000	Hz
CHANNEL:	23230	
REFERENCE VOLTAGE:	20.00	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	20.00	- 30	782,000,245	245	0.0000313
100 %		- 20	782,000,267	267	0.0000341
100 %		- 10	782,000,008	8	0.0000010
100 %		0	781,999,978	-22	-0.0000028
100 %		+ 10	782,000,200	200	0.0000256
100 %		+ 20	781,999,801	-199	-0.0000254
100 %		+ 30	781,999,965	-35	-0.0000045
100 %		+ 40	782,000,021	21	0.0000027
100 %		+ 50	781,999,753	-247	-0.0000316
85 %	17.00	+ 20	782,000,045	45	0.0000058

Table 7-76. Frequency Stability Data (Band 13)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

Band 13 Frequency Stability Measurements

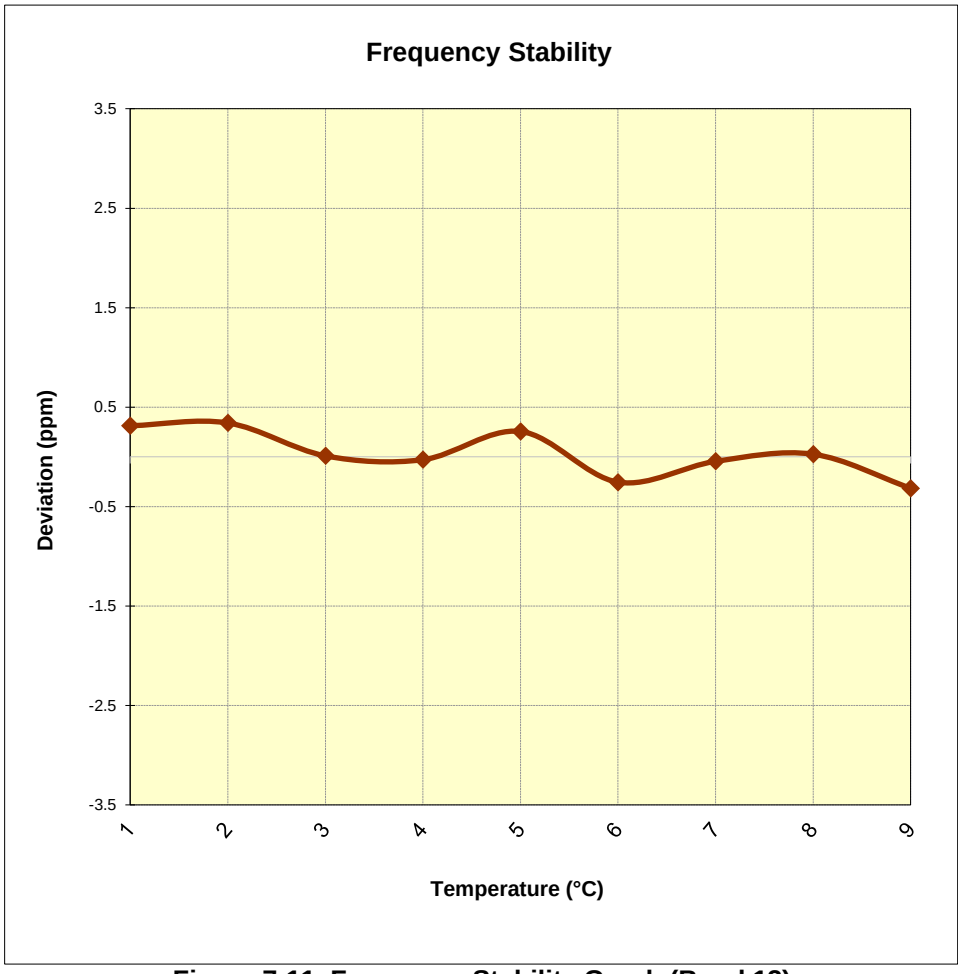


Figure 7-11. Frequency Stability Graph (Band 13)

Band 5 Frequency Stability Measurements

OPERATING FREQUENCY:	836,500,000	Hz
CHANNEL:	20525	
REFERENCE VOLTAGE:	20.00	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	20.00	- 30	836,499,670	-330	-0.0000395
100 %		- 20	836,500,313	313	0.0000374
100 %		- 10	836,499,843	-157	-0.0000188
100 %		0	836,500,155	155	0.0000185
100 %		+ 10	836,500,307	307	0.0000367
100 %		+ 20	836,499,681	-319	-0.0000381
100 %		+ 30	836,500,326	326	0.0000390
100 %		+ 40	836,499,663	-337	-0.0000403
100 %		+ 50	836,499,913	-87	-0.0000104
85 %	17.00	+ 20	836,499,935	-65	-0.0000078

Table 7-77. Frequency Stability Data (Band 5)

Band 5 Frequency Stability Measurements

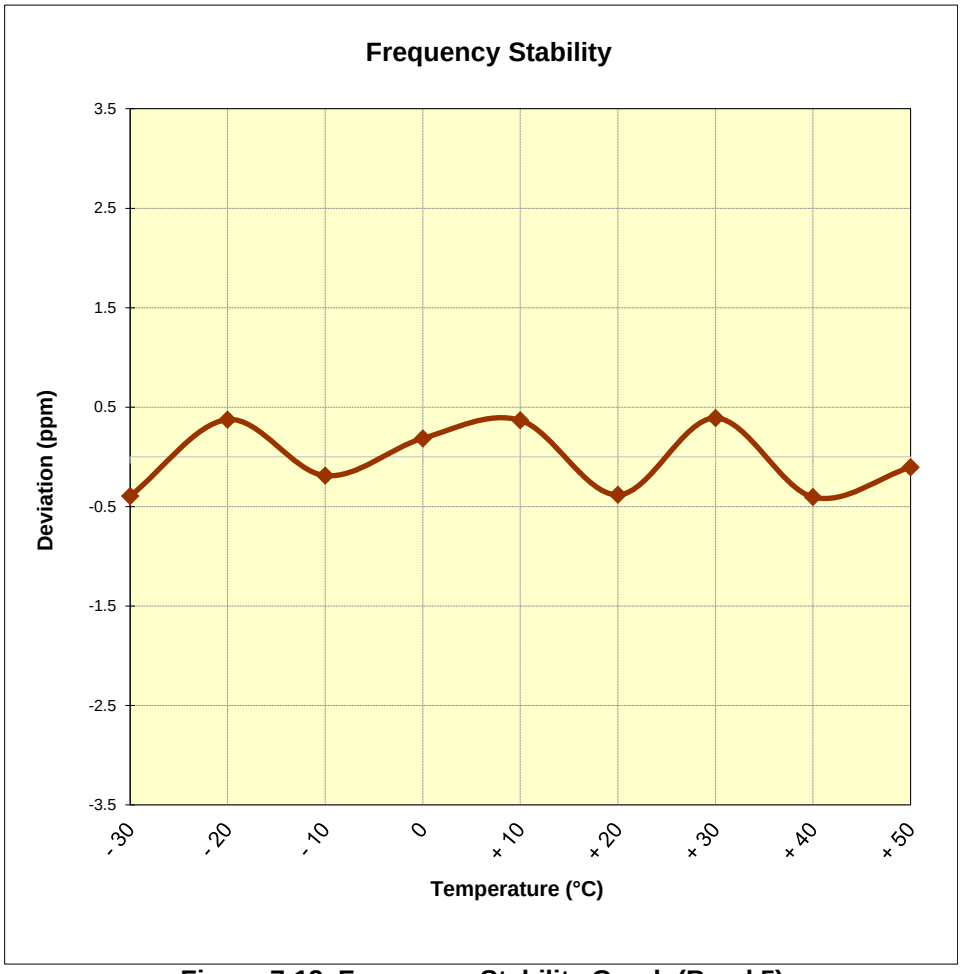


Figure 7-12. Frequency Stability Graph (Band 5)

Band 66/4 Frequency Stability Measurements

OPERATING FREQUENCY:	1,745,000,000	Hz
CHANNEL:	132322	
REFERENCE VOLTAGE:	20.00	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	20.00	- 30	1,745,000,219	219	0.0000126
100 %		- 20	1,745,000,176	176	0.0000101
100 %		- 10	1,744,999,813	-187	-0.0000107
100 %		0	1,744,999,930	-70	-0.0000040
100 %		+ 10	1,744,999,932	-68	-0.0000039
100 %		+ 20	1,745,000,042	42	0.0000024
100 %		+ 30	1,745,000,355	355	0.0000203
100 %		+ 40	1,745,000,036	36	0.0000021
100 %		+ 50	1,744,999,998	-2	-0.0000001
85 %	17.00	+ 20	1,744,999,777	-223	-0.0000128

Table 7-78. Frequency Stability Data (Band 66/4)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

Band 66/4 Frequency Stability Measurements

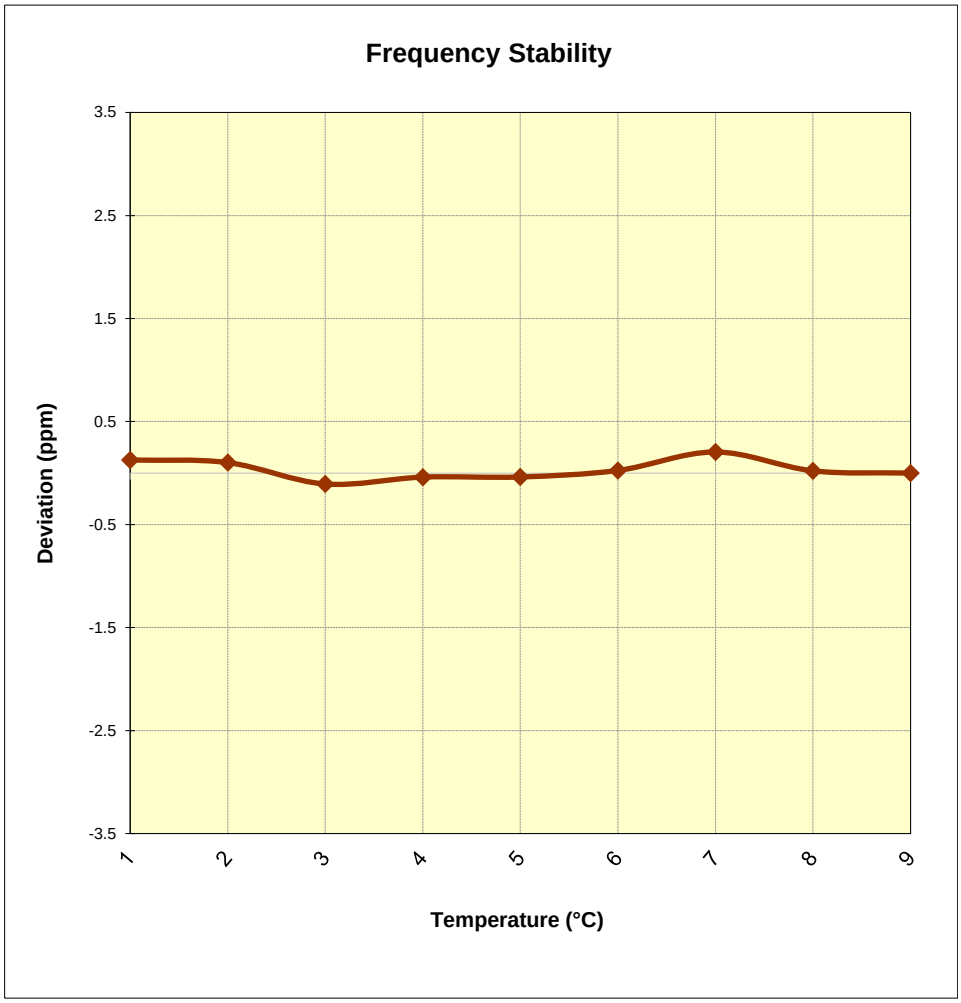


Figure 7-13. Frequency Stability Graph (Band 66/4)

Band 2 Frequency Stability Measurements

OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	18900	
REFERENCE VOLTAGE:	20.00	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	20.00	- 30	1,879,999,994	-6	-0.0000003
100 %		- 20	1,880,000,167	167	0.0000089
100 %		- 10	1,880,000,430	430	0.0000229
100 %		0	1,880,000,171	171	0.0000091
100 %		+ 10	1,880,000,039	39	0.0000021
100 %		+ 20	1,880,000,024	24	0.0000013
100 %		+ 30	1,879,999,856	-144	-0.0000077
100 %		+ 40	1,879,999,855	-145	-0.0000077
100 %		+ 50	1,879,999,743	-257	-0.0000137
85 %	17.00	+ 20	1,880,000,417	417	0.0000222

Table 7-79. Frequency Stability Data (Band 2)

Band 2 Frequency Stability Measurements

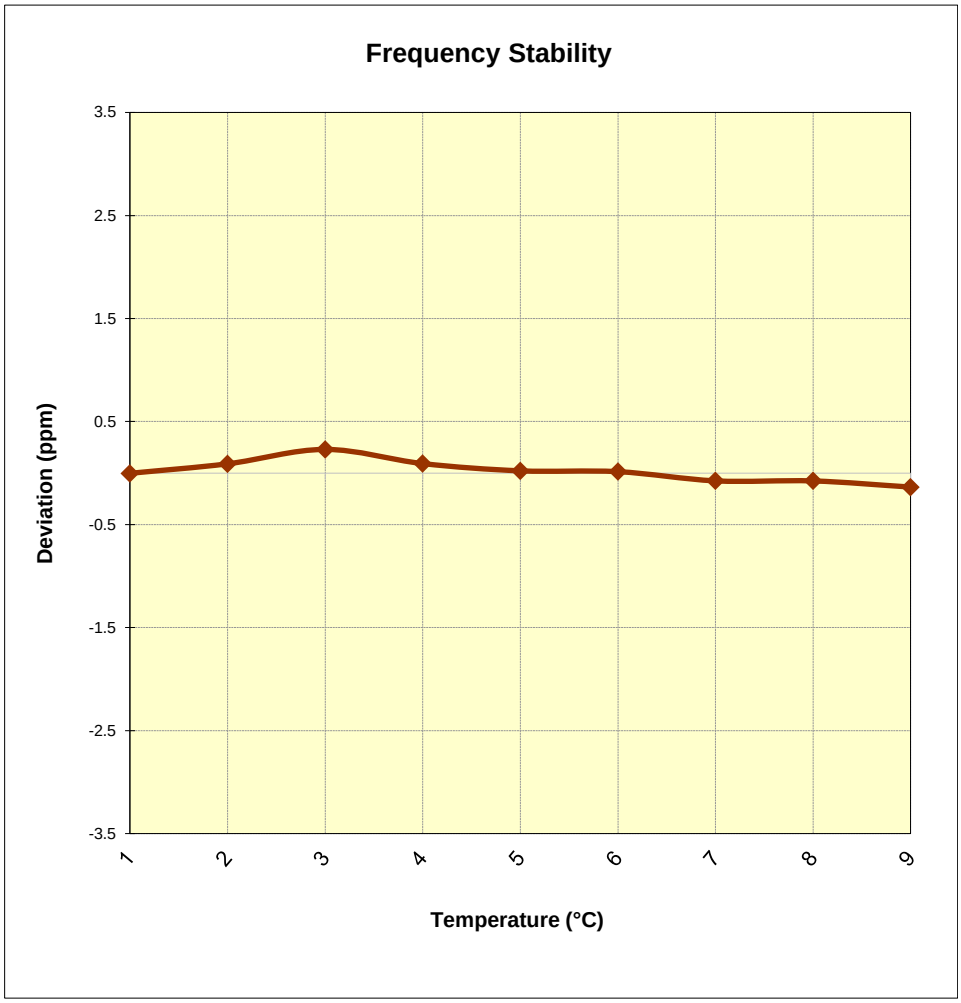


Figure 7-14. Frequency Stability Graph (Band 2)

NR Band 5 Frequency Stability Measurements

NR Band n5

Operating Frequency (Hz):	836,500,000
Ref. Voltage (VDC):	20.00
Deviation Limit:	± 0.00025% or 2.5 ppm

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	20.00	- 30	836,499,600	-287	-0.0000343
		- 20	836,500,418	531	0.0000635
		- 10	836,500,040	153	0.0000183
		0	836,499,762	-125	-0.0000149
		+ 10	836,500,238	351	0.0000420
		+ 20 (Ref)	836,499,887	0	0.0000000
		+ 30	836,499,967	80	0.0000096
		+ 40	836,500,170	283	0.0000338
		+ 50	836,499,976	89	0.0000106
85 %	17.00	+ 20	836,500,076	189	0.0000226

Table 7-80. Frequency Stability Data (NR Band 5)

NR Band 5 Frequency Stability Measurements

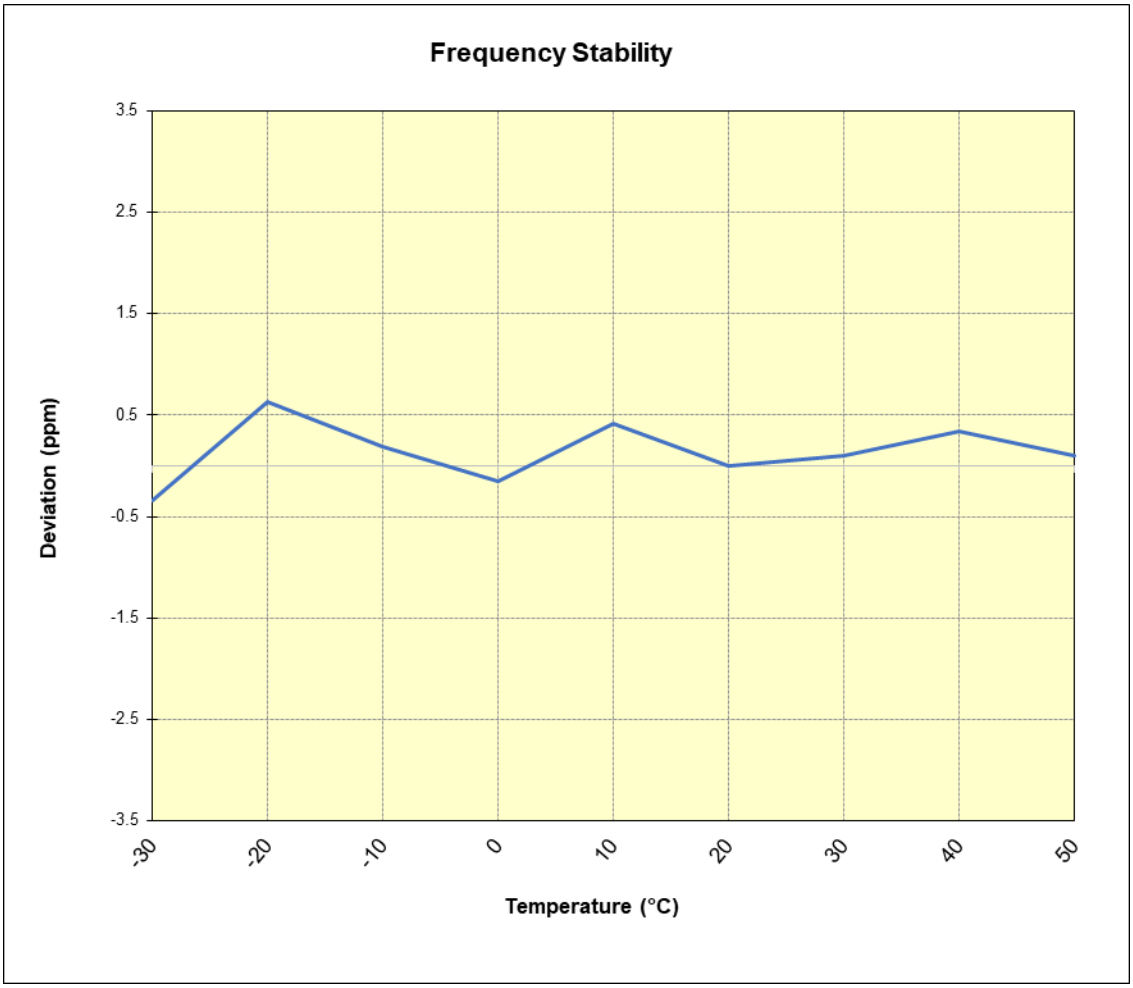


Figure 7-15. Frequency Stability Graph (NR Band 5)

NR Band 66 Frequency Stability Measurements

NR Band n66

Operating Frequency (Hz):	1,745,000,000
Ref. Voltage (VDC):	20.00
Deviation Limit:	± 0.00025% or 2.5 ppm

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	20.00	- 30	1,744,999,759	-78	-0.0000045
		- 20	1,745,000,380	543	0.0000311
		- 10	1,745,000,051	214	0.0000123
		0	1,745,000,170	333	0.0000191
		+ 10	1,745,000,085	248	0.0000142
		+ 20 (Ref)	1,744,999,837	0	0.0000000
		+ 30	1,745,000,175	338	0.0000194
		+ 40	1,744,999,636	-201	-0.0000115
		+ 50	1,745,000,045	208	0.0000119
85 %	17.00	+ 20	1,745,000,310	473	0.0000271

Table 7-81. Frequency Stability Data (NR Band 66)

NR Band 66 Frequency Stability Measurements

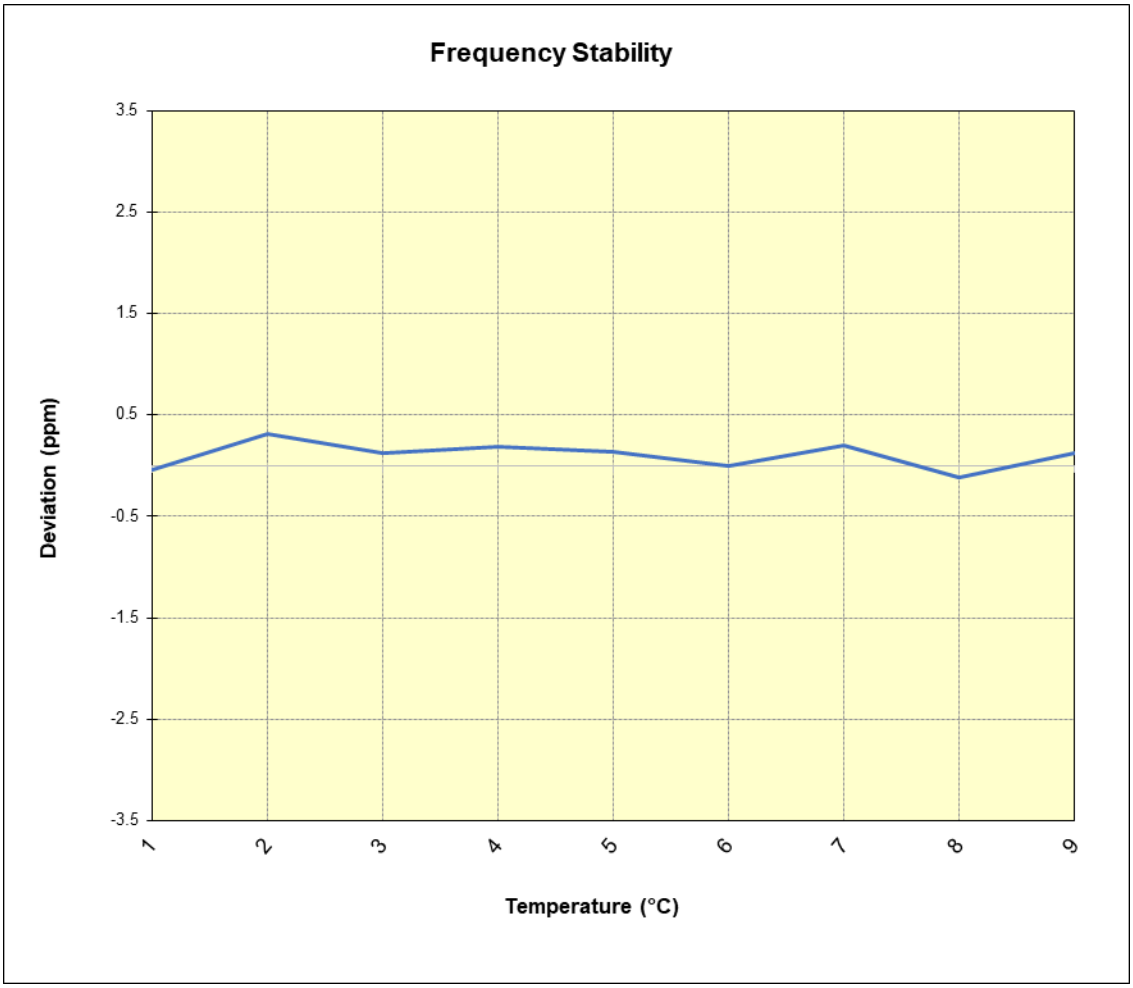


Figure 7-16. Frequency Stability Graph (NR Band 66)

NR Band 2 Frequency Stability Measurements

NR Band n2

Operating Frequency (Hz):	1,880,000,000
Ref. Voltage (VDC):	20.00
Deviation Limit:	± 0.00025% or 2.5 ppm

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	20.00	- 30	1,879,999,824	212	0.0000113
		- 20	1,879,999,961	349	0.0000186
		- 10	1,879,999,904	292	0.0000155
		0	1,879,999,791	179	0.0000095
		+ 10	1,880,000,098	486	0.0000259
		+ 20 (Ref)	1,879,999,612	0	0.0000000
		+ 30	1,879,999,839	227	0.0000121
		+ 40	1,879,999,910	298	0.0000159
		+ 50	1,880,000,179	567	0.0000302
85 %	17.00	+ 20	1,880,000,004	392	0.0000209

Table 7-82. Frequency Stability Data (NR Band 2)

NR Band 2 Frequency Stability Measurements

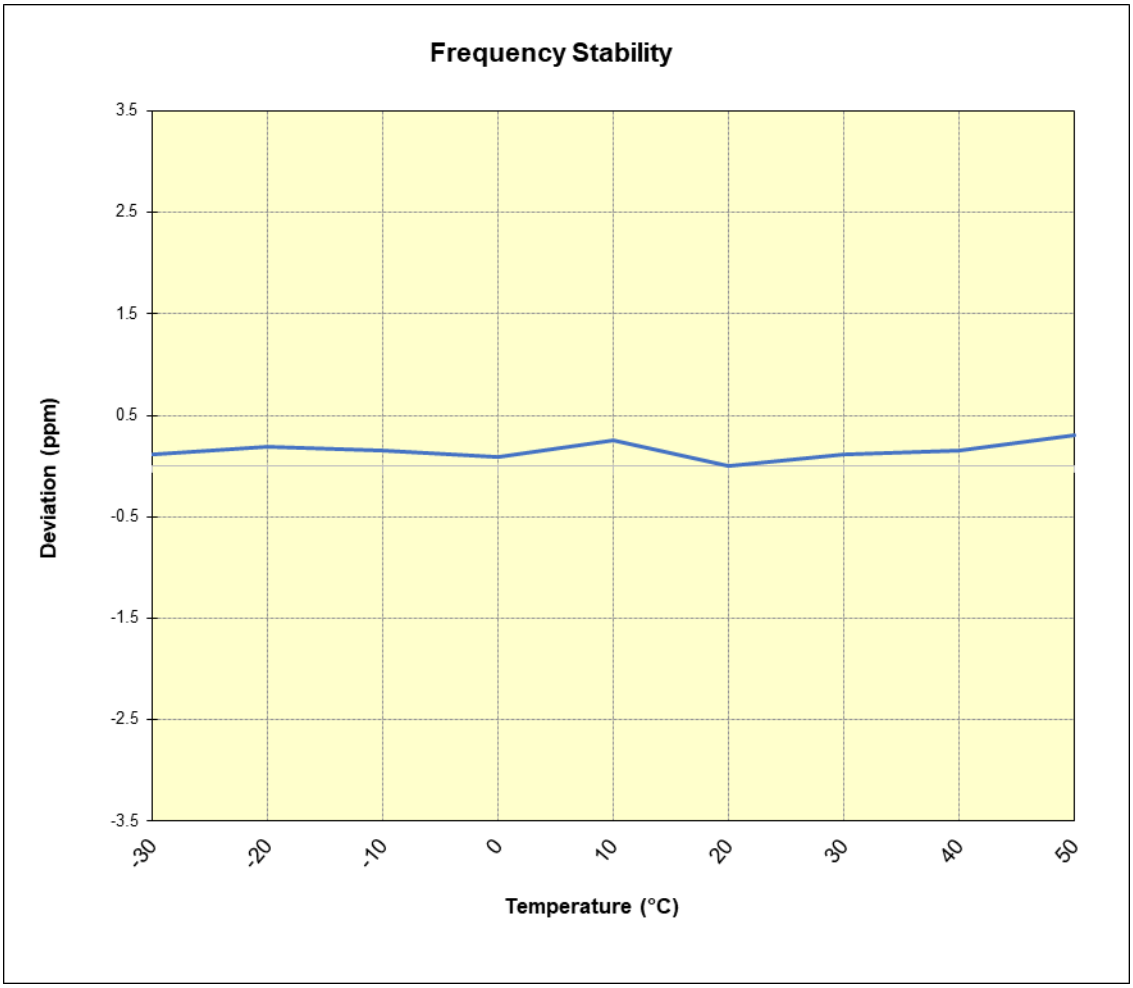


Figure 7-17. Frequency Stability Graph (NR Band 2)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Indoor Customer Premises Equipment (CPE) FCC ID: A3LSMH204V** complies with all the requirements of Parts 22, 24 & 27 of the FCC Rules.