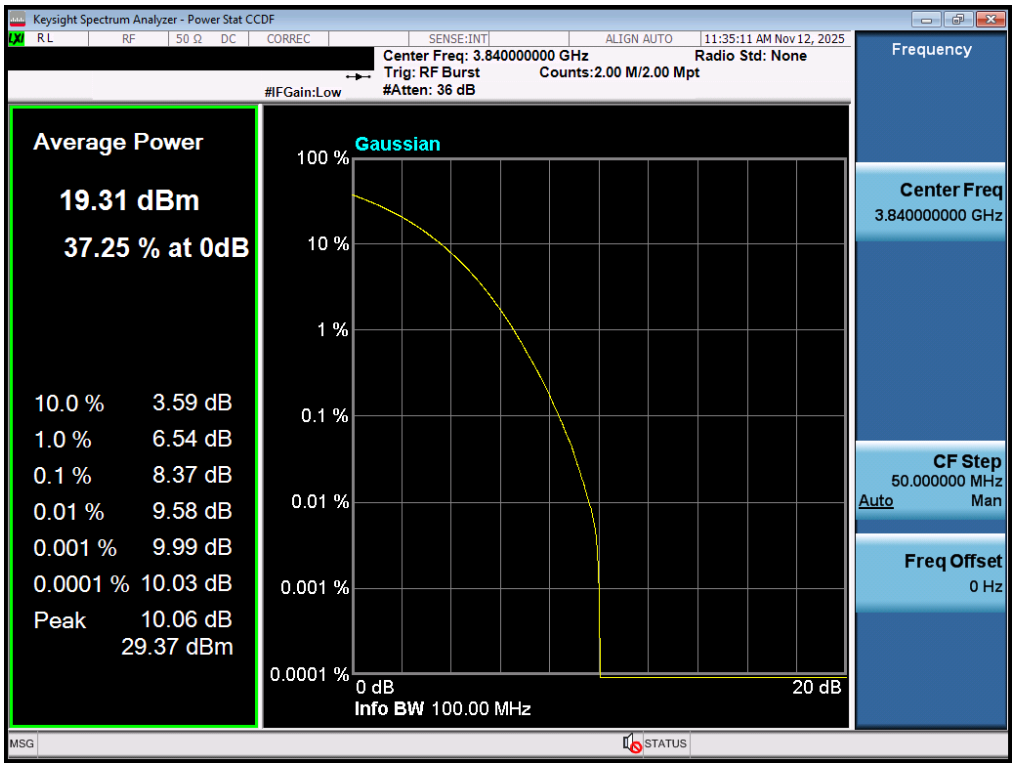
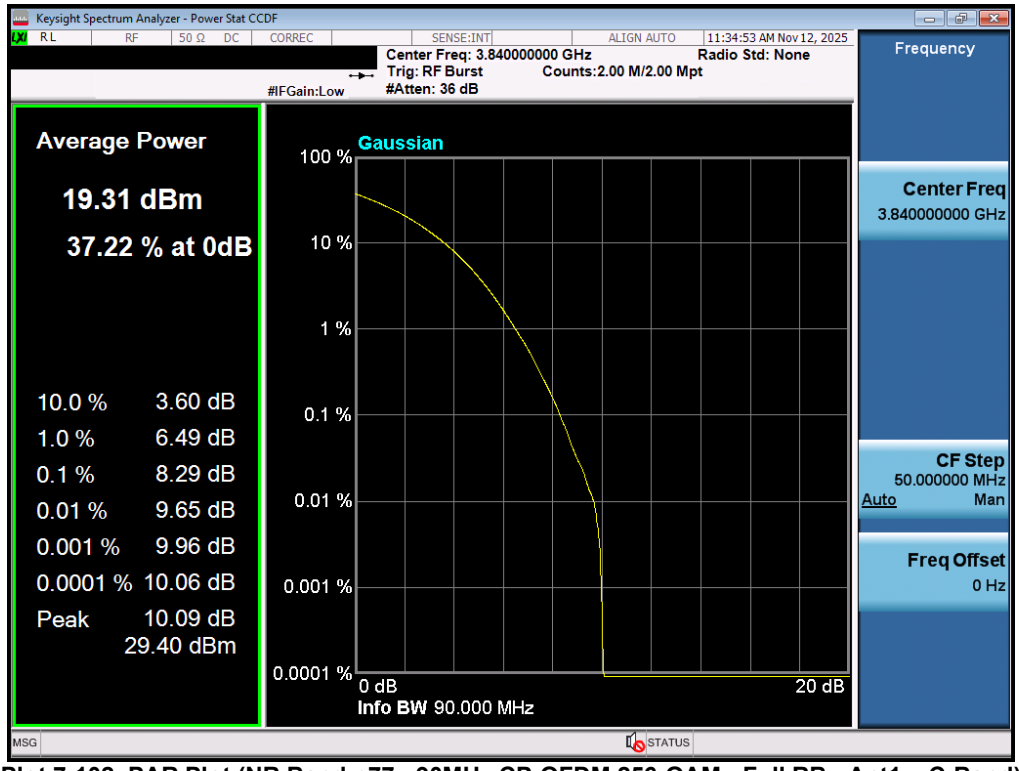
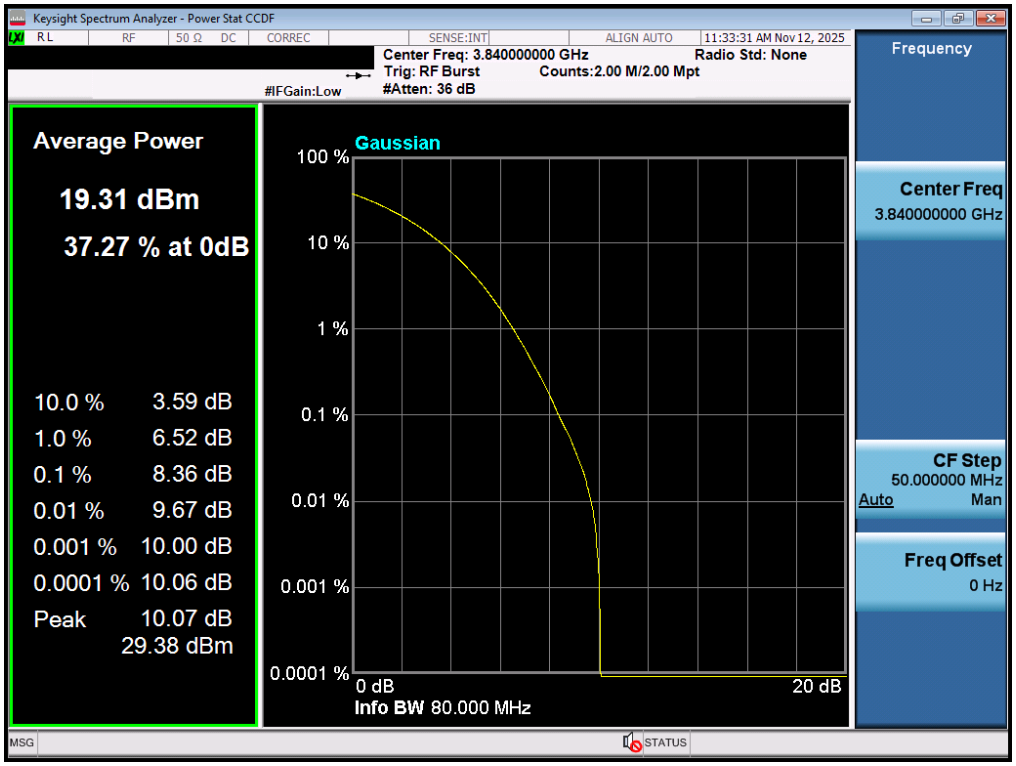
NR Band n77 – Ant1 – C-Band



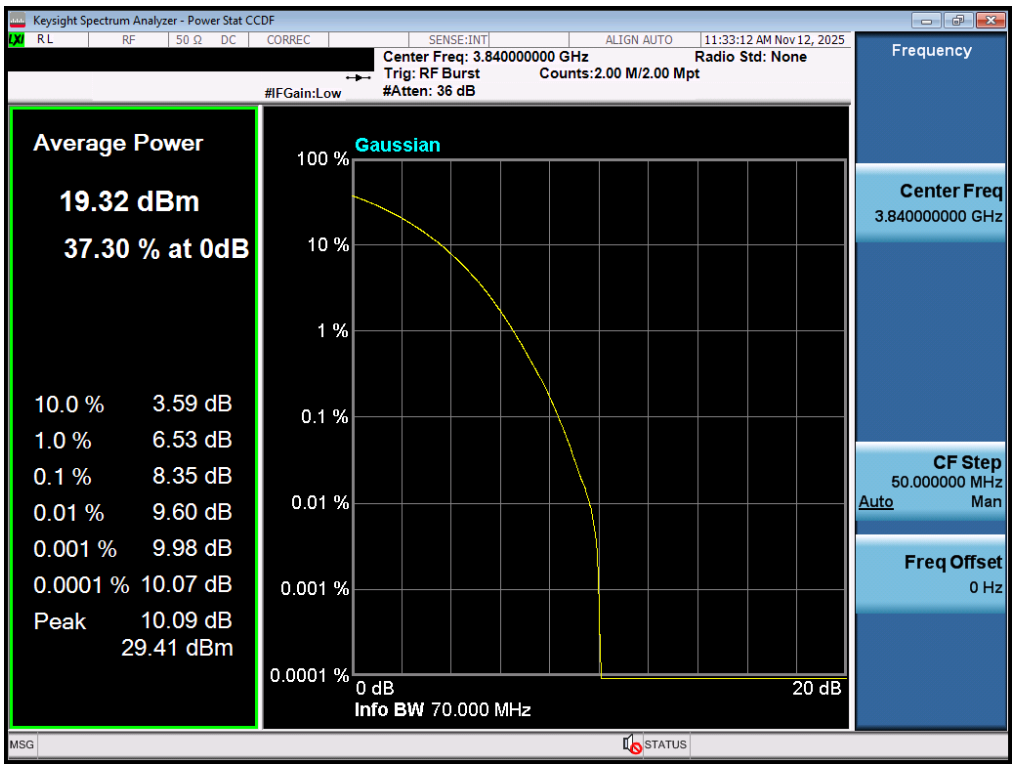
Plot 7-101. PAR Plot (NR Band n77 - 100MHz CP-OFDM 256-QAM - Full RB - Ant1 – C-Band)



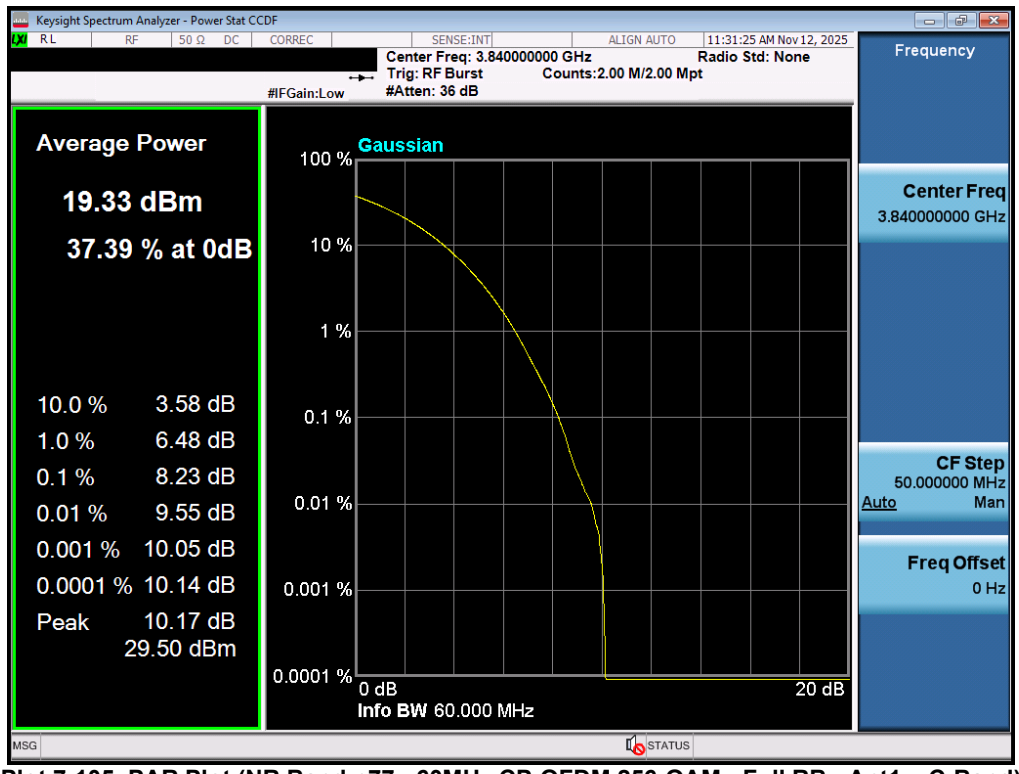
Plot 7-102. PAR Plot (NR Band n77 - 90MHz CP-OFDM 256-QAM - Full RB - Ant1 – C-Band)



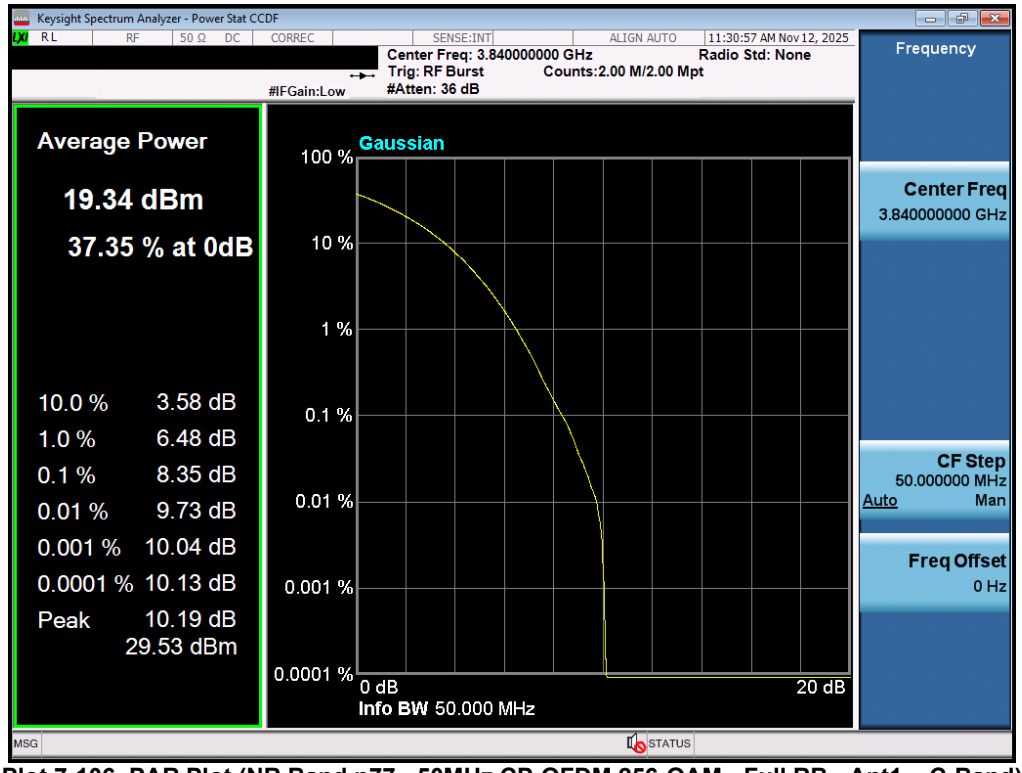
Plot 7-103. PAR Plot (NR Band n77 - 80MHz CP-OFDM 256-QAM - Full RB - Ant1 – C-Band)



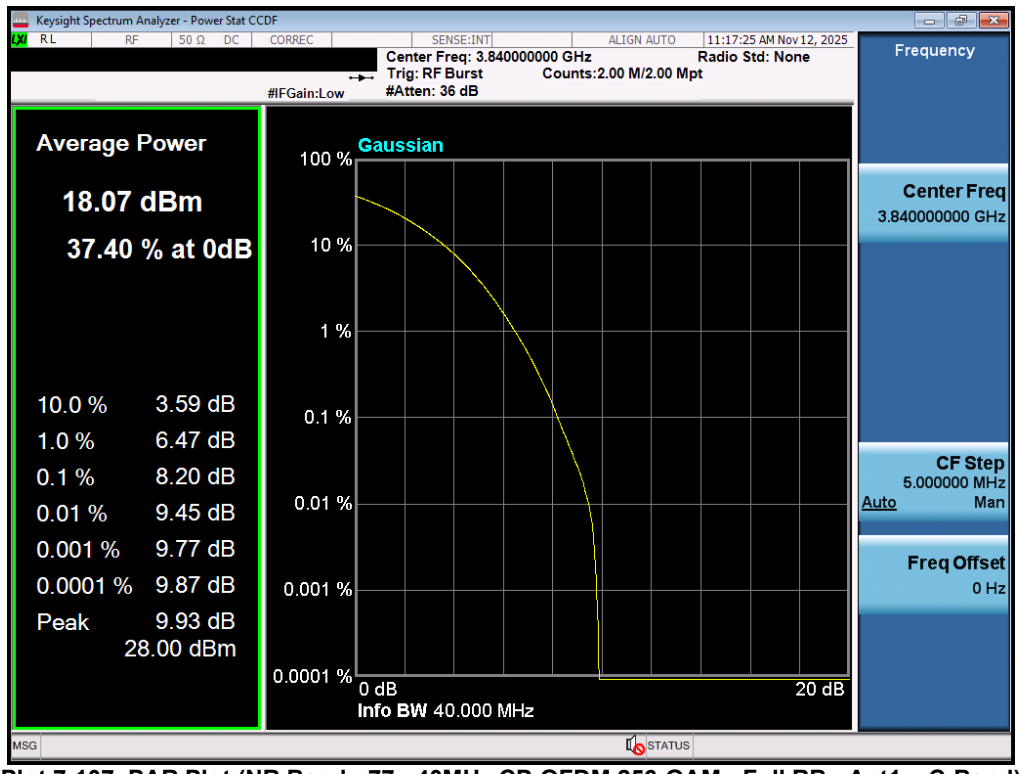
Plot 7-104. PAR Plot (NR Band n77 - 70MHz CP-OFDM 256-QAM - Full RB - Ant1 – C-Band)



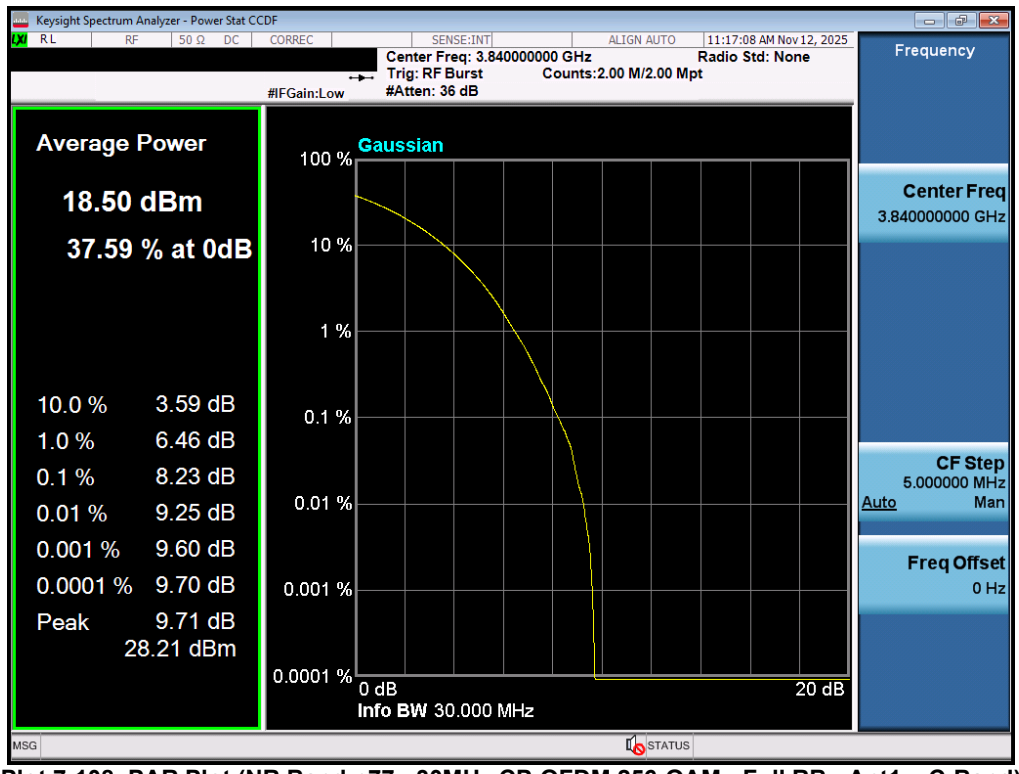
Plot 7-105. PAR Plot (NR Band n77 - 60MHz CP-OFDM 256-QAM - Full RB - Ant1 – C-Band)



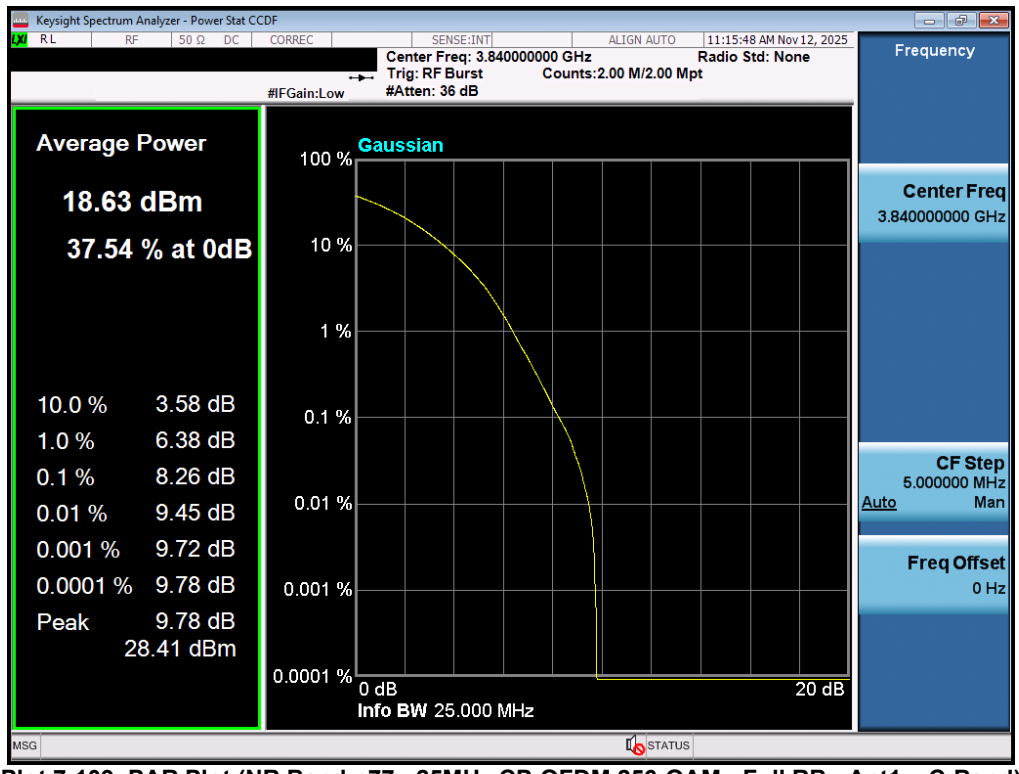
Plot 7-106. PAR Plot (NR Band n77 - 50MHz CP-OFDM 256-QAM - Full RB - Ant1 – C-Band)



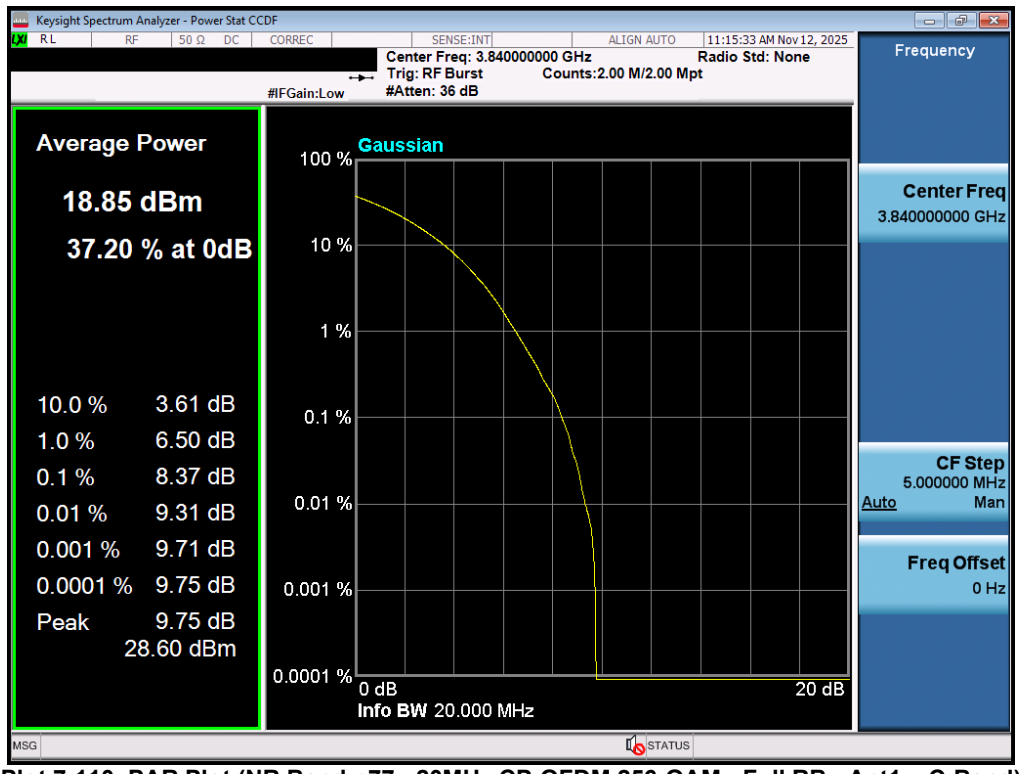
Plot 7-107. PAR Plot (NR Band n77 - 40MHz CP-OFDM 256-QAM - Full RB - Ant1 – C-Band)



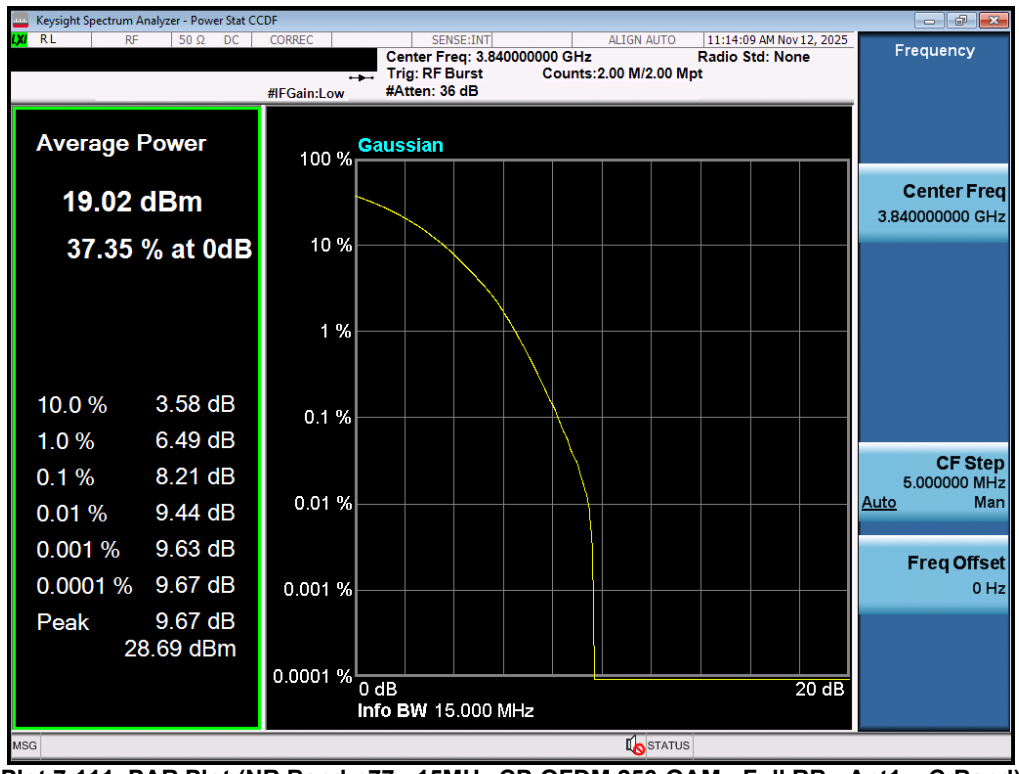
Plot 7-108. PAR Plot (NR Band n77 - 30MHz CP-OFDM 256-QAM - Full RB - Ant1 – C-Band)



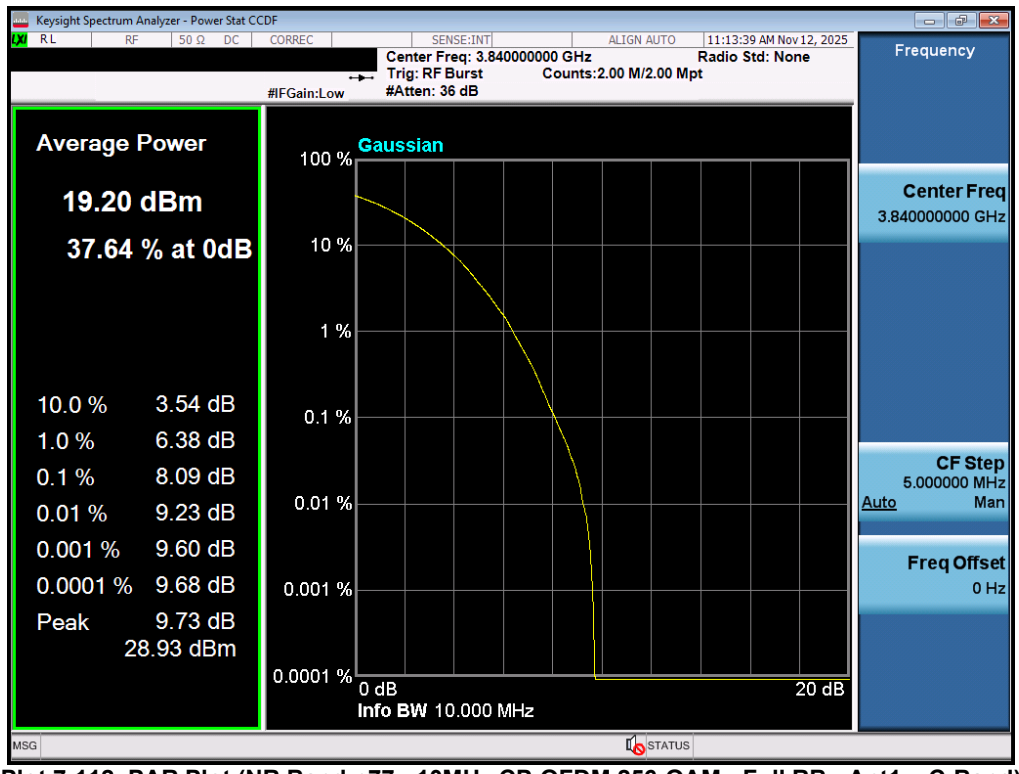
Plot 7-109. PAR Plot (NR Band n77 - 25MHz CP-OFDM 256-QAM - Full RB - Ant1 – C-Band)



Plot 7-110. PAR Plot (NR Band n77 - 20MHz CP-OFDM 256-QAM - Full RB - Ant1 – C-Band)



Plot 7-111. PAR Plot (NR Band n77 - 15MHz CP-OFDM 256-QAM - Full RB - Ant1 – C-Band)



Plot 7-112. PAR Plot (NR Band n77 - 10MHz CP-OFDM 256-QAM - Full RB - Ant1 – C-Band)

7.7 Radiated Power (EIRP)

Test Overview

Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI C63.26:2015 with the EUT transmitting into an integral antenna. Measurements are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

ANSI C63.26:2015 – Section 5.2.4.4

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
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". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration.
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power.
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.

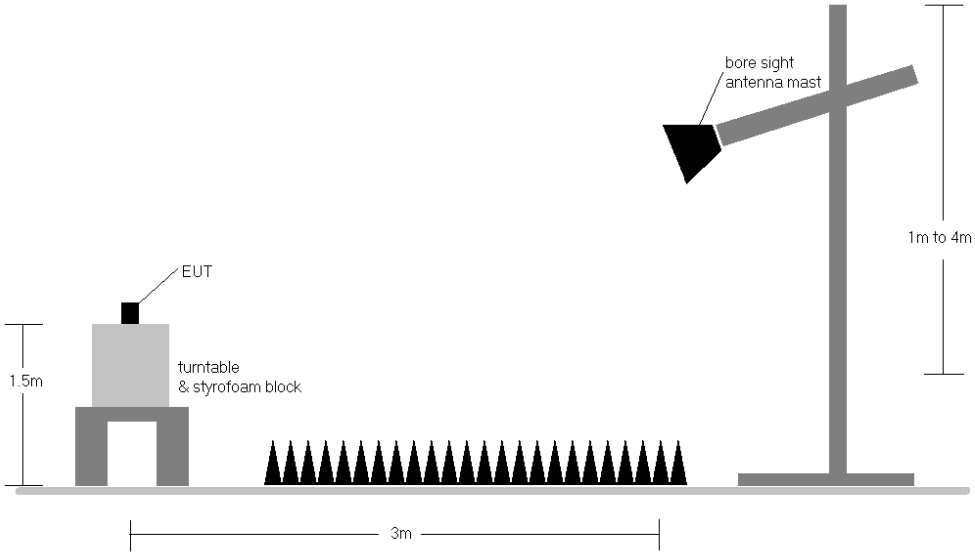


Figure 7-7. Radiated Test Setup >1GHz

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 with its standard battery.

3) For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) 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.

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]
100 MHz	π/2 BPSK	3500.01	H	136	200	6.46	1 / 136	16.32	**22.78**	0.190	30.00	-7.22
	QPSK	3500.01	H	136	200	6.46	1 / 136	16.25	22.71	0.187	30.00	-7.29
	16-QAM	3500.01	H	136	200	6.46	1 / 136	14.79	21.25	0.133	30.00	-8.75
90 MHz	π/2 BPSK	3495.00	H	136	200	6.46	1 / 1	16.38	**22.83**	0.192	30.00	-7.17
	π/2 BPSK	3500.01	H	136	200	6.46	1 / 122	16.22	22.68	0.186	30.00	-7.32
	π/2 BPSK	3504.99	H	136	200	6.47	1 / 122	16.28	22.74	0.188	30.00	-7.26
	QPSK	3495.00	H	136	200	6.46	1 / 1	16.35	22.80	0.191	30.00	-7.20
	QPSK	3500.01	H	136	200	6.46	1 / 122	16.26	22.72	0.187	30.00	-7.28
	QPSK	3504.99	H	136	200	6.47	1 / 122	16.23	22.69	0.186	30.00	-7.31
	16-QAM	3495.00	H	136	200	6.46	1 / 1	14.87	21.32	0.136	30.00	-8.68
80 MHz	π/2 BPSK	3490.02	H	136	200	6.45	1 / 1	16.34	**22.79**	0.190	30.00	-7.21
	π/2 BPSK	3500.01	H	136	200	6.46	1 / 108	16.23	22.69	0.186	30.00	-7.31
	π/2 BPSK	3510.00	H	136	200	6.47	1 / 108	16.22	22.69	0.186	30.00	-7.31
	QPSK	3490.02	H	136	200	6.45	1 / 1	16.30	22.75	0.189	30.00	-7.25
	QPSK	3500.01	H	136	200	6.46	1 / 108	16.26	22.72	0.187	30.00	-7.28
	QPSK	3510.00	H	136	200	6.47	1 / 108	16.10	22.57	0.181	30.00	-7.43
	16-QAM	3490.02	H	136	200	6.45	1 / 1	14.82	21.27	0.134	30.00	-8.73
70 MHz	π/2 BPSK	3485.01	H	136	200	6.45	1 / 1	16.42	**22.86**	0.193	30.00	-7.14
	π/2 BPSK	3500.01	H	136	200	6.46	1 / 94	16.23	22.69	0.186	30.00	-7.31
	π/2 BPSK	3514.98	H	136	200	6.47	1 / 94	16.25	22.72	0.187	30.00	-7.28
	QPSK	3485.01	H	136	200	6.45	1 / 1	16.39	22.83	0.192	30.00	-7.17
	QPSK	3500.01	H	136	200	6.46	1 / 94	16.26	22.72	0.187	30.00	-7.28
	QPSK	3514.98	H	136	200	6.47	1 / 94	16.24	22.71	0.187	30.00	-7.29
	16-QAM	3485.01	H	136	200	6.45	1 / 1	14.92	21.36	0.137	30.00	-8.64
60 MHz	π/2 BPSK	3480.00	H	136	200	6.44	1 / 1	16.42	**22.86**	0.193	30.00	-7.14
	π/2 BPSK	3500.01	H	136	200	6.46	1 / 81	16.24	22.70	0.186	30.00	-7.30
	π/2 BPSK	3519.99	H	136	200	6.48	1 / 81	16.24	22.71	0.187	30.00	-7.29
	QPSK	3480.00	H	136	200	6.44	1 / 1	16.39	22.83	0.192	30.00	-7.17
	QPSK	3500.01	H	136	200	6.46	1 / 81	16.20	22.66	0.185	30.00	-7.34
	QPSK	3519.99	H	136	200	6.48	1 / 81	16.20	22.67	0.185	30.00	-7.33
	16-QAM	3480.00	H	136	200	6.44	1 / 1	14.91	21.35	0.137	30.00	-8.65
50 MHz	π/2 BPSK	3475.02	H	136	200	6.43	1 / 1	16.45	**22.88**	0.194	30.00	-7.12
	π/2 BPSK	3500.01	H	136	200	6.46	1 / 66	16.24	22.70	0.186	30.00	-7.30
	π/2 BPSK	3525.00	H	136	200	6.48	1 / 66	16.21	22.68	0.186	30.00	-7.32
	QPSK	3475.02	H	136	200	6.43	1 / 1	16.44	22.87	0.194	30.00	-7.13
	QPSK	3500.01	H	136	200	6.46	1 / 66	16.25	22.71	0.187	30.00	-7.29
	QPSK	3525.00	H	136	200	6.48	1 / 1	16.08	22.55	0.180	30.00	-7.45
	16-QAM	3475.02	H	136	200	6.43	1 / 1	14.94	21.37	0.137	30.00	-8.63
40 MHz	π/2 BPSK	3470.01	H	136	200	6.43	1 / 1	16.49	**22.91**	0.196	30.00	-7.09
	π/2 BPSK	3500.01	H	136	200	6.46	1 / 53	16.21	22.67	0.185	30.00	-7.33
	π/2 BPSK	3529.98	H	136	200	6.48	1 / 53	16.19	22.67	0.185	30.00	-7.33
	QPSK	3470.01	H	136	200	6.43	1 / 1	16.45	22.87	0.194	30.00	-7.13
	QPSK	3500.01	H	136	200	6.46	1 / 53	16.20	22.66	0.185	30.00	-7.34
	QPSK	3529.98	H	136	200	6.48	1 / 53	16.12	22.60	0.182	30.00	-7.40
	16-QAM	3470.01	H	136	200	6.43	1 / 1	14.98	21.40	0.138	30.00	-8.60
30 MHz	π/2 BPSK	3465.00	H	136	200	6.42	1 / 1	16.50	**22.92**	0.196	30.00	-7.08
	π/2 BPSK	3500.01	H	136	200	6.46	1 / 39	16.21	22.67	0.185	30.00	-7.33
	π/2 BPSK	3534.99	H	136	200	6.48	1 / 39	16.14	22.62	0.183	30.00	-7.38
	QPSK	3465.00	H	136	200	6.42	1 / 1	16.48	22.90	0.195	30.00	-7.10
	QPSK	3500.01	H	136	200	6.46	1 / 39	16.20	22.66	0.185	30.00	-7.34
	QPSK	3534.99	H	136	200	6.48	1 / 39	16.11	22.59	0.182	30.00	-7.41
	16-QAM	3465.00	H	136	200	6.42	1 / 1	15.01	21.43	0.139	30.00	-8.57
25 MHz	π/2 BPSK	3462.51	H	136	200	6.42	1 / 1	16.57	**22.98**	0.199	30.00	-7.02
	π/2 BPSK	3500.01	H	136	200	6.46	65 / 0	16.18	22.64	0.184	30.00	-7.36
	π/2 BPSK	3537.48	H	136	200	6.48	1 / 1	16.03	22.51	0.178	30.00	-7.49
	QPSK	3462.51	H	136	200	6.42	1 / 1	16.55	22.96	0.198	30.00	-7.04
	QPSK	3500.01	H	136	200	6.46	1 / 32	16.23	22.69	0.186	30.00	-7.31
	QPSK	3537.48	H	136	200	6.48	1 / 1	16.04	22.52	0.179	30.00	-7.48
	16-QAM	3462.51	H	136	200	6.42	1 / 1	15.09	21.50	0.141	30.00	-8.50
20 MHz	π/2 BPSK	3460.02	H	136	200	6.42	1 / 1	16.56	**22.97**	0.198	30.00	-7.03
	π/2 BPSK	3500.01	H	136	200	6.46	51 / 0	16.19	22.65	0.184	30.00	-7.35
	π/2 BPSK	3540.00	H	136	200	6.49	1 / 1	16.05	22.53	0.179	30.00	-7.47
	QPSK	3460.02	H	136	200	6.42	1 / 1	16.53	22.94	0.197	30.00	-7.06
	QPSK	3500.01	H	136	200	6.46	1 / 25	16.21	22.67	0.185	30.00	-7.33
	QPSK	3540.00	H	136	200	6.49	1 / 1	16.03	22.51	0.178	30.00	-7.49
	16-QAM	3460.02	H	136	200	6.42	1 / 1	15.04	21.45	0.140	30.00	-8.55
15 MHz	π/2 BPSK	3457.50	H	136	200	6.41	1 / 1	16.55	**22.96**	0.198	30.00	-7.04
	π/2 BPSK	3500.01	H	136	200	6.46	1 / 19	16.20	22.66	0.185	30.00	-7.34
	π/2 BPSK	3542.49	H	136	200	6.49	1 / 1	16.04	22.52	0.179	30.00	-7.48
	QPSK	3457.50	H	136	200	6.41	1 / 1	16.53	22.94	0.197	30.00	-7.06
	QPSK	3500.01	H	136	200	6.46	1 / 19	16.15	22.61	0.183	30.00	-7.39
	QPSK	3542.49	H	136	200	6.49	1 / 1	16.03	22.51	0.178	30.00	-7.49
	16-QAM	3457.50	H	136	200	6.41	1 / 1	15.05	21.46	0.140	30.00	-8.54
10 MHz	π/2 BPSK	3455.01	H	136	200	6.41	1 / 1	16.55	**22.95**	0.197	30.00	-7.05
	π/2 BPSK	3500.01	H	136	200	6.46	1 / 12	16.19	22.65	0.184	30.00	-7.35
	π/2 BPSK	3544.98	H	136	200	6.49	1 / 12	16.08	22.56	0.180	30.00	-7.44
	QPSK	3455.01	H	136	200	6.41	1 / 1	16.52	22.92	0.196	30.00	-7.08
	QPSK	3500.01	H	136	200	6.46	1 / 1	16.14	22.60	0.182	30.00	-7.40
	QPSK	3544.98	H	136	200	6.49	1 / 1	16.02	22.50	0.178	30.00	-7.50
	16-QAM	3455.01	H	136	200	6.41	1 / 12	15.06	21.46	0.140	30.00	-8.54
100 MHz	QPSK (CP-OFDM)	3500.0	H	142	214	6.46	1/271	13.48	19.94	0.099	30.00	-10.06
	QPSK (Opposite Pol.)	3500.0	V	195	303	6.48	1/136	14.51	20.99	0.125	30.00	-9.01

Table 7-18. Radiated Power Test Results - Ant1 – NR n77 DoD Band

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]
100 MHz	π/2 BPSK	3750.00	H	130	149	7.01	1 / 136	18.14	25.15	0.328	30.00	-4.85
	π/2 BPSK	3840.00	H	120	147	7.15	1 / 136	18.21	**25.36**	0.344	30.00	-4.64
	π/2 BPSK	3930.00	H	130	149	7.39	1 / 136	16.97	24.36	0.273	30.00	-5.64
	QPSK	3750.00	H	130	149	7.01	1 / 136	18.06	25.07	0.322	30.00	-4.93
	QPSK	3840.00	H	120	147	7.15	1 / 136	18.03	25.18	0.330	30.00	-4.82
	QPSK	3930.00	H	130	149	7.39	1 / 136	16.84	24.23	0.265	30.00	-5.77
	16-QAM	3840.00	H	120	147	7.15	1 / 136	16.37	23.52	0.225	30.00	-6.48
90 MHz	π/2 BPSK	3745.02	H	130	149	7.00	1 / 1	18.18	25.18	0.330	30.00	-4.82
	π/2 BPSK	3840.00	H	120	147	7.15	1 / 243	18.19	**25.34**	0.342	30.00	-4.66
	π/2 BPSK	3934.98	H	130	149	7.40	1 / 122	17.13	24.53	0.284	30.00	-5.47
	QPSK	3745.02	H	130	149	7.00	1 / 1	18.11	25.11	0.325	30.00	-4.89
	QPSK	3840.00	H	120	147	7.15	1 / 243	18.03	25.18	0.330	30.00	-4.82
	QPSK	3934.98	H	130	149	7.40	1 / 122	16.84	24.24	0.266	30.00	-5.76
	16-QAM	3840.00	H	120	147	7.15	1 / 243	16.36	23.51	0.225	30.00	-6.49
80 MHz	π/2 BPSK	3740.01	H	130	149	6.99	1 / 1	18.18	25.16	0.328	30.00	-4.84
	π/2 BPSK	3840.00	H	120	147	7.15	1 / 215	18.16	**25.31**	0.340	30.00	-4.69
	π/2 BPSK	3939.99	H	130	149	7.41	1 / 108	16.95	24.36	0.273	30.00	-5.64
	QPSK	3740.01	H	130	149	6.99	1 / 1	18.12	25.10	0.324	30.00	-4.90
	QPSK	3840.00	H	120	147	7.15	1 / 215	17.99	25.14	0.327	30.00	-4.86
	QPSK	3939.99	H	130	149	7.41	1 / 108	16.65	24.06	0.255	30.00	-5.94
	16-QAM	3840.00	H	120	147	7.15	1 / 215	16.32	23.47	0.222	30.00	-6.53
70 MHz	π/2 BPSK	3735.00	H	130	149	6.97	1 / 1	18.20	25.17	0.329	30.00	-4.83
	π/2 BPSK	3840.00	H	120	147	7.15	1 / 187	18.13	**25.28**	0.338	30.00	-4.72
	π/2 BPSK	3945.00	H	130	149	7.42	1 / 1	16.85	24.27	0.267	30.00	-5.73
	QPSK	3735.00	H	130	149	6.97	1 / 1	18.15	25.12	0.325	30.00	-4.88
	QPSK	3840.00	H	120	147	7.15	1 / 187	17.96	25.11	0.325	30.00	-4.89
	QPSK	3945.00	H	130	149	7.42	1 / 94	16.67	24.09	0.257	30.00	-5.91
	16-QAM	3735.00	H	130	149	6.97	1 / 1	16.47	23.44	0.221	30.00	-6.56
60 MHz	π/2 BPSK	3730.02	H	130	149	6.96	1 / 1	18.26	25.21	0.332	30.00	-4.79
	π/2 BPSK	3840.00	H	120	147	7.15	1 / 160	18.08	**25.23**	0.334	30.00	-4.77
	π/2 BPSK	3949.98	H	130	149	7.43	1 / 81	16.83	24.25	0.266	30.00	-5.75
	QPSK	3730.02	H	130	149	6.96	1 / 1	18.20	25.15	0.328	30.00	-4.85
	QPSK	3840.00	H	120	147	7.15	1 / 160	17.94	25.09	0.323	30.00	-4.91
	QPSK	3949.98	H	130	149	7.43	1 / 81	16.63	24.05	0.254	30.00	-5.95
	16-QAM	3730.02	H	130	149	6.96	1 / 1	16.51	23.46	0.222	30.00	-6.54
50 MHz	π/2 BPSK	3725.01	H	130	149	6.94	1 / 1	18.39	**25.33**	0.342	30.00	-4.67
	π/2 BPSK	3840.00	H	120	147	7.15	1 / 131	18.11	25.26	0.336	30.00	-4.74
	π/2 BPSK	3954.99	H	130	149	7.43	1 / 66	17.01	24.44	0.278	30.00	-5.56
	QPSK	3725.01	H	130	149	6.94	1 / 1	18.34	25.28	0.338	30.00	-4.72
	QPSK	3840.00	H	120	147	7.15	1 / 131	17.96	25.11	0.325	30.00	-4.89
	QPSK	3954.99	H	130	149	7.43	1 / 1	16.73	24.16	0.261	30.00	-5.84
	16-QAM	3725.01	H	130	149	6.94	1 / 1	16.65	23.59	0.229	30.00	-6.41
40 MHz	π/2 BPSK	3720.00	H	130	149	6.93	1 / 1	18.42	**25.34**	0.342	30.00	-4.66
	π/2 BPSK	3840.00	H	120	147	7.15	1 / 104	17.99	25.14	0.327	30.00	-4.86
	π/2 BPSK	3960.00	H	130	149	7.44	1 / 53	16.82	24.26	0.267	30.00	-5.74
	QPSK	3720.00	H	130	149	6.93	1 / 1	18.37	25.29	0.338	30.00	-4.71
	QPSK	3840.00	H	120	147	7.15	1 / 104	17.85	25.00	0.316	30.00	-5.00
	QPSK	3960.00	H	130	149	7.44	1 / 1	16.61	24.05	0.254	30.00	-5.95
	16-QAM	3720.00	H	130	149	6.93	1 / 53	16.72	23.64	0.231	30.00	-6.36
30 MHz	π/2 BPSK	3715.02	H	130	149	6.91	1 / 39	18.38	**25.29**	0.338	30.00	-4.71
	π/2 BPSK	3840.00	H	120	147	7.15	1 / 76	17.94	25.09	0.323	30.00	-4.91
	π/2 BPSK	3964.98	H	130	149	7.45	1 / 39	16.86	24.31	0.270	30.00	-5.69
	QPSK	3715.02	H	130	149	6.91	1 / 39	18.28	25.19	0.331	30.00	-4.81
	QPSK	3840.00	H	120	147	7.15	1 / 76	17.80	24.95	0.313	30.00	-5.05
	QPSK	3964.98	H	130	149	7.45	1 / 39	16.61	24.06	0.255	30.00	-5.94
	16-QAM	3715.02	H	130	149	6.91	1 / 1	16.58	23.49	0.224	30.00	-6.51
25 MHz	π/2 BPSK	3712.50	H	136	200	6.91	1 / 32	18.45	**25.35**	0.343	30.00	-4.65
	π/2 BPSK	3840.00	H	136	200	7.15	1 / 63	17.90	25.05	0.320	30.00	-4.95
	π/2 BPSK	3967.50	H	136	200	7.46	1 / 32	16.68	24.13	0.259	30.00	-5.87
	QPSK	3712.50	H	136	200	6.91	1 / 32	18.44	25.34	0.342	30.00	-4.66
	QPSK	3840.00	H	136	200	7.15	1 / 63	17.76	24.91	0.310	30.00	-5.09
	QPSK	3967.50	H	136	200	7.46	1 / 32	16.50	23.95	0.248	30.00	-6.05
	16-QAM	3712.50	H	136	200	6.91	1 / 32	16.76	23.66	0.233	30.00	-6.34
20 MHz	π/2 BPSK	3710.01	H	130	149	6.90	1 / 25	18.48	**25.38**	0.346	30.00	-4.62
	π/2 BPSK	3840.00	H	120	147	7.15	1 / 49	17.88	25.03	0.319	30.00	-4.97
	π/2 BPSK	3969.99	H	130	149	7.46	1 / 25	16.77	24.23	0.265	30.00	-5.77
	QPSK	3710.01	H	130	149	6.90	1 / 25	18.38	25.28	0.338	30.00	-4.72
	QPSK	3840.00	H	120	147	7.15	1 / 49	17.75	24.90	0.309	30.00	-5.10
	QPSK	3969.99	H	130	149	7.46	1 / 49	16.48	23.94	0.248	30.00	-6.06
	16-QAM	3710.01	H	130	149	6.90	1 / 25	16.72	23.62	0.230	30.00	-6.38
15 MHz	π/2 BPSK	3707.52	H	130	149	6.89	1 / 19	18.48	**25.37**	0.345	30.00	-4.63
	π/2 BPSK	3840.00	H	120	147	7.15	1 / 19	17.87	25.02	0.318	30.00	-4.98
	π/2 BPSK	3972.48	H	130	149	7.46	1 / 19	16.80	24.26	0.267	30.00	-5.74
	QPSK	3707.52	H	130	149	6.89	1 / 19	18.35	25.24	0.335	30.00	-4.76
	QPSK	3840.00	H	120	147	7.15	1 / 36	17.71	24.86	0.306	30.00	-5.14
	QPSK	3972.48	H	130	149	7.46	1 / 19	16.50	23.96	0.249	30.00	-6.04
	16-QAM	3707.52	H	130	149	6.89	1 / 19	16.78	23.67	0.233	30.00	-6.33
10 MHz	π/2 BPSK	3705.00	H	130	149	6.89	1 / 12	18.40	**25.28**	0.338	30.00	-4.72
	π/2 BPSK	3840.00	H	120	147	7.15	1 / 12	17.87	25.02	0.318	30.00	-4.98
	π/2 BPSK	3975.00	H	130	149	7.47	1 / 12	16.69	24.16	0.261	30.00	-5.84
	QPSK	3705.00	H	130	149	6.89	1 / 12	18.31	25.19	0.331	30.00	-4.81
	QPSK	3840.00	H	120	147	7.15	1 / 12	17.68	24.83	0.304	30.00	-5.17
	QPSK	3975.00	H	130	149	7.47	1 / 12	16.43	23.90	0.246	30.00	-6.10
	16-QAM	3705.00	H	130	149	6.89	1 / 12	16.75	23.63	0.231	30.00	-6.37
100 MHz	QPSK (CP-OFDM)	3840.00	H	133	146	7.01	1/1	17.65	24.66	0.293	30.00	-5.34
	QPSK (Opposite Pol.)	3840.00	V	238	290	7.13	1/136	17.02	24.15	0.260	30.00	-5.85

Table 7-19. Radiated Power Test Results - Ant1 – NR n77 C-Band

7.8 Radiated Spurious Emissions Measurements

Test Overview

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

Test Procedures Used

ANSI C63.26:2015 – Section 5.5.4

Test Settings

1. RBW = 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.

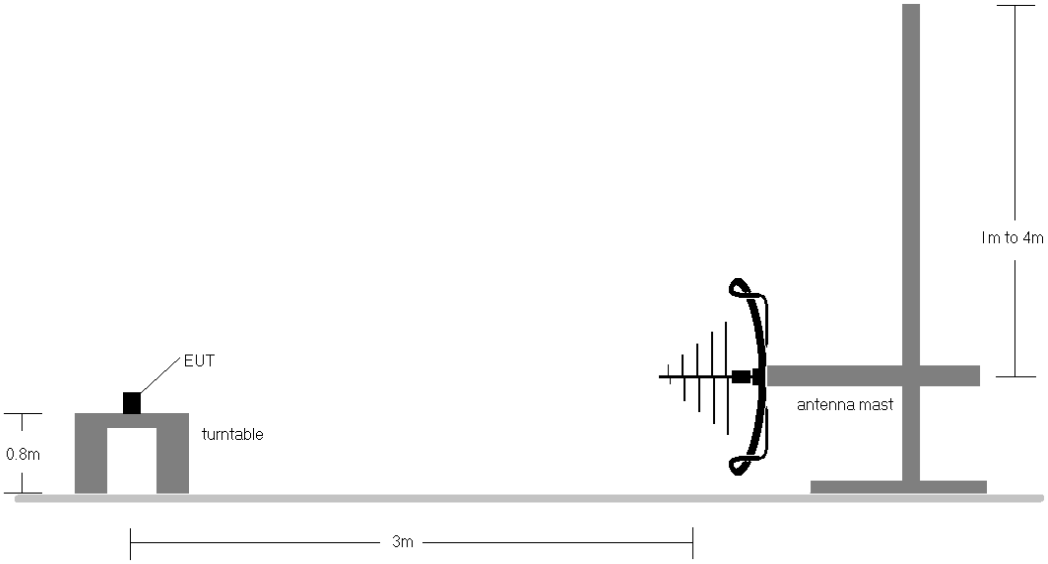


Figure 7-8. Test Instrument & Measurement Setup < 1GHz

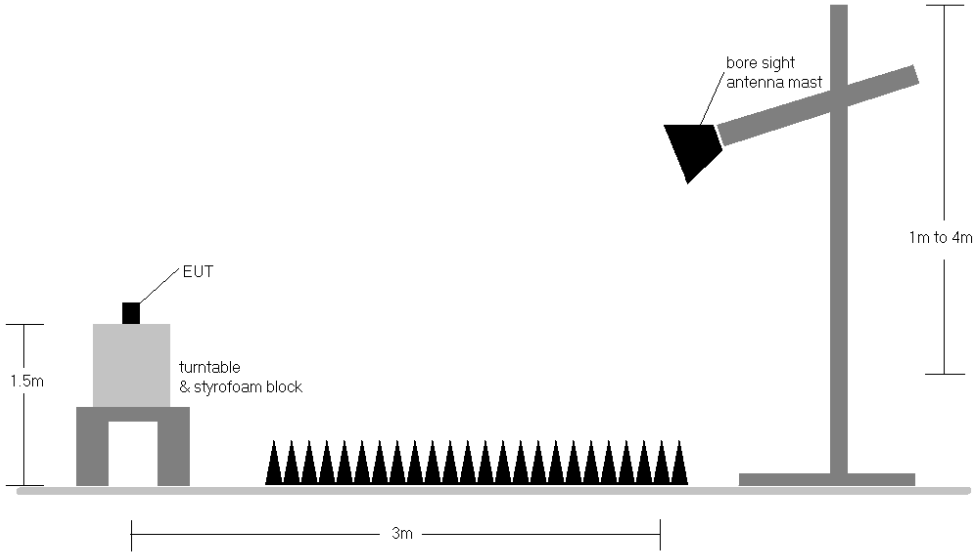


Figure 7-9. Test Instrument & Measurement Setup >1 GHz

Test Notes

1) Field strengths are calculated using the Measurement quantity conversions in ANSI C63.26:2015 Section 5.2.7:

   b) E(dBµV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m)
   d) EIRP (dBm) = E(dBµV/m) + 20logD – 104.8; where D is the measurement distance in meters.

2) 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.

3) This unit was tested with its standard battery.

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

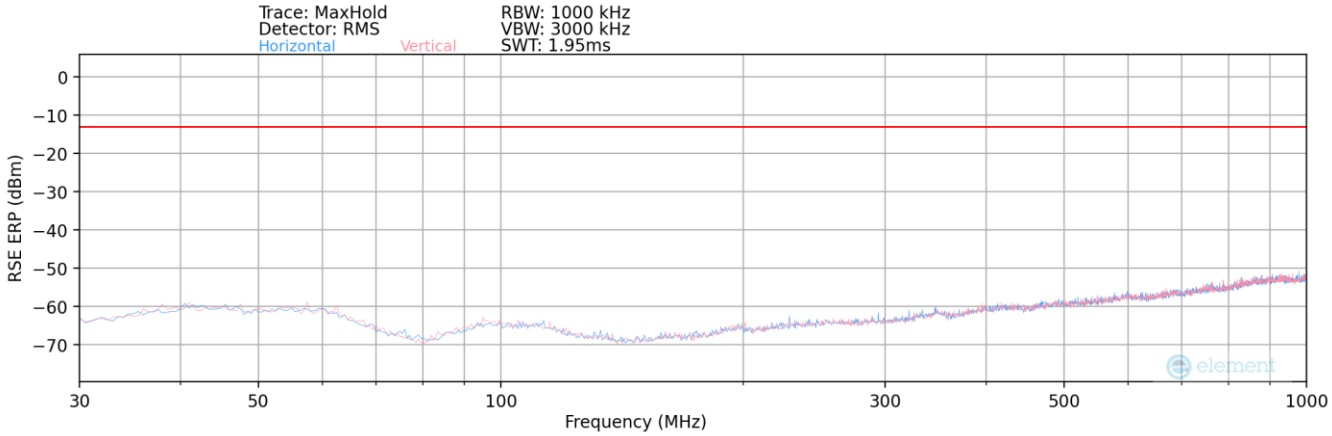
5) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

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

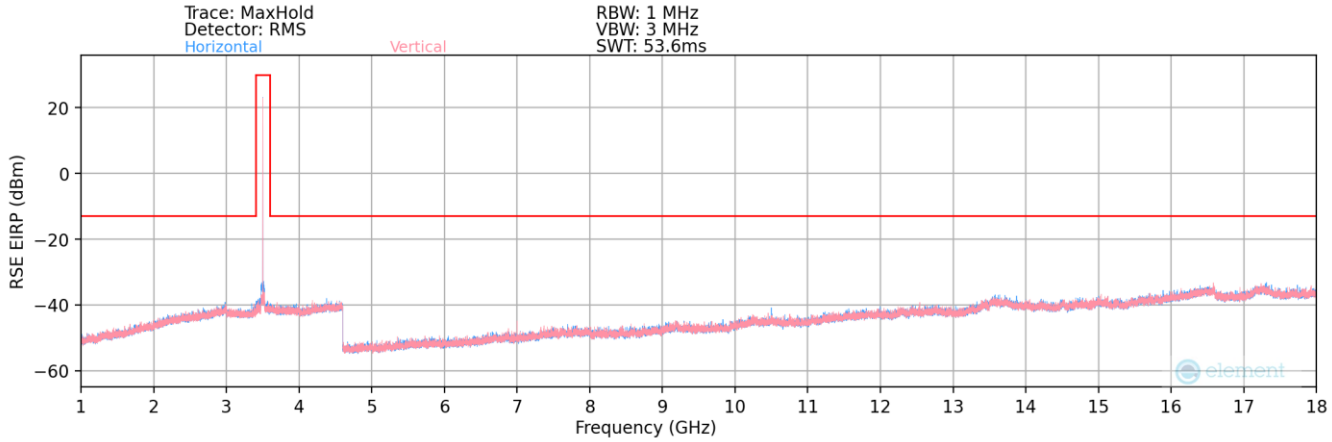
7) For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

8) Spurious emissions shown in this section are measured while operating in EN-DC mode with Sub 6GHz NR carrier as well as an LTE carrier (anchor). Spurious emissions from the NR carrier device, is subject to the rules under which the NR carrier operates. Spurious emissions caused by the LTE carrier must meet the requirements of the rules under which the LTE carrier operates.

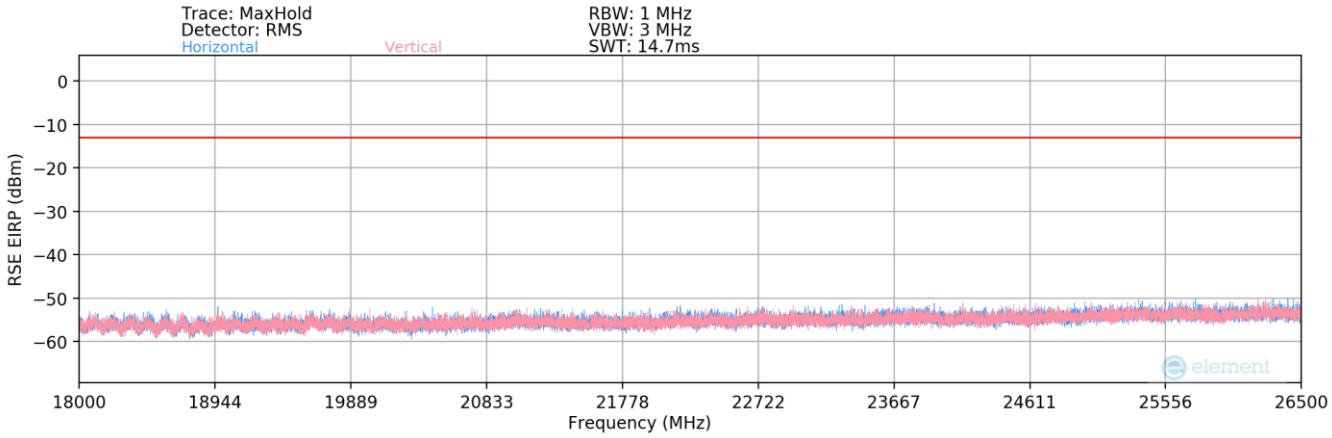
NR Band n77 – DoD Band



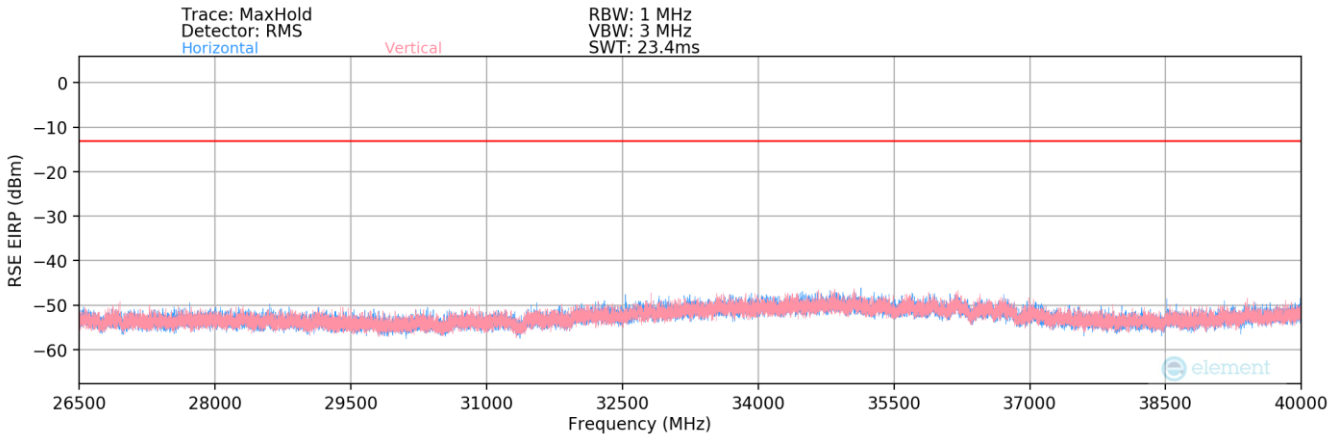
Plot 7-113. Radiated Spurious Plot (NR Band n77) – DoD Band



Plot 7-114. Radiated Spurious Plot (NR Band n77) – DoD Band



Plot 7-115. Radiated Spurious Plot (NR Band n77) – DoD Band



Plot 7-116. Radiated Spurious Plot (NR Band n77) – DoD Band

Bandwidth (MHz):	50
Frequency (MHz):	3500.01
RB / Offset:	1 / 66
Mode:	Stand Alone

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
45.00	H	-	-	-66.33	-11.36	29.31	-68.09	-13.00	-55.09
77.50	V	-	-	-70.24	-18.25	18.51	-78.90	-13.00	-65.90

Table 7-20. Radiated Spurious Data (NR Band n77) – DoD Band

Bandwidth (MHz):	50
Frequency (MHz):	3475.02
RB / Offset:	1 / 66
Mode:	Stand Alone

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]
6950.04	H	137	26	-72.06	14.50	49.44	-45.81	-13.00	-32.81
10425.06	V	156	3	-72.65	19.88	54.23	-41.03	-13.00	-28.03
13900.08	H	-	-	-75.57	25.96	57.39	-37.87	-13.00	-24.87
17375.10	H	-	-	-75.96	29.92	60.96	-34.30	-13.00	-21.30
20850.12	H	-	-	-58.46	2.64	51.18	-53.62	-13.00	-40.62

Table 7-21. Radiated Spurious Data (NR Band n77 – Low Channel) – DoD Band

Bandwidth (MHz):	50
Frequency (MHz):	3500.01
RB / Offset:	1 / 66
Mode:	Stand Alone

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]
7000.02	H	110	14	-69.61	14.81	52.20	-43.06	-13.00	-30.06
10500.03	V	170	324	-72.55	20.91	55.36	-39.90	-13.00	-26.90
14000.04	H	-	-	-75.10	26.39	58.29	-36.97	-13.00	-23.97
17500.05	H	-	-	-77.03	30.26	60.23	-35.03	-13.00	-22.03
21000.06	H	-	-	-59.97	2.82	49.85	-54.95	-13.00	-41.95

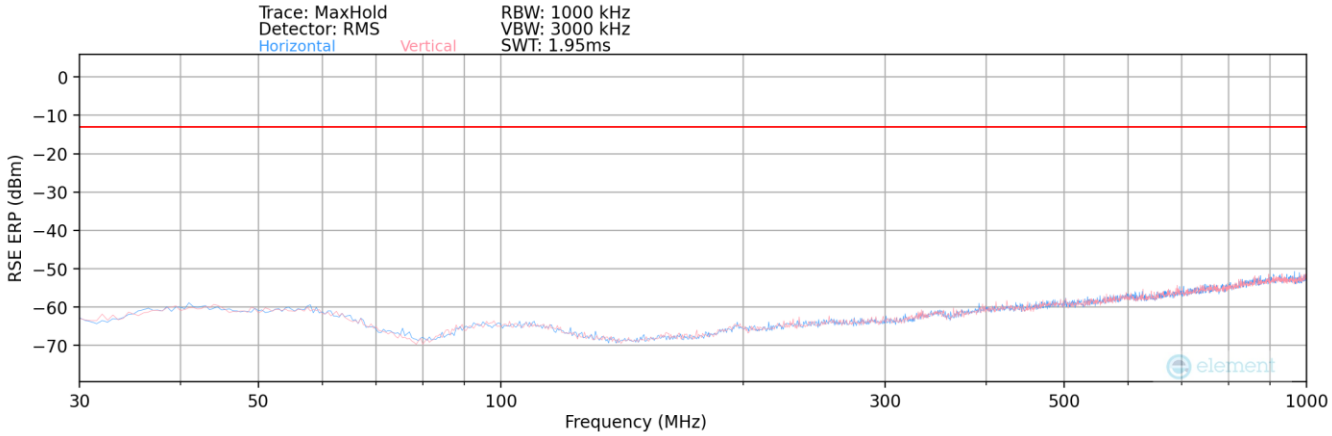
Table 7-22. Radiated Spurious Data (NR Band n77 – Mid Channel) – DoD Band

Bandwidth (MHz):	50
Frequency (MHz):	3525.00
RB / Offset:	1 / 66
Mode:	Stand Alone

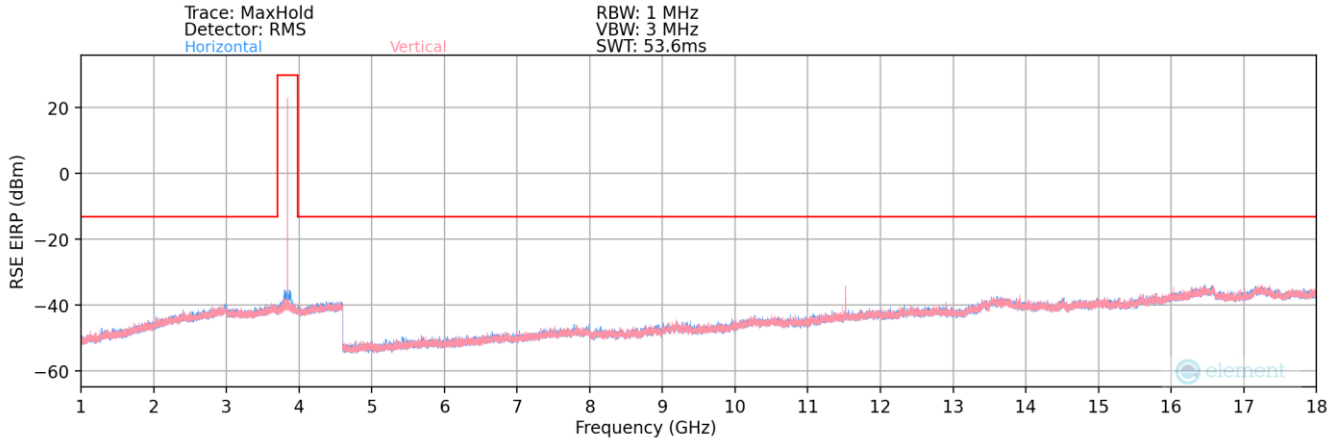
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7050.00	H	129	27	-71.40	14.96	50.56	-44.69	-13.00	-31.69
10575.00	V	129	1	-69.85	20.27	57.42	-37.84	-13.00	-24.84
14100.00	H	-	-	-76.08	25.83	56.75	-38.51	-13.00	-25.51
17625.00	H	-	-	-77.06	30.38	60.32	-34.94	-13.00	-21.94
21150.00	H	-	-	-59.02	2.89	50.87	-53.93	-13.00	-40.93

Table 7-23. Radiated Spurious Data (NR Band n77 – High Channel) – DoD Band

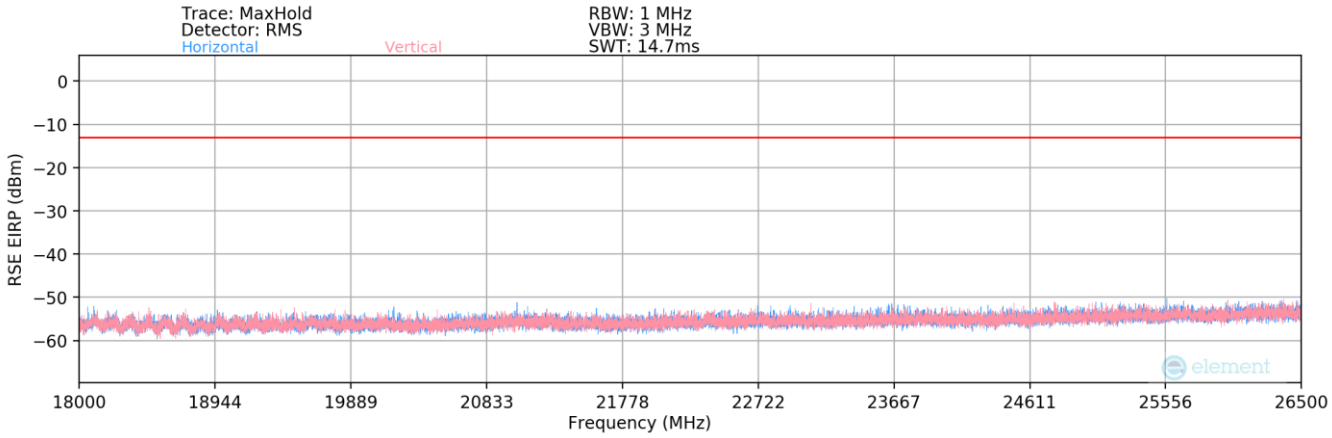
NR Band n77 – C-Band



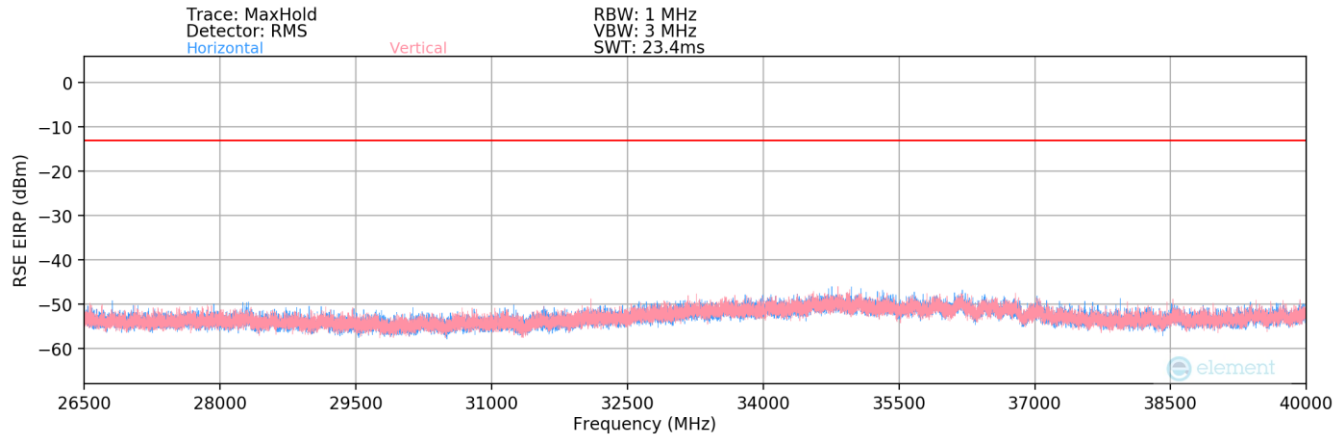
Plot 7-117. Radiated Spurious Plot (NR Band n77) – C-Band Band



Plot 7-118. Radiated Spurious Plot (NR Band n77) – C-Band Band



Plot 7-119. Radiated Spurious Plot (NR Band n77) – C-Band Band



Plot 7-120. Radiated Spurious Plot (NR Band n77) – C-Band Band

Bandwidth (MHz):	100
Frequency (MHz):	3840.00
RB / Offset:	1 / 136
Mode:	Stand Alone

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
150.00	H	-	-	-63.54	-16.75	26.71	-70.70	-13.00	-57.70

Table 7-24. Radiated Spurious Data (NR Band n77) – C-Band

Bandwidth (MHz):	100
Frequency (MHz):	3750.00
RB / Offset:	1 / 136
Mode:	Stand Alone

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]
7500.00	H	120	297	-73.88	16.16	49.28	-45.98	-13.00	-32.98
11250.00	H	109	100	-63.80	21.91	65.11	-30.14	-13.00	-17.14
15000.00	H	-	-	-76.53	27.50	57.97	-37.29	-13.00	-24.29
18750.00	H	-	-	-57.42	1.17	50.75	-54.05	-13.00	-41.05
22500.00	H	-	-	-59.58	3.45	50.87	-53.93	-13.00	-40.93

Table 7-25. Radiated Spurious Data (NR Band n77 – Low Channel) – C-Band

Bandwidth (MHz):	100
Frequency (MHz):	3840.00
RB / Offset:	1 / 136
Mode:	Stand Alone

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]
7680.00	H	156	353	-72.47	16.16	50.69	-44.57	-13.00	-31.57
11520.00	H	129	325	-66.75	22.28	62.53	-32.73	-13.00	-19.73
15360.00	H	-	-	-76.80	27.96	58.16	-37.10	-13.00	-24.10
19200.00	H	-	-	-58.53	1.64	50.11	-54.69	-13.00	-41.69
23040.00	H	-	-	-58.32	3.59	52.27	-52.53	-13.00	-39.53

Table 7-26. Radiated Spurious Data (NR Band n77 – Mid Channel) – C-Band

Bandwidth (MHz):	100
Frequency (MHz):	3930.00
RB / Offset:	1 / 136
Mode:	Stand Alone

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]
7860.00	H	149	326	-72.90	16.02	50.12	-45.14	-13.00	-32.14
11790.00	H	216	343	-72.68	21.49	55.81	-39.44	-13.00	-26.44
15720.00	H	-	-	-76.45	28.48	59.03	-36.23	-13.00	-23.23
19650.00	H	-	-	-58.75	1.89	50.14	-54.66	-13.00	-41.66
23580.00	H	-	-	-59.44	3.98	51.54	-53.26	-13.00	-40.26
27510.00	H	-	-	-58.39	4.95	53.56	-51.24	-13.00	-38.24

Table 7-27. Radiated Spurious Data (NR Band n77 – High Channel) – C-Band

7.9 Frequency Stability / Temperature Variation

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26:2015. 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 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI C63.26:2015 – Section 5.6

Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. 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.
3. 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

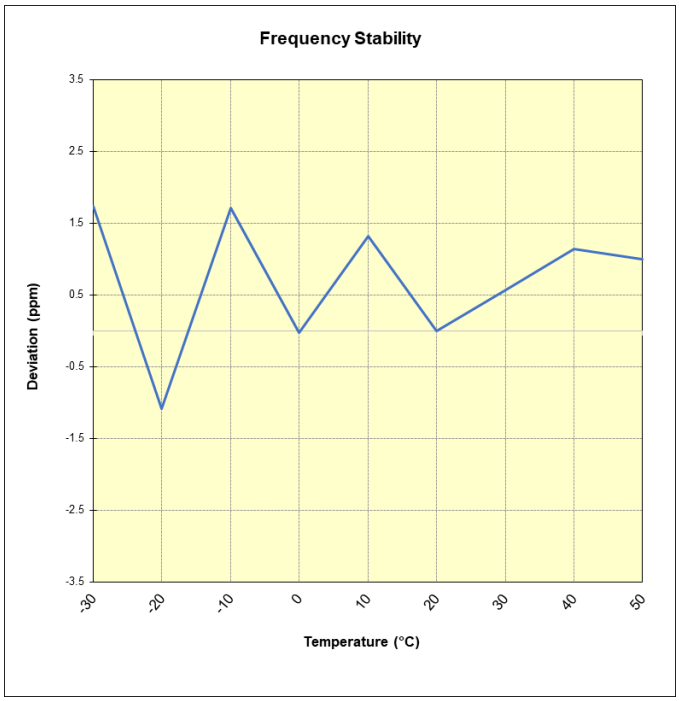
None

NR Band n77 DoD

Operating Frequency (Hz):	3,500,000,000
Ref. Voltage (VDC):	4.446

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.446	- 30	3,500,172,419	6,101	0.0001743
		- 20	3,500,162,534	-3,784	-0.0001081
		- 10	3,500,172,314	5,996	0.0001713
		0	3,500,166,226	-92	-0.0000026
		+ 10	3,500,170,966	4,648	0.0001328
		+ 20 (Ref)	3,500,166,318	0	0.0000000
		+ 30	3,500,168,331	2,013	0.0000575
		+ 40	3,500,170,314	3,996	0.0001142
		+ 50	3,500,169,820	3,502	0.0001001
attery Endpoi	3.648	+ 20	3,500,168,221	1,903	0.0000544

Table 7-28. NR Band n77 Frequency Stability Data – DoD Band



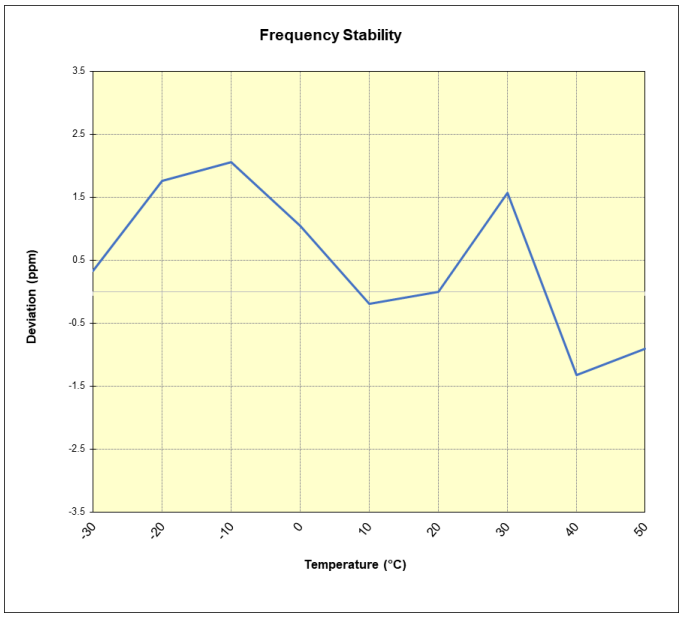
Plot 7-121. NR Band n77 Frequency Stability Chart – DoD Band

NR Band n77 C

Operating Frequency (Hz):	3,840,000,000
Ref. Voltage (VDC):	4.446

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.446	- 30	3,840,163,829	1,298	0.0000338
		- 20	3,840,169,280	6,749	0.0001757
		- 10	3,840,170,450	7,919	0.0002062
		0	3,840,166,566	4,035	0.0001051
		+ 10	3,840,161,796	-735	-0.0000191
		+ 20 (Ref)	3,840,162,531	0	0.0000000
		+ 30	3,840,168,553	6,022	0.0001568
		+ 40	3,840,157,463	-5,068	-0.0001320
		+ 50	3,840,159,034	-3,497	-0.0000911
Battery Endpoint	3.648	+ 20	3,840,160,528	-2,003	-0.0000522

Table 7-29. NR Band n77 Frequency Stability Data – C-Band



Plot 7-122. NR Band n77 Frequency Stability Chart – C-Band

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMA576U** complies with all the requirements of Part 27 of the FCC rules.

- END OF TEST REPORT -