

7.5. Power and Radiated Spurious Emissions

7.5.1 Test Limit

Radiated Power

For FCC Part 22.913(a)(2):

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

For FCC Part 24.232(c)/27.50(h):

The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 2 Watts.

For FCC Part 27.50(a):

The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 0.25 Watts.

For FCC Part 27.50(b):

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 3 Watts.

For FCC Part 27.50(d):

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 1 Watts.

Radiated Spurious Emissions

For FCC Part 22.917(a)/24.238(a)/27.53(c)/27.53(f)/27.53(h):

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log_{10}(P)$ dB.

For FCC Part 27.53(m):

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $55 + 10\log_{10}(P)$ dB.

For FCC Part 27.53(a):

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $70 + 10\log_{10}(P)$ dB.

7.5.2 Test Procedure Used

KDB 971168 D01v02r02 - Section 7.0 & ANSI/TIA-603-E-2016

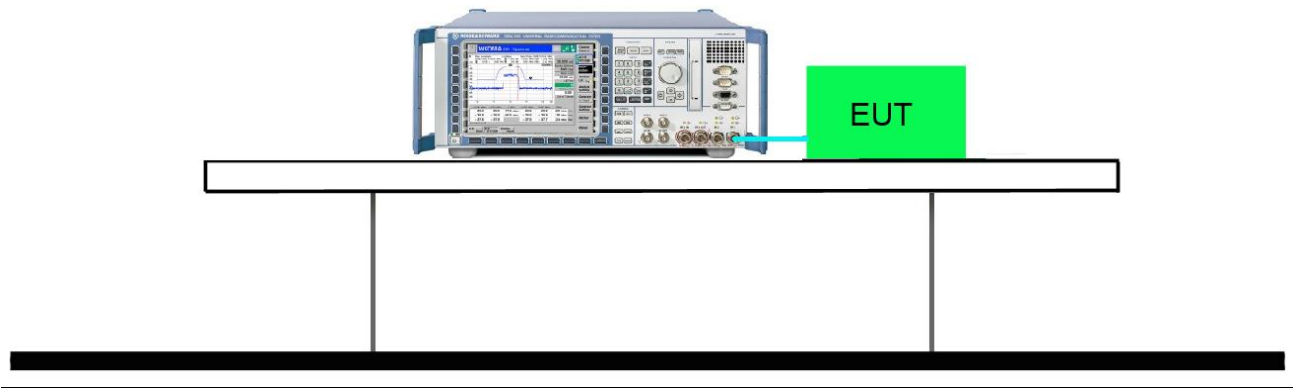
7.5.3 Test Setting

1. The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
3. The output of the test antenna shall be connected to the measuring receiver.
4. The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
5. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
6. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
7. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
8. The maximum signal level detected by the measuring receiver shall be noted.
9. The transmitter shall be replaced by a substitution antenna.
10. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
11. The substitution antenna shall be connected to a calibrated signal generator.
12. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
13. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.

14. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
15. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
16. The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
17. Test site anechoic chamber refer to ANSI C63.4: 2014.

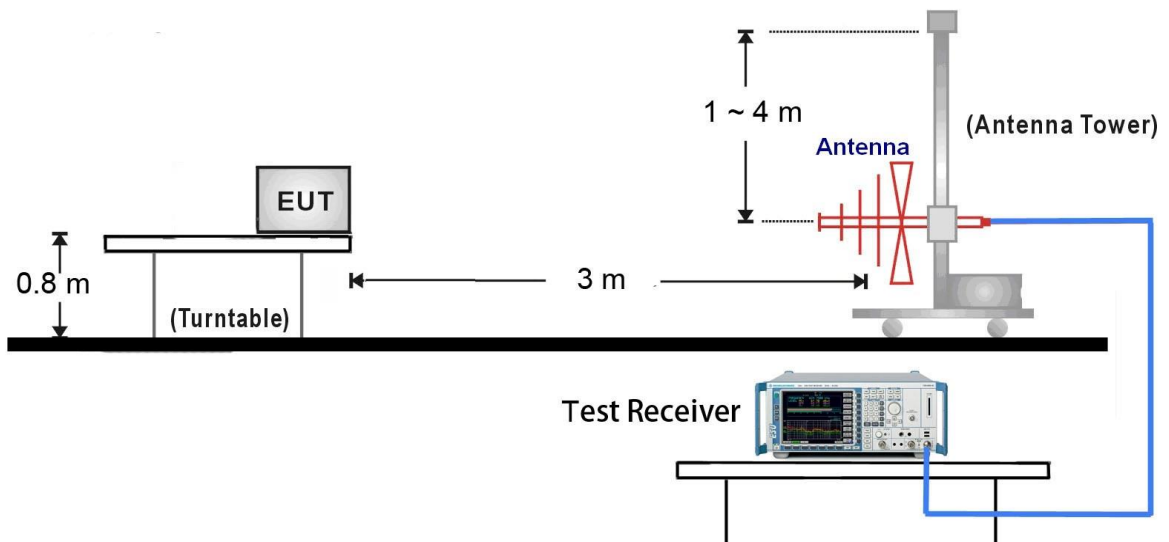
7.5.4 Test Setup

Conducted Power

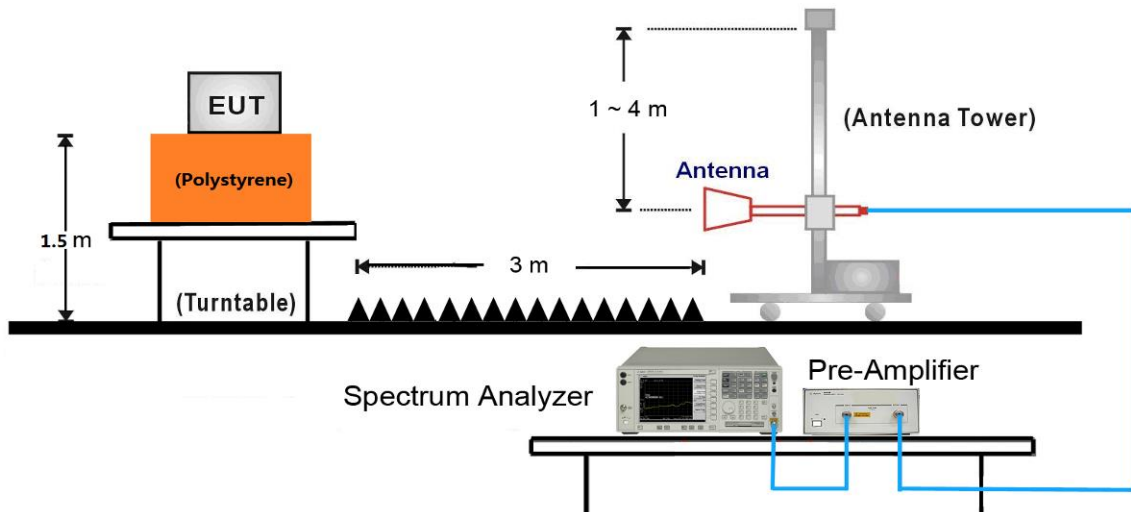


Radiated Power & Radiated Spurious Emissions

30MHz ~ 1GHz Test Setup:



1GHz ~ 10GHz Test Setup:



7.5.5 Test Result

Conducted Power

Monarch 12

LTE Band4			Maximum Conducted Output Power (Channel / Frequency (MHz))																	
Modulation	Bandwidth		1.4MHz			3MHz			5MHz			10MHz			15MHz			20MHz		
	RB	RB	19957	20175	20393	19965	20175	20385	19975	20175	20375	20000	20175	20350	20025	20175	20325	20050	20175	20300
	No.	Offset	1710.7	1732.5	1754.3	1711.5	1732.5	1753.5	1712.5	1732.5	1752.5	1715	1732.5	1750	1717.5	1732.5	1747.5	1720	1732.5	1745
QPSK	1	#0	23.20	23.40	23.03	23.44	23.40	22.90	23.22	23.07	23.01	23.10	23.28	22.92	23.03	23.08	23.09	22.74	23.20	23.52
	1	#Mid	23.28	23.55	23.09	23.49	23.52	22.83	23.55	23.02	23.02	23.49	23.41	23.27	23.68	23.30	23.00	23.54	23.51	23.33
	1	#High	23.25	23.50	22.94	23.24	23.34	23.06	23.44	23.23	23.12	23.32	23.29	23.10	23.67	22.91	23.12	23.20	23.16	23.29
	50%	#0	23.28	23.33	23.04	22.14	22.15	21.84	22.17	22.23	21.96	22.16	22.21	21.83	22.20	22.22	22.00	22.19	22.24	22.16
	50%	#Mid	23.30	23.34	23.23	22.10	22.09	22.01	22.26	22.28	22.05	22.29	22.22	22.01	22.21	22.32	22.01	22.20	22.33	22.11
	50%	#High	23.15	23.19	23.20	22.25	22.08	22.01	22.21	22.24	22.12	22.23	22.18	21.92	22.23	22.30	22.01	22.17	22.35	22.11
	100%	#0	22.12	22.19	21.89	22.04	22.02	21.98	22.07	22.17	21.94	22.24	22.06	21.95	22.25	22.08	22.01	22.28	22.11	22.00
16QAM	1	#0	22.09	22.04	21.68	21.77	22.93	21.57	22.24	22.33	21.48	22.08	22.46	21.77	22.53	22.52	21.44	22.02	22.13	21.56
	1	#Mid	22.22	22.36	21.95	22.09	22.79	21.87	22.26	22.16	21.33	22.17	22.78	21.85	22.55	23.19	21.74	22.17	22.06	21.61
	1	#High	22.05	22.01	21.97	22.18	22.53	21.71	22.27	22.01	21.64	22.05	22.45	21.97	22.75	22.54	21.93	22.16	21.39	21.71
	50%	#0	21.91	22.52	21.84	21.00	21.13	21.00	21.17	21.14	20.79	21.34	21.31	20.78	21.21	21.20	20.89	21.20	21.37	20.98
	50%	#Mid	21.91	22.38	22.00	21.11	21.18	21.10	21.07	21.30	20.79	21.39	21.36	21.17	21.31	21.15	21.06	21.28	21.23	20.96
	50%	#High	21.87	22.37	22.08	21.29	21.23	21.00	21.13	21.02	20.92	21.24	21.13	21.17	21.34	21.27	21.13	21.26	21.16	20.95
	100%	#0	21.25	21.36	20.96	21.01	21.16	20.98	21.34	21.27	21.10	21.23	21.18	20.93	21.31	21.23	20.93	21.26	21.14	20.97

LTE Band7			Maximum Conducted Output Power (Channel / Frequency (MHz))											
Modulation	Bandwidth		5MHz			10MHz			15MHz			20MHz		
	RB	RB	20775	21100	21425	20800	21100	21400	20825	21100	21375	20850	21100	21350
	No.	Offset	2502.5	2535	2567.5	2505	2535	2565	2507.5	2535	2562.5	2510	2535	2560
QPSK	1	#0	23.14	23.52	23.75	23.75	23.27	23.88	23.11	23.64	23.47	23.60	23.57	23.67
	1	#Mid	23.20	23.48	23.85	24.01	23.60	24.20	23.17	23.61	23.61	23.88	24.01	24.10
	1	#High	23.26	23.54	23.64	23.67	23.59	23.73	23.29	23.62	23.95	23.35	24.02	23.71
	50%	#0	22.27	22.66	22.67	22.72	22.43	22.77	22.19	22.53	22.63	22.61	22.74	22.69
	50%	#Mid	22.37	22.73	22.70	22.52	22.42	22.75	22.25	22.47	22.72	22.70	22.76	22.65
	50%	#High	22.22	22.63	22.73	22.80	22.39	22.90	22.27	22.53	22.90	22.70	22.68	22.78
	100%	#0	22.28	22.54	22.69	22.55	22.49	22.69	22.27	22.49	22.76	22.65	22.63	22.84
16QAM	1	#0	21.93	22.77	22.40	22.20	22.34	22.81	22.28	22.94	22.56	23.09	23.33	22.85
	1	#Mid	21.91	22.82	22.68	22.48	22.92	23.41	22.55	23.11	22.45	23.33	23.43	23.31
	1	#High	21.92	22.52	22.42	22.36	22.73	22.83	22.31	23.15	22.39	22.98	23.34	22.81
	50%	#0	21.22	21.49	21.42	21.66	21.59	21.72	21.26	21.66	21.52	21.63	21.59	21.60
	50%	#Mid	21.22	21.39	21.50	21.65	21.55	21.77	21.41	21.61	21.75	21.72	21.53	21.72
	50%	#High	21.24	21.30	21.60	21.78	21.35	21.84	21.37	21.56	21.67	21.67	21.61	21.69
	100%	#0	21.36	21.75	21.61	21.54	21.37	21.66	21.38	21.38	21.63	21.65	21.63	21.85

LTE Band12			Maximum Conducted Output Power (Channel / Frequency (MHz))											
Modulation	Bandwidth		1.4MHz			3MHz			5MHz			10MHz		
	RB	RB	23017	23095	23173	23025	23095	23165	23035	23095	23155	23060	23095	23130
	No.	Offset	699.7	707.5	715.3	700.5	707.5	714.5	701.5	707.5	713.5	704	707.5	711
QPSK	1	#0	23.36	24.06	23.67	23.76	23.88	23.70	23.61	24.04	23.71	23.92	23.24	23.97
	1	#Mid	23.47	24.18	23.93	23.91	24.09	23.69	23.74	24.03	23.65	24.17	24.28	23.93
	1	#High	23.52	24.01	23.57	23.87	23.90	23.66	24.06	23.77	23.56	23.97	23.82	23.63
	50%	#0	23.48	24.12	23.69	22.67	23.07	22.73	22.70	23.05	22.69	22.87	23.11	23.03
	50%	#Mid	23.67	24.03	23.60	22.75	23.15	22.74	22.95	23.02	22.81	23.01	23.06	22.81
	50%	#High	23.45	23.98	23.87	22.94	23.04	22.75	23.02	22.91	22.58	23.06	22.84	22.76
	100%	#0	22.47	23.06	22.71	22.79	23.08	22.79	22.92	22.98	22.63	22.97	22.91	22.88
16QAM	1	#0	22.99	22.94	22.56	22.71	23.11	22.54	22.56	23.18	22.73	22.41	22.90	23.18
	1	#Mid	23.14	22.98	22.71	22.83	23.04	22.42	22.90	23.17	22.72	22.92	22.93	23.18
	1	#High	23.08	23.33	22.56	22.80	22.87	22.40	23.08	22.90	22.61	22.86	22.66	22.40
	50%	#0	22.64	22.98	22.60	21.56	22.04	21.61	21.69	22.01	21.76	21.96	22.07	22.08
	50%	#Mid	22.91	23.20	22.93	21.65	22.26	21.53	21.96	21.83	21.83	22.02	22.13	21.87
	50%	#High	22.81	23.12	22.64	21.62	22.09	21.45	21.86	21.85	21.66	22.23	22.04	21.78
	100%	#0	21.49	22.16	21.82	21.73	21.86	21.72	21.99	21.94	21.53	21.93	21.88	21.92

LTE Band13			Maximum Conducted Output Power (Channel / Frequency (MHz))					
Modulation	Bandwidth		5MHz			10MHz		
	RB	RB	23205	23230	23255	--	23230	--
	No.	Offset	779.5	782	784.5	--	782	--
QPSK	1	#0	23.49	23.89	23.78	--	23.26	--
	1	#Mid	24.00	24.08	23.70	--	24.26	--
	1	#High	23.77	23.71	23.56	--	23.33	--
	50%	#0	23.00	23.15	23.01	--	23.12	--
	50%	#Mid	23.09	23.23	23.00	--	22.91	--
	50%	#High	22.99	23.06	23.06	--	22.93	--
	100%	#0	23.04	23.06	22.93	--	23.04	--
16QAM	1	#0	22.85	22.88	22.67	--	22.49	--
	1	#Mid	23.01	23.09	23.18	--	22.65	--
	1	#High	23.21	23.18	22.99	--	22.47	--
	50%	#0	21.98	21.97	21.84	--	22.04	--
	50%	#Mid	21.87	21.84	21.57	--	21.99	--
	50%	#High	22.22	21.79	21.84	--	21.58	--
	100%	#0	22.01	21.86	22.01	--	21.91	--

LTE Band25			Maximum Conducted Output Power (Channel / Frequency (MHz))																	
Modulation	Bandwidth		1.4MHz			3MHz			5MHz			10MHz			15MHz			20MHz		
	RB	RB	26047	26365	26683	26055	26365	26675	26065	26365	26665	26090	26365	26640	26115	26365	26615	26140	26365	26590
	No.	Offset	1850.7	1882.5	1914.3	1851.5	1882.5	1913.5	1852.5	1882.5	1912.5	1855	1882.5	1910	1857.5	1882.5	1907.5	1860	1882.5	1905
QPSK	1	#0	23.74	23.82	22.73	23.59	23.80	22.64	23.80	23.93	23.85	23.75	24.14	24.06	23.79	23.81	23.51	23.96	23.85	23.61
	1	#Mid	23.94	23.91	22.29	23.59	23.99	21.78	23.74	23.80	22.57	23.92	24.21	23.94	23.86	24.09	23.98	24.04	24.24	24.41
	1	#High	23.75	23.89	22.15	23.71	23.87	21.17	23.87	23.91	21.24	23.88	23.99	19.99	23.86	23.77	19.78	23.41	23.95	19.66
	50%	#0	23.83	23.97	22.03	22.79	22.87	22.16	22.91	22.96	22.94	22.96	22.98	23.14	22.95	23.01	23.11	23.01	23.07	23.14
	50%	#Mid	23.93	24.03	22.39	22.81	22.95	21.25	22.77	22.80	21.50	22.95	23.01	22.99	22.97	22.86	23.14	23.04	22.96	23.14
	50%	#High	23.87	23.89	21.98	22.82	22.83	21.13	22.92	22.98	21.64	22.93	22.93	22.33	22.99	23.01	22.79	22.97	23.05	23.37
	100%	#0	22.91	22.98	22.42	22.84	22.88	21.71	22.83	22.87	22.18	22.97	22.92	23.07	22.90	22.96	23.17	23.05	23.00	23.11
16QAM	1	#0	23.31	22.55	21.62	22.53	22.83	21.81	22.82	23.01	22.98	22.94	23.81	23.24	22.95	23.56	22.38	23.55	22.39	22.67
	1	#Mid	23.56	22.80	20.58	22.44	22.80	20.97	22.87	23.08	21.79	23.08	23.94	23.00	23.12	23.52	22.98	23.55	22.94	23.67
	1	#High	23.29	22.79	21.12	22.81	22.83	20.41	22.95	23.14	20.43	22.85	23.84	19.14	23.19	23.55	19.37	22.77	22.85	18.81
	50%	#0	22.91	22.98	21.12	21.53	21.57	21.25	21.76	21.61	22.12	22.03	22.03	22.24	21.76	22.17	22.05	22.06	22.04	22.10
	50%	#Mid	23.17	23.14	21.69	21.91	21.91	20.42	21.93	21.69	20.76	21.85	21.82	22.29	21.97	22.06	22.05	22.05	22.09	22.11
	50%	#High	22.93	23.07	21.02	21.56	21.55	20.44	21.77	21.78	20.52	21.91	22.13	21.43	21.84	21.94	21.94	21.97	21.97	22.11
	100%	#0	21.71	21.96	20.75	21.91	21.80	20.69	21.73	21.82	21.52	21.88	21.90	22.09	21.85	21.85	22.08	22.00	21.94	22.14

Note: Band25 Covered Band2.

LTE Band26			Maximum Conducted Output Power (Channel / Frequency (MHz))														
Modulation	Bandwidth		1.4MHz			3MHz			5MHz			10MHz			15MHz		
	RB	RB	26797	26915	27033	26805	26915	27025	26815	26915	27015	26840	26915	27015	26865	26915	26965
	No.	Offset	824.7	836.5	848.3	825.5	836.5	847.5	826.5	836.5	846.5	829	836.5	844	831.5	836.5	841.5
QPSK	1	#0	24.14	24.19	23.63	23.89	24.01	23.85	23.86	23.91	23.72	23.58	23.83	23.91	24.09	23.62	23.83
	1	#Mid	23.66	24.03	23.51	23.51	24.03	23.72	23.65	24.02	23.69	23.77	24.07	24.12	24.00	24.12	23.64
	1	#High	23.83	23.96	23.48	23.65	24.13	23.59	23.52	23.84	23.47	24.12	23.76	23.52	23.79	23.64	23.47
	50%	#0	23.80	24.19	23.64	22.81	23.01	22.53	22.57	22.92	22.71	22.64	23.02	22.83	22.62	23.01	22.99
	50%	#Mid	23.86	24.08	23.64	22.64	22.90	22.64	22.60	23.01	22.55	22.74	22.94	22.62	22.87	22.99	22.79
	50%	#High	23.79	24.33	23.58	22.62	23.02	22.68	22.62	22.91	22.63	22.87	22.97	22.51	22.95	22.91	22.78
	100%	#0	22.83	22.96	22.61	22.73	23.03	22.54	22.57	22.95	22.57	22.77	23.01	22.69	22.80	22.88	22.81
	100%	#Mid	22.83	22.96	22.61	22.73	23.03	22.54	22.57	22.95	22.57	22.77	23.01	22.69	22.80	22.88	22.81
16QAM	1	#0	22.69	23.02	22.97	23.02	23.36	22.50	22.11	22.73	22.48	23.14	23.32	22.77	22.76	23.20	22.74
	1	#Mid	22.72	23.26	22.95	23.51	23.23	22.43	22.34	22.89	22.22	23.46	23.45	22.95	23.32	23.49	23.01
	1	#High	23.15	23.08	22.90	23.62	23.26	22.31	21.90	22.27	22.43	23.35	23.15	22.28	23.19	23.18	22.65
	50%	#0	22.20	23.14	22.65	21.66	22.21	21.40	21.51	22.04	21.56	21.68	22.05	22.07	21.62	22.23	22.09
	50%	#Mid	22.92	23.54	22.60	21.75	22.26	21.31	21.81	22.11	21.38	21.72	21.92	21.86	21.89	21.72	21.84
	50%	#High	22.84	23.10	22.62	21.71	22.26	21.43	21.53	21.90	21.19	21.93	22.02	21.71	22.11	22.04	21.73
	100%	#0	21.45	21.91	21.67	21.63	22.14	21.53	21.64	22.04	21.60	21.81	22.06	21.47	21.86	21.95	21.99
	100%	#Mid	21.45	21.91	21.67	21.63	22.14	21.53	21.64	22.04	21.60	21.81	22.06	21.47	21.86	21.95	21.99

Note: Band26 Covered Band5.

LTE Band41			Maximum Conducted Output Power (Channel / Frequency (MHz))											
Modulation	Bandwidth		5MHz			10MHz			15MHz			20MHz		
	RB	RB	39675	40620	41565	39700	40620	41540	39725	40620	41515	39750	40620	41490
	No.	Offset	2498.5	2593	2687.5	2501	2593	2685	2503.5	2593	2682.5	2506	2593	2680
QPSK	1	#0	23.25	23.06	23.79	23.32	23.31	24.14	23.06	23.35	23.96	22.83	23.31	23.62
	1	#Mid	23.31	23.22	23.81	23.26	23.39	24.10	23.31	23.29	23.83	23.37	23.77	23.79
	1	#High	23.30	23.17	23.70	23.46	23.34	23.27	23.30	23.35	23.17	23.07	23.42	22.99
	50%	#0	22.48	22.44	22.98	22.48	22.51	22.99	22.25	22.42	22.97	22.16	22.44	22.95
	50%	#Mid	22.48	22.46	22.87	22.46	22.50	23.02	22.34	22.47	23.04	22.43	22.44	22.97
	50%	#High	22.45	22.44	22.92	22.57	22.51	22.99	22.44	22.48	23.06	22.39	22.51	23.02
	100%	#0	22.48	22.47	23.04	22.32	22.46	22.95	22.30	22.40	22.87	22.34	22.43	22.90
16QAM	1	#0	22.72	22.37	23.01	22.43	22.55	22.96	22.32	22.57	22.92	22.58	22.28	22.63
	1	#Mid	22.39	22.57	22.93	22.60	22.72	22.82	22.57	22.10	22.82	23.14	22.46	22.79
	1	#High	22.67	22.38	22.89	22.69	22.55	22.51	22.66	22.11	22.53	22.79	22.19	22.26
	50%	#0	21.31	21.37	21.85	21.46	21.59	22.15	21.26	21.46	22.16	21.35	21.47	22.15
	50%	#Mid	21.44	21.39	22.07	21.56	21.61	22.04	21.31	21.47	22.24	21.65	21.39	22.12
	50%	#High	21.24	21.20	21.98	21.62	21.61	21.97	21.38	21.41	22.11	21.48	21.45	22.14
	100%	#0	21.38	21.43	22.04	21.41	21.51	22.03	21.38	21.49	22.32	21.44	21.47	22.11

Note: Band41 Covered Band38.

Maximum Conducted Power and ERP/EIRP Power

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation (1) as follows

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_T$$

where

ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively. (expressed in the same units as P_{Meas} , e.g., dBm or dBW)

P_{Meas} measured transmitter output power or PSD, in dBm or dBW

G_T gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

$$\text{ERP} = \text{EIRP} - 2.15$$

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LTE Band	BW	Modulation	Conducted Peak Power (dBm)	Conducted Peak Power (W)	Antenna Gain (dBi)	Maximum EIRP (W)	EIRP Limit (W)
LTE Band4	1.4M	QPSK	23.55	0.226	2.50	0.403	1
		16QAM	22.52	0.179	2.50	0.318	1
	3M	QPSK	23.52	0.225	2.50	0.400	1
		16QAM	22.93	0.196	2.50	0.349	1
	5M	QPSK	23.55	0.226	2.50	0.403	1
		16QAM	22.33	0.171	2.50	0.304	1
	10M	QPSK	23.49	0.223	2.50	0.397	1
		16QAM	22.78	0.190	2.50	0.337	1
	15M	QPSK	23.68	0.233	2.50	0.415	1
		16QAM	23.19	0.208	2.50	0.371	1
	20M	QPSK	23.54	0.226	2.50	0.402	1
		16QAM	22.17	0.165	2.50	0.293	1

LTE Band	BW	Modulation	Conducted Peak Power (dBm)	Conducted Peak Power (W)	Antenna Gain (dBi)	Maximum EIRP (W)	EIRP Limit (W)
LTE Band7	5M	QPSK	23.85	0.243	2.10	0.394	2
		16QAM	22.82	0.191	2.10	0.310	2
	10M	QPSK	24.20	0.263	2.10	0.427	2
		16QAM	23.41	0.219	2.10	0.356	2
	15M	QPSK	23.95	0.248	2.10	0.403	2
		16QAM	23.15	0.207	2.10	0.335	2
	20M	QPSK	24.10	0.257	2.10	0.417	2
		16QAM	23.43	0.220	2.10	0.357	2

LTE Band	BW	Modulation	Conducted Peak Power (dBm)	Conducted Peak Power (W)	Antenna Gain (dBi)	Maximum ERP (W)	ERP Limit (W)
LTE Band12	1.4M	QPSK	24.18	0.262	-4.52	0.056	3
		16QAM	23.33	0.215	-4.52	0.046	3
	3M	QPSK	24.09	0.256	-4.52	0.055	3
		16QAM	23.11	0.205	-4.52	0.044	3
	5M	QPSK	24.06	0.255	-4.52	0.055	3
		16QAM	23.18	0.208	-4.52	0.045	3
	10M	QPSK	24.28	0.268	-4.52	0.058	3
		16QAM	23.18	0.208	-4.52	0.045	3

LTE Band	BW	Modulation	Conducted Peak Power (dBm)	Conducted Peak Power (W)	Antenna Gain (dBi)	Maximum ERP (W)	ERP Limit (W)
LTE Band13	5M	QPSK	24.08	0.256	-4.52	0.055	3
		16QAM	23.21	0.209	-4.52	0.045	3
	10M	QPSK	24.26	0.267	-4.52	0.057	3
		16QAM	22.65	0.184	-4.52	0.040	3

LTE Band	BW	Modulation	Conducted Peak Power (dBm)	Conducted Peak Power (W)	Antenna Gain (dBi)	Maximum EIRP (W)	EIRP Limit (W)
LTE Band25	1.4M	QPSK	24.03	0.253	2.46	0.446	2
		16QAM	23.56	0.227	2.46	0.400	2
	3M	QPSK	23.99	0.251	2.46	0.442	2
		16QAM	22.83	0.192	2.46	0.338	2
	5M	QPSK	23.93	0.247	2.46	0.436	2
		16QAM	23.14	0.206	2.46	0.363	2
	10M	QPSK	24.21	0.264	2.46	0.465	2
		16QAM	23.94	0.248	2.46	0.437	2
	15M	QPSK	24.09	0.256	2.46	0.452	2
		16QAM	23.56	0.227	2.46	0.400	2
	20M	QPSK	24.41	0.276	2.46	0.486	2
		16QAM	23.67	0.233	2.46	0.410	2

Note: Band25 Covered Band2.

LTE Band	BW	Modulation	Conducted Peak Power (dBm)	Conducted Peak Power (W)	Antenna Gain (dBi)	Maximum ERP (W)	ERP Limit (W)
LTE Band26 (Part22)	1.4M	QPSK	24.33	0.271	-3.00	0.083	2
		16QAM	23.54	0.226	-3.00	0.069	2
	3M	QPSK	24.13	0.259	-3.00	0.079	2
		16QAM	23.62	0.230	-3.00	0.070	2
	5M	QPSK	24.02	0.252	-3.00	0.077	2
		16QAM	22.89	0.195	-3.00	0.059	2
	10M	QPSK	24.12	0.258	-3.00	0.079	2
		16QAM	23.46	0.222	-3.00	0.068	2
	15M	QPSK	24.12	0.258	-3.00	0.079	2
		16QAM	23.49	0.223	-3.00	0.068	2

Note: Band26 Covered Band5.

LTE Band	BW	Modulation	Conducted Peak Power (dBm)	Conducted Peak Power (W)	Antenna Gain (dBi)	Maximum EIRP (W)	EIRP Limit (W)
LTE Band41	5M	QPSK	23.81	0.240	2.80	0.458	2
		16QAM	23.01	0.200	2.80	0.381	2
	10M	QPSK	24.14	0.259	2.80	0.494	2
		16QAM	22.96	0.198	2.80	0.377	2
	15M	QPSK	23.96	0.249	2.80	0.474	2
		16QAM	22.92	0.196	2.80	0.373	2
	20M	QPSK	23.79	0.239	2.80	0.456	2
		16QAM	23.14	0.206	2.80	0.393	2

Note: Band41 Covered Band38.

Radiated Spurious Emission

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LTE Band4							
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Ant Gain (dBi)	EIRP Measure (dBm)	Limit (dBm)	Margin (dB)
QPSK, CH20050 / 1720MHz, Bandwidth 20MHz							
3440	H	-35.75	1.34	7.54	-29.55	-13	-16.55
5160	H	-41.31	1.62	9.86	-33.07	-13	-20.07
6880	H	-49.23	1.83	11.11	-39.95	-13	-26.95
3440	V	-35.01	1.34	7.54	-28.81	-13	-15.81
5160	V	-47.09	1.62	9.86	-38.85	-13	-25.85
6880	V	-49.53	1.83	11.11	-40.25	-13	-27.25
QPSK, CH20175 /1732.5MHz, Bandwidth 20MHz							
3465	H	-37.82	1.34	7.65	-31.50	-13	-18.50
5197.5	H	-46.57	1.68	9.88	-38.37	-13	-25.37
6930	H	-50.43	1.83	11.15	-41.11	-13	-28.11
3465	V	-37.38	1.34	7.65	-31.06	-13	-18.06
5197.5	V	-51.16	1.68	9.88	-42.96	-13	-29.96
6930	V	-48.84	1.83	11.15	-39.52	-13	-26.52
QPSK, CH20300 / 1745MHz, Bandwidth 20MHz							
3490	H	-40.57	1.35	7.76	-34.15	-13	-21.15
5235	H	-50.62	1.74	9.89	-42.46	-13	-29.46
6980	H	-52.72	1.76	11.19	-43.29	-13	-30.29
3490	V	-39.05	1.35	7.76	-32.63	-13	-19.63
5235	V	-54.54	1.74	9.89	-46.38	-13	-33.38
6980	V	-51.48	1.76	11.19	-42.05	-13	-29.05

Note:

- Spurious emissions within 30-1000MHz & Other harmonic were found more than 20dB below limit line.
- $EIRP \text{ or } ERP \text{ (dBm)} = SG \text{ Reading (dBm)} - Cable \text{ Loss (dB)} + Substitute \text{ Antenna Gain (dBi)}$

LTE Band7							
SG Reading (dBm)	Cable Loss (dB)	SG Reading (dBm)	Cable Loss (dB)	Ant Gain (dBi)	EIRP Measure (dBm)	Limit (dBm)	Margin (dB)
QPSK, CH20850 / 2510MHz, Bandwidth 20MHz							
5020	H	-49.23	1.56	9.81	-40.98	-25	-15.98
7530	H	-58.31	1.82	11.73	-48.40	-25	-23.40
10040	H	-46.15	2.27	12.40	-36.02	-25	-11.02
5020	V	-50.48	1.56	9.81	-42.23	-25	-17.23
7530	V	-56.05	1.82	11.73	-46.14	-25	-21.14
10040	V	-52.89	2.27	12.40	-42.76	-25	-17.76
QPSK, CH21100 / 2535MHz, Bandwidth 20MHz							
5070	H	-47.52	1.55	9.83	-39.24	-25	-14.24
7605	H	-58.04	1.76	11.79	-48.02	-25	-23.02
10140	H	-45.83	2.39	12.40	-35.82	-25	-10.82
5070	V	-48.28	1.55	9.83	-40.00	-25	-15.00
7605	V	-57.14	1.76	11.79	-47.12	-25	-22.12
10140	V	-52.73	2.39	12.40	-42.72	-25	-17.72
QPSK, CH21350 / 2560MHz, Bandwidth 20MHz							
5120	H	-47.75	1.60	9.85	-39.50	-25	-14.50
7680	H	-53.98	1.66	11.85	-43.79	-25	-18.79
10240	H	-45.62	1.82	12.40	-35.04	-25	-10.04
5120	V	-49.21	1.60	9.85	-40.96	-25	-15.96
7680	V	-52.61	1.66	11.85	-42.42	-25	-17.42
10240	V	-47.77	1.82	12.40	-37.19	-25	-12.19

Note:

- Spurious emissions within 30-1000MHz & Other harmonic were found more than 20dB below limit line.
- $EIRP \text{ or } ERP \text{ (dBm)} = SG \text{ Reading (dBm)} - Cable \text{ Loss (dB)} + Substitute \text{ Antenna Gain (dBi)}$

LTE Band12							
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Ant Gain (dBi)	EIRP Measure (dBm)	Limit (dBm)	Margin (dB)
QPSK, CH23060 / 704MHz, Bandwidth 10MHz							
1408	H	-34.99	1.01	4.76	-31.25	-13	-18.25
2112	H	-53.61	1.16	4.72	-50.05	-13	-37.05
2816	H	-52.91	1.22	6.41	-47.72	-13	-34.72
1408	V	-32.72	1.01	4.76	-28.98	-13	-15.98
2112	V	-50.68	1.16	4.72	-47.12	-13	-34.12
2816	V	-50.59	1.22	6.41	-45.40	-13	-32.40
QPSK, CH23095 / 707.5MHz, Bandwidth 10MHz							
1415	H	-34.67	1.01	4.82	-30.86	-13	-17.86
2122.5	H	-54.30	1.16	4.75	-50.71	-13	-37.71
2830	H	-54.98	1.24	6.43	-49.79	-13	-36.79
1415	V	-34.19	1.01	4.82	-30.38	-13	-17.38
2122.5	V	-52.02	1.16	4.75	-48.43	-13	-35.43
2830	V	-52.24	1.24	6.43	-47.05	-13	-34.05
QPSK, CH23130 / 711MHz, Bandwidth 10MHz							
1422	H	-34.71	1.01	4.88	-30.84	-13	-17.84
2133	H	-52.78	1.16	4.77	-49.17	-13	-36.17
2844	H	-58.49	1.26	6.45	-53.30	-13	-40.30
1422	V	-31.37	1.01	4.88	-27.50	-13	-14.50
2133	V	-51.66	1.16	4.77	-48.05	-13	-35.05
2844	V	-52.13	1.26	6.45	-46.94	-13	-33.94

Note:

- Spurious emissions within 30-1000MHz & Other harmonic were found more than 20dB below limit line.
- $EIRP \text{ or } ERP \text{ (dBm)} = SG \text{ Reading (dBm)} - Cable \text{ Loss (dB)} + Substitute \text{ Antenna Gain (dBi)}$

LTE Band13							
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Ant Gain (dBi)	EIRP Measure (dBm)	Limit (dBm)	Margin (dB)
QPSK, CH23205 / 779.5MHz, Bandwidth 5MHz							
1559	H	-46.64	1.04	5.41	-42.27	-40	-2.27
2338.5	H	-52.82	1.15	5.28	-48.69	-13	-35.69
3118	H	-61.88	1.28	6.70	-56.46	-13	-43.46
1559	V	-45.94	1.04	5.41	-41.57	-40	-1.57
2338.5	V	-47.41	1.15	5.28	-43.28	-13	-30.28
3118	V	-61.05	1.28	6.70	-55.63	-13	-42.63
QPSK, CH23230 / 782MHz, Bandwidth 5MHz							
1564	H	-47.19	1.04	5.39	-42.84	-40	-2.84
2346	H	-49.37	1.14	5.29	-45.22	-13	-32.22
3128	H	-58.63	1.27	6.70	-53.20	-13	-40.20
1564	V	-50.67	1.04	5.39	-46.32	-40	-6.32
2346	V	-46.45	1.14	5.29	-42.30	-13	-29.30
3128	V	-61.94	1.27	6.70	-56.51	-13	-43.51
QPSK, CH23255 / 784.5MHz, Bandwidth 5MHz							
1569	H	-47.85	1.05	5.38	-43.52	-40	-3.52
2353.5	H	-52.12	1.14	5.31	-47.95	-13	-34.95
3138	H	-59.34	1.27	6.70	-53.91	-13	-40.91
1569	V	-46.57	1.05	5.38	-42.24	-40	-2.24
2353.5	V	-49.53	1.14	5.31	-45.36	-13	-32.36
3138	V	-62.24	1.27	6.70	-56.81	-13	-43.81

Note:

- Spurious emissions within 30-1000MHz & Other harmonic were found more than 20dB below limit line.
- $EIRP \text{ or } ERP \text{ (dBm)} = SG \text{ Reading (dBm)} - Cable \text{ Loss (dB)} + Substitute \text{ Antenna Gain (dBi)}$

LTE Band25							
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Ant Gain (dBi)	EIRP Measure (dBm)	Limit (dBm)	Margin (dB)
QPSK, CH26140 / 1860MHz, Bandwidth 20MHz							
3720	H	-46.95	1.38	7.89	-40.44	-13	-27.44
5580	H	-55.26	1.74	10.10	-46.90	-13	-33.90
7440	H	-55.16	1.95	11.68	-45.43	-13	-32.43
3720	V	-46.57	1.38	7.89	-40.06	-13	-27.06
5580	V	-58.42	1.74	10.10	-50.06	-13	-37.06
7440	V	-53.69	1.95	11.68	-43.96	-13	-30.96
QPSK, CH26365 / 1882.5MHz, Bandwidth 20MHz							
3765	H	-48.93	1.36	7.94	-42.35	-13	-29.35
5647.5	H	-51.71	1.79	10.10	-43.40	-13	-30.40
7530	H	-53.18	1.82	11.73	-43.27	-13	-30.27
3765	V	-49.15	1.36	7.94	-42.57	-13	-29.57
5647.5	V	-54.17	1.79	10.10	-45.86	-13	-32.86
7530	V	-49.98	1.82	11.73	-40.07	-13	-27.07
QPSK, CH26590 / 1905MHz, Bandwidth 20MHz							
3810	H	-44.97	1.35	8.05	-38.27	-13	-25.27
5715	H	-52.92	1.84	10.10	-44.66	-13	-31.66
7620	H	-49.56	1.71	11.80	-39.47	-13	-26.47
3810	V	-43.12	1.35	8.05	-36.42	-13	-23.42
5715	V	-49.58	1.84	10.10	-41.32	-13	-28.32
7620	V	-47.19	1.71	11.80	-37.10	-13	-24.10

Note:

1. Band25 Covered Band2.
2. Spurious emissions within 30-1000MHz & Other harmonic were found more than 20dB below limit line.
3. $EIRP \text{ or } ERP \text{ (dBm)} = SG \text{ Reading (dBm)} - Cable \text{ Loss (dB)} + Substitute \text{ Antenna Gain (dBi)}$

LTE Band26							
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Ant Gain (dBi)	EIRP Measure (dBm)	Limit (dBm)	Margin (dB)
QPSK, CH26865 / 831.5MHz, Bandwidth 15MHz							
1663	H	-47.18	1.06	5.17	-43.07	-13	-30.07
2494.5	H	-22.19	1.10	5.50	-17.79	-13	-4.79
3326	H	-64.01	1.30	6.78	-58.54	-13	-45.54
1663	V	-42.20	1.06	5.17	-38.09	-13	-25.09
2494.5	V	-34.98	1.10	5.50	-30.58	-13	-17.58
3326	V	-65.84	1.30	6.78	-60.37	-13	-47.37
QPSK, CH26915 / 836.5MHz, Bandwidth 15MHz							
1673	H	-43.85	1.06	5.16	-39.75	-13	-26.75
2509.5	H	-46.54	1.11	5.52	-42.13	-13	-29.13
3346	H	-61.14	1.30	6.82	-55.62	-13	-42.62
1673	V	-45.33	1.06	5.16	-41.23	-13	-28.23
2509.5	V	-28.41	1.11	5.52	-24.00	-13	-11.00
3346	V	-61.52	1.30	6.82	-56.00	-13	-43.00
QPSK, CH26965 / 841.5MHz, Bandwidth 15MHz							
1683	H	-45.07	1.05	5.14	-40.98	-13	-27.98
2524.5	H	-27.24	1.11	5.53	-22.82	-13	-9.82
3366	H	-59.49	1.30	6.86	-53.92	-13	-40.92
1683	V	-42.07	1.05	5.14	-37.98	-13	-24.98
2524.5	V	-22.29	1.11	5.53	-17.87	-13	-4.87
3366	V	-60.82	1.30	6.86	-55.25	-13	-42.25

Note:

1. Band26 Covered Band5.
2. Spurious emissions within 30-1000MHz & Other harmonic were found more than 20dB below limit line.
3. EIRP or ERP (dBm) = SG Reading (dBm) - Cable Loss (dB) + Substitute Antenna Gain (dBi)

LTE Band41							
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Ant Gain (dBi)	EIRP Measure (dBm)	Limit (dBm)	Margin (dB)
QPSK, CH39750 / 2506MHz, Bandwidth 20MHz							
5012	H	-47.29	1.57	9.81	-39.06	-25	-14.06
7518	H	-59.31	1.88	11.72	-49.47	-25	-24.47
10024	H	-43.11	2.11	12.40	-32.82	-25	-7.82
5012	V	-49.10	1.57	9.81	-40.87	-25	-15.87
7518	V	-56.85	1.88	11.72	-47.01	-25	-22.01
10024	V	-50.99	2.11	12.40	-40.70	-25	-15.70
QPSK, CH40620 / 2593MHz, Bandwidth 20MHz							
5186	H	-50.66	1.66	9.88	-42.44	-25	-17.44
7779	H	-55.15	1.69	11.94	-44.90	-25	-19.90
10372	H	-43.97	2.24	12.40	-33.81	-25	-8.81
5186	V	-47.94	1.66	9.88	-39.72	-25	-14.72
7779	V	-50.94	1.69	11.94	-40.69	-25	-15.69
10372	V	-44.09	2.24	12.40	-33.93	-25	-8.93
QPSK, CH41490 / 2680MHz, Bandwidth 20MHz							
5360	H	-46.79	1.65	9.99	-38.45	-25	-13.45
8040	H	-55.99	1.99	12.24	-45.74	-25	-20.74
10720	H	-36.29	2.78	12.40	-26.67	-25	-1.67
5360	V	-53.09	1.65	9.99	-44.75	-25	-19.75
8040	V	-51.23	1.99	12.24	-40.98	-25	-15.98
10720	V	-40.30	2.78	12.40	-30.68	-25	-5.68

Note:

1. Band41 Covered Band38.
2. Spurious emissions within 30-1000MHz & Other harmonic were found more than 20dB below limit line.
3. $EIRP \text{ or } ERP \text{ (dBm)} = SG \text{ Reading (dBm)} - Cable \text{ Loss (dB)} + Substitute \text{ Antenna Gain (dBi)}$

7.6. Peak-Average Ratio

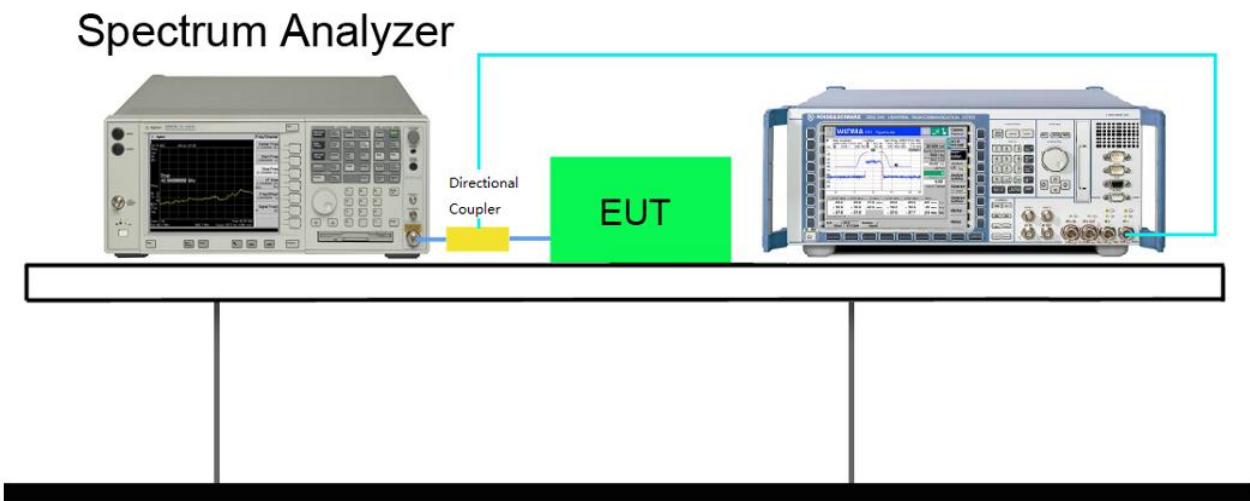
7.6.1 Test Limit

The transmitter's peak-to-average power ratio (PAPR) shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

7.6.2 Test Procedure

KDB 971168 D01v02r02 - Section 5.7 & ANSI/TIA-603-E-2016

7.6.3 Test Setup



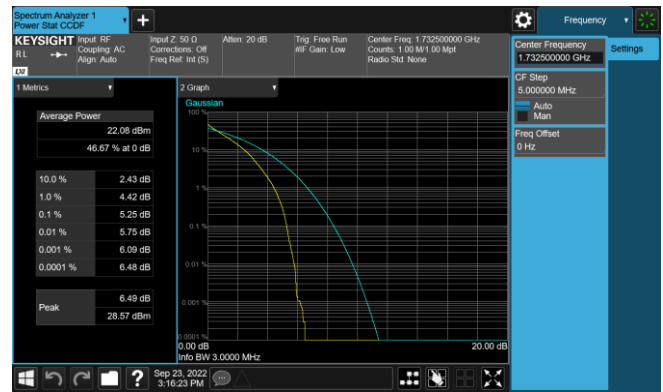
7.6.4 Test Result

Test Mode	Channel/ Frequency (MHz)	Modulation	Bandwidth (MHz)	RB Size	RB Offset	Test Result
LTE Band 4	CH20175 (1732.5MHz)	QPSK	1.4	6	0	Pass
			3	15	0	Pass
			5	25	0	Pass
			10	50	0	Pass
			15	75	0	Pass
			20	100	0	Pass
		16QAM	1.4	6	0	Pass
			3	15	0	Pass
			5	25	0	Pass
			10	50	0	Pass
			15	75	0	Pass
			20	100	0	Pass

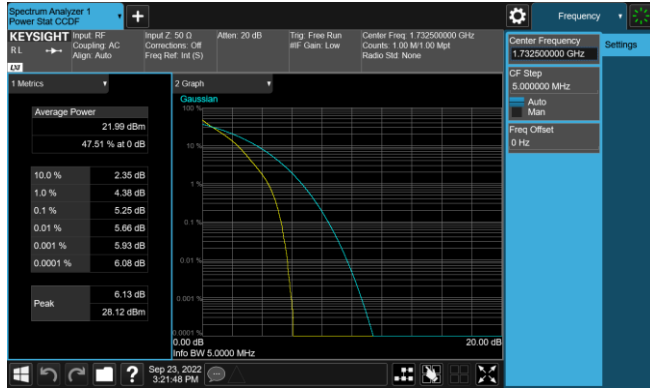
LTE Band 4 QPSK 1.4MHz CH20175 6RB#0



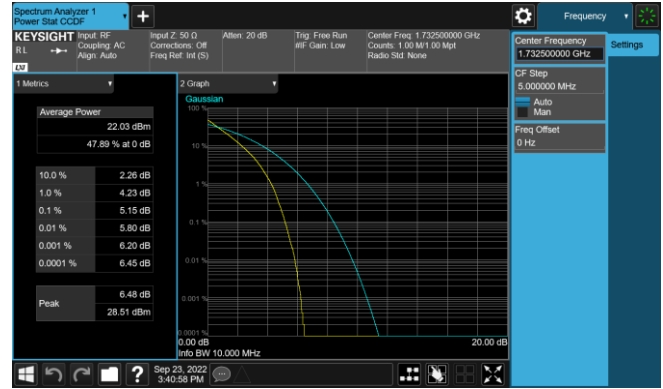
LTE Band 4 QPSK 3MHz CH20175 15RB#0



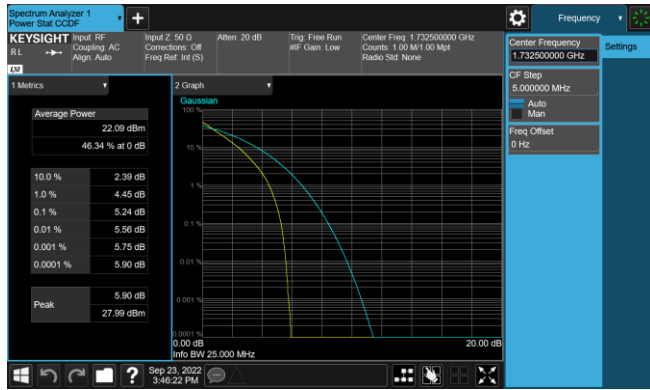
LTE Band 4 QPSK 5MHz CH20175 25RB#0



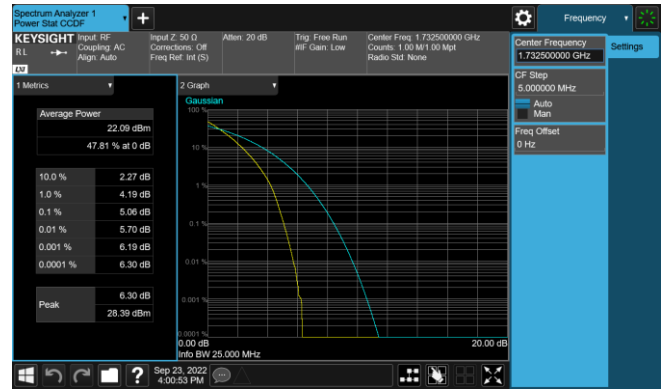
LTE Band 4 QPSK 10MHz CH20175 50RB#0



LTE Band 4 QPSK 15MHz CH20175 75RB#0



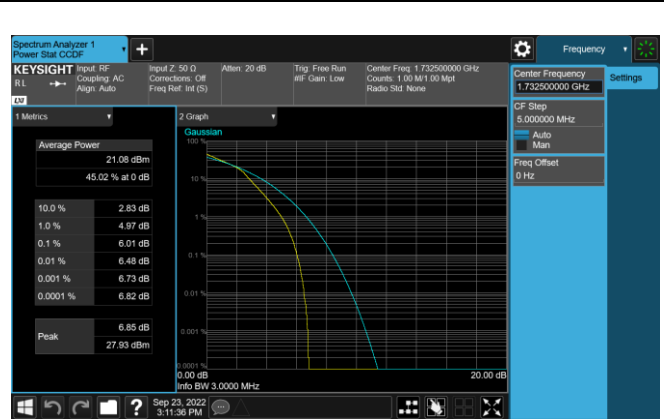
LTE Band 4 QPSK 20MHz CH20175 100RB#0



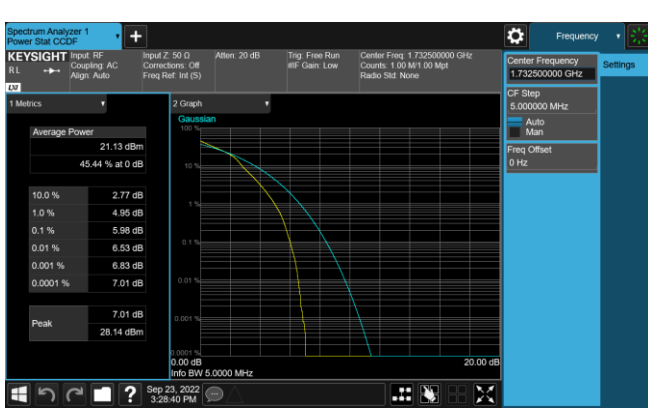
LTE Band 4 16QAM 1.4MHz CH20175 6RB#0



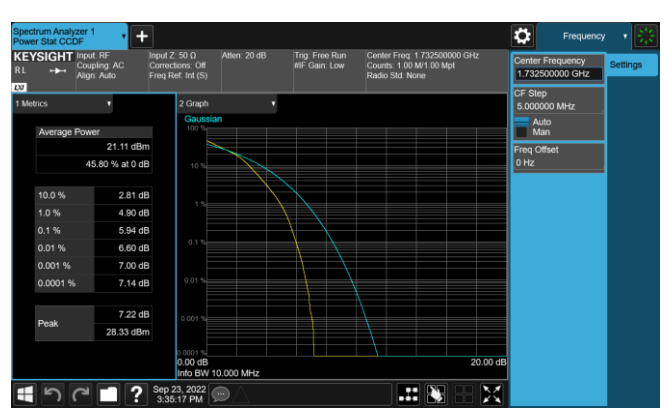
LTE Band 4 16QAM 3MHz CH20175 15RB#0



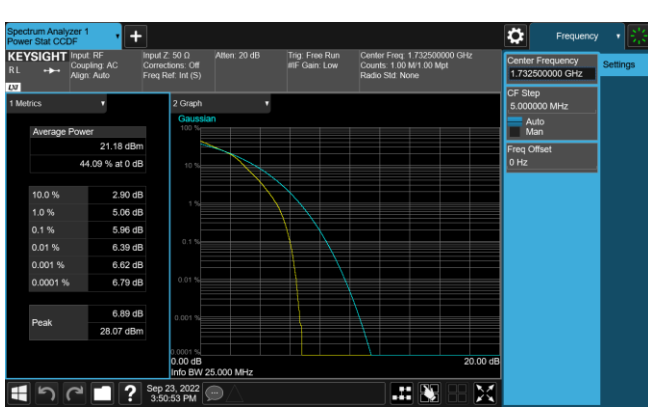
LTE Band 4 16QAM 5MHz CH20175 25RB#0



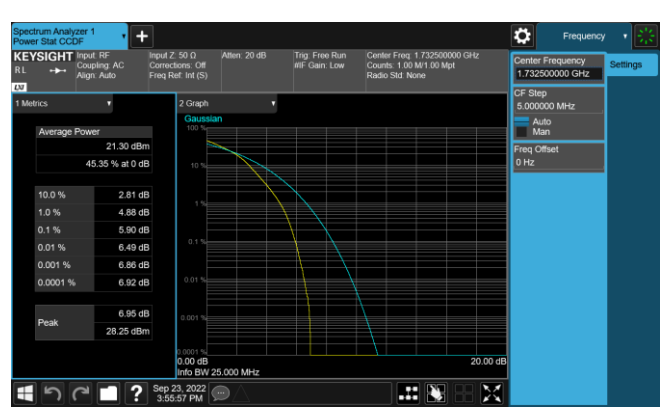
LTE Band 4 16QAM 10MHz CH20175 50RB#0



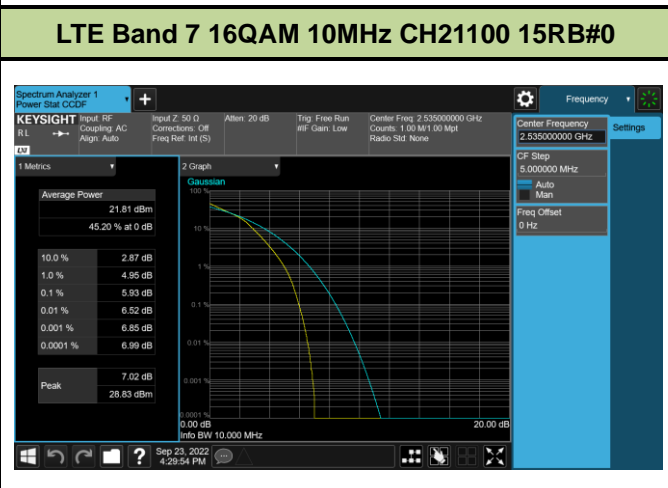
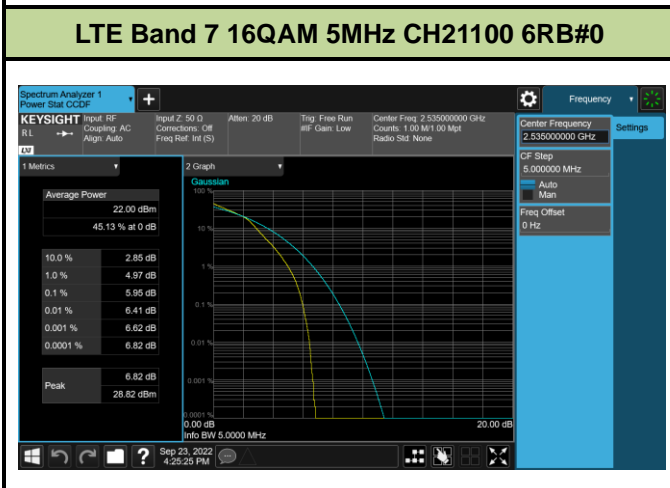
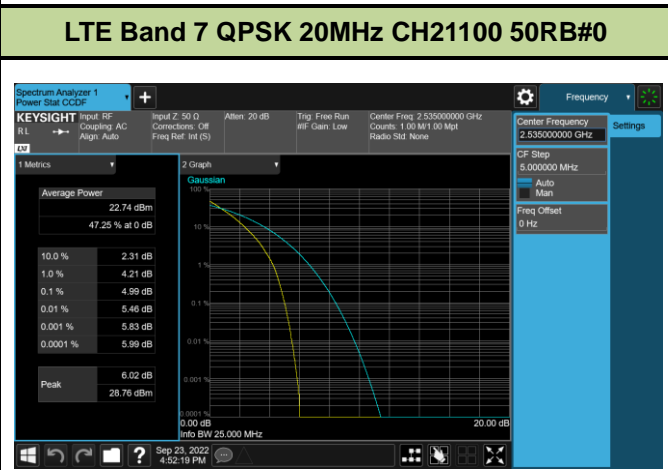
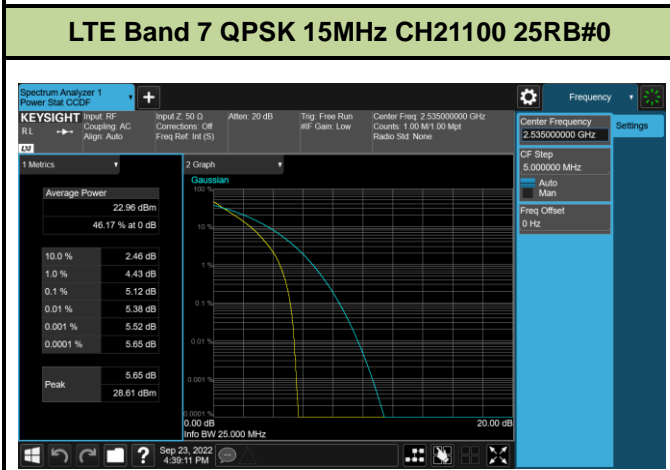
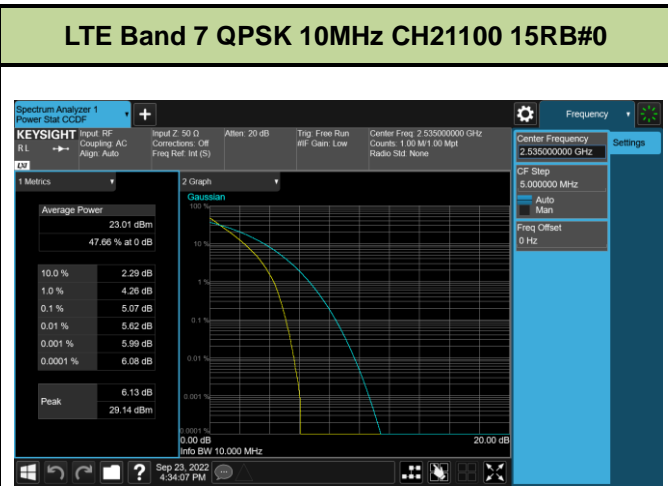
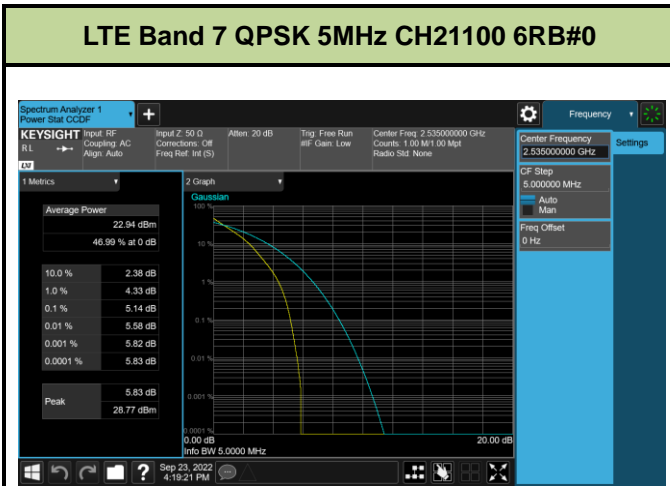
LTE Band 4 16QAM 15MHz CH20175 75RB#0

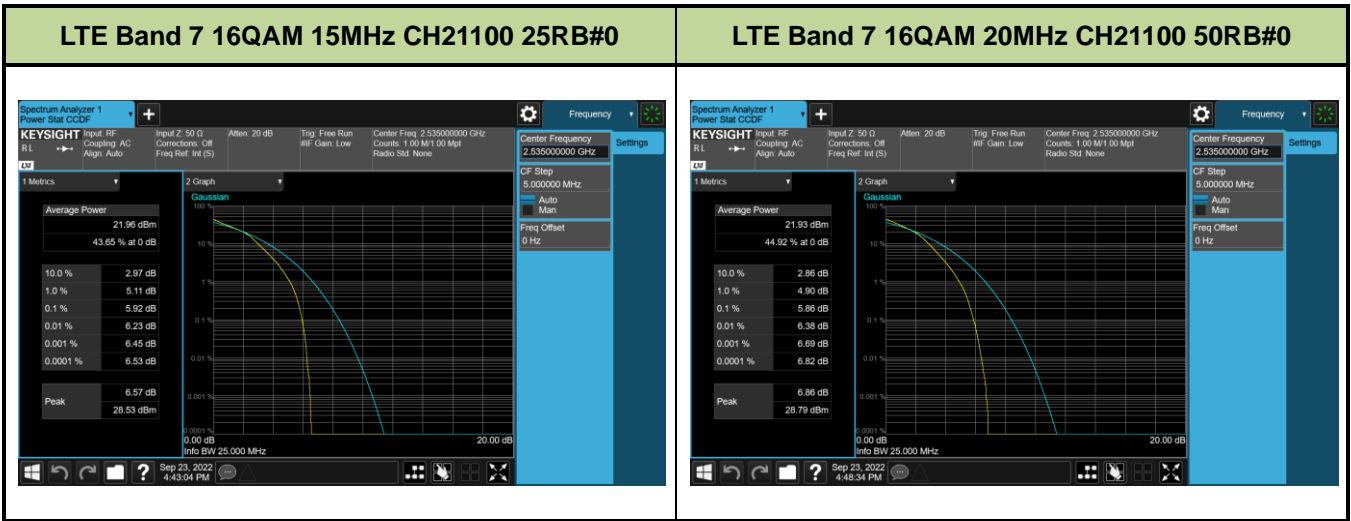


LTE Band 4 16QAM 20MHz CH20175 100RB#0



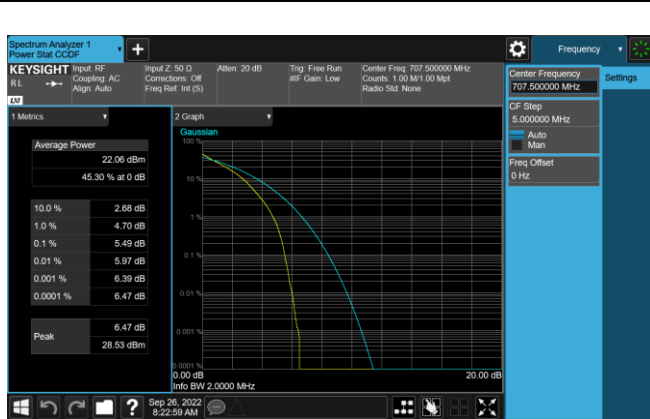
Test Mode	Channel/ Frequency (MHz)	Modulation	Bandwidth (MHz)	RB Size	RB Offset	Test Result
LTE Band 7	CH21100 (2535MHz)	QPSK	5	25	0	Pass
			10	50	0	Pass
			15	75	0	Pass
			20	100	0	Pass
		16QAM	5	25	0	Pass
			10	50	0	Pass
			15	75	0	Pass
			20	100	0	Pass



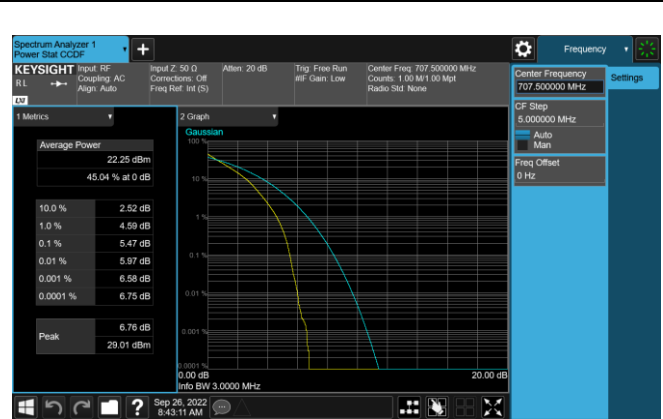


Test Mode	Channel/ Frequency (MHz)	Modulation	Bandwidth (MHz)	RB Size	RB Offset	Test Result
LTE Band 12	CH23095 (707.5MHz)	QPSK	1.4	6	0	Pass
			3	15	0	Pass
			5	25	0	Pass
			10	50	0	Pass
		16QAM	1.4	6	0	Pass
			3	15	0	Pass
			5	25	0	Pass
			10	50	0	Pass

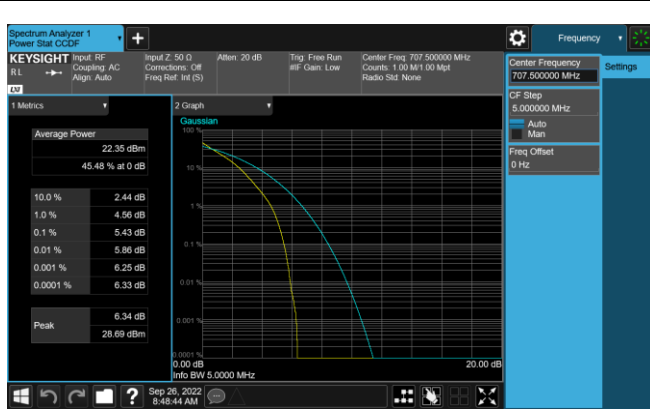
LTE Band 12 QPSK 1.4MHz CH23095 6RB#0



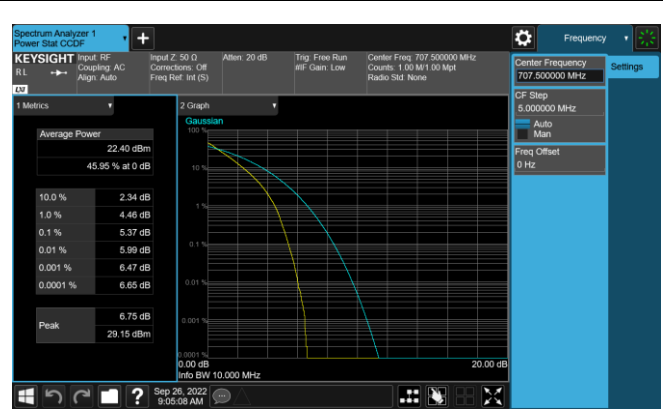
LTE Band 12 QPSK 3MHz CH23095 15RB#0



LTE Band 12 QPSK 5MHz CH23095 25RB#0



LTE Band 12 QPSK 10MHz CH23095 50RB#0



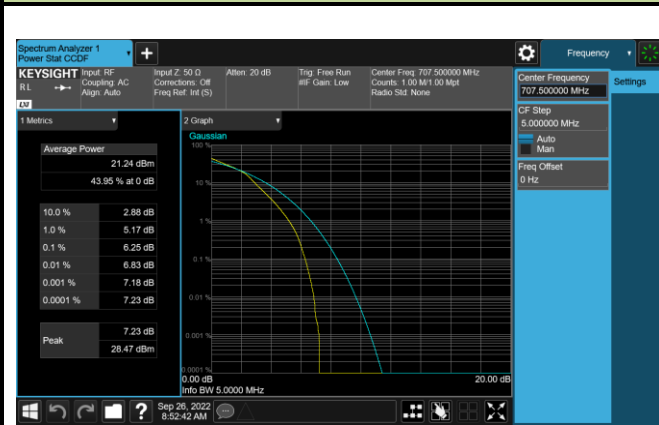
LTE Band 12 16QAM 1.4MHz CH23095 6RB#0



LTE Band 12 16QAM 3MHz CH23095 15RB#0



LTE Band 12 16QAM 5MHz CH23095 25RB#0



LTE Band 12 16QAM 10MHz CH23095 50RB#0



Test Mode	Channel/ Frequency (MHz)	Modulation	Bandwidth (MHz)	RB Size	RB Offset	Test Result
LTE Band 13	CH23230 (782MHz)	QPSK	5	25	0	Pass
			10	50	0	Pass
		16QAM	5	25	0	Pass
			10	50	0	Pass