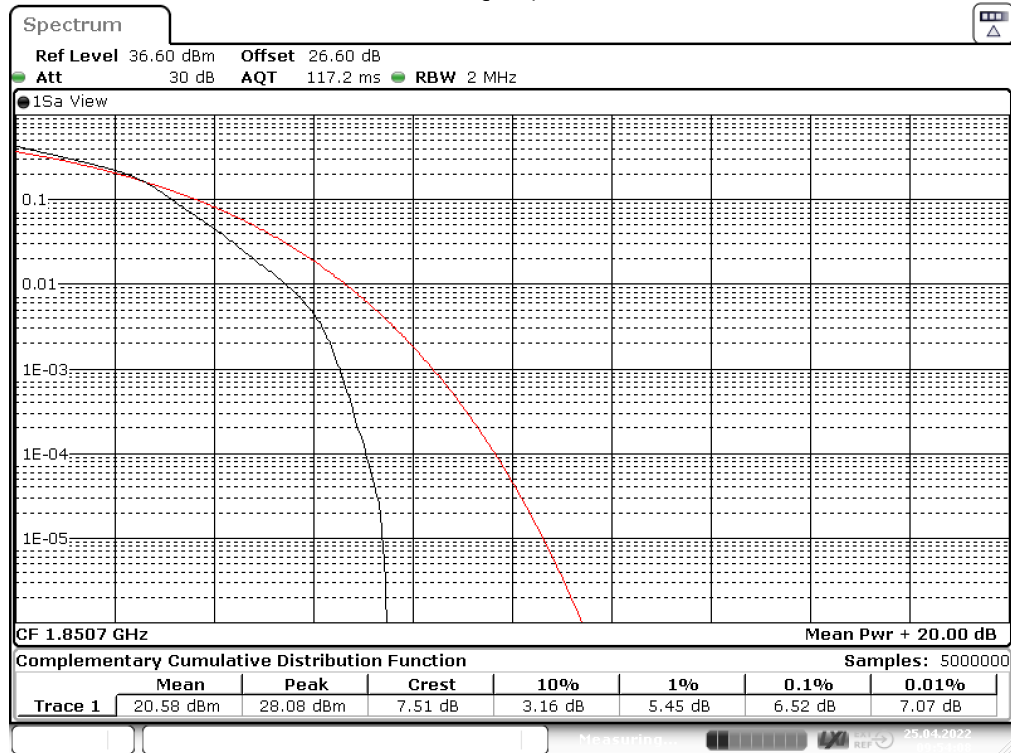


5.14.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

LTE eFDD2 16QAM, Channel = low



Date: 25.APR.2022 09:54:08

5.14.5 TEST EQUIPMENT USED

- Radio Lab

5.15 RF OUTPUT POWER

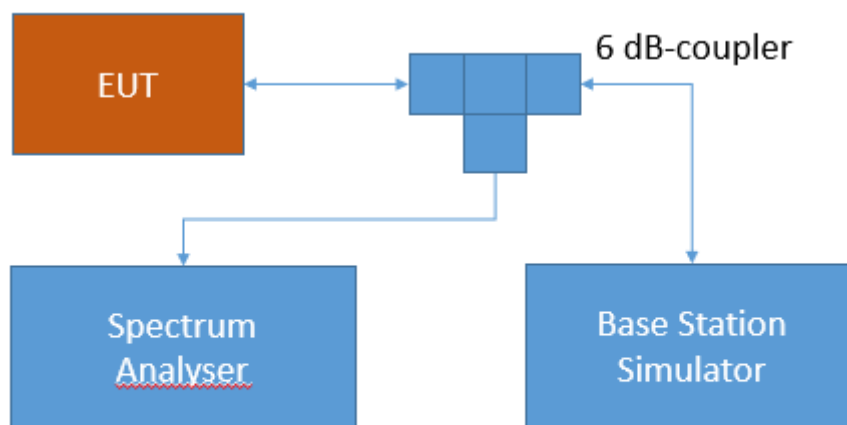
Standard **FCC PART 27 Subpart C**

The test was performed according to:
ANSI C63.26: 2015

5.15.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the applicable RF Output power test case per § 2.1046 and RSS-GEN 6.12. The limit and the requirements come from the applicable rule part and ISSED RSS-Standard for the operating band of the cellular device.

The EUT was connected to the test setup according to the following diagram:



Test Setup FCC Part 22/24/27/90 Cellular;
RF Output power

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

The Spectrum Analyzer settings can be directly found in the measurement diagrams.

5.15.2 TEST REQUIREMENTS / LIMITS

FCC Part 27; Miscellaneous Wireless Communication Services

Subpart C – Technical standards

§ 27.50 - Power limits and duty cycle

Band 13:

(b) The following power limits apply to transmitters operating in the 746-758 MHz, 775-788 MHz and 805-806 MHz bands:

(10) Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

RSS-130; 4.6.3 Transmitter Output Power

The e.r.p. shall not exceed 3 watts for portable equipment and indoor fixed subscriber equipment.

Band 12:

(c) The following power and antenna height requirements apply to stations transmitting in the 600 MHz band and the 698-746 MHz band:

(10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

RSS-130; 4.6.3 Transmitter Output Power

The e.r.p. shall not exceed 3 watts for portable equipment and indoor fixed subscriber equipment.

Band 4/66:

(d) The following power and antenna height requirements apply to stations transmitting in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz and 2180-2200 MHz bands:

(4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum.

RSS-139; 6.5 Transmitter Output Power

The equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters shall not exceed one watt.

Band 71:

(c) The following power requirements apply to stations transmitting in the 600 MHz band and the 698-746 MHz band:

(10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

RSS-130; 4.6.3 Transmitter Output

The e.r.p. shall not exceed 3 watts for portable equipment and indoor fixed subscriber equipment.

5.15.3 TEST PROTOCOL

Ambient temperature: 20 - 28 °C
Relative humidity: 30 - 45 %

Radio Technology	Channel	Resource Blocks	Bandwidth [MHz]	RMS Conducted Power (dBm)	FCC Limit (W)	IC Limit (W)	Maximum Antenna Gain FCC (dBi)	Maximum Antenna Gain IC (dBi)
LTE eFDD 4 QPSK	low	1	1.4	23.72	1 (EIRP)	1 (EIRP)	6.28	6.28
LTE eFDD 4 QPSK	low	3	1.4	23.34	1 (EIRP)	1 (EIRP)	6.66	6.66
LTE eFDD 4 QPSK	low	6	1.4	22.57	1 (EIRP)	1 (EIRP)	7.43	7.43
LTE eFDD 4 QPSK	mid	1	1.4	23.34	1 (EIRP)	1 (EIRP)	6.66	6.66
LTE eFDD 4 QPSK	mid	3	1.4	23.28	1 (EIRP)	1 (EIRP)	6.72	6.72
LTE eFDD 4 QPSK	mid	6	1.4	22.37	1 (EIRP)	1 (EIRP)	7.63	7.63
LTE eFDD 4 QPSK	high	1	1.4	24.05	1 (EIRP)	1 (EIRP)	5.95	5.95
LTE eFDD 4 QPSK	high	3	1.4	23.76	1 (EIRP)	1 (EIRP)	6.24	6.24
LTE eFDD 4 QPSK	high	6	1.4	22.79	1 (EIRP)	1 (EIRP)	7.21	7.21
LTE eFDD 4 16QAM	low	1	1.4	22.48	1 (EIRP)	1 (EIRP)	7.52	7.52
LTE eFDD 4 16QAM	low	6	1.4	21.38	1 (EIRP)	1 (EIRP)	8.62	8.62
LTE eFDD 4 16QAM	mid	1	1.4	22.96	1 (EIRP)	1 (EIRP)	7.04	7.04
LTE eFDD 4 16QAM	mid	6	1.4	21.32	1 (EIRP)	1 (EIRP)	8.68	8.68
LTE eFDD 4 16QAM	high	1	1.4	23.17	1 (EIRP)	1 (EIRP)	6.83	6.83
LTE eFDD 4 16QAM	high	6	1.4	21.74	1 (EIRP)	1 (EIRP)	8.26	8.26
LTE eFDD 4 QPSK	low	1	3	23.27	1 (EIRP)	1 (EIRP)	6.73	6.73
LTE eFDD 4 QPSK	low	15	3	22.47	1 (EIRP)	1 (EIRP)	7.53	7.53
LTE eFDD 4 QPSK	mid	1	3	23.32	1 (EIRP)	1 (EIRP)	6.68	6.68
LTE eFDD 4 QPSK	mid	15	3	22.38	1 (EIRP)	1 (EIRP)	7.62	7.62
LTE eFDD 4 QPSK	high	1	3	23.82	1 (EIRP)	1 (EIRP)	6.18	6.18
LTE eFDD 4 QPSK	high	15	3	22.79	1 (EIRP)	1 (EIRP)	7.21	7.21
LTE eFDD 4 16QAM	low	1	3	22.59	1 (EIRP)	1 (EIRP)	7.41	7.41
LTE eFDD 4 16QAM	low	15	3	21.28	1 (EIRP)	1 (EIRP)	8.72	8.72
LTE eFDD 4 16QAM	mid	1	3	22.44	1 (EIRP)	1 (EIRP)	7.56	7.56
LTE eFDD 4 16QAM	mid	15	3	21.51	1 (EIRP)	1 (EIRP)	8.49	8.49
LTE eFDD 4 16QAM	high	1	3	23.20	1 (EIRP)	1 (EIRP)	6.80	6.80
LTE eFDD 4 16QAM	high	15	3	21.79	1 (EIRP)	1 (EIRP)	8.21	8.21
LTE eFDD 4 QPSK	low	1	5	22.84	1 (EIRP)	1 (EIRP)	7.16	7.16
LTE eFDD 4 QPSK	low	12	5	21.98	1 (EIRP)	1 (EIRP)	8.02	8.02
LTE eFDD 4 QPSK	low	25	5	22.00	1 (EIRP)	1 (EIRP)	8.00	8.00
LTE eFDD 4 QPSK	mid	1	5	23.07	1 (EIRP)	1 (EIRP)	6.93	6.93
LTE eFDD 4 QPSK	mid	12	5	21.87	1 (EIRP)	1 (EIRP)	8.13	8.13

LTE eFDD 4 QPSK	mid	25	5	21.91	1 (EIRP)	1 (EIRP)	8.09	8.09
LTE eFDD 4 QPSK	high	1	5	23.42	1 (EIRP)	1 (EIRP)	6.58	6.58
LTE eFDD 4 QPSK	high	12	5	22.22	1 (EIRP)	1 (EIRP)	7.78	7.78
LTE eFDD 4 QPSK	high	25	5	22.43	1 (EIRP)	1 (EIRP)	7.57	7.57
LTE eFDD 4 16QAM	low	1	5	21.96	1 (EIRP)	1 (EIRP)	8.04	8.04
LTE eFDD 4 16QAM	low	25	5	21.02	1 (EIRP)	1 (EIRP)	8.98	8.98
LTE eFDD 4 16QAM	mid	1	5	22.15	1 (EIRP)	1 (EIRP)	7.85	7.85
LTE eFDD 4 16QAM	mid	25	5	20.77	1 (EIRP)	1 (EIRP)	9.23	9.23
LTE eFDD 4 16QAM	high	1	5	22.94	1 (EIRP)	1 (EIRP)	7.06	7.06
LTE eFDD 4 16QAM	high	25	5	21.31	1 (EIRP)	1 (EIRP)	8.69	8.69
LTE eFDD 4 QPSK	low	1	10	23.33	1 (EIRP)	1 (EIRP)	6.67	6.67
LTE eFDD 4 QPSK	low	50	10	22.17	1 (EIRP)	1 (EIRP)	7.83	7.83
LTE eFDD 4 QPSK	mid	1	10	23.26	1 (EIRP)	1 (EIRP)	6.74	6.74
LTE eFDD 4 QPSK	mid	50	10	22.33	1 (EIRP)	1 (EIRP)	7.67	7.67
LTE eFDD 4 QPSK	high	1	10	23.50	1 (EIRP)	1 (EIRP)	6.50	6.50
LTE eFDD 4 QPSK	high	50	10	22.63	1 (EIRP)	1 (EIRP)	7.37	7.37
LTE eFDD 4 16QAM	low	1	10	23.17	1 (EIRP)	1 (EIRP)	6.83	6.83
LTE eFDD 4 16QAM	low	12	10	22.21	1 (EIRP)	1 (EIRP)	7.79	7.79
LTE eFDD 4 16QAM	mid	1	10	22.88	1 (EIRP)	1 (EIRP)	7.12	7.12
LTE eFDD 4 16QAM	mid	12	10	21.84	1 (EIRP)	1 (EIRP)	8.16	8.16
LTE eFDD 4 16QAM	high	1	10	22.79	1 (EIRP)	1 (EIRP)	7.21	7.21
LTE eFDD 4 16QAM	high	12	10	22.48	1 (EIRP)	1 (EIRP)	7.52	7.52
LTE eFDD 4 QPSK	low	1	15	23.23	1 (EIRP)	1 (EIRP)	6.77	6.77
LTE eFDD 4 QPSK	low	36	15	22.38	1 (EIRP)	1 (EIRP)	7.62	7.62
LTE eFDD 4 QPSK	low	75	15	22.33	1 (EIRP)	1 (EIRP)	7.67	7.67
LTE eFDD 4 QPSK	mid	1	15	23.24	1 (EIRP)	1 (EIRP)	6.76	6.76
LTE eFDD 4 QPSK	mid	36	15	22.43	1 (EIRP)	1 (EIRP)	7.57	7.57
LTE eFDD 4 QPSK	mid	75	15	22.43	1 (EIRP)	1 (EIRP)	7.57	7.57
LTE eFDD 4 QPSK	high	1	15	23.58	1 (EIRP)	1 (EIRP)	6.42	6.42
LTE eFDD 4 QPSK	high	36	15	22.66	1 (EIRP)	1 (EIRP)	7.34	7.34
LTE eFDD 4 QPSK	high	75	15	22.79	1 (EIRP)	1 (EIRP)	7.21	7.21
LTE eFDD 4 16QAM	low	1	15	22.35	1 (EIRP)	1 (EIRP)	7.65	7.65
LTE eFDD 4 16QAM	low	18	15	21.46	1 (EIRP)	1 (EIRP)	8.54	8.54
LTE eFDD 4 16QAM	mid	1	15	23.00	1 (EIRP)	1 (EIRP)	7.00	7.00
LTE eFDD 4 16QAM	mid	18	15	21.51	1 (EIRP)	1 (EIRP)	8.49	8.49
LTE eFDD 4 16QAM	high	1	15	22.62	1 (EIRP)	1 (EIRP)	7.38	7.38
LTE eFDD 4 16QAM	high	18	15	21.53	1 (EIRP)	1 (EIRP)	8.47	8.47
LTE eFDD 4 QPSK	low	1	20	23.46	1 (EIRP)	1 (EIRP)	6.54	6.54
LTE eFDD 4 QPSK	low	100	20	22.39	1 (EIRP)	1 (EIRP)	7.61	7.61
LTE eFDD 4 QPSK	mid	1	20	23.42	1 (EIRP)	1 (EIRP)	6.58	6.58
LTE eFDD 4 QPSK	mid	100	20	22.43	1 (EIRP)	1 (EIRP)	7.57	7.57
LTE eFDD 4 QPSK	high	1	20	23.58	1 (EIRP)	1 (EIRP)	6.42	6.42
LTE eFDD 4 QPSK	high	100	20	22.77	1 (EIRP)	1 (EIRP)	7.23	7.23
LTE eFDD 4 16QAM	low	1	20	23.08	1 (EIRP)	1 (EIRP)	6.92	6.92
LTE eFDD 4 16QAM	low	18	20	22.53	1 (EIRP)	1 (EIRP)	7.47	7.47
LTE eFDD 4 16QAM	mid	1	20	22.21	1 (EIRP)	1 (EIRP)	7.79	7.79
LTE eFDD 4 16QAM	mid	18	20	22.26	1 (EIRP)	1 (EIRP)	7.74	7.74

LTE eFDD 4 16QAM	high	1	20	22.52	1 (EIRP)	1 (EIRP)	7.48	7.48
LTE eFDD 4 16QAM	high	18	20	22.64	1 (EIRP)	1 (EIRP)	7.36	7.36
LTE eFDD 12 QPSK	low	1	1.4	23.48	3 (ERP)	3 (ERP)	11.29	11.29
LTE eFDD 12 QPSK	low	3	1.4	23.19	3 (ERP)	3 (ERP)	11.58	11.58
LTE eFDD 12 QPSK	low	6	1.4	22.20	3 (ERP)	3 (ERP)	12.57	12.57
LTE eFDD 12 QPSK	mid	1	1.4	23.58	3 (ERP)	3 (ERP)	11.19	11.19
LTE eFDD 12 QPSK	mid	3	1.4	23.17	3 (ERP)	3 (ERP)	11.60	11.60
LTE eFDD 12 QPSK	mid	6	1.4	22.19	3 (ERP)	3 (ERP)	12.58	12.58
LTE eFDD 12 QPSK	high	1	1.4	23.22	3 (ERP)	3 (ERP)	11.55	11.55
LTE eFDD 12 QPSK	high	3	1.4	23.13	3 (ERP)	3 (ERP)	11.64	11.64
LTE eFDD 12 QPSK	high	6	1.4	22.14	3 (ERP)	3 (ERP)	12.63	12.63
LTE eFDD 12 16QAM	low	1	1.4	22.29	3 (ERP)	3 (ERP)	12.48	12.48
LTE eFDD 12 16QAM	low	6	1.4	21.32	3 (ERP)	3 (ERP)	13.45	13.45
LTE eFDD 12 16QAM	mid	1	1.4	22.70	3 (ERP)	3 (ERP)	12.07	12.07
LTE eFDD 12 16QAM	mid	6	1.4	21.07	3 (ERP)	3 (ERP)	13.70	13.70
LTE eFDD 12 16QAM	high	1	1.4	22.73	3 (ERP)	3 (ERP)	12.04	12.04
LTE eFDD 12 16QAM	high	6	1.4	21.21	3 (ERP)	3 (ERP)	13.56	13.56
LTE eFDD 12 QPSK	low	1	3	23.05	3 (ERP)	3 (ERP)	11.72	11.72
LTE eFDD 12 QPSK	low	15	3	22.15	3 (ERP)	3 (ERP)	12.62	12.62
LTE eFDD 12 QPSK	mid	1	3	23.07	3 (ERP)	3 (ERP)	11.70	11.70
LTE eFDD 12 QPSK	mid	15	3	22.23	3 (ERP)	3 (ERP)	12.54	12.54
LTE eFDD 12 QPSK	high	1	3	22.89	3 (ERP)	3 (ERP)	11.88	11.88
LTE eFDD 12 QPSK	high	15	3	22.12	3 (ERP)	3 (ERP)	12.65	12.65
LTE eFDD 12 16QAM	low	1	3	22.23	3 (ERP)	3 (ERP)	12.54	12.54
LTE eFDD 12 16QAM	low	15	3	20.99	3 (ERP)	3 (ERP)	13.78	13.78
LTE eFDD 12 16QAM	mid	1	3	22.64	3 (ERP)	3 (ERP)	12.13	12.13
LTE eFDD 12 16QAM	mid	15	3	21.14	3 (ERP)	3 (ERP)	13.63	13.63
LTE eFDD 12 16QAM	high	1	3	21.91	3 (ERP)	3 (ERP)	12.86	12.86
LTE eFDD 12 16QAM	high	15	3	21.03	3 (ERP)	3 (ERP)	13.74	13.74
LTE eFDD 12 QPSK	low	1	5	22.80	3 (ERP)	3 (ERP)	11.97	11.97
LTE eFDD 12 QPSK	low	12	5	21.64	3 (ERP)	3 (ERP)	13.13	13.13
LTE eFDD 12 QPSK	low	25	5	21.70	3 (ERP)	3 (ERP)	13.07	13.07
LTE eFDD 12 QPSK	mid	1	5	23.03	3 (ERP)	3 (ERP)	11.74	11.74
LTE eFDD 12 QPSK	mid	12	5	21.60	3 (ERP)	3 (ERP)	13.17	13.17
LTE eFDD 12 QPSK	mid	25	5	21.72	3 (ERP)	3 (ERP)	13.05	13.05
LTE eFDD 12 QPSK	high	1	5	22.93	3 (ERP)	3 (ERP)	11.84	11.84
LTE eFDD 12 QPSK	high	12	5	21.61	3 (ERP)	3 (ERP)	13.16	13.16
LTE eFDD 12 QPSK	high	25	5	21.61	3 (ERP)	3 (ERP)	13.16	13.16
LTE eFDD 12 16QAM	low	1	5	21.30	3 (ERP)	3 (ERP)	13.47	13.47
LTE eFDD 12 16QAM	low	25	5	20.63	3 (ERP)	3 (ERP)	14.14	14.14
LTE eFDD 12 16QAM	mid	1	5	22.53	3 (ERP)	3 (ERP)	12.24	12.24
LTE eFDD 12 16QAM	mid	25	5	20.56	3 (ERP)	3 (ERP)	14.21	14.21
LTE eFDD 12 16QAM	high	1	5	21.76	3 (ERP)	3 (ERP)	13.01	13.01
LTE eFDD 12 16QAM	high	25	5	20.43	3 (ERP)	3 (ERP)	14.34	14.34
LTE eFDD 12 QPSK	low	1	10	23.16	3 (ERP)	3 (ERP)	11.61	11.61
LTE eFDD 12 QPSK	low	50	10	21.90	3 (ERP)	3 (ERP)	12.87	12.87
LTE eFDD 12 QPSK	mid	1	10	23.12	3 (ERP)	3 (ERP)	11.65	11.65

LTE eFDD 12 QPSK	mid	50	10	21.95	3 (ERP)	3 (ERP)	12.82	12.82
LTE eFDD 12 QPSK	high	1	10	22.99	3 (ERP)	3 (ERP)	11.78	11.78
LTE eFDD 12 QPSK	high	50	10	21.88	3 (ERP)	3 (ERP)	12.89	12.89
LTE eFDD 12 16QAM	low	1	10	22.10	3 (ERP)	3 (ERP)	12.67	12.67
LTE eFDD 12 16QAM	low	12	10	21.88	3 (ERP)	3 (ERP)	12.89	12.89
LTE eFDD 12 16QAM	mid	1	10	22.67	3 (ERP)	3 (ERP)	12.10	12.10
LTE eFDD 12 16QAM	mid	12	10	21.75	3 (ERP)	3 (ERP)	13.02	13.02
LTE eFDD 12 16QAM	high	1	10	21.77	3 (ERP)	3 (ERP)	13.00	13.00
LTE eFDD 12 16QAM	high	12	10	21.94	3 (ERP)	3 (ERP)	12.83	12.83
LTE eFDD 13 QPSK	low	1	5	22.95	3 (ERP)	3 (ERP)	11.82	11.82
LTE eFDD 13 QPSK	low	12	5	21.59	3 (ERP)	3 (ERP)	13.18	13.18
LTE eFDD 13 QPSK	low	25	5	21.65	3 (ERP)	3 (ERP)	13.12	13.12
LTE eFDD 13 QPSK	mid	1	5	22.98	3 (ERP)	3 (ERP)	11.79	11.79
LTE eFDD 13 QPSK	mid	12	5	21.69	3 (ERP)	3 (ERP)	13.08	13.08
LTE eFDD 13 QPSK	mid	25	5	21.68	3 (ERP)	3 (ERP)	13.09	13.09
LTE eFDD 13 QPSK	high	1	5	22.82	3 (ERP)	3 (ERP)	11.95	11.95
LTE eFDD 13 QPSK	high	12	5	21.73	3 (ERP)	3 (ERP)	13.04	13.04
LTE eFDD 13 QPSK	high	25	5	21.76	3 (ERP)	3 (ERP)	13.01	13.01
LTE eFDD 13 16QAM	low	1	5	22.34	3 (ERP)	3 (ERP)	12.43	12.43
LTE eFDD 13 16QAM	low	25	5	20.60	3 (ERP)	3 (ERP)	14.17	14.17
LTE eFDD 13 16QAM	mid	1	5	21.79	3 (ERP)	3 (ERP)	12.98	12.98
LTE eFDD 13 16QAM	mid	25	5	20.61	3 (ERP)	3 (ERP)	14.16	14.16
LTE eFDD 13 16QAM	high	1	5	22.56	3 (ERP)	3 (ERP)	12.21	12.21
LTE eFDD 13 16QAM	high	25	5	20.66	3 (ERP)	3 (ERP)	14.11	14.11
LTE eFDD 13 QPSK	mid	1	10	23.29	3 (ERP)	3 (ERP)	11.48	11.48
LTE eFDD 13 QPSK	mid	50	10	21.94	3 (ERP)	3 (ERP)	12.83	12.83
LTE eFDD 13 16QAM	mid	1	10	22.08	3 (ERP)	3 (ERP)	12.69	12.69
LTE eFDD 13 16QAM	mid	12	10	22.03	3 (ERP)	3 (ERP)	12.74	12.74
LTE eFDD 66 QPSK	low	1	1.4	23.37	1 (EIRP)	1 (EIRP)	6.63	6.63
LTE eFDD 66 QPSK	low	3	1.4	23.41	1 (EIRP)	1 (EIRP)	6.59	6.59
LTE eFDD 66 QPSK	low	6	1.4	22.40	1 (EIRP)	1 (EIRP)	7.60	7.60
LTE eFDD 66 QPSK	mid	1	1.4	23.68	1 (EIRP)	1 (EIRP)	6.32	6.32
LTE eFDD 66 QPSK	mid	3	1.4	23.54	1 (EIRP)	1 (EIRP)	6.46	6.46
LTE eFDD 66 QPSK	mid	6	1.4	22.55	1 (EIRP)	1 (EIRP)	7.45	7.45
LTE eFDD 66 QPSK	high	1	1.4	23.55	1 (EIRP)	1 (EIRP)	6.45	6.45
LTE eFDD 66 QPSK	high	3	1.4	23.53	1 (EIRP)	1 (EIRP)	6.47	6.47
LTE eFDD 66 QPSK	high	6	1.4	22.47	1 (EIRP)	1 (EIRP)	7.53	7.53
LTE eFDD 66 16QAM	low	1	1.4	22.92	1 (EIRP)	1 (EIRP)	7.08	7.08
LTE eFDD 66 16QAM	low	6	1.4	21.73	1 (EIRP)	1 (EIRP)	8.27	8.27
LTE eFDD 66 16QAM	mid	1	1.4	22.49	1 (EIRP)	1 (EIRP)	7.51	7.51
LTE eFDD 66 16QAM	mid	6	1.4	21.62	1 (EIRP)	1 (EIRP)	8.38	8.38
LTE eFDD 66 16QAM	high	1	1.4	22.90	1 (EIRP)	1 (EIRP)	7.10	7.10
LTE eFDD 66 16QAM	high	6	1.4	21.58	1 (EIRP)	1 (EIRP)	8.42	8.42
LTE eFDD 66 QPSK	low	1	3	23.58	1 (EIRP)	1 (EIRP)	6.42	6.42
LTE eFDD 66 QPSK	low	15	3	22.46	1 (EIRP)	1 (EIRP)	7.54	7.54
LTE eFDD 66 QPSK	mid	1	3	23.16	1 (EIRP)	1 (EIRP)	6.84	6.84
LTE eFDD 66 QPSK	mid	15	3	22.55	1 (EIRP)	1 (EIRP)	7.45	7.45

LTE eFDD 66 QPSK	high	1	3	23.25	1 (EIRP)	1 (EIRP)	6.75	6.75
LTE eFDD 66 QPSK	high	15	3	22.49	1 (EIRP)	1 (EIRP)	7.51	7.51
LTE eFDD 66 16QAM	low	1	3	22.37	1 (EIRP)	1 (EIRP)	7.63	7.63
LTE eFDD 66 16QAM	low	15	3	21.28	1 (EIRP)	1 (EIRP)	8.72	8.72
LTE eFDD 66 16QAM	mid	1	3	22.92	1 (EIRP)	1 (EIRP)	7.08	7.08
LTE eFDD 66 16QAM	mid	15	3	21.53	1 (EIRP)	1 (EIRP)	8.47	8.47
LTE eFDD 66 16QAM	high	1	3	22.19	1 (EIRP)	1 (EIRP)	7.81	7.81
LTE eFDD 66 16QAM	high	15	3	21.24	1 (EIRP)	1 (EIRP)	8.76	8.76
LTE eFDD 66 QPSK	low	1	5	23.04	1 (EIRP)	1 (EIRP)	6.96	6.96
LTE eFDD 66 QPSK	low	12	5	21.90	1 (EIRP)	1 (EIRP)	8.10	8.10
LTE eFDD 66 QPSK	low	25	5	21.90	1 (EIRP)	1 (EIRP)	8.10	8.10
LTE eFDD 66 QPSK	mid	1	5	22.93	1 (EIRP)	1 (EIRP)	7.07	7.07
LTE eFDD 66 QPSK	mid	12	5	22.11	1 (EIRP)	1 (EIRP)	7.89	7.89
LTE eFDD 66 QPSK	mid	25	5	22.08	1 (EIRP)	1 (EIRP)	7.92	7.92
LTE eFDD 66 QPSK	high	1	5	23.08	1 (EIRP)	1 (EIRP)	6.92	6.92
LTE eFDD 66 QPSK	high	12	5	21.90	1 (EIRP)	1 (EIRP)	8.10	8.10
LTE eFDD 66 QPSK	high	25	5	21.93	1 (EIRP)	1 (EIRP)	8.07	8.07
LTE eFDD 66 16QAM	low	1	5	21.84	1 (EIRP)	1 (EIRP)	8.16	8.16
LTE eFDD 66 16QAM	low	25	5	20.80	1 (EIRP)	1 (EIRP)	9.20	9.20
LTE eFDD 66 16QAM	mid	1	5	22.73	1 (EIRP)	1 (EIRP)	7.27	7.27
LTE eFDD 66 16QAM	mid	25	5	20.92	1 (EIRP)	1 (EIRP)	9.08	9.08
LTE eFDD 66 16QAM	high	1	5	22.07	1 (EIRP)	1 (EIRP)	7.93	7.93
LTE eFDD 66 16QAM	high	25	5	20.87	1 (EIRP)	1 (EIRP)	9.13	9.13
LTE eFDD 66 QPSK	low	1	10	23.27	1 (EIRP)	1 (EIRP)	6.73	6.73
LTE eFDD 66 QPSK	low	50	10	22.03	1 (EIRP)	1 (EIRP)	7.97	7.97
LTE eFDD 66 QPSK	mid	1	10	23.12	1 (EIRP)	1 (EIRP)	6.88	6.88
LTE eFDD 66 QPSK	mid	50	10	22.28	1 (EIRP)	1 (EIRP)	7.72	7.72
LTE eFDD 66 QPSK	high	1	10	23.28	1 (EIRP)	1 (EIRP)	6.72	6.72
LTE eFDD 66 QPSK	high	50	10	22.07	1 (EIRP)	1 (EIRP)	7.93	7.93
LTE eFDD 66 16QAM	low	1	10	21.83	1 (EIRP)	1 (EIRP)	8.17	8.17
LTE eFDD 66 16QAM	low	50	10	22.20	1 (EIRP)	1 (EIRP)	7.80	7.80
LTE eFDD 66 16QAM	mid	1	10	22.77	1 (EIRP)	1 (EIRP)	7.23	7.23
LTE eFDD 66 16QAM	mid	50	10	22.17	1 (EIRP)	1 (EIRP)	7.83	7.83
LTE eFDD 66 16QAM	high	1	10	22.20	1 (EIRP)	1 (EIRP)	7.80	7.80
LTE eFDD 66 16QAM	high	50	10	22.04	1 (EIRP)	1 (EIRP)	7.96	7.96
LTE eFDD 66 QPSK	low	1	15	23.49	1 (EIRP)	1 (EIRP)	6.51	6.51
LTE eFDD 66 QPSK	low	36	15	22.30	1 (EIRP)	1 (EIRP)	7.70	7.70
LTE eFDD 66 QPSK	low	75	15	22.27	1 (EIRP)	1 (EIRP)	7.73	7.73
LTE eFDD 66 QPSK	mid	1	15	17.58	1 (EIRP)	1 (EIRP)	12.42	12.42
LTE eFDD 66 QPSK	mid	36	15	22.50	1 (EIRP)	1 (EIRP)	7.50	7.50
LTE eFDD 66 QPSK	mid	75	15	22.48	1 (EIRP)	1 (EIRP)	7.52	7.52
LTE eFDD 66 QPSK	high	1	15	23.05	1 (EIRP)	1 (EIRP)	6.95	6.95
LTE eFDD 66 QPSK	high	36	15	22.18	1 (EIRP)	1 (EIRP)	7.82	7.82
LTE eFDD 66 QPSK	high	75	15	22.08	1 (EIRP)	1 (EIRP)	7.92	7.92
LTE eFDD 66 16QAM	low	1	15	22.33	1 (EIRP)	1 (EIRP)	7.67	7.67
LTE eFDD 66 16QAM	low	75	15	21.48	1 (EIRP)	1 (EIRP)	8.52	8.52
LTE eFDD 66 16QAM	mid	1	15	22.35	1 (EIRP)	1 (EIRP)	7.65	7.65

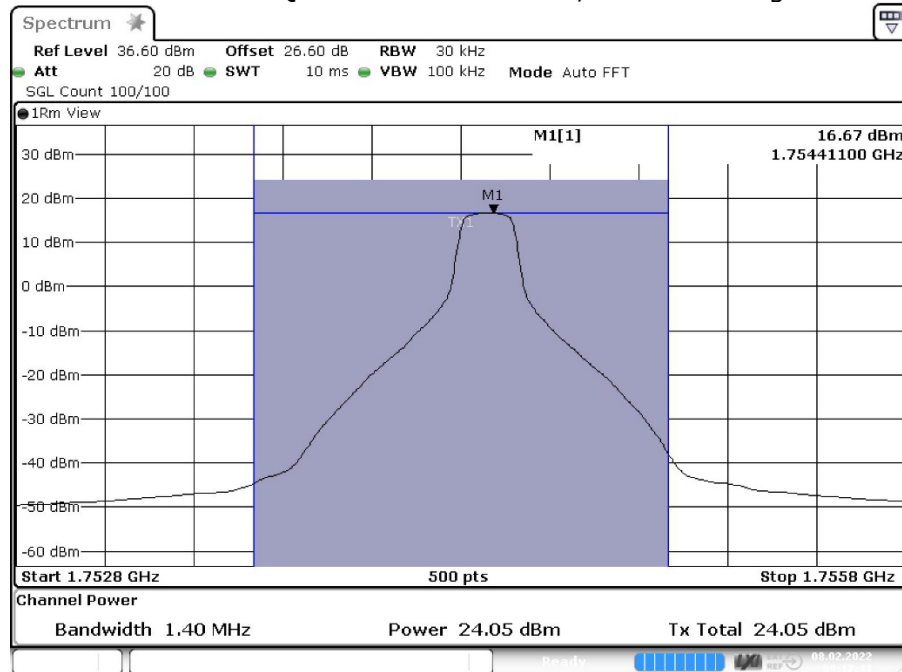
LTE eFDD 66 16QAM	mid	75	15	21.47	1 (EIRP)	1 (EIRP)	8.53	8.53
LTE eFDD 66 16QAM	high	1	15	22.21	1 (EIRP)	1 (EIRP)	7.79	7.79
LTE eFDD 66 16QAM	high	75	15	21.36	1 (EIRP)	1 (EIRP)	8.64	8.64
LTE eFDD 66 QPSK	low	1	20	23.54	1 (EIRP)	1 (EIRP)	6.46	6.46
LTE eFDD 66 QPSK	low	100	20	22.29	1 (EIRP)	1 (EIRP)	7.71	7.71
LTE eFDD 66 QPSK	mid	1	20	23.57	1 (EIRP)	1 (EIRP)	6.43	6.43
LTE eFDD 66 QPSK	mid	100	20	22.56	1 (EIRP)	1 (EIRP)	7.44	7.44
LTE eFDD 66 QPSK	high	1	20	23.67	1 (EIRP)	1 (EIRP)	6.33	6.33
LTE eFDD 66 QPSK	high	100	20	22.36	1 (EIRP)	1 (EIRP)	7.64	7.64
LTE eFDD 66 16QAM	low	1	20	22.72	1 (EIRP)	1 (EIRP)	7.28	7.28
LTE eFDD 66 16QAM	low	100	20	22.45	1 (EIRP)	1 (EIRP)	7.55	7.55
LTE eFDD 66 16QAM	mid	1	20	22.35	1 (EIRP)	1 (EIRP)	7.65	7.65
LTE eFDD 66 16QAM	mid	100	20	22.48	1 (EIRP)	1 (EIRP)	7.52	7.52
LTE eFDD 66 16QAM	high	1	20	22.06	1 (EIRP)	1 (EIRP)	7.94	7.94
LTE eFDD 66 16QAM	high	100	20	22.28	1 (EIRP)	1 (EIRP)	7.72	7.72
LTE eFDD 71 QPSK	low	1	5	22.26	3 (ERP)	3 (ERP)	12.51	12.51
LTE eFDD 71 QPSK	low	12	5	21.01	3 (ERP)	3 (ERP)	13.76	13.76
LTE eFDD 71 QPSK	low	25	5	20.92	3 (ERP)	3 (ERP)	13.85	13.85
LTE eFDD 71 QPSK	mid	1	5	21.94	3 (ERP)	3 (ERP)	12.83	12.83
LTE eFDD 71 QPSK	mid	12	5	20.87	3 (ERP)	3 (ERP)	13.90	13.90
LTE eFDD 71 QPSK	mid	25	5	20.96	3 (ERP)	3 (ERP)	13.81	13.81
LTE eFDD 71 QPSK	high	1	5	22.18	3 (ERP)	3 (ERP)	12.59	12.59
LTE eFDD 71 QPSK	high	12	5	21.05	3 (ERP)	3 (ERP)	13.72	13.72
LTE eFDD 71 QPSK	high	25	5	20.96	3 (ERP)	3 (ERP)	13.81	13.81
LTE eFDD 71 16QAM	low	1	5	21.48	3 (ERP)	3 (ERP)	13.29	13.29
LTE eFDD 71 16QAM	low	25	5	20.04	3 (ERP)	3 (ERP)	14.73	14.73
LTE eFDD 71 16QAM	mid	1	5	20.82	3 (ERP)	3 (ERP)	13.95	13.95
LTE eFDD 71 16QAM	mid	25	5	20.10	3 (ERP)	3 (ERP)	14.67	14.67
LTE eFDD 71 16QAM	high	1	5	20.73	3 (ERP)	3 (ERP)	14.04	14.04
LTE eFDD 71 16QAM	high	25	5	19.86	3 (ERP)	3 (ERP)	14.91	14.91
LTE eFDD 71 QPSK	low	1	10	22.57	3 (ERP)	3 (ERP)	12.20	12.20
LTE eFDD 71 QPSK	low	50	10	21.15	3 (ERP)	3 (ERP)	13.62	13.62
LTE eFDD 71 QPSK	mid	1	10	22.08	3 (ERP)	3 (ERP)	12.69	12.69
LTE eFDD 71 QPSK	mid	50	10	21.26	3 (ERP)	3 (ERP)	13.51	13.51
LTE eFDD 71 QPSK	high	1	10	22.57	3 (ERP)	3 (ERP)	12.20	12.20
LTE eFDD 71 QPSK	high	50	10	21.39	3 (ERP)	3 (ERP)	13.38	13.38
LTE eFDD 71 16QAM	low	1	10	21.44	3 (ERP)	3 (ERP)	13.33	13.33
LTE eFDD 71 16QAM	low	50	10	20.31	3 (ERP)	3 (ERP)	14.46	14.46
LTE eFDD 71 16QAM	mid	1	10	21.67	3 (ERP)	3 (ERP)	13.10	13.10
LTE eFDD 71 16QAM	mid	50	10	21.03	3 (ERP)	3 (ERP)	13.74	13.74
LTE eFDD 71 16QAM	high	1	10	21.19	3 (ERP)	3 (ERP)	13.58	13.58
LTE eFDD 71 16QAM	high	50	10	21.31	3 (ERP)	3 (ERP)	13.46	13.46
LTE eFDD 71 QPSK	low	1	15	22.38	3 (ERP)	3 (ERP)	12.39	12.39
LTE eFDD 71 QPSK	low	36	15	21.29	3 (ERP)	3 (ERP)	13.48	13.48
LTE eFDD 71 QPSK	low	75	15	21.38	3 (ERP)	3 (ERP)	13.39	13.39
LTE eFDD 71 QPSK	mid	1	15	22.23	3 (ERP)	3 (ERP)	12.54	12.54
LTE eFDD 71 QPSK	mid	36	15	21.52	3 (ERP)	3 (ERP)	13.25	13.25

LTE eFDD 71 QPSK	mid	75	15	21.32	3 (ERP)	3 (ERP)	13.45	13.45
LTE eFDD 71 QPSK	high	1	15	22.23	3 (ERP)	3 (ERP)	12.54	12.54
LTE eFDD 71 QPSK	high	36	15	21.43	3 (ERP)	3 (ERP)	13.34	13.34
LTE eFDD 71 QPSK	high	75	15	21.35	3 (ERP)	3 (ERP)	13.42	13.42
LTE eFDD 71 16QAM	low	1	15	21.46	3 (ERP)	3 (ERP)	13.31	13.31
LTE eFDD 71 16QAM	low	75	15	20.40	3 (ERP)	3 (ERP)	14.37	14.37
LTE eFDD 71 16QAM	mid	1	15	21.67	3 (ERP)	3 (ERP)	13.10	13.10
LTE eFDD 71 16QAM	mid	75	15	20.44	3 (ERP)	3 (ERP)	14.33	14.33
LTE eFDD 71 16QAM	high	1	15	21.14	3 (ERP)	3 (ERP)	13.63	13.63
LTE eFDD 71 16QAM	high	75	15	20.27	3 (ERP)	3 (ERP)	14.50	14.50
LTE eFDD 71 QPSK	low	1	20	22.70	3 (ERP)	3 (ERP)	12.07	12.07
LTE eFDD 71 QPSK	low	100	20	21.39	3 (ERP)	3 (ERP)	13.38	13.38
LTE eFDD 71 QPSK	mid	1	20	22.44	3 (ERP)	3 (ERP)	12.33	12.33
LTE eFDD 71 QPSK	mid	100	20	20.82	3 (ERP)	3 (ERP)	13.95	13.95
LTE eFDD 71 QPSK	high	1	20	22.36	3 (ERP)	3 (ERP)	12.41	12.41
LTE eFDD 71 QPSK	high	100	20	21.47	3 (ERP)	3 (ERP)	13.30	13.30
LTE eFDD 71 16QAM	low	1	20	22.29	3 (ERP)	3 (ERP)	12.48	12.48
LTE eFDD 71 16QAM	low	100	20	21.45	3 (ERP)	3 (ERP)	13.32	13.32
LTE eFDD 71 16QAM	mid	1	20	21.32	3 (ERP)	3 (ERP)	13.45	13.45
LTE eFDD 71 16QAM	mid	100	20	21.53	3 (ERP)	3 (ERP)	13.24	13.24
LTE eFDD 71 16QAM	high	1	20	21.82	3 (ERP)	3 (ERP)	12.95	12.95
LTE eFDD 71 16QAM	high	100	20	21.43	3 (ERP)	3 (ERP)	13.34	13.34

Remark: Please see next sub-clause for the measurement plot.

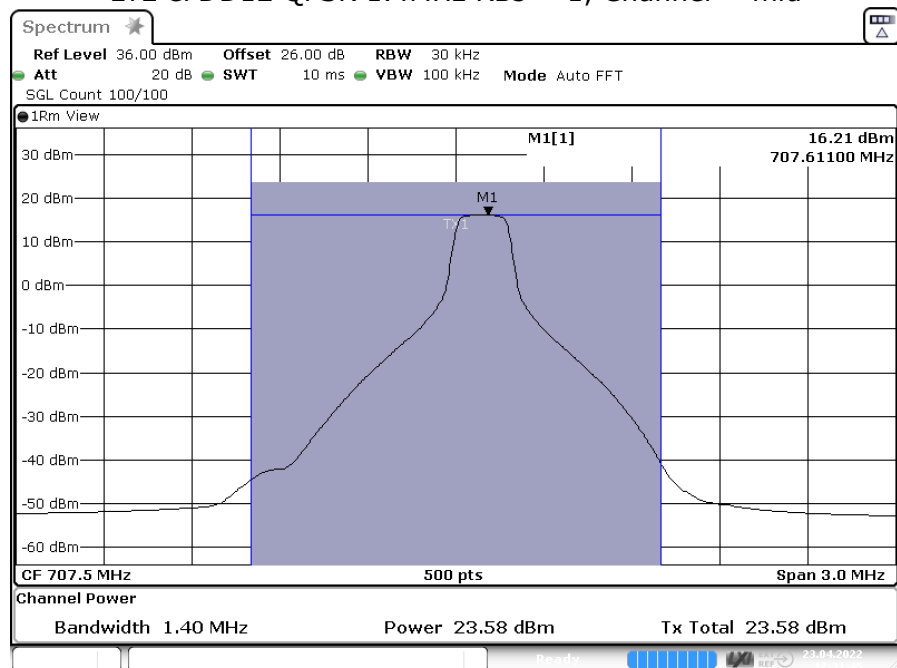
5.15.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

LTE eFDD4 QPSK 1.4MHz RBs = 1, Channel = high



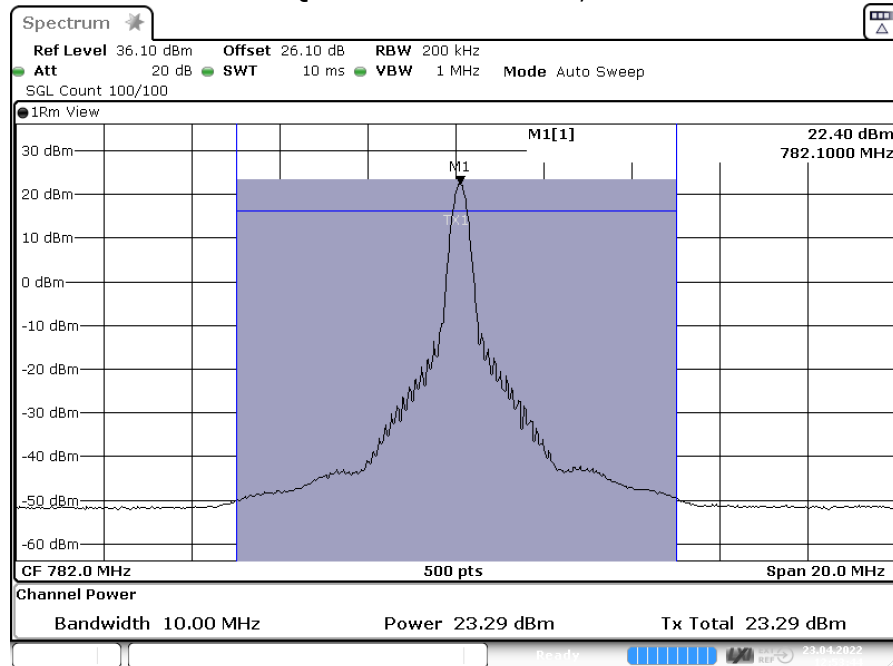
Date: 8.FEB.2022 09:17:41

LTE eFDD12 QPSK 1.4MHz RBs = 1, Channel = mid



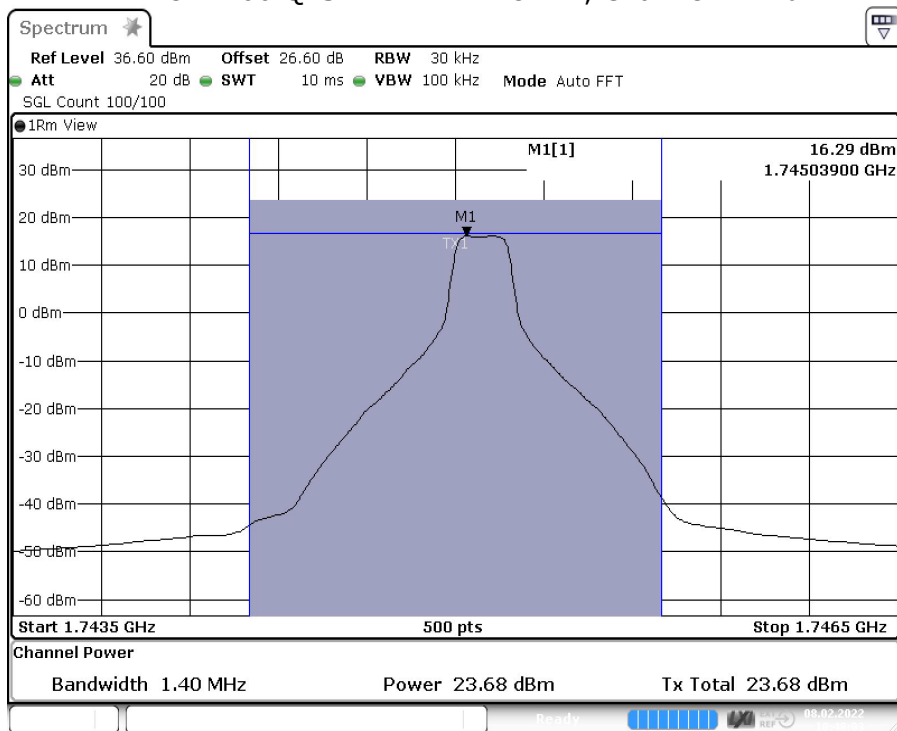
Date: 23.APR.2022 12:31:45

LTE eFDD13 QPSK 10MHz RBs = 1, Channel = mid



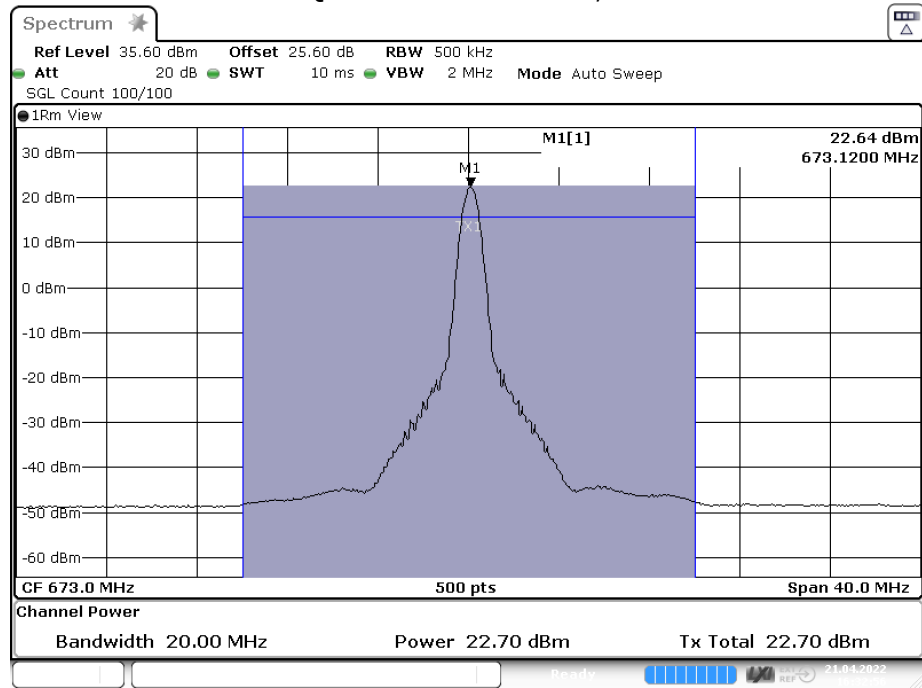
Date: 23.APR.2022 12:53:44

LTE eFDD66 QPSK 1.4MHz RBs = 1, Channel = mid



Date: 8.FEB.2022 10:48:03

LTE eTDD71 QPSK 20MHz RBs = 1, Channel = low



Date: 21. APR. 2022 16:32:56

5.15.5 TEST EQUIPMENT USED

- Radio Lab

5.16 FREQUENCY STABILITY

Standard **FCC PART 27 Subpart C**

The test was performed according to:
ANSI C63.26: 2015

5.16.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the applicable frequency stability test case per § 2.1055 and RSS-GEN 6.11. The limit and the requirements come from the applicable rule part and ISSED RSS-Standard for the operating band of the cellular device.

The EUT was connected to the test setup according to the following diagram:



Test Setup FCC Part 22/24/27/90 Cellular;
Frequency stability

The attenuation of the measuring / stimulus path is known for each measured frequency and are considered.

5.16.2 TEST REQUIREMENTS / LIMITS

FCC Part 27; Miscellaneous Wireless Communication Services

Subpart C – Technical standards

§ 27.54 - Frequency stability

All Bands

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Band 12/13/71:

RSS-130; 4.5 Transmitter frequency stability

For equipment that is capable of transmitting numerous channels simultaneously for different applications (e.g. LTE and narrowband – Internet of Things (IoT)), the occupied bandwidth shall be the bandwidth representing the sum of the occupied bandwidths of these channels.

The frequency stability shall be sufficient to ensure that the occupied bandwidth remains within each frequency block range when tested at the temperature and supply voltage variations specified in RSS-Gen.

Band 4/66:

RSS-139; 6.4 Frequency Stability

The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

5.16.3 TEST PROTOCOL

LTE eFDD 4

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	4331.25	4	10	passed
-30	5			7	16	passed
-30	10			6	12	passed
-20	0	normal	4331.25	5	9	passed
-20	5			8	8	passed
-20	10			2	7	passed
-10	0	normal	4331.25	3	12	passed
-10	5			4	14	passed
-10	10			4	10	passed
0	0	normal	4331.25	6	9	passed
0	5			1	8	passed
0	10			7	9	passed
10	0	normal	4331.25	5	10	passed
10	5			4	16	passed
10	10			8	12	passed
20	0	low	4331.25	8	14	passed
20	5			9	11	passed
20	10			6	12	passed
20	0	normal	4331.25	3	9	passed
20	5			4	13	passed
20	10			2	14	passed
20	0	high	4331.25	4	8	passed
20	5			7	17	passed
20	10			3	12	passed
30	0	normal	4331.25	5	10	passed
30	5			8	12	passed
30	10			8	13	passed
40	0	normal	4331.25	7	14	passed
40	5			6	15	passed
40	10			4	19	passed
50	0	normal	4331.25	8	11	passed
50	5			3	9	passed
50	10			4	15	passed

LTE eFDD 12

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	1768.75	-0.62	-6.34	passed
-30	5			-1.43	-5.37	passed
-30	10			-1.85	-7.58	passed
-20	0	normal	1768.75	2.13	5.89	passed
-20	5			-0.74	-5.76	passed
-20	10			1.66	4.85	passed
-10	0	normal	1768.75	0.64	5.66	passed
-10	5			-0.3	-4.38	passed
-10	10			2.3	6.71	passed
0	0	normal	1768.75	2.21	6.4	passed
0	5			0.07	-5.74	passed
0	10			1.03	-5.79	passed
10	0	normal	1768.75	-0.18	-8.42	passed
10	5			0.4	-6.24	passed
10	10			1.51	7.92	passed
20	0	low	1768.75	-1.39	-3.03	passed
20	5			-1.11	-2.36	passed
20	10			0.12	1.61	passed
20	0	normal	1768.75	-0.32	-2.08	passed
20	5			-1.43	-3.67	passed
20	10			-0.23	1.17	passed
20	0	high	1768.75	0.58	3.25	passed
20	5			0.23	1.66	passed
20	10			-0.13	-1.76	passed
30	0	normal	1768.75	0.95	6.48	passed
30	5			0.64	6.12	passed
30	10			-0.03	-7.15	passed
40	0	normal	1768.75	-1.57	-6.75	passed
40	5			0.16	-6.32	passed
40	10			-0.3	-3.88	passed
50	0	normal	1768.75	-0.59	-5.16	passed
50	5			-0.37	7.02	passed
50	10			-0.67	-5.49	passed

LTE eFDD 13

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	1955	-0.82	-6.52	passed
-30	5			-0.23	-6.28	passed
-30	10			-1.65	-7.42	passed
-20	0	normal	1955	1.92	6.71	passed
-20	5			0.56	7.27	passed
-20	10			1.36	-7.62	passed
-10	0	normal	1955	-0.36	-6.44	passed
-10	5			0.44	4.86	passed
-10	10			-0.3	-6.22	passed
0	0	normal	1955	-0.26	5.23	passed
0	5			1.81	6.99	passed
0	10			1.66	6.29	passed
10	0	normal	1955	0.82	4.51	passed
10	5			-0.25	-8.07	passed
10	10			1.95	8.3	passed
20	0	low	1955	0.28	-2.81	passed
20	5			0.13	2.36	passed
20	10			1.56	2.57	passed
20	0	normal	1955	1.3	3.22	passed
20	5			1.37	2.94	passed
20	10			0.01	-2.62	passed
20	0	high	1955	0.34	1.58	passed
20	5			0.35	1.86	passed
20	10			0.25	-1.85	passed
30	0	normal	1955	0.2	-8.02	passed
30	5			-0.8	-6.53	passed
30	10			-0.18	-6.51	passed
40	0	normal	1955	-1.06	-8.43	passed
40	5			-1.76	-8.94	passed
40	10			-0.32	-4.65	passed
50	0	normal	1955	-0.4	-8.69	passed
50	5			0.83	5.87	passed
50	10			0.14	-6.88	passed

LTE eFDD 66

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	4362.5	2	11	passed
-30	5			2	9	passed
-30	10			3	12	passed
-20	0	normal	4362.5	1	8	passed
-20	5			2	9	passed
-20	10			1	11	passed
-10	0	normal	4362.5	1	13	passed
-10	5			2	10	passed
-10	10			3	8	passed
0	0	normal	4362.5	1	12	passed
0	5			4	8	passed
0	10			3	9	passed
10	0	normal	4362.5	1	9	passed
10	5			3	7	passed
10	10			4	10	passed
20	0	low	4362.5	2	9	passed
20	5			1	13	passed
20	10			3	11	passed
20	0	normal	4362.5	5	12	passed
20	5			4	12	passed
20	10			3	10	passed
20	0	high	4362.5	1	8	passed
20	5			3	9	passed
20	10			2	13	passed
30	0	normal	4362.5	4	10	passed
30	5			3	9	passed
30	10			1	12	passed
40	0	normal	4362.5	2	10	passed
40	5			4	8	passed
40	10			3	11	passed
50	0	normal	4362.5	3	7	passed
50	5			4	9	passed
50	10			2	10	passed

LTE eFDD 71

Temp. °C	Duration min	Voltage	Limit Hz	Freq. error Average (Hz)	Freq. error Max. (Hz)	Verdict
-30	0	normal	1955	-1.07	-4.82	passed
-30	5			-0.8	-6.21	passed
-30	10			-2.85	-6.15	passed
-20	0	normal	1955	0.43	3.43	passed
-20	5			-1.52	-4.85	passed
-20	10			-1.14	-6.25	passed
-10	0	normal	1955	1.76	4.85	passed
-10	5			-0.6	-3.85	passed
-10	10			-0.33	-5.31	passed
0	0	normal	1955	0.51	-5.83	passed
0	5			-0.18	-6.12	passed
0	10			-0.13	-5	passed
10	0	normal	1955	0.31	6.32	passed
10	5			0.04	5.74	passed
10	10			-0.56	-5.7	passed
20	0	low	1955	-0.94	-3.04	passed
20	5			-0.55	-2.38	passed
20	10			-0.27	1.53	passed
20	0	normal	1955	-0.08	-5.32	passed
20	5			-0.64	-2.98	passed
20	10			0.1	2.39	passed
20	0	high	1955	-0.2	-2.13	passed
20	5			0.82	2.71	passed
20	10			-0.16	-1.69	passed
30	0	normal	1955	-1.97	-7.07	passed
30	5			-1.93	-8.1	passed
30	10			-0.7	-6.16	passed
40	0	normal	1955	-1	-9.53	passed
40	5			-2.4	-6.76	passed
40	10			-0.99	-6.74	passed
50	0	normal	1955	-2.43	-7.39	passed
50	5			-2.42	-8.44	passed
50	10			-0.97	-6.47	passed

5.16.4 TEST EQUIPMENT USED

- Radio Lab

5.17 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

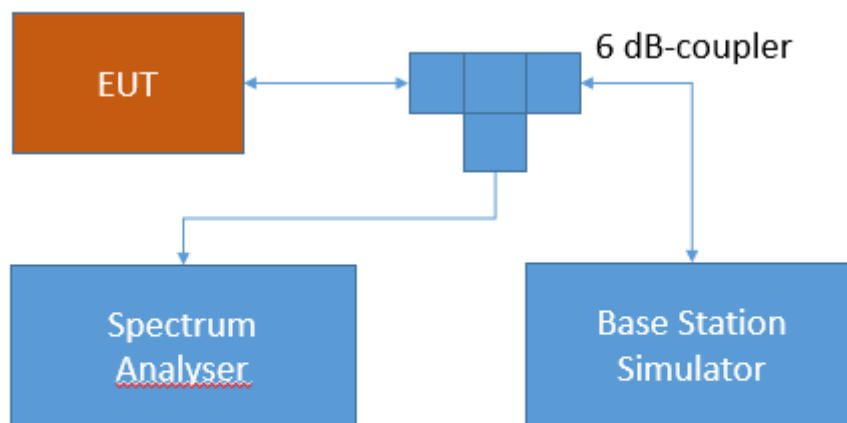
Standard **FCC PART 27 Subpart C**

The test was performed according to:
ANSI C63.26: 2015

5.17.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the applicable conducted spurious emission test case per § 2.1051 and RSS-GEN 6.13. The limit comes from the applicable rule part and ISSED RSS-Standard for the operating band of the cellular device.

The EUT was connected to the test setup according to the following diagram:



Test Setup FCC Part 22/24/27/90 Cellular;
Spurious Emissions at antenna terminal

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

The Spectrum Analyzer settings can be directly found in the measurement diagrams.

5.17.2 TEST REQUIREMENTS / LIMITS

FCC Part 2.1051; Measurement required: Spurious emissions at antenna terminal:

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in §2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

FCC Part 27; Miscellaneous Wireless Communication Services

Subpart C – Technical standards

§27.53 – Emission limits

Band 13

(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

- a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:
 - i. $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment and
 - ii. $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment
- b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

Band 12:

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

- a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:
 - i. $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment and
 - ii. $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment
- b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

Band 4/66:

(h) *AWS emission limits— (1) General protection levels.* Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.

RSS-139; 6.6 Transmitter Unwanted Emissions

Equipment shall comply with the limits in (i) and (ii) below.

- i. In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10} p$ (watts) dB.
- ii. After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10} p$ (watts) dB.

Band 71:

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

- a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:
 - i. $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment and
 - ii. $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment
- b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

5.17.3 TEST PROTOCOL

Ambient temperature: 20 - 28 °C
Relative humidity: 30 - 45 %

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
LTE eFDD4 QPSK	low	rms	maxhold	5	1709.99	-32.63	-23	9.63
LTE eFDD4 QPSK	mid	rms	maxhold	-	-	-	-13	>20
LTE eFDD4 QPSK	high	rms	maxhold	5	1755.00	-31.41	-23	8.41

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
LTE eFDD12 QPSK	low	rms	maxhold	-	-	-	-13	>20
LTE eFDD12 QPSK	mid	rms	maxhold	-	-	-	-13	>20
LTE eFDD12 QPSK	high	rms	maxhold	-	-	-	-13	>20

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
LTE eFDD13 QPSK	low	rms	maxhold	-	-	-	-13	>20
LTE eFDD13 QPSK	mid	rms	maxhold	-	-	-	-13	>20
LTE eFDD13 QPSK	high	rms	maxhold	30	787.00	-26.28	-23	3.28

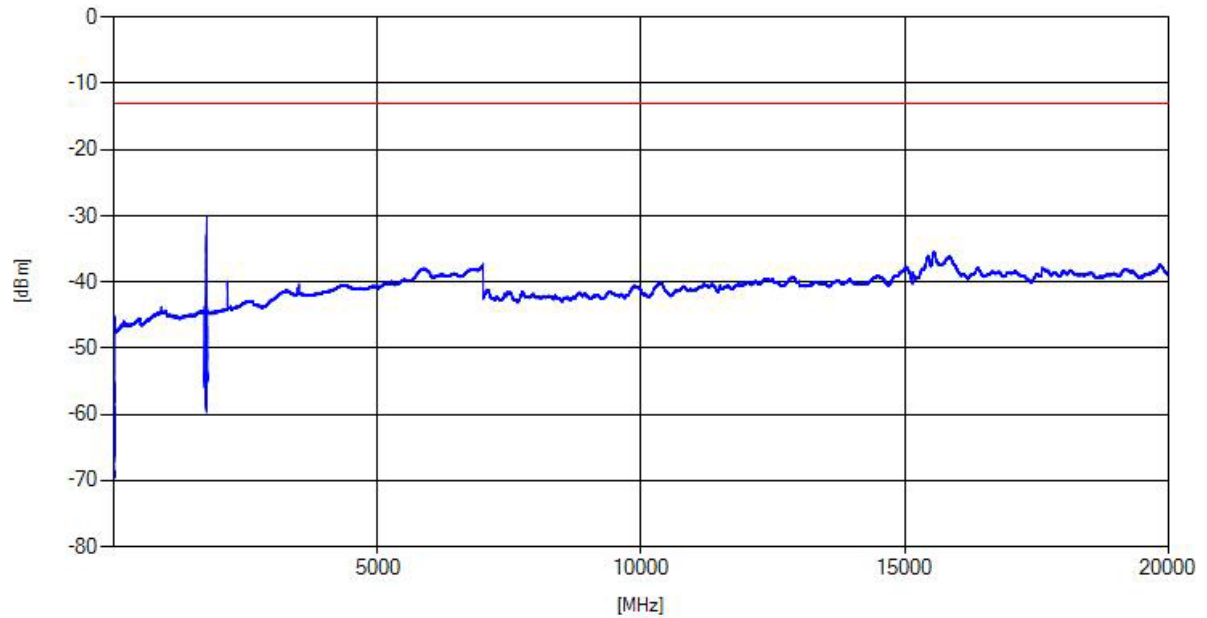
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
LTE eFDD66 QPSK	low	rms	maxhold	50	1709.99	-22.18	-13	9.18
LTE eFDD66 QPSK	mid	rms	maxhold	-	-	-	-13	>20
LTE eFDD66 QPSK	high	rms	maxhold	50	1780.00	-22.54	-13	9.54

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
LTE eFDD71 QPSK	low	rms	maxhold	5	663.00	-25.68	-23	2.68
LTE eFDD71 QPSK	mid	rms	maxhold	-	-	-	-13	>20
LTE eFDD71 QPSK	high	rms	maxhold	5	698.00	-26.06	-23	3.06

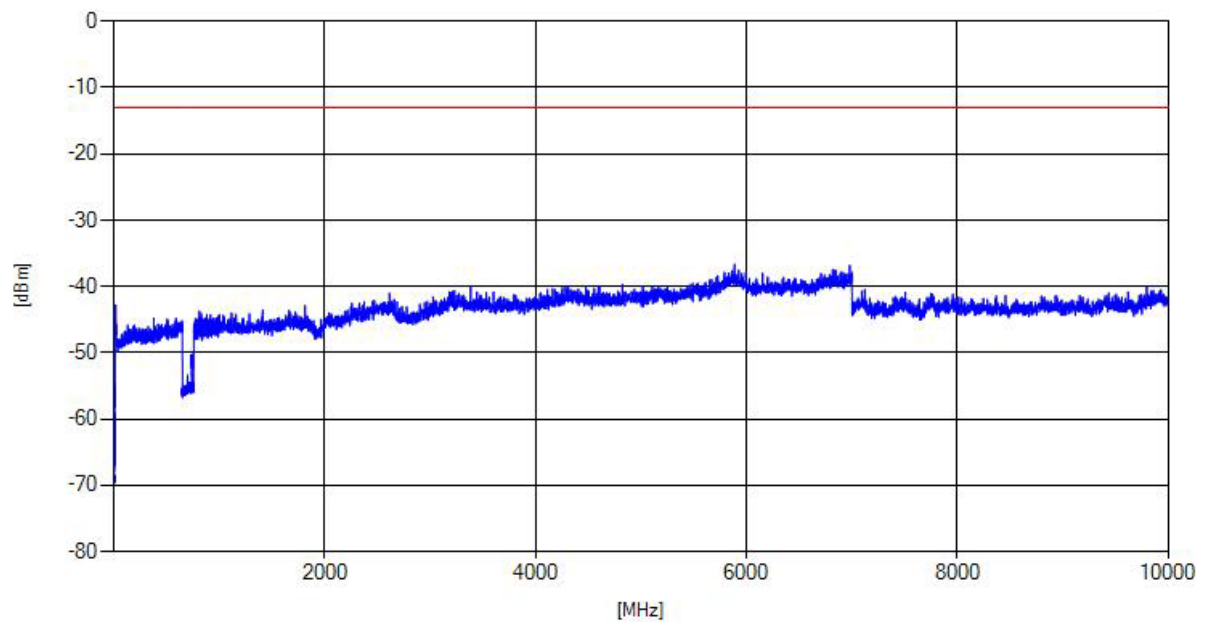
Remark: Please see next sub-clause for the measurement plot.

5.17.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

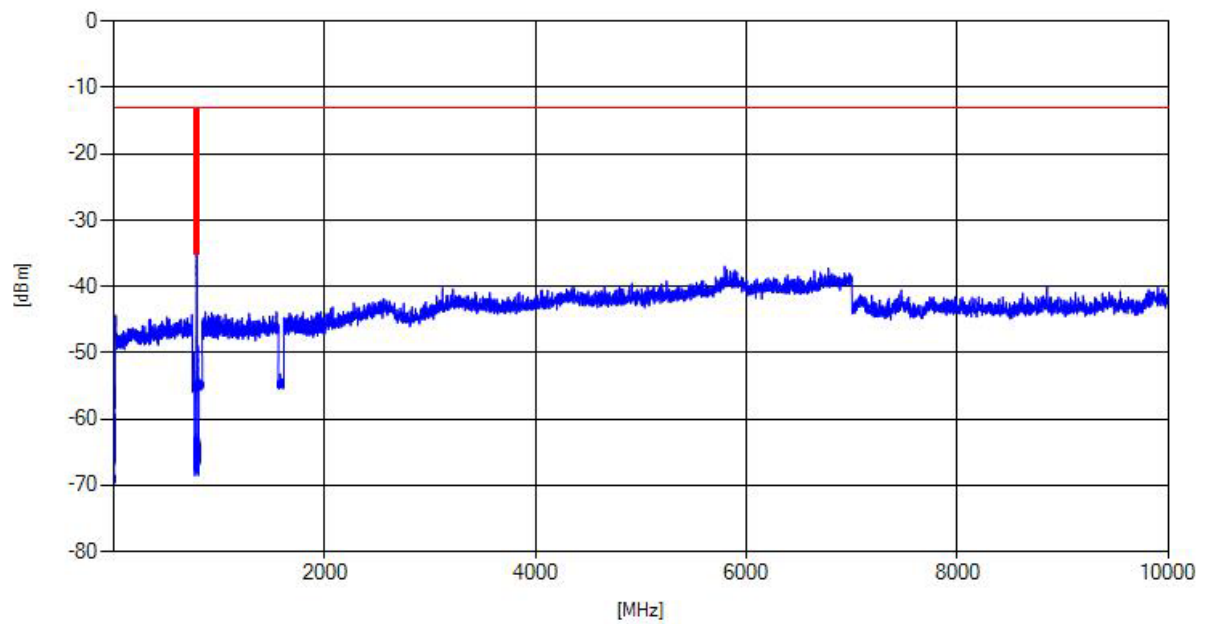
LTE eFDD 4 QPSK, Channel = high



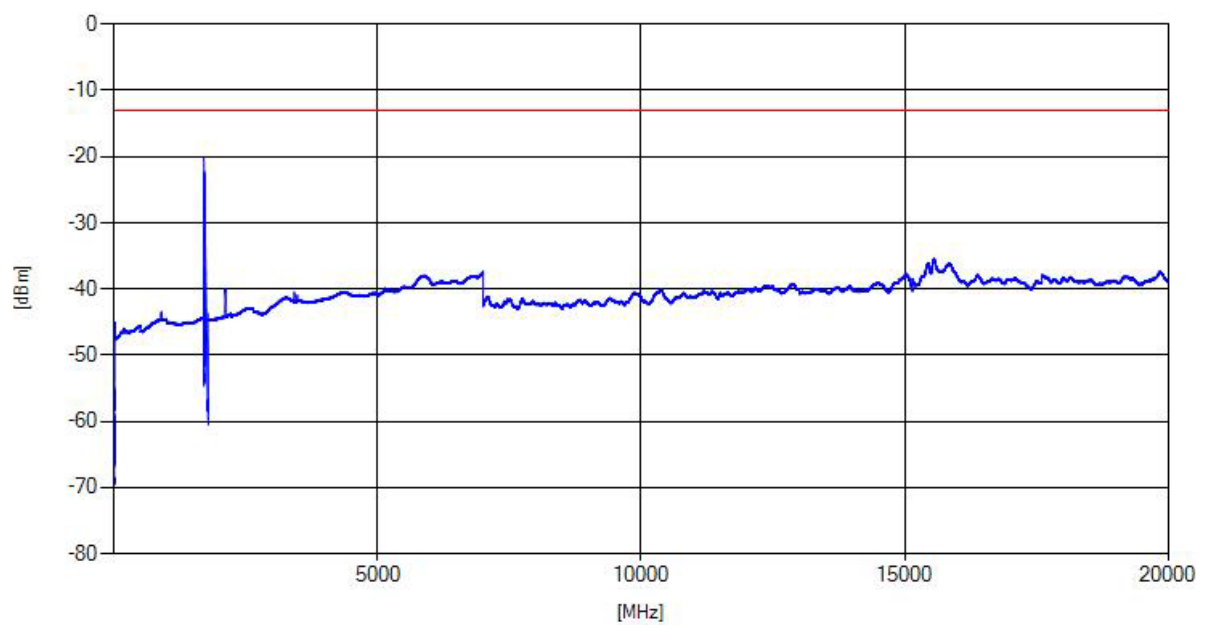
LTE eFDD 12 QPSK, Channel = mid



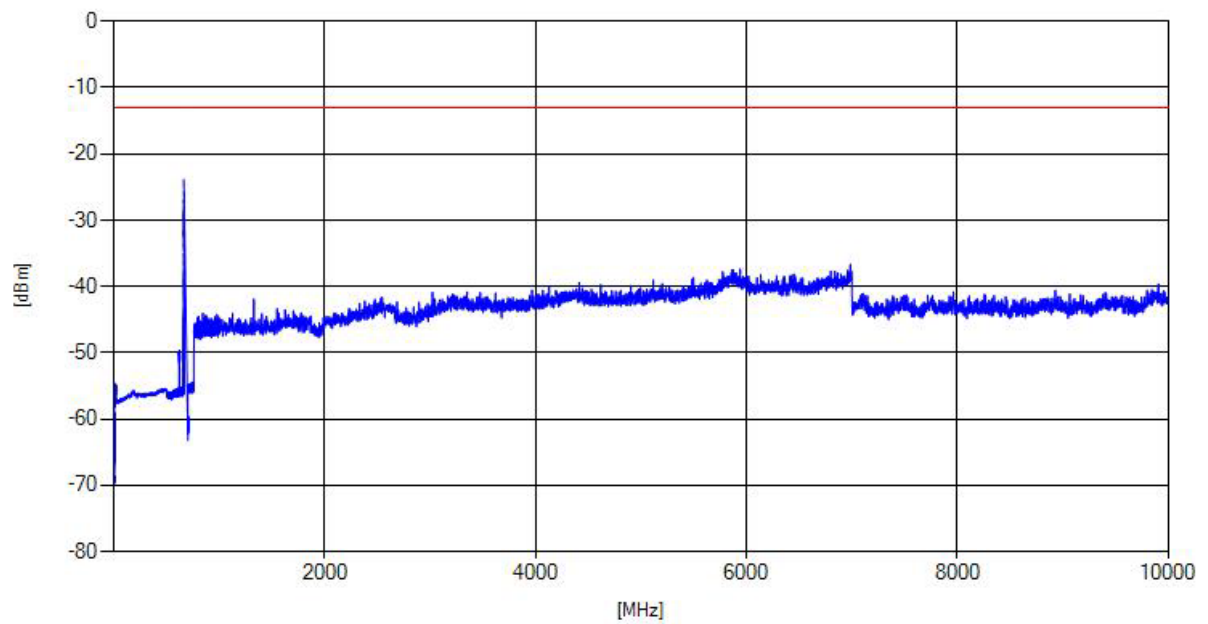
LTE eFDD 13 QPSK, Channel = high



LTE eFDD 66 QPSK, Channel = low



LTE eFDD 71 QPSK, Channel = low



5.17.5 TEST EQUIPMENT USED

- Radio Lab

5.18 FIELD STRENGTH OF SPURIOUS RADIATION

Standard **FCC PART 27 Subpart C**

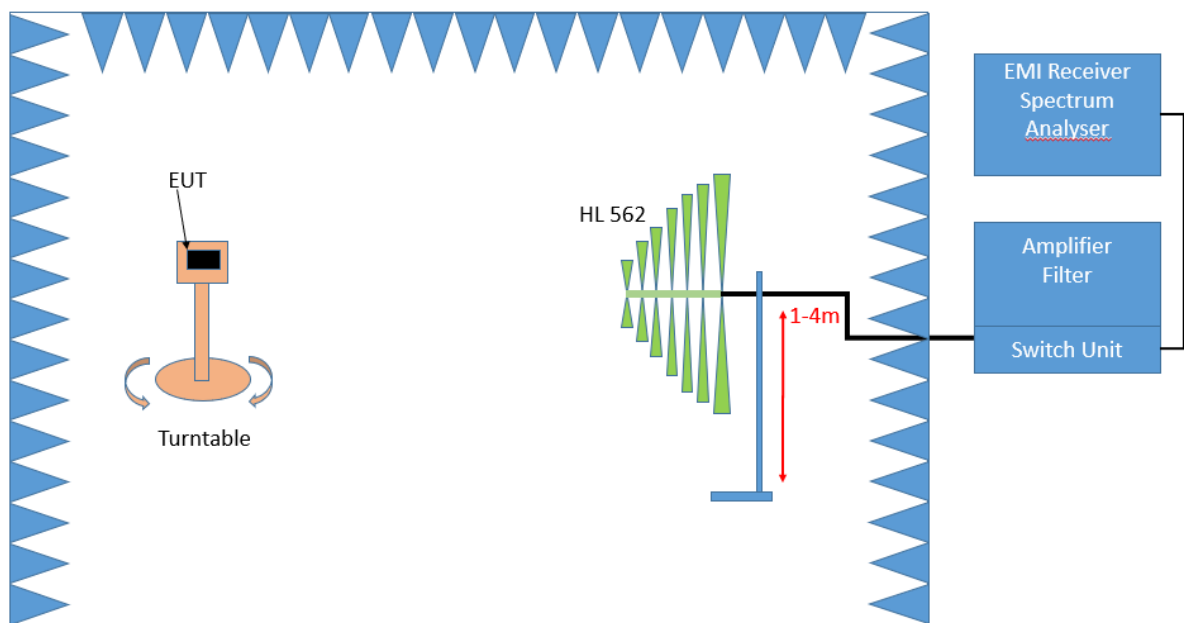
The test was performed according to:
ANSI C63.26: 2015

5.18.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the applicable radiated spurious emission measurements per § 2.1053 and RSS-GEN 6.13. The limit and requirements come from the applicable rule part and ISSED RSS-Standard for the operating band of the cellular device.

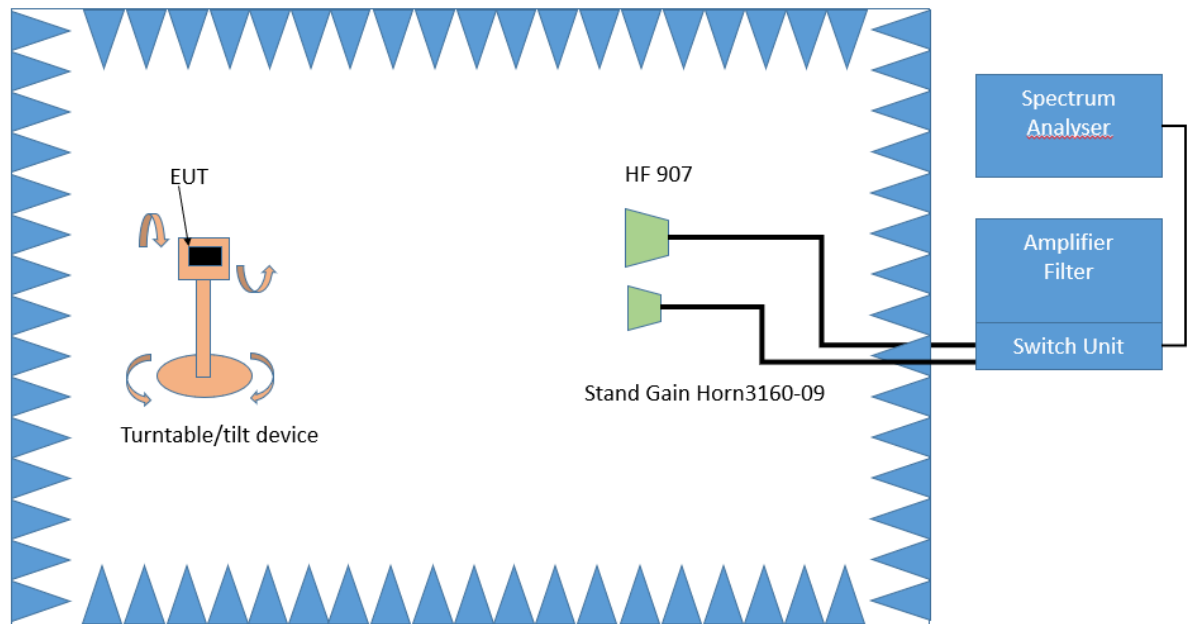
The EUT was connected to the test setup according to the following diagram:

Frequency Range: 30 MHz – 1 GHz:



Test Setup; Spurious Emission Radiated (SAC), 30 MHz- 1GHz

Frequency Range: 1 GHz – 26.5 GHz



Test Setup; Spurious Emission Radiated (FAC), 1 GHz-26.5 GHz

The test set-up was made in accordance to the general provisions of ANSI C63.26 in a typical installation configuration. The Equipment Under Test (EUT) was set up on a non-conductive table 1.0 x 2.0 m² in the semi-anechoic chamber. The influence of the EUT support table that is used between 30–1000 MHz was evaluated.

The measurement procedure is implemented into the EMI test software EMC32 from R&S. Exploratory tests are performed at 3 orthogonal axes to determine the worst-case orientation of a body-worn or handheld EUT. The final test on all kind of EUTs is also performed at 3 axes. A pre-check is performed while the EUT is powered from a DC power source.

1. Measurement above 30 MHz and up to 1 GHz

Step 1: Preliminary scan

This is a preliminary test to identify the highest amplitudes relative to the limit.

Settings for step 1:

- Antenna distance: 3 m
- Detector: Peak
- RBW: 100 kHz
- VBW: 300 kHz
- Sweep time: coupled
- Turntable angle range: –180° to 90°
- Turntable step size: 90°
- Height variation range: 1 – 3 m
- Height variation step size: 2 m
- Polarisation: Horizontal + Vertical

Intention of this step is, to determine the radiated EMI-profile of the EUT. Afterwards the relevant emissions for the final measurement are identified.

Step 2: Adjustment measurement

In this step the accuracy of the turntable azimuth and antenna height will be improved. This is necessary to find out the maximum value of every frequency.

For each frequency, which was determined the turntable azimuth and antenna height will be adjusted. The turntable azimuth will slowly vary by 360°. During this action, the value of emission is continuously measured. The turntable azimuth at the highest emission will be

recorded and adjusted. In this position, the antenna height will also slowly vary from 1 – 4 m. During this action, the value of emission is also continuously measured. The antenna height of the highest emission will also be recorded and adjusted.

- Detector: Peak
- Measured frequencies: in step 1 determined frequencies
- RBW: 100 kHz
- VBW: 300 kHz
- Sweep time: coupled
- Turntable angle range: $\pm 45^\circ$ around the determined value
- Height variation range: ± 100 cm around the determined value
- Antenna Polarisation: max. value determined in step 1

Step 3: Final measurement with RMS detector

With the settings determined in step 3, the final measurement will be performed:

EMI receiver settings for step 4:

- Detector: RMQ
- Measured frequencies: in step 1 determined frequencies
- RBW: 100 kHz
- VBW: 300 kHz
- Sweep time: 1 s

After the measurement a plot will be generated which contains a diagram with the results of the preliminary scan and a chart with the frequencies and values of the results of the final measurement.

3. Measurement above 1 GHz

The following modifications apply to the measurement procedure for the frequency range above 1 GHz:

Step 1:

The Equipment Under Test (EUT) was set up on a non-conductive support (tilt device) at 1.5 m height in the fully-anechoic chamber.

All steps were performed with one height (1.5 m) of the receiving antenna only.

The EUT is turned during the preliminary measurement across the elevation axis, with a step size of 90° .

The turn table step size (azimuth angle) for the preliminary measurement is 45° .

- Antenna distance: 3 m
- Detector: Peak
- RBW: 1 MHz
- VBW: 3 MHz
- Sweep time: coupled
- Turntable angle range: -180° to 90°
- Turntable step size: 90°
- Polarisation: Horizontal + Vertical

Step 2:

Due to the fact, that in this frequency range the test is performed in a fully anechoic room, the height scan of the receiving antenna in step 2 is omitted. Instead of this, a maximum search with a step size $\pm 45^\circ$ for the elevation axis is performed.

The turn table azimuth will slowly vary by $\pm 22.5^\circ$.

The elevation angle will slowly vary by $\pm 45^\circ$

EMI receiver settings (for all steps):

- Detector: Peak,
- RBW: 1 MHz
- VBW: 3 MHz
- Sweep time: coupled

Step 3:

Spectrum analyser settings for step 3:

- Detector: RMS
- Measured frequencies: in step 1 determined frequencies
- RBW: 1 MHz
- VBW: 3 MHz
- Sweep Time: 1 s

5.18.2 TEST REQUIREMENTS / LIMITS

FCC Part 2.1053; Measurement required: Field strength of spurious radiation:

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of §2.1049, as appropriate.

FCC Part 27; Miscellaneous Wireless Communication Services**Subpart C – Technical standards****§27.53 – Emission limits****Band 13**

(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

- a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:
 - i. $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment and
 - ii. $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment
- b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

Band 12:

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

- a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:
 - i. $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment and
 - ii. $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment
- b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

Band 4/66:

(h) *AWS emission limits—(1) General protection levels.* Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB.

RSS-139; 6.6 Transmitter Unwanted Emissions

Equipment shall comply with the limits in (i) and (ii) below.

- i. In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10} p$ (watts) dB.
- ii. After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10} p$ (watts) dB.

Band 71:

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log_{10} (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In attenuated addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

- a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:
 - i. $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment and
 - ii. $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment
- b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

5.18.3 TEST PROTOCOL

Ambient temperature: 20 - 28 °C
Relative humidity: 30 - 45 %

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
LTE eFDD4	low	rms	maxhold	50	1709.99	-22.79	-13	9.79
LTE eFDD4	mid	rms	maxhold	-	-	-	-13	>20
LTE eFDD4	high	rms	maxhold	50	1755.00	-22.71	-13	9.71

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
LTE eFDD12	low	rms	maxhold	30	699.00	-32.01	-13	19.01
LTE eFDD12	mid	rms	maxhold	-	-	-	-13	>20
LTE eFDD12	high	rms	maxhold	30	716.00	-25.88	-13	12.88

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
LTE eFDD13	low	rms	maxhold	-	-	-	-13	>20
LTE eFDD13	mid	rms	maxhold	-	-	-	-13	>20
LTE eFDD13	high	rms	maxhold	30	787.00	-27.66	-13	14.66

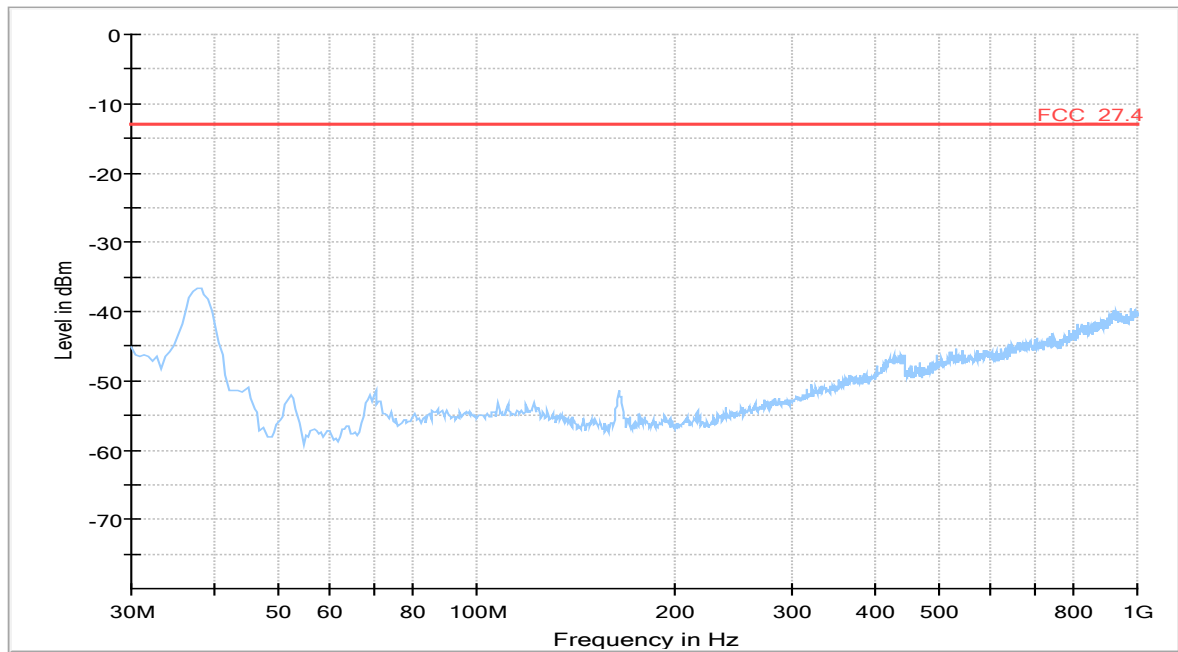
Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
LTE eFDD66	low	rms	maxhold	5	1709.99	-32.82	-23	9.82
LTE eFDD66	mid	rms	maxhold	-	-	-	-13	>20
LTE eFDD66	high	rms	maxhold	5	1780.00	-33.3	-23	10.3

Radio Technology	Channel	Detector	Trace	Resolution Bandwidth /kHz	Frequency /MHz	Peak Value /dBm	Limit /dBm	Margin to Limit /dB
LTE eFDD71	low	rms	maxhold	30	663.00	-34.09	-13	21.09
LTE eFDD71	mid	rms	maxhold	-	-	-	-13	>20
LTE eFDD71	high	rms	maxhold	30	698.00	-30.59	-13	17.59

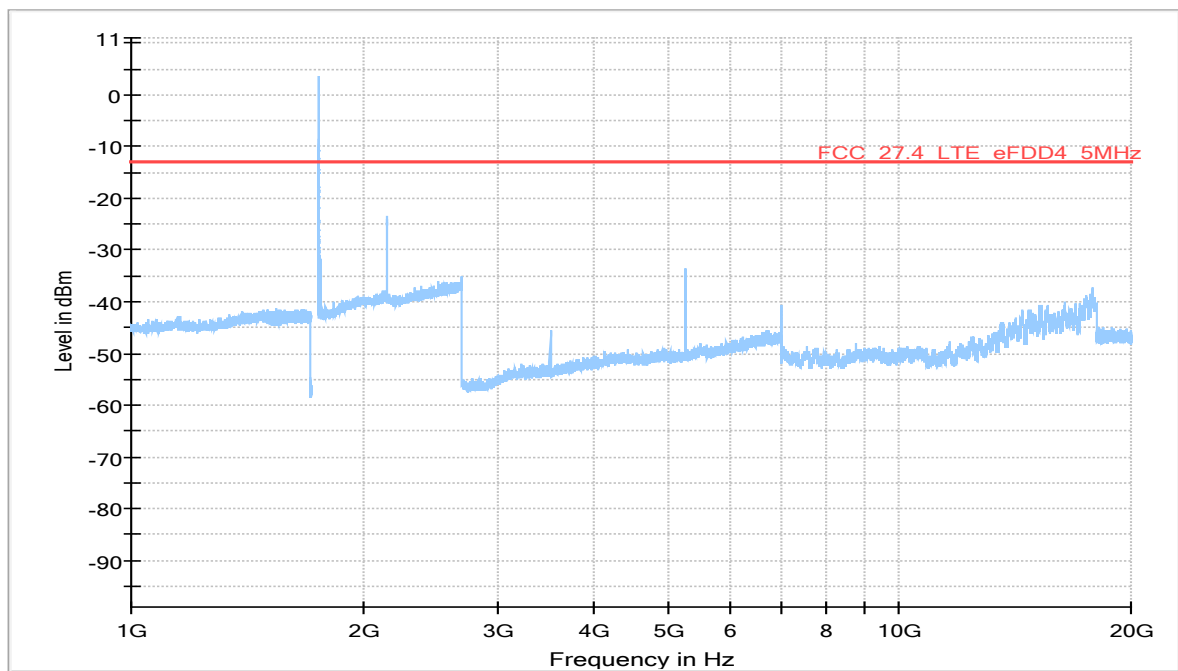
Remark: Please see next sub-clause for the measurement plot.

5.18.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

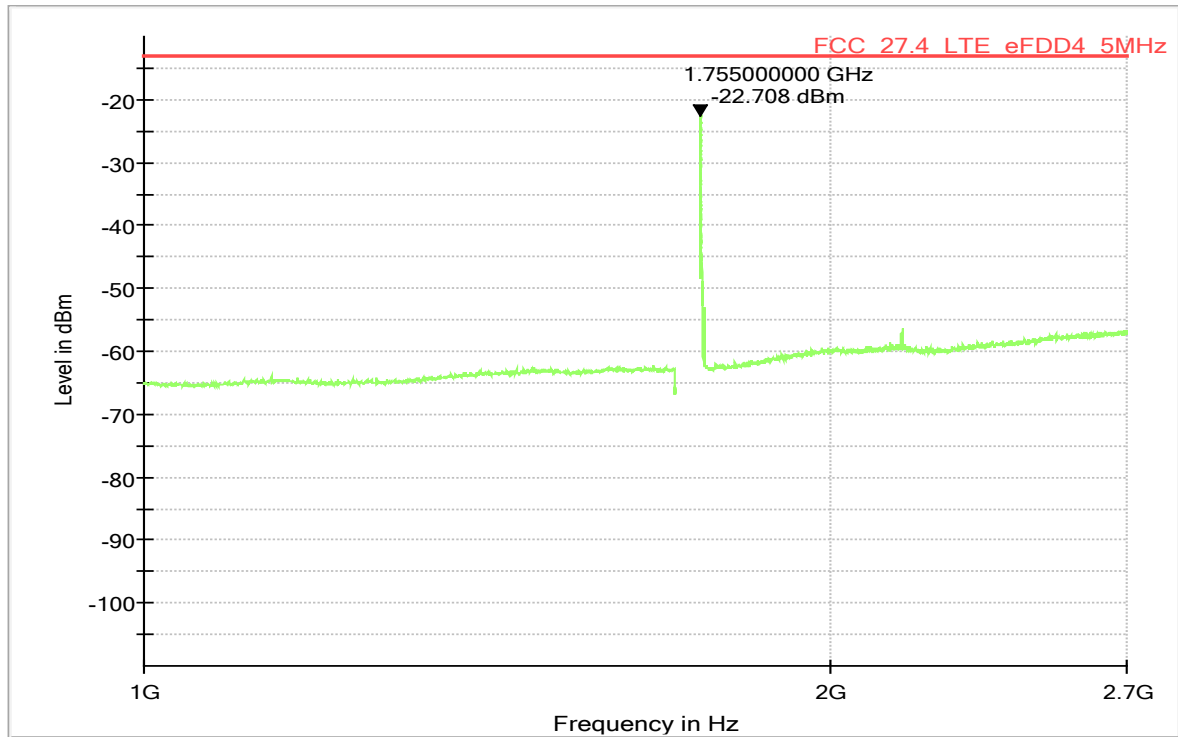
LTE eFDD 4, Channel = high
30 MHz – 1 GHz



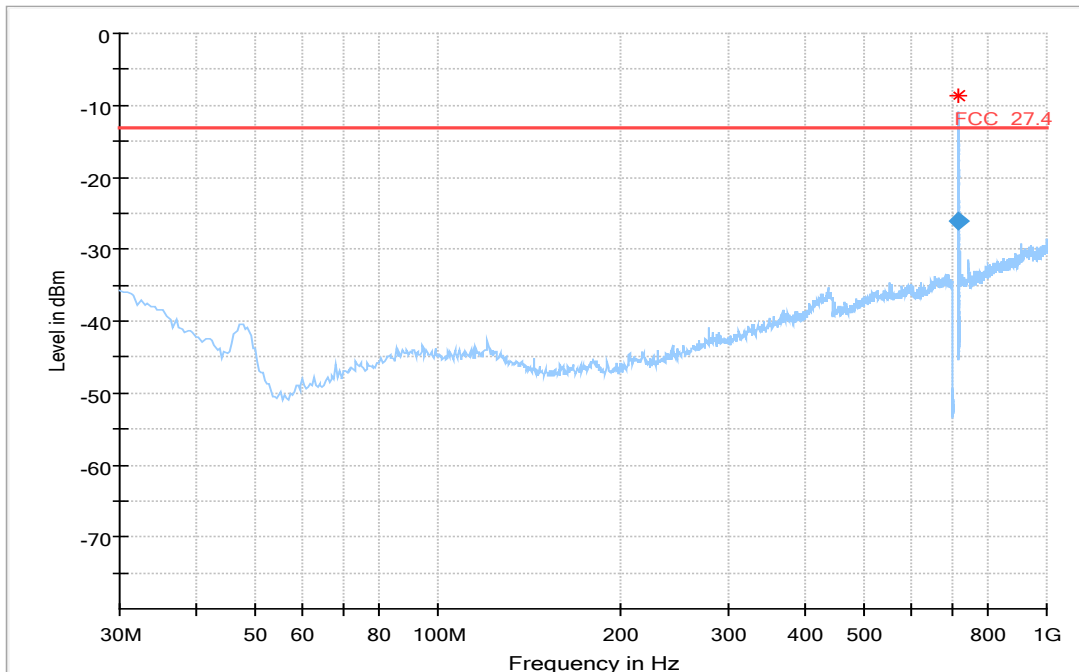
1 GHz – 20 GHz



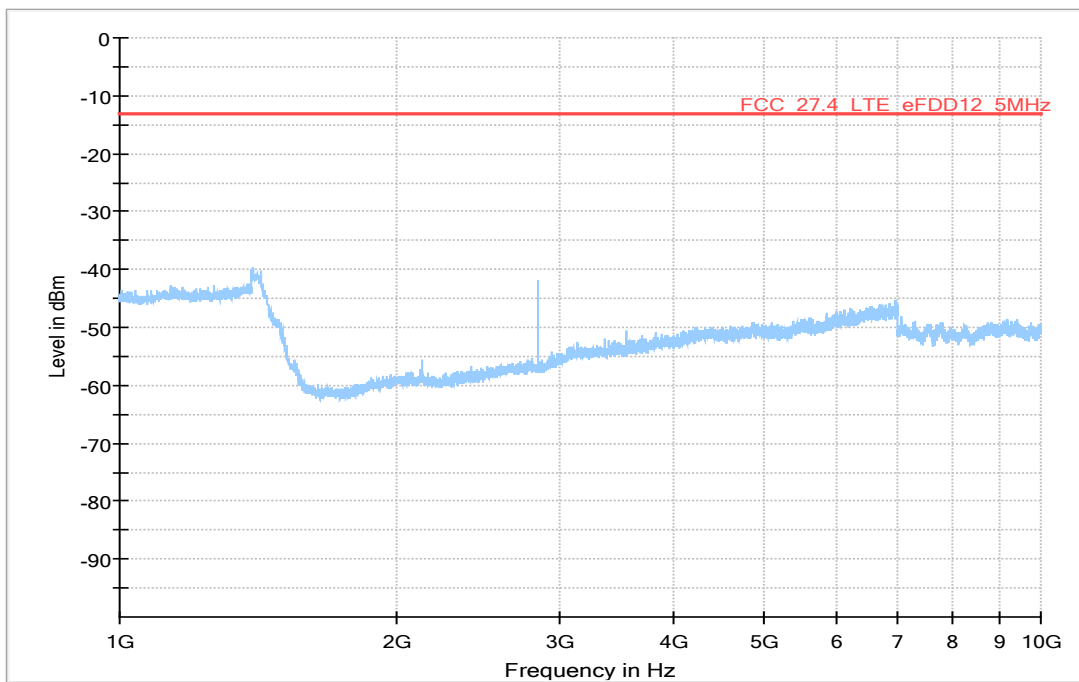
re-measurement at carrier



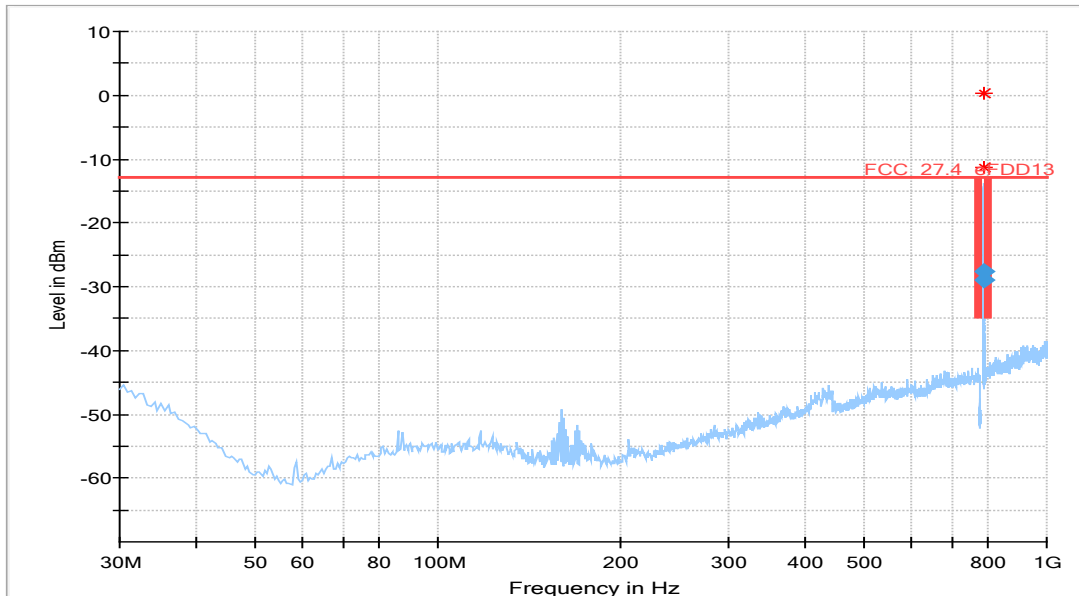
LTE eFDD 12, Channel = high
30 MHz – 1 GHz



1 GHz – 10 GHz

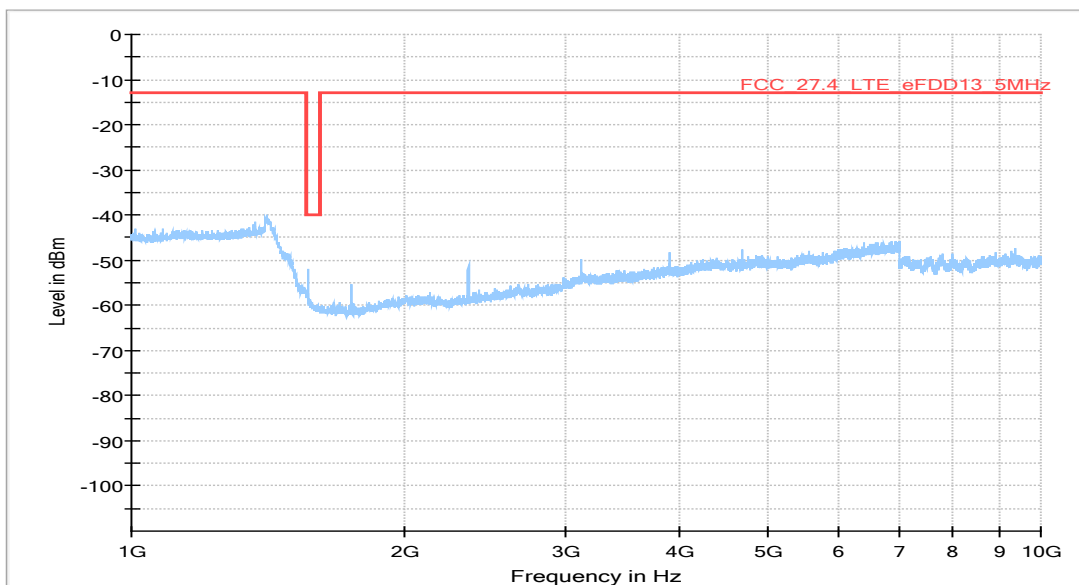


LTE eFDD 13, Channel = high
30 MHz – 1 GHz

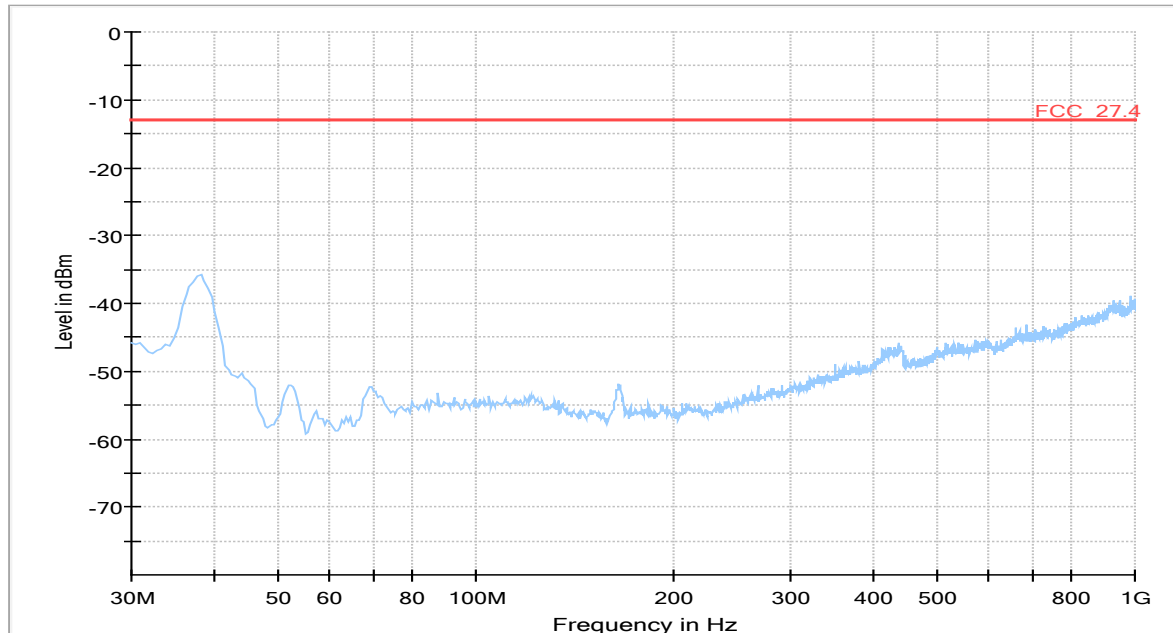


Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
787.000500	-27.66	-13.00	14.66	1000.0	30.000	103.0	H	59.0	-73.3
787.102900	-29.02	-13.00	16.02	1000.0	100.000	106.0	H	81.0	-73.3

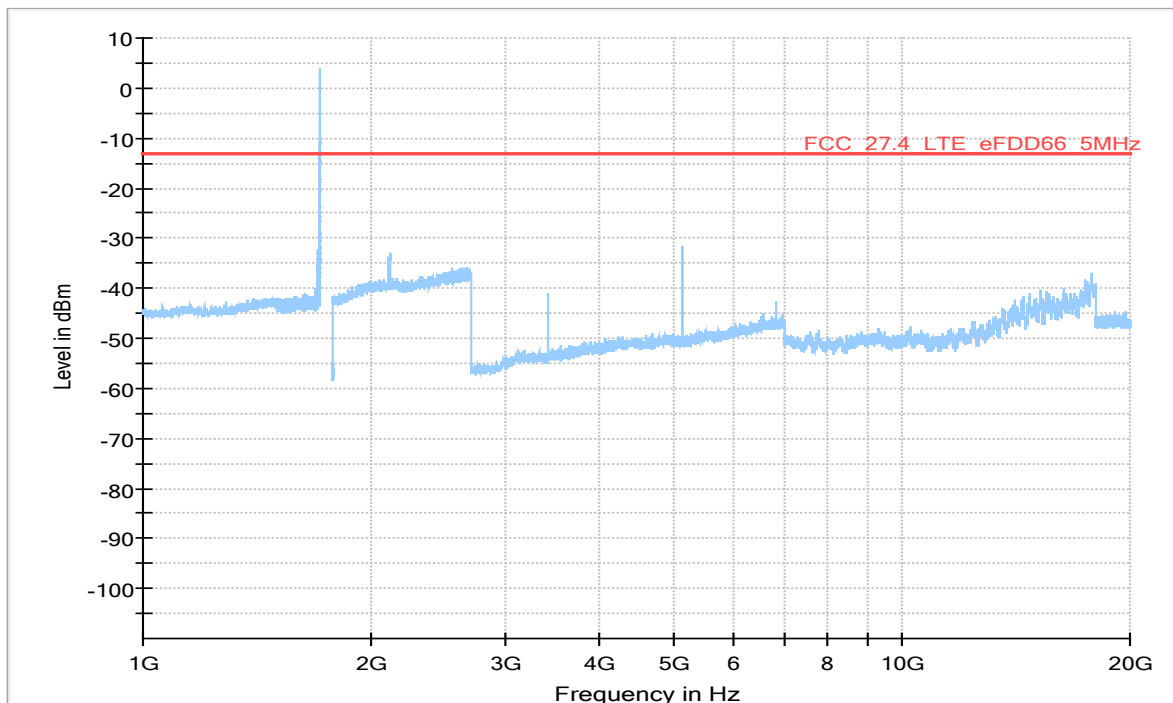
1 GHz – 10 GHz



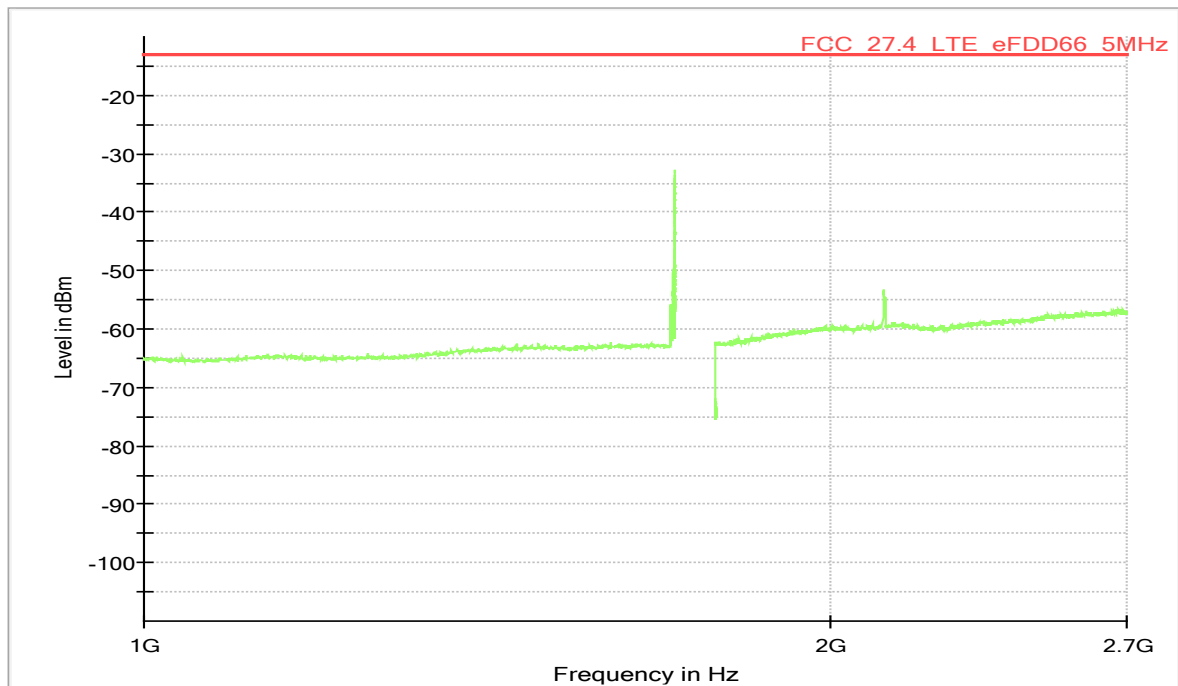
LTE eFDD 66, Channel = low
30 MHz – 1 GHz



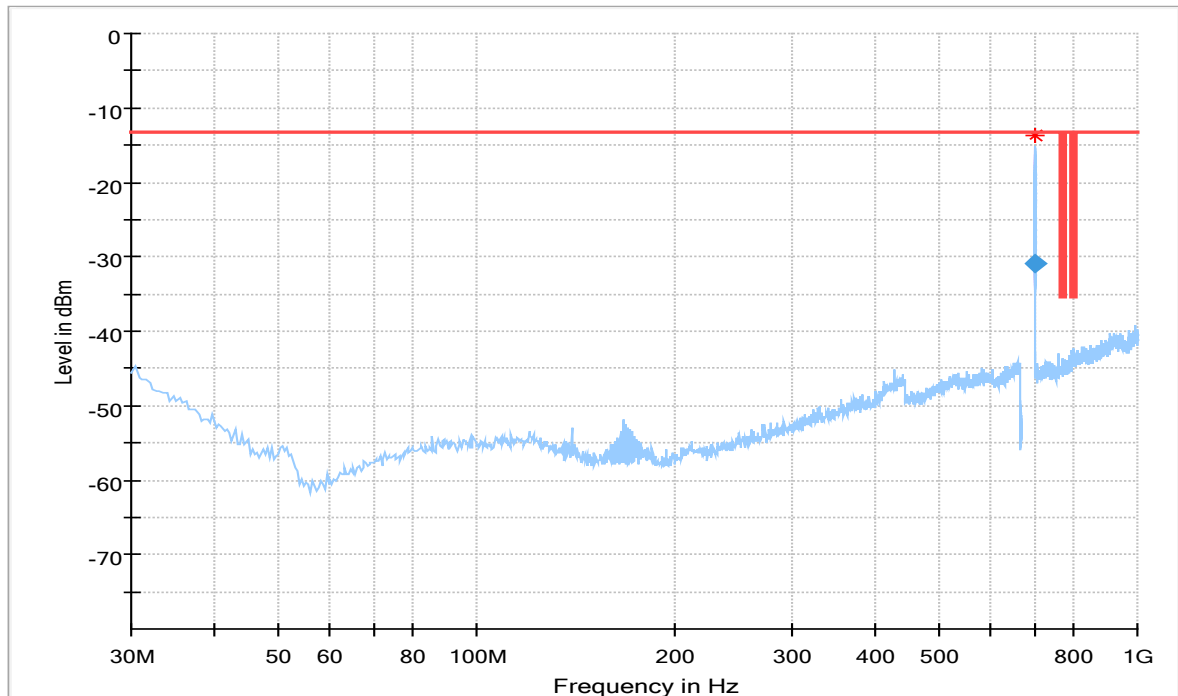
1 GHz – 20 GHz



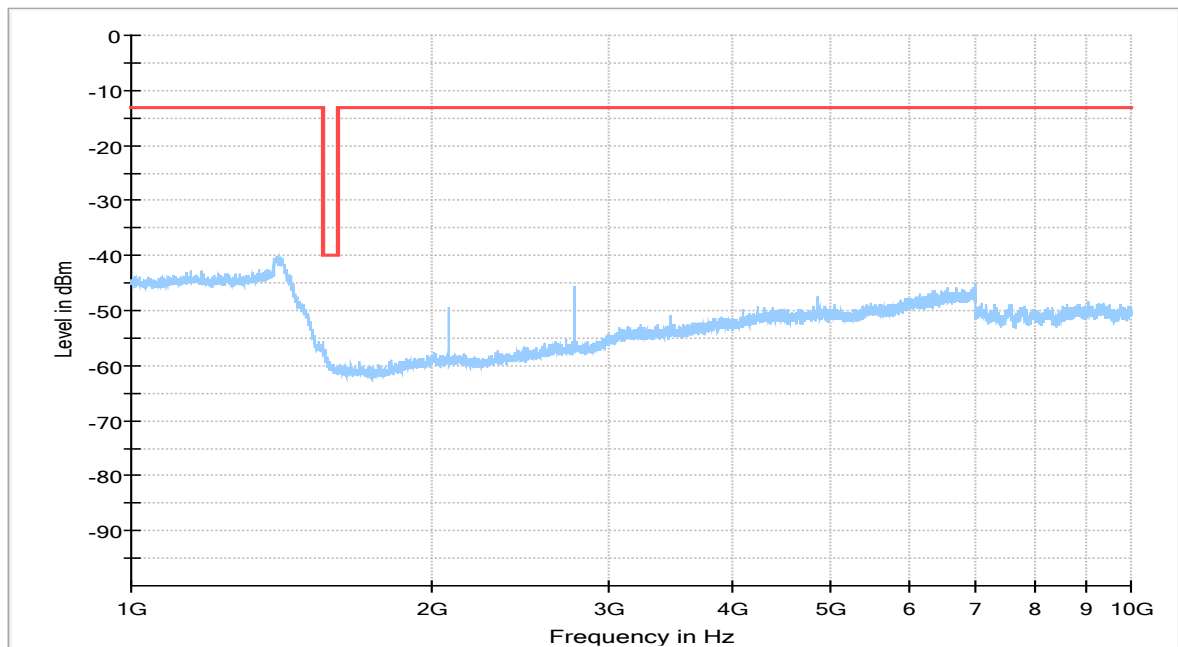
re-measurement at carrier



LTE eFDD 71, Channel = high
30 MHz – 1 GHz



1 GHz – 10 GHz



5.18.5 TEST EQUIPMENT USED

- Radiated Emissions

5.19 EMISSION AND OCCUPIED BANDWIDTH

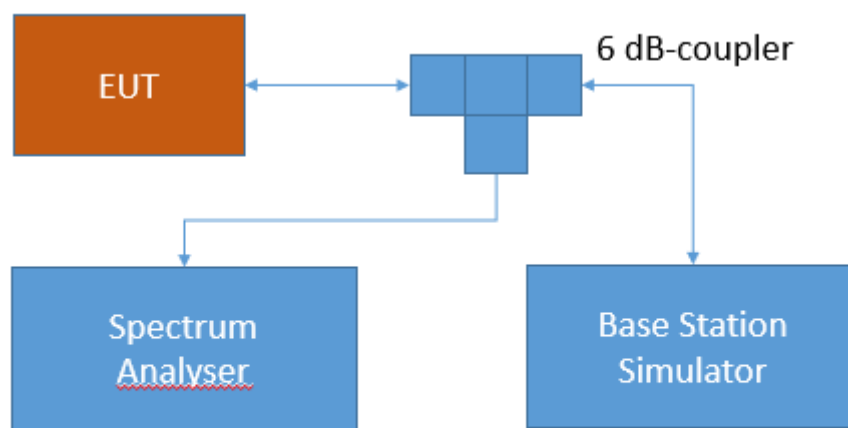
Standard **FCC PART 27 Subpart C**

The test was performed according to:
ANSI C63.26: 2015

5.19.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the applicable conducted spurious emission test case per FCC §2.1049 and RSS-GEN 6.7. The limit and the requirements come from the applicable rule part and ISSED RSS-Standard for the operating band of the cellular device.

The EUT was connected to the test setups according to the following diagram:



Test Setup FCC Part 22/24/27/90 Cellular;
Spurious Emissions at antenna terminal

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

The Spectrum Analyzer settings can be directly found in the measurement diagrams.

5.19.2 TEST REQUIREMENTS / LIMITS

FCC Part 2.1049; Occupied Bandwidth:

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable:

(h) Transmitters employing digital modulation techniques—when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the user.

(i) Transmitters designed for other types of modulation—when modulated by an appropriate signal of sufficient amplitude to be representative of the type of service in which used. A description of the input signal should be supplied.

RSS-GEN; 6.7 Occupied Bandwidth

The emission bandwidth ($\times$ dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated $\times$ dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least $3\times$ the resolution bandwidth.

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured.

The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately $3\times$ RBW.

Note: Video averaging is not permitted.

A peak, or peak hold, may be used in place of the sampling detector as this may produce a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold may be necessary to determine the occupied bandwidth if the device is not transmitting continuously.

The trace data points are recovered and are directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the 99% occupied bandwidth.

5.19.3 TEST PROTOCOL

Ambient temperature: 20 - 28 °C
Relative humidity: 30 - 45 %

Radio Technology	Channel	Ressource Blocks / Subcarrier	Bandwidth [MHz]	Nominal BW [MHz]	99 % BW [kHz]
LTE eFDD 4 QPSK	low	6	1.4	1.4	1110.00
LTE eFDD 4 QPSK	mid	6	1.4	1.4	1104.00
LTE eFDD 4 QPSK	high	6	1.4	1.4	1098.00
LTE eFDD 4 16QAM	low	6	1.4	1.4	1098.00
LTE eFDD 4 16QAM	mid	6	1.4	1.4	1098.00
LTE eFDD 4 16QAM	high	6	1.4	1.4	1104.00
LTE eFDD 4 QPSK	low	15	3	3	2736.00
LTE eFDD 4 QPSK	mid	15	3	3	2736.00
LTE eFDD 4 QPSK	high	15	3	3	2748.00
LTE eFDD 4 16QAM	low	15	3	3	2760.00
LTE eFDD 4 16QAM	mid	15	3	3	2724.00
LTE eFDD 4 16QAM	high	15	3	3	2724.00
LTE eFDD 4 QPSK	low	25	5	5	4540.00
LTE eFDD 4 QPSK	mid	25	5	5	4500.00
LTE eFDD 4 QPSK	high	25	5	5	4500.00
LTE eFDD 4 16QAM	low	25	5	5	4500.00
LTE eFDD 4 16QAM	mid	25	5	5	4520.00
LTE eFDD 4 16QAM	high	25	5	5	4540.00
LTE eFDD 4 QPSK	low	50	10	10	9000.00
LTE eFDD 4 QPSK	mid	50	10	10	9000.00
LTE eFDD 4 QPSK	high	50	10	10	8960.00
LTE eFDD 4 16QAM	low	12	10	10	2440.00
LTE eFDD 4 16QAM	mid	12	10	10	2480.00
LTE eFDD 4 16QAM	high	12	10	10	2520.00
LTE eFDD 4 QPSK	low	75	15	15	13440.00
LTE eFDD 4 QPSK	mid	75	15	15	13500.00
LTE eFDD 4 QPSK	high	75	15	15	13380.00
LTE eFDD 4 16QAM	low	18	15	15	3600.00
LTE eFDD 4 16QAM	mid	18	15	15	3660.00
LTE eFDD 4 16QAM	high	18	15	15	3660.00
LTE eFDD 4 QPSK	low	100	20	20	17920.00
LTE eFDD 4 QPSK	mid	100	20	20	18000.00
LTE eFDD 4 QPSK	high	100	20	20	18000.00
LTE eFDD 4 16QAM	low	100	20	20	4080.00
LTE eFDD 4 16QAM	mid	100	20	20	4160.00
LTE eFDD 4 16QAM	high	100	20	20	4080.00
LTE eFDD 12 QPSK	low	6	1.4	1.4	1098.00
LTE eFDD 12 QPSK	mid	6	1.4	1.4	1092.00

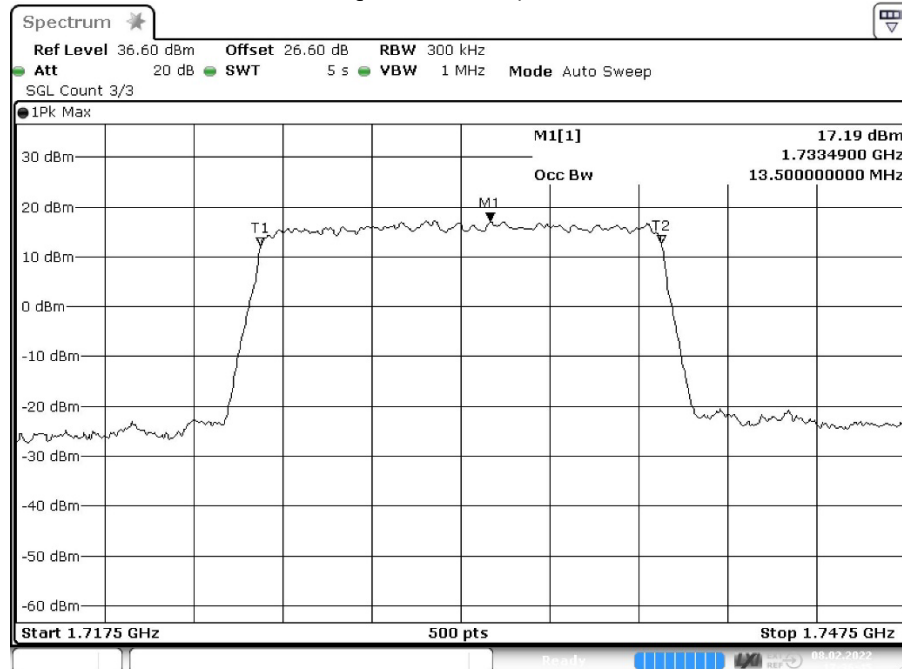
LTE eFDD 12 QPSK	high	6	1.4	1.4	1104.00
LTE eFDD 12 16QAM	low	6	1.4	1.4	1098.00
LTE eFDD 12 16QAM	mid	6	1.4	1.4	1098.00
LTE eFDD 12 16QAM	high	6	1.4	1.4	1098.00
LTE eFDD 12 QPSK	low	15	3	3	2748.00
LTE eFDD 12 QPSK	mid	15	3	3	2736.00
LTE eFDD 12 QPSK	high	15	3	3	2724.00
LTE eFDD 12 16QAM	low	15	3	3	2760.00
LTE eFDD 12 16QAM	mid	15	3	3	2736.00
LTE eFDD 12 16QAM	high	15	3	3	1140.00
LTE eFDD 12 QPSK	low	25	5	5	4520.00
LTE eFDD 12 QPSK	mid	25	5	5	4520.00
LTE eFDD 12 QPSK	high	25	5	5	4480.00
LTE eFDD 12 16QAM	low	25	5	5	4520.00
LTE eFDD 12 16QAM	mid	25	5	5	4520.00
LTE eFDD 12 16QAM	high	25	5	5	4520.00
LTE eFDD 12 QPSK	low	50	10	10	8960.00
LTE eFDD 12 QPSK	mid	50	10	10	8920.00
LTE eFDD 12 QPSK	high	50	10	10	9000.00
LTE eFDD 12 16QAM	low	12	10	10	2520.00
LTE eFDD 12 16QAM	mid	12	10	10	2480.00
LTE eFDD 12 16QAM	high	12	10	10	2440.00
LTE eFDD 13 QPSK	low	25	5	5	4480.00
LTE eFDD 13 QPSK	mid	25	5	5	4520.00
LTE eFDD 13 QPSK	high	25	5	5	4500.00
LTE eFDD 13 16QAM	low	25	5	5	4520.00
LTE eFDD 13 16QAM	mid	25	5	5	4500.00
LTE eFDD 13 16QAM	high	25	5	5	4520.00
LTE eFDD 13 QPSK	mid	50	10	10	8920.00
LTE eFDD 13 16QAM	mid	12	10	10	2400.00
LTE eFDD 66 QPSK	low	6	1.4	1.4	1098.00
LTE eFDD 66 QPSK	mid	6	1.4	1.4	1104.00
LTE eFDD 66 QPSK	high	6	1.4	1.4	1098.00
LTE eFDD 66 16QAM	low	6	1.4	1.4	1098.00
LTE eFDD 66 16QAM	mid	6	1.4	1.4	1092.00
LTE eFDD 66 16QAM	high	6	1.4	1.4	1104.00
LTE eFDD 66 QPSK	low	15	3	3	2736.00
LTE eFDD 66 QPSK	mid	15	3	3	2724.00
LTE eFDD 66 QPSK	high	15	3	3	2748.00
LTE eFDD 66 16QAM	low	15	3	3	2760.00
LTE eFDD 66 16QAM	mid	15	3	3	2736.00
LTE eFDD 66 16QAM	high	15	3	3	2724.00
LTE eFDD 66 QPSK	low	25	5	5	4540.00
LTE eFDD 66 QPSK	mid	25	5	5	4500.00
LTE eFDD 66 QPSK	high	25	5	5	4500.00
LTE eFDD 66 16QAM	low	25	5	5	4500.00
LTE eFDD 66 16QAM	mid	25	5	5	4520.00

LTE eFDD 66 16QAM	high	25	5	5	4520.00
LTE eFDD 66 QPSK	low	50	10	10	9000.00
LTE eFDD 66 QPSK	mid	50	10	10	9000.00
LTE eFDD 66 QPSK	high	50	10	10	8960.00
LTE eFDD 66 16QAM	low	12	10	10	2440.00
LTE eFDD 66 16QAM	mid	12	10	10	2480.00
LTE eFDD 66 16QAM	high	12	10	10	2520.00
LTE eFDD 66 QPSK	low	75	15	15	13440.00
LTE eFDD 66 QPSK	mid	75	15	15	13440.00
LTE eFDD 66 QPSK	high	75	15	15	13440.00
LTE eFDD 66 16QAM	low	18	15	15	3660.00
LTE eFDD 66 16QAM	mid	18	15	15	3660.00
LTE eFDD 66 16QAM	high	18	15	15	3600.00
LTE eFDD 66 QPSK	low	100	20	20	17920.00
LTE eFDD 66 QPSK	mid	100	20	20	17920.00
LTE eFDD 66 QPSK	high	100	20	20	18000.00
LTE eFDD 66 16QAM	low	18	20	20	4080.00
LTE eFDD 66 16QAM	mid	18	20	20	4080.00
LTE eFDD 66 16QAM	high	18	20	20	4080.00
LTE eFDD 71 QPSK	low	25	5	5	4480.00
LTE eFDD 71 QPSK	mid	25	5	5	4520.00
LTE eFDD 71 QPSK	high	25	5	5	4500.00
LTE eFDD 71 16QAM	low	25	5	5	9520.00
LTE eFDD 71 16QAM	mid	25	5	5	4500.00
LTE eFDD 71 16QAM	high	25	5	5	1800.00
LTE eFDD 71 QPSK	low	50	10	10	8960.00
LTE eFDD 71 QPSK	mid	50	10	10	8960.00
LTE eFDD 71 QPSK	high	50	10	10	9000.00
LTE eFDD 71 16QAM	low	12	10	10	2440.00
LTE eFDD 71 16QAM	mid	12	10	10	2520.00
LTE eFDD 71 16QAM	high	12	10	10	2440.00
LTE eFDD 71 QPSK	low	75	15	15	13440.00
LTE eFDD 71 QPSK	mid	75	15	15	13380.00
LTE eFDD 71 QPSK	high	75	15	15	13440.00
LTE eFDD 71 16QAM	low	18	15	15	3600.00
LTE eFDD 71 16QAM	mid	18	15	15	3600.00
LTE eFDD 71 16QAM	high	18	15	15	3600.00
LTE eFDD 71 QPSK	mid	100	20	20	17920.00
LTE eFDD 71 QPSK	high	18	20	20	18000.00
LTE eFDD 71 16QAM	mid	18	20	20	4080.00

Remark: Please see next sub-clause for the measurement plot.

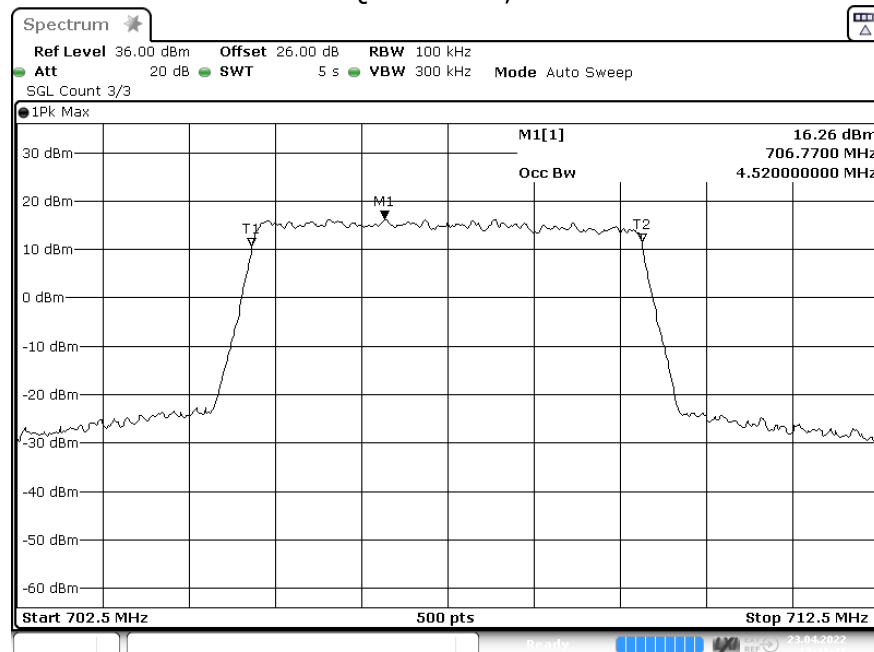
5.19.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

LTE eFDD4 QPSK 15MHz, Channel = mid



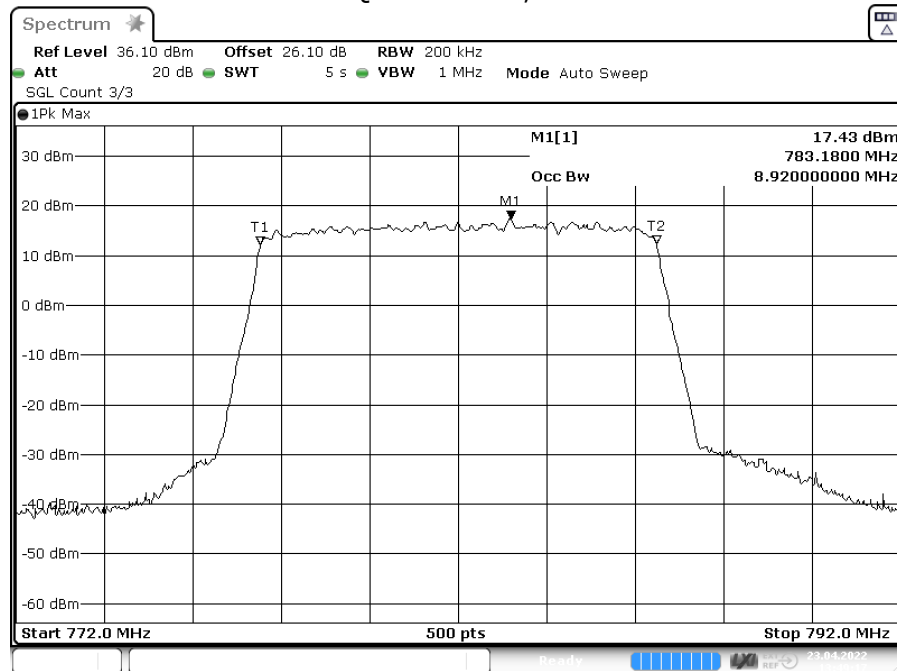
Date: 8.FEB.2022 17:36:45

LTE eFDD12 QPSK 5MHz, Channel = mid



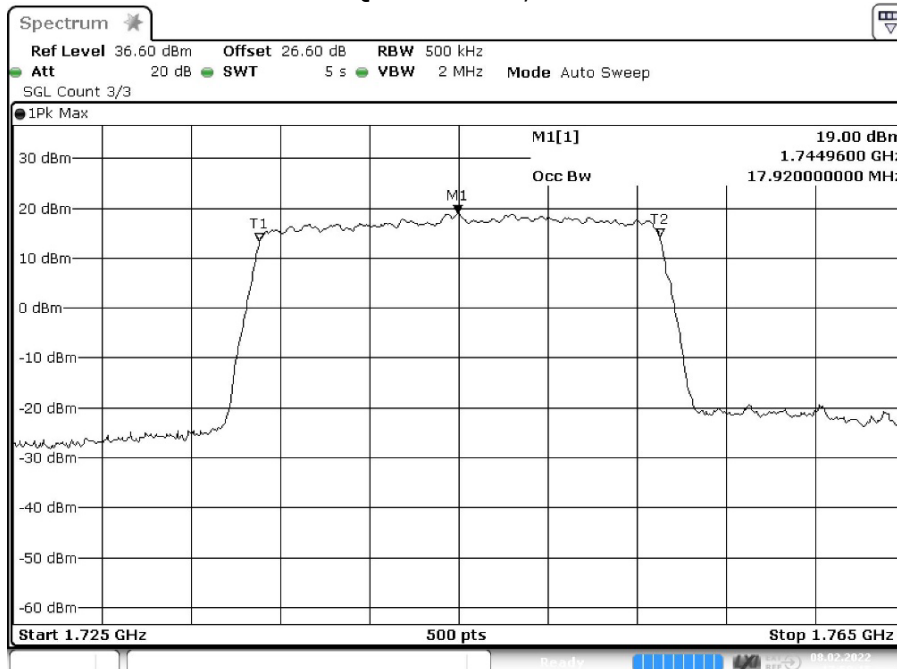
Date: 23.APR.2022 13:41:42

LTE eFDD13 QPSK 10MHz, Channel = mid

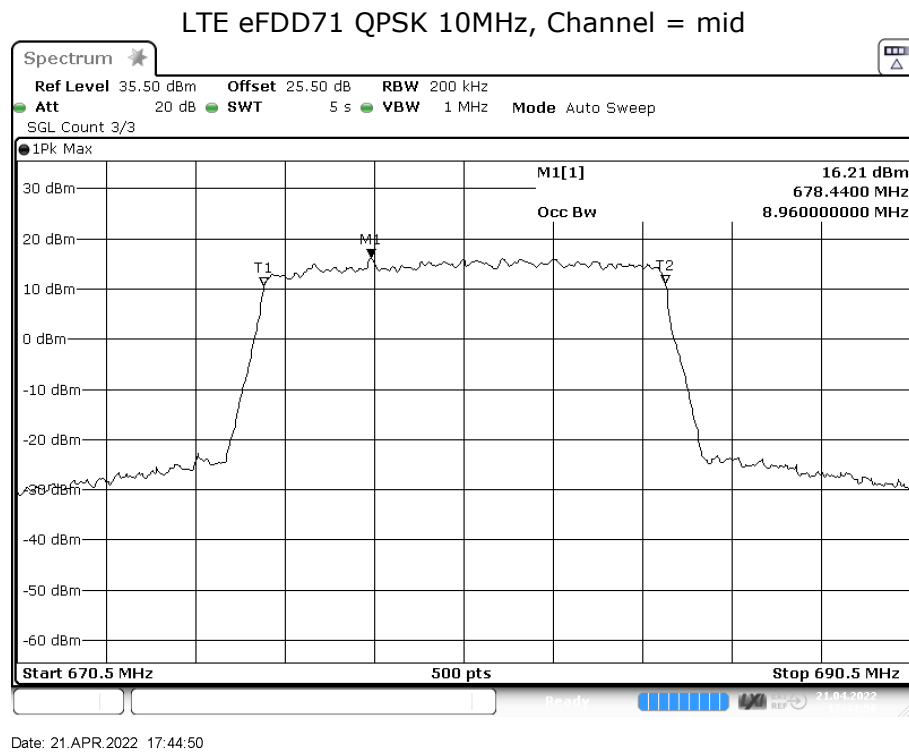


Date: 23.APR.2022 13:49:18

LTE eFDD66 QPSK 20MHz, Channel = mid



Date: 8.FEB.2022 17:59:16



5.19.5 TEST EQUIPMENT USED

- Radio Lab

5.20 BAND EDGE COMPLIANCE

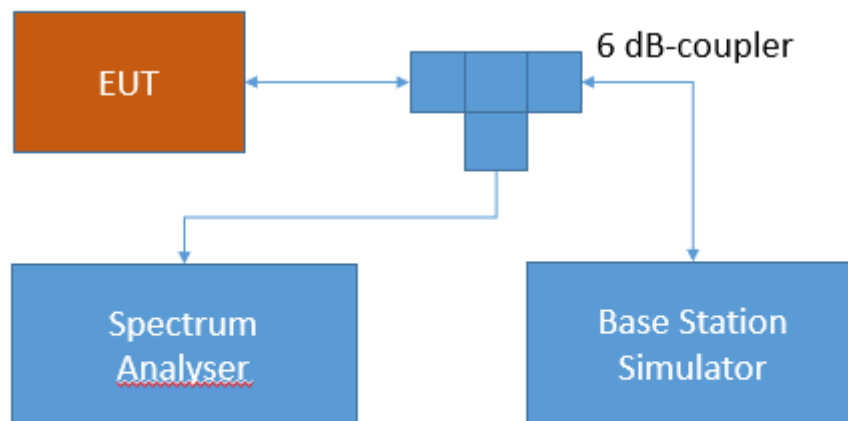
Standard **FCC PART 27 Subpart C**

The test was performed according to:
ANSI C63.26: 2015

5.20.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the applicable conducted spurious emission test case per § 2.1051 and RSS-GEN 6.13. The limit comes from the applicable rule part and ISSED RSS-Standard for the operating band of the cellular device.

The EUT was connected to the test setup according to the following diagram:



Test Setup FCC Part 22/24/27/90 Cellular;
Band edge compliance

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

The Spectrum Analyzer settings can be directly found in the measurement diagrams.

5.20.2 TEST REQUIREMENTS / LIMITS

FCC Part 2.1051; Measurement required: Spurious emissions at antenna terminal:

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in §2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

FCC Part 27; Miscellaneous Wireless Communication Services

Subpart C – Technical standards

§27.53 - Emission limits

Band 13

(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

- a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:
 - i. $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment and
 - ii. $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment
- b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

Band 12:

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

- a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:
 - i. $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment and
 - ii. $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment
- b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

Band 4/66:

(h) *AWS emission limits— (1) General protection levels.* Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.

RSS-139; 6.6 Transmitter Unwanted Emissions

Equipment shall comply with the limits in (i) and (ii) below.

- i. In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10} p$ (watts) dB.
- ii. After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10} p$ (watts) dB.

Band 71:

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130; 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130; 4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

- a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:
 - i. $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment and
 - ii. $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment
- b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

5.20.3 TEST PROTOCOL

Ambient temperature: 20 - 28 °C
Relative humidity: 30 - 45 %

Radio Technology	Channel	Resource Blocks	Bandwidth [MHz]	Peak [dBm]	Average [dBm]	RMS [dBm]	Limit /dBm	Margin to Limit /dB
LTE eFDD 4 QPSK	low	6	1.4	-18.69	-31.40	-29.60	-13	16.60
LTE eFDD 4 QPSK	high	6	1.4	-17.64	-28.84	-27.31	-13	14.31
LTE eFDD 4 16QAM	low	6	1.4	-21.18	-31.73	-30.03	-13	17.03
LTE eFDD 4 16QAM	high	6	1.4	-20.36	-29.99	-28.32	-13	15.32
LTE eFDD 4 QPSK	low	15	3	-15.83	-30.72	-27.29	-13	14.29
LTE eFDD 4 QPSK	high	15	3	-16.27	-30.09	-27.85	-13	14.85
LTE eFDD 4 16QAM	low	15	3	-17.53	-32.00	-29.08	-13	16.08
LTE eFDD 4 16QAM	high	15	3	-17.38	-30.31	-28.25	-13	15.25
LTE eFDD 4 QPSK	low	25	5	-15.34	-33.49	-28.89	-13	15.89
LTE eFDD 4 QPSK	high	25	5	-14.86	-30.57	-27.71	-13	14.71
LTE eFDD 4 16QAM	low	25	5	-15.54	-33.66	-29.66	-13	16.66
LTE eFDD 4 16QAM	high	25	5	-15.79	-30.63	-27.90	-13	14.90
LTE eFDD 4 QPSK	low	50	10	-16.93	-35.46	-32.11	-13	19.11
LTE eFDD 4 QPSK	high	50	10	-17.79	-32.71	-30.48	-13	17.48
LTE eFDD 4 16QAM	low	12	10	-14.37	-31.28	-28.10	-13	15.10
LTE eFDD 4 16QAM	high	12	10	-10.46	-26.63	-24.59	-13	11.59
LTE eFDD 4 QPSK	low	75	15	-14.67	-35.06	-32.89	-13	19.89
LTE eFDD 4 QPSK	high	75	15	-16.31	-31.67	-29.87	-13	16.87
LTE eFDD 4 16QAM	low	18	15	-13.18	-31.80	-29.50	-13	16.50
LTE eFDD 4 16QAM	high	18	15	-12.73	-27.27	-25.40	-13	12.40
LTE eFDD 4 QPSK	low	100	20	-21.66	-35.94	-34.50	-13	21.50
LTE eFDD 4 QPSK	high	100	20	-18.43	-34.47	-32.78	-13	19.78
LTE eFDD 4 16QAM	low	18	20	-18.59	-31.77	-30.20	-13	17.20
LTE eFDD 4 16QAM	high	18	20	-12.43	-27.50	-25.79	-13	12.79
LTE eFDD 12 QPSK	low	6	1.4	-16.54	-28.82	-26.78	-13	13.78
LTE eFDD 12 QPSK	high	6	1.4	-18.05	-30.34	-28.25	-13	15.25
LTE eFDD 12 16QAM	low	6	1.4	-17.63	-29.79	-27.66	-13	14.66
LTE eFDD 12 16QAM	high	6	1.4	-20.94	-32.01	-30.00	-13	17.00
LTE eFDD 12 QPSK	low	15	3	-16.10	-29.44	-27.01	-13	14.01
LTE eFDD 12 QPSK	high	15	3	-18.60	-32.53	-29.97	-13	16.97
LTE eFDD 12 16QAM	low	15	3	-18.31	-31.68	-28.93	-13	15.93
LTE eFDD 12 16QAM	high	15	3	-19.71	-33.59	-30.69	-13	17.69
LTE eFDD 12 QPSK	low	25	5	-16.15	-31.67	-28.88	-13	15.88
LTE eFDD 12 QPSK	high	25	5	-16.45	-33.18	-29.60	-13	16.60
LTE eFDD 12 16QAM	low	25	5	-16.27	-32.92	-30.05	-13	17.05
LTE eFDD 12 16QAM	high	25	5	-16.67	-34.17	-30.45	-13	17.45
LTE eFDD 12 QPSK	low	50	10	-11.30	-31.00	-28.44	-13	15.44
LTE eFDD 12 QPSK	high	50	10	-10.80	-31.05	-28.62	-13	15.62

LTE eFDD 12 16QAM	low	12	10	-7.19	-25.78	-23.23	-13	10.23
LTE eFDD 12 16QAM	high	12	10	-7.26	-27.53	-24.45	-13	11.45
LTE eFDD 13 QPSK	low	6	5	-22.72	-36.53	-33.55	-13	20.55
LTE eFDD 13 QPSK	high	6	5	-20.28	-36.72	-33.16	-13	20.16
LTE eFDD 13 16QAM	low	6	5	-23.41	-38.61	-35.09	-13	22.09
LTE eFDD 13 16QAM	high	6	5	-23.21	-38.08	-34.57	-13	21.57
LTE eFDD 13 QPSK	low	50	10	-29.23	-41.48	-39.42	-13	26.42
LTE eFDD 13 QPSK	high	50	10	-29.23	-41.59	-39.30	-13	26.30
LTE eFDD 13 16QAM	low	12	10	-24.58	-37.84	-35.51	-13	22.51
LTE eFDD 13 16QAM	high	12	10	-24.54	-38.24	-35.58	-13	22.58
LTE eFDD 66 QPSK	low	6	1.4	-17.67	-31.17	-29.07	-13	16.07
LTE eFDD 66 QPSK	high	6	1.4	-20.41	-31.68	-30.18	-13	17.18
LTE eFDD 66 16QAM	low	6	1.4	-20.10	-32.38	-30.26	-13	17.26
LTE eFDD 66 16QAM	high	6	1.4	-19.80	-31.20	-29.56	-13	16.56
LTE eFDD 66 QPSK	low	15	3	-15.98	-30.72	-27.37	-13	14.37
LTE eFDD 66 QPSK	high	15	3	-17.16	-32.19	-29.58	-13	16.58
LTE eFDD 66 16QAM	low	15	3	-18.10	-32.17	-29.12	-13	16.12
LTE eFDD 66 16QAM	high	15	3	-19.15	-32.01	-29.67	-13	16.67
LTE eFDD 66 QPSK	low	25	5	-14.77	-33.49	-28.98	-13	15.98
LTE eFDD 66 QPSK	high	25	5	-15.78	-32.86	-29.33	-13	16.33
LTE eFDD 66 16QAM	low	25	5	-15.90	-33.61	-29.71	-13	16.71
LTE eFDD 66 16QAM	high	25	5	-16.06	-32.54	-29.26	-13	16.26
LTE eFDD 66 QPSK	low	50	10	-17.22	-35.49	-32.19	-13	19.19
LTE eFDD 66 QPSK	high	50	10	-18.50	-34.97	-32.46	-13	19.46
LTE eFDD 66 16QAM	low	12	10	-14.62	-31.44	-28.21	-13	15.21
LTE eFDD 66 16QAM	high	12	10	-14.58	-29.59	-27.77	-13	14.77
LTE eFDD 66 QPSK	low	75	15	-14.57	-35.23	-32.78	-13	19.78
LTE eFDD 66 QPSK	high	75	15	-17.58	-33.40	-31.62	-13	18.62
LTE eFDD 66 16QAM	low	18	15	-13.47	-31.53	-29.35	-13	16.35
LTE eFDD 66 16QAM	high	18	15	-14.58	-29.59	-27.77	-13	14.77
LTE eFDD 66 QPSK	low	100	20	-21.97	-36.77	-35.17	-13	22.17
LTE eFDD 66 QPSK	high	100	20	-23.41	-35.65	-34.11	-13	21.11
LTE eFDD 66 16QAM	low	18	20	-18.57	-32.00	-30.29	-13	17.29
LTE eFDD 66 16QAM	high	18	20	-17.05	-30.23	-28.69	-13	15.69
LTE eFDD 71 QPSK	low	25	5	-12.95	-32.12	-27.98	-13	14.98
LTE eFDD 71 QPSK	high	25	5	-9.76	-30.49	-26.18	-13	13.18
LTE eFDD 71 16QAM	low	25	5	-11.48	-33.42	-29.11	-13	16.11
LTE eFDD 71 16QAM	high	25	5	-12.77	-31.69	-27.38	-13	14.38
LTE eFDD 71 QPSK	low	50	10	-12.60	-34.40	-30.95	-13	17.95
LTE eFDD 71 QPSK	high	50	10	-11.18	-31.61	-29.30	-13	16.30
LTE eFDD 71 16QAM	low	12	10	-8.48	-28.66	-25.55	-13	12.55
LTE eFDD 71 16QAM	high	12	10	-7.32	-26.56	-24.11	-13	11.11
LTE eFDD 71 QPSK	low	75	15	-14.86	-34.75	-32.68	-13	19.68
LTE eFDD 71 QPSK	high	75	15	-14.66	-32.04	-30.11	-13	17.11
LTE eFDD 71 16QAM	low	18	15	-12.24	-31.89	-29.11	-13	16.11
LTE eFDD 71 16QAM	high	18	15	-9.77	-29.82	-27.03	-13	14.03
LTE eFDD 71 QPSK	low	100	20	-16.06	-33.66	-32.06	-13	19.06

LTE eFDD 71 QPSK	high	100	20	-13.28	-31.66	-29.86	-13	16.86
LTE eFDD 71 16QAM	low	18	20	-7.38	-29.71	-27.27	-13	14.27
LTE eFDD 71 16QAM	high	18	20	-8.75	-26.87	-25.07	-13	12.07

Remark: Please see next sub-clause for the measurement plot.