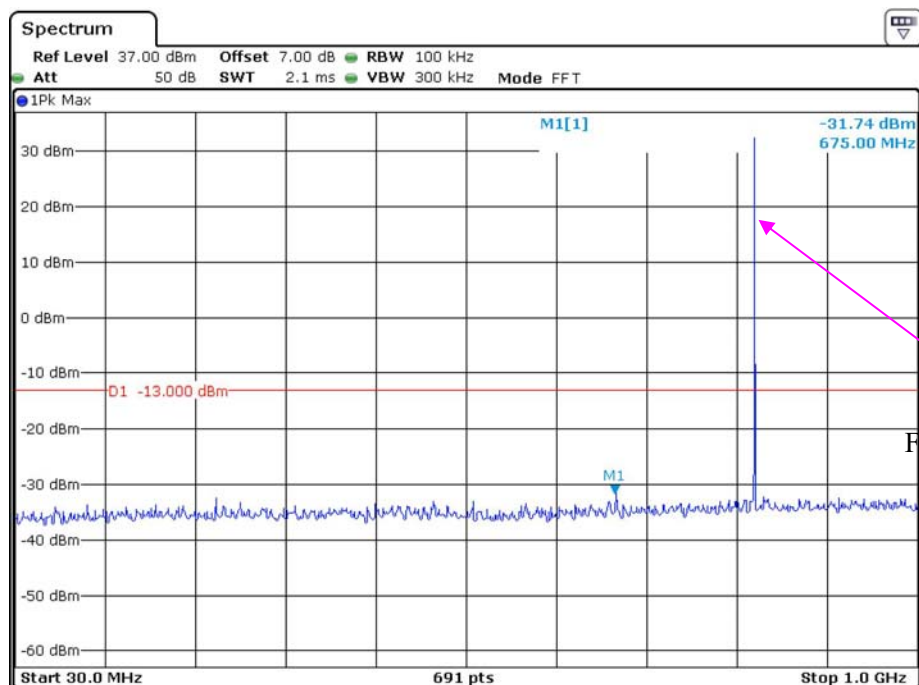
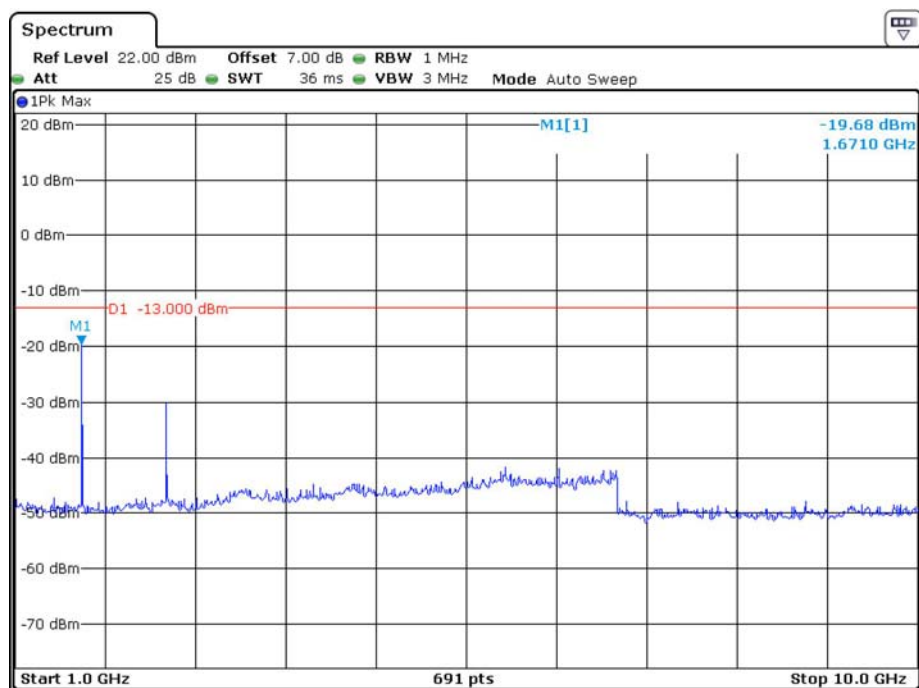


**Cellular Band
Low Channel:****30 MHz – 1 GHz (GSM Mode)**

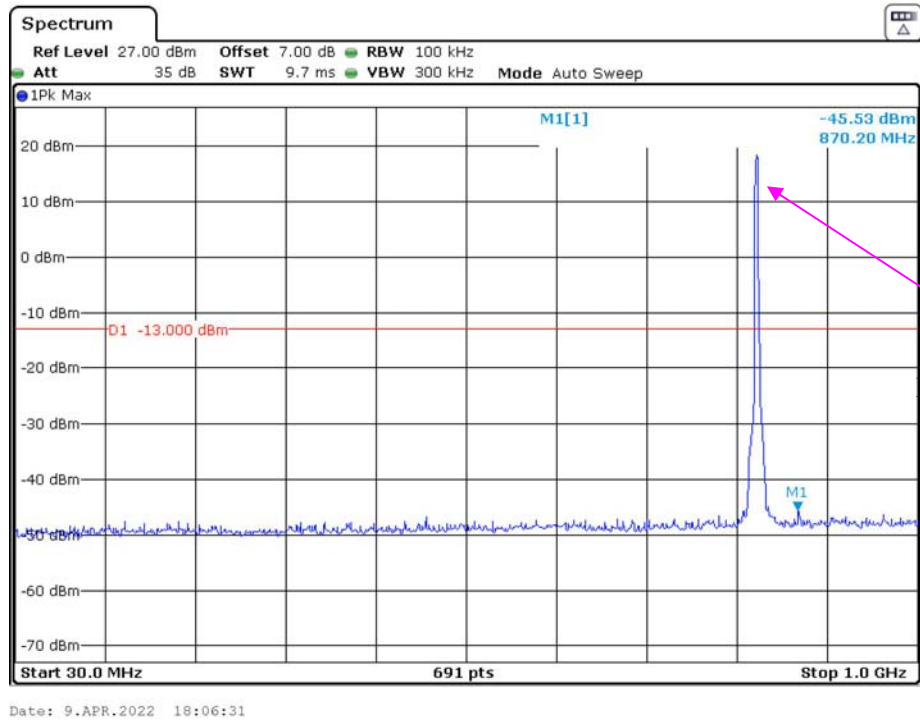
Date: 9.APR.2022 17:16:13

Fundamental test

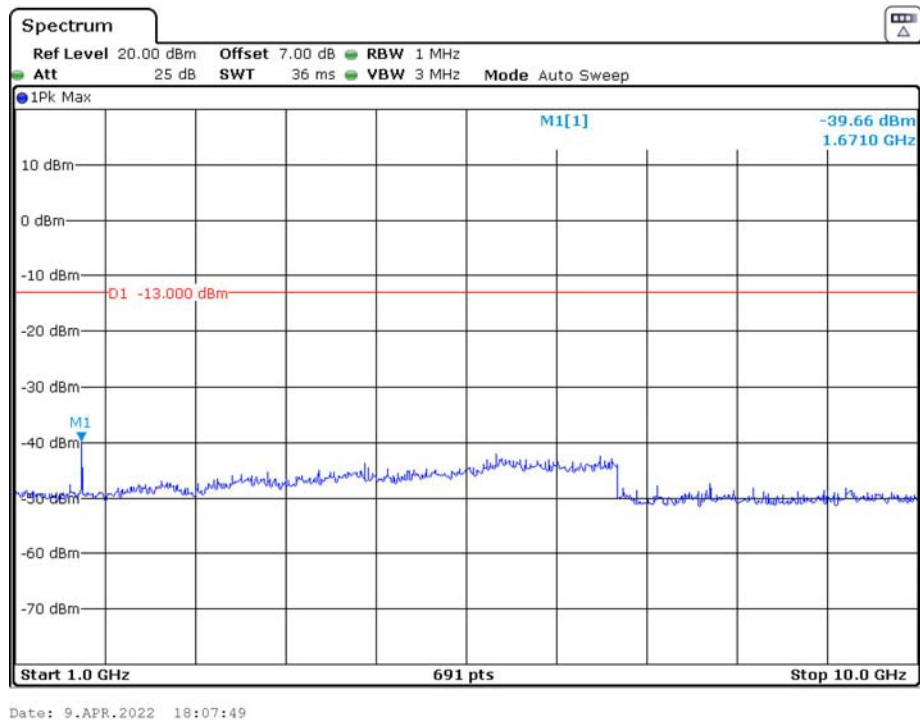
1 GHz – 10 GHz (GSM Mode)

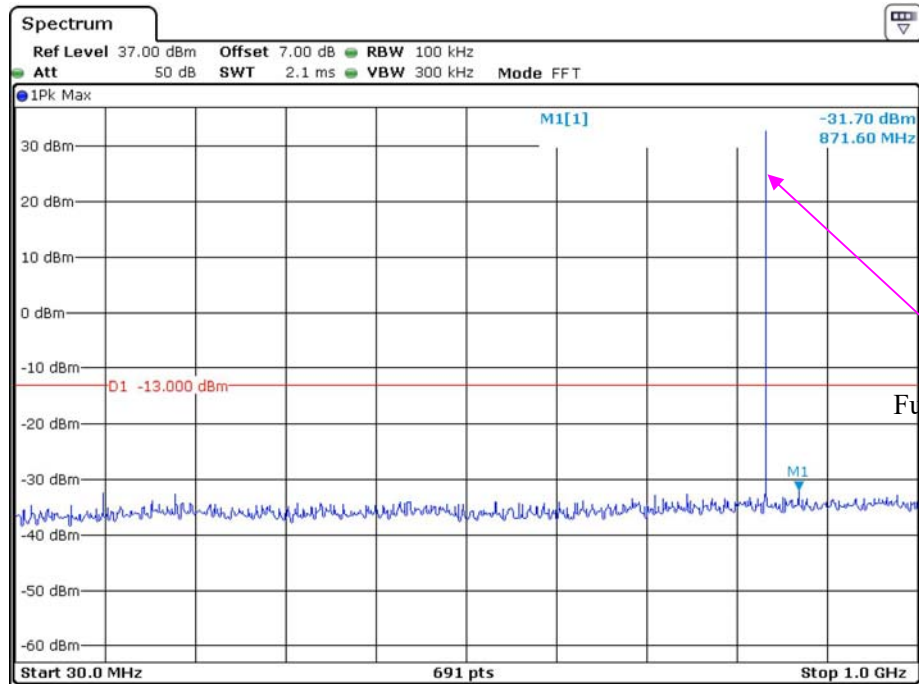
Date: 9.APR.2022 17:19:55

30 MHz – 1 GHz (WCDMA Mode)



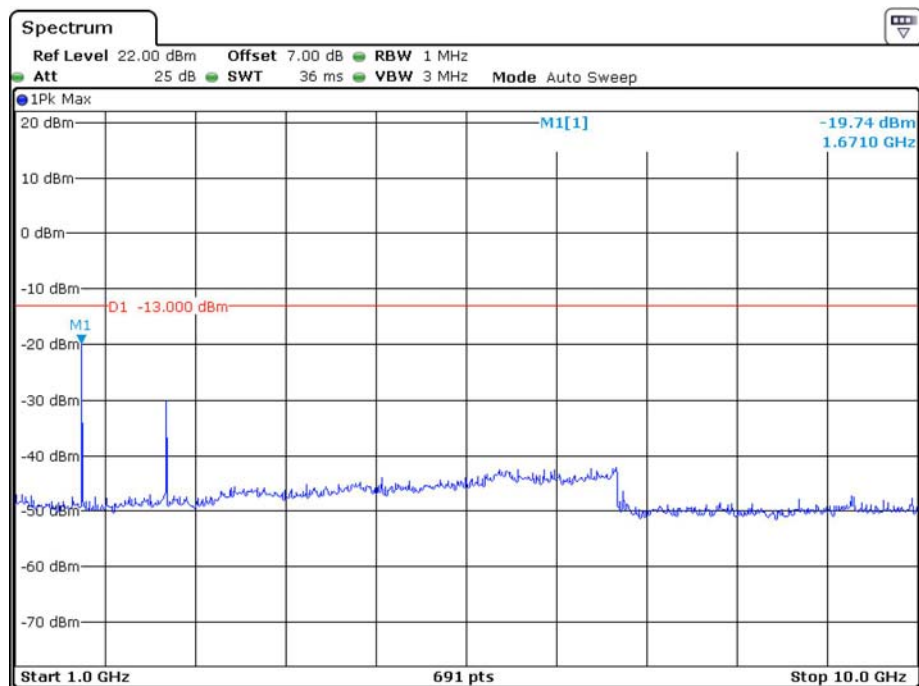
1 GHz – 10 GHz (WCDMA Mode)



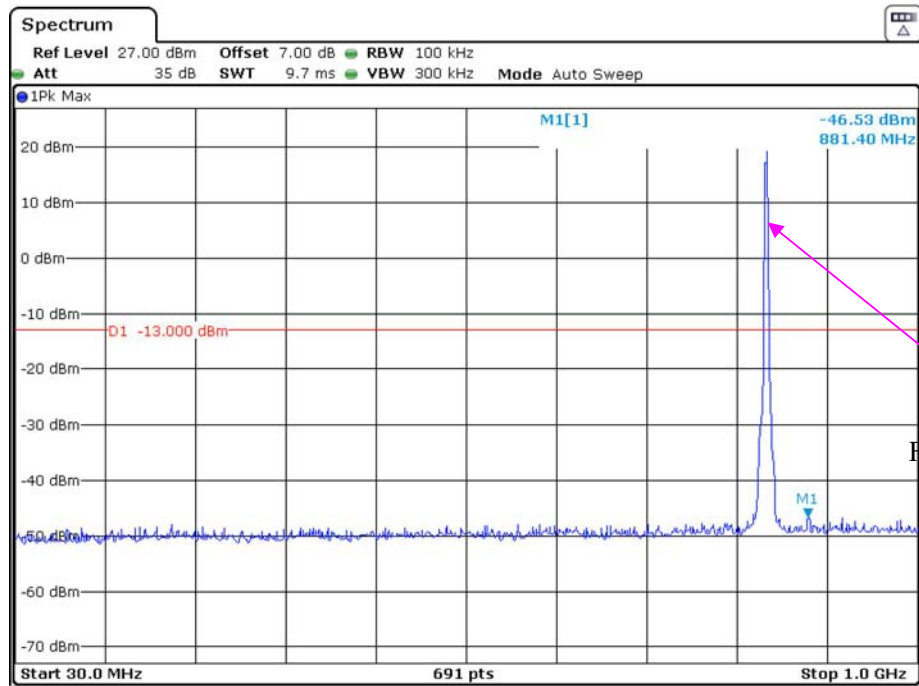
Middle Channel:**30 MHz – 1 GHz (GSM Mode)**

Date: 9.APR.2022 17:15:31

Fundamental test

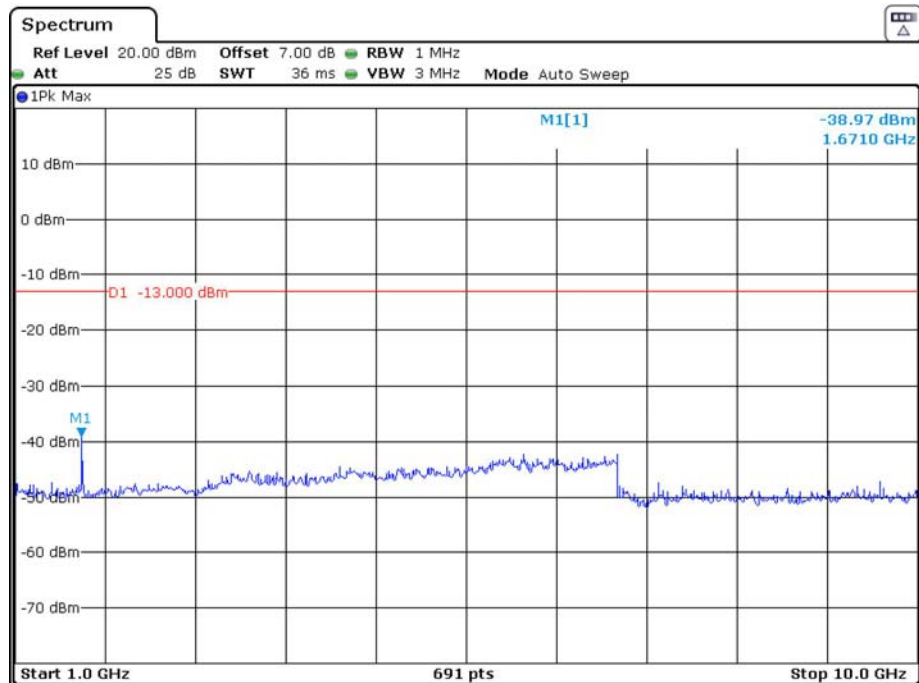
1 GHz – 10 GHz (GSM Mode)

Date: 9.APR.2022 17:19:48

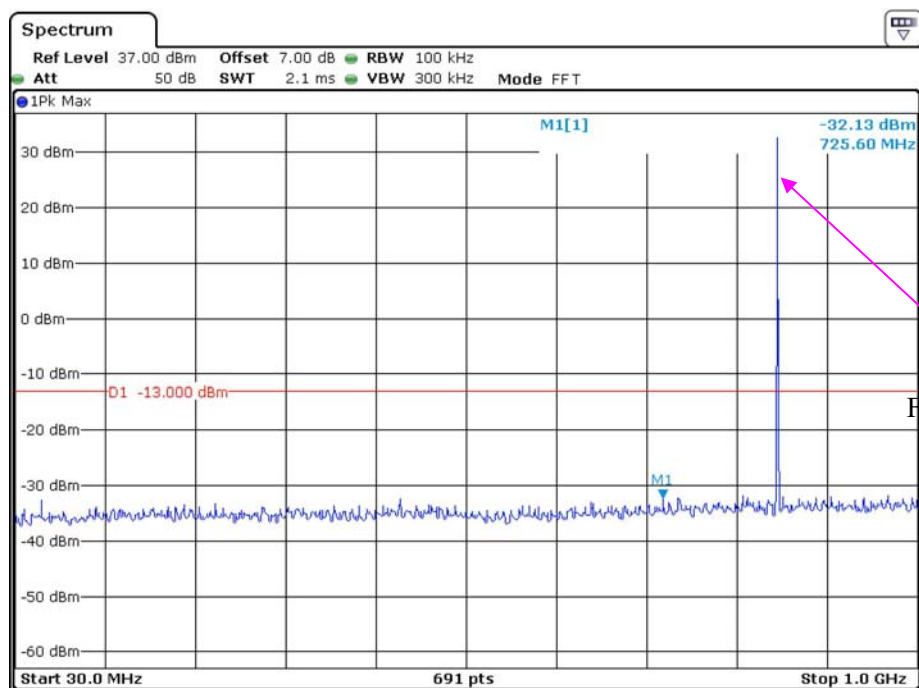
30 MHz – 1 GHz (WCDMA Mode)

Date: 9.APR.2022 18:06:45

Fundamental test

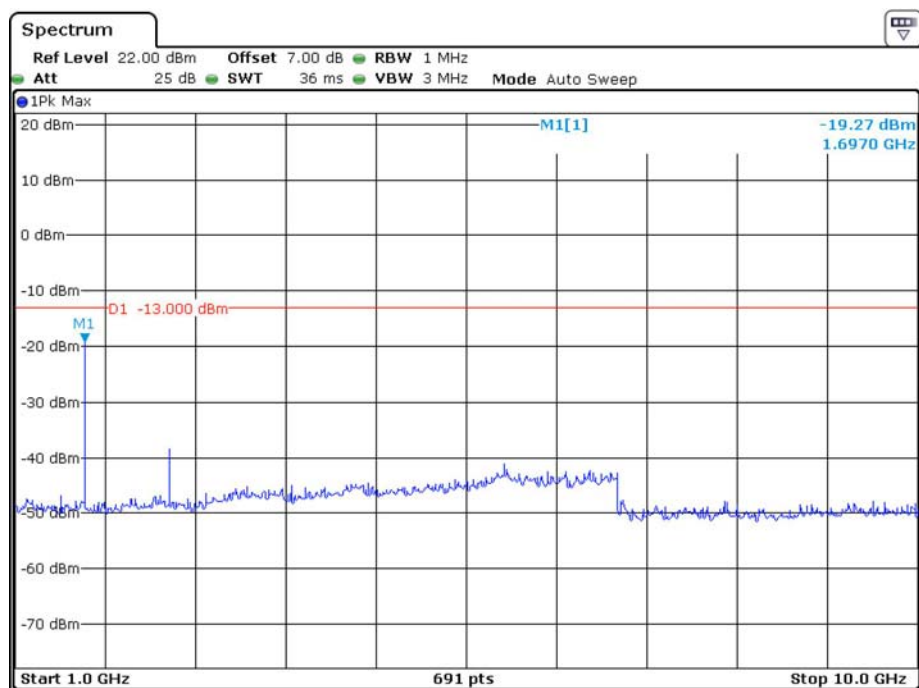
1 GHz – 10 GHz (WCDMA Mode)

Date: 9.APR.2022 18:07:40

High Channel:**30 MHz – 1 GHz (GSM Mode)**

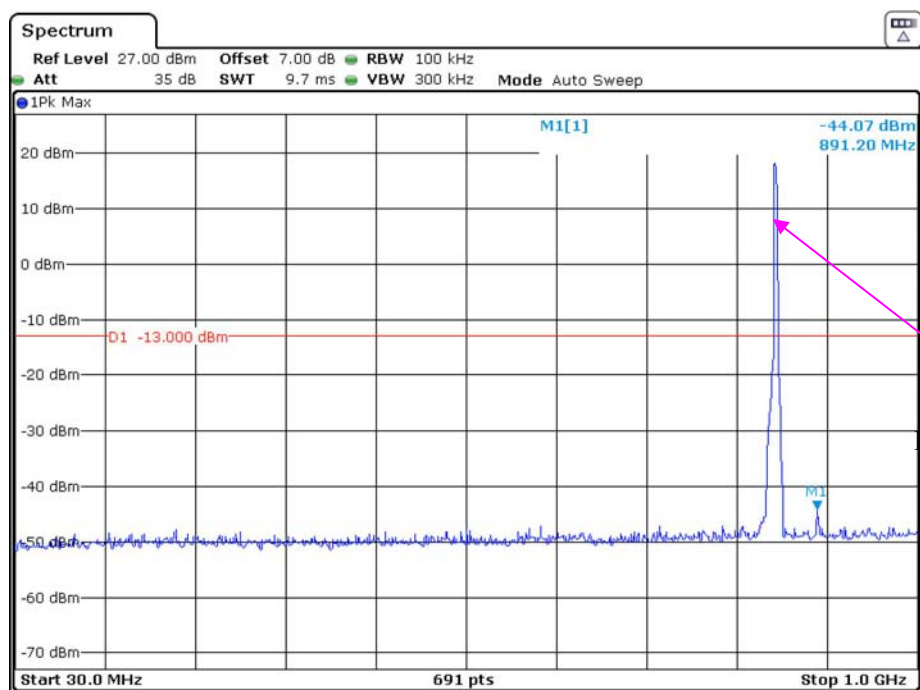
Date: 9.APR.2022 17:14:22

Fundamental test

1 GHz – 10 GHz (GSM Mode)

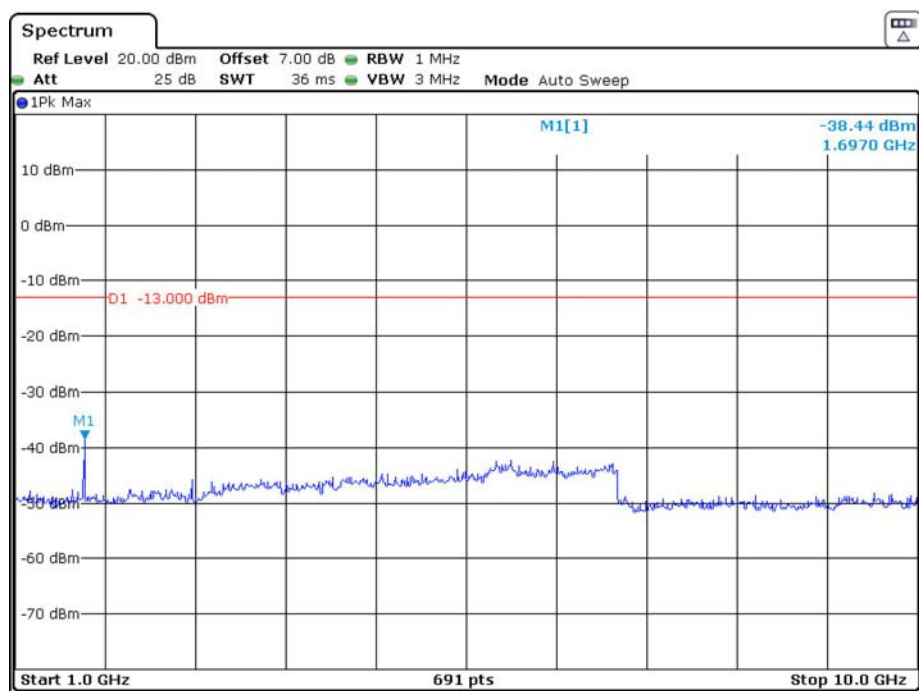
Date: 9.APR.2022 17:19:36

30 MHz – 1 GHz (WCDMA Mode)

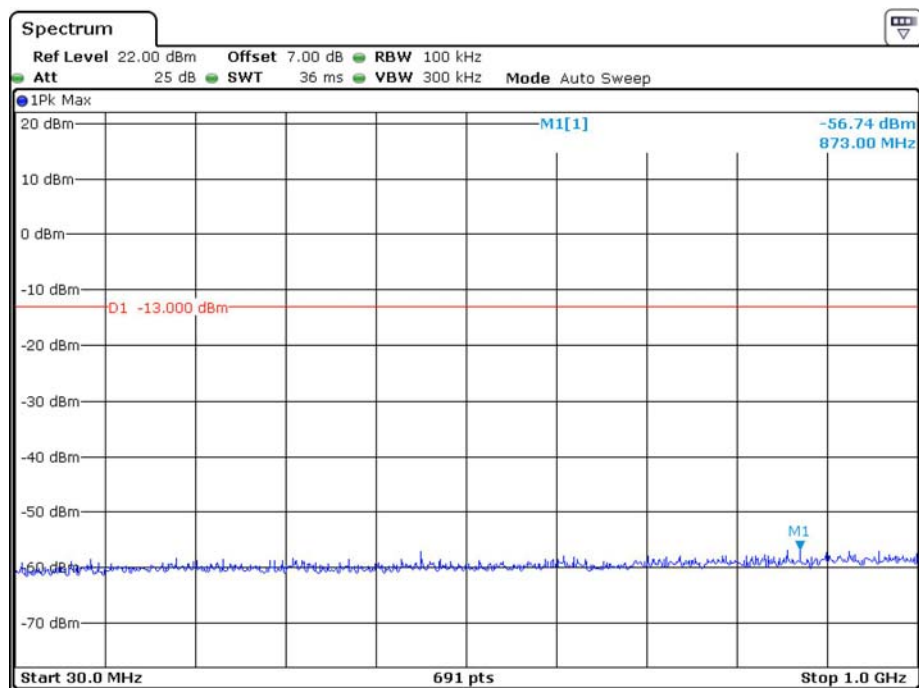


Date: 9.APR.2022 18:07:00

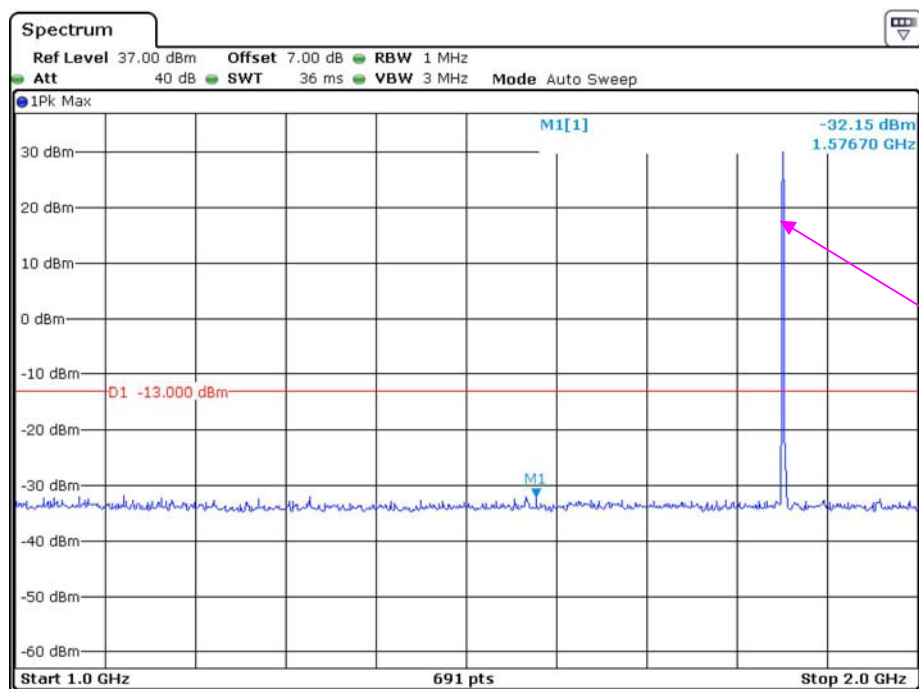
1 GHz – 10 GHz (WCDMA Mode)



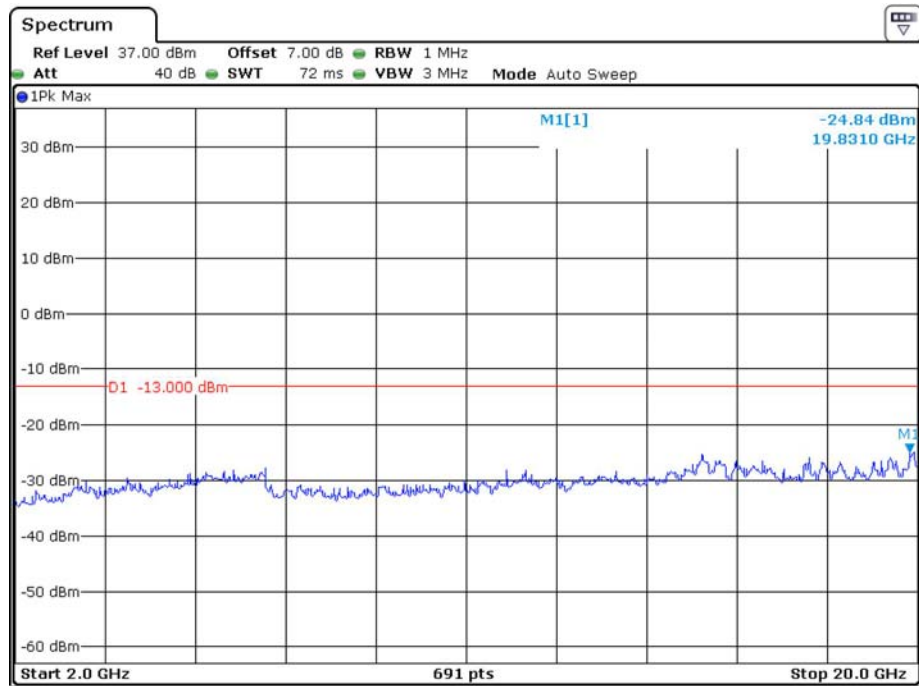
Date: 9.APR.2022 18:07:29

**PCS Band
Low Channel:****30 MHz – 1 GHz (GSM Mode)**

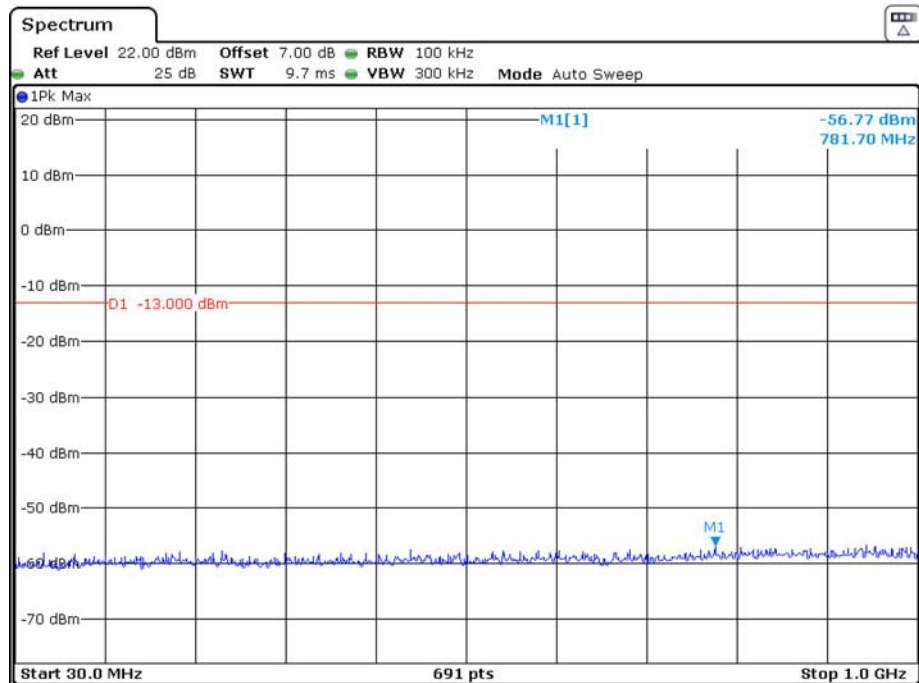
Date: 9.APR.2022 17:24:57

1 GHz – 2 GHz (GSM Mode)

Date: 9.APR.2022 17:26:22

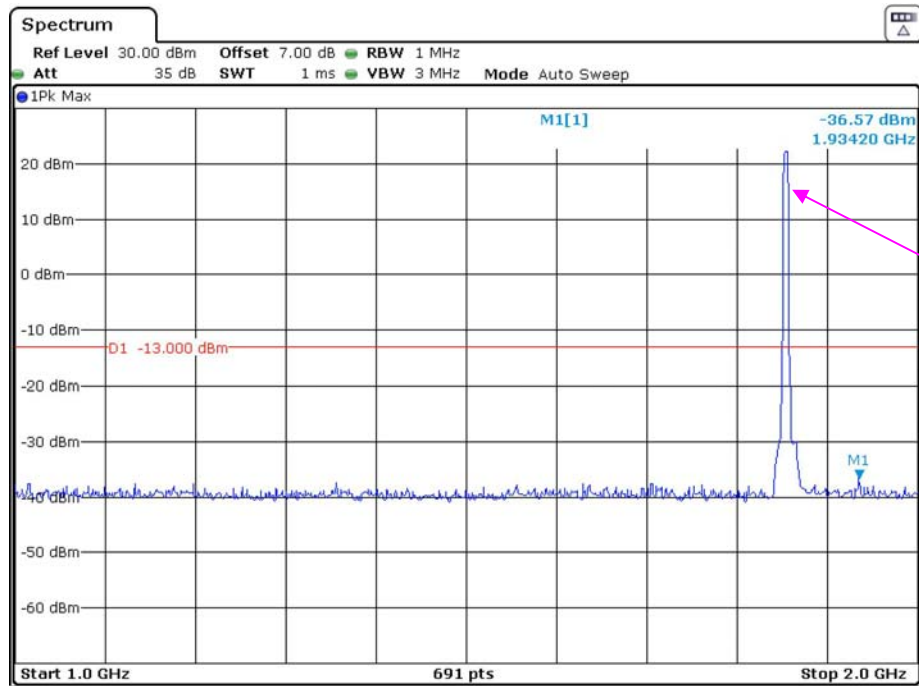
2 GHz – 20 GHz (GSM Mode)

Date: 9.APR.2022 17:28:33

30 MHz – 1 GHz (WCDMA Mode)

Date: 9.APR.2022 17:44:05

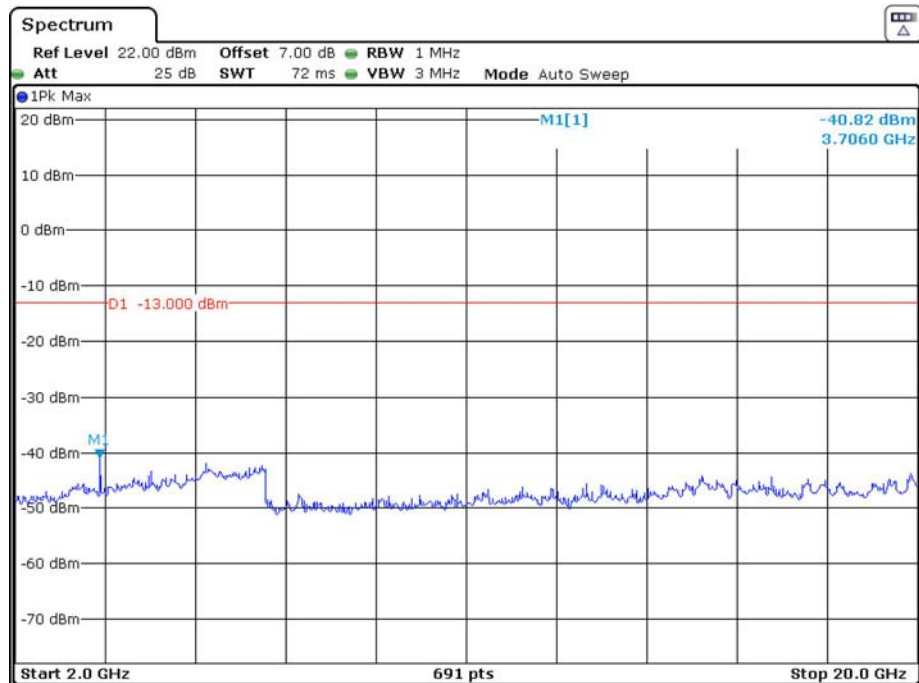
1 GHz – 2 GHz (WCDMA Mode)



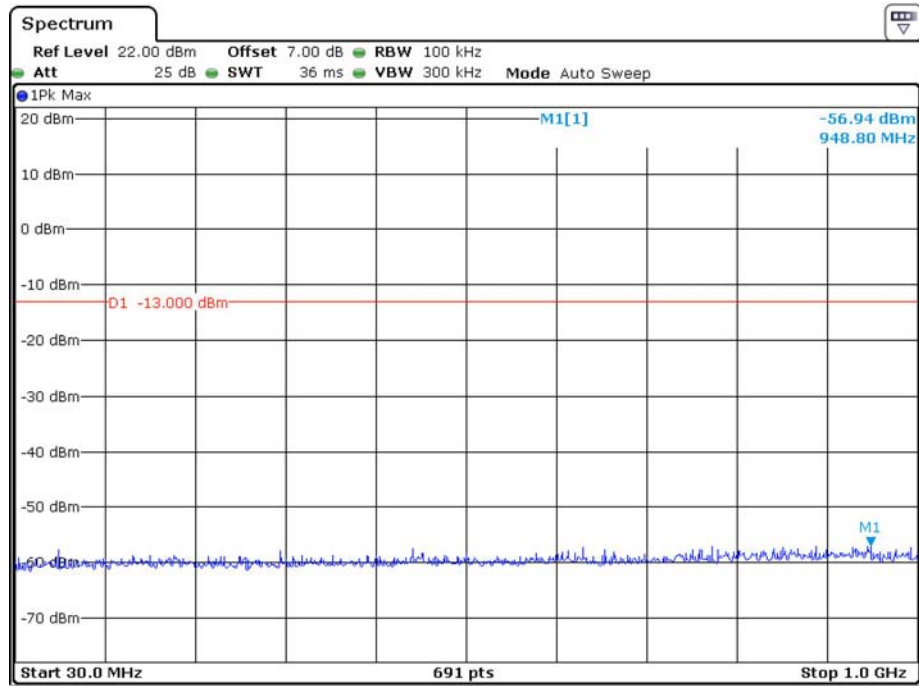
Date: 9.APR.2022 17:45:51

Fundamental test

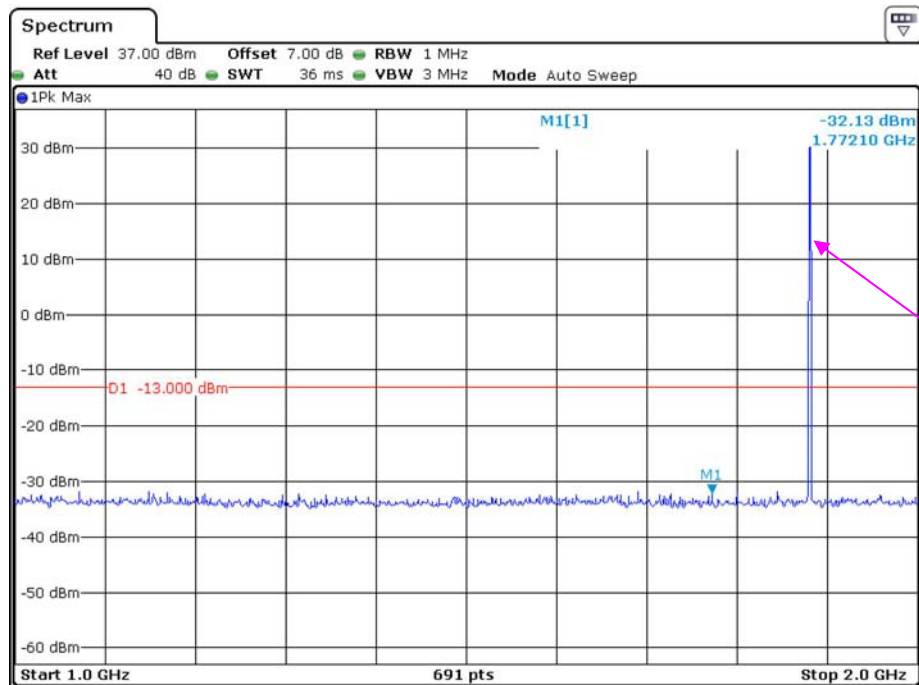
2 GHz – 20 GHz (WCDMA Mode)



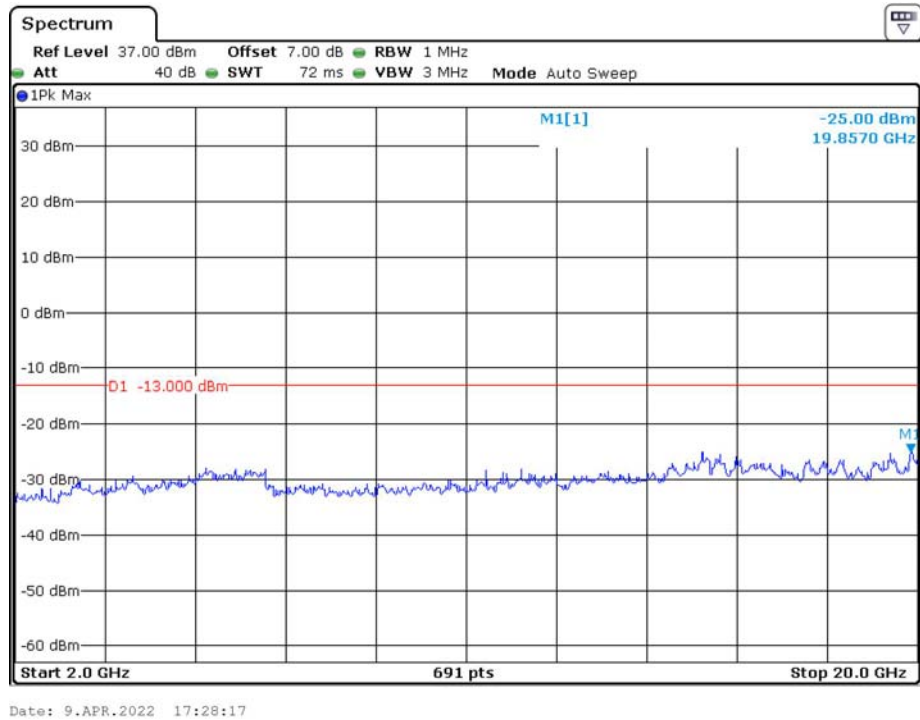
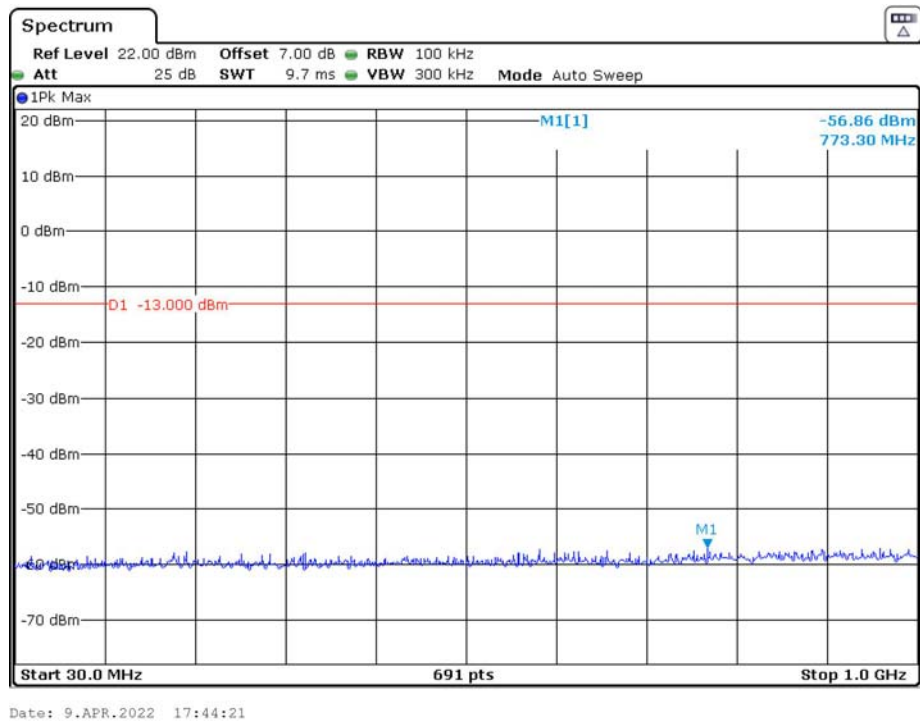
Date: 9.APR.2022 17:47:16

Middle Channel:**30 MHz – 1 GHz (GSM Mode)**

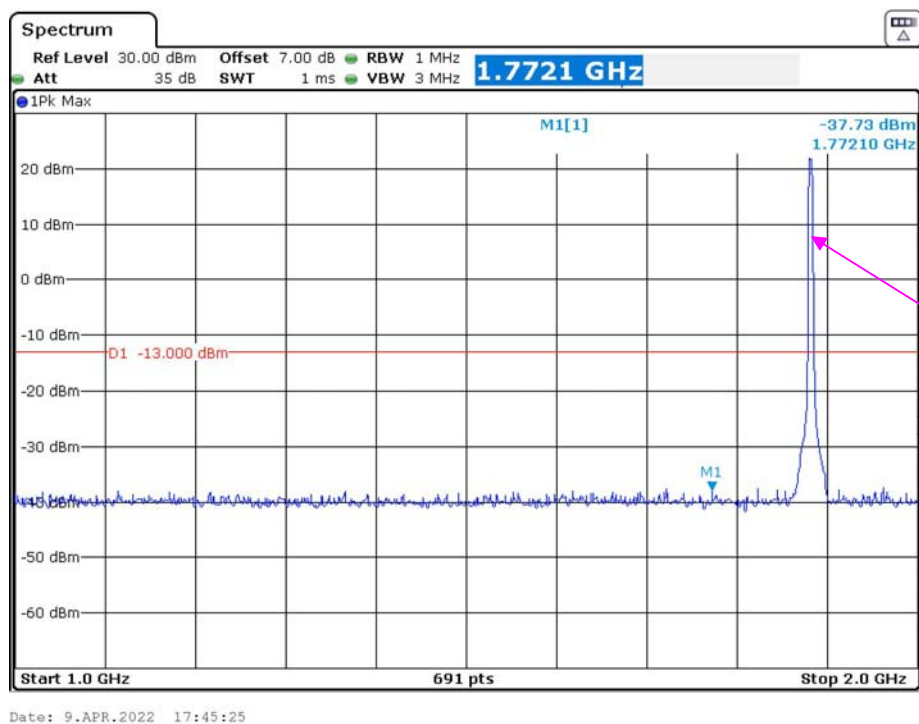
Date: 9.APR.2022 17:24:20

1 GHz – 2 GHz (GSM Mode)

Date: 9.APR.2022 17:27:21

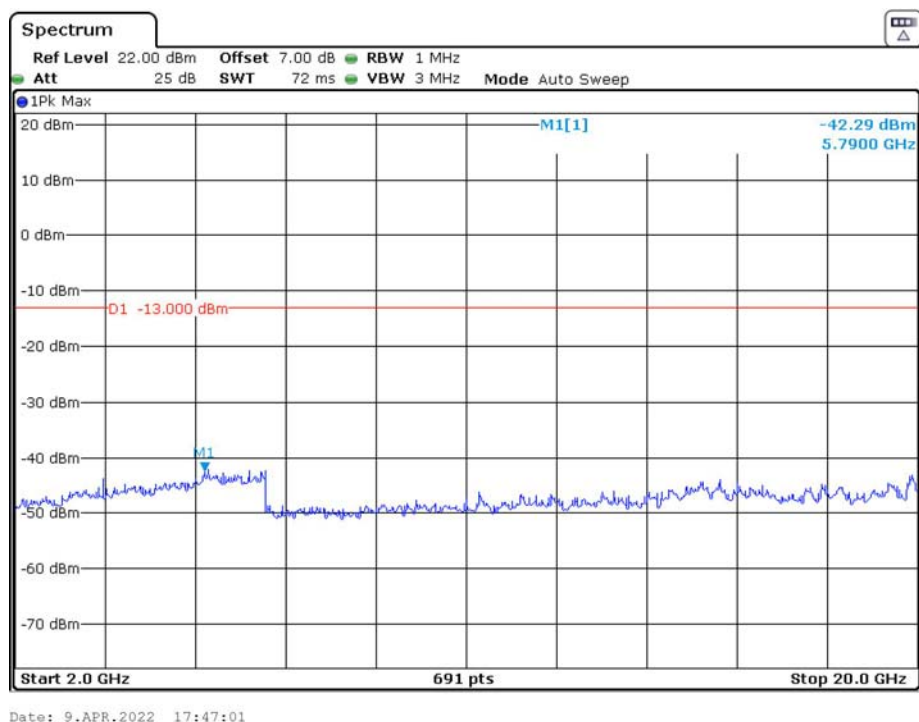
2 GHz– 20 GHz (GSM Mode)**30 MHz – 1 GHz (WCDMA Mode)**

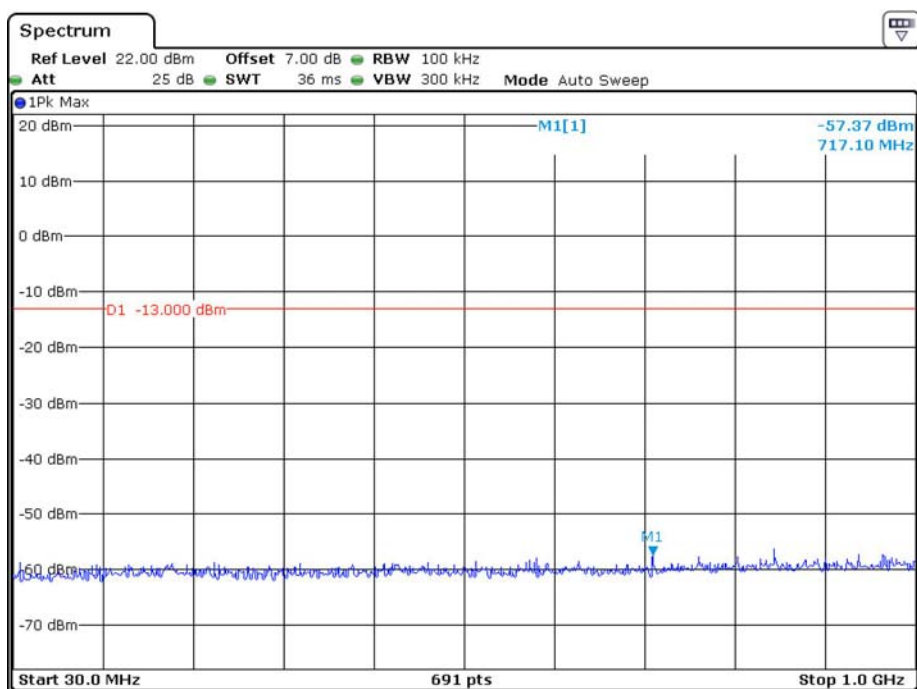
1 GHz – 2 GHz (WCDMA Mode)



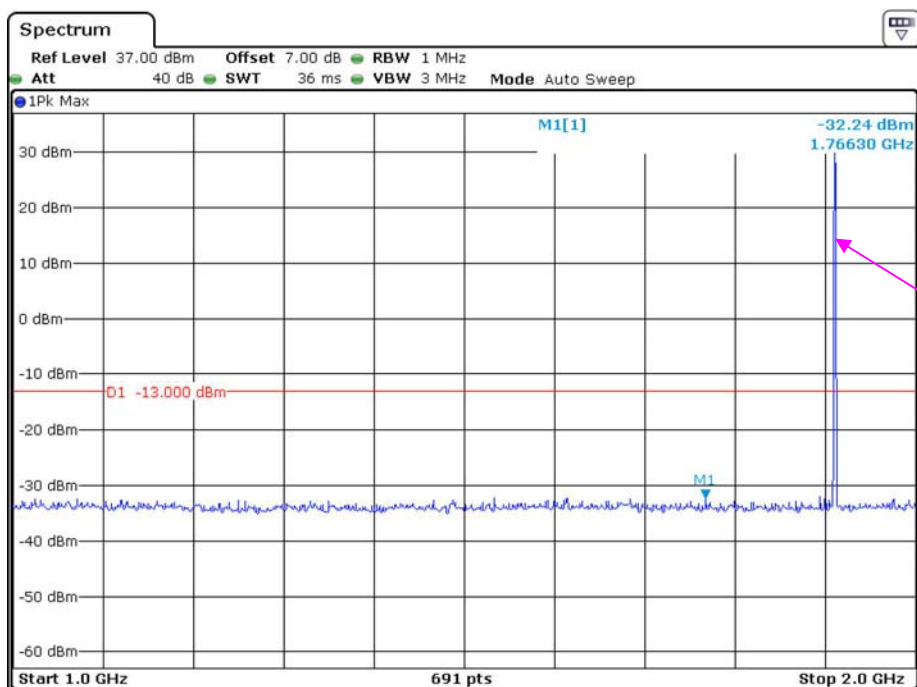
Fundamental test

2 GHz – 20 GHz (WCDMA Mode)



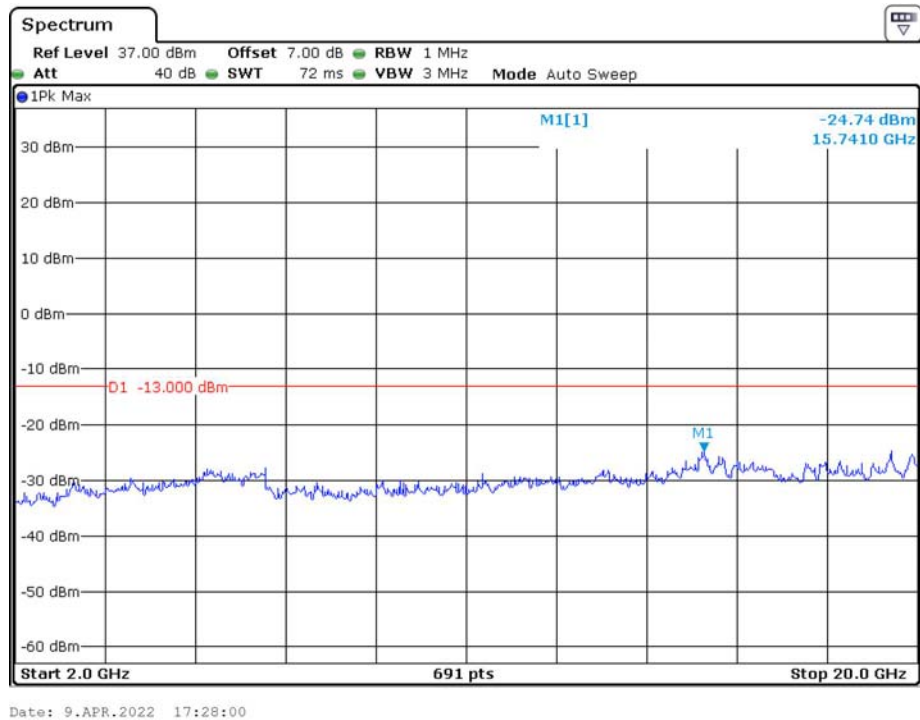
High Channel:**30 MHz – 1 GHz (GSM Mode)**

Date: 9.APR.2022 17:24:03

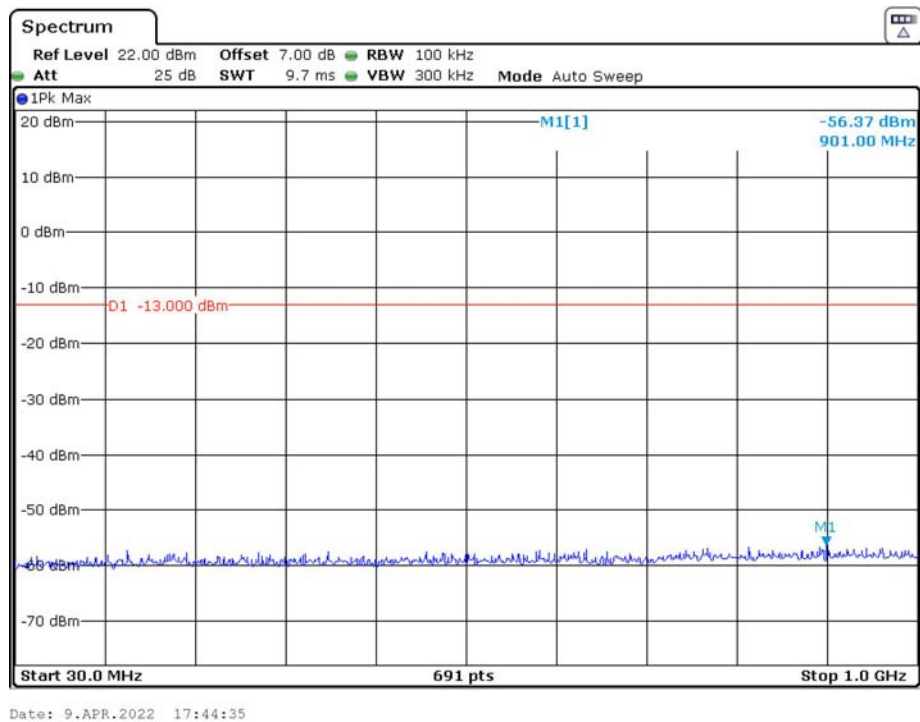
1 GHz– 2 GHz (GSM Mode)

Date: 9.APR.2022 17:27:38

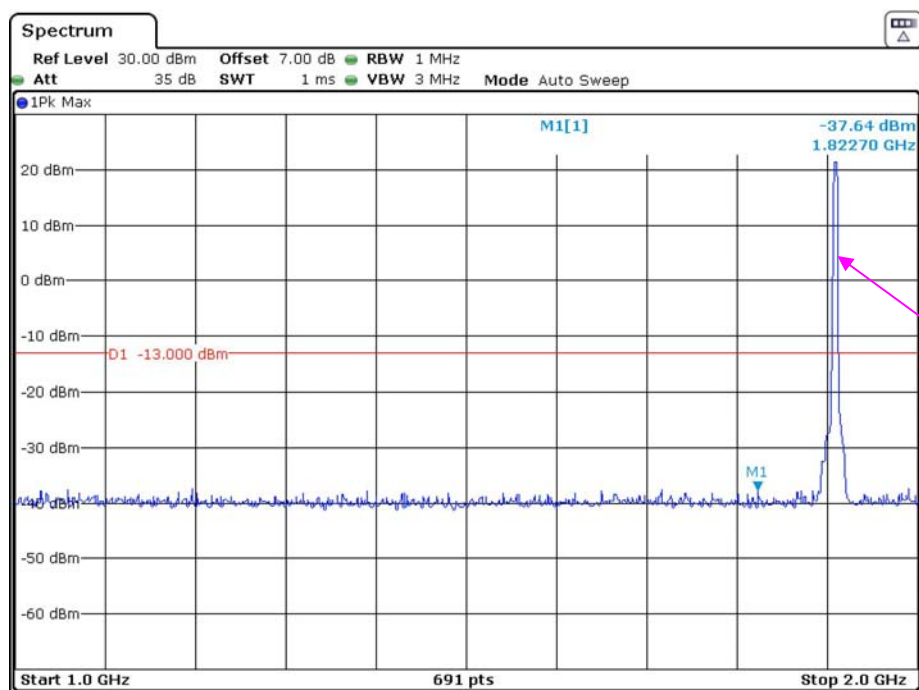
2 GHz– 20 GHz (GSM Mode)



30 MHz – 1 GHz (WCDMA Mode)

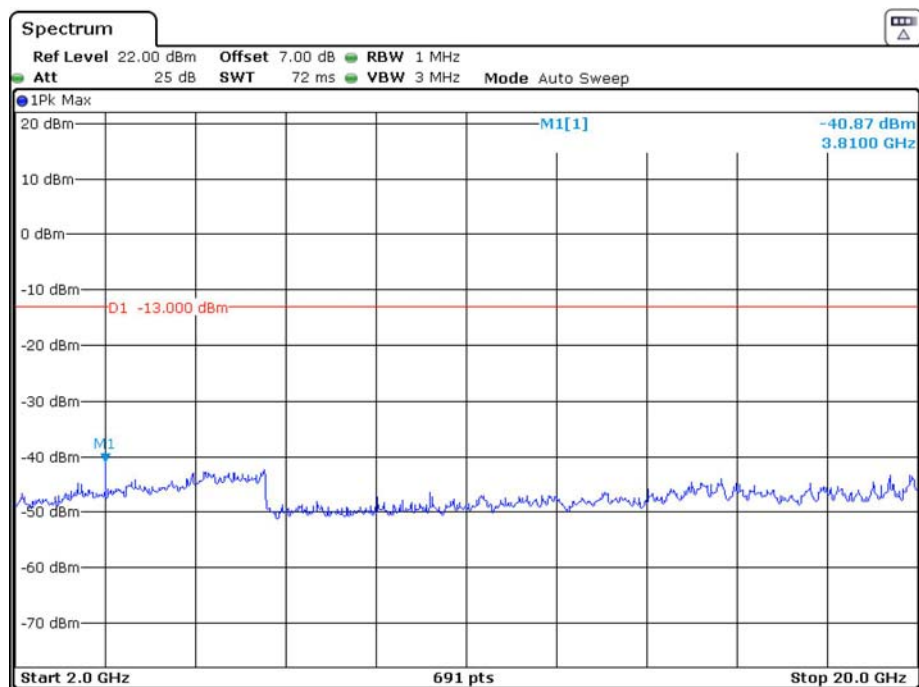


1 GHz – 2 GHz (WCDMA Mode)



Date: 9.APR.2022 17:46:22

2GHz – 20 GHz (WCDMA Mode)



Date: 9.APR.2022 17:46:47

The test plots of LTE band please refer to the Appendix B.

FCC § 2.1053; § 22.917 (a); § 24.238 (a); § 27.53 - SPURIOUS RADIATED EMISSIONS

Applicable Standard

FCC § 2.1053, § 22.917(a) & § 24.238(a) & § 27.53.

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the receiving antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Test Data

Environmental Conditions

Temperature:	25~26 °C
Relative Humidity:	55~58 %
ATM Pressure:	101.0 kPa

The testing was performed by Leo Li from 2022-04-15 to 2022-04-18.

EUT operation mode: Transmitting (Scan with X-AXIS, Y-AXIS, Z-AXIS, the worst case Y-AXIS was recorded)

The worst case is as below:

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
GSM850								
Test frequency range: 30MHz-10GHz								
Low channel								
235.82	-73.86	247	2.1	H	6.6	-67.26	-13	-54.26
235.82	-64.26	112	1.6	V	-1.4	-65.66	-13	-52.66
1648.4	-53.20	237	1.6	H	3.5	-49.70	-13	-36.70
1648.4	-52.80	14	1.3	V	3.1	-49.70	-13	-36.70
2472.6	-49.80	8	1.8	H	6.6	-43.20	-13	-30.20
2472.6	-47.50	132	1.6	V	5.8	-41.70	-13	-28.70
3296.8	-51.20	23	2.0	H	6.4	-44.80	-13	-31.80
3296.8	-51.00	359	2.0	V	5.7	-45.30	-13	-32.30
Middle channel								
235.82	-74.33	165	1.6	H	6.6	-67.73	-13	-54.73
235.82	-65.21	247	1.6	V	-1.4	-66.61	-13	-53.61
1673.2	-51.90	288	1.7	H	3.8	-48.10	-13	-35.10
1673.2	-51.80	195	1.2	V	3.1	-48.70	-13	-35.70
2509.8	-50.00	225	1.9	H	6.2	-43.80	-13	-30.80
2509.8	-49.60	69	1.6	V	5.6	-44.00	-13	-31.00
3346.4	-51.30	321	1.5	H	6.6	-44.70	-13	-31.70
3346.4	-49.30	351	1.2	V	5.4	-43.90	-13	-30.90
High channel								
235.82	-74.77	267	1.8	H	6.6	-68.17	-13	-55.17
235.82	-64.28	53	1.3	V	-1.4	-65.68	-13	-52.68
1697.6	-51.30	56	1.7	H	4.1	-47.20	-13	-34.20
1697.6	-49.40	100	1.8	V	3.1	-46.30	-13	-33.30
2546.4	-48.60	251	1.2	H	6.1	-42.50	-13	-29.50
2546.4	-47.00	27	1.6	V	5.8	-41.20	-13	-28.20
3395.2	-51.50	347	1.5	H	6.2	-45.30	-13	-32.30
3395.2	-50.10	294	1.1	V	5.4	-44.70	-13	-31.70

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
GSM1900								
Test frequency range: 30MHz-20GHz								
Low channel								
235.82	-74.12	15	1.4	H	6.6	-67.52	-13	-54.52
235.82	-65.20	301	1.3	V	-1.4	-66.60	-13	-53.60
3700.4	-53.20	97	1.5	H	8.1	-45.10	-13	-32.10
3700.4	-52.20	266	1.4	V	7.6	-44.60	-13	-31.60
Middle channel								
235.82	-74.20	55	1.7	H	6.6	-67.60	-13	-54.60
235.82	-65.12	230	1.7	V	-1.4	-66.52	-13	-53.52
3760.0	-54.10	330	1.5	H	8.8	-45.30	-13	-32.30
3760.0	-52.90	185	1.8	V	8.0	-44.90	-13	-31.90
High channel								
235.82	-73.93	313	1.3	H	6.6	-67.33	-13	-54.33
235.82	-64.95	227	1.4	V	-1.4	-66.35	-13	-53.35
3819.6	-53.70	266	1.2	H	8.7	-45.00	-13	-32.00
3819.6	-52.20	311	1.0	V	8.0	-44.20	-13	-31.20

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
WCDMA Band 2								
Test frequency range: 30MHz-20GHz								
Low channel								
235.82	-74.76	124	1.4	H	6.6	-68.16	-13	-55.16
235.82	-63.89	17	2.2	V	-1.4	-65.29	-13	-52.29
3704.8	-56.50	223	1.5	H	8.2	-48.30	-13	-35.30
3704.8	-54.80	229	1.2	V	7.6	-47.20	-13	-34.20
Middle channel								
235.82	-75.56	79	1.6	H	6.6	-68.96	-13	-55.96
235.82	-63.62	167	2.1	V	-1.4	-65.02	-13	-52.02
3760.0	-57.00	55	2.1	H	8.8	-48.20	-13	-35.20
3760.0	-55.90	44	1.9	V	8.0	-47.90	-13	-34.90
High channel								
235.82	-74.57	298	2.1	H	6.6	-67.97	-13	-54.97
235.82	-63.79	92	1.7	V	-1.4	-65.19	-13	-52.19
3815.2	-57.40	82	1.5	H	8.7	-48.70	-13	-35.70
3815.2	-56.00	21	1.9	V	7.9	-48.10	-13	-35.10

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
WCDMA Band 5								
Test frequency range: 30MHz-10GHz								
Low channel								
235.82	-73.71	217	1.3	H	6.6	-67.11	-13	-54.11
235.82	-65.55	166	1.6	V	-1.4	-66.95	-13	-53.95
1652.8	-55.60	51	1.1	H	3.5	-52.10	-13	-39.10
1652.8	-54.40	316	1.5	V	3.1	-51.30	-13	-38.30
2479.2	-53.60	47	1.8	H	6.5	-47.10	-13	-34.10
2479.2	-52.30	55	1.4	V	5.7	-46.60	-13	-33.60
3305.6	-51.70	81	1.1	H	6.4	-45.30	-13	-32.30
3305.6	-51.20	174	1.1	V	5.7	-45.50	-13	-32.50
Middle channel								
235.82	-73.99	235	2.1	H	6.6	-67.39	-13	-54.39
235.82	-64.30	200	2.1	V	-1.4	-65.70	-13	-52.70
1673.2	-56.30	181	1.4	H	3.8	-52.50	-13	-39.50
1673.2	-54.90	262	2.2	V	3.1	-51.80	-13	-38.80
2509.8	-53.90	7	1.7	H	6.2	-47.70	-13	-34.70
2509.8	-52.70	303	2.1	V	5.6	-47.10	-13	-34.10
3346.4	-52.00	35	1.6	H	6.6	-45.40	-13	-32.40
3346.4	-50.60	42	1.2	V	5.4	-45.20	-13	-32.20
High channel								
235.82	-73.87	56	2.0	H	6.6	-67.27	-13	-54.27
235.82	-64.03	224	2.1	V	-1.4	-65.43	-13	-52.43
1693.2	-56.40	27	1.6	H	4.0	-52.40	-13	-39.40
1693.2	-55.20	343	1.5	V	3.1	-52.10	-13	-39.10
2539.8	-53.10	37	1.5	H	6.1	-47.00	-13	-34.00
2539.8	-52.60	138	1.1	V	5.7	-46.90	-13	-33.90
3386.4	-51.31	220	1.3	H	6.3	-45.01	-13	-32.01
3386.4	-50.40	35	1.2	V	5.4	-45.00	-13	-32.00

LTE Bands: (pre-scan all bandwidths and modulation, the worst case as below)

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
LTE Band 2								
Test frequency range: 30MHz-20GHz								
QPSK, 1.4MHz, Low channel								
235.82	-73.61	121	1.0	H	6.6	-67.01	-13	-54.01
235.82	-64.99	196	1.7	V	-1.4	-66.39	-13	-53.39
3701.4	-53.80	327	2.0	H	8.1	-45.70	-13	-32.70
3701.4	-52.80	295	2.2	V	7.6	-45.20	-13	-32.20
QPSK, 1.4MHz, Middle channel								
235.82	-75.17	282	1.8	H	6.6	-68.57	-13	-55.57
235.82	-64.22	223	1.7	V	-1.4	-65.62	-13	-52.62
3760.0	-54.90	53	1.4	H	8.8	-46.10	-13	-33.10
3760.0	-54.51	148	1.1	V	8.0	-46.51	-13	-33.51
QPSK, 1.4MHz, High channel								
235.82	-74.43	350	1.1	H	6.6	-67.83	-13	-54.83
235.82	-64.73	45	1.9	V	-1.4	-66.13	-13	-53.13
3818.6	-54.70	286	2.0	H	8.7	-46.00	-13	-33.00
3818.6	-53.70	94	1.6	V	7.9	-45.80	-13	-32.80

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
LTE Band 5								
Test frequency range: 30MHz-10GHz								
QPSK, 1.4MHz, Low channel								
235.82	-74.10	288	2.1	H	6.6	-67.50	-13	-54.50
235.82	-64.00	159	1.9	V	-1.4	-65.40	-13	-52.40
1649.4	-60.20	114	1.2	H	3.5	-56.70	-13	-43.70
1649.4	-57.80	43	2.1	V	3.1	-54.70	-13	-41.70
2474.1	-40.00	266	1.6	H	6.6	-33.40	-13	-20.40
2474.1	-34.20	153	1.5	V	5.8	-28.40	-13	-15.40
3298.8	-45.00	298	1.2	H	6.4	-38.60	-13	-25.60
3298.8	-43.30	234	1.9	V	5.7	-37.60	-13	-24.60
QPSK, 1.4MHz, Middle channel								
235.82	-74.39	23	1.8	H	6.6	-67.79	-13	-54.79
235.82	-64.75	198	2.0	V	-1.4	-66.15	-13	-53.15
1673.0	-50.80	297	1.5	H	3.8	-47.00	-13	-34.00
1673.0	-49.60	300	1.1	V	3.1	-46.50	-13	-33.50
2509.5	-52.70	76	1.3	H	6.2	-46.50	-13	-33.50
2509.5	-48.60	305	2.2	V	5.6	-43.00	-13	-30.00
3346.0	-46.70	96	1.1	H	6.6	-40.10	-13	-27.10
3346.0	-43.80	56	1.6	V	5.4	-38.40	-13	-25.40
QPSK, 1.4MHz, High channel								
235.82	-74.58	77	1.3	H	6.6	-67.98	-13	-54.98
235.82	-65.57	185	1.4	V	-1.4	-66.97	-13	-53.97
1696.6	-59.30	186	1.4	H	4.1	-55.20	-13	-42.20
1696.6	-56.10	87	1.3	V	3.1	-53.00	-13	-40.00
2544.9	-52.10	108	2.0	H	6.1	-46.00	-13	-33.00
2544.9	-51.60	30	1.9	V	5.8	-45.80	-13	-32.80
3393.2	-42.10	26	2.1	H	6.3	-35.80	-13	-22.80
3393.2	-40.60	309	2.1	V	5.4	-35.20	-13	-22.20

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
LTE Band 12								
Test frequency range: 30MHz-10GHz								
QPSK, 1.4MHz, Low channel								
235.82	-73.91	46	1.3	H	6.6	-67.31	-13	-54.31
235.82	-64.88	287	1.2	V	-1.4	-66.28	-13	-53.28
1399.4	-56.40	255	1.9	H	5.9	-50.50	-13	-37.50
1399.4	-58.40	27	1.8	V	5.9	-52.50	-13	-39.50
2099.1	-52.80	111	1	H	6.3	-46.50	-13	-33.50
2099.1	-53.30	168	1.2	V	5.1	-48.20	-13	-35.20
2798.8	-53.60	123	1.1	H	6.7	-46.90	-13	-33.90
2798.8	-53.57	67	1.5	V	6.7	-46.87	-13	-33.87
QPSK, 1.4MHz, Middle channel								
235.82	-75.15	313	1.7	H	6.6	-68.55	-13	-55.55
235.82	-65.27	271	1.8	V	-1.4	-66.67	-13	-53.67
1415.0	-61.90	202	1.2	H	5.7	-56.20	-13	-43.20
1415.0	-60.90	136	1.1	V	5.4	-55.50	-13	-42.50
2122.5	-51.70	358	1.4	H	6.7	-45.00	-13	-32.00
2122.5	-52.00	240	2.1	V	5.8	-46.20	-13	-33.20
2830.0	-53.80	36	1.5	H	7.1	-46.70	-13	-33.70
2830.0	-51.70	357	2.1	V	6.5	-45.20	-13	-32.20
QPSK, 1.4MHz, High channel								
235.82	-75.06	139	1.7	H	6.6	-68.46	-13	-55.46
235.82	-65.04	291	1.5	V	-1.4	-66.44	-13	-53.44
1430.6	-59.10	219	2.1	H	5.4	-53.70	-13	-40.70
1430.6	-58.90	78	1.8	V	4.8	-54.10	-13	-41.10
2145.9	-51.10	104	1.4	H	7.0	-44.10	-13	-31.10
2145.9	-52.50	297	2.1	V	6.6	-45.90	-13	-32.90
2861.2	-54.10	109	2	H	7.3	-46.80	-13	-33.80
2861.2	-49.30	43	1.8	V	6.3	-43.00	-13	-30.00

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
LTE Band 13								
Test frequency range: 30MHz-10GHz								
QPSK, 5MHz, Low channel								
235.82	-73.85	311	1.4	H	6.6	-67.25	-13	-54.25
235.82	-64.66	35	1.5	V	-1.4	-66.06	-13	-53.06
1559.0	-56.00	189	1.3	H	4.2	-51.80	-40	-11.80
1559.0	-57.10	300	1.7	V	3.3	-53.80	-40	-13.80
2338.5	-56.60	206	1.4	H	7.3	-49.30	-13	-36.30
2338.5	-55.10	189	1.1	V	6.5	-48.60	-13	-35.60
3118.0	-53.80	141	2.1	H	7.3	-46.50	-13	-33.50
3118.0	-52.50	87	2.1	V	6.5	-46.00	-13	-33.00
QPSK, 5MHz, Middle channel								
235.82	-75.55	179	1.3	H	6.6	-68.95	-13	-55.95
235.82	-63.92	27	2	V	-1.4	-65.32	-13	-52.32
1564.0	-60.20	190	1.2	H	4.2	-56.00	-40	-16.00
1564.0	-58.60	33	2	V	3.3	-55.30	-40	-15.30
2346.0	-58.10	306	1.3	H	7.3	-50.80	-13	-37.80
2346.0	-57.20	323	1	V	6.4	-50.80	-13	-37.80
3128.0	-53.90	148	1.2	H	7.3	-46.60	-13	-33.60
3128.0	-53.50	79	1.8	V	6.6	-46.90	-13	-33.90
QPSK, 5MHz, High channel								
235.82	-75.27	262	2	H	6.6	-68.67	-13	-55.67
235.82	-63.78	101	1.6	V	-1.4	-65.18	-13	-52.18
1569.0	-60.30	249	1.2	H	4.2	-56.10	-40	-16.10
1569.0	-58.80	269	1.7	V	3.3	-55.50	-40	-15.50
2353.5	-57.10	190	1.2	H	7.3	-49.80	-13	-36.80
2353.5	-56.60	3	1.6	V	6.4	-50.20	-13	-37.20
3138.0	-54.50	58	1.3	H	7.4	-47.10	-13	-34.10
3138.0	-53.80	9	1.1	V	6.6	-47.20	-13	-34.20

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
LTE Band 41								
Test frequency range: 30MHz-26.5GHz								
QPSK, 5MHz, Low channel								
235.82	-75.33	260	2.0	H	6.6	-68.73	-25	-43.73
235.82	-64.19	98	1.8	V	-1.4	-65.59	-25	-40.59
5075.0	-55.80	79	1.8	H	11.2	-44.60	-25	-19.60
5075.0	-55.90	251	1.4	V	10.8	-45.10	-25	-20.10
QPSK, 5MHz, Middle channel								
235.82	-75.00	109	2.1	H	6.6	-68.40	-25	-43.40
235.82	-65.60	309	1.4	V	-1.4	-67.00	-25	-42.00
5190.0	-54.70	169	1.9	H	10.5	-44.20	-25	-19.20
5190.0	-54.00	254	2.0	V	10.0	-44.00	-25	-19.00
QPSK, 5MHz, High channel								
235.82	-75.36	188	1.3	H	6.6	-68.76	-25	-43.76
235.82	-65.20	230	1.7	V	-1.4	-66.60	-25	-41.60
5305.0	-48.80	222	1.4	H	9.6	-39.20	-25	-14.20
5305.0	-47.60	316	1.7	V	8.8	-38.80	-25	-13.80

Note:

Absolute Level = Reading Level + Substituted Factor

Substituted Factor contains: SG Level - Cable loss+ Antenna Gain

Margin = Absolute Level - Limit

FCC§ 22.917 (a);§ 24.238 (a); §27.53 (c)(h)(m) - BAND EDGES**Applicable Standard**

According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to FCC §27.53 (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:

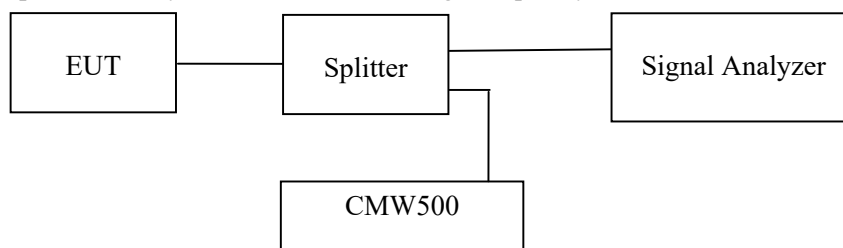
- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below 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;

According to FCC §27.53 (h)(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 $43 + 10 \log(P)$ dB.

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency



Test Data**Environmental Conditions**

Temperature:	23~28 °C
Relative Humidity:	52~57 %
ATM Pressure:	101.0 kPa

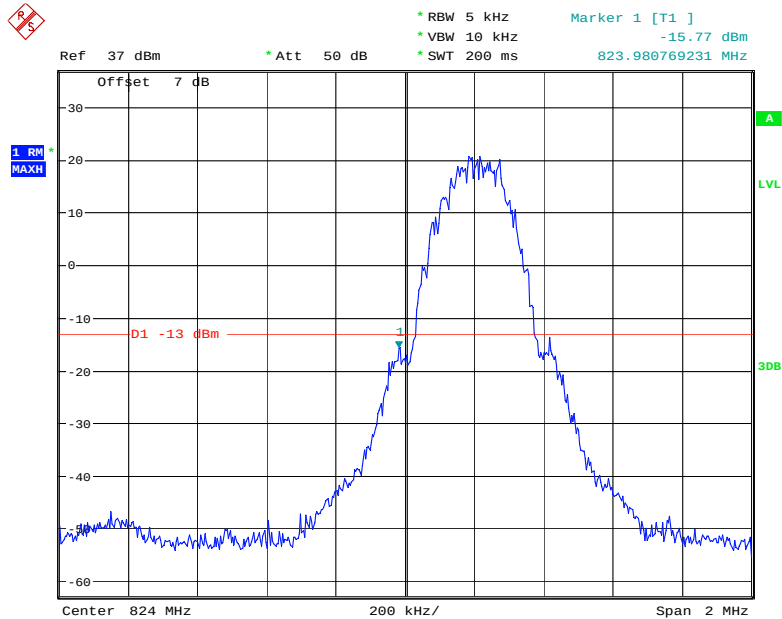
The testing was performed by Key Pei and Andy Yu from 2022-04-09 to 2022-06-10.

EUT operation mode: Transmitting (Worst case)

Test Result: Pass

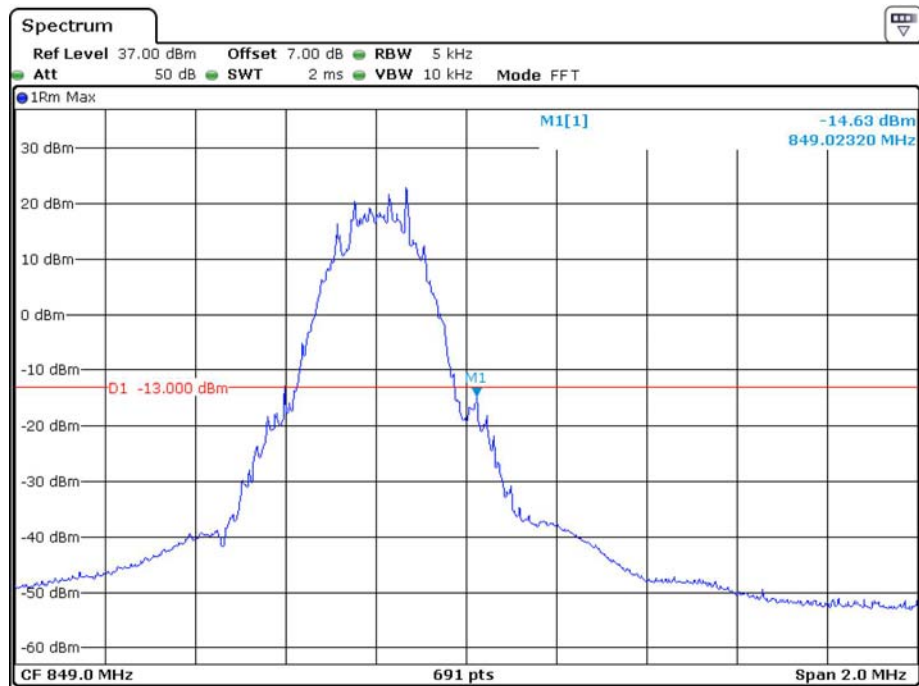
Please refer to the following plots.

Cellular Band, Left Band Edge for GSM (GMSK) Mode



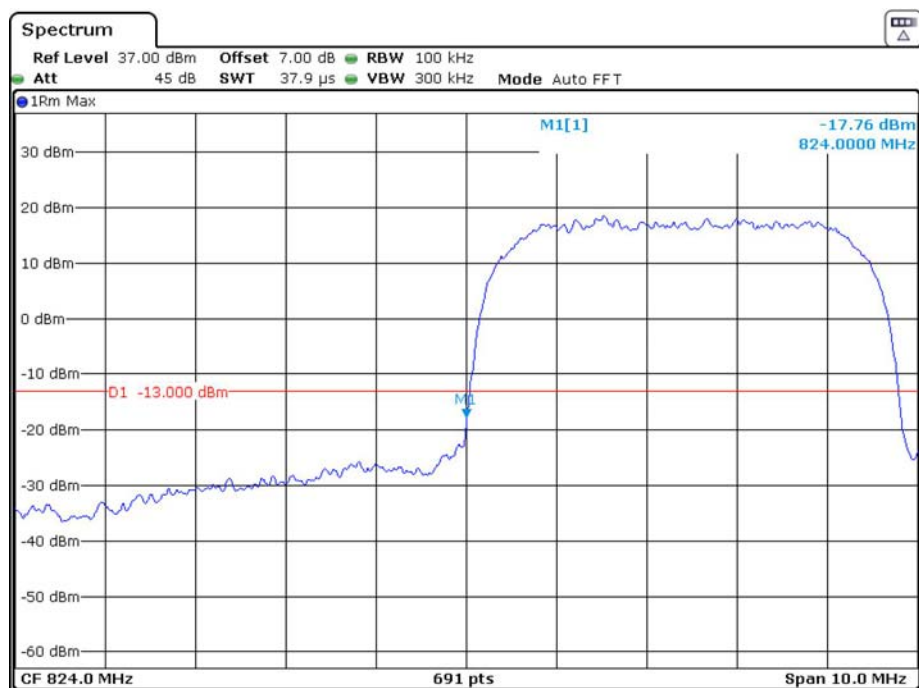
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Cellular Band, Right Band Edge for GSM (GMSK) Mode



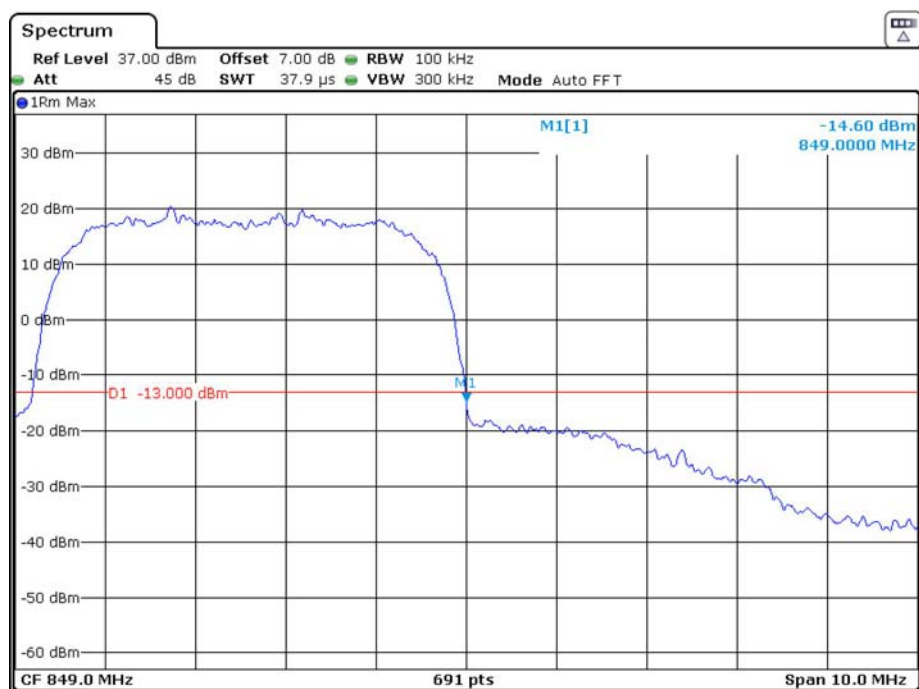
Date: 9.APR.2022 17:12:59

Cellular Band, Left Band Edge for RMC (BPSK) Mode

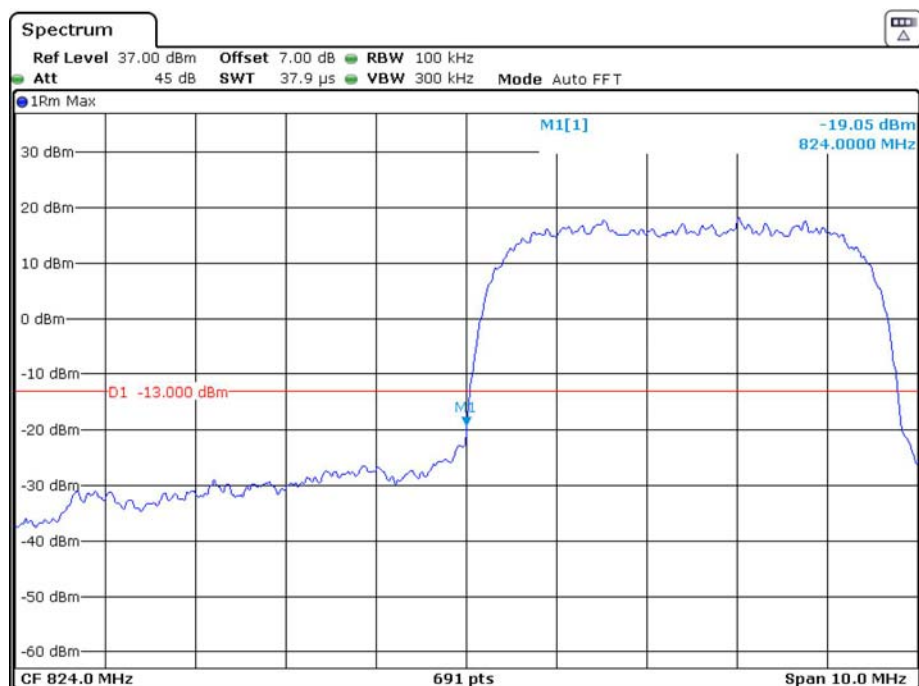


Date: 9.APR.2022 18:04:54

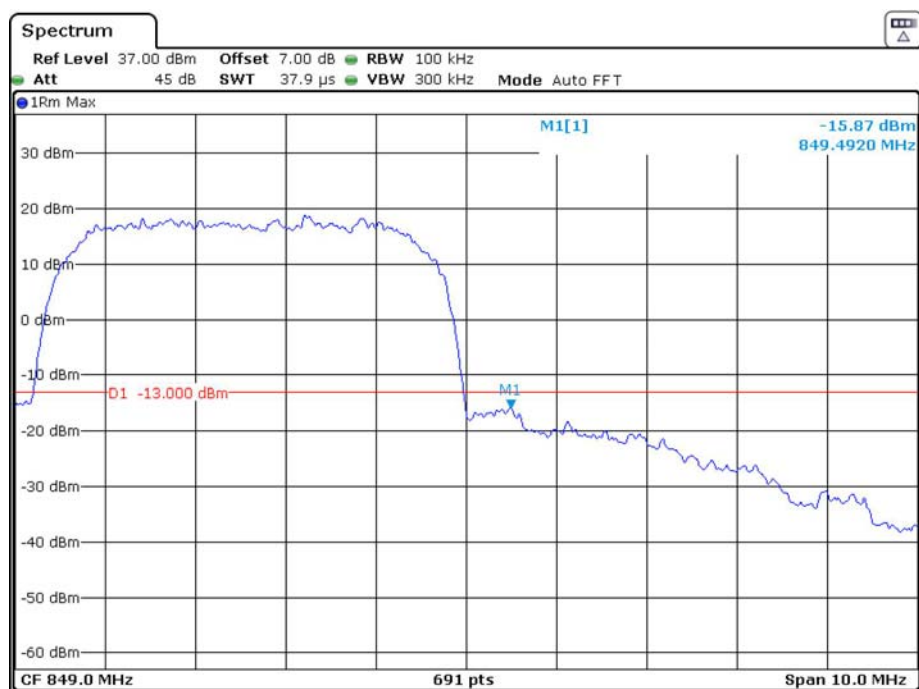
Cellular Band, Right Band Edge for RMC (BPSK) Mode



Date: 9.APR.2022 18:04:39

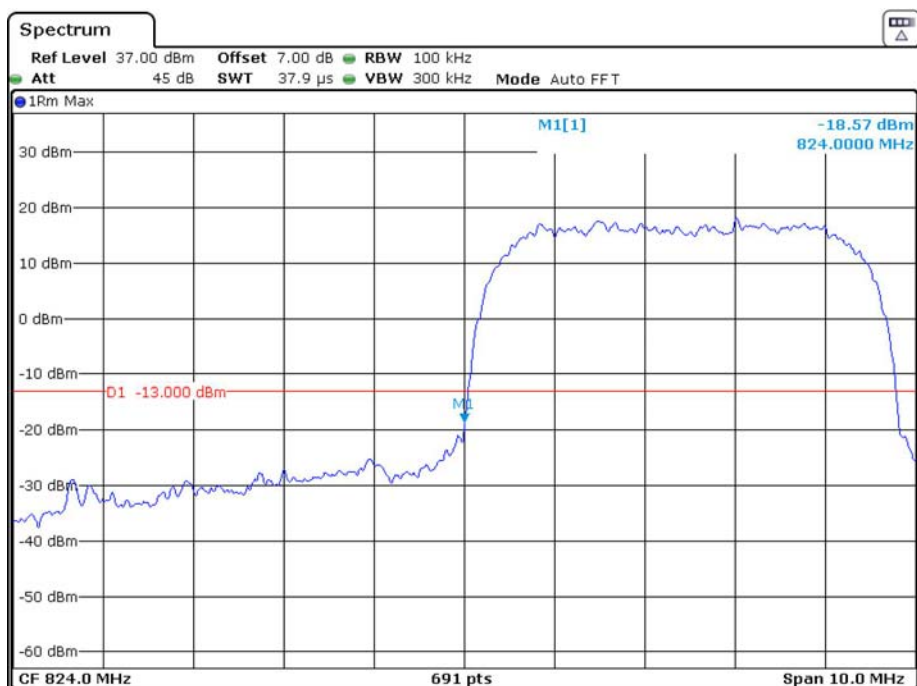
Cellular Band, Left Band Edge for HSDPA(16QAM) Mode

Date: 9.APR.2022 18:13:16

Cellular Band, Right Band Edge for HSDPA (16QAM) Mode

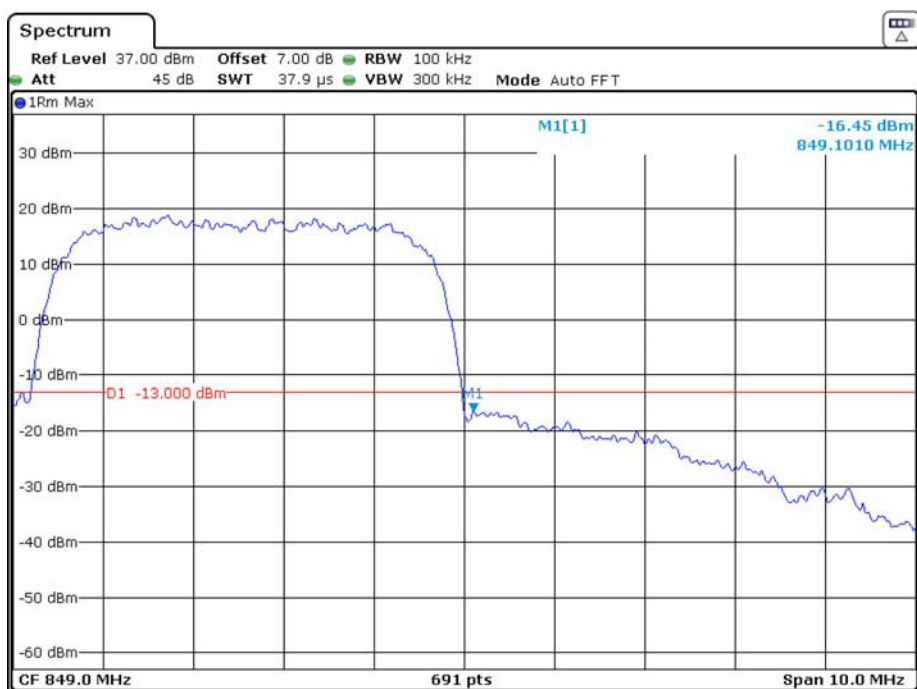
Date: 9.APR.2022 18:13:02

Cellular Band, Left Band Edge for HSUPA (QPSK) Mode



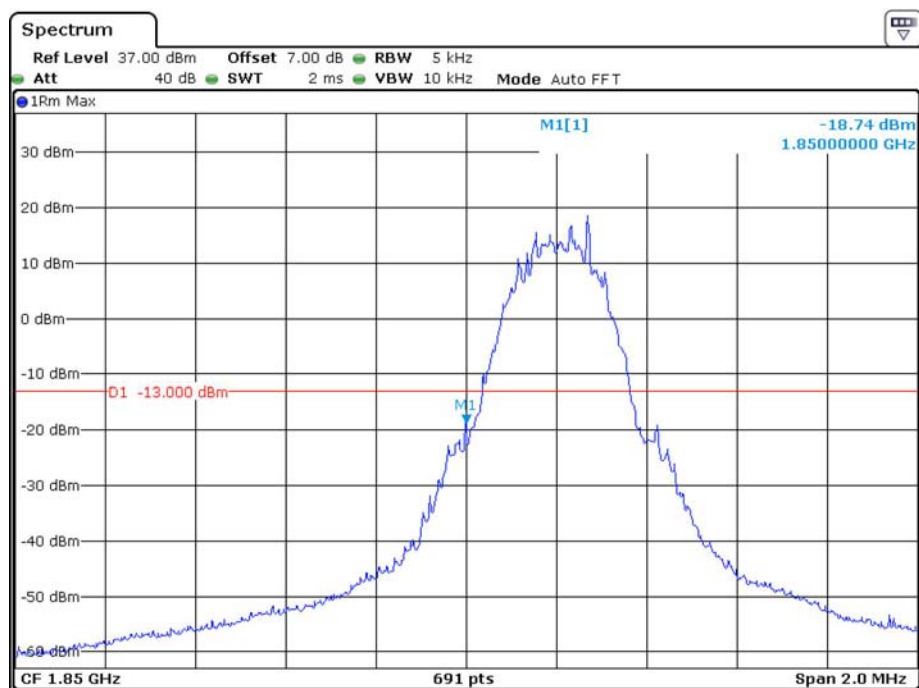
Date: 9.APR.2022 18:15:26

Cellular Band, Right Band Edge for HSUPA (QPSK) Mode



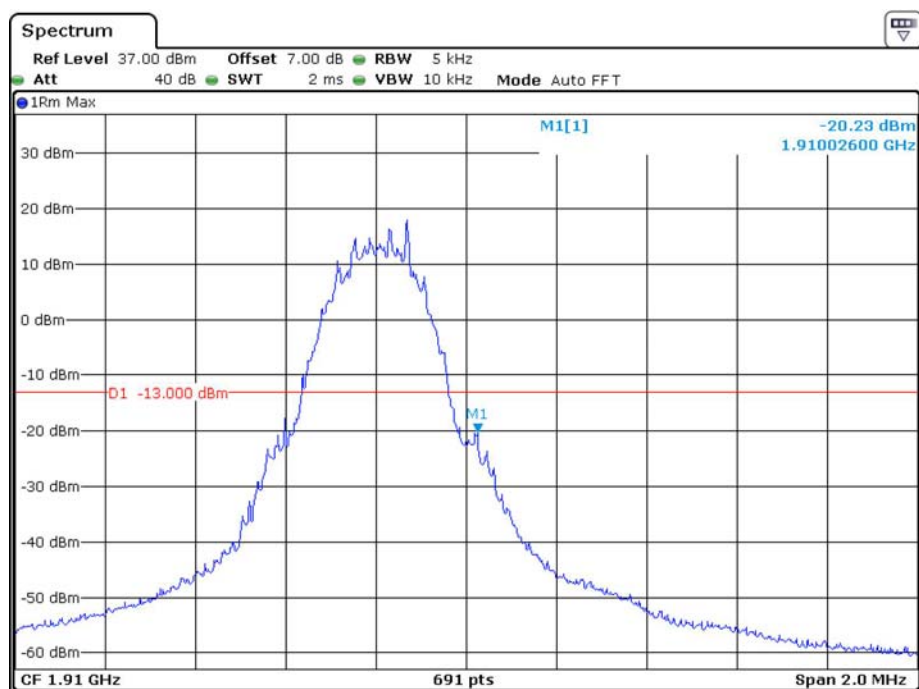
Date: 9.APR.2022 18:15:47

PCS Band, Left Band Edge for GSM (GMSK) Mode



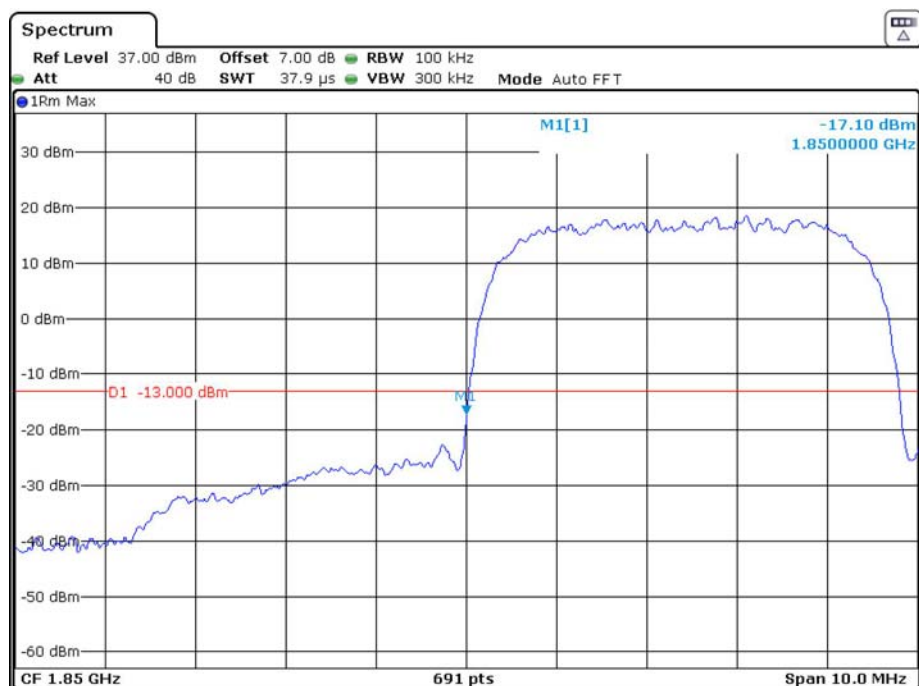
Date: 9.APR.2022 17:29:53

PCS Band, Right Band Edge for GSM (GMSK) Mode



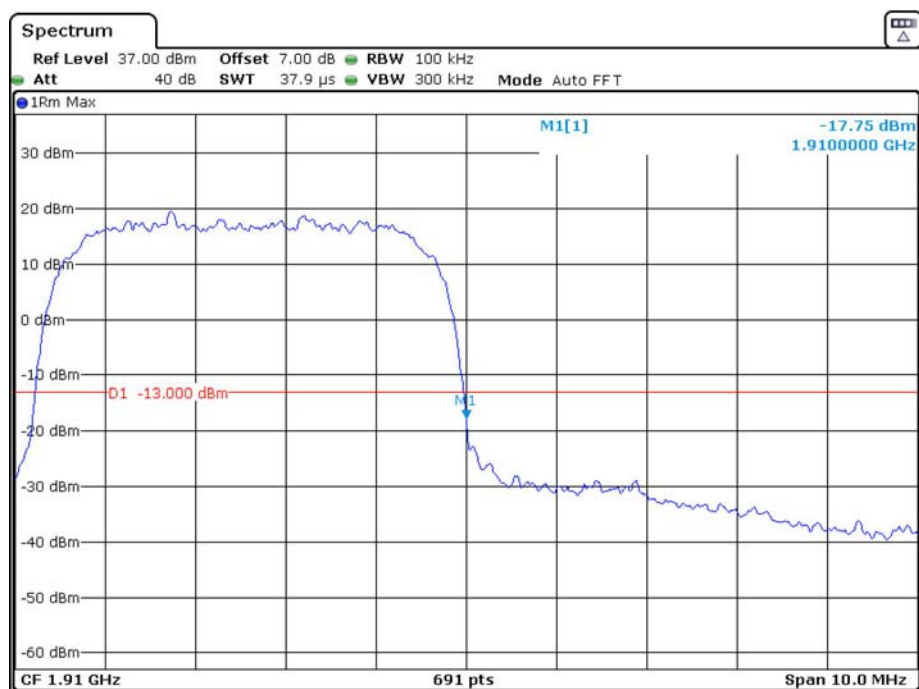
Date: 9.APR.2022 17:30:11

PCS Band, Left Band Edge for RMC (BPSK) Mode



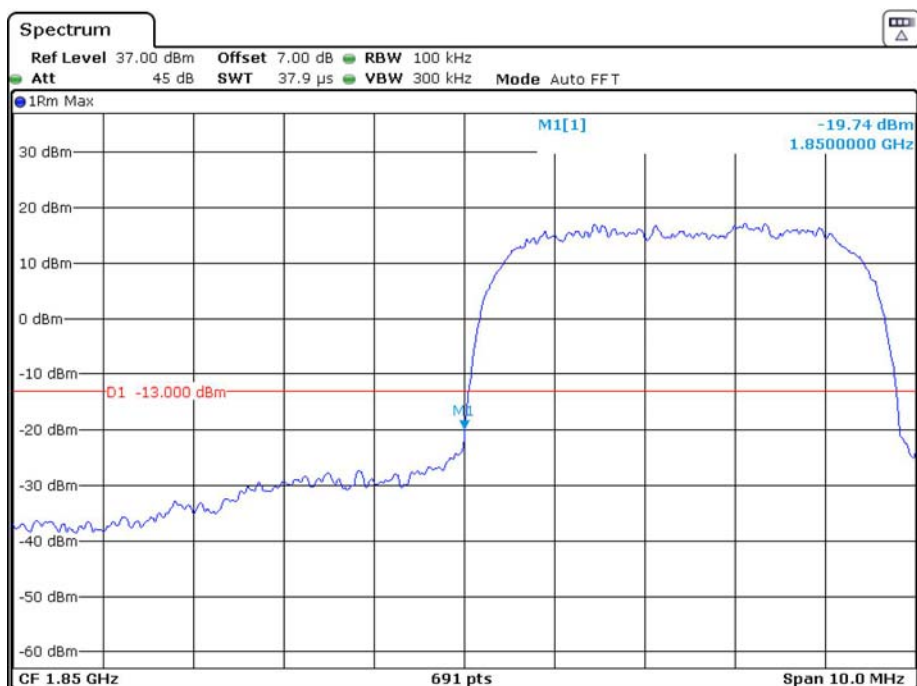
Date: 9.APR.2022 17:43:10

PCS Band, Right Band Edge for RMC (BPSK) Mode



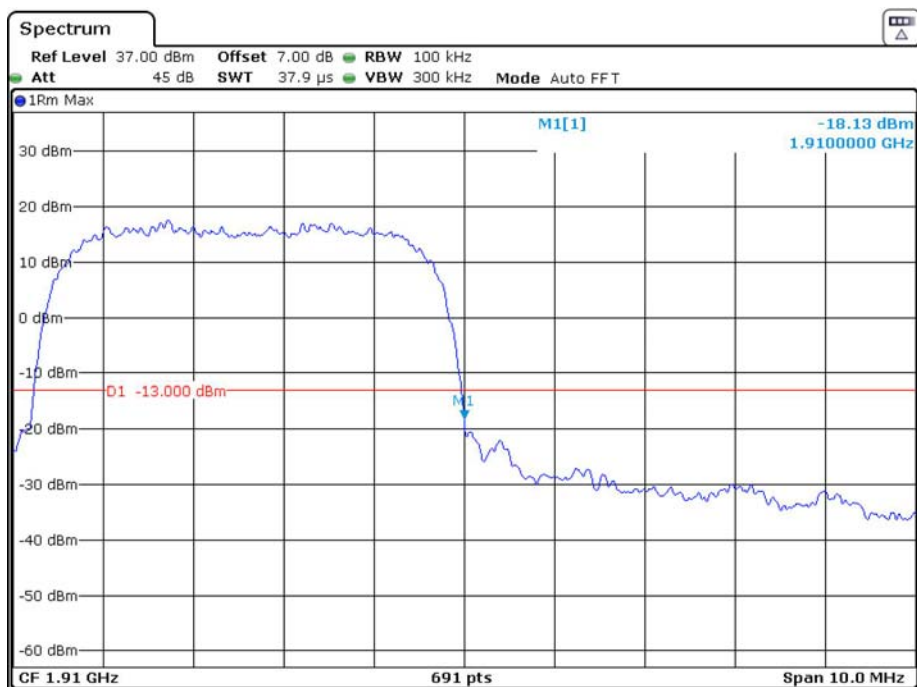
Date: 9.APR.2022 17:42:53

PCS Band, Left Band Edge for HSDPA(16QAM) Mode

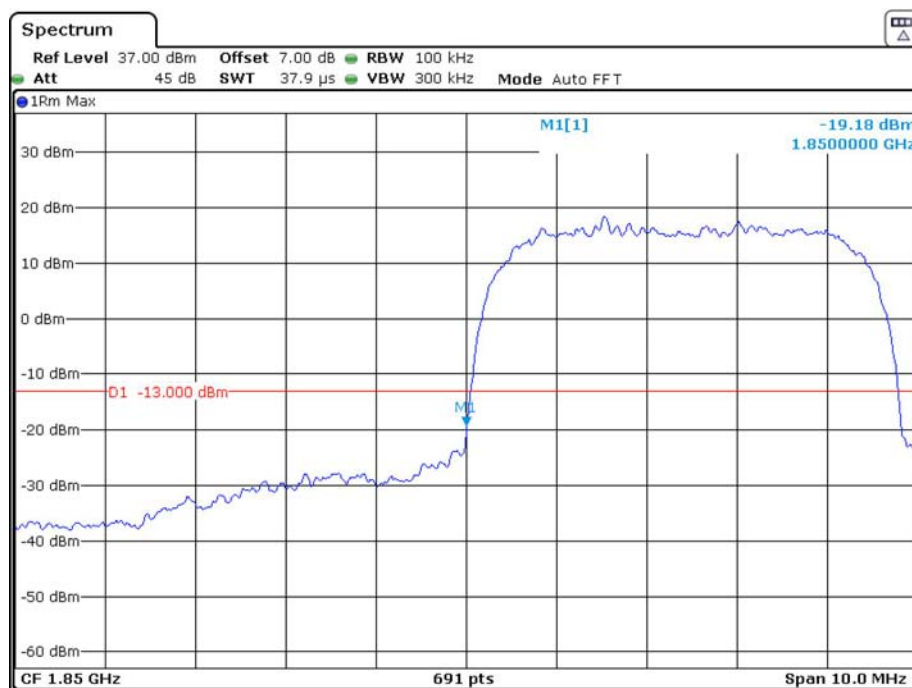


Date: 9.APR.2022 17:57:06

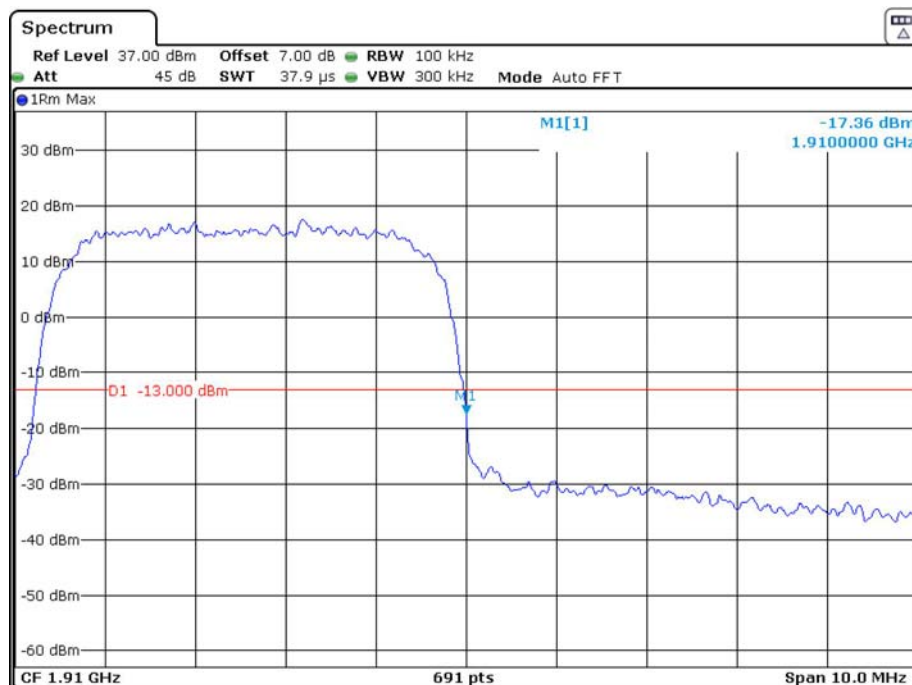
PCS Band, Right Band Edge for HSDPA (16QAM) Mode



Date: 9.APR.2022 17:57:24

PCS Band, Left Band Edge for HSUPA (QPSK) Mode

Date: 9.APR.2022 17:56:47

PCS Band, Right Band Edge for HSUPA (QPSK) Mode

Date: 9.APR.2022 17:56:28

The test plots of LTE bands please refer to the Appendix C.

FCC § 2.1055; § 22.355; § 24.235; §27.54 - FREQUENCY STABILITY

Applicable Standard

FCC § 2.1055, §22.355, §24.235&§27.54.

According to FCC §2.1055, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile > 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

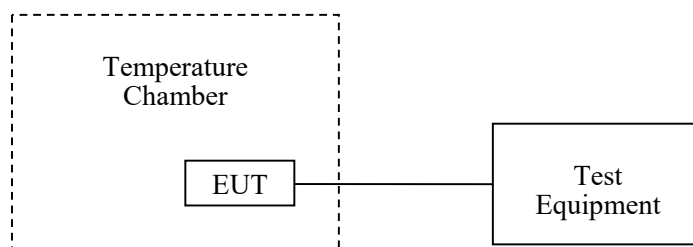
According to §24.235&§27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external AC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The AC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



Test Data**Environmental Conditions**

Temperature:	23~26 °C
Relative Humidity:	52~56 %
ATM Pressure:	101.0 kPa

The testing was performed by Key Pei from 2022-04-09 to 2022-04-14.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the following tables.

Cellular Band (Part 22H)**GSM Mode**

Middle Channel, $f_0=836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	18.09	0.0216	2.5
-20		11.90	0.0142	2.5
-10		9.07	0.0108	2.5
0		13.45	0.0161	2.5
10		7.26	0.0087	2.5
20		7.26	0.0087	2.5
30		13.31	0.0159	2.5
40		15.80	0.0189	2.5
50		7.73	0.0092	2.5
20	L.V.	7.82	0.0093	2.5
	H.V.	8.07	0.0097	2.5

WCDMA Mode

Middle Channel, $f_0=836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	1.47	0.0018	2.5
-20		1.56	0.0019	2.5
-10		2.31	0.0028	2.5
0		1.42	0.0017	2.5
10		1.32	0.0016	2.5
20		0.87	0.0010	2.5
30		0.88	0.0011	2.5
40		1.23	0.0015	2.5
50		2.24	0.0027	2.5
20	L.V.	1.56	0.0019	2.5
	H.V.	0.92	0.0011	2.5

PCS Band (Part 24E)
GSM Mode

Middle Channel, $f_0=1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	20.16	0.0107	pass
-20		10.64	0.0057	pass
-10		4.53	0.0024	pass
0		10.09	0.0054	pass
10		5.16	0.0027	pass
20		2.18	0.0012	pass
30		7.92	0.0042	pass
40		6.47	0.0034	pass
50		5.35	0.0028	pass
20	L.V.	6.12	0.0033	pass
	H.V.	6.74	0.0036	pass

WCDMA Mode

Middle Channel, $f_0=1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	1.33	0.0007	pass
-20		1.82	0.0010	pass
-10		2.54	0.0014	pass
0		2.73	0.0015	pass
10		2.06	0.0011	pass
20		0.97	0.0005	pass
30		1.11	0.0006	pass
40		1.35	0.0007	pass
50		1.64	0.0009	pass
20	L.V.	1.28	0.0007	pass
	H.V.	2.01	0.0011	pass

LTE:
QPSK:
Band 2:

10.0 MHz Middle Channel, $f_0=1880\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	9.23	0.0049	pass
-20		-9.97	-0.0053	pass
-10		-6.13	-0.0033	pass
0		6.17	0.0033	pass
10		7.92	0.0042	pass
20		6.46	0.0034	pass
30		-6.52	-0.0035	pass
40		7.18	0.0038	pass
50		-9.69	-0.0052	pass
20	L.V.	-8.17	-0.0043	pass
	H.V.	-7.05	-0.0038	pass

Band 5:

10.0 MHz Middle Channel, $f_0=836.5\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	5.36	0.0064	2.5
-20		9.11	0.0109	2.5
-10		8.51	0.0102	2.5
0		-7.15	-0.0085	2.5
10		-5.29	-0.0063	2.5
20		7.24	0.0087	2.5
30		-5.81	-0.0069	2.5
40		5.59	0.0067	2.5
50		6.87	0.0082	2.5
20	L.V.	9.94	0.0119	2.5
	H.V.	9.99	0.0119	2.5

Band 12:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	699.0372	715.9636	699	716
-20		699.0355	715.9622	699	716
-10		699.0361	715.9672	699	716
0		699.0342	715.9664	699	716
10		699.0343	715.9647	699	716
20		699.0382	715.9673	699	716
30		699.0378	715.9662	699	716
40		699.0364	715.9645	699	716
50		699.0363	715.9656	699	716
20	L.V.	699.0332	715.9673	699	716
	H.V.	699.0354	715.9642	699	716

Band 13:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	777.1284	786.8462	777	787
-20		777.1237	786.8436	777	787
-10		777.1255	786.8442	777	787
0		777.1217	786.8467	777	787
10		777.1243	786.8452	777	787
20		777.1295	786.8481	777	787
30		777.1254	786.8464	777	787
40		777.1292	786.8496	777	787
50		777.1265	786.8452	777	787
20	L.V.	777.1213	786.8462	777	787
	H.V.	777.1263	786.8454	777	787

Band 41:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	2535.0563	2654.9457	2535	2655
-20		2535.0542	2654.9454	2535	2655
-10		2535.0527	2654.9414	2535	2655
0		2535.0536	2654.9426	2535	2655
10		2535.0554	2654.9453	2535	2655
20		2535.0527	2654.9473	2535	2655
30		2535.0532	2654.9457	2535	2655
40		2535.0547	2654.9443	2535	2655
50		2535.0528	2654.9375	2535	2655
20	L.V.	2535.0496	2654.9435	2535	2655
	H.V.	2535.0522	2654.9441	2535	2655

Note: the applicant declared the operating frequency range is 2535-2655MHz for LTE Band 41.

16QAM:**Band 2:**

10.0 MHz Middle Channel, f ₀ =1880MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	-8.27	-0.0044	pass
-20		-6.68	-0.0036	pass
-10		9.77	0.0052	pass
0		-7.62	-0.0041	pass
10		-9.91	-0.0053	pass
20		-9.82	-0.0052	pass
30		-6.68	-0.0036	pass
40		-8.85	-0.0047	pass
50		5.67	0.0030	pass
20	L.V.	6.05	0.0032	pass
	H.V.	7.52	0.0040	pass

Band 5:

10.0 MHz Middle Channel, $f_0=836.5\text{MHz}$				
Temperature (°C)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	2.10	0.0025	2.5
-20		6.80	0.0081	2.5
-10		-9.52	-0.0114	2.5
0		-8.15	-0.0097	2.5
10		-8.88	-0.0106	2.5
20		-9.82	-0.0117	2.5
30		8.38	0.0100	2.5
40		6.75	0.0081	2.5
50		-5.89	-0.0070	2.5
20	L.V.	8.98	0.0107	2.5
	H.V.	-7.83	-0.0094	2.5

Band 12:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	N.V.	699.0386	715.9687	699	716
-20		699.0354	715.9635	699	716
-10		699.0374	715.9644	699	716
0		699.0328	715.9672	699	716
10		699.0341	715.9657	699	716
20		699.0435	715.9626	699	716
30		699.0341	715.9612	699	716
40		699.0347	715.9656	699	716
50		699.0326	715.9636	699	716
20	L.V.	699.0345	715.9647	699	716
	H.V.	699.0333	715.9676	699	716

Band 13:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	777.0316	786.9216	777	787
-20		777.0343	786.9247	777	787
-10		777.0311	786.9243	777	787
0		777.0362	786.9242	777	787
10		777.0335	786.9264	777	787
20		777.0327	786.9256	777	787
30		777.0332	786.9228	777	787
40		777.0322	786.9233	777	787
50		777.0293	786.9256	777	787
20	L.V.	777.0344	786.9274	777	787
	H.V.	777.0345	786.9245	777	787

Band 41:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	2535.0515	2654.8547	2535	2655
-20		2535.0496	2654.8532	2535	2655
-10		2535.0434	2654.8556	2535	2655
0		2535.0459	2654.8582	2535	2655
10		2535.0452	2654.8548	2535	2655
20		2535.0436	2654.8555	2535	2655
30		2535.0444	2654.8562	2535	2655
40		2535.0446	2654.8536	2535	2655
50		2535.0465	2654.8597	2535	2655
20	L.V.	2535.0427	2654.8546	2535	2655
	H.V.	2535.0433	2654.8545	2535	2655

Note: the applicant declared the operating frequency range is 2535-2655MHz for LTE Band 41.

***** **END OF REPORT** *****