ERP for LTE Band 40-Lower Side

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
2307.5	5	QPSK	1/0	12.20	V	8.10	0.98	19.32	23.98
2310.0	5	QPSK	1/0	11.98	V	8.10	0.98	19.10	23.98
2312.5	5	QPSK	1/24	12.03	V	8.10	0.98	19.15	23.98
2307.5	5	QPSK	1/0	13.76	H	8.10	0.98	20.88	23.98
2310.0	5	QPSK	1/0	13.67	H	8.10	0.98	20.79	23.98
2312.5	5	QPSK	1/24	13.80	H	8.10	0.98	20.92	23.98
2307.5	5	16-QAM	1/0	12.02	V	8.10	0.98	19.14	23.98
2310.0	5	16-QAM	1/0	12.09	V	8.10	0.98	19.21	23.98
2312.5	5	16-QAM	1/24	12.03	V	8.10	0.98	19.15	23.98
2307.5	5	16-QAM	1/0	13.60	H	8.10	0.98	20.72	23.98
2310.0	5	16-QAM	1/0	13.72	H	8.10	0.98	20.84	23.98
2312.5	5	16-QAM	1/24	13.61	H	8.10	0.98	20.73	23.98
2310	10	QPSK	1/0	12.70	V	8.10	0.98	19.82	23.98
2310	10	QPSK	1/49	12.69	V	8.10	0.98	19.81	23.98
2310	10	QPSK	1/0	13.66	H	8.10	0.98	20.78	23.98
2310	10	QPSK	1/49	13.82	H	8.10	0.98	20.94	23.98
2310	10	16-QAM	1/0	12.25	V	8.10	0.98	19.37	23.98
2310	10	16-QAM	1/49	11.89	V	8.10	0.98	19.01	23.98
2310	10	16-QAM	1/0	13.82	H	8.10	0.98	20.94	23.98
2310	10	16-QAM	1/49	13.74	H	8.10	0.98	20.86	23.98

ERP for LTE Band 40-UpperSide

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
2352.5	5	QPSK	1/0	12.76	V	8.10	0.98	19.88	23.98
2355.0	5	QPSK	1/0	12.59	V	8.10	0.98	19.71	23.98
2357.5	5	QPSK	1/24	12.55	V	8.10	0.98	19.67	23.98
2352.5	5	QPSK	1/0	14.28	H	8.10	0.98	21.40	23.98
2355.0	5	QPSK	1/0	14.28	H	8.10	0.98	21.40	23.98
2357.5	5	QPSK	1/24	14.42	H	8.10	0.98	21.54	23.98
2352.5	5	16-QAM	1/0	11.81	V	8.10	0.98	18.93	23.98
2355.0	5	16-QAM	1/0	11.52	V	8.10	0.98	18.64	23.98
2357.5	5	16-QAM	1/24	11.54	V	8.10	0.98	18.66	23.98
2352.5	5	16-QAM	1/0	13.37	H	8.10	0.98	20.49	23.98
2355.0	5	16-QAM	1/0	13.27	H	8.10	0.98	20.39	23.98
2357.5	5	16-QAM	1/24	13.34	H	8.10	0.98	20.46	23.98
2355	10	QPSK	1/0	12.72	V	8.10	0.98	19.84	23.98
2355	10	QPSK	1/49	12.48	V	8.10	0.98	19.60	23.98
2355	10	QPSK	1/0	14.30	H	8.10	0.98	21.42	23.98
2355	10	QPSK	1/49	14.11	H	8.10	0.98	21.23	23.98
2355	10	16-QAM	1/0	11.76	V	8.10	0.98	18.88	23.98
2355	10	16-QAM	1/49	11.68	V	8.10	0.98	18.80	23.98
2355	10	16-QAM	1/0	13.33	H	8.10	0.98	20.45	23.98
2355	10	16-QAM	1/49	13.27	H	8.10	0.98	20.39	23.98

ERP for LTE Band 41

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
2498.5	5	QPSK	1/0	11.89	V	8.23	1.12	19.00	33
2593.0	5	QPSK	1/0	12.12	V	8.23	1.12	19.23	33
2687.5	5	QPSK	1/24	11.94	V	8.23	1.12	19.05	33
2498.5	5	QPSK	1/0	13.54	H	8.23	1.12	20.65	33
2593.0	5	QPSK	1/0	13.40	H	8.23	1.12	20.51	33
2687.5	5	QPSK	1/24	13.52	H	8.23	1.12	20.63	33
2498.5	5	16-QAM	1/0	10.18	V	8.23	1.12	17.29	33
2593.0	5	16-QAM	1/0	11.74	V	8.23	1.12	18.85	33
2687.5	5	16-QAM	1/24	11.84	V	8.23	1.12	18.95	33
2498.5	5	16-QAM	1/0	13.43	H	8.23	1.12	20.54	33
2593.0	5	16-QAM	1/0	13.54	H	8.23	1.12	20.65	33
2687.5	5	16-QAM	1/24	13.51	H	8.23	1.12	20.62	33
2501.0	10	QPSK	1/0	10.70	V	8.23	1.12	17.81	33
2593.0	10	QPSK	1/49	10.77	V	8.23	1.12	17.88	33
2685.0	10	QPSK	1/0	10.65	V	8.23	1.12	17.76	33
2501.0	10	QPSK	1/0	12.33	H	8.23	1.12	19.44	33
2593.0	10	QPSK	1/49	12.62	H	8.23	1.12	19.73	33
2685.0	10	QPSK	1/0	12.39	H	8.23	1.12	19.50	33
2501.0	10	16-QAM	1/0	9.82	V	8.23	1.12	16.93	33
2593.0	10	16-QAM	1/49	10.06	V	8.23	1.12	17.17	33
2685.0	10	16-QAM	1/0	10.08	V	8.23	1.12	17.19	33
2501.0	10	16-QAM	1/0	11.39	H	8.23	1.12	18.50	33
2593.0	10	16-QAM	1/49	11.42	H	8.23	1.12	18.53	33
2685.0	10	16-QAM	1/0	11.55	H	8.23	1.12	18.66	33
2503.5	15	QPSK	1/0	10.57	V	8.23	1.12	17.68	33
2593.0	15	QPSK	1/74	10.56	V	8.23	1.12	17.67	33
2682.5	15	QPSK	1/0	10.75	V	8.23	1.12	17.86	33
2503.5	15	QPSK	1/0	10.54	H	8.23	1.12	17.65	33
2593.0	15	QPSK	1/74	12.44	H	8.23	1.12	19.55	33
2682.5	15	QPSK	1/0	12.38	H	8.23	1.12	19.49	33
2503.5	15	16-QAM	1/0	10.43	V	8.23	1.12	17.54	33
2593.0	15	16-QAM	1/74	10.27	V	8.23	1.12	17.38	33
2682.5	15	16-QAM	1/0	10.07	V	8.23	1.12	17.18	33
2503.5	15	16-QAM	1/0	11.65	H	8.23	1.12	18.76	33
2593.0	15	16-QAM	1/74	11.63	H	8.23	1.12	18.74	33
2682.5	15	16-QAM	1/0	11.64	H	8.23	1.12	18.75	33

2506.0	20	QPSK	1/99	10.76	V	8.23	1.12	17.87	33
2593.0	20	QPSK	1/99	9.74	V	8.23	1.12	16.85	33
2680.0	20	QPSK	1/0	10.84	V	8.23	1.12	17.95	33
2506.0	20	QPSK	1/99	12.04	H	8.23	1.12	19.15	33
2593.0	20	QPSK	1/99	11.01	H	8.23	1.12	18.12	33
2680.0	20	QPSK	1/0	11.70	H	8.23	1.12	18.81	33
2506.0	20	16-QAM	1/99	12.91	V	8.23	1.12	20.02	33
2593.0	20	16-QAM	1/99	12.56	V	8.23	1.12	19.67	33
2680.0	20	16-QAM	1/0	12.82	V	8.23	1.12	19.93	33
2506.0	20	16-QAM	1/99	14.30	H	8.23	1.12	21.41	33
2593.0	20	16-QAM	1/99	14.14	H	8.23	1.12	21.25	33
2680.0	20	16-QAM	1/0	14.19	H	8.23	1.12	21.30	33

Note: Above is the worst mode data.

8. PEAK-TO-AVERAGE RATIO

8.1 PROVISIONS APPLICABLE

① CCDF Procedure for PAPR :

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Set the measurement interval as follows:

-for continuous transmissions, set to 1 ms,

-or burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time

that is less than or equal to the burst duration.

4. Record the maximum PAPR level associated with a probability of 0.1%.

② Alternate Procedure for PAPR:

Use one of the procedures presented in 5.2(ANSI C63.26-2015) to measure the total peak power and record as P_{Pk}. Use one of the applicable procedures presented 5.2(ANSI C63.26-2015) to measure the total average power and recordas PAvg. Determine the P.A.R. from:

P.A.R(dB) = PPk (dBm) – PAvg (dBm) (PAvg = Average Power + Duty cycle Factor)

8.2 MEASUREMENT METHOD

Test Settings(Peak Power):

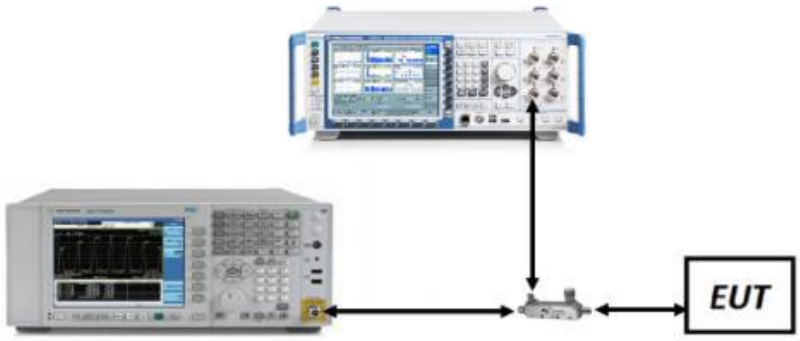
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

1. Set the RBW ≥ OBW.
2. Set VBW ≥ 3 × RBW.
3. Set span ≥ 2 × OBW.
4. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period).
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the peak amplitude level.

Test Settings(Average Power)

1. Set span to 2 × to 3 × the OBW.
2. Set RBW ≥ OBW.
3. Set VBW ≥ 3 × RBW.
4. Set number of measurement points in sweep ≥ 2 × span / RBW.
5. Sweep time: Set ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (automation-compatible) measurement. The transmission period is the (on + off) time.
6. Detector = power averaging (rms).
7. Set sweep trigger to “free run.”
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. (To accurately determine the average power over the on and off period of the transmitter, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.)
9. Use the peak marker function to determine the maximum amplitude level.
10. Add [10 log (1/duty cycle)] to the measured maximum power level to compute the average power during continuous transmission. For example, add [10 log (1/0.25)] = 6 dB if the duty cycle is a constant 25%.

8.3 MEASUREMENT SETUP



8.4 MEASUREMENT RESULT

LTE BAND 5

Mode	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band5	1.4MHz	QPSK	20407	6RB#0	4.98	13	PASS
Band5	1.4MHz	QPSK	20525	6RB#0	5.06	13	PASS
Band5	1.4MHz	QPSK	20643	6RB#0	4.79	13	PASS
Band5	1.4MHz	16QAM	20407	6RB#0	5.63	13	PASS
Band5	1.4MHz	16QAM	20525	6RB#0	5.87	13	PASS
Band5	1.4MHz	16QAM	20643	6RB#0	5.56	13	PASS
Band5	3MHz	QPSK	20415	15RB#0	4.92	13	PASS
Band5	3MHz	QPSK	20525	15RB#0	5.03	13	PASS
Band5	3MHz	QPSK	20635	15RB#0	4.88	13	PASS
Band5	3MHz	16QAM	20415	15RB#0	5.60	13	PASS
Band5	3MHz	16QAM	20525	15RB#0	5.87	13	PASS
Band5	3MHz	16QAM	20635	15RB#0	5.71	13	PASS
Band5	5MHz	QPSK	20425	25RB#0	4.86	13	PASS
Band5	5MHz	QPSK	20525	25RB#0	5.02	13	PASS
Band5	5MHz	QPSK	20625	25RB#0	4.86	13	PASS
Band5	5MHz	16QAM	20425	25RB#0	5.61	13	PASS
Band5	5MHz	16QAM	20525	25RB#0	5.79	13	PASS
Band5	5MHz	16QAM	20625	25RB#0	5.74	13	PASS
Band5	10MHz	QPSK	20450	50RB#0	5.00	13	PASS
Band5	10MHz	QPSK	20525	50RB#0	5.14	13	PASS
Band5	10MHz	QPSK	20600	50RB#0	5.11	13	PASS
Band5	10MHz	16QAM	20450	50RB#0	5.78	13	PASS
Band5	10MHz	16QAM	20525	50RB#0	5.86	13	PASS
Band5	10MHz	16QAM	20600	50RB#0	5.86	13	PASS

LTE BAND 38

Mode	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band38	5MHz	QPSK	37775	25RB#0	5.61	13	PASS
Band38	5MHz	QPSK	38000	25RB#0	6.69	13	PASS
Band38	5MHz	QPSK	38225	25RB#0	11.69	13	PASS
Band38	5MHz	16QAM	37775	25RB#0	6.31	13	PASS
Band38	5MHz	16QAM	38000	25RB#0	8.66	13	PASS
Band38	5MHz	16QAM	38225	25RB#0	10.01	13	PASS
Band38	10MHz	QPSK	37800	50RB#0	5.70	13	PASS
Band38	10MHz	QPSK	38000	50RB#0	8.47	13	PASS
Band38	10MHz	QPSK	38200	50RB#0	10.61	13	PASS
Band38	10MHz	16QAM	37800	50RB#0	6.54	13	PASS
Band38	10MHz	16QAM	38000	50RB#0	7.47	13	PASS
Band38	10MHz	16QAM	38200	50RB#0	10.80	13	PASS
Band38	15MHz	QPSK	37825	75RB#0	5.85	13	PASS
Band38	15MHz	QPSK	38000	75RB#0	7.58	13	PASS
Band38	15MHz	QPSK	38175	75RB#0	5.94	13	PASS
Band38	15MHz	16QAM	37825	75RB#0	6.50	13	PASS
Band38	15MHz	16QAM	38000	75RB#0	7.61	13	PASS
Band38	15MHz	16QAM	38175	75RB#0	6.37	13	PASS
Band38	20MHz	QPSK	37850	100RB#0	6.02	13	PASS
Band38	20MHz	QPSK	38000	100RB#0	6.92	13	PASS
Band38	20MHz	QPSK	38150	100RB#0	5.61	13	PASS
Band38	20MHz	16QAM	37850	100RB#0	6.42	13	PASS
Band38	20MHz	16QAM	38000	100RB#0	7.81	13	PASS
Band38	20MHz	16QAM	38150	100RB#0	6.27	13	PASS

LTE BAND 40

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band40	5MHz	QPSK	38725	25RB#0	5.58	13	PASS
Band40	5MHz	QPSK	38750	25RB#0	5.51	13	PASS
Band40	5MHz	QPSK	38775	25RB#0	5.40	13	PASS
Band40	5MHz	QPSK	39175	25RB#0	6.07	13	PASS
Band40	5MHz	QPSK	39200	25RB#0	5.87	13	PASS
Band40	5MHz	QPSK	39225	25RB#0	6.02	13	PASS
Band40	5MHz	16QAM	38725	25RB#0	6.32	13	PASS
Band40	5MHz	16QAM	38750	25RB#0	6.26	13	PASS
Band40	5MHz	16QAM	38775	25RB#0	6.14	13	PASS
Band40	5MHz	16QAM	39175	25RB#0	6.56	13	PASS
Band40	5MHz	16QAM	39200	25RB#0	6.85	13	PASS
Band40	5MHz	16QAM	39225	25RB#0	6.66	13	PASS
Band40	10MHz	QPSK	38750	50RB#0	5.47	13	PASS
Band40	10MHz	QPSK	39200	50RB#0	5.93	13	PASS
Band40	10MHz	16QAM	38750	50RB#0	6.27	13	PASS
Band40	10MHz	16QAM	39200	50RB#0	6.68	13	PASS

LTE BAND 41

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band41	5MHz	QPSK	40065	25RB#0	8.47	13	PASS
Band41	5MHz	QPSK	40640	25RB#0	8.48	13	PASS
Band41	5MHz	QPSK	41215	25RB#0	8.52	13	PASS
Band41	5MHz	16QAM	40065	25RB#0	8.40	13	PASS
Band41	5MHz	16QAM	40640	25RB#0	8.50	13	PASS
Band41	5MHz	16QAM	41215	25RB#0	8.44	13	PASS
Band41	10MHz	QPSK	40090	50RB#0	8.45	13	PASS
Band41	10MHz	QPSK	40640	50RB#0	9.40	13	PASS
Band41	10MHz	QPSK	41190	50RB#0	8.53	13	PASS
Band41	10MHz	16QAM	40090	50RB#0	8.46	13	PASS
Band41	10MHz	16QAM	40640	50RB#0	9.48	13	PASS
Band41	10MHz	16QAM	41190	50RB#0	8.50	13	PASS
Band41	15MHz	QPSK	40115	75RB#0	6.08	13	PASS
Band41	15MHz	QPSK	40640	75RB#0	5.79	13	PASS
Band41	15MHz	QPSK	41175	75RB#0	5.83	13	PASS
Band41	15MHz	16QAM	40115	75RB#0	6.43	13	PASS
Band41	15MHz	16QAM	40640	75RB#0	6.29	13	PASS
Band41	15MHz	16QAM	41175	75RB#0	6.33	13	PASS
Band41	20MHz	QPSK	40140	100RB#0	5.62	13	PASS
Band41	20MHz	QPSK	40640	100RB#0	5.62	13	PASS
Band41	20MHz	QPSK	41150	100RB#0	5.69	13	PASS
Band41	20MHz	16QAM	40140	100RB#0	6.41	13	PASS
Band41	20MHz	16QAM	40640	100RB#0	6.24	13	PASS
Band41	20MHz	16QAM	41150	100RB#0	6.34	13	PASS

9. SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL

9.1 PROVISIONS APPLICABLE

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

9.2 MEASUREMENT METHOD

For Band 2/Band 4/Band 5/Band 12/Band 13/Band 14/Band 17/Band 25/Band 26/Band 66/Band 71:
The minimum permissible attenuation level of any spurious emission is 43 + log10(P[Watts]), where P is the transmitter power in Watts.
For Band 7:
(i) 40 + 10 log10 p from the channel edges to 5 MHz away
(ii) 43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and
(iii) 55 + 10 log10 p at X MHz and beyond from the channel edges
For Band 14:
On all frequencies between 769-775 MHz and 799-805 MHz:< 65 + 10log10 (P[Watts])

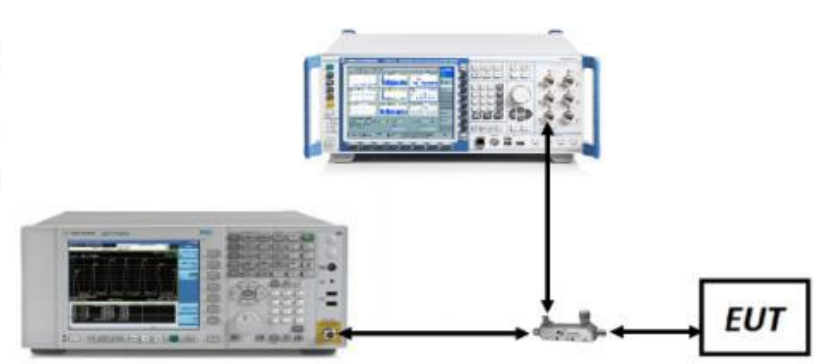
Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
1. RBW = 1 MHz
2. VBW ≥ 3 MHz
3. Detector = RMS
4. Trace Mode = Average
5. Sweep time = auto
6. Number of points in sweep ≥ 2 * Span / RBW

Test Note

Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

9.3 MEASUREMENT SETUP



9.4 MEASUREMENT RESULT

Please refer to: appendix a test plots for spurious and harmonic emissions at antenna terminal

Note: 1. No transmission signal is found in standby or receiving mode, and the default value is lower than the limit of 20dB, which is not recorded in this report.

10 RADIATED SPURIOUS EMISSION

10.1.PROVISIONS APPLICABLE

(A) On any frequency outside a licensee's frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm.

At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

(B) For specific criteria, please refer to the description in section 9.2 of the report for corresponding evaluation.

10.2. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that

means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.
11. For spurious emissions above 1GHz, a horn antenna is substituted in place of the EUT.
    The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.
    The spurious emissions is calculated by the following formula;

    Result(dBm) = Pg(dBm) +Factor(dB)

    Factor(dB) = Ant Gain(dB)-Cable Loss(dB) + Power Splitter(dB) (Above 1GHz)

    Factor(dB) = Ant Gain(dB)-Cable Loss(dB) (Below 1GHz)

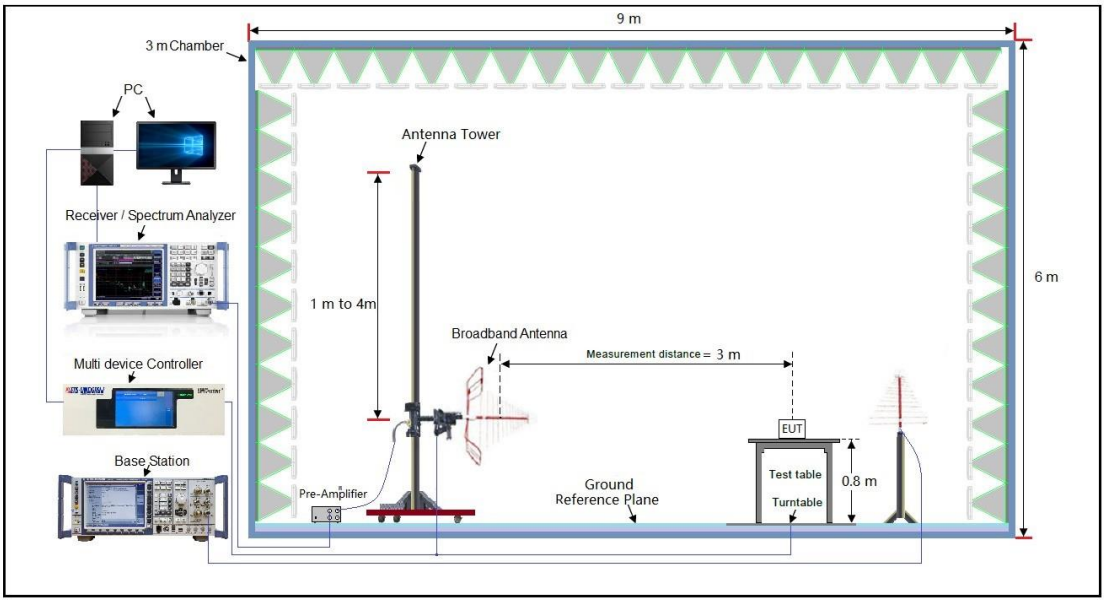
    Where: Pgis the generator output power into the substitution antenna.
    If the fundalmatal frequency is below 1GHz, RF output power has been converted to EIRP.

    EIRP(dBm) = ERP(dBm) + 2.15
12. Examples of Factor parameters for testing radiation spurious:

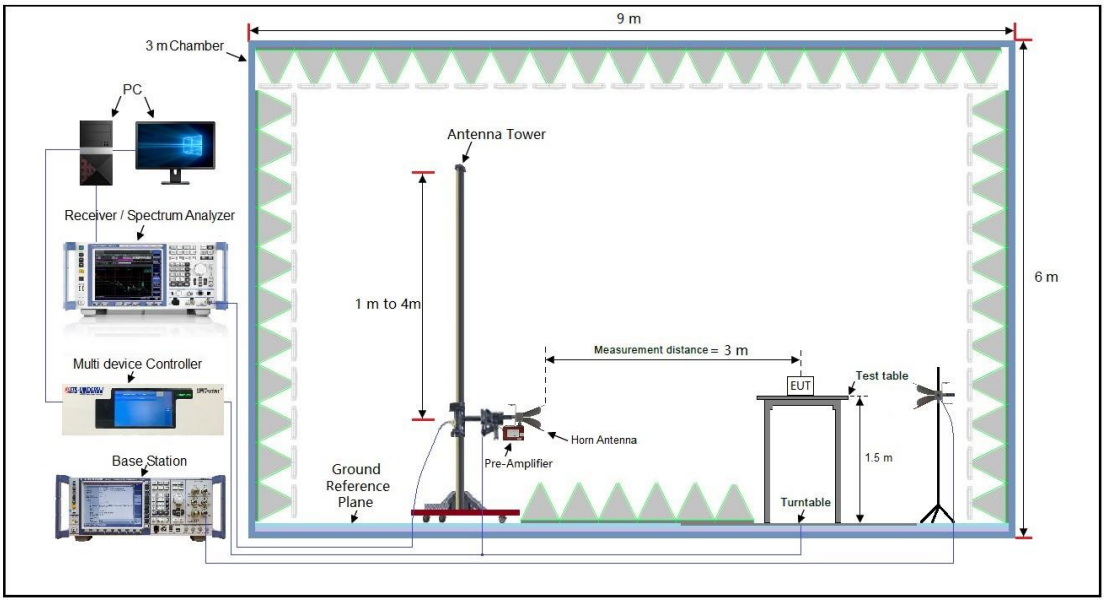
Frequency Range(MHz)	Factor(dB)
30-500	6.18
500-1000	9.37
1000-1500	27.56
1500-2000	28.27
2000-3000	29.45
3000-5000	30.15
5000-10000	31.26
10000-15000	32.78
15000-20000	33.99
Above 20GHz	35.04

10.3. MEASUREMENT SETUP

Radiated Emissions 30MHz to 1GHz Test setup



Radiated Emissions Above 1GHz Test setup



10.4 MEASUREMENT RESULT

LTE Band 5

Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2487	V	-41.13	-13	-28.13
1658	V	-42.75	-13	-29.75
512.2	V	-47.64	-13	-34.64
365.5	V	-46.89	-13	-33.89
2487	H	-39.47	-13	-26.47
1658	H	-40.49	-13	-27.49
521.1	H	-44.49	-13	-31.49
336.5	H	-44.26	-13	-31.26

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2509.5	V	-42.07	-13	-29.07
1673	V	-43.51	-13	-30.51
725.8	V	-47.40	-13	-34.40
616.6	V	-47.48	-13	-34.48
2509.5	H	-41.61	-13	-28.61
1673	H	-42.27	-13	-29.27
705.5	H	-46.64	-13	-33.64
558.9	H	-45.79	-13	-32.79

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2532	V	-40.27	-13	-27.27
1688	V	-40.81	-13	-27.81
648.3	V	-46.68	-13	-33.68
482.7	V	-47.28	-13	-34.28
2532	H	-39.90	-13	-26.90
1688	H	-40.70	-13	-27.70
785.6	H	-45.97	-13	-32.97
615.7	H	-48.18	-13	-35.18

LTE Band 38
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
7717.5	V	-49.20	-25	-36.20
5145	V	-45.94	-25	-32.94
881.2	V	-48.82	-25	-35.82
594.3	V	-52.46	-25	-39.46
7717.5	H	-46.96	-25	-33.96
5145	H	-44.27	-25	-31.27
463.8	H	-53.87	-25	-40.87
367.5	H	-49.76	-25	-36.76

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
7785	V	-45.65	-25	-32.65
5190	V	-46.67	-25	-33.67
674.1	V	-52.72	-25	-39.72
493.2	V	-52.72	-25	-39.72
7785	H	-46.47	-25	-33.47
5190	H	-47.29	-25	-34.29
421.8	H	-48.81	-25	-35.81
203.1	H	-52.38	-25	-39.38

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
7851	V	-45.87	-25	-32.87
5235	V	-46.96	-25	-33.96
745.3	V	-49.50	-25	-36.50
582.6	V	-51.85	-25	-38.85
7851	H	-44.09	-25	-31.09
5235	H	-44.91	-25	-31.91
742.1	H	-51.70	-25	-38.70
652.7	H	-50.44	-25	-37.44

LTE Band 40-Lower Side
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
6922.5	V	-50.62	-40	-10.62
4615.0	V	-47.43	-40	-7.43
857.3	V	-51.33	-40	-11.33
921.6	V	-54.20	-40	-14.20
6922.5	H	-49.77	-40	-9.77
4615.0	H	-46.93	-40	-6.93
584.3	H	-55.53	-40	-15.53
462.8	H	-51.05	-40	-11.05

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
6930	V	-47.38	-40	-7.38
4620	V	-47.68	-40	-7.68
587.6	V	-54.39	-40	-14.39
415.9	V	-54.55	-40	-14.55
6930	H	-47.64	-40	-7.64
4620	H	-49.67	-40	-9.67
469.5	H	-50.35	-40	-10.35
351.2	H	-53.15	-40	-13.15

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
6937.5	V	-48.19	-40	-8.19
4625.0	V	-48.09	-40	-8.09
785.4	V	-52.26	-40	-12.26
569.3	V	-53.18	-40	-13.18
6937.5	H	-45.88	-40	-5.88
4625.0	H	-46.74	-40	-6.74
699.7	H	-53.18	-40	-13.18
512.0	H	-52.20	-40	-12.20

LTE Band 40-Upper Side
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
7057.5	V	-49.22	-40	-9.22
4705.0	V	-46.39	-40	-6.39
763.5	V	-49.98	-40	-9.98
512.8	V	-53.20	-40	-13.20
7057.5	H	-47.23	-40	-7.23
4705.0	H	-44.36	-40	-4.36
496.8	H	-55.13	-40	-15.13
359.2	H	-50.50	-40	-10.50

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
7065	V	-47.12	-40	-7.12
4710	V	-47.43	-40	-7.43
887.4	V	-53.40	-40	-13.40
746.3	V	-52.80	-40	-12.80
7065	H	-46.72	-40	-6.72
4710	H	-47.37	-40	-7.37
649.7	H	-49.20	-40	-9.20
523.1	H	-53.58	-40	-13.58

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
7072.5	V	-46.36	-40	-6.36
4715.0	V	-48.18	-40	-8.18
469.8	V	-49.77	-40	-9.77
321.7	V	-53.31	-40	-13.31
7072.5	H	-44.66	-40	-4.66
4715.0	H	-45.12	-40	-5.12
447.5	H	-53.02	-40	-13.02
369.3	H	-51.45	-40	-11.45

LTE Band 41
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
7495.5	V	-48.08	-25	-23.08
4997	V	-44.81	-25	-19.81
612.1	V	-48.09	-25	-23.09
483.6	V	-52.67	-25	-27.67
7495.5	H	-45.23	-25	-20.23
4997	H	-44.65	-25	-19.65
742.8	H	-53.11	-25	-28.11
563.7	H	-49.25	-25	-24.25

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
7779	V	-44.80	-25	-19.80
5186	V	-45.92	-25	-20.92
568.2	V	-51.50	-25	-26.50
341.5	V	-53.14	-25	-28.14
7779	H	-44.54	-25	-19.54
5186	H	-45.96	-25	-20.96
552.7	H	-47.80	-25	-22.80
421.5	H	-52.87	-25	-27.87

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
8062.5	V	-44.76	-25	-19.76
5375	V	-45.39	-25	-20.39
642.9	V	-48.33	-25	-23.33
471.6	V	-51.09	-25	-26.09
8062.5	H	-43.86	-25	-18.86
5375	H	-44.30	-25	-19.30
363.2	H	-50.19	-25	-25.19
274.6	H	-49.78	-25	-24.78

Note: 1. Margin (dB) = Emission Level(dBm) -Limit(dBm)
Emission Level(dBm)= Measurement Reading(dBm)+Factor(dB)
Factor(dB) = ANT Gain -Cable Loss + Power Splitter

2. The test refers to the value of Factor, please refer to the results listed in the test method in this section of the report.
3. Radiated Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0.
4. Below 30MHz, no spurious emission was found, and only the worst mode data above 30MHz is recorded in the report.

11. FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

11.1 PROVISIONS APPLICABLE

11.1.1 For Hand carried battery powered equipment

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

a.) Temperature: The temperature is varied from -20°C to +55°C in 10°C increments using an environmental chamber.

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

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

11.1.2 For equipment powered by primary supply voltage

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from 5°C to +45°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

11.2 MEASUREMENT METHOD

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER.

1 Measure the carrier frequency at room temperature.

2 Subject the EUT to overnight soak at 10℃. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on channel 20175 for LTE band 4 measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

3 Repeat the above measurements at 10℃ increments from 5℃ to +45℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

4 Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.

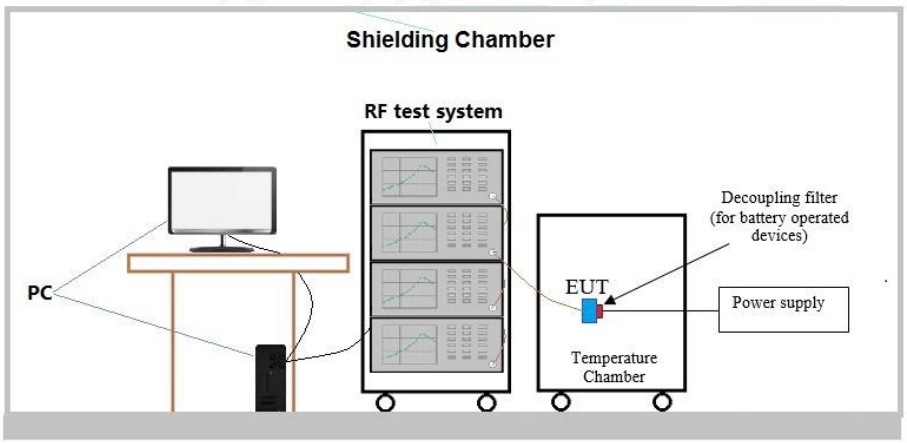
5 Subject the EUT to overnight soak at +25℃.

6 With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

7 Repeat the above measurements at 10℃ increments from +45℃ to 5℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

8 At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

11.3 MEASUREMENT SETUP



11.4 MEASUREMENT RESULT

LTE Band 5

Middle Channel, f_O = 836.5MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-20	3.7	8.40	0.003640
-10		-9.08	-0.003935
0		10.71	0.004641
10		-19.60	-0.008485
20		-16.78	-0.007264
30		-14.69	-0.006359
40		-13.35	-0.005773
50		-16.24	-0.007023
25	4.20	-12.22	-0.005284
	3.15	12.50	0.005313

LTE Band 38

Middle Channel, f_O = 2595.0 MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-20	3.7	-14.32	-0.005567
-10		52.24	0.020307
0		24.58	0.009555
10		34.69	0.013368
20		31.57	0.012166
30		26.85	0.010347
40		-23.37	-0.008928
50		21.23	0.008111
25	4.20	-39.50	-0.015091
	3.15	43.49	0.016906

LTE Band 40-Lower Side

Middle Channel, f_O = 2310.0MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-20	3.7	8.40	0.003640
-10		-9.08	-0.003935
0		10.71	0.004641
10		-19.60	-0.008485
20		-16.78	-0.007264
30		-14.69	-0.006359
40		-13.35	-0.005773
50		-16.24	-0.007023
25	4.20	-12.22	-0.005284
	3.15	12.50	0.005313

LTE Band 40-Upper Side

Middle Channel, f_O = 2355.0 MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-20	3.7	7.51	0.003192
-10		16.29	0.006925
0		3.12	0.001325
10		-11.69	-0.004964
20		-12.59	-0.005346
30		7.21	0.003058
40		-6.77	-0.002872
50		5.02	0.002129
25	4.20	17.74	0.007688
	3.15	11.82	0.005122

LTE Band 41

Middle Channel, f_O = 2593.0 MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-20	3.7	-22.43	-0.008977
-10		24.52	0.009814
0		24.25	0.009706
10		26.48	0.010598
20		31.33	0.012540
30		-74.57	-0.029387
40		-27.15	-0.010700
50		-36.42	-0.014353
25	4.20	-43.96	-0.017324
	3.15	-43.52	-0.017151

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

Note:1. The device under test maintains the minimum and maximum operating temperature and the required limit voltage according to the manufacturer's requirements.

2. Only the worst working mode data is recorded in the report.

12. OCCUPIED BANDWIDTH

12.1 PROVISIONS APPLICABLE

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

The EUT makes a call to the communication simulator.

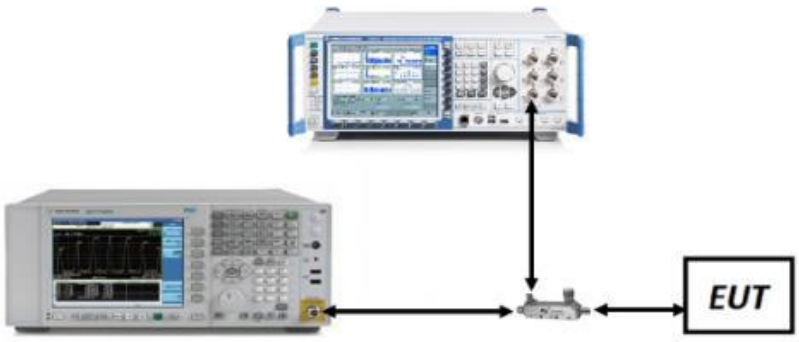
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

12.2 MEASUREMENT METHOD

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

12.3 MEASUREMENT SETUP



12.4 MEASUREMENT RESULT

LTE Band 5

Channel Bandwidth: 1.4 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	6	0	1.0906	1.234	PASS
	MCH	6	0	1.0894	1.225	PASS
	HCH	6	0	1.0891	1.223	PASS
16QAM	LCH	6	0	1.0901	1.222	PASS
	MCH	6	0	1.0884	1.237	PASS
	HCH	6	0	1.0904	1.239	PASS

Channel Bandwidth: 3 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	15	0	2.6942	2.978	PASS
	MCH	15	0	2.7017	2.964	PASS
	HCH	15	0	2.6924	2.952	PASS
16QAM	LCH	15	0	2.6875	2.961	PASS
	MCH	15	0	2.6947	2.982	PASS
	HCH	15	0	2.6942	2.978	PASS

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	4.4888	4.857	PASS
	MCH	25	0	4.4941	4.885	PASS
	HCH	25	0	4.4892	4.878	PASS
16QAM	LCH	25	0	4.4929	4.865	PASS
	MCH	25	0	4.4974	4.878	PASS
	HCH	25	0	4.4957	4.889	PASS

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	50	0	8.9803	9.565	PASS
	MCH	50	0	8.9856	9.552	PASS
	HCH	50	0	8.9691	9.544	PASS
16QAM	LCH	50	0	8.9637	9.577	PASS
	MCH	50	0	8.9808	9.576	PASS
	HCH	50	0	8.9624	9.545	PASS

LTE Band 38

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	4.5036	4.835	PASS
	MCH	25	0	4.4957	4.880	PASS
	HCH	25	0	4.4979	4.830	PASS
16QAM	LCH	25	0	4.4903	4.872	PASS
	MCH	25	0	4.4838	4.869	PASS
	HCH	25	0	4.4947	4.815	PASS

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	50	0	8.9681	9.507	PASS
	MCH	50	0	8.9742	9.553	PASS
	HCH	50	0	8.9728	9.538	PASS
16QAM	LCH	50	0	8.9701	9.523	PASS
	MCH	50	0	8.9808	9.554	PASS
	HCH	50	0	8.9732	9.576	PASS

Channel Bandwidth: 15 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	75	0	13.425	14.22	PASS
	MCH	75	0	13.475	14.30	PASS
	HCH	75	0	13.465	14.29	PASS
16QAM	LCH	75	0	13.431	14.27	PASS
	MCH	75	0	13.461	14.29	PASS
	HCH	75	0	13.450	14.28	PASS

Channel Bandwidth: 20 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	100	0	17.912	18.97	PASS
	MCH	100	0	17.962	18.99	PASS
	HCH	100	0	17.948	18.99	PASS
16QAM	LCH	100	0	17.922	18.96	PASS
	MCH	100	0	17.954	19.02	PASS
	HCH	100	0	17.946	18.96	PASS

LTE Band 40 Lower Side

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	4.5014	4.938	PASS
	MCH	25	0	4.4997	4.896	PASS
	HCH	25	0	4.5109	4.840	PASS
16QAM	LCH	25	0	4.4964	4.891	PASS
	MCH	25	0	4.4973	4.855	PASS
	HCH	25	0	4.4962	4.920	PASS

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	MCH	50	0	8.9762	9.487	PASS
16QAM	MCH	50	0	8.9652	9.546	PASS

LTE Band 40 Upper Side

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	4.4970	4.994	PASS
	MCH	25	0	4.5059	4.877	PASS
	HCH	25	0	4.5148	4.860	PASS
16QAM	LCH	25	0	4.4987	4.925	PASS
	MCH	25	0	4.5068	4.877	PASS
	HCH	25	0	4.5002	4.941	PASS

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	MCH	50	0	8.9998	9.541	PASS
16QAM	MCH	50	0	8.9875	9.545	PASS

LTE Band 41

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	4.5008	4.835	PASS
	MCH	25	0	4.4958	4.889	PASS
	HCH	25	0	4.4979	4.836	PASS
16QAM	LCH	25	0	4.4899	4.868	PASS
	MCH	25	0	4.4894	4.871	PASS
	HCH	25	0	4.4910	4.819	PASS

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	50	0	8.9750	9.545	PASS
	MCH	50	0	8.9743	9.519	PASS
	HCH	50	0	8.9735	9.534	PASS
16QAM	LCH	50	0	8.9749	9.564	PASS
	MCH	50	0	8.9788	9.565	PASS
	HCH	50	0	8.9814	9.549	PASS

Channel Bandwidth: 15 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	75	0	13.485	14.32	PASS
	MCH	75	0	13.476	14.30	PASS
	HCH	75	0	13.459	14.29	PASS
16QAM	LCH	75	0	13.459	14.26	PASS
	MCH	75	0	13.457	14.30	PASS
	HCH	75	0	13.447	14.28	PASS

Channel Bandwidth: 20 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	100	0	17.966	18.95	PASS
	MCH	100	0	17.944	19.02	PASS
	HCH	100	0	17.964	18.99	PASS
16QAM	LCH	100	0	17.983	18.96	PASS
	MCH	100	0	17.963	19.00	PASS
	HCH	100	0	17.957	18.98	PASS

Note: Please refers to Appendix B for compliance test plots for Occupied Bandwidth &Emission Bandwidth.

13. BAND EDGE

13.1 MEASUREMENT OVERVIEW

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

13.2 MEASUREMENT METHOD

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1% of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

TEST NOTE

§90.543(e)

1. On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.
2. On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.
3. On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.
4. Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measure ment instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to i ndicate spectral energy in a 6.25 kHz segment.
5. Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instr umentation 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 bandwid th of 30kHz may be employed.

§27.53(m)

Equipment shall comply with the following unwanted emission limits:

a) for base station and fixed subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least 43 + 10 log10 p

b) for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:40 + 10 log10 p from the channel

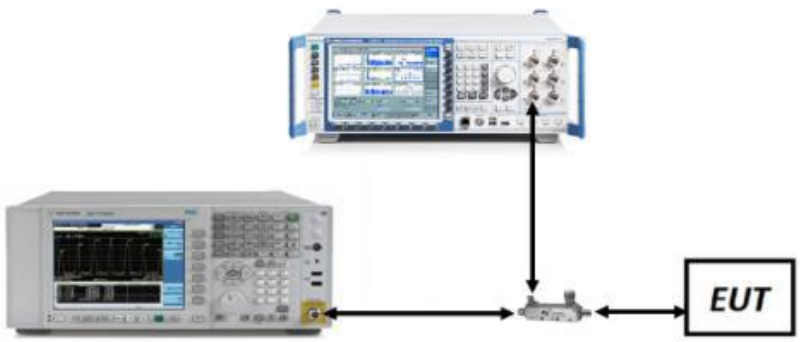
edges to 5 MHz away 43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and 55 + 10 log10 p at X MHz and beyond from the channel edges In addition, the attenuation shall not be less than 43 + 10 log10 p on all frequencies between 2490.5 MHz and 2496 MHz, and 55 + 10 log10 p at or below 2490.5 MHz.

In (a) and (b), p is the transmitter power measured in watts and X is 6 MHz or the equipment occupied bandwidth, whichever is greater.

According to FCC 22.917, 24.238, 27.53 specified that 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.In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. All measurements were done at 2 channels(low and high operational frequency range.)

The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

13.3 MEASUREMENT METHOD

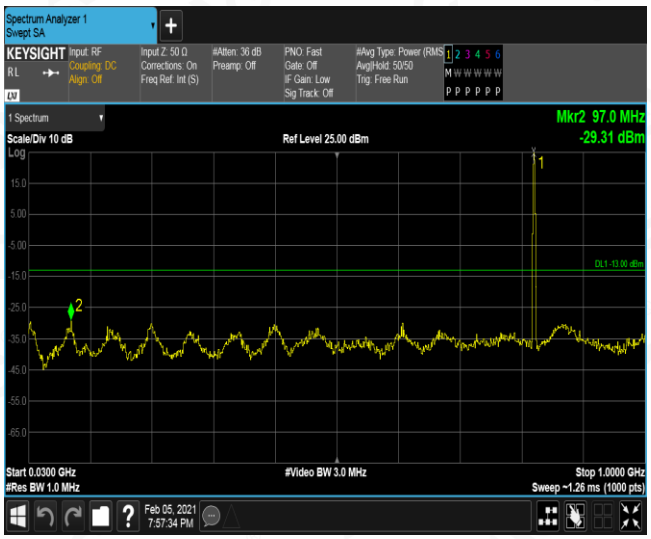
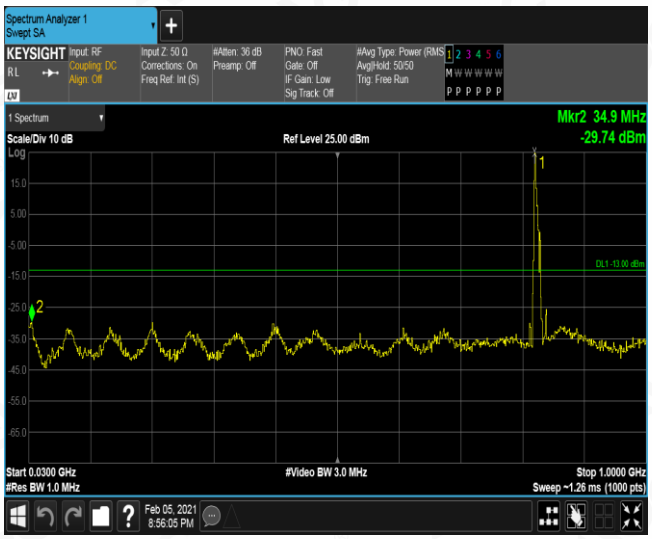
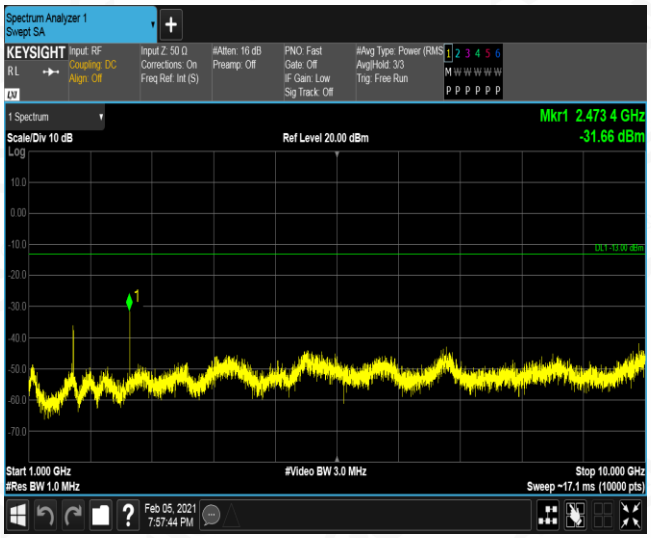
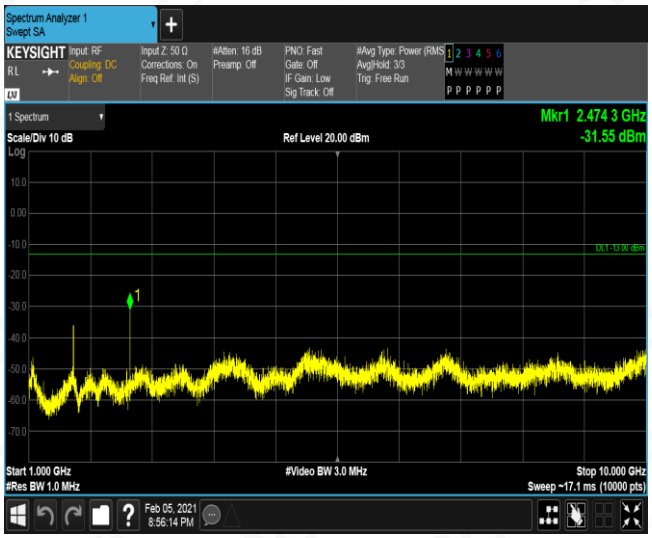


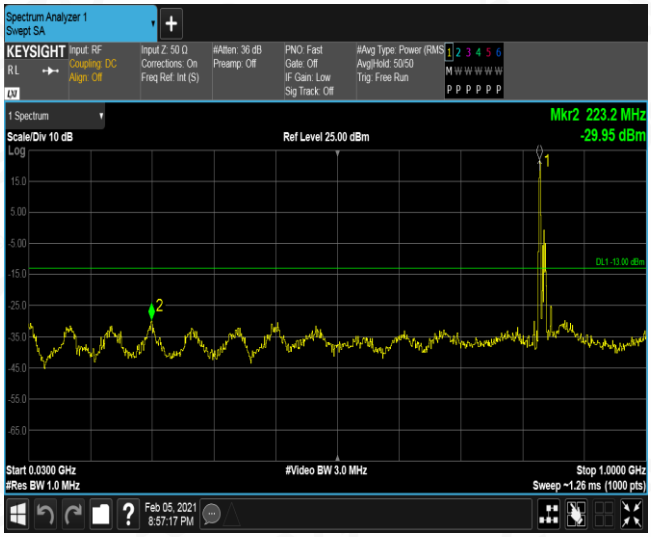
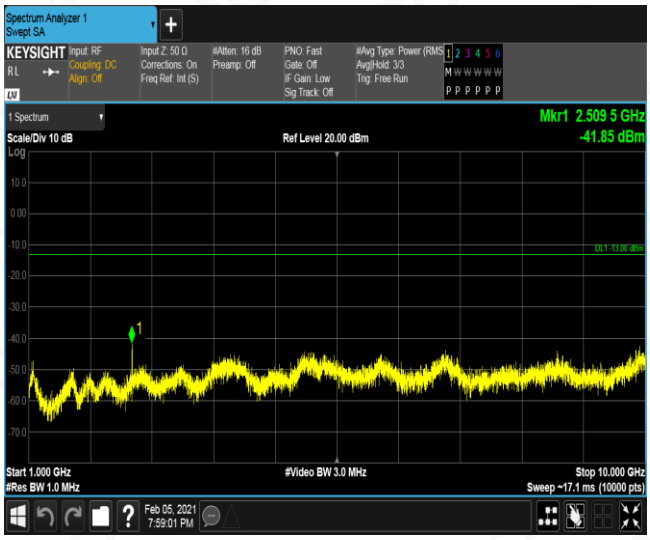
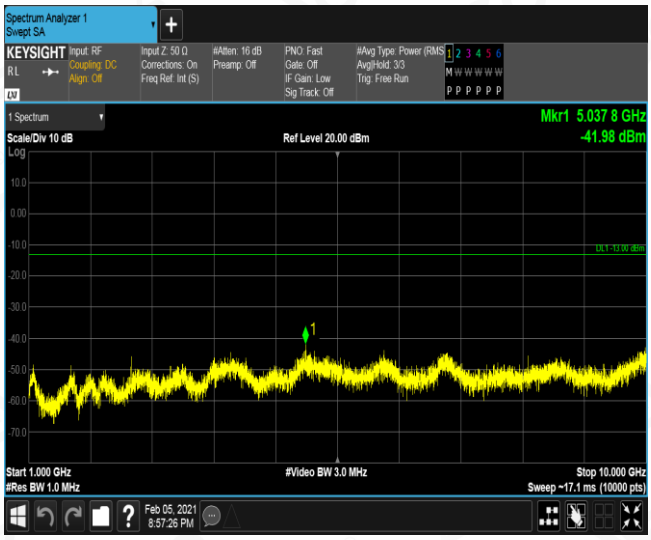
13.4 MEASUREMENT RESULT

NOTE: Please refers to Appendix C for compliance test plots for band edge

APPENDIX A TEST PLOTS FOR SPURIOUS EMISSIONS AT ANTENNA TERMINALS

LTE BAND 5

1.4MHz_LCH_QPSK_1RB#0	10MHz_LCH_QPSK_1RB#0
	
	

1.4MHz_MCH_QPSK_1RB#0	10MHz_MCH_QPSK_1RB#0
	
	

1.4MHz_HCH_QPSK_1RB#0	10MHz_HCH_QPSK_1RB#0