1715.0	10	QPSK	1/0	11.65	V	7.95	0.79	18.81	30
1745.0	10	QPSK	1/49	11.61	V	7.95	0.79	18.77	30
1775.0	10	QPSK	1/0	11.55	V	7.95	0.79	18.71	30
1715.0	10	QPSK	1/0	12.94	H	7.95	0.79	20.10	30
1745.0	10	QPSK	1/49	12.85	H	7.95	0.79	20.01	30
1775.0	10	QPSK	1/0	12.89	H	7.95	0.79	20.05	30
1715.0	10	16-QAM	1/0	13.19	V	7.95	0.79	20.35	30
1745.0	10	16-QAM	1/49	13.15	V	7.95	0.79	20.31	30
1775.0	10	16-QAM	1/0	13.10	V	7.95	0.79	20.26	30
1715.0	10	16-QAM	1/0	14.43	H	7.95	0.79	21.59	30
1745.0	10	16-QAM	1/49	14.51	H	7.95	0.79	21.67	30
1775.0	10	16-QAM	1/0	14.34	H	7.95	0.79	21.50	30
1717.5	15	QPSK	1/0	13.81	V	7.95	0.79	20.97	30
1745.0	15	QPSK	1/74	12.34	V	7.95	0.79	19.50	30
1772.5	15	QPSK	1/0	12.59	V	7.95	0.79	19.75	30
1717.5	15	QPSK	1/0	14.94	H	7.95	0.79	22.10	30
1745.0	15	QPSK	1/74	13.70	H	7.95	0.79	20.86	30
1772.5	15	QPSK	1/0	13.80	H	7.95	0.79	20.96	30
1717.5	15	16-QAM	1/0	11.43	V	7.95	0.79	18.59	30
1745.0	15	16-QAM	1/74	11.38	V	7.95	0.79	18.54	30
1772.5	15	16-QAM	1/0	11.42	V	7.95	0.79	18.58	30
1717.5	15	16-QAM	1/0	12.76	H	7.95	0.79	19.92	30
1745.0	15	16-QAM	1/74	12.62	H	7.95	0.79	19.78	30
1772.5	15	16-QAM	1/0	12.97	H	7.95	0.79	20.13	30
1720.0	20	QPSK	1/99	11.88	V	7.95	0.79	19.04	30
1745.0	20	QPSK	1/99	11.72	V	7.95	0.79	18.88	30
1770.0	20	QPSK	1/0	13.11	V	7.95	0.79	20.27	30
1720.0	20	QPSK	1/99	13.12	H	7.95	0.79	20.28	30
1745.0	20	QPSK	1/99	13.05	H	7.95	0.79	20.21	30
1770.0	20	QPSK	1/0	14.36	H	7.95	0.79	21.52	30
1720.0	20	16-QAM	1/99	12.30	V	7.95	0.79	19.46	30
1745.0	20	16-QAM	1/99	12.49	V	7.95	0.79	19.65	30
1770.0	20	16-QAM	1/0	12.28	V	7.95	0.79	19.44	30
1720.0	20	16-QAM	1/99	13.50	H	7.95	0.79	20.66	30
1745.0	20	16-QAM	1/99	13.74	H	7.95	0.79	20.90	30
1770.0	20	16-QAM	1/0	13.62	H	7.95	0.79	20.78	30

ERP for LTE Band 71

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
665.5	5	QPSK	1/0	13.92	V	6.6	0.47	20.05	34.77
680.5	5	QPSK	1/0	13.67	V	6.6	0.47	19.80	34.77
695.5	5	QPSK	1/24	13.54	V	6.6	0.47	19.67	34.77
665.5	5	QPSK	1/0	15.25	H	6.6	0.47	21.38	34.77
680.5	5	QPSK	1/0	15.19	H	6.6	0.47	21.32	34.77
695.5	5	QPSK	1/24	15.17	H	6.6	0.47	21.30	34.77
665.5	5	16-QAM	1/0	12.73	V	6.6	0.47	18.86	34.77
680.5	5	16-QAM	1/0	13.89	V	6.6	0.47	20.02	34.77
695.5	5	16-QAM	1/24	13.97	V	6.6	0.47	20.10	34.77
665.5	5	16-QAM	1/0	14.28	H	6.6	0.47	20.41	34.77
680.5	5	16-QAM	1/0	15.30	H	6.6	0.47	21.43	34.77
695.5	5	16-QAM	1/24	15.38	H	6.6	0.47	21.51	34.77
668.0	10	QPSK	1/0	14.32	V	6.6	0.47	20.45	34.77
680.5	10	QPSK	1/49	14.51	V	6.6	0.47	20.64	34.77
693.0	10	QPSK	1/0	14.23	V	6.6	0.47	20.36	34.77
668.0	10	QPSK	1/0	15.57	H	6.6	0.47	21.70	34.77
680.5	10	QPSK	1/49	15.65	H	6.6	0.47	21.78	34.77
693.0	10	QPSK	1/0	15.56	H	6.6	0.47	21.69	34.77
668.0	10	16-QAM	1/0	13.14	V	6.6	0.47	19.27	34.77
680.5	10	16-QAM	1/49	13.33	V	6.6	0.47	19.46	34.77
693.0	10	16-QAM	1/0	12.65	V	6.6	0.47	18.78	34.77
668.0	10	16-QAM	1/0	14.35	H	6.6	0.47	20.48	34.77
680.5	10	16-QAM	1/49	14.47	H	6.6	0.47	20.60	34.77
693.0	10	16-QAM	1/0	14.28	H	6.6	0.47	20.41	34.77
670.5	15	QPSK	1/0	11.22	V	6.6	0.47	17.35	34.77
680.5	15	QPSK	1/74	13.07	V	6.6	0.47	19.20	34.77
690.5	15	QPSK	1/0	12.99	V	6.6	0.47	19.12	34.77
670.5	15	QPSK	1/0	12.77	H	6.6	0.47	18.90	34.77
680.5	15	QPSK	1/74	14.52	H	6.6	0.47	20.65	34.77
690.5	15	QPSK	1/0	14.52	H	6.6	0.47	20.65	34.77
670.5	15	16-QAM	1/0	12.17	V	6.6	0.47	18.30	34.77
680.5	15	16-QAM	1/74	12.36	V	6.6	0.47	18.49	34.77
690.5	15	16-QAM	1/0	13.04	V	6.6	0.47	19.17	34.77
670.5	15	16-QAM	1/0	13.62	H	6.6	0.47	19.75	34.77
680.5	15	16-QAM	1/74	13.50	H	6.6	0.47	19.63	34.77
690.5	15	16-QAM	1/0	14.56	H	6.6	0.47	20.69	34.77

673.0	20	QPSK	1/99	13.49	V	6.6	0.47	19.62	34.77
680.5	20	QPSK	1/99	13.36	V	6.6	0.47	19.49	34.77
688.0	20	QPSK	1/0	12.15	V	6.6	0.47	18.28	34.77
673.0	20	QPSK	1/99	14.63	H	6.6	0.47	20.76	34.77
680.5	20	QPSK	1/99	14.58	H	6.6	0.47	20.71	34.77
688.0	20	QPSK	1/0	13.67	H	6.6	0.47	19.80	34.77
673.0	20	16-QAM	1/99	14.01	V	6.6	0.47	20.14	34.77
680.5	20	16-QAM	1/99	13.92	V	6.6	0.47	20.05	34.77
688.0	20	16-QAM	1/0	13.03	V	6.6	0.47	19.16	34.77
673.0	20	16-QAM	1/99	15.34	H	6.6	0.47	21.47	34.77
680.5	20	16-QAM	1/99	15.33	H	6.6	0.47	21.46	34.77
688.0	20	16-QAM	1/0	14.39	H	6.6	0.47	20.52	34.77

Note: Above is the worst mode data.

9. PEAK-TO-AVERAGE RATIO

9.1 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)

9.2 MEASUREMENT METHOD

Test Settings(Peak Power):

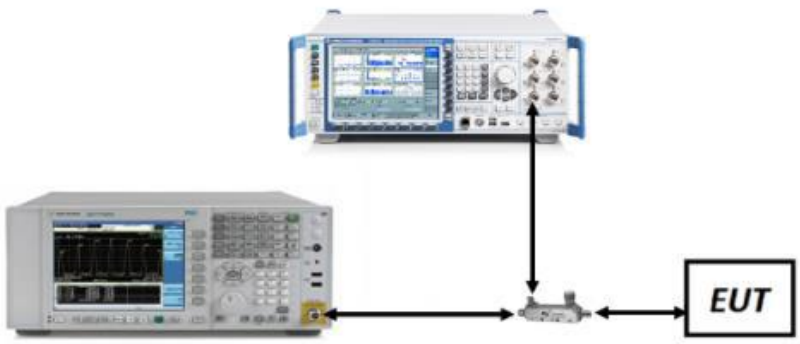
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

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%.

9.3 MEASUREMENT SETUP



9.4 MEASUREMENT RESULT

LTE Band 2

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band2	1.4MHz	QPSK	18607	6RB#0	5.07	13	PASS
Band2	1.4MHz	QPSK	18900	6RB#0	5.02	13	PASS
Band2	1.4MHz	QPSK	19193	6RB#0	4.89	13	PASS
Band2	1.4MHz	16QAM	18607	6RB#0	5.99	13	PASS
Band2	1.4MHz	16QAM	18900	6RB#0	5.95	13	PASS
Band2	1.4MHz	16QAM	19193	6RB#0	5.74	13	PASS
Band2	3MHz	QPSK	18615	15RB#0	5.15	13	PASS
Band2	3MHz	QPSK	18900	15RB#0	5.12	13	PASS
Band2	3MHz	QPSK	19185	15RB#0	4.95	13	PASS
Band2	3MHz	16QAM	18615	15RB#0	6.10	13	PASS
Band2	3MHz	16QAM	18900	15RB#0	6.01	13	PASS
Band2	3MHz	16QAM	19185	15RB#0	5.79	13	PASS
Band2	5MHz	QPSK	18625	25RB#0	5.22	13	PASS
Band2	5MHz	QPSK	18900	25RB#0	5.14	13	PASS
Band2	5MHz	QPSK	19175	25RB#0	4.93	13	PASS
Band2	5MHz	16QAM	18625	25RB#0	6.09	13	PASS
Band2	5MHz	16QAM	18900	25RB#0	6.01	13	PASS
Band2	5MHz	16QAM	19175	25RB#0	5.75	13	PASS
Band2	10MHz	QPSK	18650	50RB#0	5.20	13	PASS
Band2	10MHz	QPSK	18900	50RB#0	5.18	13	PASS
Band2	10MHz	QPSK	19150	50RB#0	4.98	13	PASS
Band2	10MHz	16QAM	18650	50RB#0	6.12	13	PASS
Band2	10MHz	16QAM	18900	50RB#0	5.98	13	PASS
Band2	10MHz	16QAM	19150	50RB#0	5.85	13	PASS
Band2	15MHz	QPSK	18675	75RB#0	5.33	13	PASS
Band2	15MHz	QPSK	18900	75RB#0	5.33	13	PASS
Band2	15MHz	QPSK	19125	75RB#0	5.20	13	PASS
Band2	15MHz	16QAM	18675	75RB#0	6.10	13	PASS
Band2	15MHz	16QAM	18900	75RB#0	6.04	13	PASS
Band2	15MHz	16QAM	19125	75RB#0	5.95	13	PASS
Band2	20MHz	QPSK	18700	100RB#0	5.06	13	PASS
Band2	20MHz	QPSK	18900	100RB#0	5.20	13	PASS
Band2	20MHz	QPSK	19100	100RB#0	5.07	13	PASS
Band2	20MHz	16QAM	18700	100RB#0	5.99	13	PASS
Band2	20MHz	16QAM	18900	100RB#0	6.02	13	PASS
Band2	20MHz	16QAM	19100	100RB#0	5.93	13	PASS

LTE Band 4

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band4	1.4MHz	QPSK	19957	6RB#0	4.87	13	PASS
Band4	1.4MHz	QPSK	20175	6RB#0	5.24	13	PASS
Band4	1.4MHz	QPSK	20393	6RB#0	5.24	13	PASS
Band4	1.4MHz	16QAM	19957	6RB#0	5.74	13	PASS
Band4	1.4MHz	16QAM	20175	6RB#0	6.09	13	PASS
Band4	1.4MHz	16QAM	20393	6RB#0	6.10	13	PASS
Band4	3MHz	QPSK	19965	15RB#0	5.01	13	PASS
Band4	3MHz	QPSK	20175	15RB#0	5.32	13	PASS
Band4	3MHz	QPSK	20385	15RB#0	5.35	13	PASS
Band4	3MHz	16QAM	19965	15RB#0	5.89	13	PASS
Band4	3MHz	16QAM	20175	15RB#0	6.17	13	PASS
Band4	3MHz	16QAM	20385	15RB#0	6.19	13	PASS
Band4	5MHz	QPSK	19975	25RB#0	5.12	13	PASS
Band4	5MHz	QPSK	20175	25RB#0	5.33	13	PASS
Band4	5MHz	QPSK	20375	25RB#0	5.36	13	PASS
Band4	5MHz	16QAM	19975	25RB#0	5.87	13	PASS
Band4	5MHz	16QAM	20175	25RB#0	6.12	13	PASS
Band4	5MHz	16QAM	20375	25RB#0	6.12	13	PASS
Band4	10MHz	QPSK	20000	50RB#0	5.12	13	PASS
Band4	10MHz	QPSK	20175	50RB#0	5.25	13	PASS
Band4	10MHz	QPSK	20350	50RB#0	5.32	13	PASS
Band4	10MHz	16QAM	20000	50RB#0	5.97	13	PASS
Band4	10MHz	16QAM	20175	50RB#0	6.09	13	PASS
Band4	10MHz	16QAM	20350	50RB#0	6.15	13	PASS
Band4	15MHz	QPSK	20025	75RB#0	5.49	13	PASS
Band4	15MHz	QPSK	20175	75RB#0	5.31	13	PASS
Band4	15MHz	QPSK	20325	75RB#0	5.51	13	PASS
Band4	15MHz	16QAM	20025	75RB#0	6.15	13	PASS
Band4	15MHz	16QAM	20175	75RB#0	6.08	13	PASS
Band4	15MHz	16QAM	20325	75RB#0	6.20	13	PASS
Band4	20MHz	QPSK	20050	100RB#0	5.40	13	PASS
Band4	20MHz	QPSK	20175	100RB#0	5.07	13	PASS
Band4	20MHz	QPSK	20300	100RB#0	5.34	13	PASS
Band4	20MHz	16QAM	20050	100RB#0	6.18	13	PASS
Band4	20MHz	16QAM	20175	100RB#0	5.97	13	PASS
Band4	20MHz	16QAM	20300	100RB#0	6.13	13	PASS

LTE BAND 5

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band5	1.4MHz	QPSK	20407	6RB#0	4.26	13	PASS
Band5	1.4MHz	QPSK	20525	6RB#0	5.15	13	PASS
Band5	1.4MHz	QPSK	20643	6RB#0	5.05	13	PASS
Band5	1.4MHz	16QAM	20407	6RB#0	5.18	13	PASS
Band5	1.4MHz	16QAM	20525	6RB#0	6.05	13	PASS
Band5	1.4MHz	16QAM	20643	6RB#0	5.90	13	PASS
Band5	3MHz	QPSK	20415	15RB#0	4.28	13	PASS
Band5	3MHz	QPSK	20525	15RB#0	5.21	13	PASS
Band5	3MHz	QPSK	20635	15RB#0	5.03	13	PASS
Band5	3MHz	16QAM	20415	15RB#0	5.19	13	PASS
Band5	3MHz	16QAM	20525	15RB#0	6.05	13	PASS
Band5	3MHz	16QAM	20635	15RB#0	5.85	13	PASS
Band5	5MHz	QPSK	20425	25RB#0	4.39	13	PASS
Band5	5MHz	QPSK	20525	25RB#0	5.16	13	PASS
Band5	5MHz	QPSK	20625	25RB#0	4.78	13	PASS
Band5	5MHz	16QAM	20425	25RB#0	5.28	13	PASS
Band5	5MHz	16QAM	20525	25RB#0	5.98	13	PASS
Band5	5MHz	16QAM	20625	25RB#0	5.66	13	PASS
Band5	10MHz	QPSK	20450	50RB#0	4.92	13	PASS
Band5	10MHz	QPSK	20525	50RB#0	4.94	13	PASS
Band5	10MHz	QPSK	20600	50RB#0	4.75	13	PASS
Band5	10MHz	16QAM	20450	50RB#0	5.73	13	PASS
Band5	10MHz	16QAM	20525	50RB#0	5.83	13	PASS
Band5	10MHz	16QAM	20600	50RB#0	5.57	13	PASS

LTE Band 12

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band12	1.4MHz	QPSK	23017	6RB#0	4.98	13	PASS
Band12	1.4MHz	QPSK	23095	6RB#0	5.02	13	PASS
Band12	1.4MHz	QPSK	23173	6RB#0	4.83	13	PASS
Band12	1.4MHz	16QAM	23017	6RB#0	5.84	13	PASS
Band12	1.4MHz	16QAM	23095	6RB#0	5.96	13	PASS
Band12	1.4MHz	16QAM	23173	6RB#0	5.79	13	PASS
Band12	3MHz	QPSK	23025	15RB#0	5.02	13	PASS
Band12	3MHz	QPSK	23095	15RB#0	5.06	13	PASS
Band12	3MHz	QPSK	23165	15RB#0	5.05	13	PASS
Band12	3MHz	16QAM	23025	15RB#0	5.91	13	PASS
Band12	3MHz	16QAM	23095	15RB#0	5.96	13	PASS
Band12	3MHz	16QAM	23165	15RB#0	5.83	13	PASS
Band12	5MHz	QPSK	23035	25RB#0	5.06	13	PASS
Band12	5MHz	QPSK	23095	25RB#0	5.07	13	PASS
Band12	5MHz	QPSK	23155	25RB#0	5.05	13	PASS
Band12	5MHz	16QAM	23035	25RB#0	5.87	13	PASS
Band12	5MHz	16QAM	23095	25RB#0	5.86	13	PASS
Band12	5MHz	16QAM	23155	25RB#0	5.84	13	PASS
Band12	10MHz	QPSK	23060	50RB#0	5.11	13	PASS
Band12	10MHz	QPSK	23095	50RB#0	5.10	13	PASS
Band12	10MHz	QPSK	23130	50RB#0	5.03	13	PASS
Band12	10MHz	16QAM	23060	50RB#0	5.90	13	PASS
Band12	10MHz	16QAM	23095	50RB#0	5.91	13	PASS
Band12	10MHz	16QAM	23130	50RB#0	5.89	13	PASS

LTE Band 13

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band13	5MHz	QPSK	23205	25RB#0	4.78	13	PASS
Band13	5MHz	QPSK	23230	25RB#0	4.73	13	PASS
Band13	5MHz	QPSK	23255	25RB#0	4.65	13	PASS
Band13	5MHz	16QAM	23205	25RB#0	5.60	13	PASS
Band13	5MHz	16QAM	23230	25RB#0	5.55	13	PASS
Band13	5MHz	16QAM	23255	25RB#0	5.52	13	PASS
Band13	10MHz	QPSK	23230	50RB#0	4.77	13	PASS
Band13	10MHz	16QAM	23230	50RB#0	5.63	13	PASS

LTE BAND 14

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band14	5MHz	QPSK	23305	25RB#0	4.88	13	PASS
Band14	5MHz	QPSK	23330	25RB#0	4.75	13	PASS
Band14	5MHz	QPSK	23355	25RB#0	4.65	13	PASS
Band14	5MHz	16QAM	23305	25RB#0	5.72	13	PASS
Band14	5MHz	16QAM	23330	25RB#0	5.54	13	PASS
Band14	5MHz	16QAM	23355	25RB#0	5.46	13	PASS
Band14	10MHz	QPSK	23330	50RB#0	4.77	13	PASS
Band14	10MHz	16QAM	23330	50RB#0	5.63	13	PASS

LTE BAND 66

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band66	1.4MHz	QPSK	131979	6RB#0	4.82	13	PASS
Band66	1.4MHz	QPSK	132322	6RB#0	5.26	13	PASS
Band66	1.4MHz	QPSK	132665	6RB#0	4.60	13	PASS
Band66	1.4MHz	16QAM	131979	6RB#0	5.67	13	PASS
Band66	1.4MHz	16QAM	132322	6RB#0	6.14	13	PASS
Band66	1.4MHz	16QAM	132665	6RB#0	5.51	13	PASS
Band66	3MHz	QPSK	131987	15RB#0	4.97	13	PASS
Band66	3MHz	QPSK	132322	15RB#0	5.36	13	PASS
Band66	3MHz	QPSK	132657	15RB#0	4.73	13	PASS
Band66	3MHz	16QAM	131987	15RB#0	5.83	13	PASS
Band66	3MHz	16QAM	132322	15RB#0	6.21	13	PASS
Band66	3MHz	16QAM	132657	15RB#0	5.54	13	PASS
Band66	5MHz	QPSK	131997	25RB#0	5.06	13	PASS
Band66	5MHz	QPSK	132322	25RB#0	5.36	13	PASS
Band66	5MHz	QPSK	132647	25RB#0	4.73	13	PASS
Band66	5MHz	16QAM	131997	25RB#0	5.88	13	PASS
Band66	5MHz	16QAM	132322	25RB#0	6.17	13	PASS
Band66	5MHz	16QAM	132647	25RB#0	5.55	13	PASS
Band66	10MHz	QPSK	132022	50RB#0	5.08	13	PASS
Band66	10MHz	QPSK	132322	50RB#0	5.37	13	PASS
Band66	10MHz	QPSK	132622	50RB#0	4.85	13	PASS
Band66	10MHz	16QAM	132022	50RB#0	5.96	13	PASS
Band66	10MHz	16QAM	132322	50RB#0	6.19	13	PASS
Band66	10MHz	16QAM	132622	50RB#0	5.68	13	PASS
Band66	15MHz	QPSK	132047	75RB#0	5.47	13	PASS
Band66	15MHz	QPSK	132322	75RB#0	5.48	13	PASS
Band66	15MHz	QPSK	132597	75RB#0	5.09	13	PASS
Band66	15MHz	16QAM	132047	75RB#0	6.14	13	PASS
Band66	15MHz	16QAM	132322	75RB#0	6.18	13	PASS
Band66	15MHz	16QAM	132597	75RB#0	5.81	13	PASS
Band66	20MHz	QPSK	132072	100RB#0	5.39	13	PASS
Band66	20MHz	QPSK	132322	100RB#0	5.27	13	PASS
Band66	20MHz	QPSK	132572	100RB#0	5.06	13	PASS
Band66	20MHz	16QAM	132072	100RB#0	6.17	13	PASS
Band66	20MHz	16QAM	132322	100RB#0	6.12	13	PASS
Band66	20MHz	16QAM	132572	100RB#0	5.85	13	PASS

LTE BAND 71

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band71	5MHz	QPSK	133147	25RB#0	4.48	13	PASS
Band71	5MHz	QPSK	133297	25RB#0	4.84	13	PASS
Band71	5MHz	QPSK	133447	25RB#0	5.03	13	PASS
Band71	5MHz	16QAM	133147	25RB#0	5.35	13	PASS
Band71	5MHz	16QAM	133297	25RB#0	5.66	13	PASS
Band71	5MHz	16QAM	133447	25RB#0	5.86	13	PASS
Band71	10MHz	QPSK	133172	50RB#0	4.63	13	PASS
Band71	10MHz	QPSK	133297	50RB#0	4.74	13	PASS
Band71	10MHz	QPSK	133422	50RB#0	4.99	13	PASS
Band71	10MHz	16QAM	133172	50RB#0	5.45	13	PASS
Band71	10MHz	16QAM	133297	50RB#0	5.64	13	PASS
Band71	10MHz	16QAM	133422	50RB#0	5.81	13	PASS
Band71	15MHz	QPSK	133197	75RB#0	5.18	13	PASS
Band71	15MHz	QPSK	133297	75RB#0	4.86	13	PASS
Band71	15MHz	QPSK	133397	75RB#0	5.18	13	PASS
Band71	15MHz	16QAM	133197	75RB#0	5.86	13	PASS
Band71	15MHz	16QAM	133297	75RB#0	5.69	13	PASS
Band71	15MHz	16QAM	133397	75RB#0	5.90	13	PASS
Band71	20MHz	QPSK	133222	100RB#0	5.05	13	PASS
Band71	20MHz	QPSK	133322	100RB#0	4.76	13	PASS
Band71	20MHz	QPSK	133372	100RB#0	5.05	13	PASS
Band71	20MHz	16QAM	133222	100RB#0	5.88	13	PASS
Band71	20MHz	16QAM	133322	100RB#0	5.68	13	PASS
Band71	20MHz	16QAM	133372	100RB#0	5.86	13	PASS

10. SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL

10.1 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.

10.2 MEASUREMENT METHOD

For Band 2/Band 4/Band 5/Band 12/Band 13/Band 14/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])
For Band 38/41:
1.The attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge,
2. 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge.
3. 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge.
4. The attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz.
5. 55 + 10 log (P) dB at or below 2490.5 MHz.
6. X is the greater of 6MHz or the actual emission bandwidth.

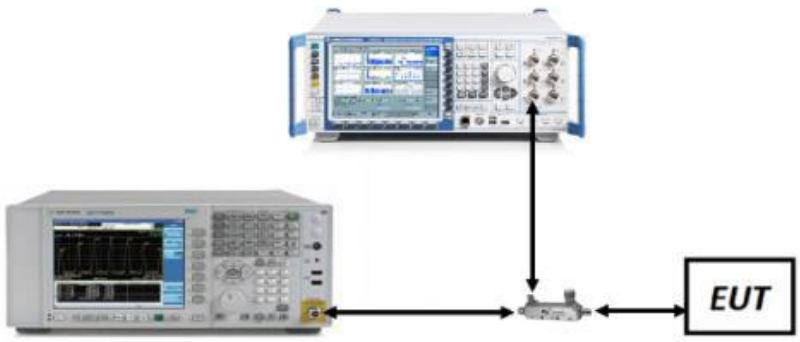
Test Settings

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.

10.3 MEASUREMENT SETUP



10.4 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.

11. RADIATED SPURIOUS EMISSION

11.1 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.

11.2 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.

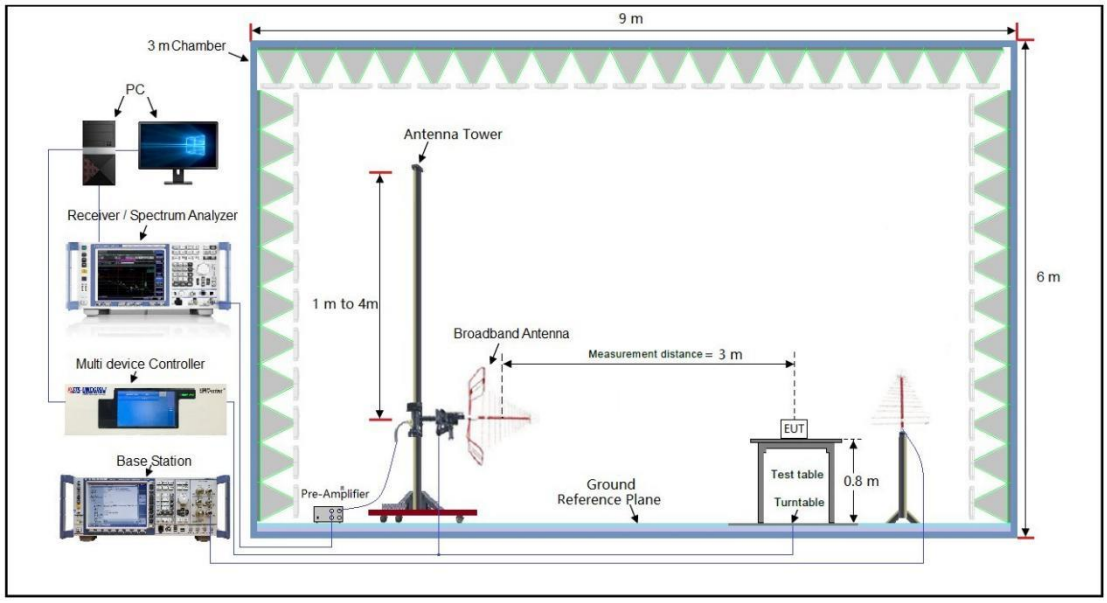
EIRP(dBm) = ERP(dBm) + 2.15

12. Examples of Factor parameters for testing radiation spurious:

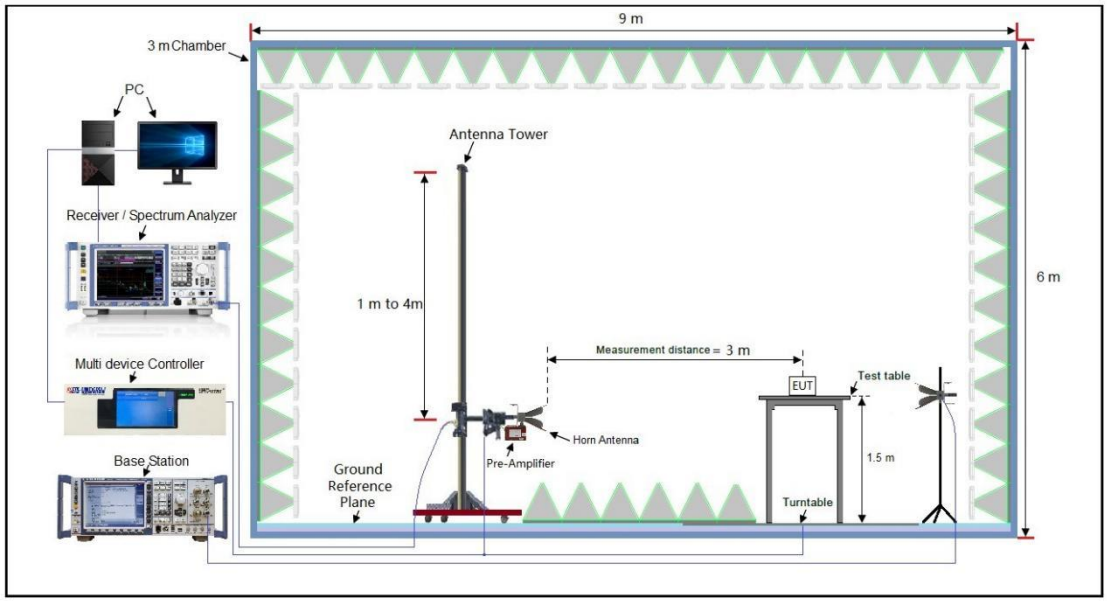
Frequency Range(MHz)	Factor(dB)
30-500	6.18
500-1000	9.37
1000-1500	27.56
1500-2000	28.27
2000-3000	29.45
3000-5000	30.15
5000-10000	31.26
10000-15000	32.78
15000-20000	33.99
Above 20GHz	35.04

11.3 MEASUREMENT SETUP

Radiated Emissions 30MHz to 1GHz Test setup



Radiated Emissions Above 1GHz Test setup



11.4 MEASUREMENT RESULT

LTE Band 2
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
5580	V	-41.02	-13	-28.02
3720	V	-39.95	-13	-26.95
695.5	V	-48.01	-13	-35.01
412.1	V	-50.30	-13	-37.30
5580	H	-39.68	-13	-26.68
3720	H	-41.93	-13	-28.93
678.3	H	-48.03	-13	-35.03
452.1	H	-50.44	-13	-37.44

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
5640	V	-40.77	-13	-27.77
3760	V	-39.86	-13	-26.86
885.1	V	-47.84	-13	-34.84
618.7	V	-48.50	-13	-35.50
5640	H	-48.97	-13	-35.97
3760	H	-41.37	-13	-28.37
851.3	H	-44.86	-13	-31.86
732.5	H	-48.60	-13	-35.60

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
5700	V	-41.62	-13	-28.62
3800	V	-42.06	-13	-29.06
664.5	V	-46.88	-13	-33.88
525.8	V	-46.38	-13	-33.38
5700	H	-40.25	-13	-27.25
3800	H	-39.81	-13	-26.81
669.8	H	-48.08	-13	-35.08
574.4	H	-48.68	-13	-35.68

LTE Band 4
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
5160	V	-38.51	-13	-25.51
3440	V	-38.98	-13	-25.98
745.5	V	-44.39	-13	-31.39
528.1	V	-46.85	-13	-33.85
5160	H	-38.78	-13	-25.78
3440	H	-39.52	-13	-26.52
520.5	H	-46.47	-13	-33.47
395.8	H	-43.00	-13	-30.00

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
5197.5	V	-38.07	-13	-25.07
3465	V	-38.03	-13	-25.03
669.4	V	-45.75	-13	-32.75
512.5	V	-47.40	-13	-34.40
5197.5	H	-38.39	-13	-25.39
3465	H	-39.14	-13	-26.14
569.4	H	-46.40	-13	-33.40
469.3	H	-45.13	-13	-32.13

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
5235	V	-38.03	-13	-25.03
3490	V	-38.94	-13	-25.94
711.1	V	-47.68	-13	-34.68
528.7	V	-46.89	-13	-33.89
5235	H	-37.63	-13	-24.63
3490	H	-38.28	-13	-25.28
612.5	H	-45.30	-13	-32.30
553.9	H	-44.82	-13	-31.82

LTE Band 5

Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2487	V	-41.95	-13	-28.95
1658	V	-42.42	-13	-29.42
512.2	V	-46.56	-13	-33.56
365.5	V	-46.55	-13	-33.55
2487	H	-40.45	-13	-27.45
1658	H	-40.14	-13	-27.14
521.1	H	-44.92	-13	-31.92
336.5	H	-44.74	-13	-31.74

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2509.5	V	-42.47	-13	-29.47
1673	V	-42.49	-13	-29.49
725.8	V	-47.13	-13	-34.13
616.6	V	-46.79	-13	-33.79
2509.5	H	-40.93	-13	-27.93
1673	H	-42.17	-13	-29.17
705.5	H	-45.88	-13	-32.88
558.9	H	-45.88	-13	-32.88

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2532	V	-40.66	-13	-27.66
1688	V	-39.53	-13	-26.53
648.3	V	-46.76	-13	-33.76
482.7	V	-46.29	-13	-33.29
2532	H	-40.33	-13	-27.33
1688	H	-40.42	-13	-27.42
785.6	H	-45.72	-13	-32.72
615.7	H	-48.58	-13	-35.58

LTE Band 12
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2112.0	V	-43.04	-13	-30.04
1408	V	-41.87	-13	-28.87
658.1	V	-50.52	-13	-37.52
516.9	V	-50.10	-13	-37.10
2112	H	-42.37	-13	-29.37
1408	H	-41.38	-13	-28.38
714.4	H	-49.28	-13	-36.28
669.5	H	-48.86	-13	-35.86

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2122.5	V	-44.86	-13	-31.86
1415	V	-43.56	-13	-30.56
651.5	V	-48.29	-13	-35.29
512.7	V	-50.68	-13	-37.68
2122.5	H	-42.94	-13	-29.94
1415	H	-43.19	-13	-30.19
525.4	H	-48.62	-13	-35.62
498.7	H	-50.60	-13	-37.60

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2133	V	-44.33	-13	-31.33
1422	V	-43.80	-13	-30.80
653.3	V	-47.83	-13	-34.83
592.7	V	-48.55	-13	-35.55
2133	H	-44.62	-13	-31.62
1422	H	-44.62	-13	-31.62
641.5	H	-51.94	-13	-38.94
558.3	H	-48.98	-13	-35.98

LTE Band 13
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2338.5	V	-47.40	-13	-34.40
1559	V	-45.25	-13	-32.25
678.2	V	-48.33	-13	-35.33
423.6	V	-51.88	-13	-38.88
2338.5	H	-45.30	-13	-32.30
1559	H	-44.65	-13	-31.65
577.3	H	-52.83	-13	-39.83
345.9	H	-49.02	-13	-36.02

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2346	V	-46.08	-13	-33.08
1564	V	-45.62	-13	-32.62
611.7	V	-51.69	-13	-38.69
444,8	V	-52.16	-13	-39.16
2346	H	-43.83	-13	-30.83
1564	H	-45.50	-13	-32.50
692.8	H	-48.27	-13	-35.27
439.4	H	-51.83	-13	-38.83

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2353.5	V	-45.52	-13	-32.52
1569	V	-44.99	-13	-31.99
572.8	V	-49.38	-13	-36.38
309.9	V	-51.81	-13	-38.81
2353.5	H	-44.05	-13	-31.05
1569	H	-43.18	-13	-30.18
602.7	H	-49.80	-13	-36.80
413.6	H	-49.55	-13	-36.55

LTE Band 14
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2371.5	V	-45.13	-13	-32.13
1581	V	-46.69	-13	-33.69
577.9	V	-48.13	-13	-35.13
415.6.6	V	-50.24	-13	-37.24
2371.5	H	-44.36	-13	-31.36
1581	H	-44.58	-13	-31.58
699.2	H	-51.83	-13	-38.83
514.7	H	-48.48	-13	-35.48

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2379	V	-45.97	-13	-32.97
1586	V	-45.31	-13	-32.31
611.7	V	-50.02	-13	-37.02
444,8	V	-51.49	-13	-38.49
2379	H	-44.46	-13	-31.46
1586	H	-44.18	-13	-31.18
692.8	H	-47.73	-13	-34.73
439.4	H	-52.30	-13	-39.30

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2386.5	V	-46.80	-13	-33.80
1591	V	-45.32	-13	-32.32
572.8	V	-49.36	-13	-36.36
309.9	V	-50.87	-13	-37.87
2386.6	H	-42.66	-13	-29.66
1591	H	-43.99	-13	-30.99
602.7	H	-51.71	-13	-38.71
413.6	H	-49.45	-13	-36.45

LTE Band 13 (1559 MHz ~ 1610 MHz Wideband Band)

Operating Frequency (MHz)	Measured Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm/MHz)	Margin (dB)
779.5	1559	V	-43.53	-40	-3.53
782.0	1564	V	-44.94	-40	-4.94
784.5	1569	V	-42.38	-40	-2.38
779.5	1559	H	-44.14	-40	-4.14
782.0	1564	H	-45.09	-40	-5.09
784.5	1569	H	-43.55	-40	-3.55

LTE Band 14 (1559 MHz ~ 1610 MHz Wideband Band)

Operating Frequency (MHz)	Measured Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm/MHz)	Margin (dB)
790.5	1581	V	-44.31	-40	-4.31
793.0	1586	V	-44.29	-40	-4.29
795.5	1591	V	-42.22	-40	-2.22
790.5	1581	H	-43.60	-40	-3.60
793.0	1586	H	-42.96	-40	-2.96
795.5	1591	H	-43.22	-40	-3.22

Note: The spurious emissions found in the frequency band 1559-1610MHz meet the stricter Wideband limits.

LTE Band 66
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
5132.1	V	-44.52	-13	-31.52
3421.4	V	-42.08	-13	-29.08
698.3	V	-47.56	-13	-34.56
417.5	V	-49.17	-13	-36.17
5132.1	H	-43.07	-13	-30.07
3421.4	H	-43.78	-13	-30.78
504.9	H	-51.05	-13	-38.05
431.9	H	-47.80	-13	-34.80

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
5235	V	-42.86	-13	-29.86
3490	V	-43.31	-13	-30.31
578.2	V	-48.77	-13	-35.77
345.7	V	-50.13	-13	-37.13
5235	H	-43.25	-13	-30.25
3490	H	-42.20	-13	-29.20
634.8	H	-46.74	-13	-33.74
412.9	H	-51.59	-13	-38.59

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
5337.9	V	-41.93	-13	-28.93
3558.6	V	-41.31	-13	-28.31
752.6	V	-47.02	-13	-34.02
546.1	V	-49.03	-13	-36.03
5337.9	H	-43.00	-13	-30.00
3558.6	H	-41.25	-13	-28.25
687.3	H	-48.40	-13	-35.40
436.6	H	-47.28	-13	-34.28

LTE Band 71
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1996.5	V	-42.09	-13	-29.09
1331	V	-42.93	-13	-29.93
511.2	V	-45.35	-13	-32.35
375.4	V	-48.59	-13	-35.59
1996.5	H	-42.58	-13	-29.58
1331	H	-43.07	-13	-30.07
577.1	H	-51.83	-13	-38.83
309.6	H	-48.26	-13	-35.26

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2041.5	V	-43.35	-13	-30.35
1361	V	-43.62	-13	-30.62
515.1	V	-49.43	-13	-36.43
345.7	V	-51.10	-13	-38.10
2041.5	H	-43.65	-13	-30.65
1361	H	-43.22	-13	-30.22
564.5	H	-46.92	-13	-33.92
315.9	H	-52.32	-13	-39.32

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
2086.5	V	-41.29	-13	-28.29
1391	V	-41.21	-13	-28.21
546.6	V	-47.35	-13	-34.35
345.1	V	-50.07	-13	-37.07
2086.5	H	-42.41	-13	-29.41
1391	H	-41.71	-13	-28.71
534.2	H	-49.33	-13	-36.33
322.9	H	-48.08	-13	-35.08

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.

12. FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

12.1 PROVISIONS APPLICABLE

12.1.1 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 +50°C in 10°C increments using an environmental chamber.

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

For Part 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.

12.1.2 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 -20°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

12.2 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 -20℃. 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 -20℃ to +50℃. 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.

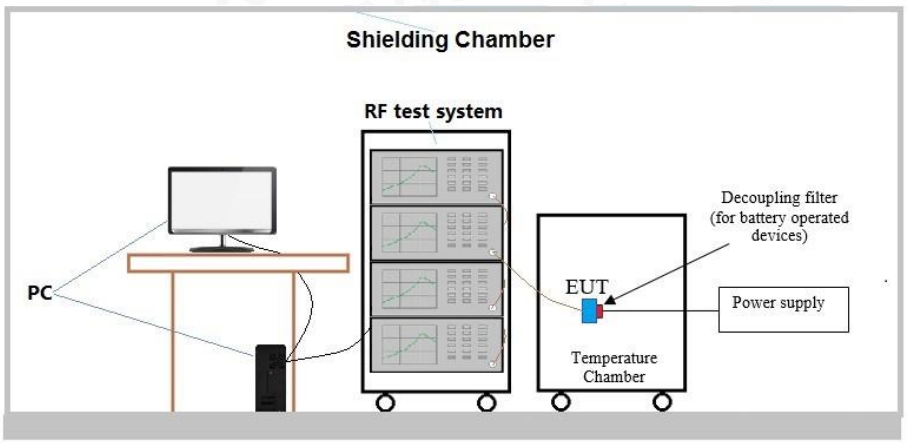
5 Subject the EUT to overnight soak at +50℃.

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 +50℃ to -20℃. 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.

12.3 MEASUREMENT SETUP



12.4 MEASUREMENT RESULT

LTE Band 2

Middle Channel, f_O = 1880 MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-20	3.70	-7.91	-0.004274
-10		-5.85	-0.003161
0		-10.19	-0.005506
10		-6.04	-0.003213
20		-6.09	-0.003239
30		-8.47	-0.004505
40		-4.33	-0.002268
50		-5.45	-0.002854
25	4.20	-4.56	-0.002388
	3.15	-8.70	-0.004701

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 temperature and voltage range as tested.

LTE Band 4

Middle Channel, f_O = 1732.5 MHz				
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Temperature (℃)
-20	3.70	5.21	0.003046	±2.5
-10		3.29	0.001923	±2.5
0		4.89	0.002858	±2.5
10		3.39	0.001957	±2.5
20		-4.92	-0.002840	±2.5
30		-3.98	-0.002297	±2.5
40		-7.72	-0.004401	±2.5
50		-5.49	-0.003129	±2.5
25	4.20	-7.45	-0.004247	±2.5
	3.15	-3.81	-0.002227	±2.5

LTE Band 5

Middle Channel, f_O = 836.5 MHz				
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Temperature (℃)
-20	3.70	-5.71	-0.006924	±2.5
-10		-4.42	-0.005360	
0		-3.08	-0.003735	±2.5
10		-4.31	-0.005152	±2.5
20		-4.59	-0.005487	±2.5
30		-3.52	-0.004208	±2.5
40		-2.89	-0.003407	±2.5
50		1.59	0.001874	
25	4.20	-2.40	-0.002829	±2.5
	3.15	-3.48	-0.004220	±2.5

LTE Band 12

Middle Channel, f_O = 707.5 MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-20	3.70	-3.46	-0.004945
-10		-2.55	-0.003644
0		-3.15	-0.004502
10		-2.73	-0.003859
20		1.56	0.002205
30		-1.30	-0.001837
40		-3.45	-0.004823
50		-2.96	-0.004138
25	4.20	-5.19	-0.007256
	3.15	-3.79	-0.005417

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 temperature and voltage range as tested.

LTE Band 13

Middle Channel, f_O = 782.0MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-20	3.70	-3.05	-0.003913
-10		-3.03	-0.003887
0		-2.69	-0.003451
10		-1.42	-0.001816
20		-4.61	-0.005895
30		-3.45	-0.004412
40		2.15	0.002741
50		-2.12	-0.002702
25	4.20	-2.12	-0.002702
	3.15	-3.72	-0.004772

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 temperature and voltage range as tested.

LTE Band 14

Middle Channel, f_O = 793.0MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-20	3.70	-3.06	-0.003871
-10		-3.86	-0.004883
0		-4.19	-0.005300
10		-2.47	-0.003115
20		-2.63	-0.003317
30		-1.53	-0.001929
40		-2.10	-0.002640
50		-2.37	-0.002979
25	4.20	1.69	0.002124
	3.15	-3.36	-0.004250

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 temperature and voltage range as tested.

LTE Band 66

Middle Channel, f_O = 1745.0MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-20	3.70	4.65	0.002718
-10		3.42	0.001999
0		4.61	0.002695
10		-7.12	-0.004080
20		-4.91	-0.002814
30		-7.98	-0.004573
40		-3.73	-0.002096
50		4.52	0.002540
25	4.20	4.63	0.002602
	3.15	-6.75	-0.003946

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 temperature and voltage range as tested.

LTE Band 71

Middle Channel, fo = 680.5MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-20	3.70	-3.86	-0.005800
-10		-3.13	-0.004703
0		-2.47	-0.003711
10		-3.81	-0.005599
20		-3.71	-0.005452
30		-2.66	-0.003909
40		-3.33	-0.004788
50		-1.93	-0.002775
25	4.20	-2.68	-0.003853
	3.15	-4.02	-0.006041

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 temperature 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.

13. OCCUPIED BANDWIDTH

13.1 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.

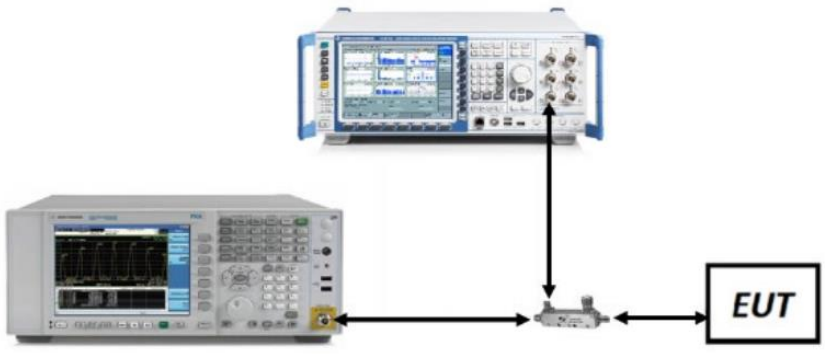
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

13.2 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

13.3 MEASUREMENT SETUP



13.4 MEASUREMENT RESULT

LTE Band 2

Channel Bandwidth: 1.4 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	6	0	1.0921	1.259	PASS
	MCH	6	0	1.0928	1.272	PASS
	HCH	6	0	1.0892	1.275	PASS
16QAM	LCH	6	0	1.0906	1.263	PASS
	MCH	6	0	1.0916	1.248	PASS
	HCH	6	0	1.0924	1.265	PASS

Channel Bandwidth: 3 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	15	0	2.6911	2.897	PASS
	MCH	15	0	2.6936	2.926	PASS
	HCH	15	0	2.6946	2.906	PASS
16QAM	LCH	15	0	2.6962	2.906	PASS
	MCH	15	0	2.6928	2.915	PASS
	HCH	15	0	2.6994	2.912	PASS

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	4.5046	4.901	PASS
	MCH	25	0	4.4995	4.877	PASS
	HCH	25	0	4.5050	4.884	PASS
16QAM	LCH	25	0	4.5035	4.878	PASS
	MCH	25	0	4.5022	4.896	PASS
	HCH	25	0	4.5060	4.896	PASS

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	50	0	8.9656	9.532	PASS
	MCH	50	0	8.9697	9.531	PASS
	HCH	50	0	8.9580	9.525	PASS
16QAM	LCH	50	0	8.9589	9.522	PASS
	MCH	50	0	8.9651	9.543	PASS
	HCH	50	0	8.9551	9.514	PASS

Channel Bandwidth: 15 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	75	0	13.409	14.23	PASS
	MCH	75	0	13.446	14.27	PASS
	HCH	75	0	13.413	14.24	PASS
16QAM	LCH	75	0	13.408	14.22	PASS
	MCH	75	0	13.432	14.24	PASS
	HCH	75	0	13.414	14.24	PASS

Channel Bandwidth: 20 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	100	0	17.815	18.88	PASS
	MCH	100	0	17.897	18.96	PASS
	HCH	100	0	17.890	18.94	PASS
16QAM	LCH	100	0	17.828	18.90	PASS
	MCH	100	0	17.916	18.95	PASS
	HCH	100	0	17.877	18.94	PASS

LTE Band 4

Channel Bandwidth: 1.4 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	6	0	1.0929	1.250	PASS
	MCH	6	0	1.0917	1.268	PASS
	HCH	6	0	1.0899	1.250	PASS
16QAM	LCH	6	0	1.0907	1.274	PASS
	MCH	6	0	1.0893	1.264	PASS
	HCH	6	0	1.0912	1.276	PASS

Channel Bandwidth: 3 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	15	0	2.6998	2.900	PASS
	MCH	15	0	2.6908	2.927	PASS
	HCH	15	0	2.7012	2.925	PASS
16QAM	LCH	15	0	2.6899	2.919	PASS
	MCH	15	0	2.6886	2.917	PASS
	HCH	15	0	2.6950	2.926	PASS

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	4.4992	4.897	PASS
	MCH	25	0	4.4989	4.904	PASS
	HCH	25	0	4.5001	4.890	PASS
16QAM	LCH	25	0	4.5035	4.854	PASS
	MCH	25	0	4.5053	4.862	PASS
	HCH	25	0	4.5043	4.901	PASS

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	50	0	8.9776	9.547	PASS
	MCH	50	0	8.9569	9.528	PASS
	HCH	50	0	8.9621	9.544	PASS
16QAM	LCH	50	0	8.9618	9.513	PASS
	MCH	50	0	8.9441	9.534	PASS
	HCH	50	0	8.9750	9.523	PASS

Channel Bandwidth: 15 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	75	0	13.478	14.31	PASS
	MCH	75	0	13.421	14.29	PASS
	HCH	75	0	13.439	14.27	PASS
16QAM	LCH	75	0	13.468	14.28	PASS
	MCH	75	0	13.397	14.22	PASS
	HCH	75	0	13.436	14.27	PASS

Channel Bandwidth: 20 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	100	0	17.974	18.96	PASS
	MCH	100	0	17.837	18.92	PASS
	HCH	100	0	17.904	18.99	PASS
16QAM	LCH	100	0	17.963	18.96	PASS
	MCH	100	0	17.833	18.92	PASS
	HCH	100	0	17.936	18.98	PASS

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	1.271	PASS
	MCH	6	0	1.0900	1.265	PASS
	HCH	6	0	1.0912	1.252	PASS
16QAM	LCH	6	0	1.0907	1.258	PASS
	MCH	6	0	1.0894	1.262	PASS
	HCH	6	0	1.0919	1.267	PASS

Channel Bandwidth: 3 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	15	0	2.6896	2.903	PASS
	MCH	15	0	2.6969	2.898	PASS
	HCH	15	0	2.6991	2.921	PASS
16QAM	LCH	15	0	2.6903	2.900	PASS
	MCH	15	0	2.6905	2.904	PASS
	HCH	15	0	2.6918	2.907	PASS

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	4.4983	4.889	PASS
	MCH	25	0	4.4989	4.879	PASS
	HCH	25	0	4.5028	4.892	PASS
16QAM	LCH	25	0	4.5018	4.866	PASS
	MCH	25	0	4.5039	4.877	PASS
	HCH	25	0	4.4999	4.892	PASS

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	50	0	8.9848	9.569	PASS
	MCH	50	0	8.9703	9.528	PASS
	HCH	50	0	8.9747	9.567	PASS
16QAM	LCH	50	0	8.9637	9.525	PASS
	MCH	50	0	8.9543	9.520	PASS
	HCH	50	0	8.9682	9.546	PASS

LTE Band 12

Channel Bandwidth: 1.4 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	6	0	1.0915	1.255	PASS
	MCH	6	0	1.0916	1.249	PASS
	HCH	6	0	1.0918	1.251	PASS
16QAM	LCH	6	0	1.0898	1.252	PASS
	MCH	6	0	1.0923	1.263	PASS
	HCH	6	0	1.0912	1.261	PASS

Channel Bandwidth: 3 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	15	0	2.6923	2.902	PASS
	MCH	15	0	2.6971	2.907	PASS
	HCH	15	0	2.6987	2.915	PASS
16QAM	LCH	15	0	2.6909	2.916	PASS
	MCH	15	0	2.6918	2.908	PASS
	HCH	15	0	2.6963	2.925	PASS

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	4.4953	4.894	PASS
	MCH	25	0	4.4976	4.863	PASS
	HCH	25	0	4.5044	4.843	PASS
16QAM	LCH	25	0	4.5017	4.841	PASS
	MCH	25	0	4.5018	4.899	PASS
	HCH	25	0	4.5137	4.877	PASS

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	50	0	8.9678	9.564	PASS
	MCH	50	0	8.9527	9.551	PASS
	HCH	50	0	8.9490	9.510	PASS
16QAM	LCH	50	0	8.9604	9.545	PASS
	MCH	50	0	8.9514	9.518	PASS
	HCH	50	0	8.9468	9.510	PASS

LTE Band 13

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	4.4984	4.896	PASS
	MCH	25	0	4.5009	4.899	PASS
	HCH	25	0	4.5009	4.858	PASS
16QAM	LCH	25	0	4.5038	4.901	PASS
	MCH	25	0	4.5000	4.889	PASS
	HCH	25	0	4.5061	4.882	PASS

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	MCH	50	0	8.9577	9.541	PASS
16QAM	MCH	50	0	8.9529	9.529	PASS

LTE Band 14

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	4.4982	4.914	PASS
	MCH	25	0	4.4992	4.901	PASS
	HCH	25	0	4.5068	4.867	PASS
16QAM	LCH	25	0	4.5037	4.869	PASS
	MCH	25	0	4.4995	4.901	PASS
	HCH	25	0	4.5048	4.860	PASS

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	MCH	50	0	8.9534	9.550	PASS
16QAM	MCH	50	0	8.9451	9.501	PASS

LTE Band 66

Channel Bandwidth: 1.4 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	6	0	1.0922	1.272	PASS
	MCH	6	0	1.0898	1.262	PASS
	HCH	6	0	1.0928	1.262	PASS
16QAM	LCH	6	0	1.0919	1.259	PASS
	MCH	6	0	1.0923	1.267	PASS
	HCH	6	0	1.0903	1.258	PASS

Channel Bandwidth: 3 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	15	0	2.6948	2.889	PASS
	MCH	15	0	2.6976	2.909	PASS
	HCH	15	0	2.6964	2.932	PASS
16QAM	LCH	15	0	2.6871	2.905	PASS
	MCH	15	0	2.6906	2.893	PASS
	HCH	15	0	2.6935	2.934	PASS

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	4.4979	4.892	PASS
	MCH	25	0	4.4997	4.904	PASS
	HCH	25	0	4.5015	4.916	PASS
16QAM	LCH	25	0	4.5062	4.843	PASS
	MCH	25	0	4.5062	4.843	PASS
	HCH	25	0	4.4996	4.904	PASS