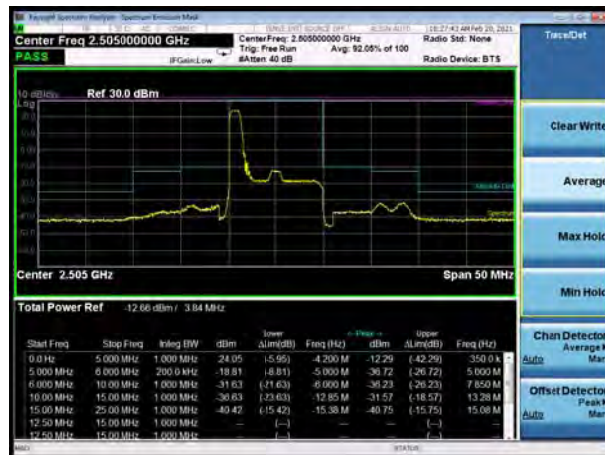
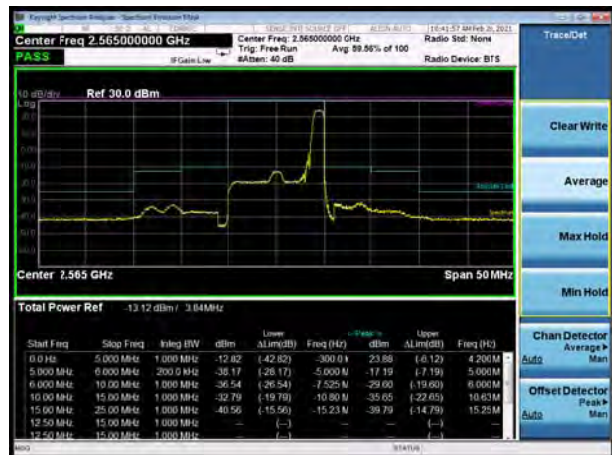




LTE Band 7 QPSK 10MHz CH-Low, 1 RB



LTE Band 7 QPSK 10MHz CH-High, 1 RB



LTE Band 7 QPSK 10MHz CH-Low, 100%RB



LTE Band 7 QPSK 10MHz CH-High, 100%RB



LTE Band 7 QPSK 15MHz CH-Low, 1 RB



LTE Band 7 QPSK 15MHz CH-High, 1 RB





LTE Band 7 QPSK 15MHz CH-Low, 100%RB



LTE Band 7 QPSK 15MHz CH-High, 100%RB



LTE Band 7 QPSK 20MHz CH-Low, 1 RB



LTE Band 7 QPSK 20MHz CH-High, 1 RB



LTE Band 7 QPSK 20MHz CH-Low, 100%RB



LTE Band 7 QPSK 20MHz CH-High, 100%RB





LTE Band 7 16QAM 5MHz CH-Low, 1 RB



LTE Band 7 16QAM 5MHz CH-High, 1 RB



LTE Band 7 16QAM 5MHz CH-Low, 100%RB



LTE Band 7 16QAM 5MHz CH-High, 100%RB



LTE Band 7 16QAM 10MHz CH-Low, 1 RB



LTE Band 7 16QAM 10MHz CH-High, 1 RB





LTE Band 7 16QAM 10MHz CH-Low, 100%RB



LTE Band 7 16QAM 10MHz CH-High, 100%RB



LTE Band 7 16QAM 15MHz CH-Low, 1 RB



LTE Band 7 16QAM 15MHz CH-High, 1 RB



LTE Band 7 16QAM 15MHz CH-Low, 100%RB



LTE Band 7 16QAM 15MHz CH-High, 100%RB





LTE Band 7 16QAM 20MHz CH-Low, 1 RB



LTE Band 7 16QAM 20MHz CH-High, 1 RB



LTE Band 7 16QAM 20MHz CH-Low, 100%RB



LTE Band 7 16QAM 20MHz CH-High, 100%RB



LTE Band 7 64QAM 5MHz CH-Low, 1 RB



LTE Band 7 64QAM 5MHz CH-High, 1 RB





LTE Band 7 64QAM 5MHz CH-Low, 100%RB



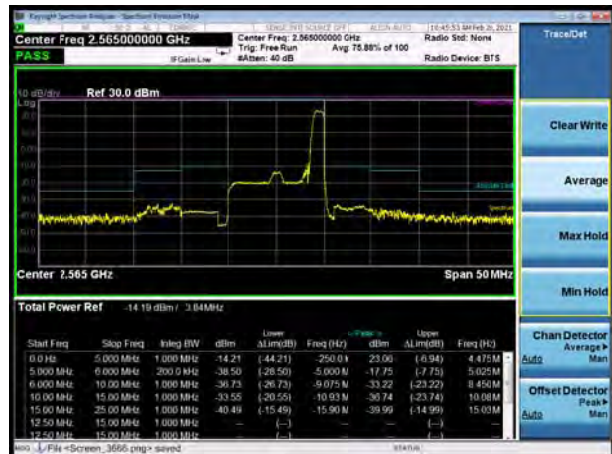
LTE Band 7 64QAM 5MHz CH-High, 100%RB



LTE Band 7 64QAM 10MHz CH-Low, 1 RB



LTE Band 7 64QAM 10MHz CH-High, 1 RB



LTE Band 7 64QAM 10MHz CH-Low, 100%RB



LTE Band 7 64QAM 10MHz CH-High, 100%RB





LTE Band 7 64QAM 15MHz CH-Low, 1 RB



LTE Band 7 64QAM 15MHz CH-High, 1 RB



LTE Band 7 64QAM 15MHz CH-Low, 100%RB



LTE Band 7 64QAM 15MHz CH-High, 100%RB



LTE Band 7 64QAM 20MHz CH-Low, 1 RB



LTE Band 7 64QAM 20MHz CH-High, 1 RB





LTE Band 7 64QAM 20MHz CH-Low, 100%RB



LTE Band 7 64QAM 20MHz CH-High, 100%RB



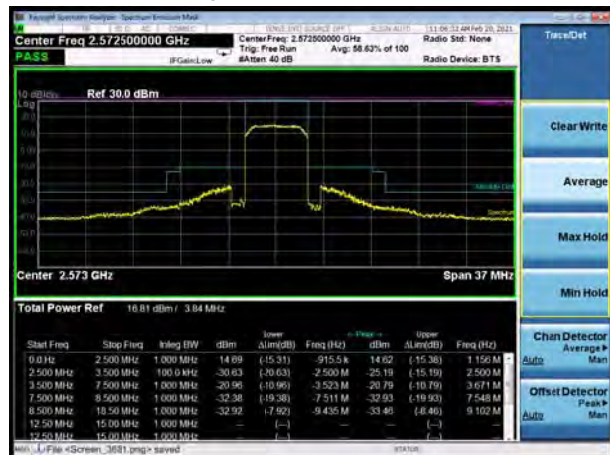
LTE Band 38 QPSK 5MHz CH-Low, 1 RB



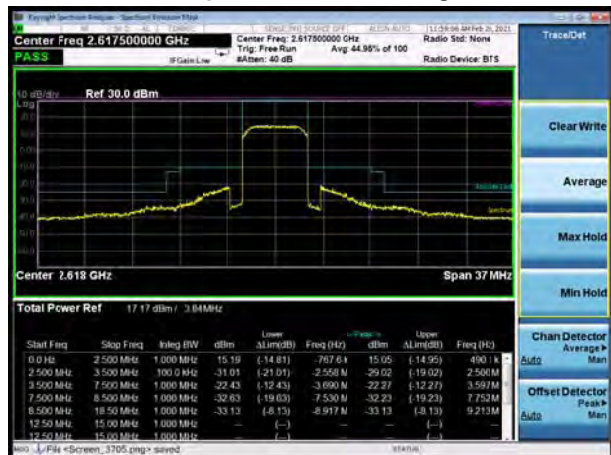
LTE Band 38 QPSK 5MHz CH-High, 1 RB



LTE Band 38 QPSK 5MHz CH-Low, 100%RB

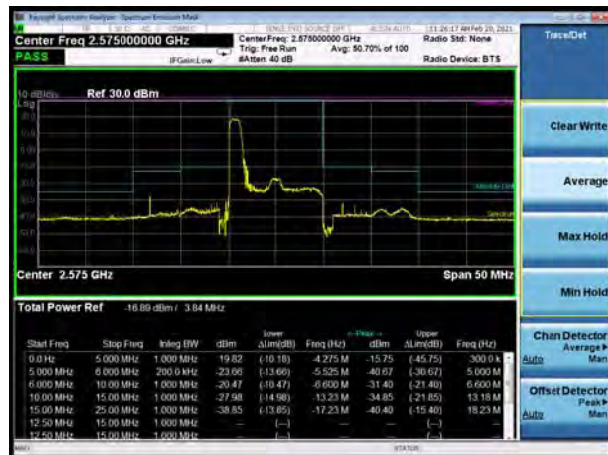


LTE Band 38 QPSK 5MHz CH-High, 100%RB





LTE Band 38 QPSK 10MHz CH-Low, 1 RB



LTE Band 38 QPSK 10MHz CH-High, 1 RB



LTE Band 38 QPSK 10MHz CH-Low, 100%RB



LTE Band 38 QPSK 10MHz CH-High, 100%RB



LTE Band 38 QPSK 15MHz CH-Low, 1 RB

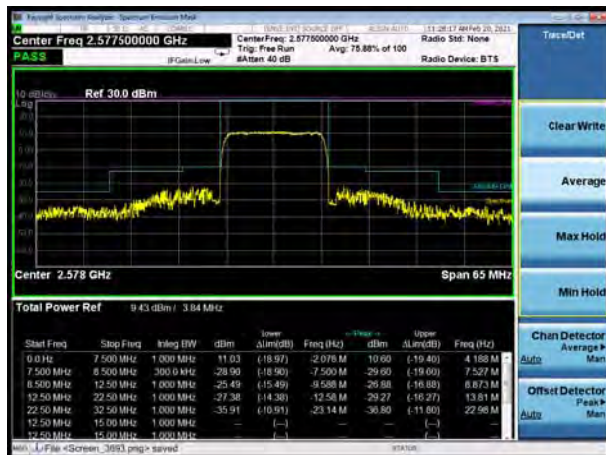


LTE Band 38 QPSK 15MHz CH-High, 1 RB





LTE Band 38 QPSK 15MHz CH-Low, 100%RB



LTE Band 38 QPSK 15MHz CH-High, 100%RB



LTE Band 38 QPSK 20MHz CH-Low, 1 RB



LTE Band 38 QPSK 20MHz CH-High, 1 RB



LTE Band 38 QPSK 20MHz CH-Low, 100%RB



LTE Band 38 QPSK 20MHz CH-High, 100%RB





LTE Band 38 16QAM 5MHz CH-Low, 1 RB



LTE Band 38 16QAM 5MHz CH-High, 1 RB



LTE Band 38 16QAM 5MHz CH-Low, 100%RB



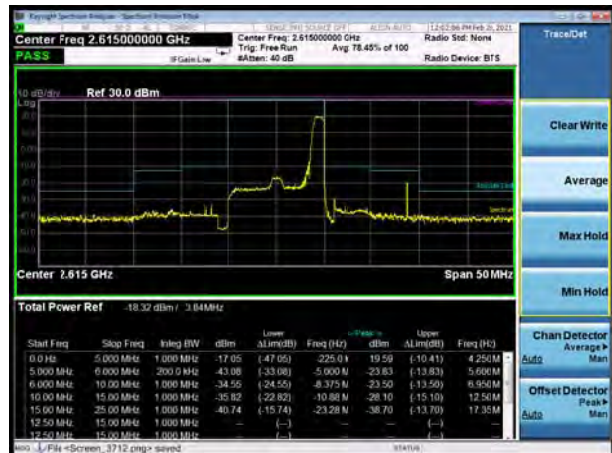
LTE Band 38 16QAM 5MHz CH-High, 100%RB



LTE Band 38 16QAM 10MHz CH-Low, 1 RB



LTE Band 38 16QAM 10MHz CH-High, 1 RB





LTE Band 38 16QAM 10MHz CH-Low, 100%RB



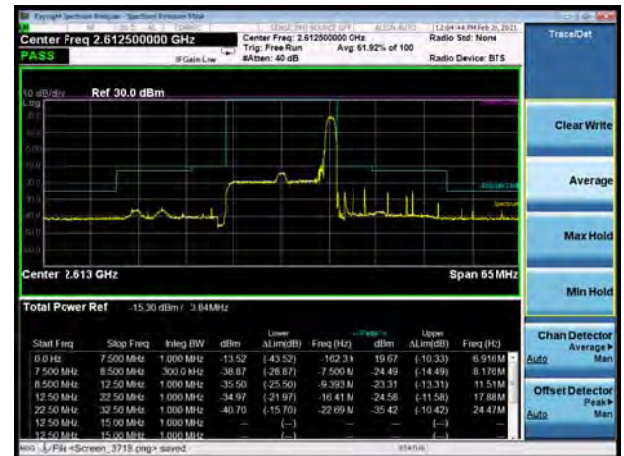
LTE Band 38 16QAM 10MHz CH-High, 100%RB



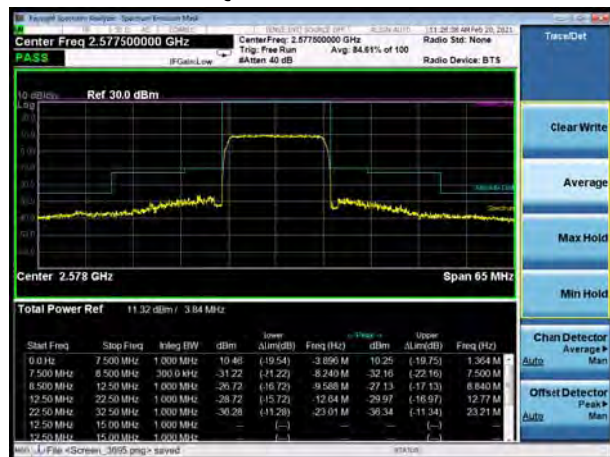
LTE Band 38 16QAM 15MHz CH-Low, 1 RB



LTE Band 38 16QAM 15MHz CH-High, 1 RB



LTE Band 38 16QAM 15MHz CH-Low, 100%RB



LTE Band 38 16QAM 15MHz CH-High, 100%RB





LTE Band 38 16QAM 20MHz CH-Low, 1 RB



LTE Band 38 16QAM 20MHz CH-High, 1 RB



LTE Band 38 16QAM 20MHz CH-Low, 100%RB



LTE Band 38 16QAM 20MHz CH-High, 100%RB



LTE Band 38 64QAM 5MHz CH-Low, 1 RB



LTE Band 38 64QAM 5MHz CH-High, 1 RB

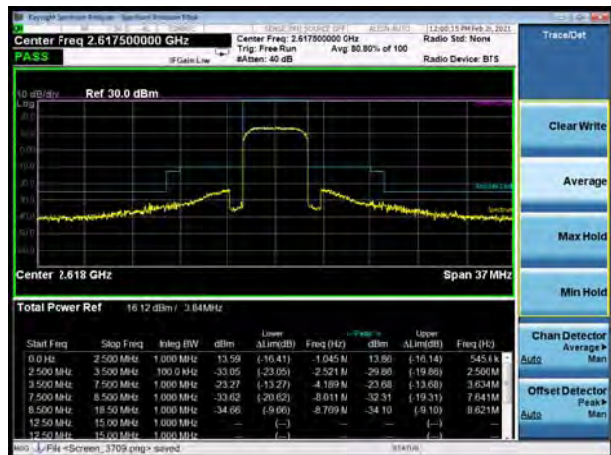




LTE Band 38 64QAM 5MHz CH-Low, 100%RB



LTE Band 38 64QAM 5MHz CH-High, 100%RB



LTE Band 38 64QAM 10MHz CH-Low, 1 RB



LTE Band 38 64QAM 10MHz CH-High, 1 RB



LTE Band 38 64QAM 10MHz CH-Low, 100%RB



LTE Band 38 64QAM 10MHz CH-High, 100%RB





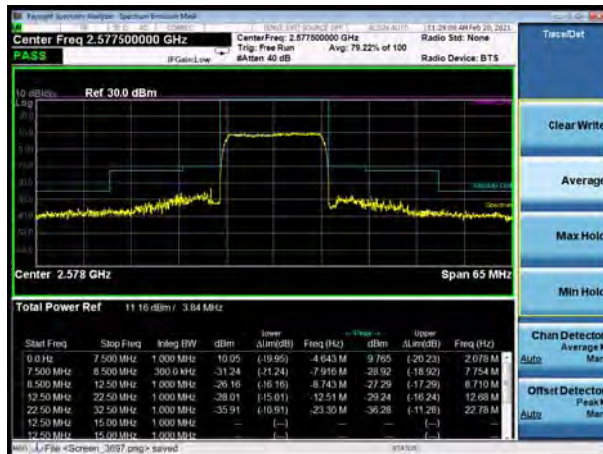
LTE Band 38 64QAM 15MHz CH-Low, 1 RB



LTE Band 38 64QAM 15MHz CH-High, 1 RB



LTE Band 38 64QAM 15MHz CH-Low, 100%RB



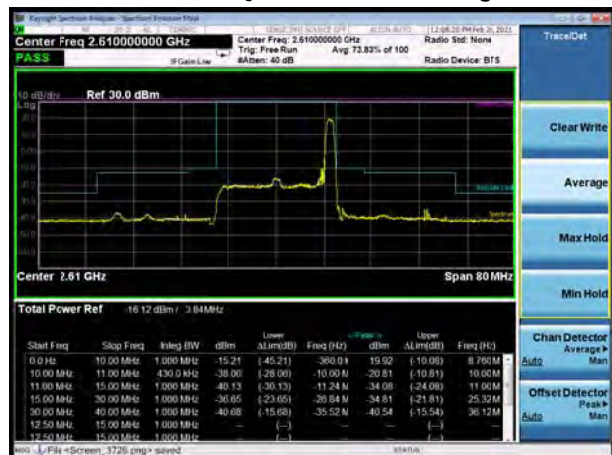
LTE Band 38 64QAM 15MHz CH-High, 100%RB



LTE Band 38 64QAM 20MHz CH-Low, 1 RB



LTE Band 38 64QAM 20MHz CH-High, 1 RB

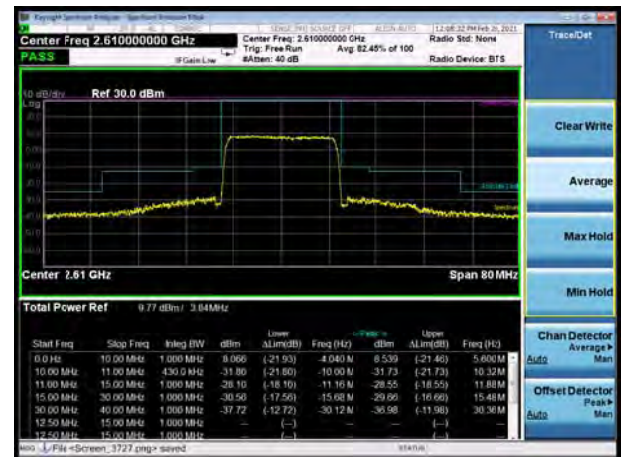




LTE Band 38 64QAM 20MHz CH-Low, 100%RB



LTE Band 38 64QAM 20MHz CH-High, 100%RB



LTE Band 41 QPSK 5MHz CH-Low, 1 RB



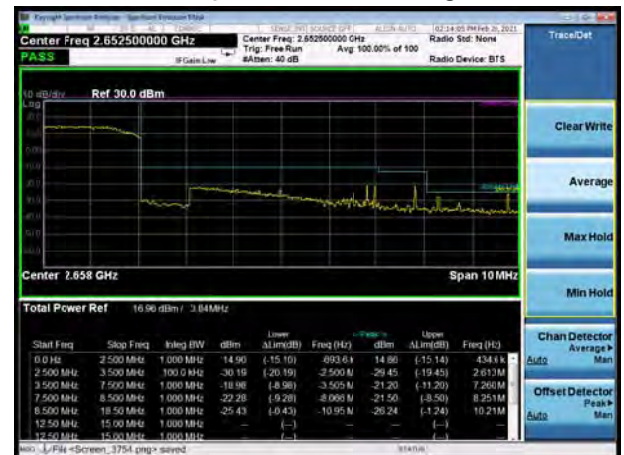
LTE Band 41 QPSK 5MHz CH-High, 1 RB



LTE Band 41 QPSK 5MHz CH-Low, 100%RB



LTE Band 41 QPSK 5MHz CH-High, 100%RB

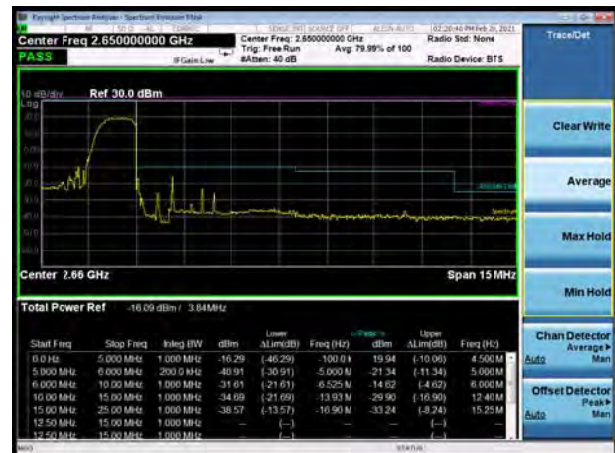




LTE Band 41 QPSK 10MHz CH-Low, 1 RB



LTE Band 41 QPSK 10MHz CH-High, 1 RB



LTE Band 41 QPSK 10MHz CH-Low, 100%RB



LTE Band 41 QPSK 10MHz CH-High, 100%RB



LTE Band 41 QPSK 15MHz CH-Low, 1 RB



LTE Band 41 QPSK 15MHz CH-High, 1 RB





LTE Band 41 QPSK 15MHz CH-Low, 100%RB



LTE Band 41 QPSK 15MHz CH-High, 100%RB



LTE Band 41 QPSK 20MHz CH-Low, 1 RB



LTE Band 41 QPSK 20MHz CH-High, 1 RB



LTE Band 41 QPSK 20MHz CH-Low, 100%RB



LTE Band 41 QPSK 20MHz CH-High, 100%RB

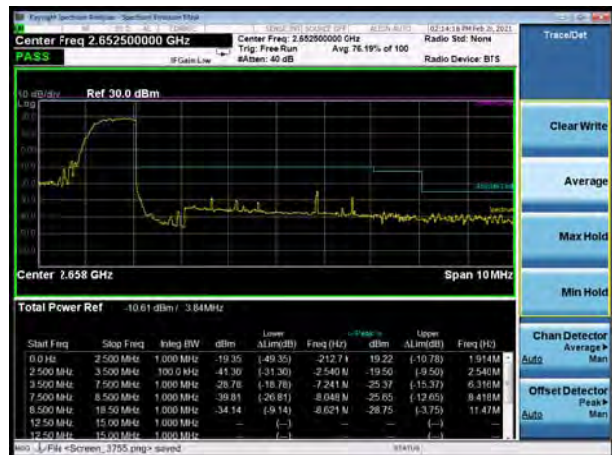




LTE Band 41 16QAM 5MHz CH-Low, 1 RB



LTE Band 41 16QAM 5MHz CH-High, 1 RB



LTE Band 41 16QAM 5MHz CH-Low, 100%RB



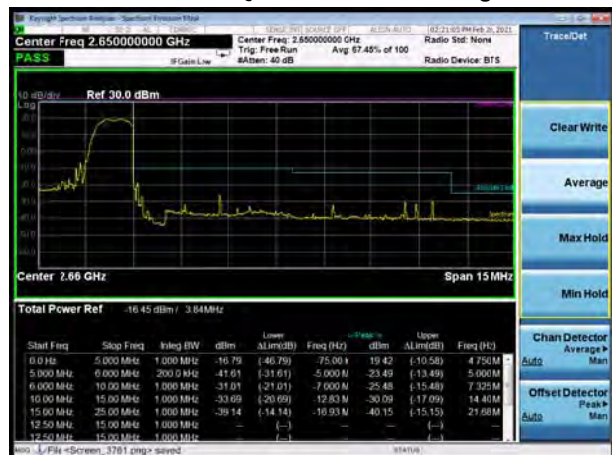
LTE Band 41 16QAM 5MHz CH-High, 100%RB



LTE Band 41 16QAM 10MHz CH-Low, 1 RB



LTE Band 41 16QAM 10MHz CH-High, 1 RB





LTE Band 41 16QAM 10MHz CH-Low, 100%RB



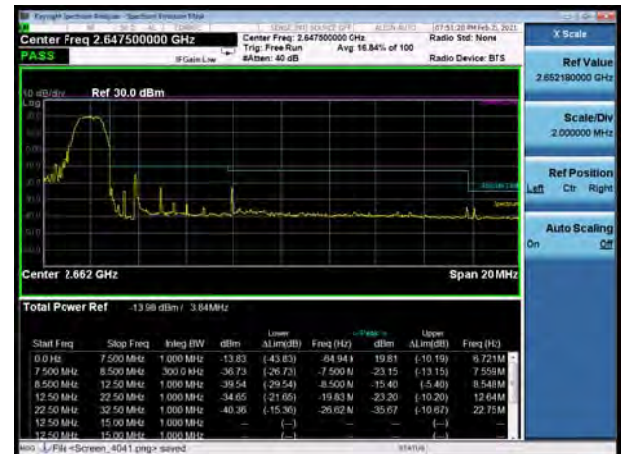
LTE Band 41 16QAM 10MHz CH-High, 100%RB



LTE Band 41 16QAM 15MHz CH-Low, 1 RB



LTE Band 41 16QAM 15MHz CH-High, 1 RB



LTE Band 41 16QAM 15MHz CH-Low, 100%RB



LTE Band 41 16QAM 15MHz CH-High, 100%RB

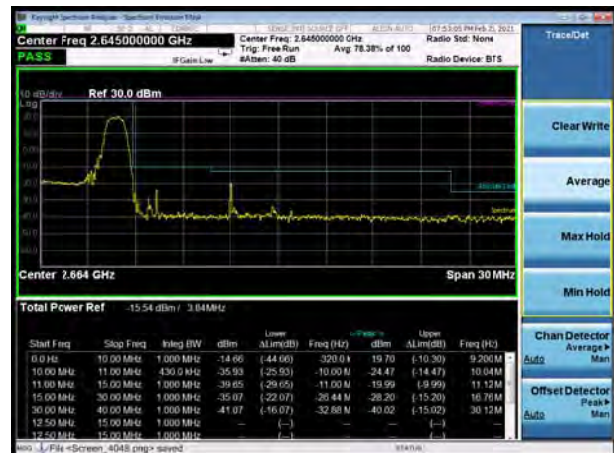




LTE Band 41 16QAM 20MHz CH-Low, RB 1



LTE Band 41 16QAM 20MHz CH-High, RB 1



LTE Band 41 16QAM 20MHz CH-Low, 100%RB



LTE Band 41 16QAM 20MHz CH-High, 100%RB



LTE Band 41 64QAM 5MHz CH-Low, 1 RB



LTE Band 41 64QAM 5MHz CH-High, 1 RB





LTE Band 41 64QAM 5MHz CH-Low, 100%RB



LTE Band 41 64QAM 5MHz CH-High, 100%RB



LTE Band 41 64QAM 10MHz CH-Low, 1 RB



LTE Band 41 64QAM 10MHz CH-High, 1 RB



LTE Band 41 64QAM 10MHz CH-Low, 100%RB

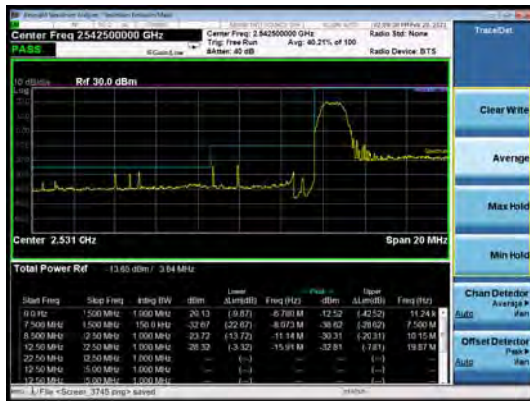


LTE Band 41 64QAM 10MHz CH-High, 100%RB





LTE Band 41 64QAM 15MHz CH-Low, 1 RB



LTE Band 41 64QAM 15MHz CH-High, 1 RB



LTE Band 41 64QAM 15MHz CH-Low, 100%RB



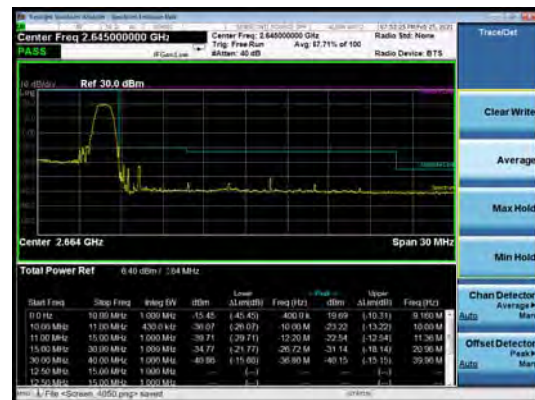
LTE Band 41 64QAM 15MHz CH-High, 100%RB



LTE Band 41 64QAM 20MHz CH-Low, RB 1



LTE Band 41 64QAM 20MHz CH-High, RB 1



LTE Band 41 64QAM 20MHz CH-Low, 100%RB

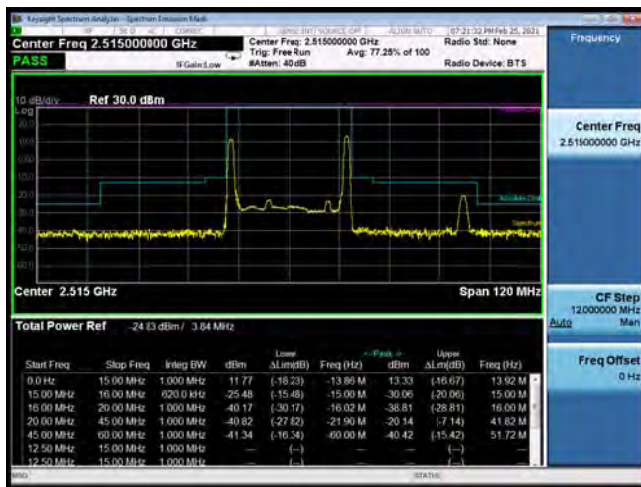


LTE Band 41 64QAM 20MHz CH-High, 100%RB





CA_7C QPSK 20MHz+10MHz CH-Low, 1 RB



CA_7C QPSK 20MHz+10MHz CH-High, 1 RB



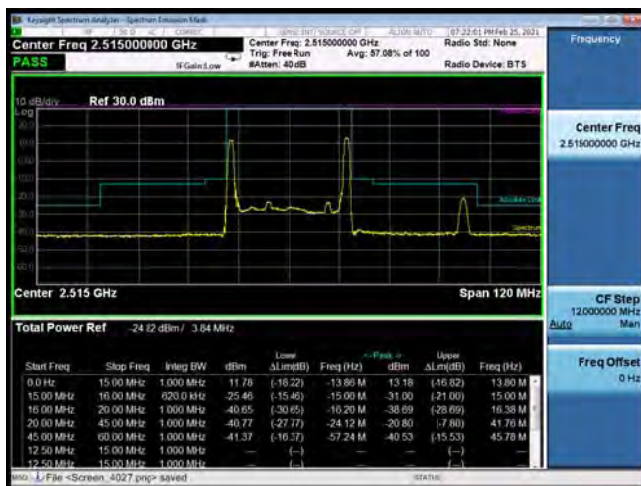
CA_7C 16QAM 20MHz+10MHz CH-Low, 1 RB



CA_7C 16QAM 20MHz+10MHz CH-High, 1 RB



CA_7C 64QAM 20MHz+10MHz CH-Low, 1 RB



CA_7C 64QAM 20MHz+10MHz CH-High, 1 RB





CA_7C QPSK 20MHz+10MHz CH-Low, 100%RB



CA_7C QPSK 20MHz+10MHz CH-High, 100%RB



CA_7C 16QAM 20MHz+10MHz CH-Low, 100%RB



CA_7C 16QAM 20MHz+10MHz CH-High, 100%RB



CA_7C 64QAM 20MHz+10MHz CH-Low, 100%RB



CA_7C 64QAM 20MHz+10MHz CH-High, 100%RB





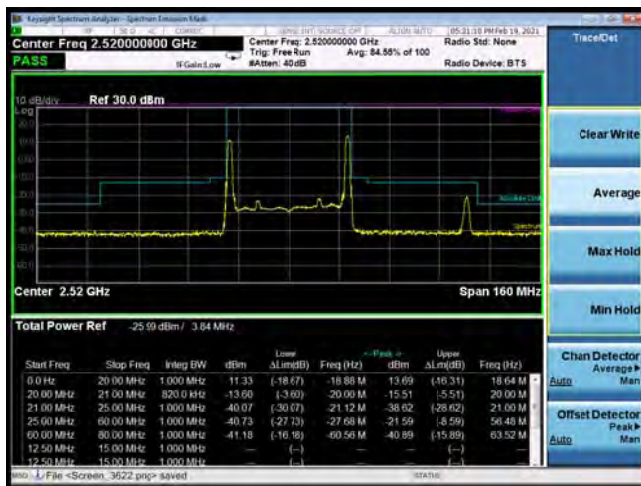
CA_7C QPSK 20MHz+20MHz CH-Low, 1 RB



CA_7C QPSK 20MHz+20MHz CH-High, 1 RB



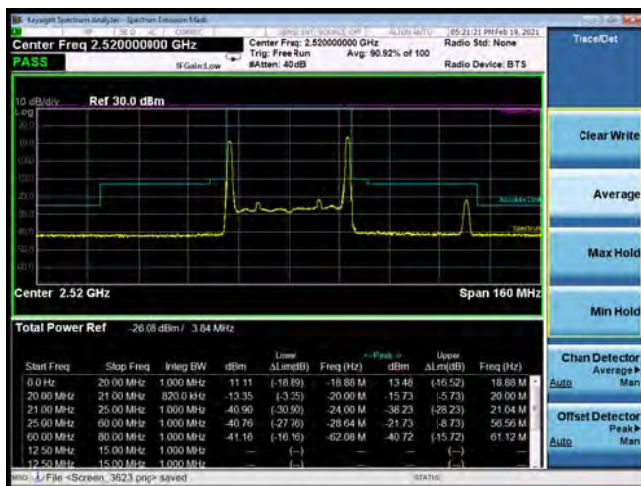
CA_7C 16QAM 20MHz+20MHz CH-Low, 1 RB



CA_7C 16QAM 20MHz+20MHz CH-High, 1 RB



CA_7C 64QAM 20MHz+20MHz CH-Low, 1 RB



CA_7C 64QAM 20MHz+20MHz CH-High, 1 RB





CA_7C QPSK 20MHz+20MHz CH-Low, 100%RB



CA_7C QPSK 20MHz+20MHz CH-High, 100%RB



CA_7C 16QAM 20MHz+20MHz CH-Low, 100%RB



CA_7C 16QAM 20MHz+20MHz CH-High, 100%RB



CA_7C 64QAM 20MHz+20MHz CH-Low, 100%RB

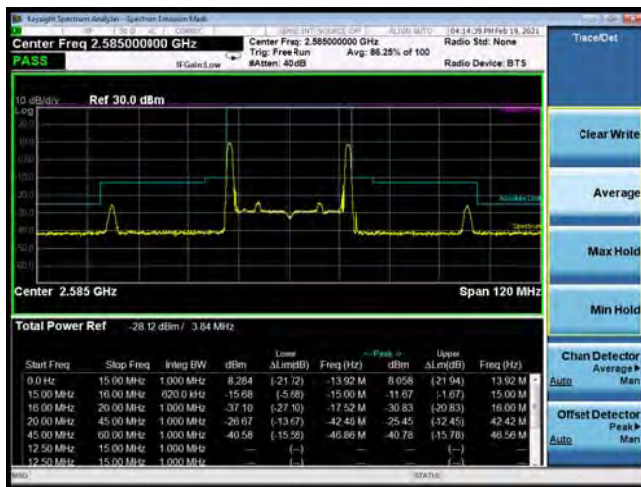


CA_7C 64QAM 20MHz+20MHz CH-High, 100%RB





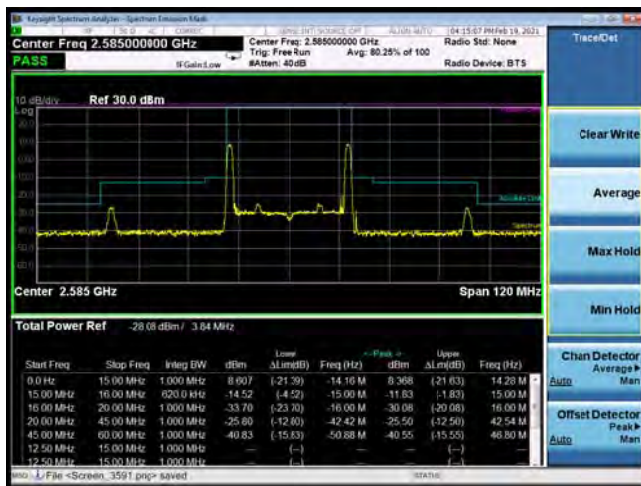
CA_38C QPSK 15MHz+15MHz CH-Low, 1 RB



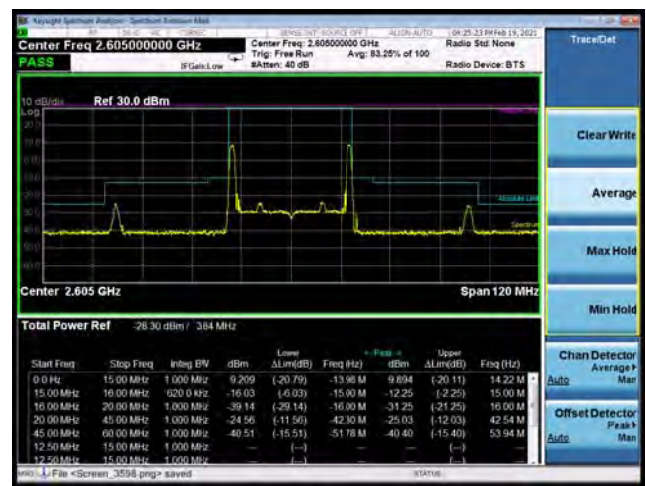
CA_38C QPSK 15MHz+15MHz CH-High, 1 RB



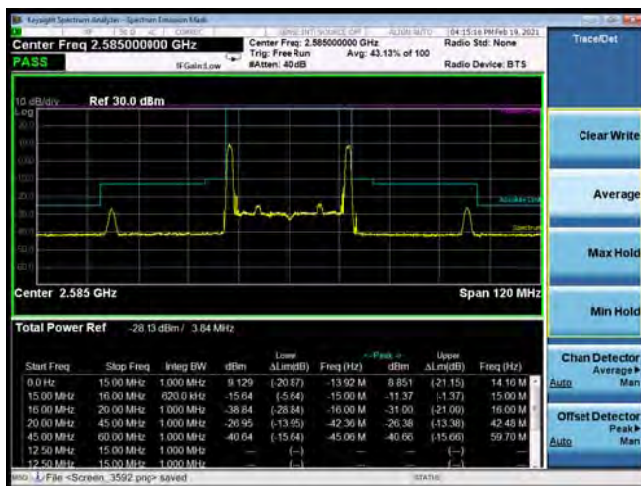
CA_38C 16QAM 15MHz+15MHz CH-Low, 1 RB



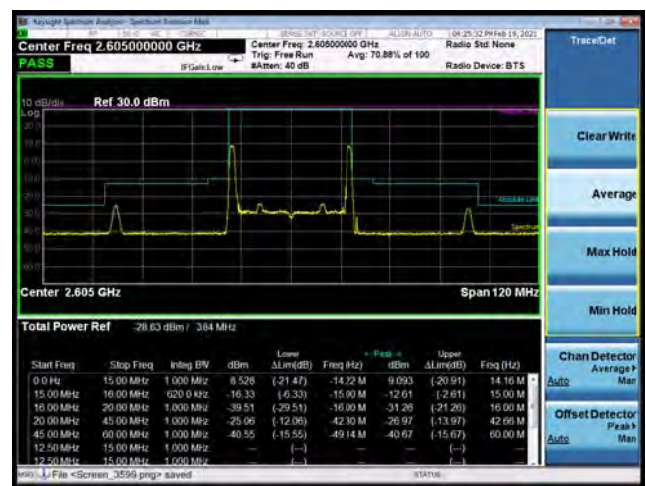
CA_38C 16QAM 15MHz+15MHz CH-High, 1 RB



CA_38C 64QAM 15MHz+15MHz CH-Low, 1 RB

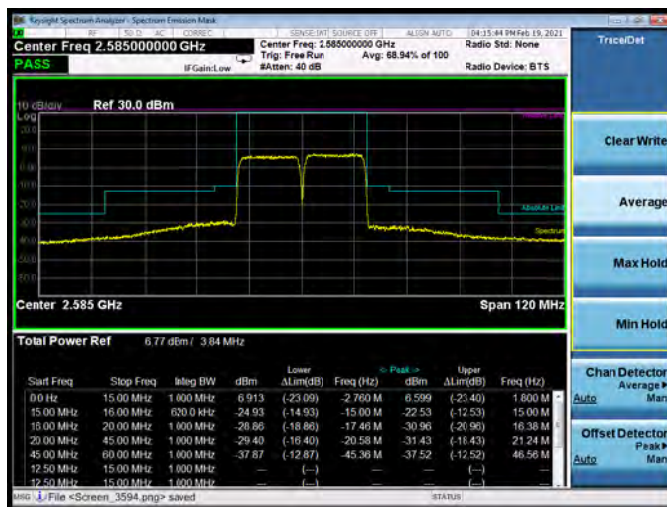


CA_38C 64QAM 15MHz+15MHz CH-High, 1 RB

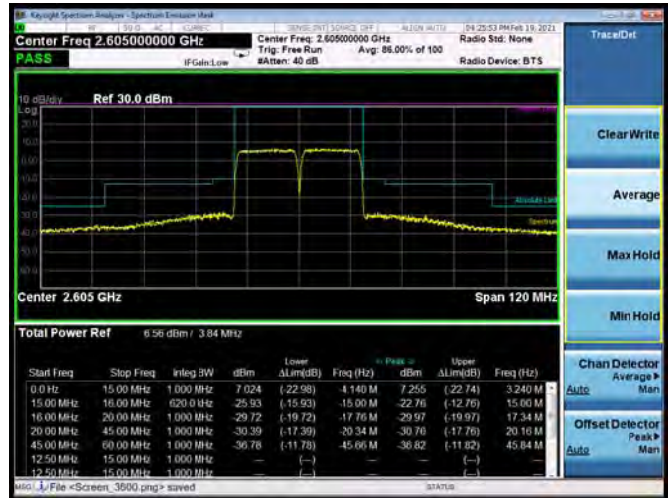




CA_38C QPSK 15MHz+15MHz CH-Low,100%RB



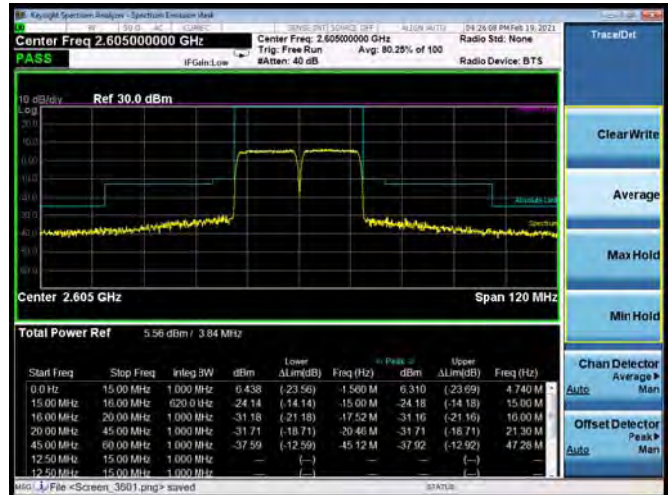
CA_38C QPSK 15MHz+15MHz CH-High,100%RB



CA_38C 16QAM 15MHz+15MHz CH-Low,100%RB



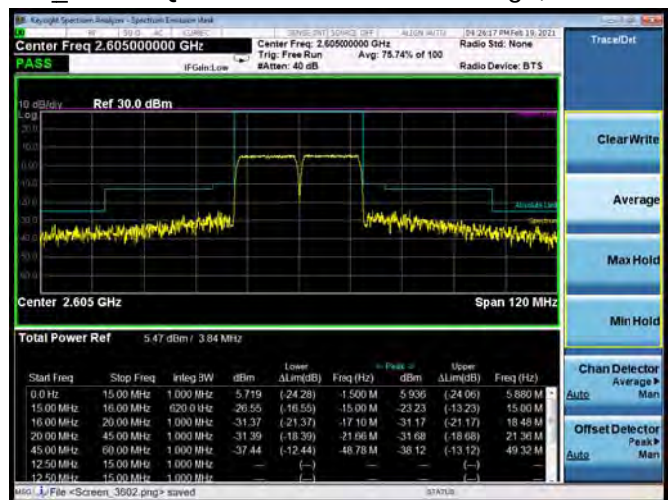
CA_38C 16QAM 15MHz+15MHz CH-High,100%RB



CA_38C 64QAM 15MHz+15MHz CH-Low,100%RB

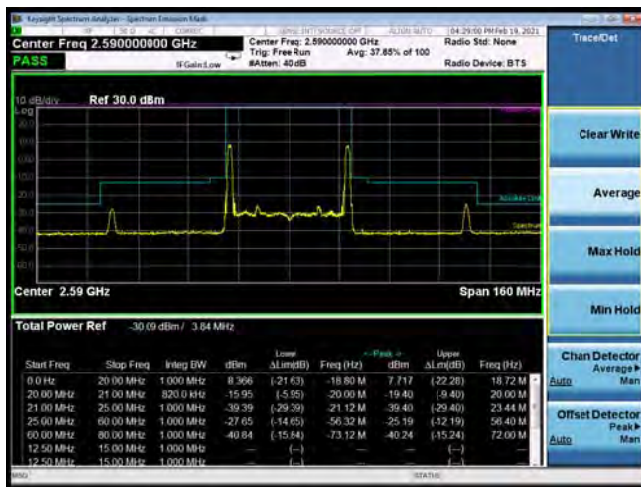


CA_38C 64QAM 15MHz+15MHz CH-High,100%RB





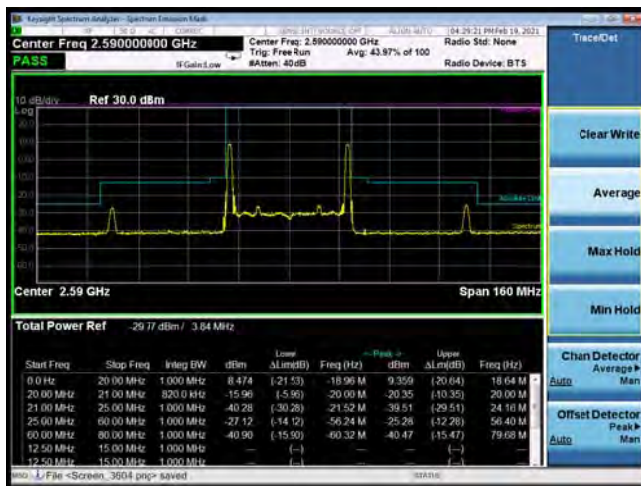
CA_38C QPSK 20MHz+20MHz CH-Low, 1 RB



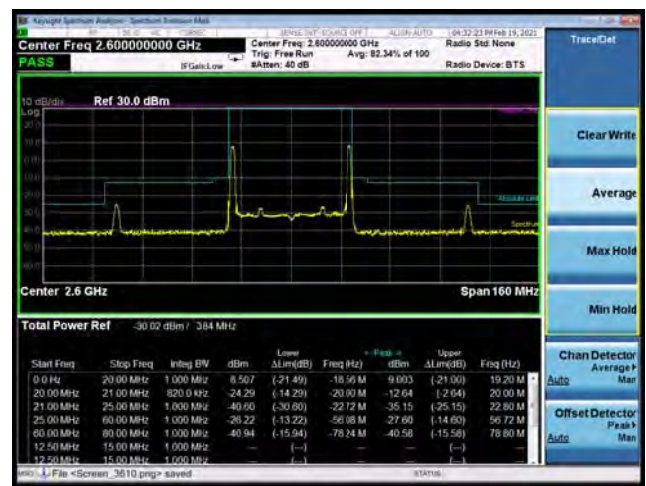
CA_38C QPSK 20MHz+20MHz CH-High, 1 RB



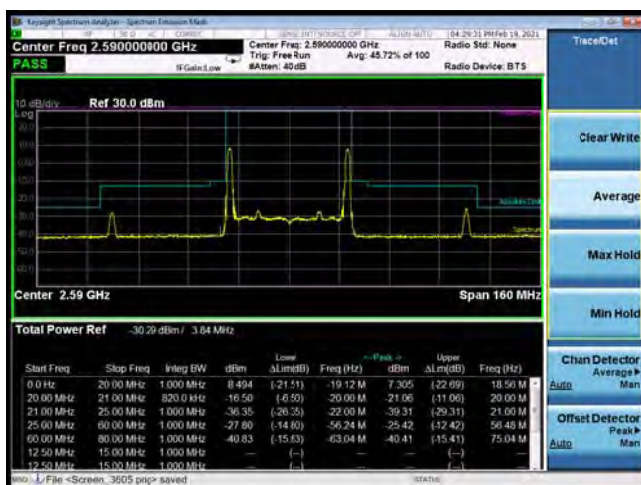
CA_38C 16QAM 20MHz+20MHz CH-Low, 1 RB



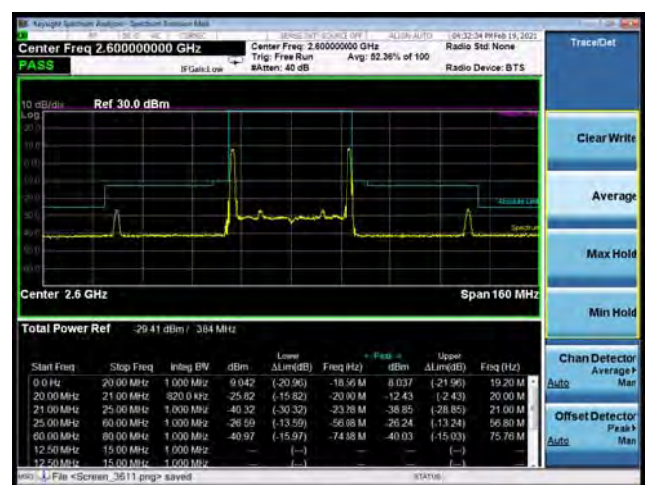
CA_38C 16QAM 20MHz+20MHz CH-High, 1 RB



CA_38C 64QAM 20MHz+20MHz CH-Low, 1 RB



CA_38C 64QAM 20MHz+20MHz CH-High, 1 RB





CA_38C QPSK 20MHz+20MHz CH-Low,100%RB



CA_38C QPSK 20MHz+20MHz CH-High,100%RB



CA_38C 16QAM 20MHz+20MHz CH-Low,100%RB



CA_38C 16QAM 20MHz+20MHz CH-High,100%RB



CA_38C 64QAM 20MHz+20MHz CH-Low,100%RB



CA_38C 64QAM 20MHz+20MHz CH-High,100%RB



5.4 Peak-to-Average Power Ratio (PAPR)

Ambient condition

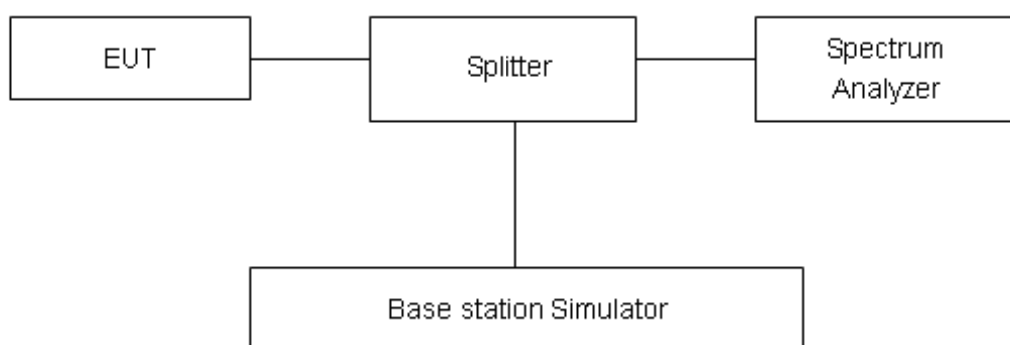
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

Measure the total peak power and record as PPK. And measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

$$\text{PAPR (dB)} = \text{PPk (dBm)} - \text{PAvg (dBm)}.$$

Test Setup



Limits

Rule Part 27.50(d)(5) Equipment employed must be authorized in accordance with the provisions of 24.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.4$ dB.



Test Results

WCDMA Band IV	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
RMC	1312	1712.4	24.70	20.84	3.86	≤13	PASS
	1413	1732.6	25.13	21.35	3.78	≤13	PASS
	1513	1752.6	25.17	20.70	4.47	≤13	PASS

LTE Band 4								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	19957	1710.7	27.50	23.28	4.22	≤13	PASS
		20175	1732.5	28.09	23.21	4.88	≤13	PASS
		20393	1754.3	28.27	23.14	5.13	≤13	PASS
	3	19965	1711.5	27.54	23.10	4.44	≤13	PASS
		20175	1732.5	27.98	23.07	4.91	≤13	PASS
		20385	1753.5	28.16	23.06	5.10	≤13	PASS
	5	19975	1712.5	27.66	23.16	4.50	≤13	PASS
		20175	1732.5	28.09	23.13	4.96	≤13	PASS
		20375	1752.5	28.26	23.14	5.12	≤13	PASS
	10	20000	1715	27.89	23.16	4.73	≤13	PASS
		20175	1732.5	28.12	23.13	4.99	≤13	PASS
		20350	1750	28.15	23.14	5.01	≤13	PASS
	15	20025	1717.5	28.58	23.28	5.30	≤13	PASS
		20175	1732.5	28.56	23.26	5.30	≤13	PASS
		20325	1747.5	28.50	23.25	5.25	≤13	PASS
	20	20050	1720	28.46	23.24	5.22	≤13	PASS
		20175	1732.5	28.33	23.13	5.20	≤13	PASS
		20300	1745	28.31	23.15	5.16	≤13	PASS
16QAM	1.4	19957	1710.7	27.33	22.18	5.15	≤13	PASS
		20175	1732.5	27.92	22.25	5.67	≤13	PASS
		20393	1754.3	28.17	22.21	5.96	≤13	PASS
	3	19965	1711.5	27.42	22.08	5.34	≤13	PASS
		20175	1732.5	27.94	22.10	5.84	≤13	PASS
		20385	1753.5	28.08	22.09	5.99	≤13	PASS
	5	19975	1712.5	27.51	22.19	5.32	≤13	PASS
		20175	1732.5	27.97	22.21	5.76	≤13	PASS
		20375	1752.5	28.10	22.18	5.92	≤13	PASS
	10	20000	1715	27.76	22.16	5.60	≤13	PASS
		20175	1732.5	27.95	22.14	5.81	≤13	PASS



	15	20350	1750	28.02	22.15	5.87	≤13	PASS
		20025	1717.5	28.19	22.24	5.95	≤13	PASS
		20175	1732.5	28.20	22.20	6.00	≤13	PASS
		20325	1747.5	28.11	22.22	5.89	≤13	PASS
	20	20050	1720	28.28	22.24	6.04	≤13	PASS
		20175	1732.5	28.16	22.17	5.99	≤13	PASS
		20300	1745	28.11	22.17	5.94	≤13	PASS
64QAM	1.4	19957	1710.7	26.83	21.69	5.14	≤13	PASS
		20175	1732.5	27.45	21.75	5.70	≤13	PASS
		20393	1754.3	27.70	21.74	5.96	≤13	PASS
	3	19965	1711.5	26.92	21.60	5.32	≤13	PASS
		20175	1732.5	27.40	21.60	5.80	≤13	PASS
		20385	1753.5	27.64	21.63	6.01	≤13	PASS
	5	19975	1712.5	27.04	21.69	5.35	≤13	PASS
		20175	1732.5	27.48	21.70	5.78	≤13	PASS
		20375	1752.5	27.63	21.73	5.90	≤13	PASS
	10	20000	1715	27.30	21.69	5.61	≤13	PASS
		20175	1732.5	27.48	21.64	5.84	≤13	PASS
		20350	1750	27.52	21.68	5.84	≤13	PASS
	15	20025	1717.5	27.73	21.76	5.97	≤13	PASS
		20175	1732.5	27.74	21.73	6.01	≤13	PASS
		20325	1747.5	27.68	21.72	5.96	≤13	PASS
	20	20050	1720	27.81	21.75	6.06	≤13	PASS
		20175	1732.5	27.69	21.67	6.02	≤13	PASS
		20300	1745	27.65	21.67	5.98	≤13	PASS

LTE Band 7								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	5	20775	2502.5	28.07	23.11	4.96	≤13	PASS
		21100	2535	27.74	22.98	4.76	≤13	PASS
		21425	2567.5	27.71	23.02	4.69	≤13	PASS
	10	20800	2505	28.23	23.10	5.13	≤13	PASS
		21100	2535	27.78	22.99	4.79	≤13	PASS
		21400	2565	27.90	23.06	4.84	≤13	PASS
	15	20825	2507.5	28.61	23.11	5.50	≤13	PASS
		21100	2535	28.24	23.05	5.19	≤13	PASS
		21375	2562.5	28.36	23.11	5.25	≤13	PASS



	20	20850	2510	28.42	23.07	5.35	≤13	PASS
		21100	2535	28.07	22.91	5.16	≤13	PASS
		21350	2560	28.21	22.97	5.24	≤13	PASS
16QAM	5	20775	2502.5	27.90	22.11	5.79	≤13	PASS
		21100	2535	27.55	22.01	5.54	≤13	PASS
		21425	2567.5	27.59	22.05	5.54	≤13	PASS
	10	20800	2505	28.06	22.09	5.97	≤13	PASS
		21100	2535	27.52	21.95	5.57	≤13	PASS
		21400	2565	27.72	22.05	5.67	≤13	PASS
	15	20825	2507.5	28.20	22.09	6.11	≤13	PASS
		21100	2535	27.74	21.96	5.78	≤13	PASS
		21375	2562.5	27.99	22.03	5.96	≤13	PASS
	20	20850	2510	28.17	22.04	6.13	≤13	PASS
		21100	2535	27.74	21.86	5.88	≤13	PASS
		21350	2560	27.98	21.98	6.00	≤13	PASS
16QAM	5	20775	2502.5	27.33	21.52	5.81	≤13	PASS
		21100	2535	26.88	21.32	5.56	≤13	PASS
		21425	2567.5	26.92	21.35	5.57	≤13	PASS
	10	20800	2505	27.44	21.49	5.95	≤13	PASS
		21100	2535	26.97	21.32	5.65	≤13	PASS
		21400	2565	27.05	21.35	5.70	≤13	PASS
	15	20825	2507.5	27.68	21.48	6.20	≤13	PASS
		21100	2535	27.18	21.31	5.87	≤13	PASS
		21375	2562.5	27.30	21.34	5.96	≤13	PASS
	20	20850	2510	27.66	21.49	6.17	≤13	PASS
		21100	2535	27.16	21.26	5.90	≤13	PASS
		21350	2560	27.28	21.28	6.00	≤13	PASS

LTE Band 38								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	5	37775	2572.5	27.78	20.42	7.36	≤13	PASS
		38000	2595	28.18	20.27	7.91	≤13	PASS
		38225	2617.5	28.25	20.44	7.81	≤13	PASS



	10	37800	2575	27.89	20.79	7.10	≤13	PASS
		38000	2595	28.25	20.87	7.38	≤13	PASS
		38200	2615	28.28	20.81	7.47	≤13	PASS
	15	37825	2577.5	28.25	20.76	7.49	≤13	PASS
		38000	2595	28.58	21.40	7.18	≤13	PASS
		38175	2612.5	28.60	20.76	7.84	≤13	PASS
	20	37850	2580	28.02	20.78	7.24	≤13	PASS
		38000	2595	28.22	20.83	7.39	≤13	PASS
		38150	2610	28.30	20.90	7.40	≤13	PASS
16QAM	5	37775	2572.5	27.52	19.51	8.01	≤13	PASS
		38000	2595	28.05	20.29	7.76	≤13	PASS
		38225	2617.5	27.87	19.05	8.82	≤13	PASS
	10	37800	2575	27.68	20.17	7.51	≤13	PASS
		38000	2595	27.99	19.53	8.46	≤13	PASS
		38200	2615	28.12	19.87	8.25	≤13	PASS
	15	37825	2577.5	27.93	20.28	7.65	≤13	PASS
		38000	2595	28.10	18.98	9.12	≤13	PASS
		38175	2612.5	28.22	20.48	7.74	≤13	PASS
	20	37850	2580	27.74	19.25	8.49	≤13	PASS
		38000	2595	28.07	20.57	7.50	≤13	PASS
		38150	2610	27.97	19.18	8.79	≤13	PASS
64QAM	5	37775	2572.5	26.79	17.11	9.68	≤13	PASS
		38000	2595	27.24	18.01	9.23	≤13	PASS
		38225	2617.5	27.18	17.85	9.33	≤13	PASS
	10	37800	2575	26.95	17.35	9.60	≤13	PASS
		38000	2595	27.21	17.93	9.28	≤13	PASS
		38200	2615	27.24	17.80	9.44	≤13	PASS
	15	37825	2577.5	27.21	17.62	9.59	≤13	PASS
		38000	2595	27.18	16.40	10.78	≤13	PASS
		38175	2612.5	27.43	18.19	9.24	≤13	PASS
	20	37850	2580	27.11	17.95	9.16	≤13	PASS
		38000	2595	27.07	16.80	10.27	≤13	PASS
		38150	2610	27.14	17.55	9.59	≤13	PASS



LTE Band 41								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	5	39675	2498.5	27.16	18.48	8.68	≤13	PASS
		40620	2593	27.29	18.97	8.32	≤13	PASS
		41565	2687.5	26.71	17.85	8.86	≤13	PASS
	10	39700	2501	26.90	17.94	8.96	≤13	PASS
		40620	2593	26.86	17.84	9.02	≤13	PASS
		41540	2685	26.76	17.75	9.01	≤13	PASS
	15	39725	2503.5	27.25	18.06	9.19	≤13	PASS
		40620	2593	27.15	17.56	9.59	≤13	PASS
		41515	2682.5	27.12	17.87	9.25	≤13	PASS
	20	39750	2506	27.55	19.45	8.10	≤13	PASS
		40620	2593	26.83	17.70	9.13	≤13	PASS
		41490	2680	26.81	17.92	8.89	≤13	PASS
16QAM	5	39675	2498.5	26.88	17.46	9.42	≤13	PASS
		40620	2593	26.98	17.82	9.16	≤13	PASS
		41565	2687.5	26.46	16.85	9.61	≤13	PASS
	10	39700	2501	26.74	17.34	9.40	≤13	PASS
		40620	2593	26.57	16.77	9.80	≤13	PASS
		41540	2685	26.47	16.71	9.76	≤13	PASS
	15	39725	2503.5	26.85	17.44	9.41	≤13	PASS
		40620	2593	26.70	16.51	10.19	≤13	PASS
		41515	2682.5	26.71	17.11	9.60	≤13	PASS
	20	39750	2506	26.67	17.11	9.56	≤13	PASS
		40620	2593	26.62	17.22	9.40	≤13	PASS
		41490	2680	26.53	17.03	9.50	≤13	PASS
64QAM	5	39675	2498.5	26.86	17.31	9.55	≤13	PASS
		40620	2593	26.93	17.57	9.36	≤13	PASS
		41565	2687.5	26.47	17.11	9.36	≤13	PASS
	10	39700	2501	26.68	16.88	9.80	≤13	PASS
		40620	2593	26.61	17.06	9.55	≤13	PASS
		41540	2685	26.48	16.81	9.67	≤13	PASS
	15	39725	2503.5	26.84	17.25	9.59	≤13	PASS
		40620	2593	26.80	17.55	9.25	≤13	PASS
		41515	2682.5	26.71	17.12	9.59	≤13	PASS
	20	39750	2506	26.61	16.97	9.64	≤13	PASS
		40620	2593	26.52	16.28	10.24	≤13	PASS
		41490	2680	26.50	16.49	10.01	≤13	PASS



CA_7C								
Bandwidth	PCC		SCC1		Modulation	Peak-to-Average Power Ratio (PAPR)		
	Channel	Frequency (MHz)	Channel	Frequency (MHz)		Peak (dBm)	Avg (dBm)	PAPR (dB)
CA_7C_10MHz+20MHz_QPSK	21006	2525.6	21150	2540	QPSK	25.79	20.23	5.56
CA_7C_10MHz+20MHz_16QAM	21006	2525.6	21150	2540	16QAM	25.53	19.27	6.26
CA_7C_10MHz+20MHz_64QAM	21006	2525.6	21150	2540	64QAM	25.58	19.29	6.29
CA_7C_20MHz+10MHz_QPSK	21051	2530.1	21195	2544.5	QPSK	25.89	20.60	5.29
CA_7C_20MHz+10MHz_16QAM	21051	2530.1	21195	2544.5	16QAM	25.76	19.62	6.14
CA_7C_20MHz+10MHz_64QAM	21051	2530.1	21195	2544.5	64QAM	25.78	19.62	6.16
CA_7C_15MHz+10MHz_QPSK	21051	2530.1	21171	2542.1	QPSK	26.73	20.97	5.76
CA_7C_15MHz+10MHz_16QAM	21051	2530.1	21171	2542.1	16QAM	26.25	19.99	6.26
CA_7C_15MHz+10MHz_64QAM	21051	2530.1	21171	2542.1	64QAM	26.24	20.00	6.24
CA_7C_15MHz+15MHz_QPSK	21025	2527.5	21175	2542.5	QPSK	25.80	20.38	5.42
CA_7C_15MHz+15MHz_16QAM	21025	2527.5	21175	2542.5	16QAM	25.60	19.41	6.19
CA_7C_15MHz+15MHz_64QAM	21025	2527.5	21175	2542.5	64QAM	25.70	19.42	6.28
CA_7C_15MHz+20MHz_QPSK	21003	2525.3	21174	2542.4	QPSK	25.58	19.60	5.98
CA_7C_15MHz+20MHz_16QAM	21003	2525.3	21174	2542.4	16QAM	24.98	18.61	6.37
CA_7C_15MHz+20MHz_64QAM	21003	2525.3	21174	2542.4	64QAM	25.16	18.63	6.53
CA_7C_20MHz+15MHz_QPSK	21026	2527.6	21197	2544.7	QPSK	25.43	19.95	5.48
CA_7C_20MHz+15MHz_16QAM	21026	2527.6	21197	2544.7	16QAM	25.24	18.99	6.25
CA_7C_20MHz+15MHz_64QAM	21026	2527.6	21197	2544.7	64QAM	25.22	18.98	6.24
CA_7C_20MHz+20MHz_QPSK	21001	2525.1	21199	2544.9	QPSK	25.11	19.18	5.93
CA_7C_20MHz+20MHz_16QAM	21001	2525.1	21199	2544.9	16QAM	24.79	18.20	6.59
CA_7C_20MHz+20MHz_64QAM	21001	2525.1	21199	2544.9	64QAM	24.92	18.22	6.70

CA_38C								
Bandwidth	PCC		SCC1		Modulation	Peak-to-Average Power Ratio (PAPR)		
	Channel	Frequency (MHz)	Channel	Frequency (MHz)		Peak (dBm)	Avg (dBm)	PAPR (dB)
CA_38C_15MHz+15MHz_QPSK	37925	2587.5	38075	2602.5	QPSK	26.36	16.03	10.33
CA_38C_15MHz+15MHz_16QAM	37925	2587.5	38075	2602.5	16QAM	25.91	15.32	10.59
CA_38C_15MHz+15MHz_64QAM	37925	2587.5	38075	2602.5	64QAM	25.94	15.54	10.40
CA_38C_20MHz+20MHz_QPSK	37901	2585.1	38099	2604.9	QPSK	25.33	14.89	10.44
CA_38C_20MHz+20MHz_16QAM	37901	2585.1	38099	2604.9	16QAM	24.80	13.47	11.33
CA_38C_20MHz+20MHz_64QAM	37901	2585.1	38099	2604.9	64QAM	24.94	14.59	10.35

5.5 Frequency Stability

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -30°C to +50°C in 10°C step size.

(1)With all power removed, the temperature was decreased to -10°C and permitted to stabilize for three hours.

(2)Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.

(3) Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

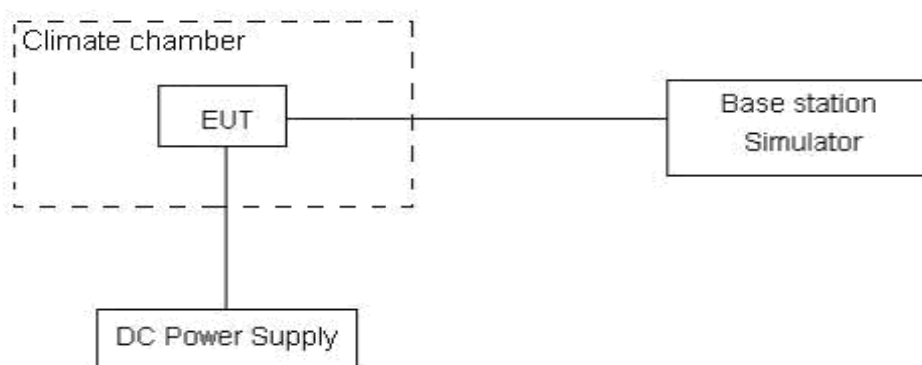
Frequency Stability (Voltage Variation)

The frequency stability shall be measured with variation of primary supply voltage as follows:

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.

This transceiver is specified to operate with an input voltage of between 3.6 V and 4.45 V, with a nominal voltage of 3.87V.

Test setup



Limits

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

Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor $k = 3, U=0.01\text{ppm}$.



Test Result

WCDMA Band IV						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	QPSK	BPSK	QPSK	BPSK	
Normal (25℃)	Normal	7.63	4.00	0.00406	0.00213	PASS
Extreme (50℃)		16.72	12.27	0.00889	0.00653	PASS
Extreme (40℃)		9.83	16.86	0.00523	0.00897	PASS
Extreme (30℃)		16.21	8.14	0.00862	0.00433	PASS
Extreme (20℃)		1.37	16.98	0.00073	0.00903	PASS
Extreme (10℃)		9.35	7.47	0.00497	0.00397	PASS
Extreme (0℃)		1.44	12.29	0.00077	0.00654	PASS
Extreme (-10℃)		8.11	14.39	0.00432	0.00765	PASS
Extreme (-20℃)		3.24	8.11	0.00172	0.00431	PASS
Extreme (-30℃)		14.90	17.41	0.00792	0.00926	PASS
25℃	LV	6.36	2.75	0.00338	0.00146	PASS
	HV	9.53	5.36	0.00507	0.00285	PASS

LTE Band 4								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	1.4MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	6.76	8.78	3.32	0.00359	0.00467	0.00177	PASS
Extreme (50℃)		10.01	7.36	2.66	0.00533	0.00391	0.00142	PASS
Extreme (40℃)		2.21	14.18	1.40	0.00117	0.00754	0.00074	PASS
Extreme (30℃)		4.54	13.21	8.91	0.00242	0.00702	0.00474	PASS
Extreme (20℃)		11.27	1.20	5.53	0.00600	0.00064	0.00294	PASS
Extreme (10℃)		13.73	17.57	14.03	0.00731	0.00934	0.00746	PASS
Extreme (0℃)		3.59	8.22	17.19	0.00191	0.00437	0.00914	PASS
Extrem (-10℃)		7.70	7.76	16.88	0.00409	0.00413	0.00898	PASS
Extrem (-20℃)		4.63	1.74	12.91	0.00246	0.00092	0.00687	PASS
Extrem (-30℃)		7.35	10.10	13.38	0.00391	0.00537	0.00712	PASS
25℃	LV	11.28	11.75	2.87	0.00600	0.00625	0.00153	PASS
	HV	14.58	13.59	2.10	0.00775	0.00723	0.00112	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	



Normal (25℃)	Normal	5.30	12.50	4.39	0.00282	0.00665	0.00233	PASS
Extreme (50℃)		17.01	9.21	16.13	0.00905	0.00490	0.00858	PASS
Extreme (40℃)		5.05	14.02	17.40	0.00269	0.00746	0.00926	PASS
Extreme (30℃)		7.72	6.68	3.27	0.00411	0.00355	0.00174	PASS
Extreme (20℃)		12.59	4.38	12.33	0.00670	0.00233	0.00656	PASS
Extreme (10℃)		14.54	8.69	16.14	0.00774	0.00462	0.00858	PASS
Extreme (0℃)		8.68	13.04	6.51	0.00462	0.00694	0.00346	PASS
Extrem (-10℃)		13.15	7.81	1.36	0.00699	0.00416	0.00072	PASS
Extrem (-20℃)		8.31	15.52	13.15	0.00442	0.00825	0.00700	PASS
Extrem (-30℃)		1.44	17.87	1.60	0.00077	0.00950	0.00085	PASS
25℃	LV	7.10	10.49	8.18	0.00377	0.00558	0.00435	PASS
	HV	11.69	16.98	2.89	0.00622	0.00903	0.00154	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	7.18	3.58	11.93	0.00382	0.00190	0.00635	PASS
Extreme (50℃)		14.57	16.70	16.51	0.00775	0.00889	0.00878	PASS
Extreme (40℃)		12.30	8.33	6.91	0.00654	0.00443	0.00368	PASS
Extreme (30℃)		4.03	15.96	14.41	0.00214	0.00849	0.00767	PASS
Extreme (20℃)		12.31	3.37	14.91	0.00655	0.00179	0.00793	PASS
Extreme (10℃)		9.05	11.24	4.10	0.00481	0.00598	0.00218	PASS
Extreme (0℃)		8.73	10.49	3.80	0.00464	0.00558	0.00202	PASS
Extrem (-10℃)		14.91	1.19	15.92	0.00793	0.00063	0.00847	PASS
Extrem (-20℃)		14.57	2.48	13.86	0.00775	0.00132	0.00737	PASS
Extrem (-30℃)		14.51	8.97	12.84	0.00772	0.00477	0.00683	PASS
25℃	LV	6.21	4.11	11.73	0.00330	0.00219	0.00624	PASS
	HV	17.61	3.74	11.83	0.00937	0.00199	0.00629	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	5.43	4.79	9.06	0.00289	0.00255	0.00482	PASS
Extreme (50℃)		10.62	12.44	9.37	0.00565	0.00662	0.00498	PASS
Extreme (40℃)		7.11	15.74	3.70	0.00378	0.00837	0.00197	PASS
Extreme (30℃)		5.69	15.32	3.83	0.00303	0.00815	0.00204	PASS
Extreme (20℃)		17.51	11.86	10.42	0.00931	0.00631	0.00554	PASS
Extreme (10℃)		1.26	7.74	13.90	0.00067	0.00412	0.00739	PASS
Extreme (0℃)		6.69	5.41	14.96	0.00356	0.00288	0.00796	PASS
Extrem (-10℃)		7.25	16.76	9.14	0.00386	0.00891	0.00486	PASS
Extrem (-20℃)		17.74	6.43	13.81	0.00943	0.00342	0.00735	PASS
Extrem (-30℃)		14.65	6.89	9.56	0.00779	0.00367	0.00508	PASS



25℃	LV	2.56	15.49	11.58	0.00136	0.00824	0.00616	PASS
	HV	9.41	2.99	5.70	0.00501	0.00159	0.00303	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	15MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	4.92	8.33	14.65	0.00262	0.00443	0.00779	PASS
Extreme (50℃)		12.92	3.59	7.02	0.00687	0.00191	0.00373	PASS
Extreme (40℃)		13.57	13.50	11.71	0.00722	0.00718	0.00623	PASS
Extreme (30℃)		17.60	3.23	7.15	0.00936	0.00172	0.00380	PASS
Extreme (20℃)		14.44	1.50	10.68	0.00768	0.00080	0.00568	PASS
Extreme (10℃)		12.80	13.54	4.79	0.00681	0.00720	0.00255	PASS
Extreme (0℃)		15.27	17.54	8.64	0.00812	0.00933	0.00460	PASS
Extrem (-10℃)		14.60	11.11	17.86	0.00777	0.00591	0.00950	PASS
Extrem (-20℃)		5.31	10.74	16.04	0.00282	0.00571	0.00853	PASS
Extrem (-30℃)		8.71	3.73	4.09	0.00463	0.00198	0.00218	PASS
25℃	LV	4.94	5.66	8.83	0.00263	0.00301	0.00470	PASS
	HV	4.47	2.25	14.86	0.00238	0.00120	0.00790	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	12.45	14.00	11.13	0.00662	0.00745	0.00592	PASS
Extreme (50℃)		3.17	17.43	2.19	0.00169	0.00927	0.00117	PASS
Extreme (40℃)		11.36	3.83	6.53	0.00604	0.00204	0.00348	PASS
Extreme (30℃)		1.96	7.62	10.34	0.00104	0.00406	0.00550	PASS
Extreme (20℃)		10.87	16.72	17.76	0.00578	0.00890	0.00945	PASS
Extreme (10℃)		10.39	9.47	6.21	0.00553	0.00504	0.00330	PASS
Extreme (0℃)		10.87	12.48	17.10	0.00578	0.00664	0.00910	PASS
Extrem (-10℃)		16.09	10.53	11.60	0.00856	0.00560	0.00617	PASS
Extrem (-20℃)		17.87	11.46	12.41	0.00951	0.00610	0.00660	PASS
Extrem (-30℃)		14.41	14.87	5.43	0.00766	0.00791	0.00289	PASS
25℃	LV	1.80	7.00	15.26	0.00096	0.00372	0.00812	PASS
	HV	7.24	10.82	10.52	0.00385	0.00576	0.00560	PASS

LTE Band 7								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	7.58	6.49	10.33	0.00403	0.00345	0.00550	PASS



Extreme (50℃)		14.11	8.62	16.30	0.00751	0.00458	0.00867	PASS
Extreme (40℃)		11.10	3.58	2.06	0.00590	0.00190	0.00110	PASS
Extreme (30℃)		3.85	4.41	8.91	0.00205	0.00234	0.00474	PASS
Extreme (20℃)		17.69	8.43	1.93	0.00941	0.00448	0.00102	PASS
Extreme (10℃)		5.97	10.22	11.95	0.00317	0.00544	0.00636	PASS
Extreme (0℃)		13.79	14.59	11.45	0.00734	0.00776	0.00609	PASS
Extreme (-10℃)		16.36	6.22	1.22	0.00870	0.00331	0.00065	PASS
Extreme (-20℃)		17.99	12.31	11.13	0.00957	0.00655	0.00592	PASS
Extreme (-30℃)		15.93	13.82	7.54	0.00847	0.00735	0.00401	PASS
25℃	LV	12.50	14.20	15.10	0.00665	0.00755	0.00803	PASS
	HV	15.72	8.44	2.31	0.00836	0.00449	0.00123	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	16.89	11.56	11.30	0.00899	0.00615	0.00601	PASS
Extreme (50℃)		10.08	16.71	12.79	0.00536	0.00889	0.00680	PASS
Extreme (40℃)		14.27	16.40	3.80	0.00759	0.00872	0.00202	PASS
Extreme (30℃)		8.49	4.96	7.98	0.00452	0.00264	0.00424	PASS
Extreme (20℃)		1.41	13.88	15.94	0.00075	0.00738	0.00848	PASS
Extreme (10℃)		9.27	13.93	11.18	0.00493	0.00741	0.00595	PASS
Extreme (0℃)		16.01	5.50	13.96	0.00852	0.00293	0.00743	PASS
Extreme (-10℃)		7.27	5.81	17.45	0.00386	0.00309	0.00928	PASS
Extreme (-20℃)		3.03	1.30	1.08	0.00161	0.00069	0.00058	PASS
Extreme (-30℃)		7.77	7.46	17.42	0.00414	0.00397	0.00927	PASS
25℃	LV	1.94	11.08	10.45	0.00103	0.00589	0.00556	PASS
	HV	9.10	7.05	16.34	0.00484	0.00375	0.00869	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	15MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	14.41	5.46	17.87	0.00767	0.00291	0.00951	PASS
Extreme (50℃)		10.68	8.18	13.99	0.00568	0.00435	0.00744	PASS
Extreme (40℃)		6.23	3.55	2.80	0.00331	0.00189	0.00149	PASS
Extreme (30℃)		6.80	8.52	11.05	0.00362	0.00453	0.00588	PASS
Extreme (20℃)		4.46	10.86	2.35	0.00237	0.00578	0.00125	PASS
Extreme (10℃)		7.12	1.73	13.73	0.00379	0.00092	0.00730	PASS
Extreme (0℃)		11.89	5.04	13.08	0.00633	0.00268	0.00696	PASS
Extreme (-10℃)		1.18	13.23	5.37	0.00063	0.00703	0.00285	PASS
Extreme (-20℃)		14.39	5.12	13.14	0.00766	0.00272	0.00699	PASS
Extreme (-30℃)		1.90	4.84	12.19	0.00101	0.00257	0.00648	PASS
25℃	LV	17.55	5.16	17.17	0.00934	0.00275	0.00913	PASS



	HV	1.08	9.72	14.90	0.00058	0.00517	0.00792	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	8.84	11.81	2.27	0.00470	0.00628	0.00121	PASS
Extreme (50℃)		2.26	12.94	6.78	0.00120	0.00688	0.00361	PASS
Extreme (40℃)		4.83	4.12	1.08	0.00257	0.00219	0.00058	PASS
Extreme (30℃)		16.16	16.42	16.99	0.00859	0.00874	0.00904	PASS
Extreme (20℃)		4.03	14.55	8.12	0.00215	0.00774	0.00432	PASS
Extreme (10℃)		11.57	7.93	9.38	0.00616	0.00422	0.00499	PASS
Extreme (0℃)		15.07	17.52	14.66	0.00802	0.00932	0.00780	PASS
Extreme (-10℃)		14.75	16.51	3.00	0.00785	0.00878	0.00160	PASS
Extreme (-20℃)		12.21	1.87	13.60	0.00649	0.00100	0.00723	PASS
Extreme (-30℃)		3.75	3.53	8.88	0.00200	0.00188	0.00472	PASS
25℃	LV	13.63	4.62	7.47	0.00725	0.00246	0.00398	PASS
	HV	13.56	2.90	3.08	0.00721	0.00154	0.00164	PASS

LTE Band 38								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	16.26	7.94	2.81	0.00865	0.00423	0.00149	PASS
Extreme (50℃)		15.12	3.95	10.78	0.00804	0.00210	0.00574	PASS
Extreme (40℃)		13.63	9.63	1.27	0.00725	0.00512	0.00068	PASS
Extreme (30℃)		3.04	4.29	4.10	0.00162	0.00228	0.00218	PASS
Extreme (20℃)		17.94	12.43	8.84	0.00955	0.00661	0.00470	PASS
Extreme (10℃)		16.39	17.54	13.86	0.00872	0.00933	0.00737	PASS
Extreme (0℃)		12.18	17.04	13.95	0.00648	0.00907	0.00742	PASS
Extreme (-10℃)		11.36	14.38	14.66	0.00604	0.00765	0.00780	PASS
Extreme (-20℃)		3.59	15.82	6.69	0.00191	0.00841	0.00356	PASS
Extreme (-30℃)		9.33	16.57	17.76	0.00496	0.00881	0.00945	PASS
25℃	LV	7.54	17.42	12.58	0.00401	0.00926	0.00669	PASS
	HV	7.34	2.36	12.62	0.00391	0.00126	0.00671	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	16.96	10.77	7.99	0.00902	0.00573	0.00425	PASS
Extreme (50℃)		9.17	15.78	11.92	0.00488	0.00839	0.00634	PASS



Extreme (40℃)		5.86	13.10	17.50	0.00312	0.00697	0.00931	PASS
Extreme (30℃)		5.88	6.25	8.19	0.00313	0.00332	0.00436	PASS
Extreme (20℃)		14.32	9.18	14.11	0.00762	0.00488	0.00750	PASS
Extreme (10℃)		15.40	3.81	1.34	0.00819	0.00203	0.00071	PASS
Extreme (0℃)		9.38	1.15	12.12	0.00499	0.00061	0.00645	PASS
Extreme (-10℃)		4.80	17.80	3.43	0.00255	0.00947	0.00182	PASS
Extreme (-20℃)		9.43	6.22	4.13	0.00502	0.00331	0.00220	PASS
Extreme (-30℃)		4.23	3.39	15.13	0.00225	0.00180	0.00805	PASS
25℃	LV	9.59	6.60	15.62	0.00510	0.00351	0.00831	PASS
	HV	8.12	14.00	1.42	0.00432	0.00745	0.00075	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	15MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	1.18	14.19	17.46	0.00063	0.00755	0.00929	PASS
Extreme (50℃)		14.36	4.20	2.23	0.00764	0.00224	0.00118	PASS
Extreme (40℃)		13.03	3.05	9.82	0.00693	0.00162	0.00523	PASS
Extreme (30℃)		13.48	6.65	6.11	0.00717	0.00354	0.00325	PASS
Extreme (20℃)		10.50	4.29	12.05	0.00559	0.00228	0.00641	PASS
Extreme (10℃)		13.93	7.43	3.90	0.00741	0.00395	0.00207	PASS
Extreme (0℃)		1.24	11.95	9.21	0.00066	0.00636	0.00490	PASS
Extreme (-10℃)		1.36	6.62	8.61	0.00072	0.00352	0.00458	PASS
Extreme (-20℃)		10.86	12.63	16.80	0.00578	0.00672	0.00893	PASS
Extreme (-30℃)		13.45	2.31	4.50	0.00716	0.00123	0.00239	PASS
25℃	LV	10.44	7.29	4.73	0.00555	0.00388	0.00252	PASS
	HV	4.34	12.59	7.83	0.00231	0.00670	0.00416	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	2.33	4.50	9.18	0.00124	0.00239	0.00489	PASS
Extreme (50℃)		2.28	5.42	13.01	0.00121	0.00288	0.00692	PASS
Extreme (40℃)		11.95	15.81	3.87	0.00636	0.00841	0.00206	PASS
Extreme (30℃)		13.58	6.93	11.99	0.00722	0.00369	0.00638	PASS
Extreme (20℃)		16.31	2.97	8.04	0.00868	0.00158	0.00428	PASS
Extreme (10℃)		1.99	6.23	9.31	0.00106	0.00331	0.00495	PASS
Extreme (0℃)		7.28	2.17	6.30	0.00387	0.00115	0.00335	PASS
Extreme (-10℃)		3.22	1.83	5.44	0.00171	0.00097	0.00290	PASS
Extreme (-20℃)		10.45	2.11	7.95	0.00556	0.00112	0.00423	PASS
Extreme (-30℃)		1.67	8.96	1.35	0.00089	0.00477	0.00072	PASS
25℃	LV	16.36	15.42	11.62	0.00870	0.00820	0.00618	PASS
	HV	8.35	10.56	3.79	0.00444	0.00562	0.00202	PASS



LTE Band 41								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	4.76	13.01	17.71	0.00253	0.00692	0.00942	PASS
Extreme (50℃)		10.57	12.32	13.77	0.00562	0.00655	0.00732	PASS
Extreme (40℃)		14.00	11.85	15.90	0.00745	0.00630	0.00846	PASS
Extreme (30℃)		1.16	15.39	4.51	0.00062	0.00819	0.00240	PASS
Extreme (20℃)		4.15	4.38	7.08	0.00221	0.00233	0.00376	PASS
Extreme (10℃)		8.47	13.88	1.63	0.00451	0.00738	0.00087	PASS
Extreme (0℃)		3.16	10.89	9.90	0.00168	0.00579	0.00526	PASS
Extreme (-10℃)		5.20	9.61	7.91	0.00276	0.00511	0.00420	PASS
Extreme (-20℃)		10.80	16.59	5.33	0.00575	0.00883	0.00284	PASS
Extreme (-30℃)		8.41	11.57	17.01	0.00447	0.00615	0.00905	PASS
25℃	LV	5.13	10.22	12.14	0.00273	0.00543	0.00646	PASS
	HV	12.69	15.69	8.78	0.00675	0.00835	0.00467	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	7.51	1.57	14.51	0.00399	0.00084	0.00772	PASS
Extreme (50℃)		16.99	3.00	11.56	0.00904	0.00159	0.00615	PASS
Extreme (40℃)		7.76	14.69	8.12	0.00413	0.00781	0.00432	PASS
Extreme (30℃)		12.37	10.06	5.59	0.00658	0.00535	0.00298	PASS
Extreme (20℃)		13.89	12.19	14.21	0.00739	0.00649	0.00756	PASS
Extreme (10℃)		15.09	8.07	16.63	0.00802	0.00429	0.00885	PASS
Extreme (0℃)		15.09	5.19	4.01	0.00803	0.00276	0.00213	PASS
Extreme (-10℃)		9.26	6.46	7.89	0.00492	0.00344	0.00420	PASS
Extreme (-20℃)		6.00	15.61	7.56	0.00319	0.00830	0.00402	PASS
Extreme (-30℃)		11.15	2.69	16.68	0.00593	0.00143	0.00887	PASS
25℃	LV	1.47	16.21	13.73	0.00078	0.00862	0.00731	PASS
	HV	11.29	5.73	13.98	0.00600	0.00305	0.00744	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	15MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	15.67	7.71	13.39	0.00834	0.00410	0.00712	PASS
Extreme (50℃)		16.57	1.28	13.14	0.00881	0.00068	0.00699	PASS
Extreme (40℃)		3.59	6.09	16.42	0.00191	0.00324	0.00873	PASS



Extreme (30℃)		5.95	14.48	7.81	0.00317	0.00770	0.00415	PASS
Extreme (20℃)		11.84	17.30	1.34	0.00630	0.00920	0.00071	PASS
Extreme (10℃)		4.37	1.90	12.70	0.00233	0.00101	0.00676	PASS
Extreme (0℃)		16.43	11.44	8.02	0.00874	0.00609	0.00427	PASS
Extreme (-10℃)		12.65	15.49	11.00	0.00673	0.00824	0.00585	PASS
Extreme (-20℃)		2.51	6.07	10.79	0.00133	0.00323	0.00574	PASS
Extreme (-30℃)		13.16	12.67	7.47	0.00700	0.00674	0.00397	PASS
25℃	LV	13.22	12.28	13.10	0.00703	0.00653	0.00697	PASS
	HV	7.42	10.80	15.11	0.00395	0.00574	0.00803	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz							
Temperature	Voltage							
Normal (25℃)	Normal	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)		15.87	13.83	14.57	0.00844	0.00736	0.00775	PASS
Extreme (50℃)		15.22	11.65	5.28	0.00810	0.00620	0.00281	PASS
Extreme (40℃)		4.69	4.83	17.60	0.00249	0.00257	0.00936	PASS
Extreme (30℃)		5.62	6.38	12.59	0.00299	0.00339	0.00670	PASS
Extreme (20℃)		13.49	10.24	12.31	0.00718	0.00545	0.00655	PASS
Extreme (10℃)		8.04	4.34	11.17	0.00428	0.00231	0.00594	PASS
Extreme (0℃)		14.64	2.49	15.99	0.00779	0.00132	0.00851	PASS
Extreme (-10℃)		9.33	3.66	4.09	0.00496	0.00195	0.00218	PASS
Extreme (-20℃)		4.58	2.70	14.42	0.00244	0.00144	0.00767	PASS
Extreme (-30℃)		17.99	2.21	15.99	0.00957	0.00118	0.00851	PASS
25℃	LV	8.50	1.81	1.89	0.00452	0.00096	0.00100	PASS
	HV	14.53	10.65	8.19	0.00773	0.00567	0.00435	PASS

CA_7C						
CA_7C_QPSK		20MHz+10MHz (Bandwidth)		20MHz+20MHz (Bandwidth)		Verdict
Condition		Delta (Hz)	Frequency Stability (ppm)	Delta (Hz)	Frequency Stability (ppm)	
Temperature	Voltage					
Normal (25℃)	Normal	14.08	0.00749	12.62	0.00671	PASS
Extreme (50℃)		1.35	0.00072	14.70	0.00782	PASS
Extreme (40℃)		11.77	0.00626	6.37	0.00339	PASS
Extreme (30℃)		4.12	0.00219	4.89	0.00260	PASS
Extreme (20℃)		2.18	0.00116	9.98	0.00531	PASS
Extreme (10℃)		17.69	0.00941	16.52	0.00879	PASS
Extreme (0℃)		12.69	0.00675	13.97	0.00743	PASS
Extreme (-10℃)		8.83	0.00470	10.97	0.00584	PASS
Extreme (-20℃)		9.10	0.00484	1.34	0.00071	PASS
Extreme (-30℃)		7.21	0.00383	1.51	0.00080	PASS



RF Test Report			Report No.: RZ200A0500-R3			
25℃	LV	5.70	0.00303	13.49	0.00718	PASS
	HV	13.25	0.00705	17.36	0.00923	PASS
CA_7C_16QAM		20MHz+10MHz (Bandwidth)		20MHz+20MHz (Bandwidth)		Verdict
Condition		Delta (Hz)	Frequency Stability (ppm)	Delta (Hz)	Frequency Stability (ppm)	
Temperature	Voltage					
Normal (25℃)	Normal	4.75	0.00253	4.11	0.00219	PASS
Extreme (50℃)		7.39	0.00393	8.68	0.00462	PASS
Extreme (40℃)		12.92	0.00687	13.45	0.00716	PASS
Extreme (30℃)		11.09	0.00590	17.44	0.00928	PASS
Extreme (20℃)		2.67	0.00142	7.07	0.00376	PASS
Extreme (10℃)		10.92	0.00581	8.64	0.00459	PASS
Extreme (0℃)		5.56	0.00296	4.20	0.00223	PASS
Extreme (-10℃)		10.94	0.00582	9.49	0.00505	PASS
Extreme (-20℃)		16.14	0.00859	4.60	0.00245	PASS
Extreme (-30℃)		3.58	0.00190	15.91	0.00847	PASS
25℃	LV	13.24	0.00704	10.20	0.00543	PASS
	HV	13.09	0.00696	15.78	0.00840	PASS
CA_7C_64QAM		20MHz+10MHz (Bandwidth)		20MHz+20MHz (Bandwidth)		Verdict
Condition		Delta (Hz)	Frequency Stability (ppm)	Delta (Hz)	Frequency Stability (ppm)	
Temperature	Voltage					
Normal (25℃)	Normal	11.16	0.00594	14.77	0.00785	PASS
Extreme (50℃)		5.49	0.00292	15.63	0.00832	PASS
Extreme (40℃)		7.67	0.00408	4.94	0.00263	PASS
Extreme (30℃)		7.50	0.00399	11.58	0.00616	PASS
Extreme (20℃)		15.74	0.00837	14.46	0.00769	PASS
Extreme (10℃)		14.18	0.00754	2.59	0.00138	PASS
Extreme (0℃)		8.32	0.00443	5.04	0.00268	PASS
Extreme (-10℃)		11.81	0.00628	12.22	0.00650	PASS
Extreme (-20℃)		9.05	0.00482	15.95	0.00848	PASS
Extreme (-30℃)		12.55	0.00667	9.26	0.00493	PASS
25℃	LV	16.87	0.00897	5.03	0.00267	PASS
	HV	15.71	0.00835	14.09	0.00749	PASS



CA_38C						
CA_38C_QPSK		15MHz+15MHz (Bandwidth)		20MHz+20MHz (Bandwidth)		Verdict
Condition		Delta (Hz)	Frequency Stability (ppm)	Delta (Hz)	Frequency Stability (ppm)	
Temperature	Voltage					
Normal (25℃)	Normal	11.87	0.00631	14.32	0.00762	PASS
Extreme (50℃)		5.58	0.00297	7.33	0.00390	PASS
Extreme (40℃)		14.38	0.00765	1.52	0.00081	PASS
Extreme (30℃)		14.54	0.00773	11.25	0.00598	PASS
Extreme (20℃)		15.82	0.00842	12.69	0.00675	PASS
Extreme (10℃)		7.98	0.00425	11.11	0.00591	PASS
Extreme (0℃)		16.07	0.00855	3.84	0.00204	PASS
Extreme (-10℃)		17.49	0.00931	4.54	0.00242	PASS
Extreme (-20℃)		10.53	0.00560	16.01	0.00852	PASS
Extreme (-30℃)		7.06	0.00376	15.35	0.00816	PASS
25℃	LV	7.22	0.00384	17.09	0.00909	PASS
	HV	1.56	0.00083	2.70	0.00144	PASS
CA_38C_16QAM		15MHz+15MHz (Bandwidth)		20MHz+20MHz (Bandwidth)		Verdict
Condition		Delta (Hz)	Frequency Stability (ppm)	Delta (Hz)	Frequency Stability (ppm)	
Temperature	Voltage					
Normal (25℃)	Normal	5.75	0.00306	9.38	0.00499	PASS
Extreme (50℃)		17.66	0.00939	9.34	0.00497	PASS
Extreme (40℃)		4.76	0.00253	2.78	0.00148	PASS
Extreme (30℃)		5.26	0.00280	8.31	0.00442	PASS
Extreme (20℃)		15.74	0.00837	6.01	0.00320	PASS
Extreme (10℃)		5.62	0.00299	3.72	0.00198	PASS
Extreme (0℃)		2.50	0.00133	4.36	0.00232	PASS
Extreme (-10℃)		17.44	0.00928	8.25	0.00439	PASS
Extreme (-20℃)		2.79	0.00148	12.19	0.00648	PASS
Extreme (-30℃)		8.30	0.00442	17.70	0.00941	PASS
25℃	LV	14.16	0.00753	16.27	0.00866	PASS
	HV	8.59	0.00457	15.28	0.00813	PASS
CA_38C_64QAM		15MHz+15MHz (Bandwidth)		20MHz+20MHz (Bandwidth)		Verdict
Condition		Delta (Hz)	Frequency Stability (ppm)	Delta (Hz)	Frequency Stability (ppm)	
Temperature	Voltage					
Normal (25℃)	Normal	7.30	0.00388	11.25	0.00599	PASS
Extreme (50℃)		2.88	0.00153	9.61	0.00511	PASS



Extreme (40℃)		14.11	0.00751	7.89	0.00420	PASS
Extreme (30℃)		15.03	0.00799	1.15	0.00061	PASS
Extreme (20℃)		17.00	0.00904	13.04	0.00694	PASS
Extreme (10℃)		11.67	0.00621	13.48	0.00717	PASS
Extreme (0℃)		3.87	0.00206	3.14	0.00167	PASS
Extreme (-10℃)		14.09	0.00749	12.18	0.00648	PASS
Extreme (-20℃)		16.88	0.00898	3.17	0.00169	PASS
Extreme (-30℃)		7.35	0.00391	3.99	0.00212	PASS
25℃	LV	15.29	0.00813	15.79	0.00840	PASS
	HV	14.66	0.00780	11.93	0.00635	PASS