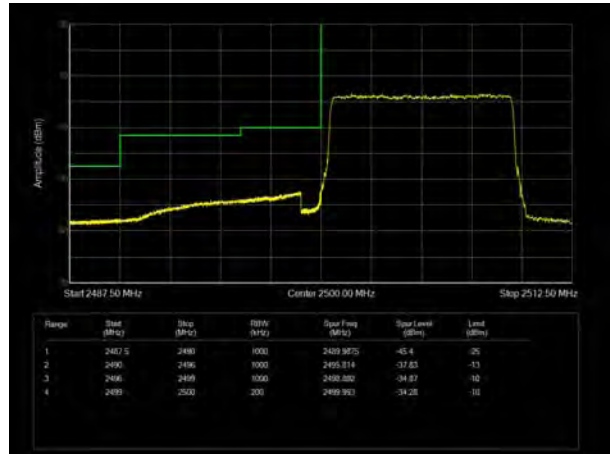
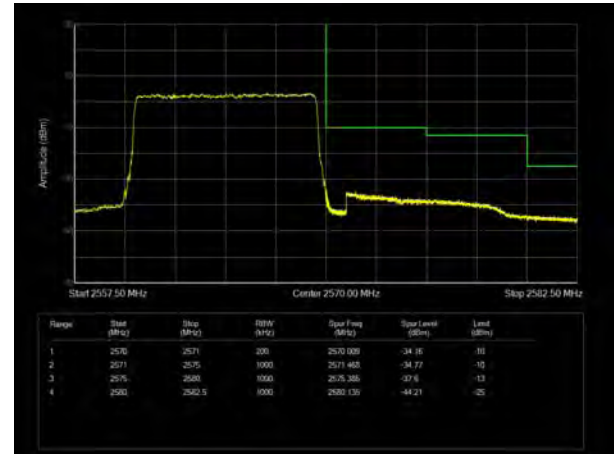




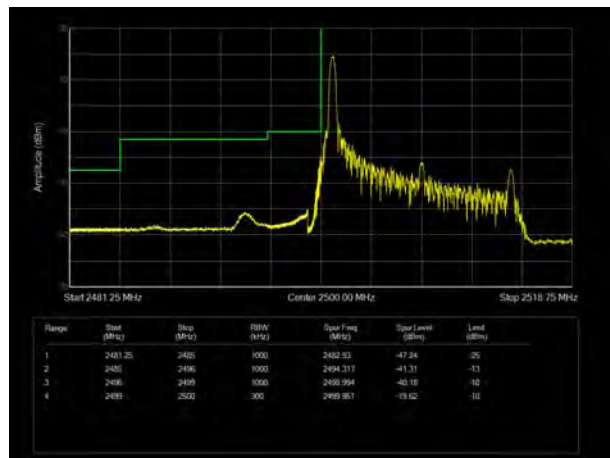
LTE Band 7 QPSK 10MHz CH-Low, 100%RB



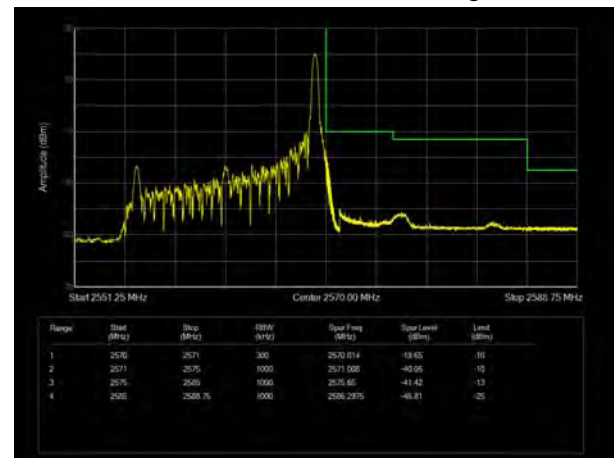
LTE Band 7 QPSK 10MHz CH-High, 100%RB



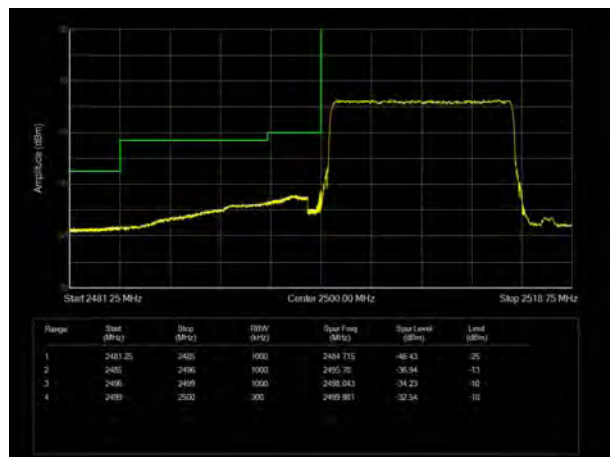
LTE Band 7 QPSK 15MHz CH-Low, 1 RB



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



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

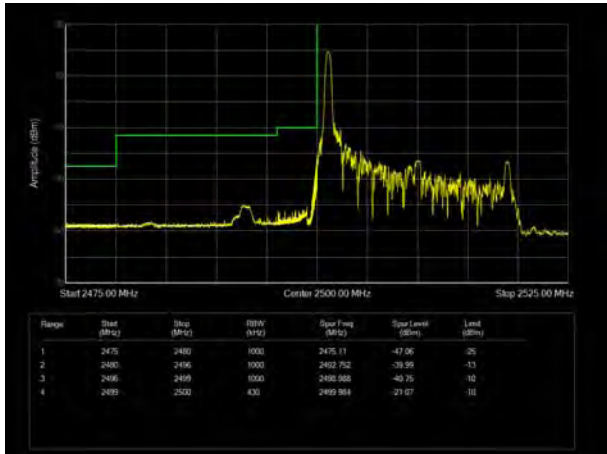


LTE Band 7 QPSK 15MHz CH-High, 100%RB

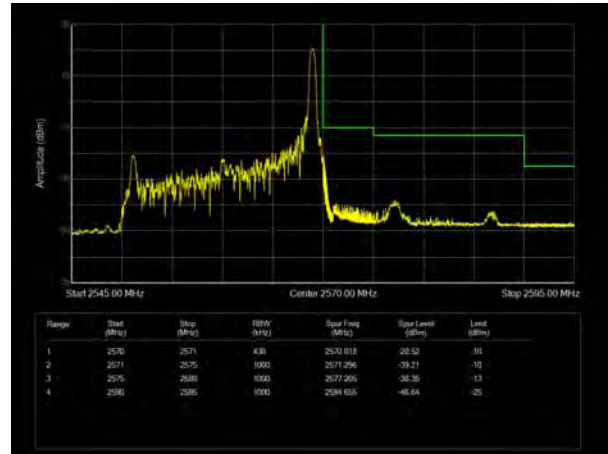




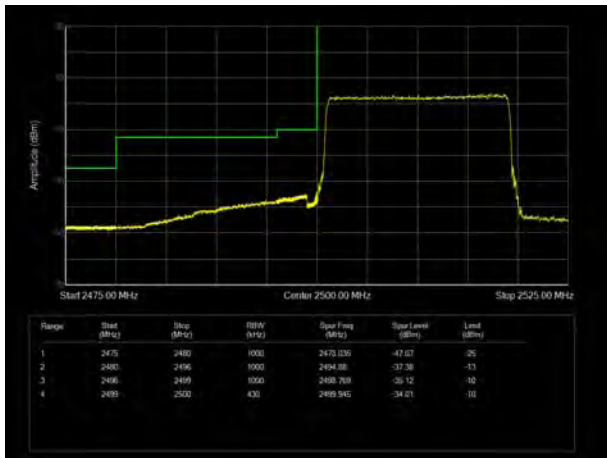
LTE Band 7 QPSK 20MHz CH-Low, 1 RB



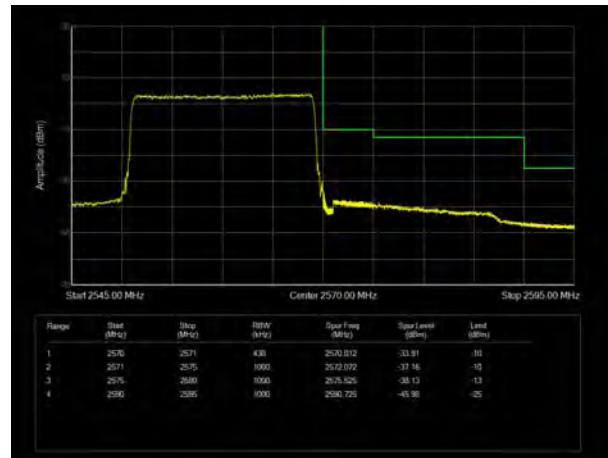
LTE Band 7 QPSK 20MHz CH-High, 1 RB



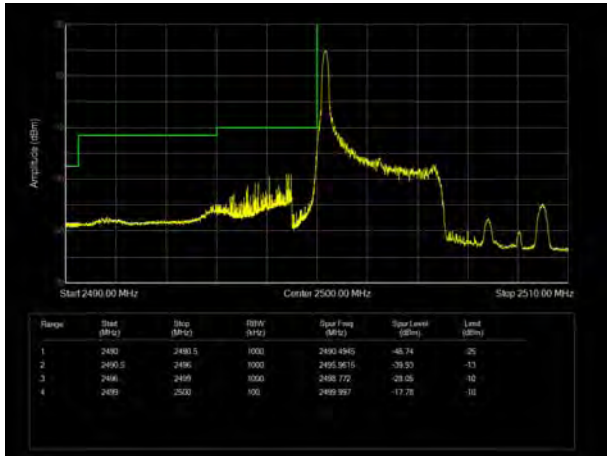
LTE Band 7 QPSK 20MHz CH-Low, 100%RB



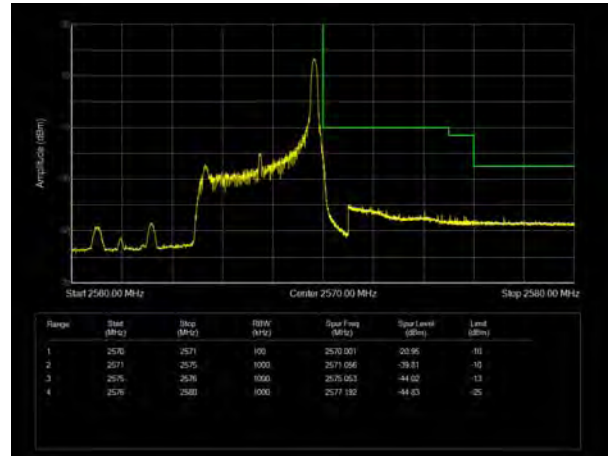
LTE Band 7 QPSK 20MHz CH-High, 100%RB



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

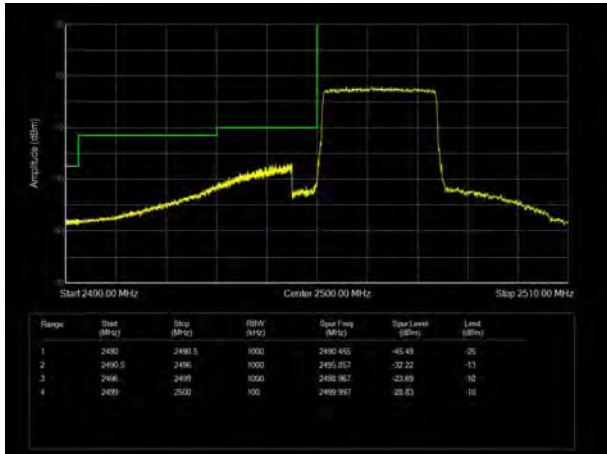


LTE Band 7 16QAM 5MHz CH-High, 1 RB

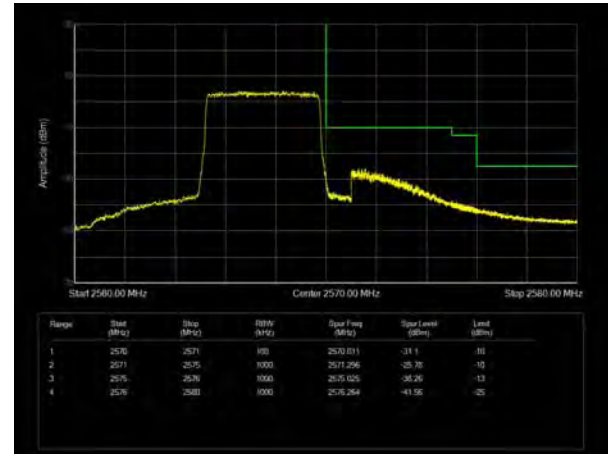




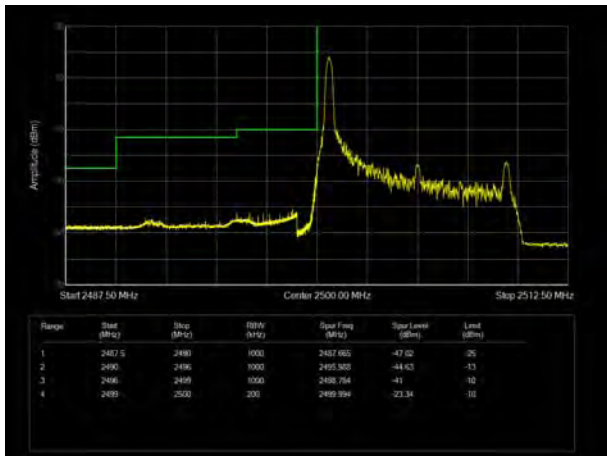
LTE Band 7 16QAM 5MHz CH-Low, 100%RB



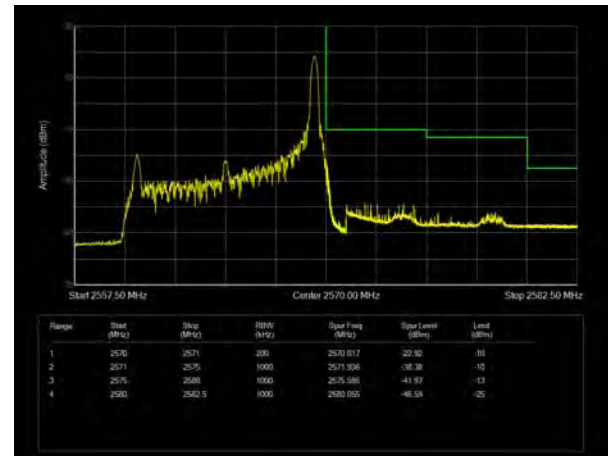
LTE Band 7 16QAM 5MHz CH-High, 100%RB



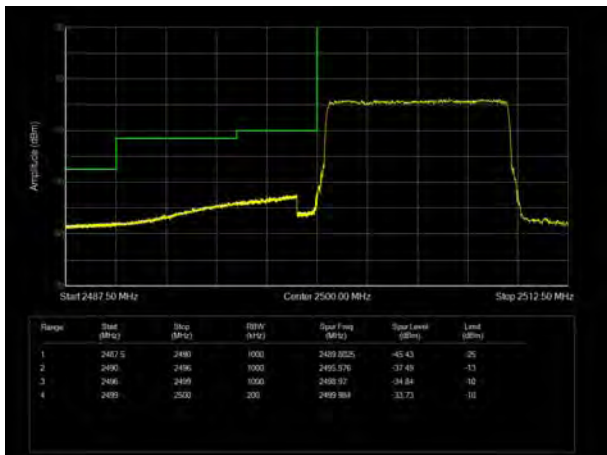
LTE Band 7 16QAM 10MHz CH-Low, 1 RB



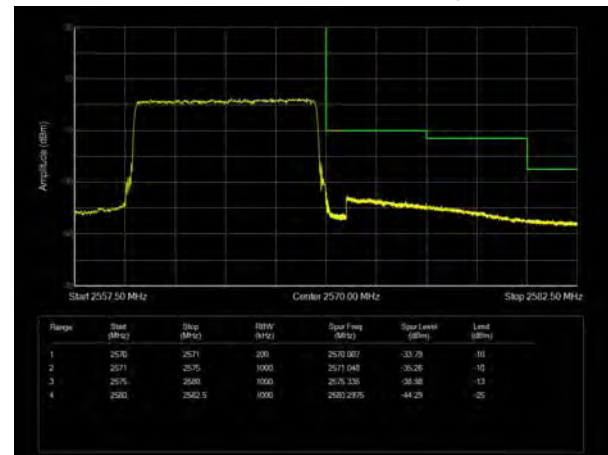
LTE Band 7 16QAM 10MHz CH-High, 1 RB



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

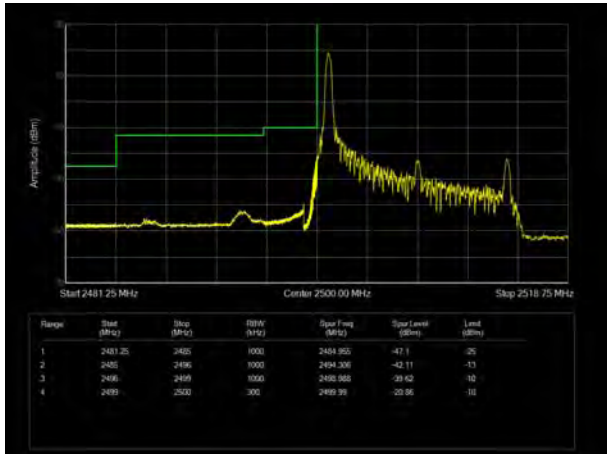


LTE Band 7 16QAM 10MHz CH-High, 100%RB

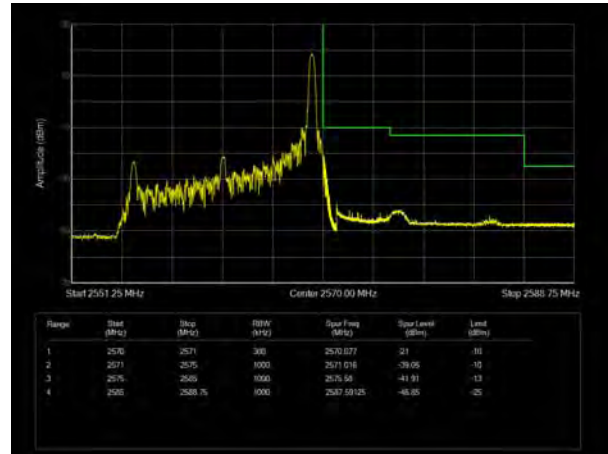




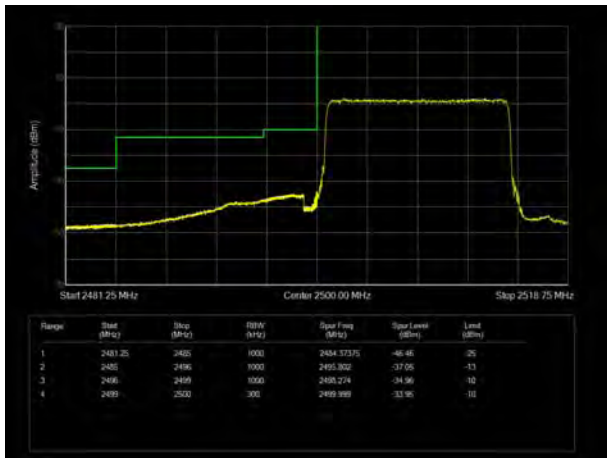
LTE Band 7 16QAM 15MHz CH-Low, 1 RB



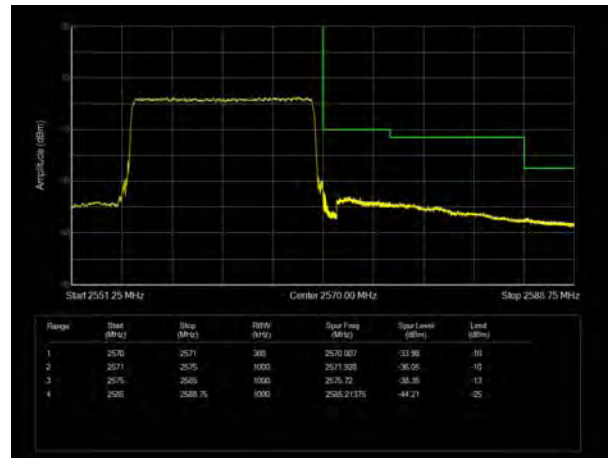
LTE Band 7 16QAM 15MHz CH-High, 1 RB



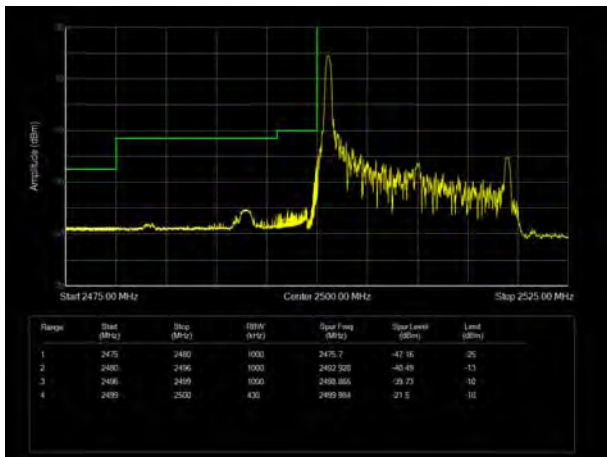
LTE Band 7 16QAM 15MHz CH-Low, 100%RB



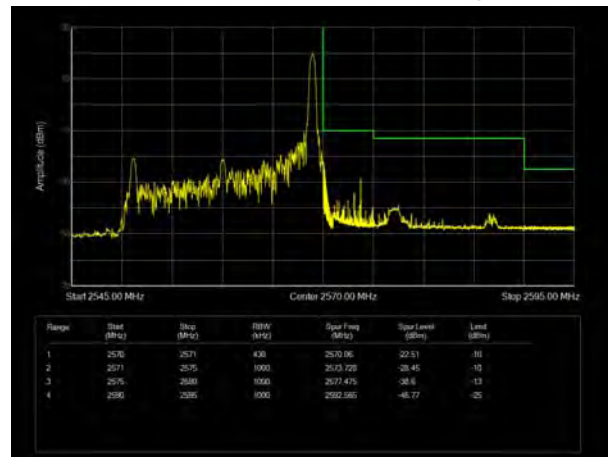
LTE Band 7 16QAM 15MHz CH-High, 100%RB



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

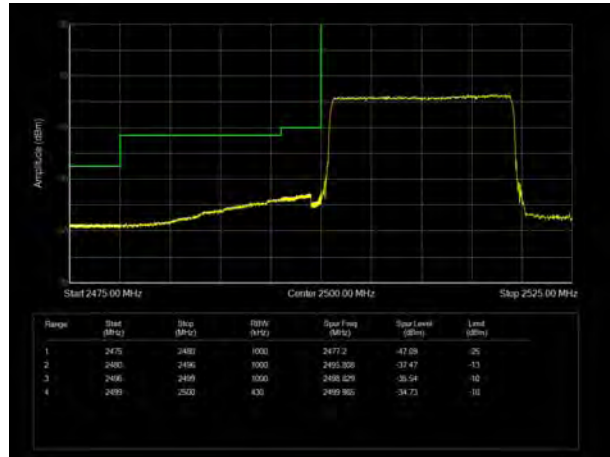


LTE Band 7 16QAM 20MHz CH-High, 1 RB

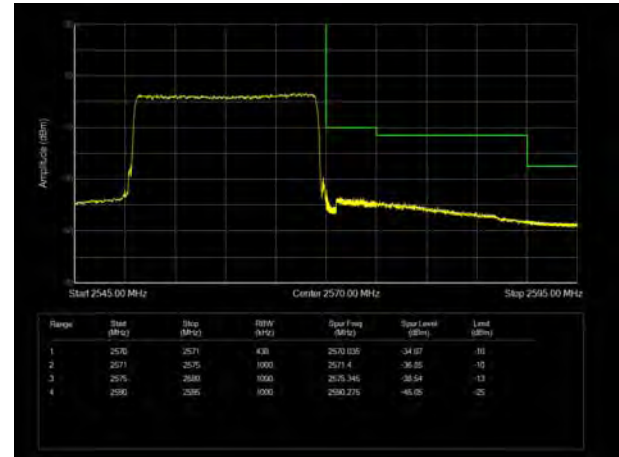




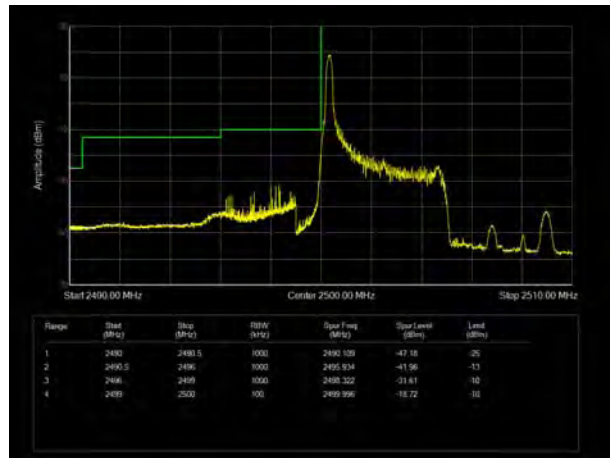
LTE Band 7 16QAM 20MHz CH-Low, 100%RB



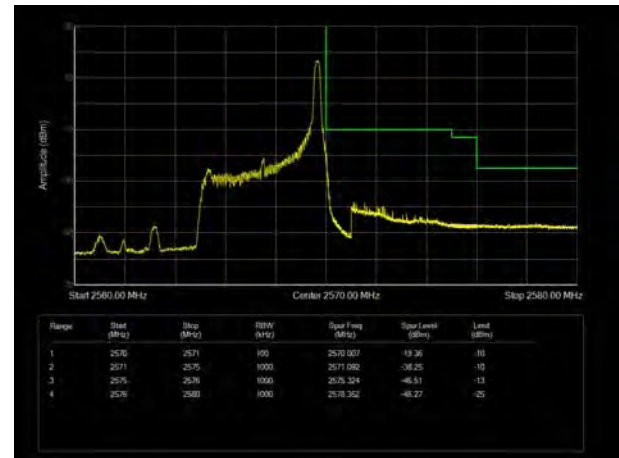
LTE Band 7 16QAM 20MHz CH-High, 100%RB



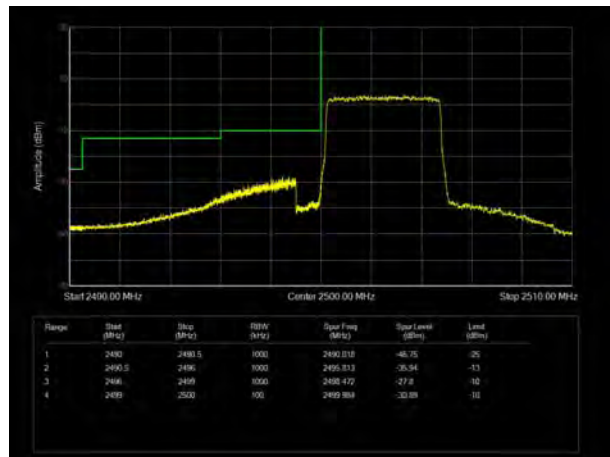
LTE Band 7 64QAM 5MHz CH-Low, 1 RB



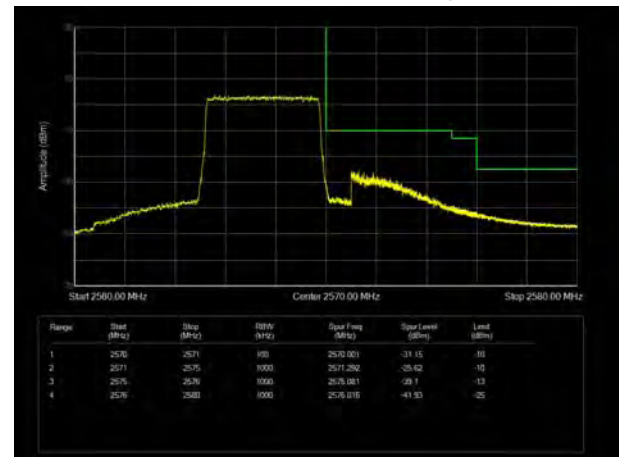
LTE Band 7 64QAM 5MHz CH-High, 1 RB



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

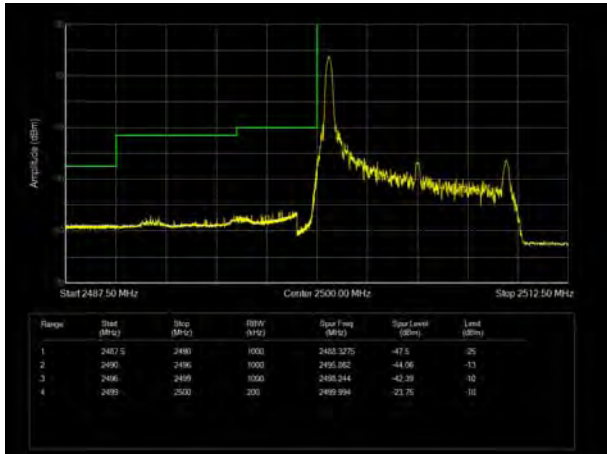


LTE Band 7 64QAM 5MHz CH-High, 100%RB

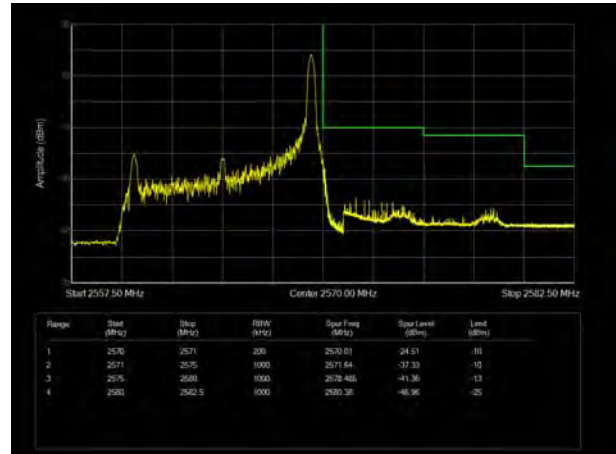




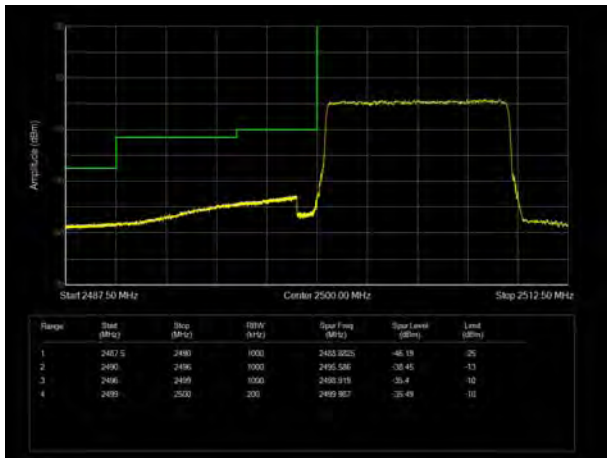
LTE Band 7 64QAM 10MHz CH-Low, 1 RB



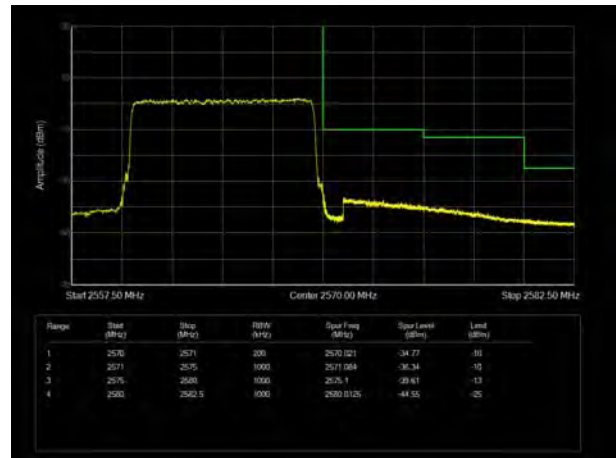
LTE Band 7 64QAM 10MHz CH-High, 1 RB



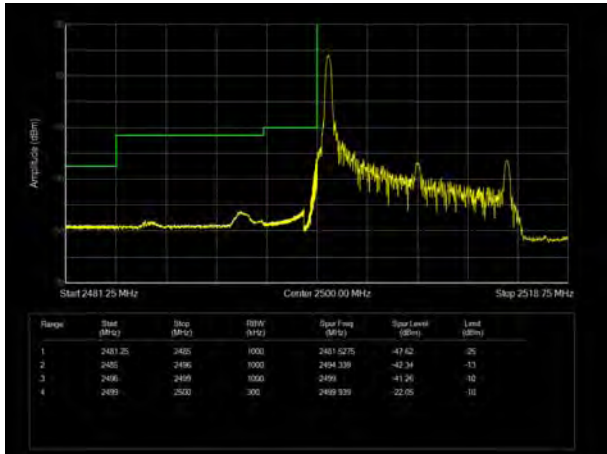
LTE Band 7 64QAM 10MHz CH-Low, 100%RB



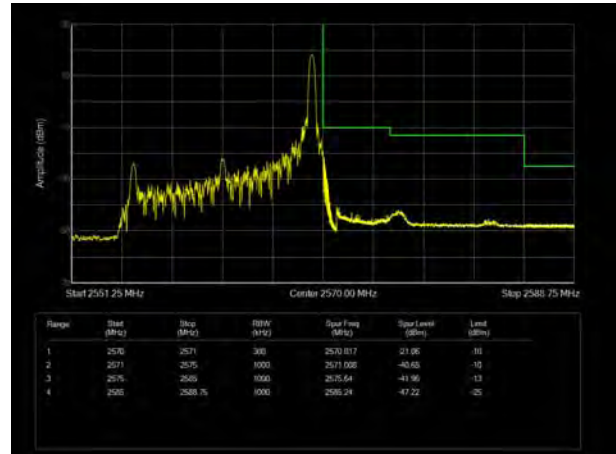
LTE Band 7 64QAM 10MHz CH-High, 100%RB



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

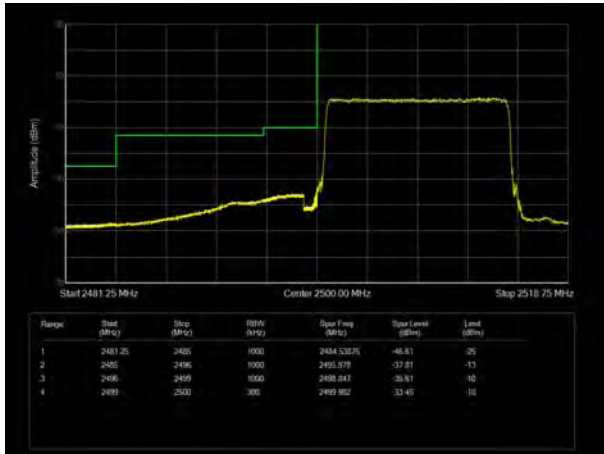


LTE Band 7 64QAM 15MHz CH-High, 1 RB

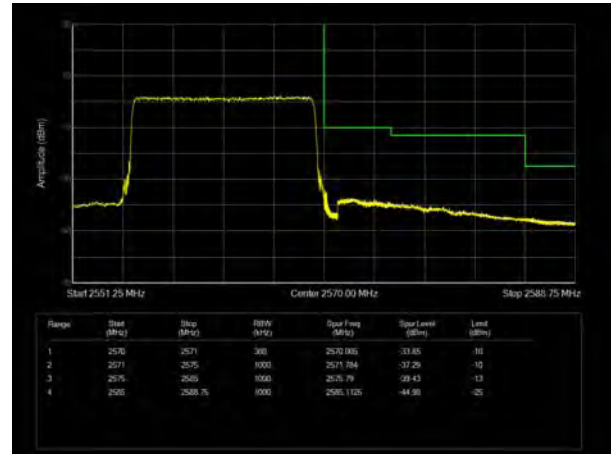




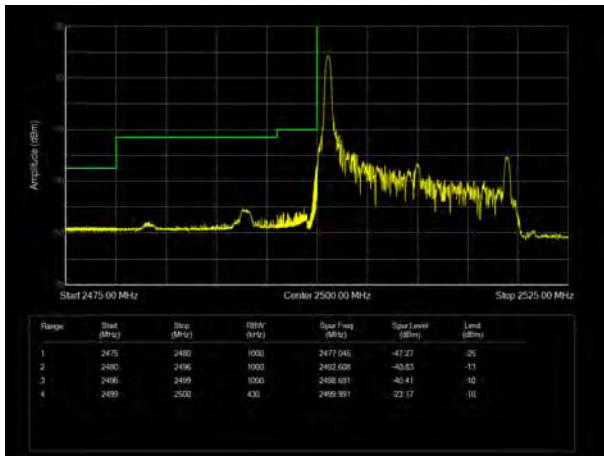
LTE Band 7 64QAM 15MHz CH-Low, 100%RB



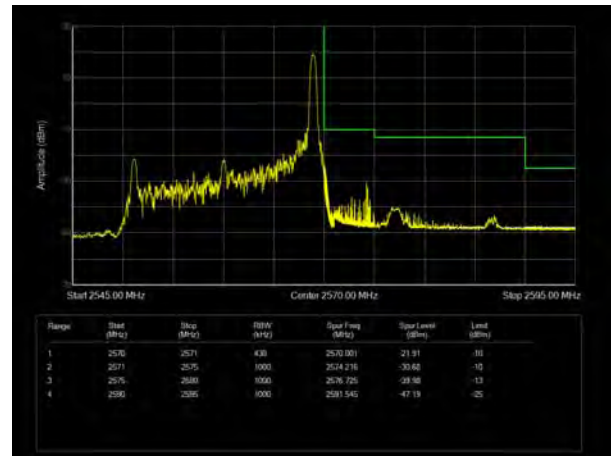
LTE Band 7 64QAM 15MHz CH-High, 100%RB



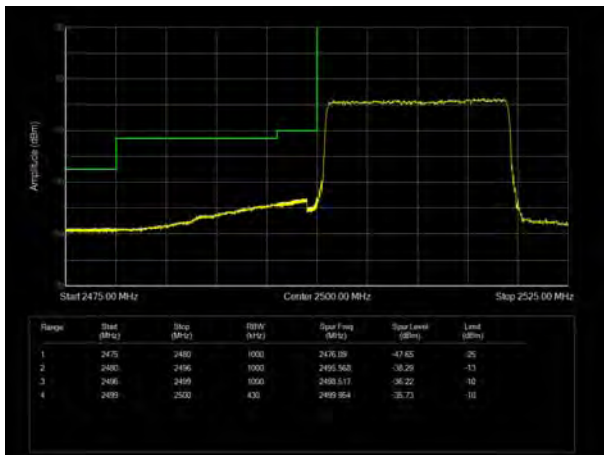
LTE Band 7 64QAM 20MHz CH-Low, 1 RB



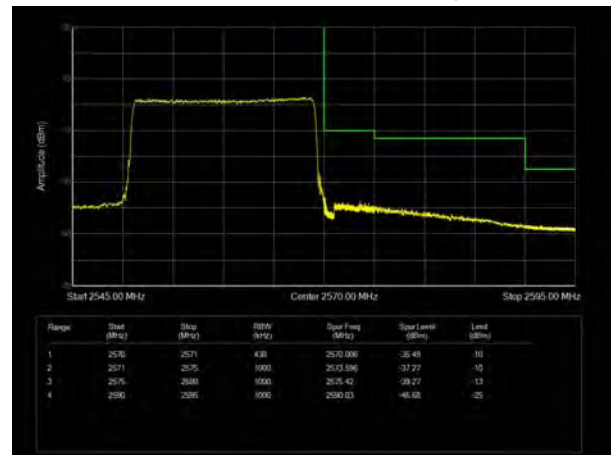
LTE Band 7 64QAM 20MHz CH-High, 1 RB



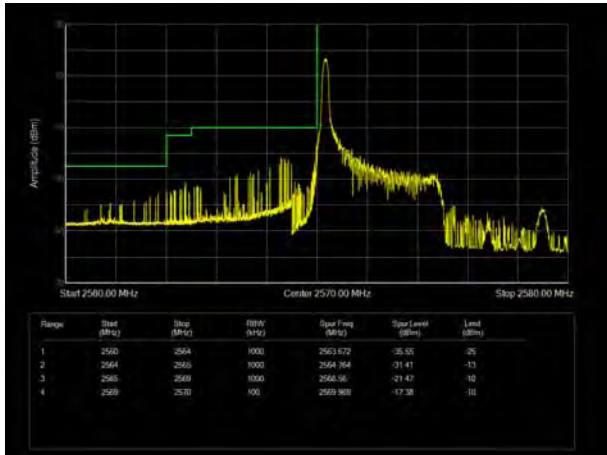
LTE Band 7 64QAM 20MHz CH-Low, 100%RB



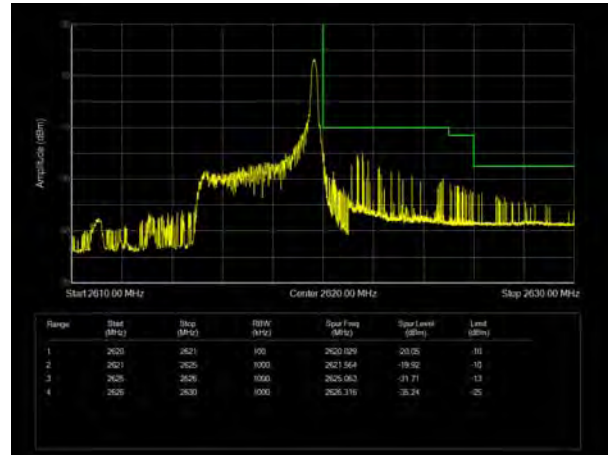
LTE Band 7 64QAM 20MHz CH-High, 100%RB



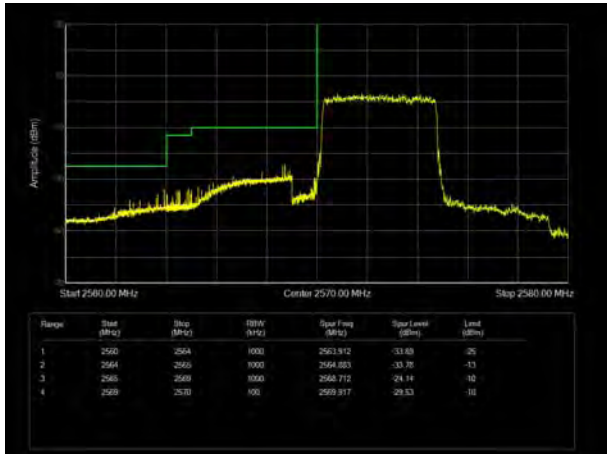
LTE Band 38 QPSK 5MHz CH-Low, 1 RB



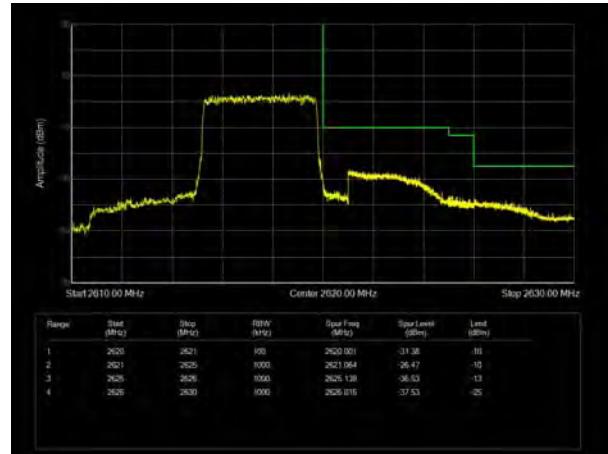
LTE Band 38 QPSK 5MHz CH-High, 1 RB



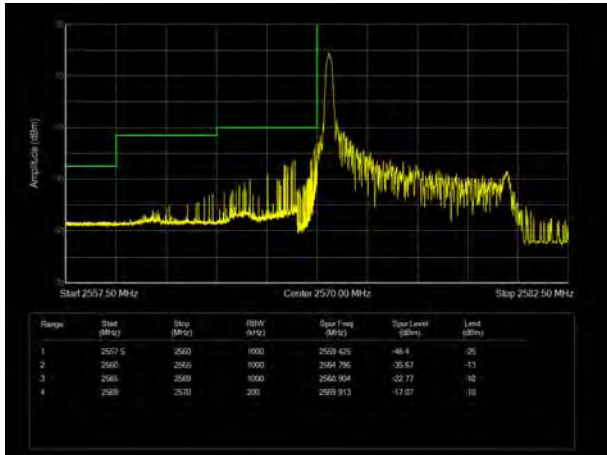
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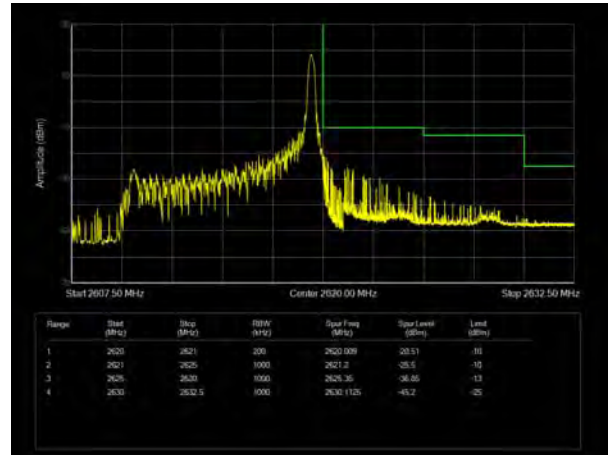
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LTE Band 38 QPSK 10MHz CH-Low, 1 RB

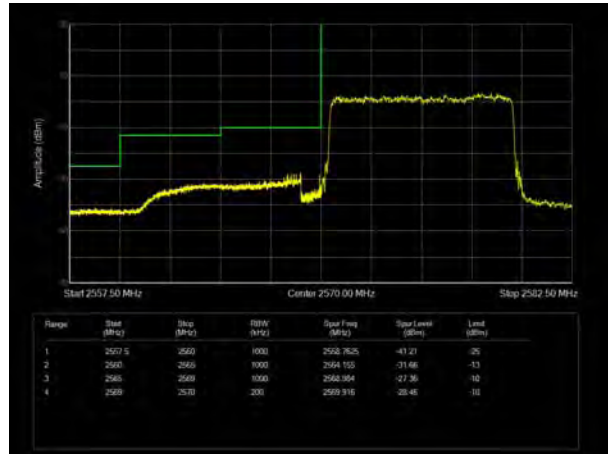


LTE Band 38 QPSK 10MHz CH-High, 1 RB

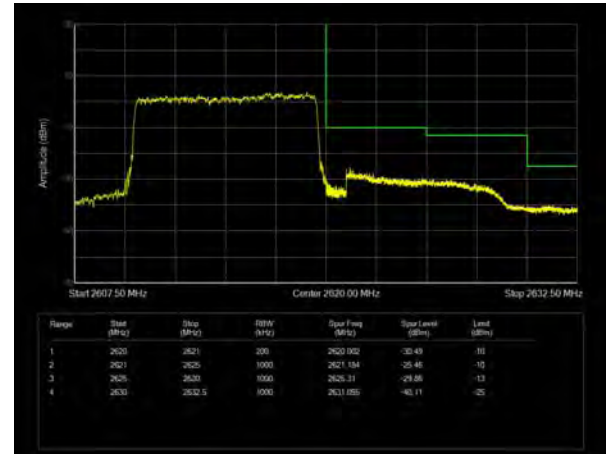




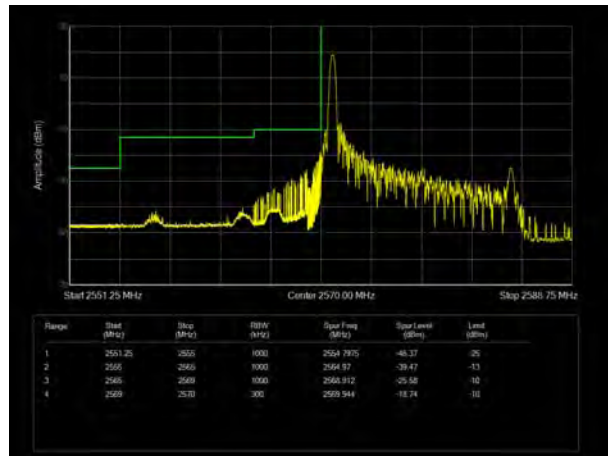
LTE Band 38 QPSK 10MHz CH-Low, 100%RB



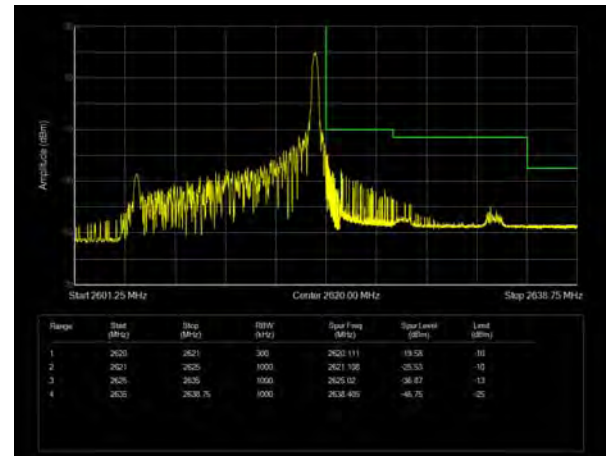
LTE Band 38 QPSK 10MHz CH-High, 100%RB



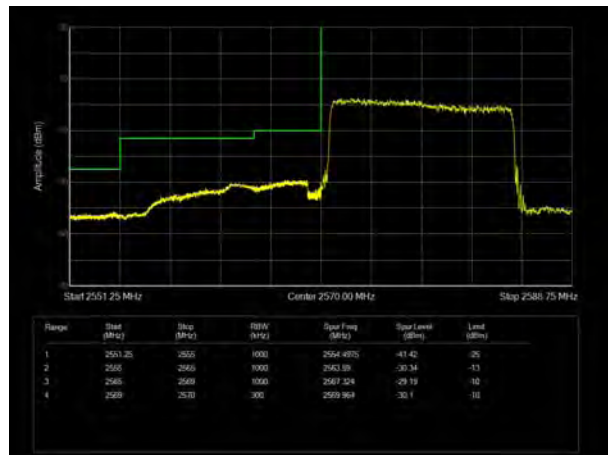
LTE Band 38 QPSK 15MHz CH-Low, 1 RB



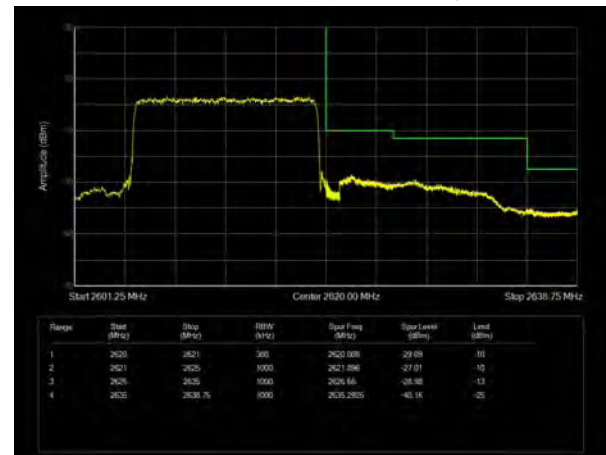
LTE Band 38 QPSK 15MHz CH-High, 1 RB



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

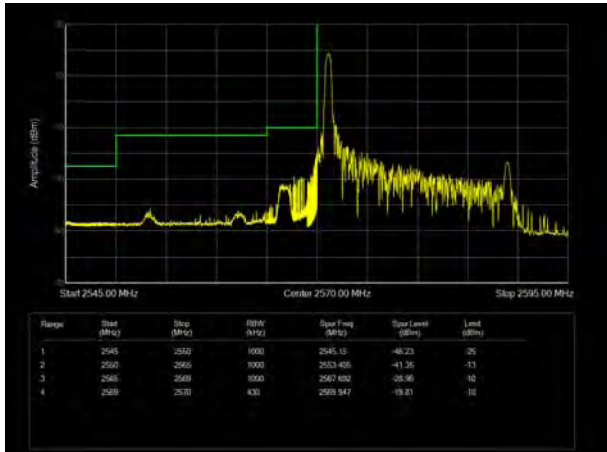


LTE Band 38 QPSK 15MHz CH-High, 100%RB

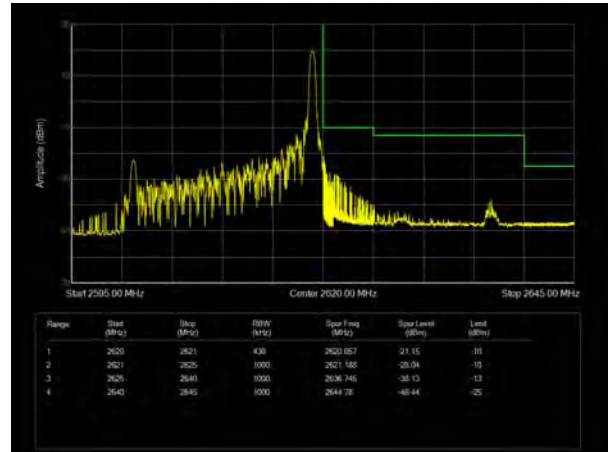




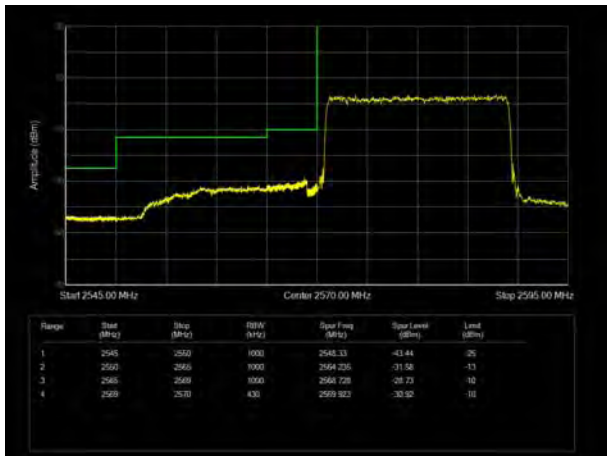
LTE Band 38 QPSK 20MHz CH-Low, 1 RB



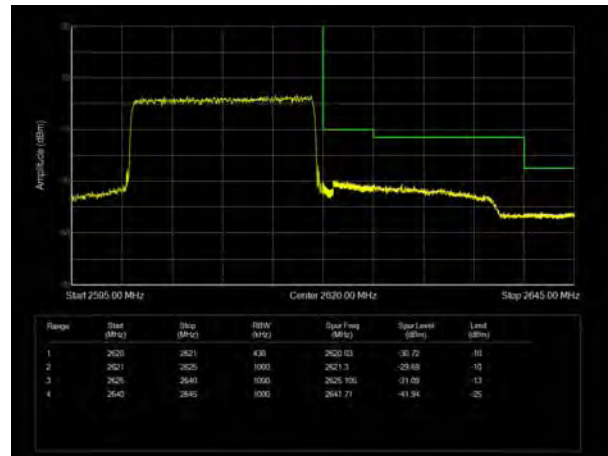
LTE Band 38 QPSK 20MHz CH-High, 1 RB



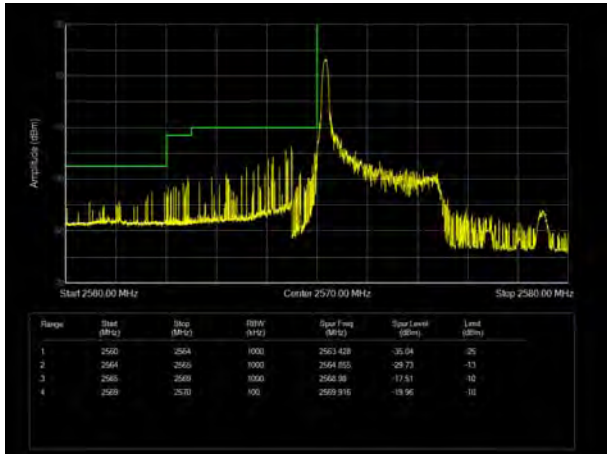
LTE Band 38 QPSK 20MHz CH-Low, 100%RB



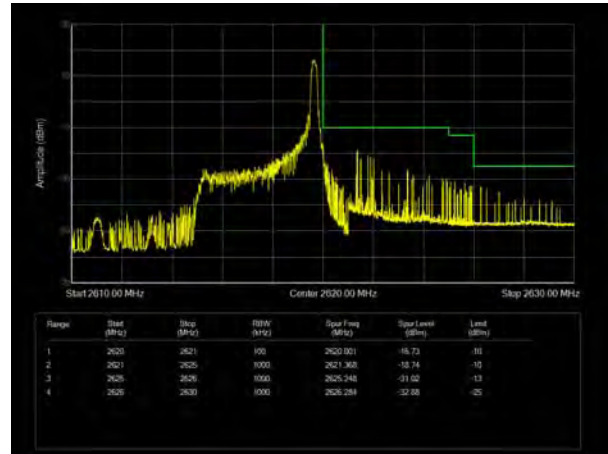
LTE Band 38 QPSK 20MHz CH-High, 100%RB



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

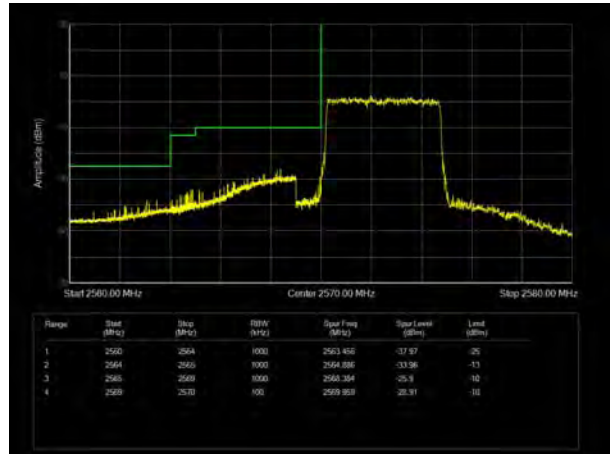


LTE Band 38 16QAM 5MHz CH-High, 1 RB

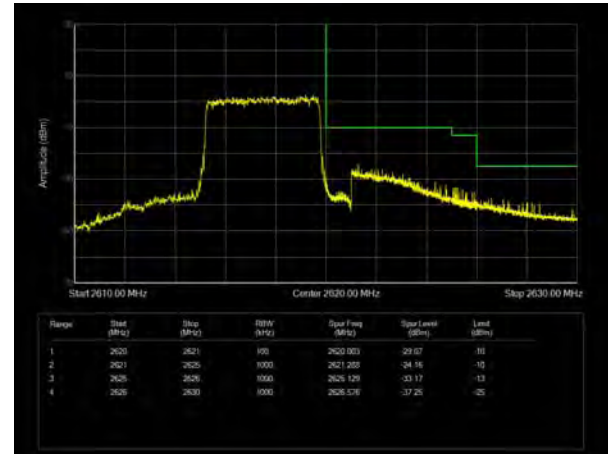




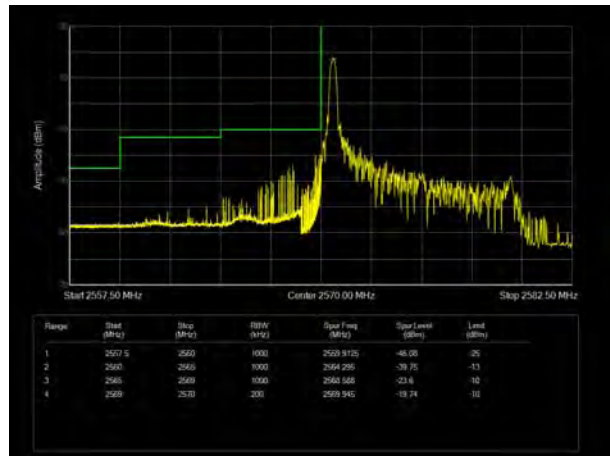
LTE Band 38 16QAM 5MHz CH-Low, 100%RB



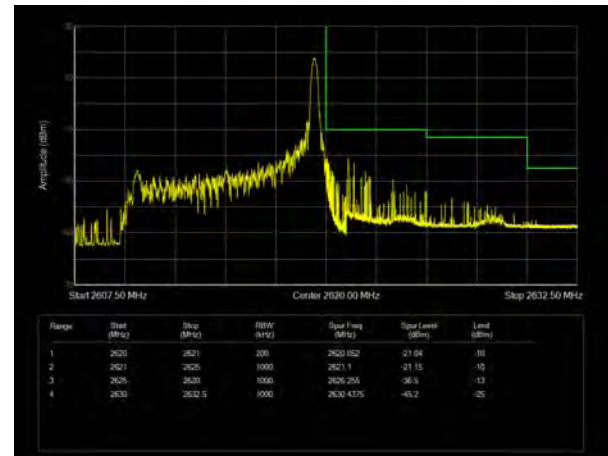
LTE Band 38 16QAM 5MHz CH-High, 100%RB



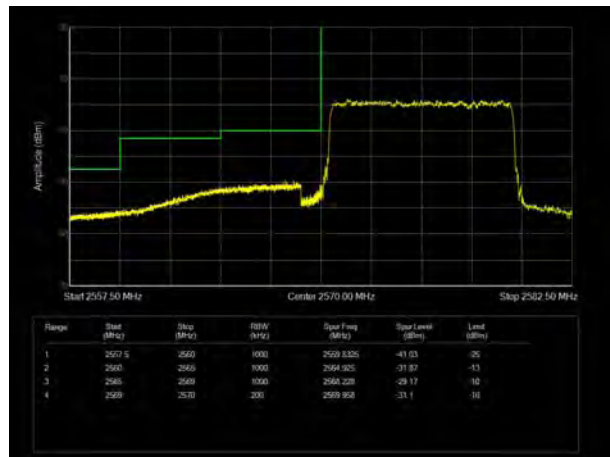
LTE Band 38 16QAM 10MHz CH-Low, 1 RB



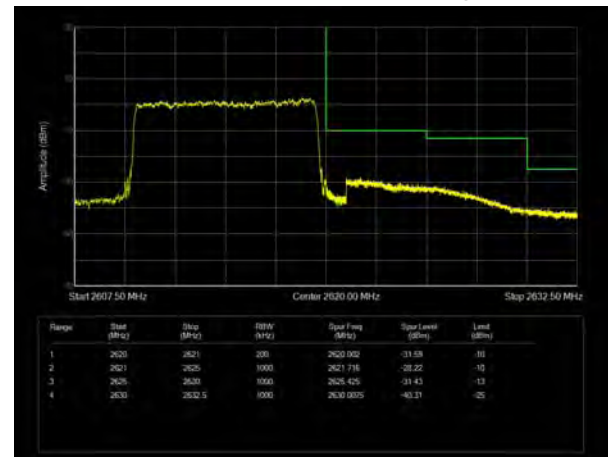
LTE Band 38 16QAM 10MHz CH-High, 1 RB



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

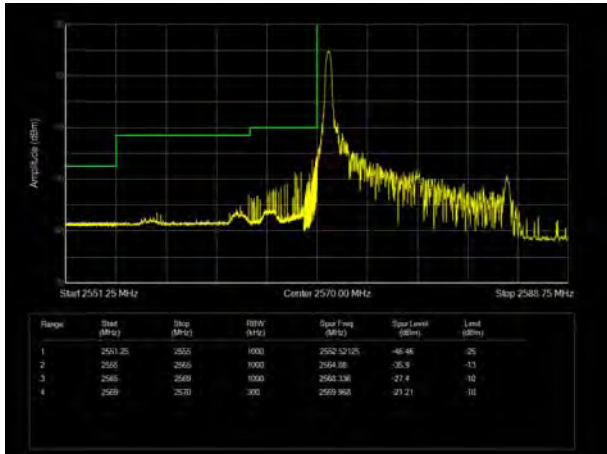


LTE Band 38 16QAM 10MHz CH-High, 100%RB

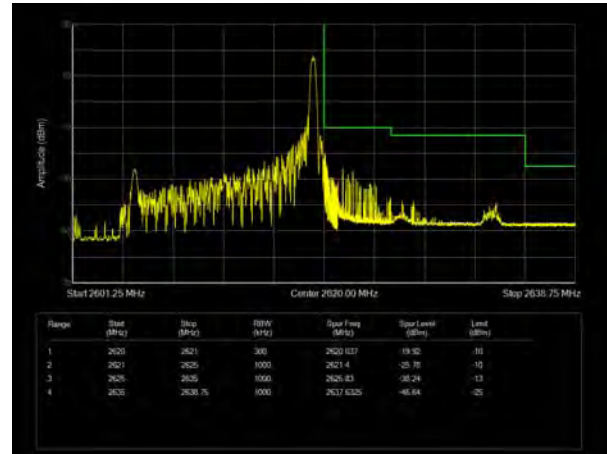




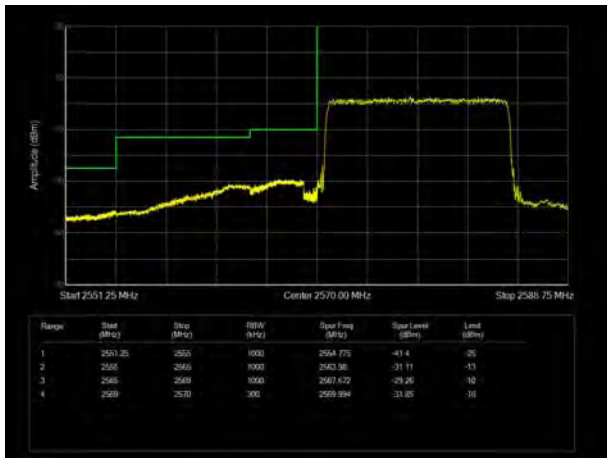
LTE Band 38 16QAM 15MHz CH-Low, 1 RB



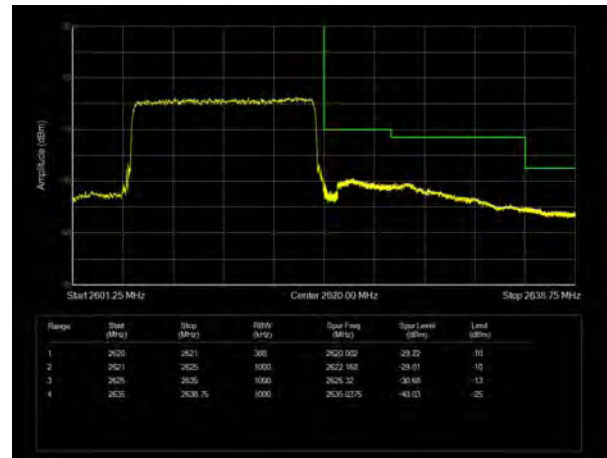
LTE Band 38 16QAM 15MHz CH-High, 1 RB



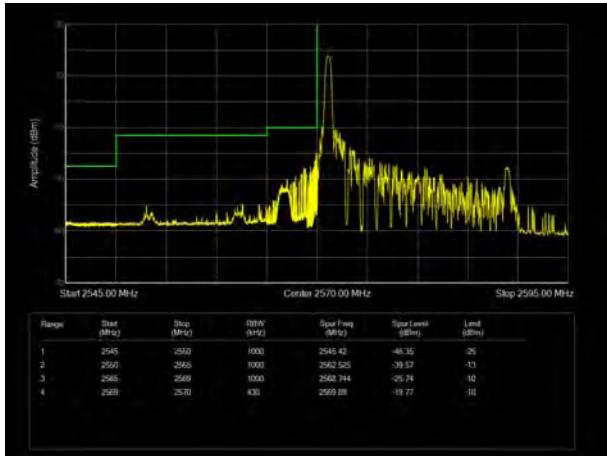
LTE Band 38 16QAM 15MHz CH-Low, 100%RB



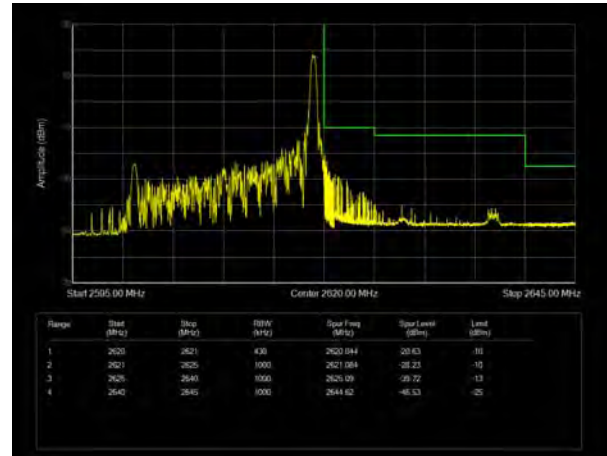
LTE Band 38 16QAM 15MHz CH-High, 100%RB



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

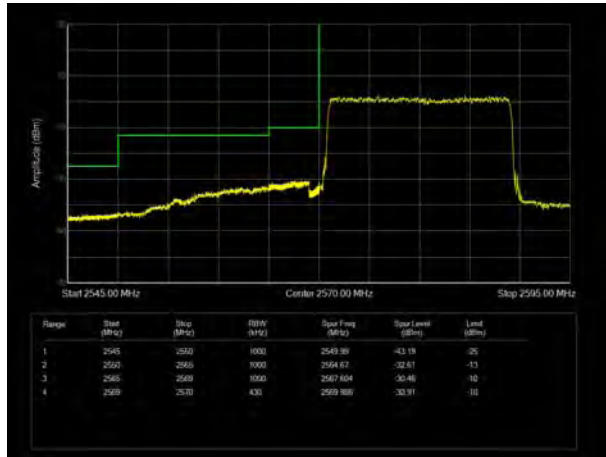


LTE Band 38 16QAM 20MHz CH-High, 1 RB

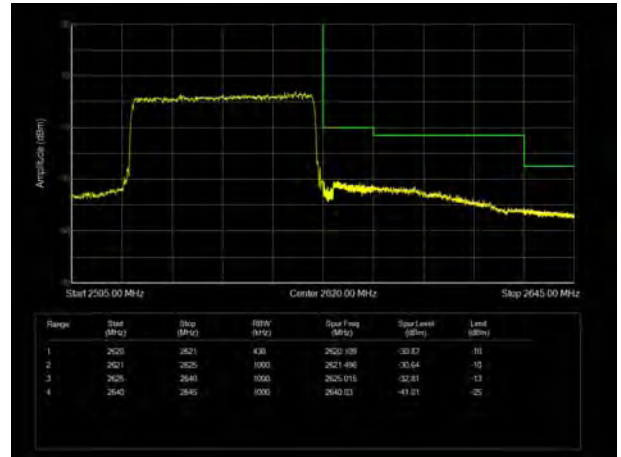




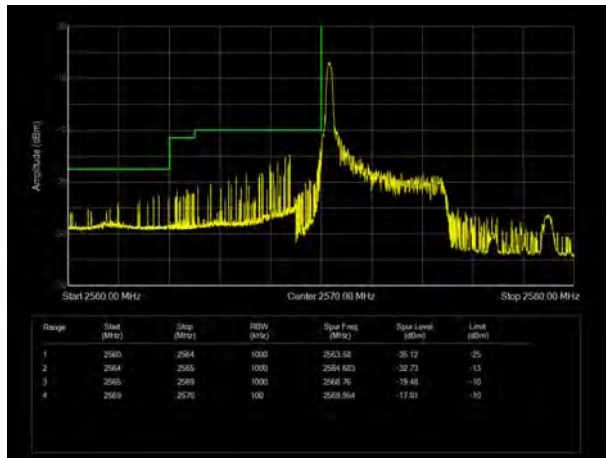
LTE Band 38 16QAM 20MHz CH-Low, 100%RB



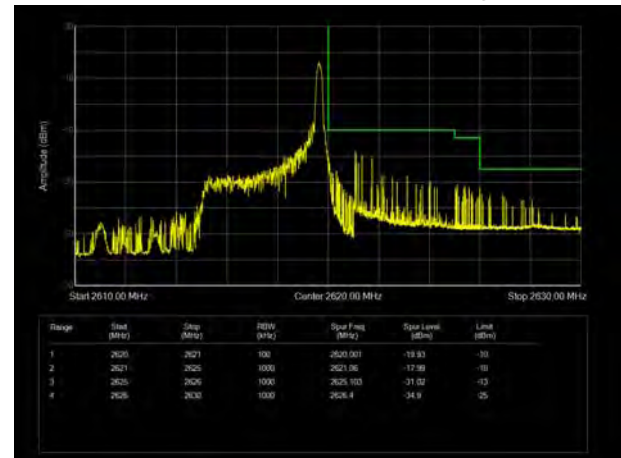
LTE Band 38 16QAM 20MHz CH-High, 100%RB



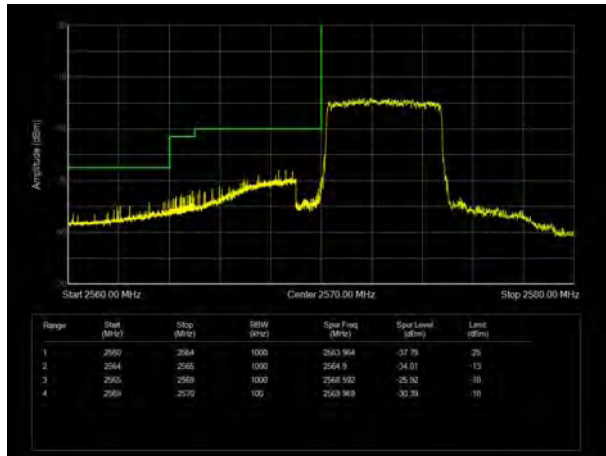
LTE Band 38 64QAM 5MHz CH-Low, 1 RB



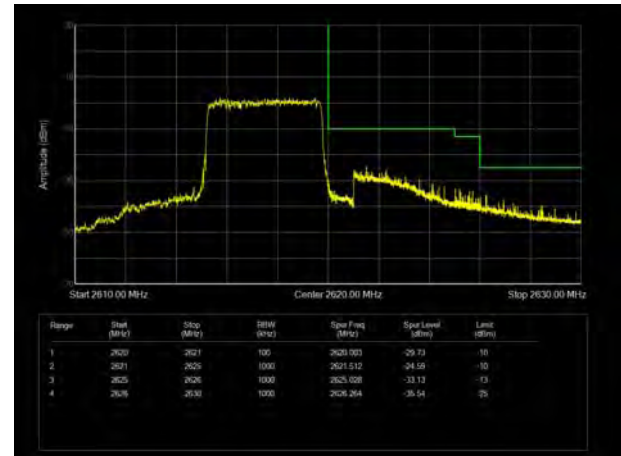
LTE Band 38 64QAM 5MHz CH-High, 1 RB



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

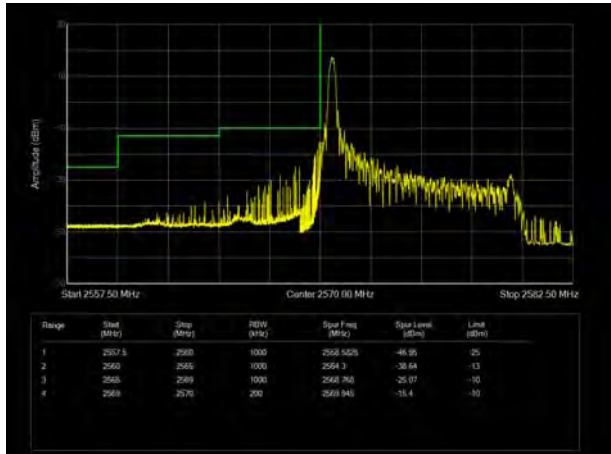


LTE Band 38 64QAM 5MHz CH-High, 100%RB

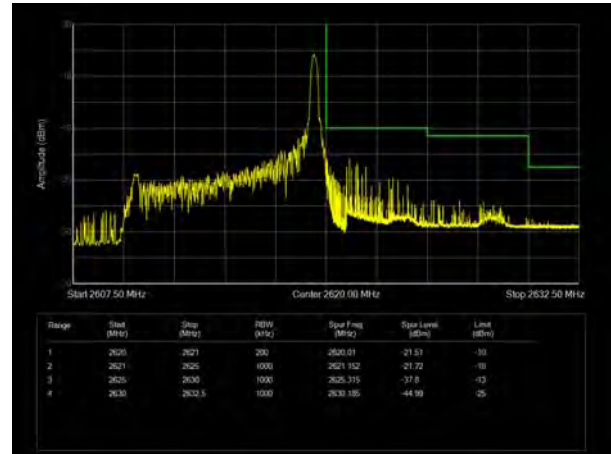




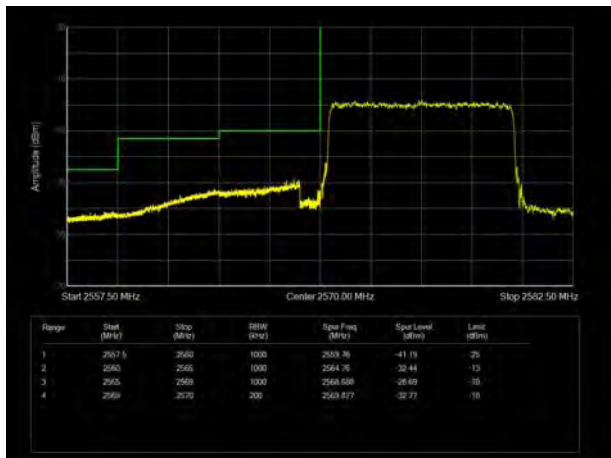
LTE Band 38 64QAM 10MHz CH-Low, 1 RB



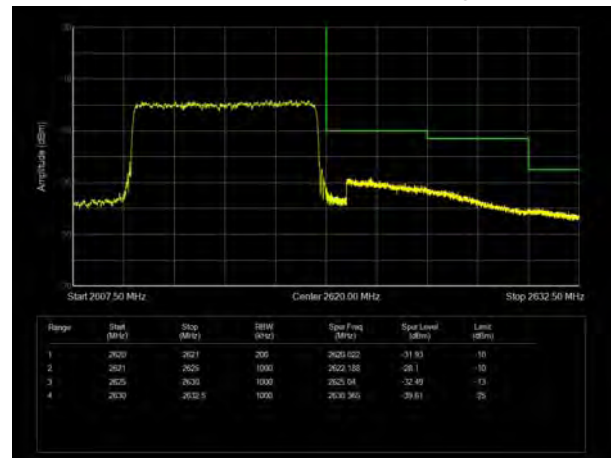
LTE Band 38 64QAM 10MHz CH-High, 1 RB



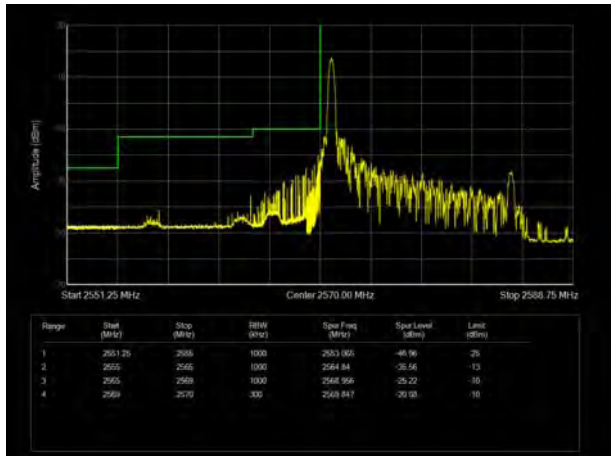
LTE Band 38 64QAM 10MHz CH-Low, 100%RB



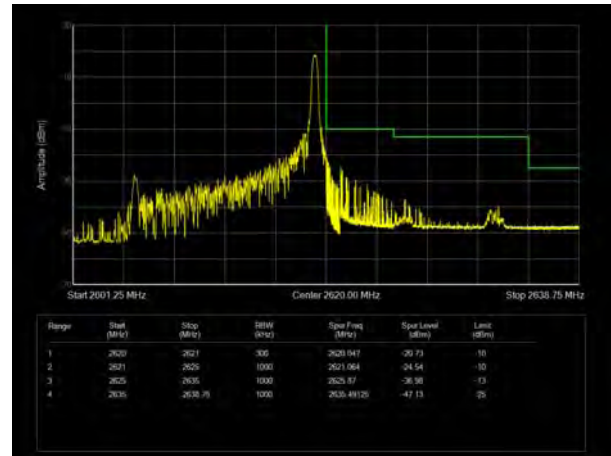
LTE Band 38 64QAM 10MHz CH-High, 100%RB



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

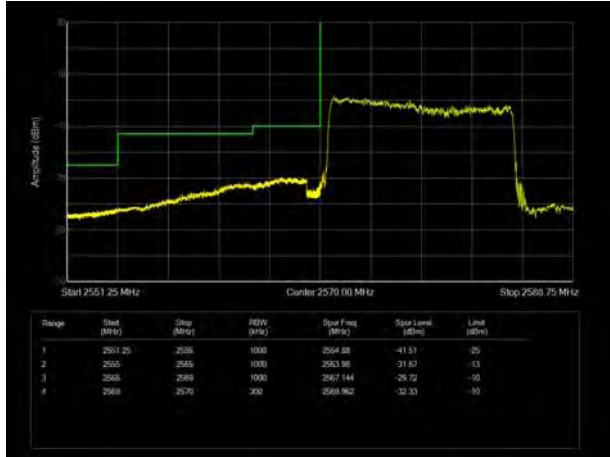


LTE Band 38 64QAM 15MHz CH-High, 1 RB

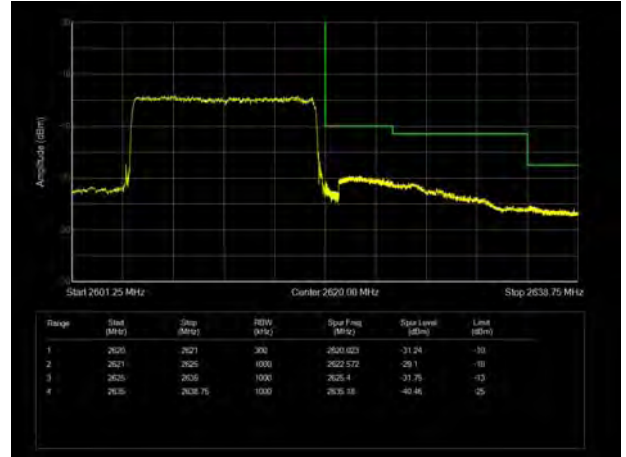




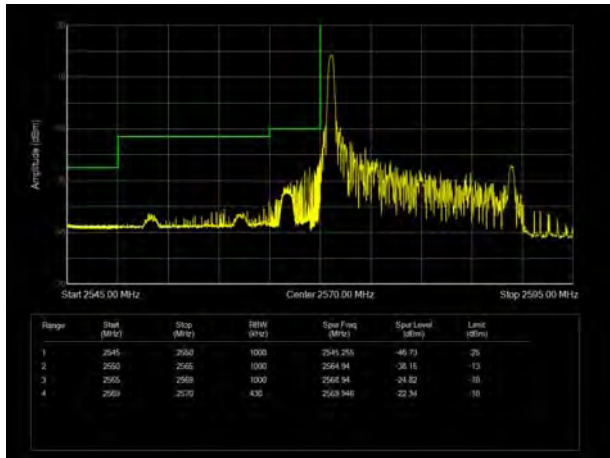
LTE Band 38 64QAM 15MHz CH-Low, 100%RB



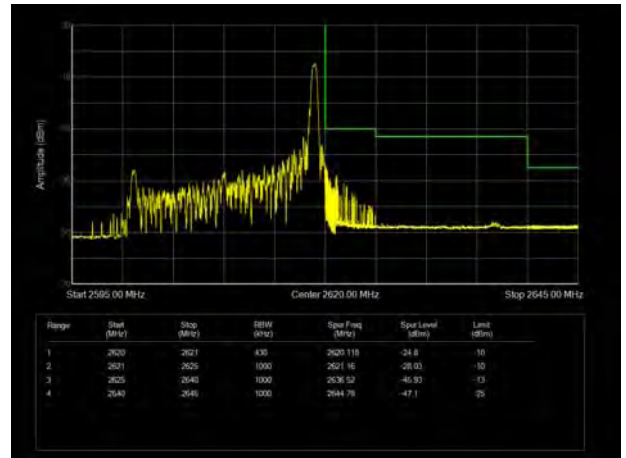
LTE Band 38 64QAM 15MHz CH-High, 100%RB



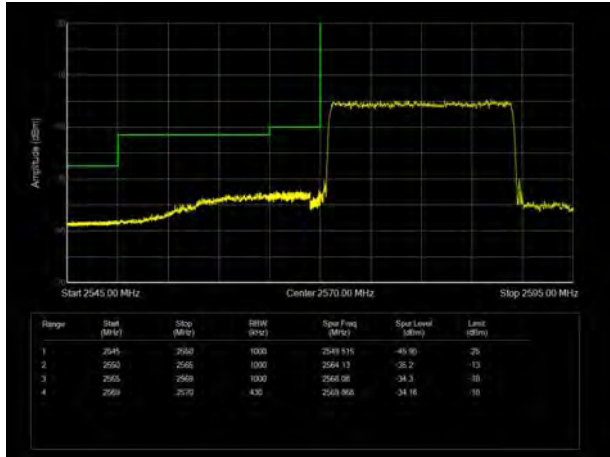
LTE Band 38 64QAM 20MHz CH-Low, 1 RB



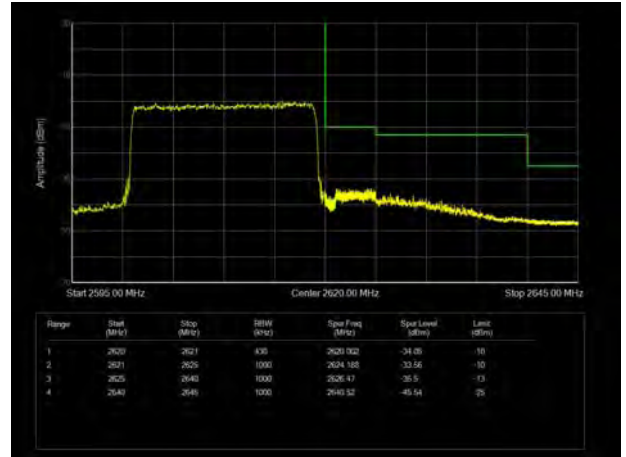
LTE Band 38 64QAM 20MHz CH-High, 1 RB



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

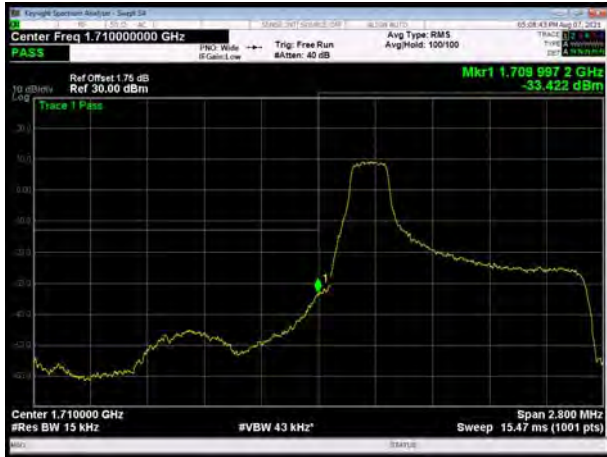


LTE Band 38 64QAM 20MHz CH-High, 100%RB





LTE Band 66 QPSK 1.4MHz CH-Low, 1 RB



LTE Band 66 QPSK 1.4MHz CH-High, 1 RB



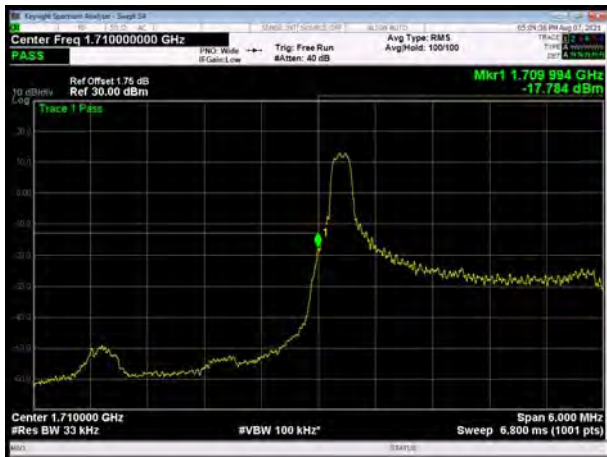
LTE Band 66 QPSK 1.4MHz CH-Low, 100%RB



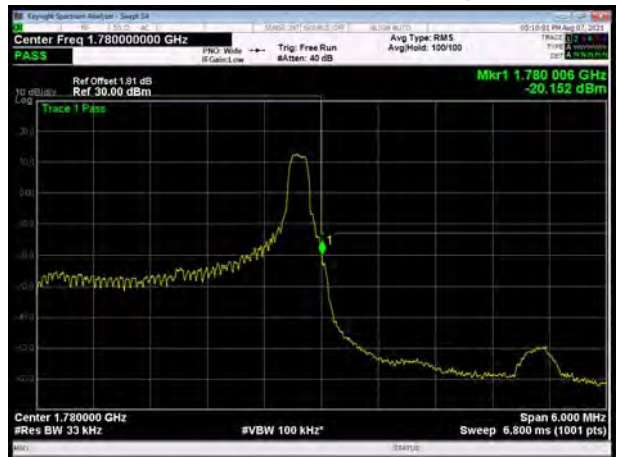
LTE Band 66 QPSK 1.4MHz CH-High, 100%RB



LTE Band 66 QPSK 3MHz CH-Low, 1 RB

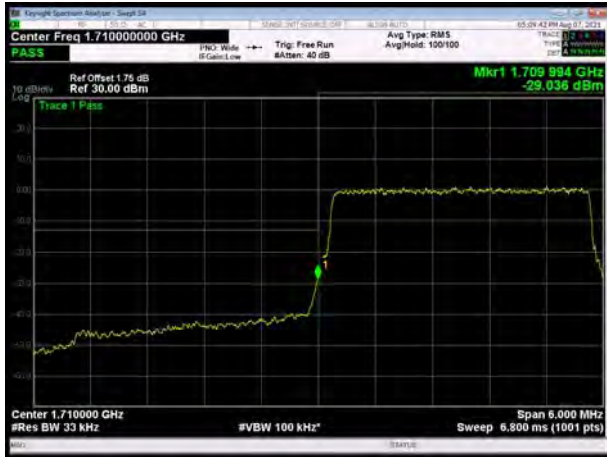


LTE Band 66 QPSK 3MHz CH-High, 1 RB

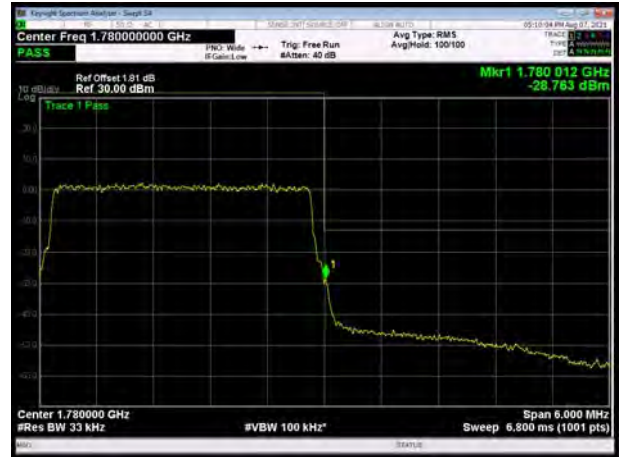




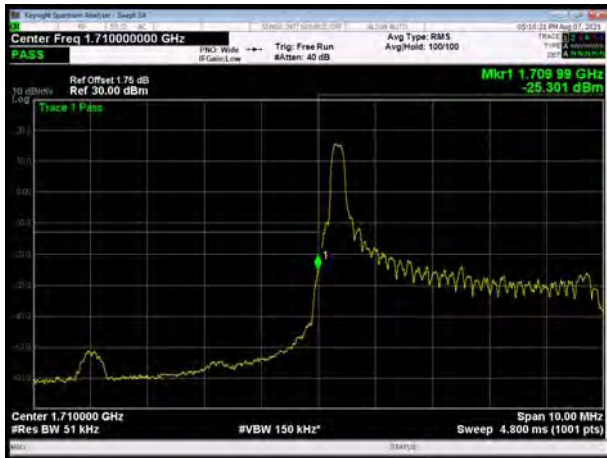
LTE Band 66 QPSK 3MHz CH-Low, 100%RB



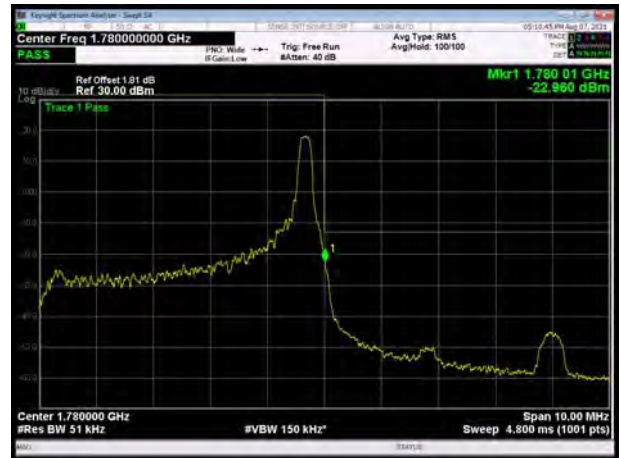
LTE Band 66 QPSK 3MHz CH-High, 100%RB



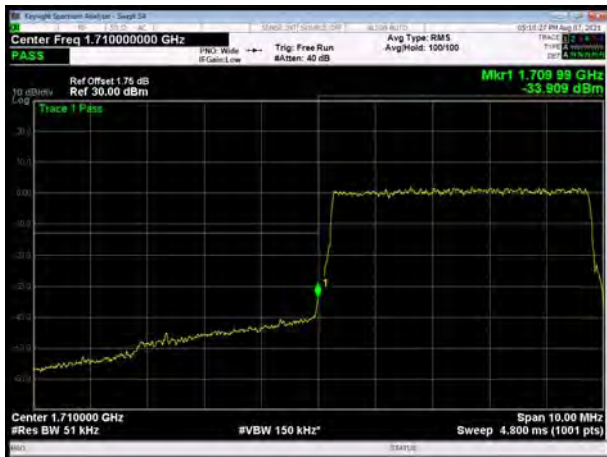
LTE Band 66 QPSK 5MHz CH-Low, 1 RB



LTE Band 66 QPSK 5MHz CH-High, 1 RB



LTE Band 66 QPSK 5MHz CH-Low, 100%RB

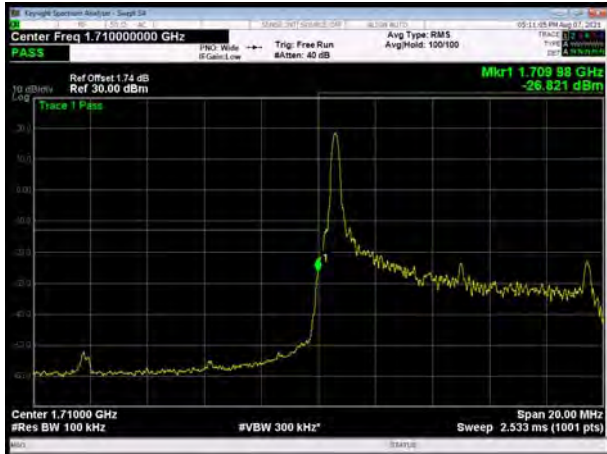


LTE Band 66 QPSK 5MHz CH-High, 100%RB

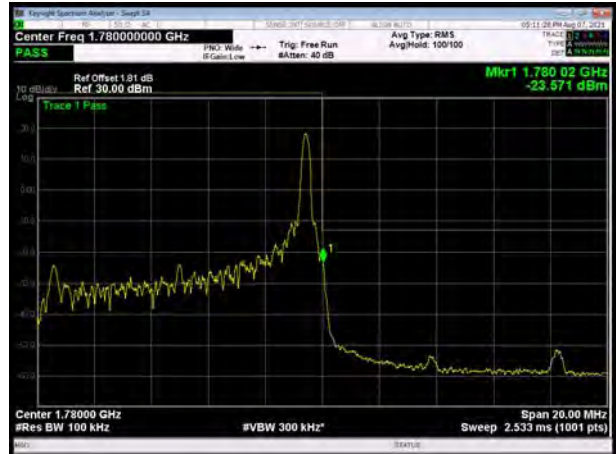




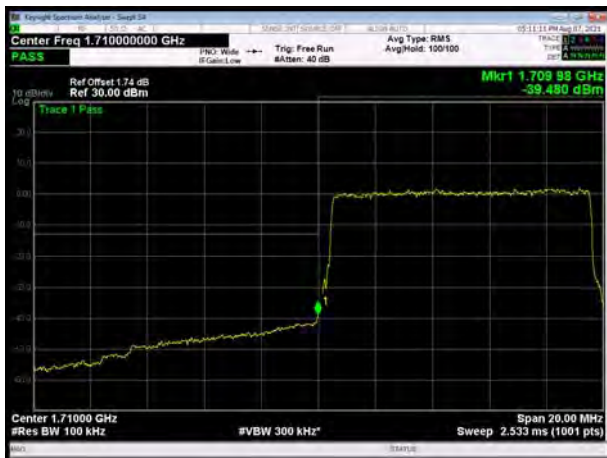
LTE Band 66 QPSK 10MHz CH-Low, 1 RB



LTE Band 66 QPSK 10MHz CH-High, 1 RB



LTE Band 66 QPSK 10MHz CH-Low, 100%RB



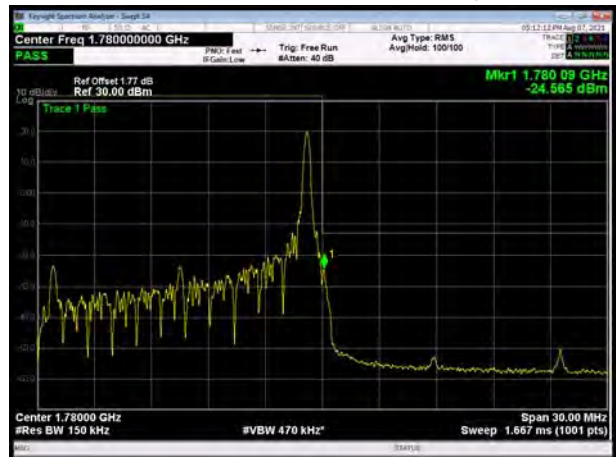
LTE Band 66 QPSK 10MHz CH-High, 100%RB



LTE Band 66 QPSK 15MHz CH-Low, 1 RB

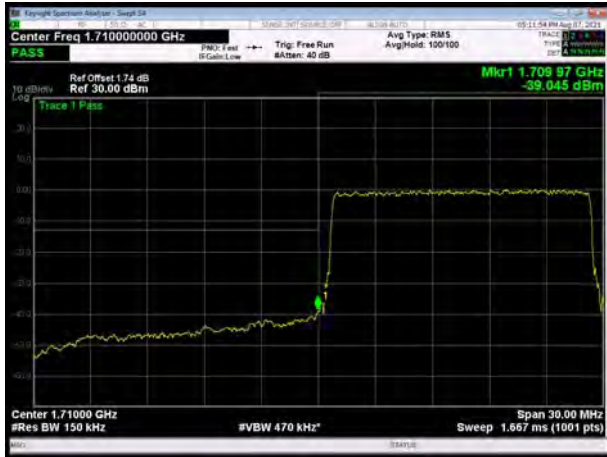


LTE Band 66 QPSK 15MHz CH-High, 1 RB

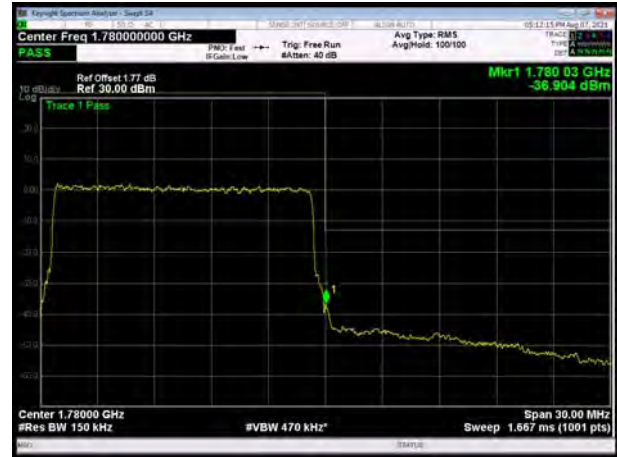




LTE Band 66 QPSK 15MHz CH-Low, 100%RB



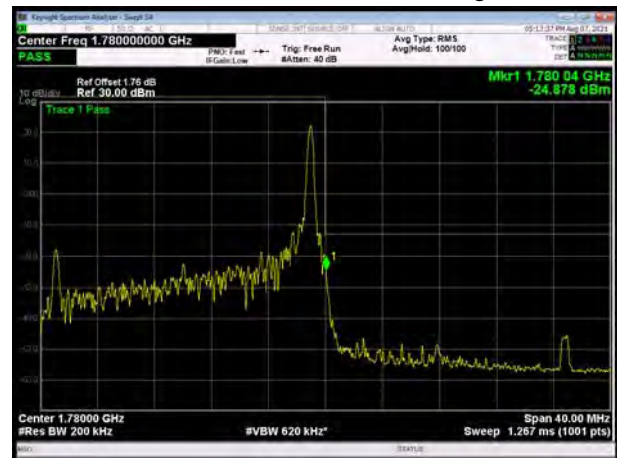
LTE Band 66 QPSK 15MHz CH-High, 100%RB



LTE Band 66 QPSK 20MHz CH-Low, 1 RB



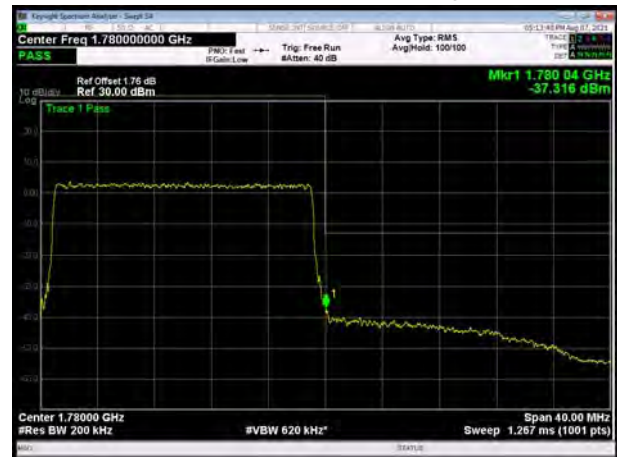
LTE Band 66 QPSK 20MHz CH-High, 1 RB



LTE Band 66 QPSK 20MHz CH-Low, 100%RB



LTE Band 66 QPSK 20MHz CH-High, 100%RB





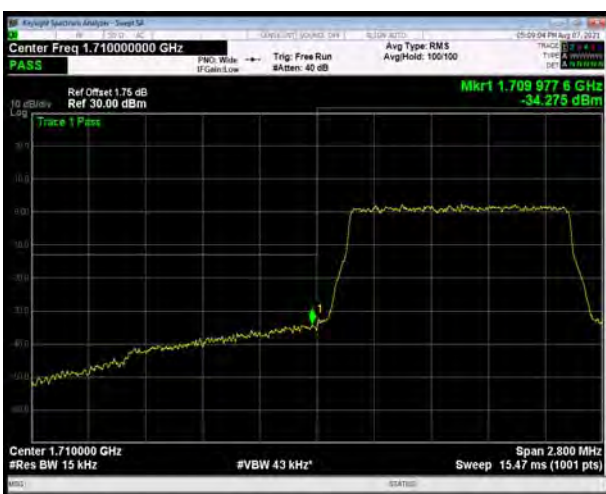
LTE Band 66 16QAM 1.4MHz CH-Low, 1 RB



LTE Band 66 16QAM 1.4MHz CH-High, 1 RB



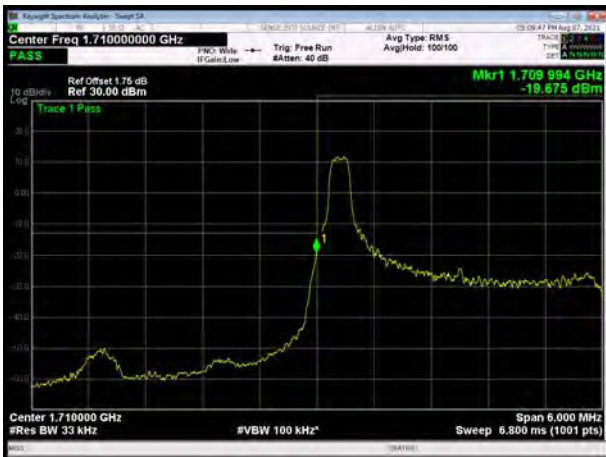
LTE Band 66 16QAM 1.4MHz CH-Low, 100%RB



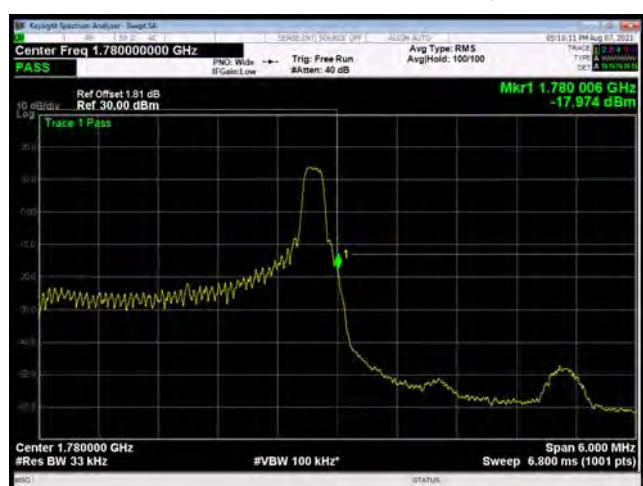
LTE Band 66 16QAM 1.4MHz CH-High, 100%RB



LTE Band 66 16QAM 3MHz CH-Low, 1 RB

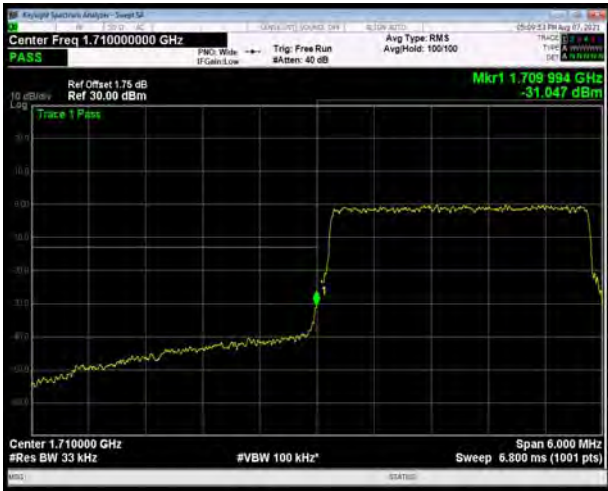


LTE Band 66 16QAM 3MHz CH-High, 1 RB

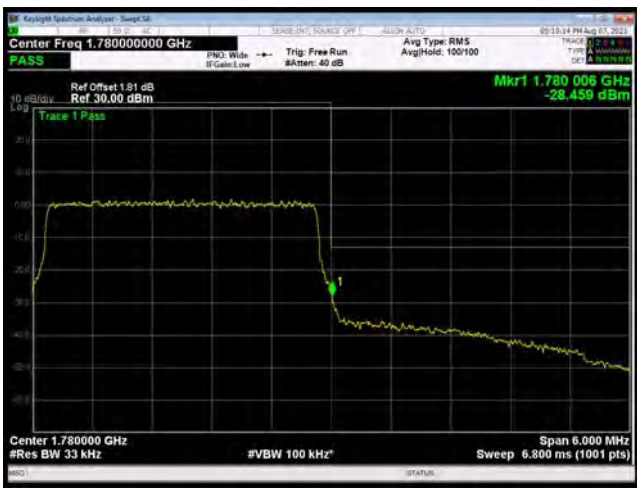




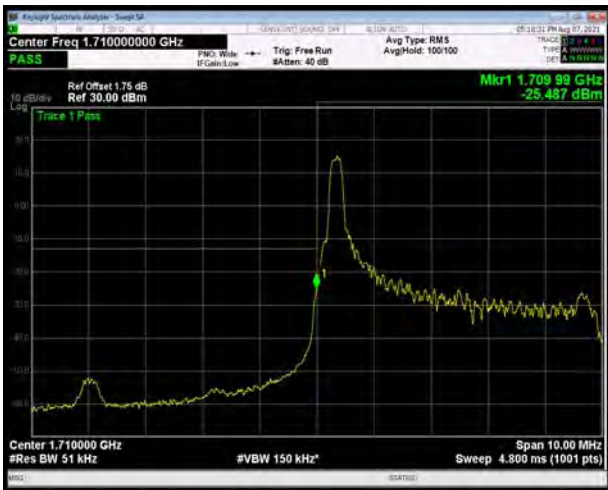
LTE Band 66 16QAM 3MHz CH-Low, 100%RB



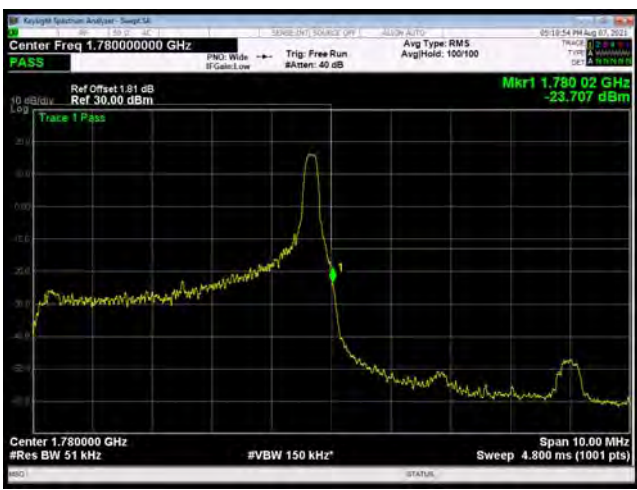
LTE Band 66 16QAM 3MHz CH-High, 100%RB



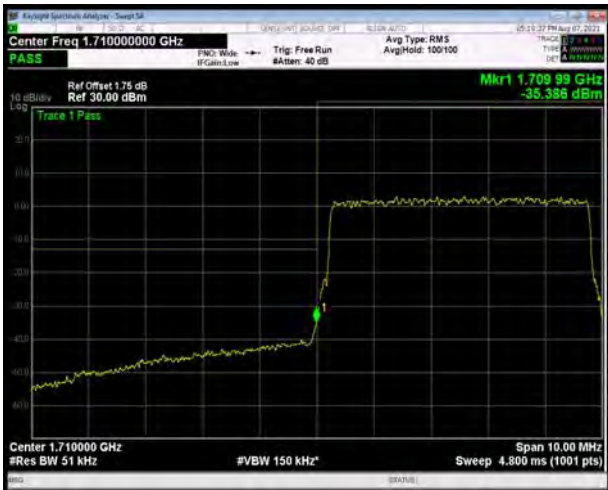
LTE Band 66 16QAM 5MHz CH-Low, 1 RB



LTE Band 66 16QAM 5MHz CH-High, 1 RB



LTE Band 66 16QAM 5MHz CH-Low, 100%RB

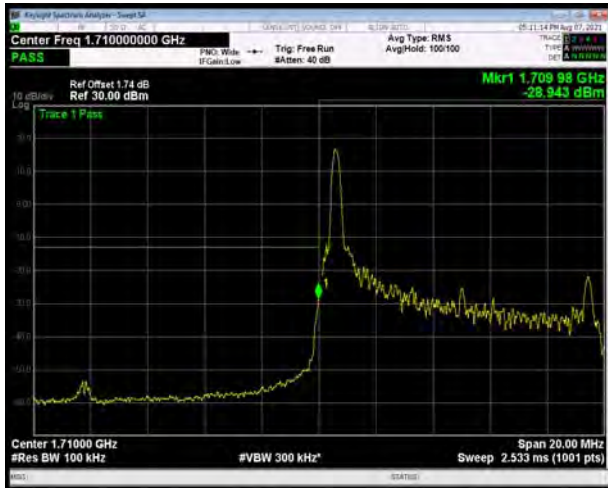


LTE Band 66 16QAM 5MHz CH-High, 100%RB

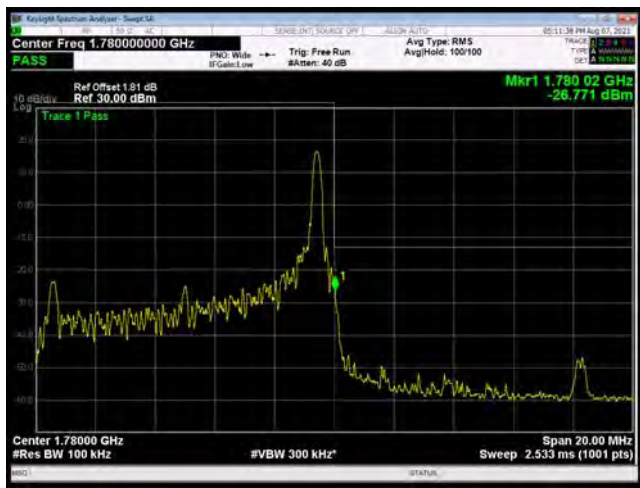




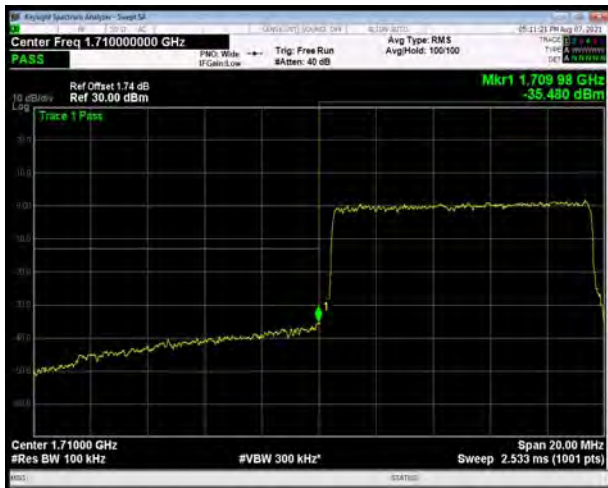
LTE Band 66 16QAM 10MHz CH-Low, 1 RB



LTE Band 66 16QAM 10MHz CH-High, 1 RB



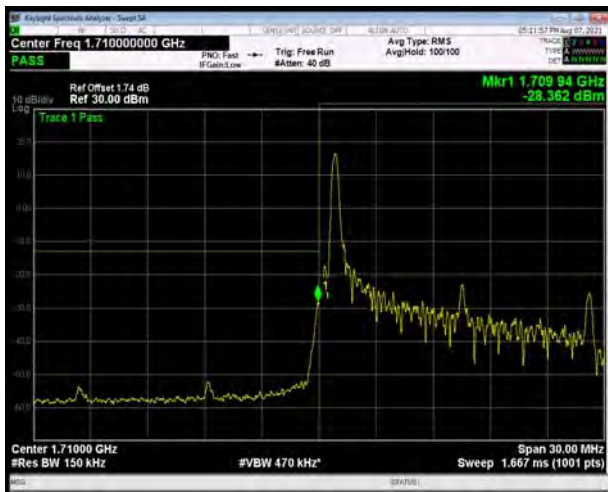
LTE Band 66 16QAM 10MHz CH-Low, 100%RB



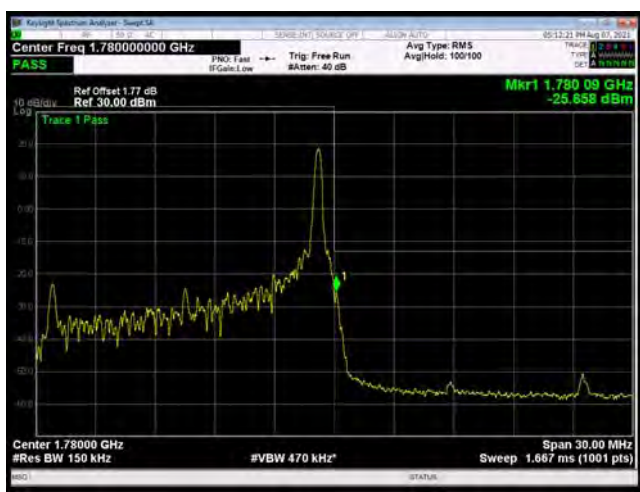
LTE Band 66 16QAM 10MHz CH-High, 100%RB



LTE Band 66 16QAM 15MHz CH-Low, 1 RB

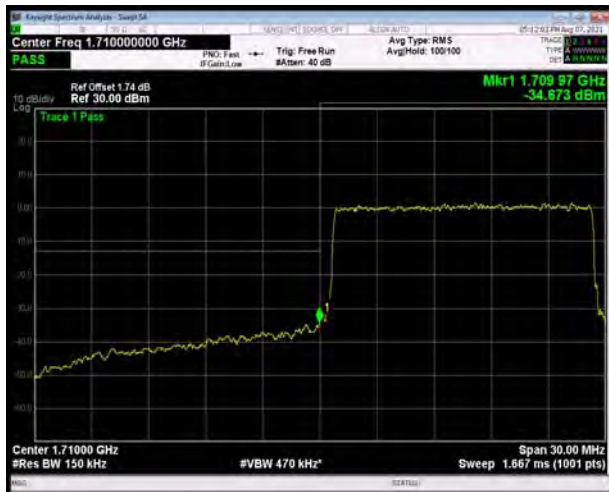


LTE Band 66 16QAM 15MHz CH-High, 1 RB





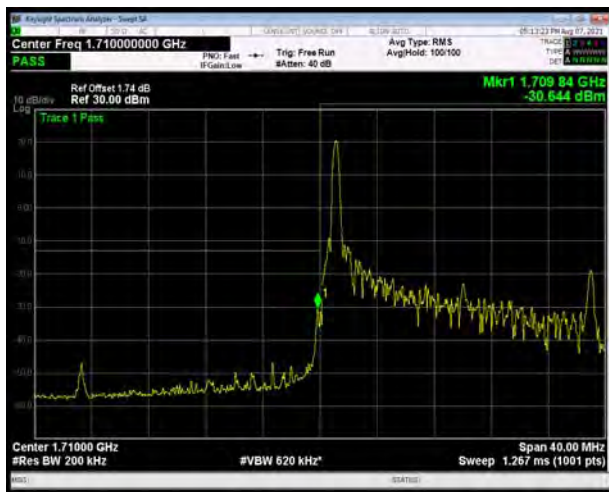
LTE Band 66 16QAM 15MHz CH-Low, 100%RB



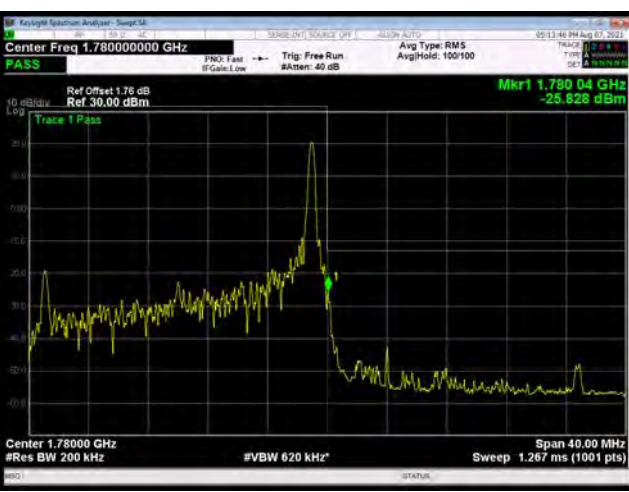
LTE Band 66 16QAM 15MHz CH-High, 100%RB



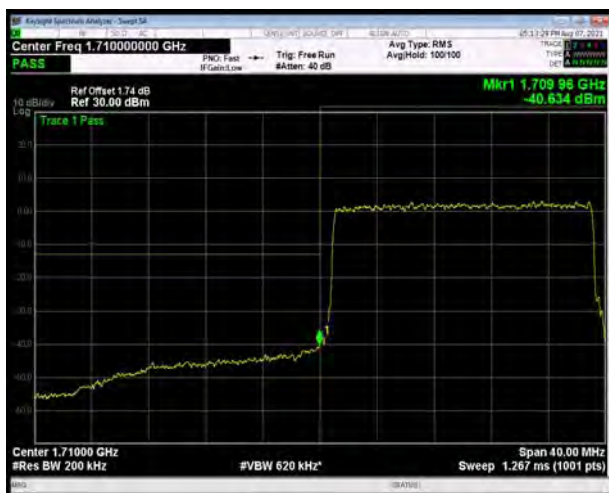
LTE Band 66 16QAM 20MHz CH-Low, 1 RB



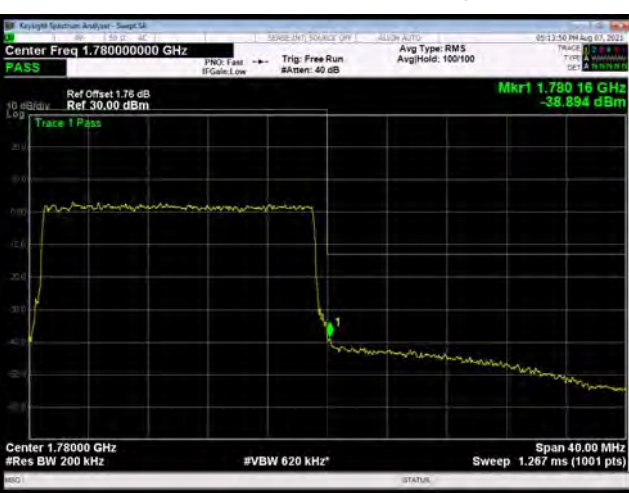
LTE Band 66 16QAM 20MHz CH-High, 1 RB



LTE Band 66 16QAM 20MHz CH-Low, 100%RB

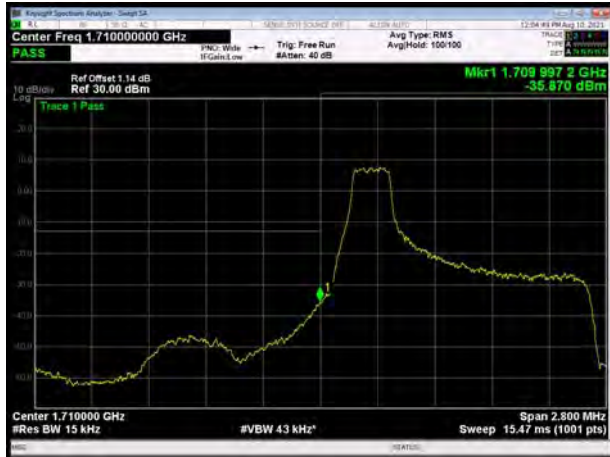


LTE Band 66 16QAM 20MHz CH-High, 100%RB





LTE Band 66 64QAM 1.4MHz CH-Low, 1 RB



LTE Band 66 QPSK 1.4MHz CH-High, 1 RB



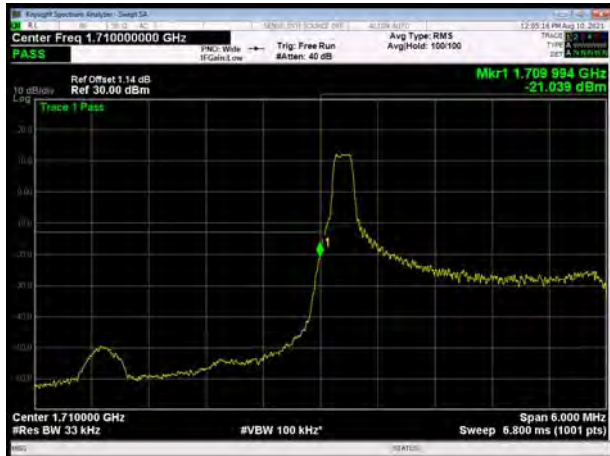
LTE Band 66 64QAM 1.4MHz CH-Low, 100%RB



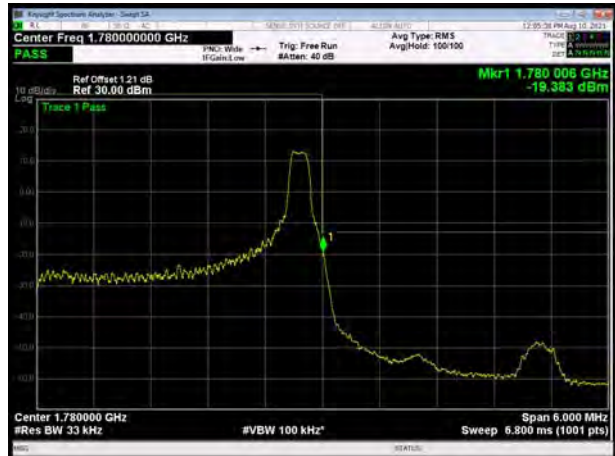
LTE Band 66 64QAM 1.4MHz CH-High, 100%RB



LTE Band 66 64QAM 3MHz CH-Low, 1 RB



LTE Band 66 64QAM 3MHz CH-High, 1 RB

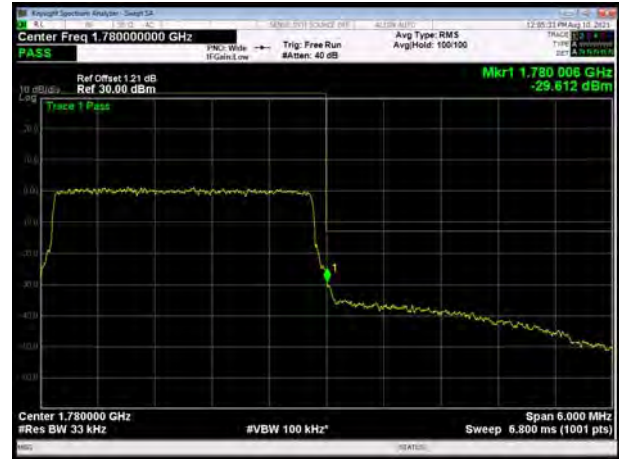




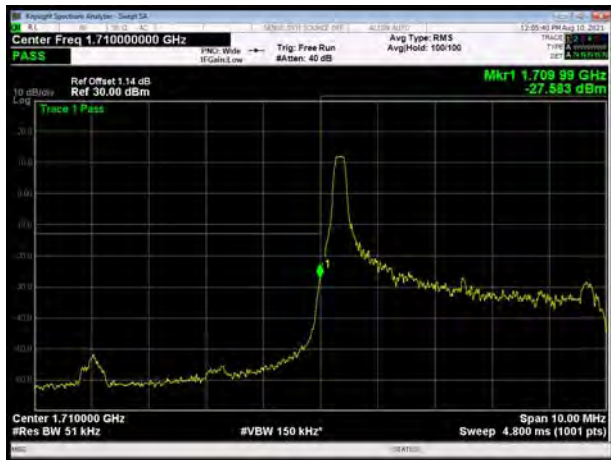
LTE Band 66 64QAM 3MHz CH-Low, 100%RB



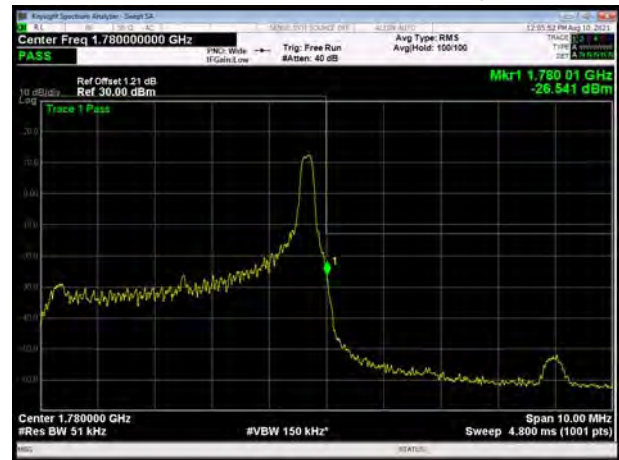
LTE Band 66 64QAM 3MHz CH-High, 100%RB



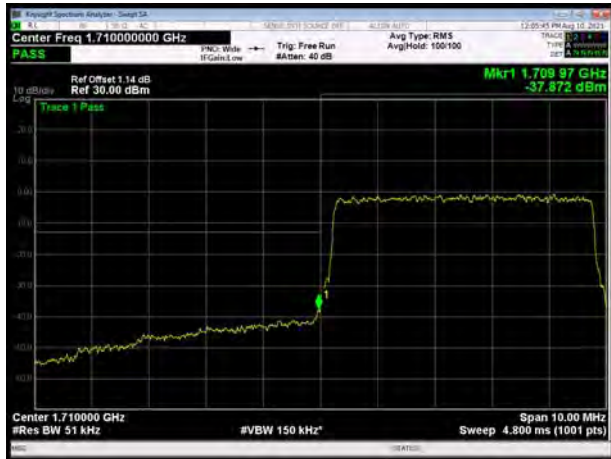
LTE Band 66 64QAM 5MHz CH-Low, 1 RB



LTE Band 66 64QAM 5MHz CH-High, 1 RB



LTE Band 66 64QAM 5MHz CH-Low, 100%RB

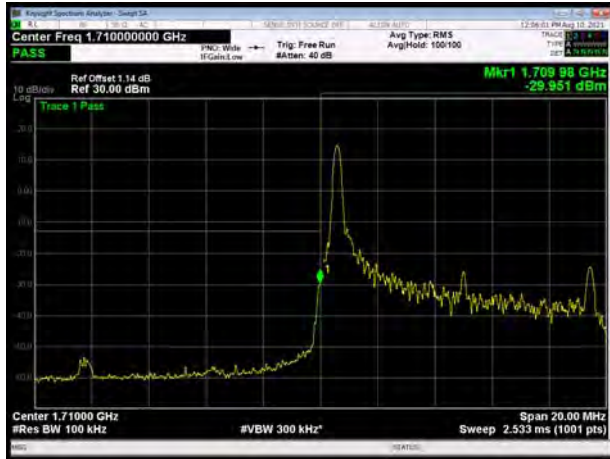


LTE Band 66 64QAM 5MHz CH-High, 100%RB

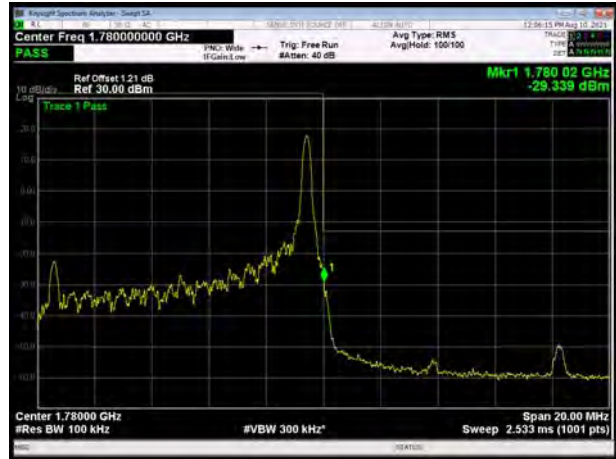




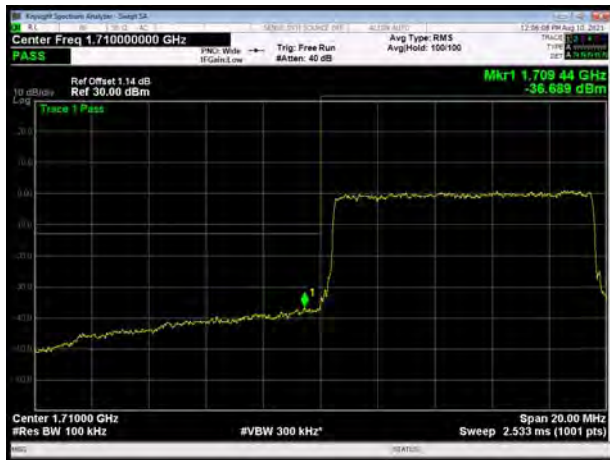
LTE Band 66 64QAM 10MHz CH-Low, 1 RB



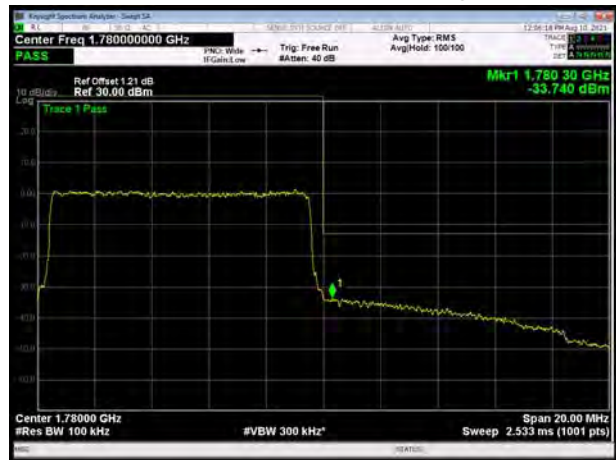
LTE Band 66 64QAM 10MHz CH-High, 1 RB



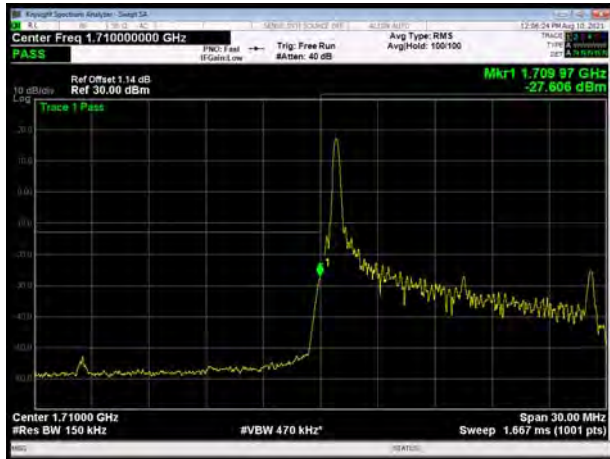
LTE Band 66 64QAM 10MHz CH-Low, 100%RB



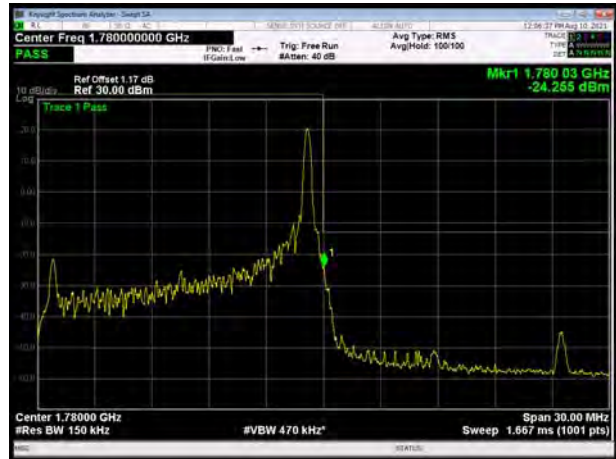
LTE Band 66 64QAM 10MHz CH-High, 100%RB



LTE Band 66 64QAM 15MHz CH-Low, 1 RB



LTE Band 66 64QAM 15MHz CH-High, 1 RB

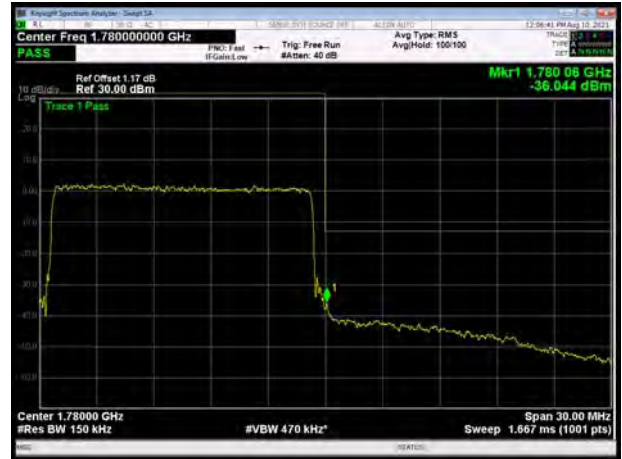




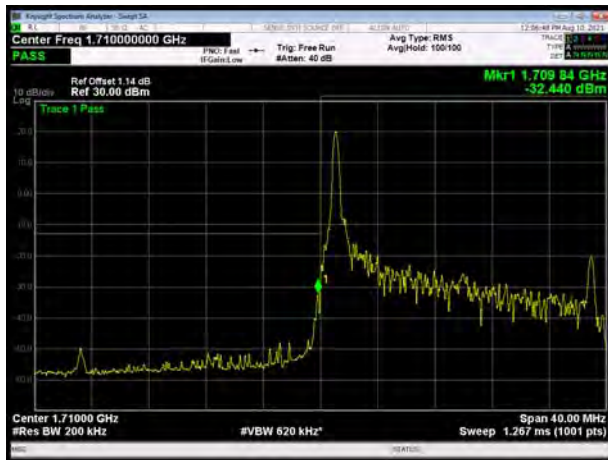
LTE Band 66 64QAM 15MHz CH-Low, 100%RB



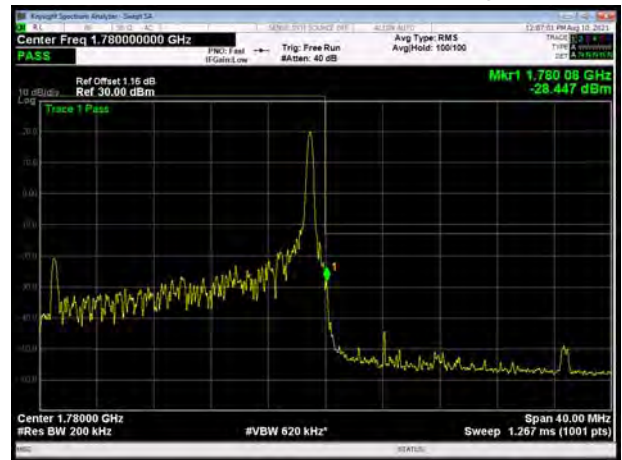
LTE Band 66 64QAM 15MHz CH-High, 100%RB



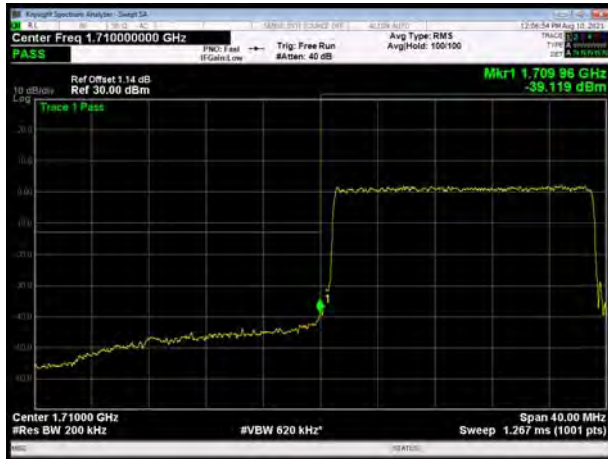
LTE Band 66 64QAM 20MHz CH-Low, 1 RB



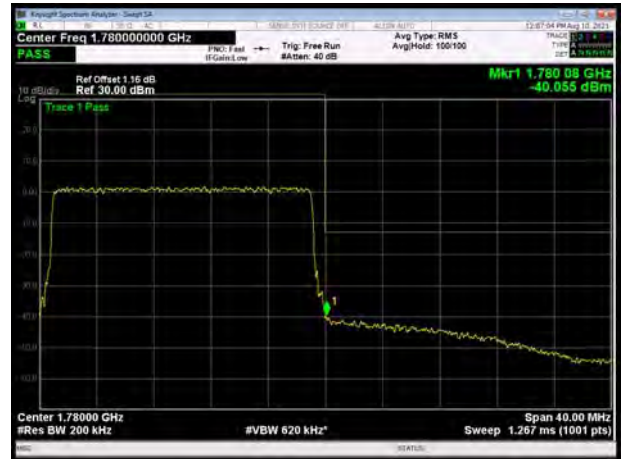
LTE Band 66 64QAM 20MHz CH-High, 1 RB



LTE Band 66 64QAM 20MHz CH-Low, 100%RB



LTE Band 66 64QAM 20MHz CH-High, 100%RB



5.4 Peak-to-Average Power Ratio (PAPR)

Ambient condition

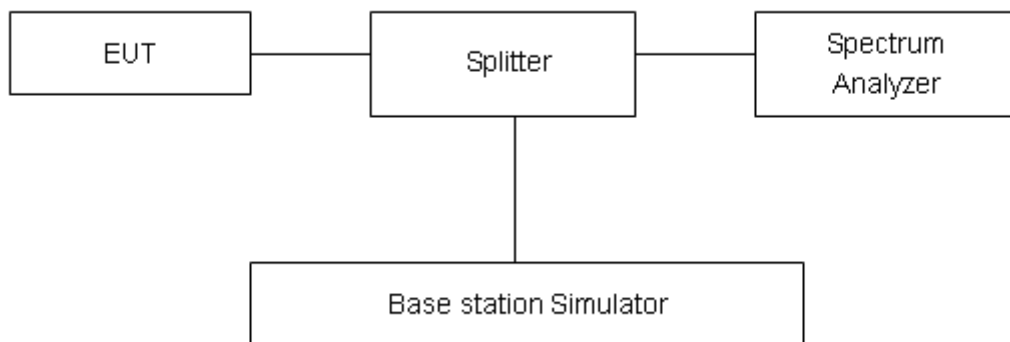
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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:

$$PAPR (dB) = PPk (dBm) - PAvg (dBm).$$

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	25.76	22.81	2.95	≤13	PASS
	1413	1732.6	26.37	23.39	2.98	≤13	PASS
	1513	1752.6	26.33	23.34	2.99	≤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	25.32	19.49	5.83	≤13	PASS
		20175	1732.5	25.48	19.62	5.86	≤13	PASS
		20393	1754.3	25.31	19.59	5.72	≤13	PASS
	3	19965	1711.5	27.18	21.76	5.42	≤13	PASS
		20175	1732.5	27.08	21.66	5.42	≤13	PASS
		20385	1753.5	27.11	21.59	5.52	≤13	PASS
	5	19975	1712.5	27.07	21.57	5.50	≤13	PASS
		20175	1732.5	27.13	21.63	5.50	≤13	PASS
		20375	1752.5	27.05	21.52	5.53	≤13	PASS
	10	20000	1715	27.03	21.48	5.55	≤13	PASS
		20175	1732.5	27.13	21.56	5.57	≤13	PASS
		20350	1750	27.21	21.63	5.58	≤13	PASS
	15	20025	1717.5	27.40	21.60	5.80	≤13	PASS
		20175	1732.5	27.55	21.65	5.90	≤13	PASS
		20325	1747.5	27.57	21.64	5.93	≤13	PASS
	20	20050	1720	27.11	21.53	5.58	≤13	PASS
		20175	1732.5	27.30	21.63	5.67	≤13	PASS
		20300	1745	27.49	21.75	5.74	≤13	PASS
16QAM	1.4	19957	1710.7	24.51	19.14	5.37	≤13	PASS
		20175	1732.5	24.41	18.78	5.63	≤13	PASS
		20393	1754.3	27.25	20.98	6.27	≤13	PASS
	3	19965	1711.5	27.05	20.72	6.33	≤13	PASS
		20175	1732.5	27.08	20.80	6.28	≤13	PASS
		20385	1753.5	26.97	20.64	6.33	≤13	PASS
	5	19975	1712.5	26.75	20.41	6.34	≤13	PASS
		20175	1732.5	26.98	20.74	6.24	≤13	PASS
		20375	1752.5	26.93	20.66	6.27	≤13	PASS
	10	20000	1715	26.95	20.59	6.36	≤13	PASS
		20175	1732.5	27.05	20.70	6.35	≤13	PASS
		20350	1750	27.00	20.66	6.34	≤13	PASS



	15	20025	1717.5	27.09	20.76	6.33	≤13	PASS
		20175	1732.5	27.09	20.69	6.40	≤13	PASS
		20325	1747.5	27.01	20.60	6.41	≤13	PASS
	20	20050	1720	27.00	20.65	6.35	≤13	PASS
		20175	1732.5	27.03	20.64	6.39	≤13	PASS
		20300	1745	27.13	20.72	6.41	≤13	PASS
64QAM	1.4	19957	1710.7	26.49	20.27	6.22	≤13	PASS
		20175	1732.5	26.66	20.38	6.28	≤13	PASS
		20393	1754.3	26.65	20.37	6.28	≤13	PASS
	3	19965	1711.5	26.48	20.18	6.30	≤13	PASS
		20175	1732.5	26.52	20.23	6.29	≤13	PASS
		20385	1753.5	26.31	20.01	6.30	≤13	PASS
	5	19975	1712.5	26.34	20.14	6.20	≤13	PASS
		20175	1732.5	26.33	20.04	6.29	≤13	PASS
		20375	1752.5	26.33	20.09	6.24	≤13	PASS
	10	20000	1715	26.34	20.04	6.30	≤13	PASS
		20175	1732.5	26.53	20.21	6.32	≤13	PASS
		20350	1750	26.35	20.00	6.35	≤13	PASS
	15	20025	1717.5	26.45	20.09	6.36	≤13	PASS
		20175	1732.5	26.56	20.17	6.39	≤13	PASS
		20325	1747.5	26.56	20.18	6.38	≤13	PASS
	20	20050	1720	26.40	20.05	6.35	≤13	PASS
		20175	1732.5	26.63	20.23	6.40	≤13	PASS
		20300	1745	26.60	20.20	6.40	≤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	23.94	18.46	5.48	≤13	PASS
		21100	2535	23.82	18.19	5.63	≤13	PASS
		21425	2567.5	24.09	18.62	5.47	≤13	PASS
	10	20800	2505	24.04	18.46	5.58	≤13	PASS
		21100	2535	24.03	18.42	5.61	≤13	PASS
		21400	2565	25.17	19.55	5.62	≤13	PASS
	15	20825	2507.5	25.70	19.77	5.93	≤13	PASS
		21100	2535	25.47	19.51	5.96	≤13	PASS
		21375	2562.5	25.41	19.44	5.97	≤13	PASS
	20	20850	2510	24.33	18.66	5.67	≤13	PASS



16QAM		21100	2535	24.21	18.52	5.69	≤13	PASS	
		21350	2560	24.73	19.04	5.69	≤13	PASS	
	5	20775	2502.5	23.78	17.64	6.14	≤13	PASS	
		21100	2535	23.67	17.35	6.32	≤13	PASS	
		21425	2567.5	23.86	17.68	6.18	≤13	PASS	
	10	20800	2505	23.85	17.61	6.24	≤13	PASS	
		21100	2535	25.33	19.34	5.99	≤13	PASS	
		21400	2565	25.52	19.72	5.80	≤13	PASS	
	15	20825	2507.5	25.38	19.36	6.02	≤13	PASS	
		21100	2535	25.31	19.21	6.10	≤13	PASS	
		21375	2562.5	25.79	19.87	5.92	≤13	PASS	
	20	20850	2510	24.16	17.80	6.36	≤13	PASS	
		21100	2535	24.03	17.65	6.38	≤13	PASS	
		21350	2560	24.62	18.26	6.36	≤13	PASS	
	64QAM	5	20775	2502.5	23.26	17.06	6.20	≤13	PASS
			21100	2535	23.07	16.79	6.28	≤13	PASS
			21425	2567.5	23.34	17.16	6.18	≤13	PASS
		10	20800	2505	23.36	17.09	6.27	≤13	PASS
21100			2535	23.41	17.06	6.35	≤13	PASS	
21400			2565	23.60	17.35	6.25	≤13	PASS	
15		20825	2507.5	23.48	17.09	6.39	≤13	PASS	
		21100	2535	23.44	17.04	6.40	≤13	PASS	
		21375	2562.5	23.95	17.61	6.34	≤13	PASS	
20		20850	2510	23.69	17.34	6.35	≤13	PASS	
		21100	2535	23.51	17.14	6.37	≤13	PASS	
		21350	2560	24.11	17.75	6.36	≤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	26.66	17.40	9.26	≤13	PASS
		38000	2595	26.62	17.67	8.95	≤13	PASS
		38225	2617.5	26.70	18.38	8.32	≤13	PASS
	10	37800	2575	26.79	18.30	8.49	≤13	PASS
		38000	2595	26.69	17.78	8.91	≤13	PASS



	15	38200	2615	26.56	17.64	8.92	≤13	PASS
		37825	2577.5	27.16	18.04	9.12	≤13	PASS
		38000	2595	27.07	18.23	8.84	≤13	PASS
	20	38175	2612.5	27.08	17.97	9.11	≤13	PASS
		37850	2580	26.65	16.93	9.72	≤13	PASS
		38000	2595	26.78	18.18	8.60	≤13	PASS
	16QAM	5	38150	2610	26.89	18.16	8.73	≤13
37775			2572.5	26.57	17.56	9.01	≤13	PASS
38000			2595	26.24	15.77	10.47	≤13	PASS
10		38225	2617.5	26.51	17.57	8.94	≤13	PASS
		37800	2575	26.59	16.53	10.06	≤13	PASS
		38000	2595	26.41	16.53	9.88	≤13	PASS
15		38200	2615	26.44	16.27	10.17	≤13	PASS
		37825	2577.5	26.95	17.82	9.13	≤13	PASS
		38000	2595	26.61	16.52	10.09	≤13	PASS
20	38175	2612.5	26.55	16.12	10.43	≤13	PASS	
	37850	2580	26.65	16.85	9.80	≤13	PASS	
	38000	2595	26.43	16.59	9.84	≤13	PASS	
64QAM	5	38150	2610	26.49	16.45	10.04	≤13	PASS
		37775	2572.5	26.31	18.25	8.06	≤13	PASS
		38000	2595	25.95	16.61	9.34	≤13	PASS
	10	38225	2617.5	25.86	16.47	9.39	≤13	PASS
		37800	2575	26.25	17.00	9.25	≤13	PASS
		38000	2595	26.11	16.84	9.27	≤13	PASS
	15	38200	2615	26.04	16.57	9.47	≤13	PASS
		37825	2577.5	26.34	16.60	9.74	≤13	PASS
		38000	2595	26.32	17.81	8.51	≤13	PASS
20	38175	2612.5	26.31	17.74	8.57	≤13	PASS	
	37850	2580	26.11	15.78	10.33	≤13	PASS	
	38000	2595	25.96	16.04	9.92	≤13	PASS	
		38150	2610	26.11	17.03	9.08	≤13	PASS



LTE Band 66								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	131979	1710.7	25.45	19.67	5.78	≤13	PASS
		132322	1745	25.95	20.18	5.77	≤13	PASS
		132665	1779.3	23.63	18.26	5.37	≤13	PASS
	3	131987	1711.5	23.99	18.56	5.43	≤13	PASS
		132322	1745	23.82	18.20	5.62	≤13	PASS
		132657	1778.5	23.78	18.39	5.39	≤13	PASS
	5	131997	1712.5	25.52	19.67	5.85	≤13	PASS
		132322	1745	25.82	20.05	5.77	≤13	PASS
		132647	1777.5	25.87	20.25	5.62	≤13	PASS
	10	132022	1715	25.54	19.64	5.90	≤13	PASS
		132322	1745	27.33	21.74	5.59	≤13	PASS
		132622	1775	27.10	21.66	5.44	≤13	PASS
	15	132047	1717.5	27.48	21.69	5.79	≤13	PASS
		132322	1745	27.53	21.58	5.95	≤13	PASS
		132597	1772.5	27.24	21.12	6.12	≤13	PASS
	20	132072	1720	25.40	19.62	5.78	≤13	PASS
		132322	1745	25.97	20.08	5.89	≤13	PASS
		132572	1770	25.48	19.70	5.78	≤13	PASS
16QAM	1.4	131979	1710.7	24.75	19.32	5.43	≤13	PASS
		132322	1745	23.69	17.23	6.46	≤13	PASS
		132665	1779.3	23.41	17.25	6.16	≤13	PASS
	3	131987	1711.5	23.81	17.52	6.29	≤13	PASS
		132322	1745	23.74	17.29	6.45	≤13	PASS
		132657	1778.5	23.60	17.42	6.18	≤13	PASS
	5	131997	1712.5	24.85	19.55	5.30	≤13	PASS
		132322	1745	24.99	19.10	5.89	≤13	PASS
		132647	1777.5	24.61	19.19	5.42	≤13	PASS
	10	132022	1715	24.79	19.34	5.45	≤13	PASS
		132322	1745	27.46	21.17	6.29	≤13	PASS
		132622	1775	27.01	20.79	6.22	≤13	PASS
	15	132047	1717.5	27.12	20.74	6.38	≤13	PASS
		132322	1745	27.57	21.21	6.36	≤13	PASS
		132597	1772.5	24.79	19.15	5.64	≤13	PASS
	20	132072	1720	24.97	19.18	5.79	≤13	PASS
		132322	1745	25.58	19.61	5.97	≤13	PASS
		132572	1770	25.05	19.32	5.73	≤13	PASS



64QAM	1.4	131979	1710.7	24.03	18.72	5.31	≤13	PASS
		132322	1745	24.49	18.76	5.73	≤13	PASS
		132665	1779.3	23.94	18.62	5.32	≤13	PASS
	3	131987	1711.5	24.23	18.91	5.32	≤13	PASS
		132322	1745	24.51	18.74	5.77	≤13	PASS
		132657	1778.5	25.77	19.23	6.54	≤13	PASS
	5	131997	1712.5	26.35	20.11	6.24	≤13	PASS
		132322	1745	26.73	20.46	6.27	≤13	PASS
		132647	1777.5	26.56	20.58	5.98	≤13	PASS
	10	132022	1715	26.42	20.10	6.32	≤13	PASS
		132322	1745	26.91	20.60	6.31	≤13	PASS
		132622	1775	26.33	20.12	6.21	≤13	PASS
	15	132047	1717.5	26.57	20.20	6.37	≤13	PASS
		132322	1745	24.76	18.87	5.89	≤13	PASS
		132597	1772.5	24.19	18.53	5.66	≤13	PASS
	20	132072	1720	24.40	18.59	5.81	≤13	PASS
		132322	1745	25.03	19.15	5.88	≤13	PASS
		132572	1770	24.44	18.69	5.75	≤13	PASS

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.

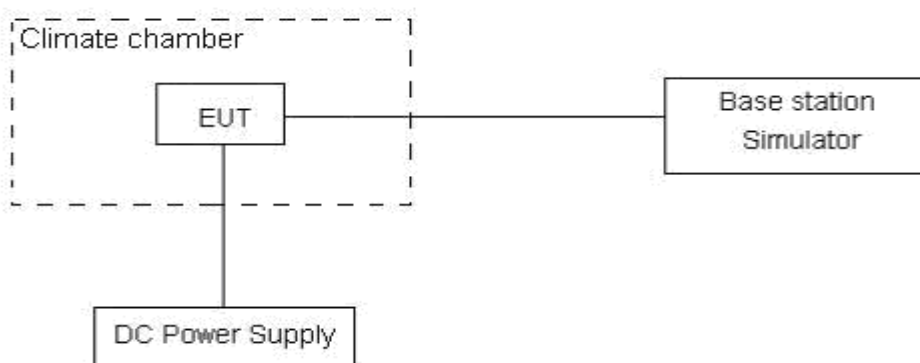
Frequency Stability (Voltage Variation)

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 3.4 V and 4.35 V, with a nominal voltage of 3.8V.

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°C)	Normal	2.71	3.13	0.00156	0.00181	PASS
Extreme (50°C)		7.35	12.43	0.00424	0.00718	PASS
Extreme (40°C)		8.70	15.69	0.00502	0.00905	PASS
Extreme (30°C)		8.36	14.63	0.00483	0.00845	PASS
Extreme (20°C)		2.59	10.60	0.00150	0.00612	PASS
Extreme (10°C)		8.00	1.42	0.00462	0.00082	PASS
Extreme (0°C)		11.62	3.79	0.00670	0.00219	PASS
Extreme (-10°C)		12.39	4.59	0.00715	0.00265	PASS
Extreme (-20°C)		11.87	13.38	0.00685	0.00772	PASS
Extreme (-30°C)		11.09	7.59	0.00640	0.00438	PASS
25°C	LV	17.59	17.31	0.01015	0.00999	PASS
	HV	9.57	17.72	0.00552	0.01023	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	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	10.37	6.68	4.85	0.00599	0.00386	0.00280	PASS
Extreme (50°C)		7.91	14.57	13.56	0.00456	0.00841	0.00783	PASS
Extreme (40°C)		13.61	8.03	14.62	0.00786	0.00463	0.00844	PASS
Extreme (30°C)		3.18	6.12	14.77	0.00184	0.00353	0.00853	PASS
Extreme (20°C)		1.10	7.59	17.81	0.00064	0.00438	0.01028	PASS
Extreme (10°C)		9.44	1.53	16.78	0.00545	0.00089	0.00969	PASS
Extreme (0°C)		6.95	12.73	12.84	0.00401	0.00735	0.00741	PASS
Extreme (-10°C)		15.45	2.07	1.48	0.00892	0.00119	0.00085	PASS
Extreme (-20°C)		8.09	13.18	15.29	0.00467	0.00761	0.00883	PASS
Extreme (-30°C)		11.13	1.40	4.34	0.00642	0.00081	0.00251	PASS
25°C	LV	11.69	12.28	12.99	0.00675	0.00709	0.00750	PASS
	HV	6.65	10.57	2.62	0.00384	0.00610	0.00151	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°C)	Normal	15.00	6.20	9.14	0.00866	0.00358	0.00528	PASS
Extreme (50°C)		6.40	15.70	3.63	0.00369	0.00906	0.00210	PASS
Extreme (40°C)		5.21	6.23	6.83	0.00301	0.00359	0.00394	PASS
Extreme (30°C)		10.23	10.43	5.15	0.00591	0.00602	0.00297	PASS
Extreme (20°C)		6.18	14.62	5.04	0.00357	0.00844	0.00291	PASS
Extreme (10°C)		17.78	15.03	9.53	0.01026	0.00868	0.00550	PASS
Extreme (0°C)		4.11	8.45	7.31	0.00237	0.00488	0.00422	PASS
Extreme (-10°C)		1.84	14.32	12.52	0.00106	0.00827	0.00723	PASS
Extreme (-20°C)		11.68	17.46	1.58	0.00674	0.01008	0.00091	PASS
Extreme (-30°C)		2.74	10.33	13.77	0.00158	0.00596	0.00795	PASS
25°C	LV	17.09	7.68	6.35	0.00986	0.00443	0.00366	PASS
	HV	16.11	15.66	12.08	0.00930	0.00904	0.00697	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°C)	Normal	16.96	3.46	8.66	0.00979	0.00200	0.00500	PASS
Extreme (50°C)		15.35	7.60	8.84	0.00886	0.00439	0.00510	PASS
Extreme (40°C)		11.73	8.26	2.90	0.00677	0.00477	0.00167	PASS
Extreme (30°C)		6.94	9.87	16.85	0.00400	0.00570	0.00973	PASS
Extreme (20°C)		12.77	5.92	9.67	0.00737	0.00342	0.00558	PASS
Extreme (10°C)		15.14	13.34	9.84	0.00874	0.00770	0.00568	PASS
Extreme (0°C)		2.61	16.41	8.78	0.00150	0.00947	0.00506	PASS
Extreme (-10°C)		14.12	2.41	2.63	0.00815	0.00139	0.00152	PASS
Extreme (-20°C)		15.51	7.85	12.55	0.00895	0.00453	0.00724	PASS
Extreme (-30°C)		9.69	9.68	13.77	0.00559	0.00559	0.00795	PASS
25°C	LV	12.71	2.83	12.07	0.00734	0.00163	0.00696	PASS
	HV	3.13	12.65	14.64	0.00181	0.00730	0.00845	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°C)	Normal	9.03	10.87	8.62	0.00521	0.00627	0.00497	PASS
Extreme (50°C)		7.79	8.58	1.51	0.00450	0.00495	0.00087	PASS
Extreme (40°C)		15.53	3.06	14.57	0.00897	0.00177	0.00841	PASS
Extreme (30°C)		9.29	4.51	14.55	0.00536	0.00260	0.00840	PASS
Extreme (20°C)		1.78	14.72	16.37	0.00103	0.00850	0.00945	PASS



Extreme (10°C)		12.85	10.04	14.65	0.00742	0.00580	0.00846	PASS
Extreme (0°C)		6.40	6.73	1.22	0.00369	0.00388	0.00071	PASS
Extreme (-10°C)		12.96	11.82	14.27	0.00748	0.00682	0.00823	PASS
Extreme (-20°C)		5.71	2.90	10.85	0.00329	0.00167	0.00626	PASS
Extreme (-30°C)		5.67	11.92	14.19	0.00327	0.00688	0.00819	PASS
25°C	LV	1.98	12.54	5.97	0.00114	0.00724	0.00345	PASS
	HV	11.52	1.51	6.37	0.00665	0.00087	0.00368	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°C)	Normal	12.85	12.45	10.64	0.00742	0.00718	0.00614	PASS
Extreme (50°C)		13.81	5.42	14.96	0.00797	0.00313	0.00863	PASS
Extreme (40°C)		2.14	7.85	3.23	0.00123	0.00453	0.00186	PASS
Extreme (30°C)		9.63	1.41	1.59	0.00556	0.00081	0.00092	PASS
Extreme (20°C)		6.58	15.21	2.36	0.00380	0.00878	0.00136	PASS
Extreme (10°C)		7.96	3.68	8.25	0.00460	0.00212	0.00476	PASS
Extreme (0°C)		1.74	9.85	15.17	0.00100	0.00569	0.00876	PASS
Extreme (-10°C)		15.07	11.61	5.47	0.00870	0.00670	0.00316	PASS
Extreme (-20°C)		17.47	15.35	11.30	0.01009	0.00886	0.00652	PASS
Extreme (-30°C)		5.21	15.39	4.76	0.00301	0.00888	0.00275	PASS
25°C	LV	9.83	4.95	6.39	0.00568	0.00286	0.00369	PASS
	HV	15.09	15.69	13.70	0.00871	0.00906	0.00791	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°C)	Normal	17.26	16.77	1.80	0.00996	0.00968	0.00104	PASS
Extreme (50°C)		1.25	14.81	13.41	0.00072	0.00855	0.00774	PASS
Extreme (40°C)		15.93	16.91	4.58	0.00920	0.00976	0.00264	PASS
Extreme (30°C)		11.26	2.71	1.88	0.00650	0.00156	0.00109	PASS
Extreme (20°C)		1.28	5.22	14.73	0.00074	0.00301	0.00850	PASS
Extreme (10°C)		11.70	1.58	6.11	0.00675	0.00091	0.00352	PASS
Extreme (0°C)		16.69	4.27	7.86	0.00963	0.00247	0.00453	PASS
Extreme (-10°C)		9.95	4.37	5.50	0.00574	0.00252	0.00317	PASS
Extreme (-20°C)		10.70	5.72	8.35	0.00617	0.00330	0.00482	PASS
Extreme (-30°C)		15.95	5.68	15.18	0.00921	0.00328	0.00876	PASS
25°C	LV	15.42	16.40	10.70	0.00890	0.00946	0.00618	PASS
	HV	15.67	17.29	15.56	0.00904	0.00998	0.00898	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°C)	Normal	13.00	13.94	9.68	0.00513	0.00550	0.00382	PASS
Extreme (50°C)		12.27	3.43	3.48	0.00484	0.00135	0.00137	PASS
Extreme (40°C)		6.30	5.81	10.67	0.00248	0.00229	0.00421	PASS
Extreme (30°C)		6.18	14.34	11.76	0.00244	0.00566	0.00464	PASS
Extreme (20°C)		8.46	8.23	1.12	0.00334	0.00325	0.00044	PASS
Extreme (10°C)		1.95	2.62	8.13	0.00077	0.00103	0.00321	PASS
Extreme (0°C)		1.64	11.42	1.50	0.00065	0.00450	0.00059	PASS
Extreme (-10°C)		16.50	15.61	7.94	0.00651	0.00616	0.00313	PASS
Extreme (-20°C)		14.30	7.68	17.62	0.00564	0.00303	0.00695	PASS
Extreme (-30°C)		8.80	14.82	13.36	0.00347	0.00585	0.00527	PASS
25°C	LV	17.37	13.77	2.46	0.00685	0.00543	0.00097	PASS
	HV	17.41	3.04	16.95	0.00687	0.00120	0.00669	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°C)	Normal	16.89	4.82	14.01	0.00666	0.00190	0.00553	PASS
Extreme (50°C)		13.06	4.84	9.93	0.00515	0.00191	0.00392	PASS
Extreme (40°C)		16.52	15.88	7.94	0.00652	0.00626	0.00313	PASS
Extreme (30°C)		8.33	14.30	6.33	0.00328	0.00564	0.00250	PASS
Extreme (20°C)		14.19	7.31	16.68	0.00560	0.00288	0.00658	PASS
Extreme (10°C)		5.13	13.44	6.56	0.00203	0.00530	0.00259	PASS
Extreme (0°C)		5.27	2.85	9.71	0.00208	0.00112	0.00383	PASS
Extreme (-10°C)		17.36	16.00	10.21	0.00685	0.00631	0.00403	PASS
Extreme (-20°C)		12.38	10.12	3.52	0.00488	0.00399	0.00139	PASS
Extreme (-30°C)		12.00	13.70	10.17	0.00473	0.00540	0.00401	PASS
25°C	LV	6.11	17.29	8.49	0.00241	0.00682	0.00335	PASS
	HV	11.15	13.63	2.59	0.00440	0.00538	0.00102	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°C)	Normal	3.17	7.59	6.39	0.00125	0.00299	0.00252	PASS
Extreme (50°C)		9.52	2.19	2.15	0.00376	0.00086	0.00085	PASS
Extreme (40°C)		12.54	15.49	15.77	0.00495	0.00611	0.00622	PASS
Extreme (30°C)		8.60	4.21	17.71	0.00339	0.00166	0.00699	PASS



Extreme (20°C)		4.46	1.36	8.92	0.00176	0.00054	0.00352	PASS
Extreme (10°C)		15.54	17.01	17.55	0.00613	0.00671	0.00692	PASS
Extreme (0°C)		6.35	8.00	8.36	0.00251	0.00315	0.00330	PASS
Extreme (-10°C)		12.22	9.07	7.33	0.00482	0.00358	0.00289	PASS
Extreme (-20°C)		15.35	12.69	4.24	0.00605	0.00501	0.00167	PASS
Extreme (-30°C)		17.62	5.09	17.96	0.00695	0.00201	0.00708	PASS
25°C	LV	15.29	16.86	12.55	0.00603	0.00665	0.00495	PASS
	HV	12.27	4.33	7.44	0.00484	0.00171	0.00293	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°C)	Normal	16.44	11.78	11.52	0.00648	0.00465	0.00455	PASS
Extreme (50°C)		17.72	16.70	10.38	0.00699	0.00659	0.00410	PASS
Extreme (40°C)		1.55	12.40	4.35	0.00061	0.00489	0.00172	PASS
Extreme (30°C)		9.04	8.12	13.78	0.00356	0.00320	0.00544	PASS
Extreme (20°C)		8.06	9.28	10.55	0.00318	0.00366	0.00416	PASS
Extreme (10°C)		14.98	16.98	9.72	0.00591	0.00670	0.00383	PASS
Extreme (0°C)		17.80	17.54	3.98	0.00702	0.00692	0.00157	PASS
Extreme (-10°C)		6.54	11.66	17.92	0.00258	0.00460	0.00707	PASS
Extreme (-20°C)		15.58	14.02	5.24	0.00615	0.00553	0.00207	PASS
Extreme (-30°C)		10.81	6.02	7.46	0.00426	0.00237	0.00294	PASS
25°C	LV	2.80	13.70	7.47	0.00111	0.00540	0.00295	PASS
	HV	12.85	12.80	17.84	0.00507	0.00505	0.00704	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°C)	Normal	14.65	7.27	6.66	0.00564	0.00280	0.00257	PASS
Extreme (50°C)		4.09	11.87	15.99	0.00158	0.00457	0.00616	PASS
Extreme (40°C)		8.60	7.42	14.49	0.00332	0.00286	0.00558	PASS
Extreme (30°C)		17.33	1.44	12.75	0.00668	0.00055	0.00491	PASS
Extreme (20°C)		4.94	17.28	7.56	0.00190	0.00666	0.00292	PASS
Extreme (10°C)		8.85	1.53	8.59	0.00341	0.00059	0.00331	PASS
Extreme (0°C)		2.54	15.10	6.88	0.00098	0.00582	0.00265	PASS
Extreme (-10°C)		7.59	13.96	8.48	0.00292	0.00538	0.00327	PASS
Extreme (-20°C)		1.94	14.59	2.92	0.00075	0.00562	0.00112	PASS
Extreme (-30°C)		10.47	1.29	13.08	0.00403	0.00050	0.00504	PASS
25°C	LV	12.11	11.01	2.38	0.00467	0.00424	0.00092	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°C)	Normal	3.48	4.47	3.30	0.00134	0.00172	0.00127	PASS
Extreme (50°C)		10.34	12.42	5.87	0.00398	0.00479	0.00226	PASS
Extreme (40°C)		4.14	9.85	14.26	0.00160	0.00380	0.00550	PASS
Extreme (30°C)		3.17	9.61	1.25	0.00122	0.00370	0.00048	PASS
Extreme (20°C)		8.72	16.73	2.79	0.00336	0.00645	0.00107	PASS
Extreme (10°C)		6.52	8.82	17.99	0.00251	0.00340	0.00693	PASS
Extreme (0°C)		5.31	1.14	1.07	0.00205	0.00044	0.00041	PASS
Extreme (-10°C)		11.00	6.74	1.65	0.00424	0.00260	0.00064	PASS
Extreme (-20°C)		15.80	13.82	13.93	0.00609	0.00533	0.00537	PASS
Extreme (-30°C)		10.60	16.38	7.42	0.00408	0.00631	0.00286	PASS
25°C	LV	1.78	9.61	10.89	0.00068	0.00370	0.00420	PASS
	HV	9.64	14.19	12.96	0.00371	0.00547	0.00499	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°C)	Normal	13.00	15.00	5.00	0.00501	0.00578	0.00193	PASS
Extreme (50°C)		3.00	4.00	16.00	0.00116	0.00154	0.00617	PASS
Extreme (40°C)		14.00	10.00	10.00	0.00539	0.00385	0.00385	PASS
Extreme (30°C)		14.00	3.00	13.00	0.00539	0.00116	0.00501	PASS
Extreme (20°C)		2.00	16.00	4.00	0.00077	0.00617	0.00154	PASS
Extreme (10°C)		4.00	4.00	5.00	0.00154	0.00154	0.00193	PASS
Extreme (0°C)		11.00	15.00	3.00	0.00424	0.00578	0.00116	PASS
Extreme (-10°C)		11.00	8.00	8.00	0.00424	0.00308	0.00308	PASS
Extreme (-20°C)		3.00	13.00	17.00	0.00116	0.00501	0.00655	PASS
Extreme (-30°C)		1.00	7.00	1.00	0.00039	0.00270	0.00039	PASS
25°C	LV	14.00	17.00	12.00	0.00539	0.00655	0.00462	PASS
	HV	2.00	7.00	15.00	0.00077	0.00270	0.00578	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°C)	Normal	11.00	11.00	8.00	0.00424	0.00424	0.00308	PASS
Extreme (50°C)		5.00	5.00	14.00	0.00193	0.00193	0.00539	PASS
Extreme (40°C)		2.00	12.00	12.00	0.00077	0.00462	0.00462	PASS
Extreme (30°C)		14.00	10.00	2.00	0.00539	0.00385	0.00077	PASS



Extreme (20°C)		12.00	5.00	4.00	0.00462	0.00193	0.00154	PASS
Extreme (10°C)		2.00	16.00	15.00	0.00077	0.00617	0.00578	PASS
Extreme (0°C)		9.00	13.00	7.00	0.00347	0.00501	0.00270	PASS
Extreme (-10°C)		3.00	1.00	9.00	0.00116	0.00039	0.00347	PASS
Extreme (-20°C)		10.00	9.00	11.00	0.00385	0.00347	0.00424	PASS
Extreme (-30°C)		14.00	5.00	14.00	0.00539	0.00193	0.00539	PASS
25°C	LV	6.00	9.00	1.00	0.00231	0.00347	0.00039	PASS
	HV	8.00	6.00	8.00	0.00308	0.00231	0.00308	PASS

LTE Band 66								
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°C)	Normal	7.00	6.00	1.00	0.00401	0.00344	0.00057	PASS
Extreme (50°C)		14.00	9.00	15.00	0.00802	0.00516	0.00860	PASS
Extreme (40°C)		12.00	14.00	10.00	0.00688	0.00802	0.00573	PASS
Extreme (30°C)		1.00	7.00	6.00	0.00057	0.00401	0.00344	PASS
Extreme (20°C)		9.00	3.00	4.00	0.00516	0.00172	0.00229	PASS
Extreme (10°C)		7.00	15.00	2.00	0.00401	0.00860	0.00115	PASS
Extreme (0°C)		12.00	6.00	14.00	0.00688	0.00344	0.00802	PASS
Extreme (-10°C)		1.00	16.00	14.00	0.00057	0.00917	0.00802	PASS
Extreme (-20°C)		6.00	4.00	1.00	0.00344	0.00229	0.00057	PASS
Extreme (-30°C)		3.00	9.00	6.00	0.00172	0.00516	0.00344	PASS
25°C		LV	3.00	7.00	5.00	0.00172	0.00401	0.00287
	HV	1.00	14.00	1.00	0.00057	0.00802	0.00057	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°C)	Normal	7.00	10.00	6.00	0.00401	0.00573	0.00344	PASS
Extreme (50°C)		2.00	10.00	15.00	0.00115	0.00573	0.00860	PASS
Extreme (40°C)		3.00	14.00	1.00	0.00172	0.00802	0.00057	PASS
Extreme (30°C)		9.00	17.00	1.00	0.00516	0.00974	0.00057	PASS
Extreme (20°C)		16.00	7.00	8.00	0.00917	0.00401	0.00458	PASS
Extreme (10°C)		7.00	10.00	17.00	0.00401	0.00573	0.00974	PASS
Extreme (0°C)		7.00	16.00	5.00	0.00401	0.00917	0.00287	PASS
Extreme (-10°C)		5.00	10.00	11.00	0.00287	0.00573	0.00630	PASS
Extreme (-20°C)		17.00	3.00	12.00	0.00974	0.00172	0.00688	PASS
Extreme (-30°C)		13.00	12.00	4.00	0.00745	0.00688	0.00229	PASS
25°C		LV	6.00	9.00	3.00	0.00344	0.00516	0.00172
	HV	5.00	5.00	17.00	0.00287	0.00287	0.00974	PASS
Condition		Freq.Error	Freq.Error	Freq.Error	Frequency	Frequency	Frequency	Verdict



		(Hz)	(Hz)	(Hz)	Stability (ppm)	Stability (ppm)	Stability (ppm)	
BANDWIDTH	5MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	1.00	9.00	5.00	0.00057	0.00516	0.00287	PASS
Extreme (50°C)		16.00	12.00	9.00	0.00917	0.00688	0.00516	PASS
Extreme (40°C)		11.00	9.00	5.00	0.00630	0.00516	0.00287	PASS
Extreme (30°C)		10.00	3.00	16.00	0.00573	0.00172	0.00917	PASS
Extreme (20°C)		12.00	10.00	16.00	0.00688	0.00573	0.00917	PASS
Extreme (10°C)		16.00	7.00	11.00	0.00917	0.00401	0.00630	PASS
Extreme (0°C)		3.00	16.00	2.00	0.00172	0.00917	0.00115	PASS
Extreme (-10°C)		14.00	10.00	10.00	0.00802	0.00573	0.00573	PASS
Extreme (-20°C)		14.00	17.00	6.00	0.00802	0.00974	0.00344	PASS
Extreme (-30°C)		11.00	1.00	13.00	0.00630	0.00057	0.00745	PASS
25°C		LV	5.00	14.00	7.00	0.00287	0.00802	0.00401
	HV	8.00	17.00	14.00	0.00458	0.00974	0.00802	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°C)	Normal	5.00	4.00	2.00	0.00287	0.00229	0.00115	PASS
Extreme (50°C)		3.00	4.00	7.00	0.00172	0.00229	0.00401	PASS
Extreme (40°C)		12.00	12.00	5.00	0.00688	0.00688	0.00287	PASS
Extreme (30°C)		10.00	16.00	4.00	0.00573	0.00917	0.00229	PASS
Extreme (20°C)		16.00	7.00	2.00	0.00917	0.00401	0.00115	PASS
Extreme (10°C)		3.00	7.00	9.00	0.00172	0.00401	0.00516	PASS
Extreme (0°C)		10.00	15.00	2.00	0.00573	0.00860	0.00115	PASS
Extreme (-10°C)		5.00	9.00	14.00	0.00287	0.00516	0.00802	PASS
Extreme (-20°C)		7.00	13.00	3.00	0.00401	0.00745	0.00172	PASS
Extreme (-30°C)		11.00	16.00	17.00	0.00630	0.00917	0.00974	PASS
25°C		LV	2.00	1.00	1.00	0.00115	0.00057	0.00057
	HV	11.00	7.00	17.00	0.00630	0.00401	0.00974	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°C)	Normal	8.00	10.00	3.00	0.00458	0.00573	0.00172	PASS
Extreme (50°C)		7.00	2.00	10.00	0.00401	0.00115	0.00573	PASS
Extreme (40°C)		12.00	15.00	15.00	0.00688	0.00860	0.00860	PASS
Extreme (30°C)		7.00	10.00	16.00	0.00401	0.00573	0.00917	PASS
Extreme (20°C)		7.00	4.00	11.00	0.00401	0.00229	0.00630	PASS
Extreme (10°C)		3.00	7.00	2.00	0.00172	0.00401	0.00115	PASS
Extreme (0°C)		10.00	2.00	7.00	0.00573	0.00115	0.00401	PASS
Extreme (-10°C)		16.00	7.00	7.00	0.00917	0.00401	0.00401	PASS



Extreme (-20°C)		12.00	6.00	2.00	0.00688	0.00344	0.00115	PASS
Extreme (-30°C)		3.00	13.00	8.00	0.00172	0.00745	0.00458	PASS
25°C	LV	17.00	6.00	4.00	0.00974	0.00344	0.00229	PASS
	HV	5.00	1.00	5.00	0.00287	0.00057	0.00287	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°C)	Normal	17.00	9.00	1.00	0.00974	0.00516	0.00057	PASS
Extreme (50°C)		10.00	6.00	6.00	0.00573	0.00344	0.00344	PASS
Extreme (40°C)		3.00	4.00	16.00	0.00172	0.00229	0.00917	PASS
Extreme (30°C)		15.00	4.00	4.00	0.00860	0.00229	0.00229	PASS
Extreme (20°C)		15.00	1.00	6.00	0.00860	0.00057	0.00344	PASS
Extreme (10°C)		15.00	6.00	5.00	0.00860	0.00344	0.00287	PASS
Extreme (0°C)		12.00	11.00	15.00	0.00688	0.00630	0.00860	PASS
Extreme (-10°C)		7.00	5.00	3.00	0.00401	0.00287	0.00172	PASS
Extreme (-20°C)		13.00	3.00	16.00	0.00745	0.00172	0.00917	PASS
Extreme (-30°C)		3.00	4.00	17.00	0.00172	0.00229	0.00974	PASS
25°C	LV	11.00	17.00	10.00	0.00630	0.00974	0.00573	PASS
	HV	15.00	11.00	3.00	0.00860	0.00630	0.00172	PASS

5.6 Spurious Emissions at Antenna Terminals

Ambient condition

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

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 9kHz to the 10th harmonic of the carrier. The peak detector is used.

RBW is set to 100kHz, VBW is set to 300kHz for 30MHz~1GHz

RBW is set to 1MHz, VBW is set to 3MHz for above 1GHz, Sweep is set to ATUO.

RBW is set to 1 kHz (0.009MHz~ 0.15 MHz),

RBW is set to 10 kHz (0.15 MHz~ 30 MHz)

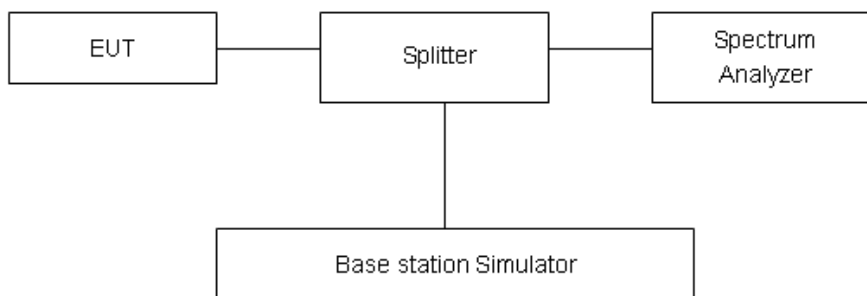
RBW is set to 100 kHz (30MHz~1000 MHz)

RBW is set to 1000 kHz (above 1000MHz)

Of those disturbances below (limit – 20 dB), the mark is not required for the EUT.

The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup



Limits

Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB..”

Rule Part 27.53(m) $55 + 10 \log(P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(4) of this section.

Part 27.53(m) Limit	-25 dBm
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**Measurement Uncertainty**

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-27GHz	1.407 dB

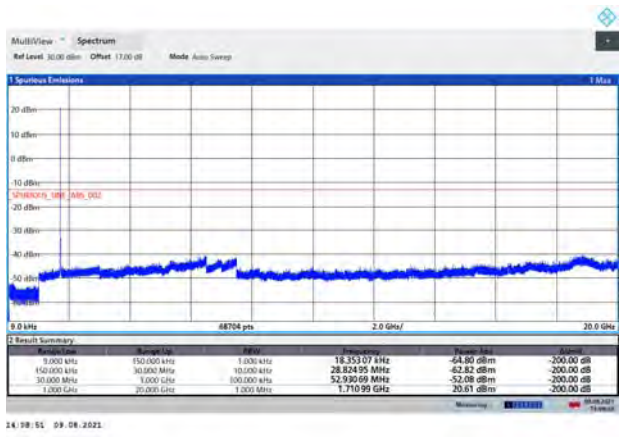


Test Result

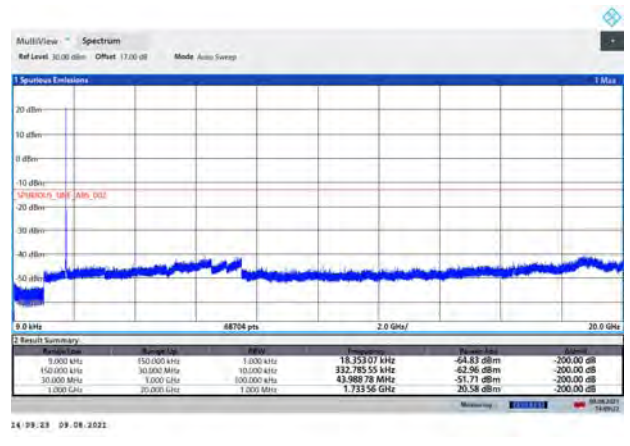
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

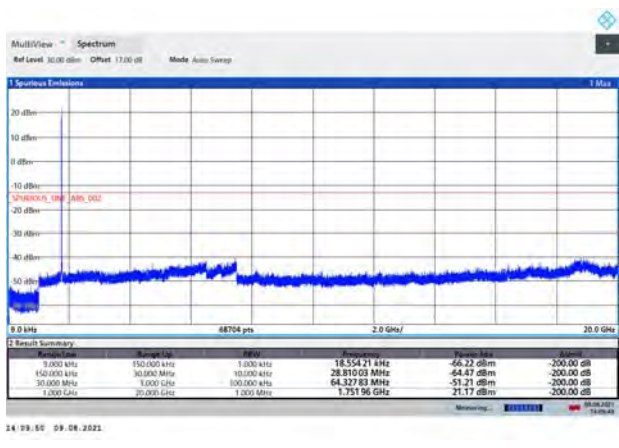
WCDMA Band IV CH-Low 9kHz~20GHz



WCDMA Band IV CH-Middle 9kHz~20GHz

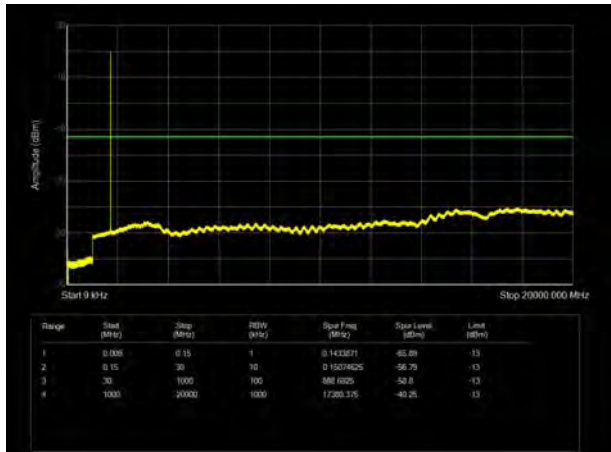


WCDMA Band IV CH-High 9kHz~20GHz

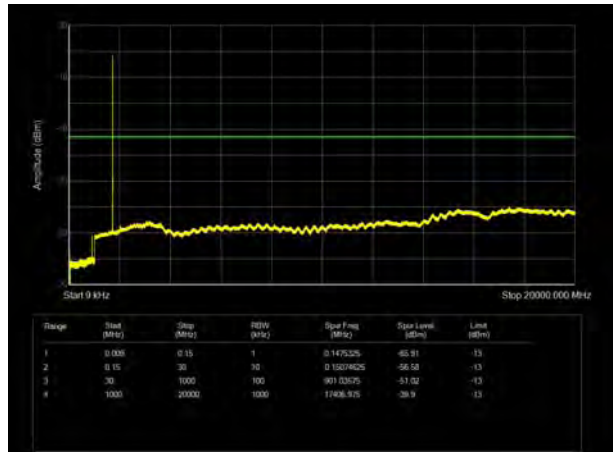




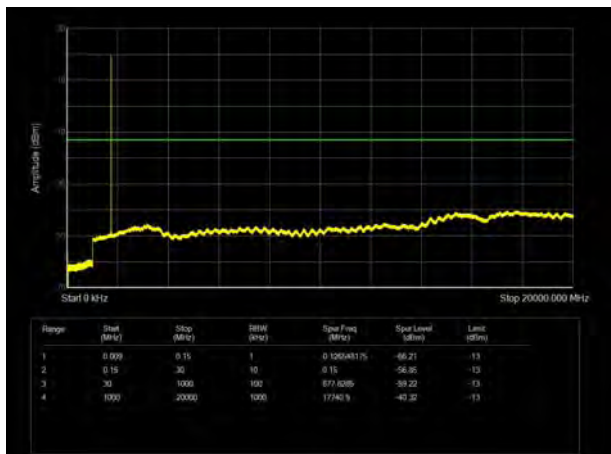
LTE Band 4 1.4MHz CH-Low 9kHz~20GHz



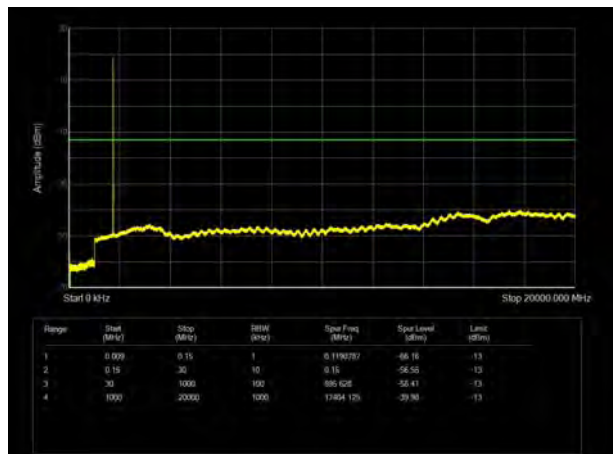
LTE Band 4 3MHz CH- Low 9kHz~20GHz



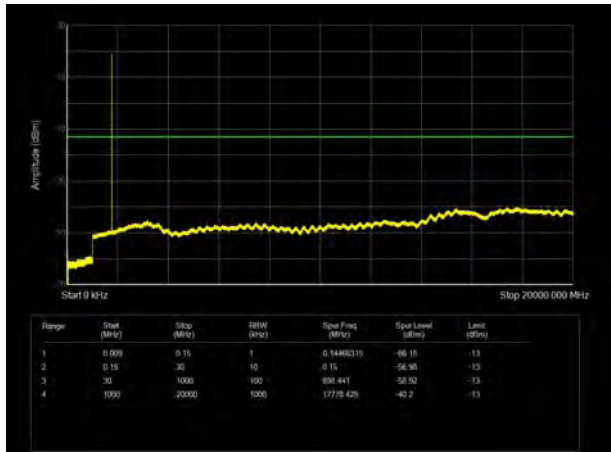
LTE Band 4 1.4MHz CH- Middle 9kHz~20GHz



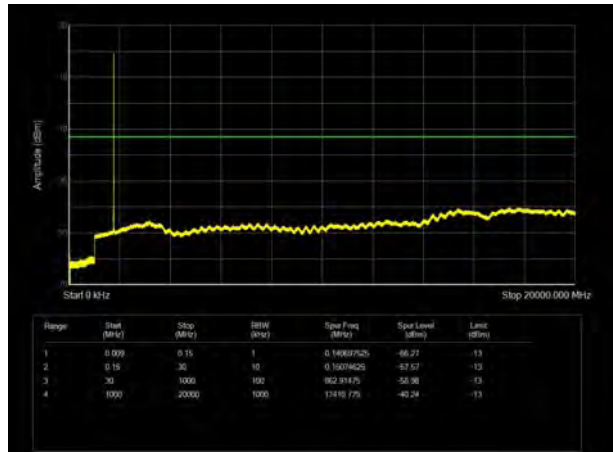
LTE Band 4 3MHz CH- Middle 9kHz~20GHz



LTE Band 4 1.4MHz CH- High 9kHz~20GHz

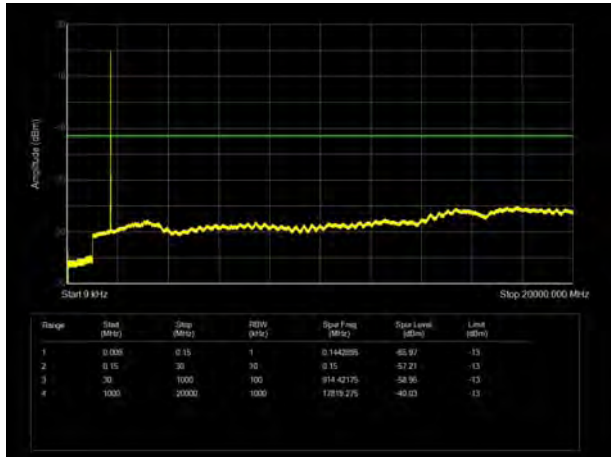


LTE Band 4 3MHz CH-High 9kHz~20GHz

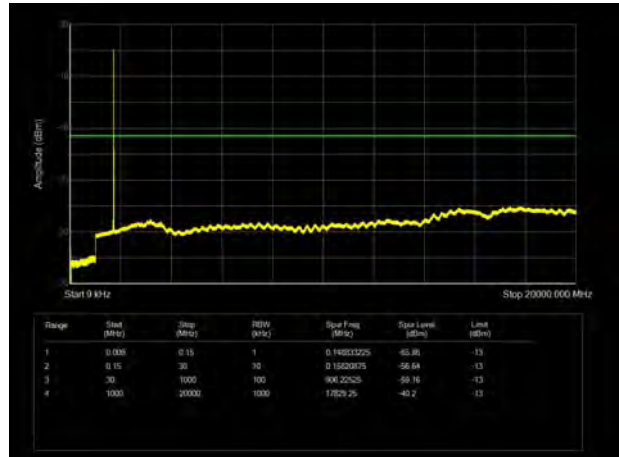




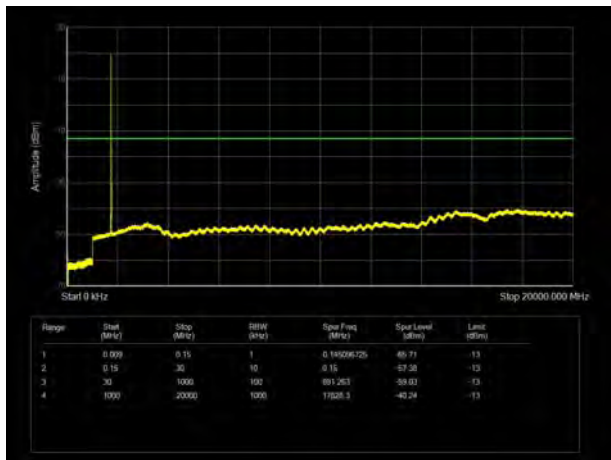
LTE Band 4 5MHz CH- Low 9kHz~20GHz



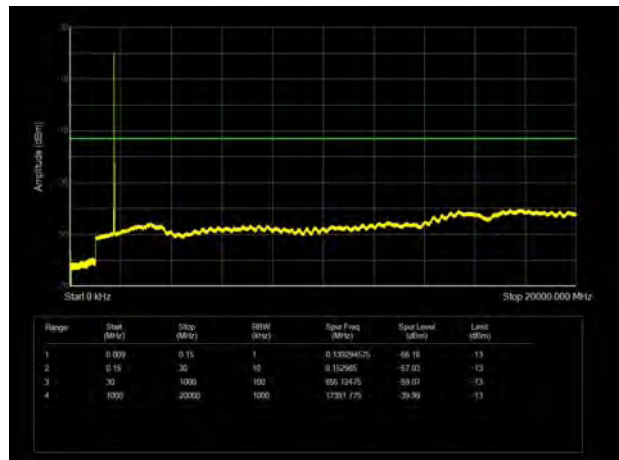
LTE Band 4 10MHz CH- Low 9kHz~20GHz



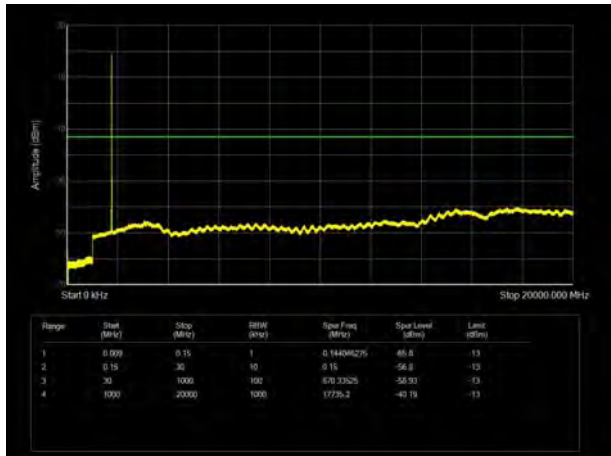
LTE Band 4 5MHz CH- Middle 9kHz~20GHz



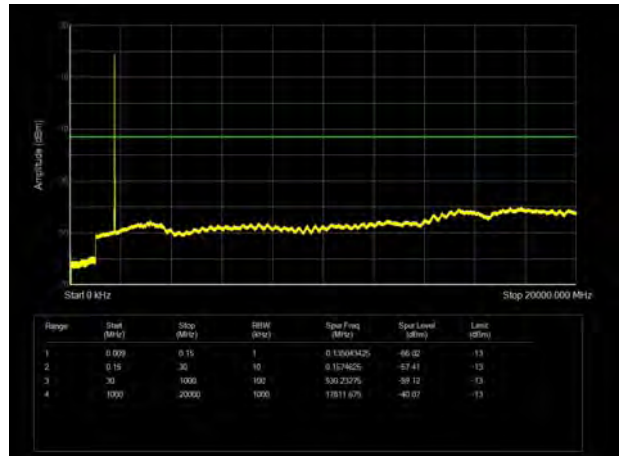
LTE Band 4 10MHz CH- Middle 9kHz~20GHz



LTE Band 4 5MHz CH-High 9kHz~20GHz

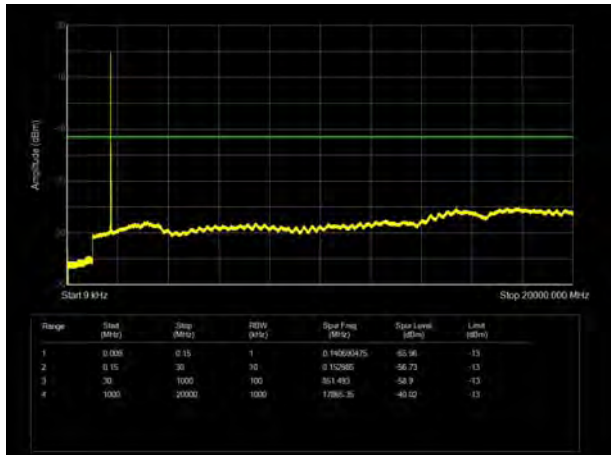


LTE Band 4 10MHz CH-High 9kHz~20GHz

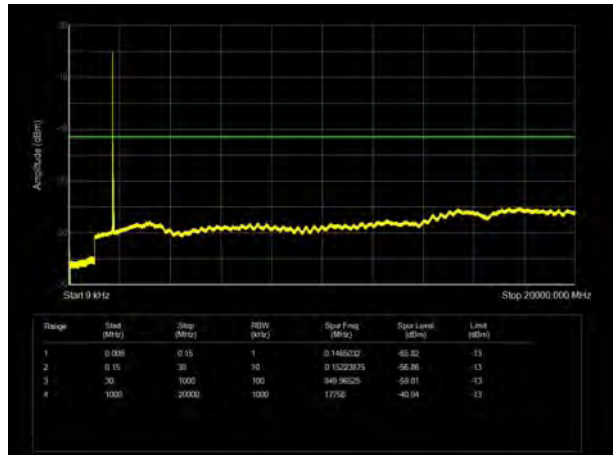




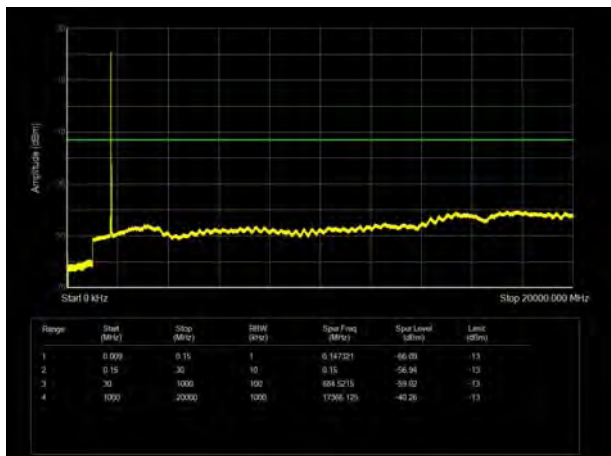
LTE Band 4 15MHz CH- Low 9kHz~20GHz



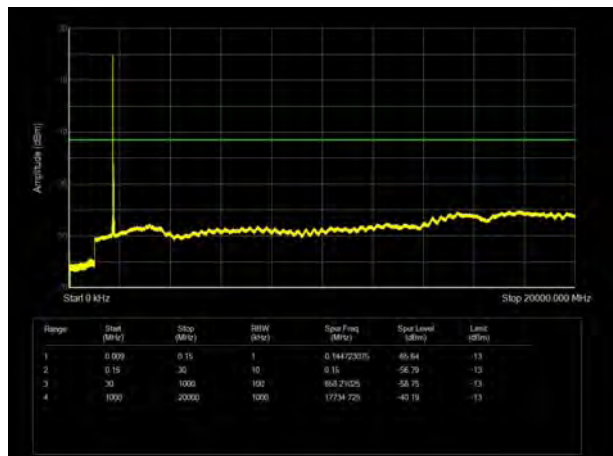
LTE Band 4 20MHz CH-Low 9kHz~20GHz



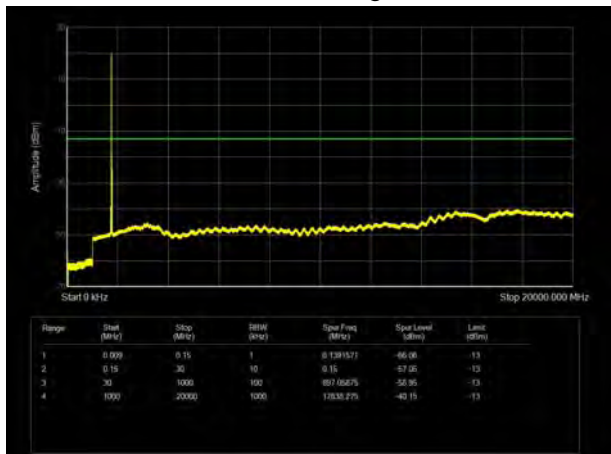
LTE Band 4 15MHz CH- Middle 9kHz~20GHz



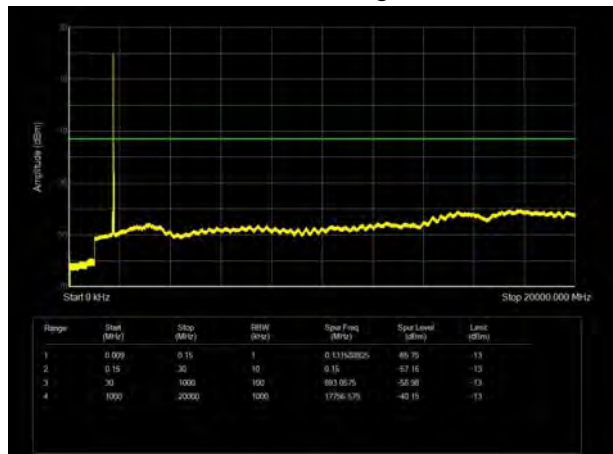
LTE Band 4 20MHz CH- Middle 9kHz~20GHz



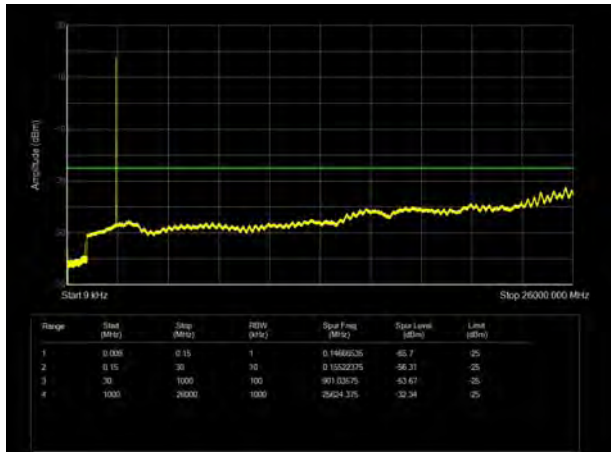
LTE Band 4 15MHz CH-High 9kHz~20GHz



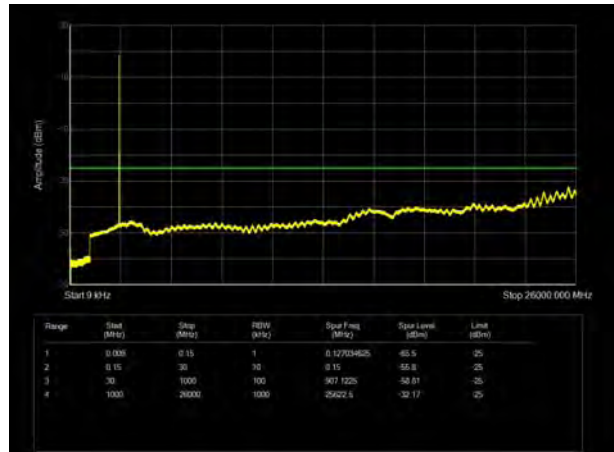
LTE Band 4 20MHz CH- High 9kHz~20GHz



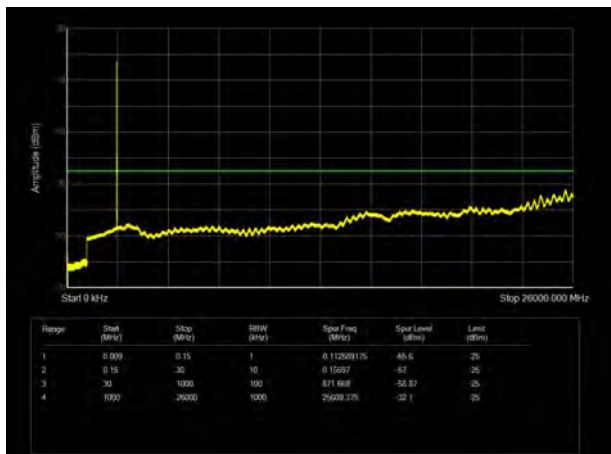
LTE Band 7 5MHz CH-Low 9kHz~26GHz



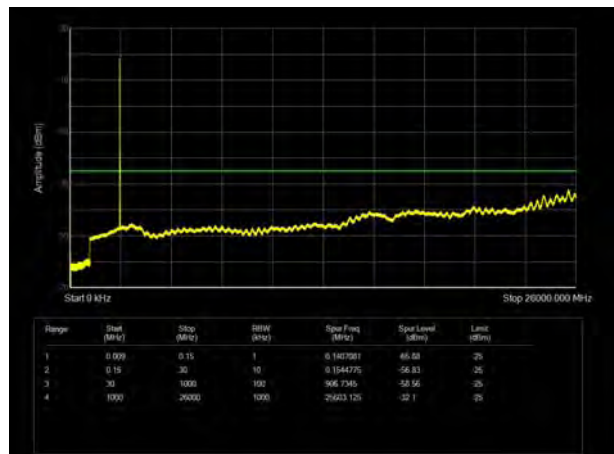
LTE Band 7 10MHz CH- Low 9kHz~26GHz



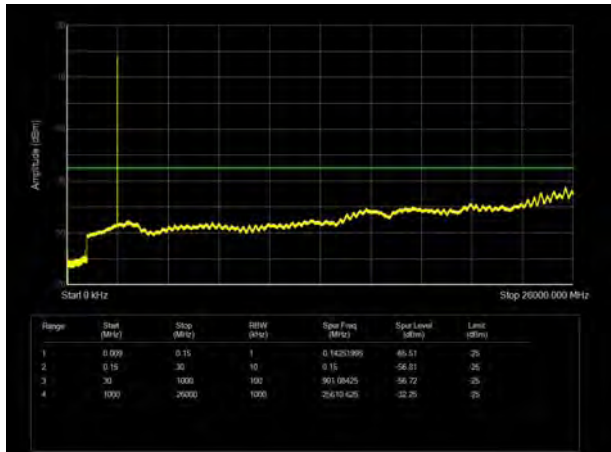
LTE Band 7 5MHz CH- Middle 9kHz~26GHz



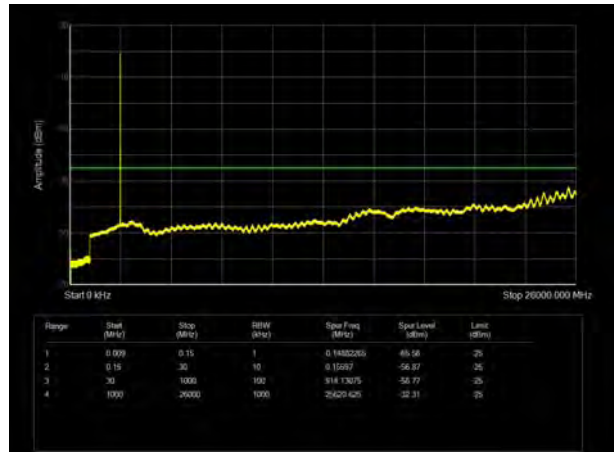
LTE Band 7 10MHz CH- Middle 9kHz~26GHz



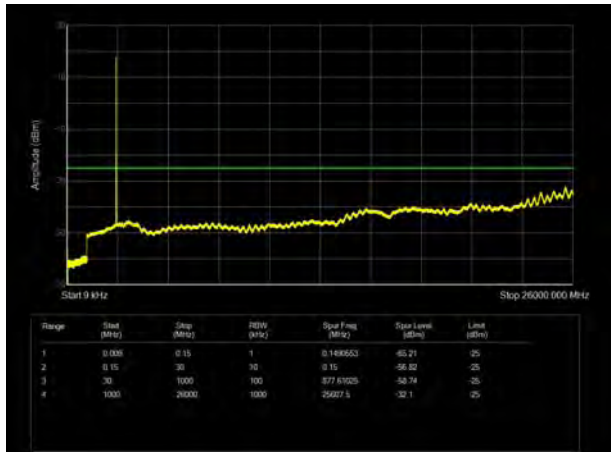
LTE Band 7 5MHz CH- High 9kHz~26GHz



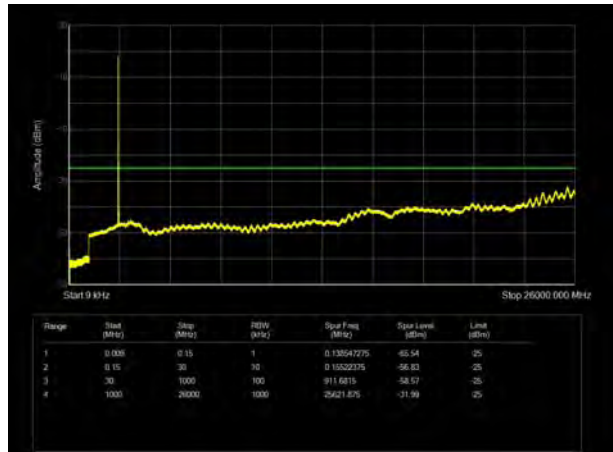
LTE Band 7 10MHz CH-High 9kHz~26GHz



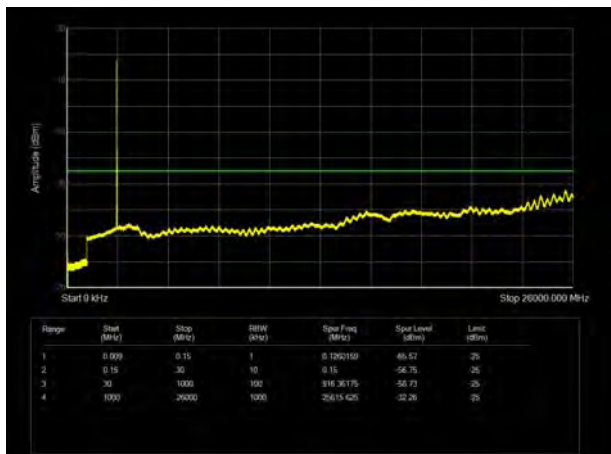
LTE Band 7 15MHz CH- Low 9kHz~26GHz



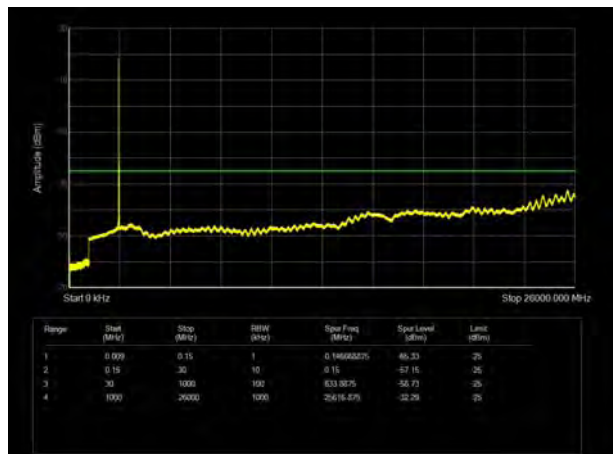
LTE Band 7 20MHz CH-Low 9kHz~26GHz



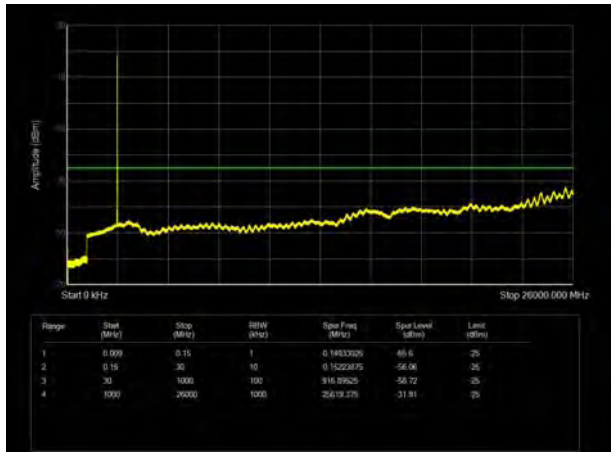
LTE Band 7 15MHz CH- Middle 9kHz~26GHz



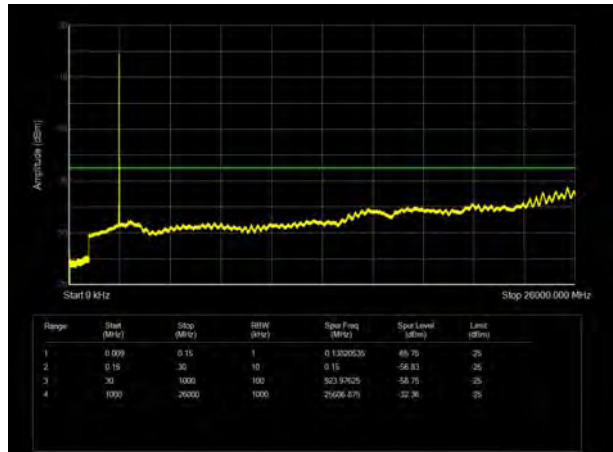
LTE Band 7 20MHz CH- Middle 9kHz~26GHz



LTE Band 7 15MHz CH-High 9kHz~26GHz

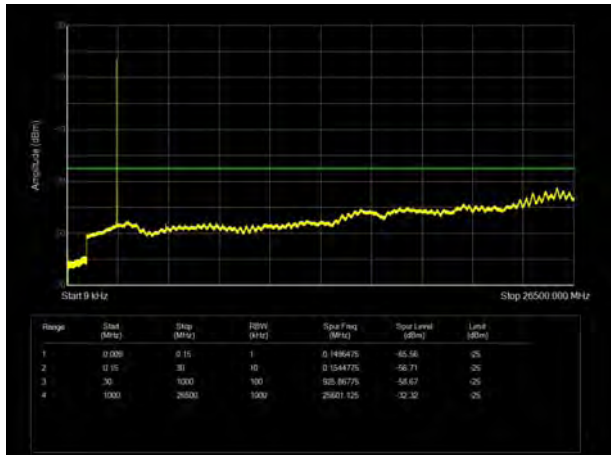


LTE Band 7 20MHz CH- High 9kHz~26GHz

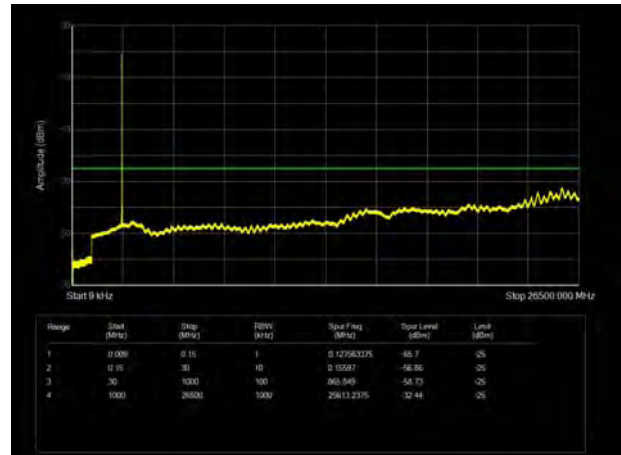




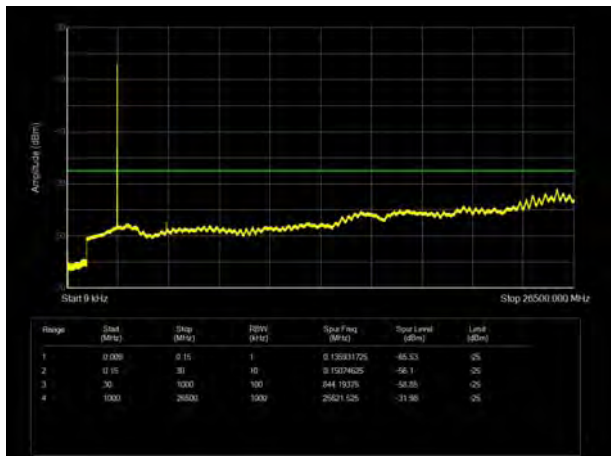
LTE Band 38 5MHz CH- Low 9kHz~26.5GHz



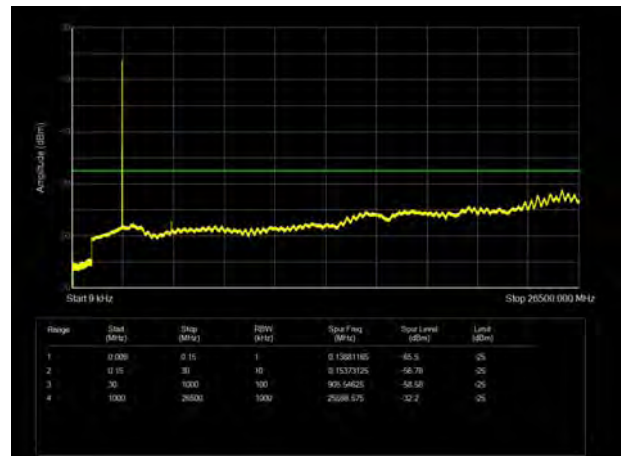
LTE Band 38 10MHz CH-Low 9kHz~26.5GHz



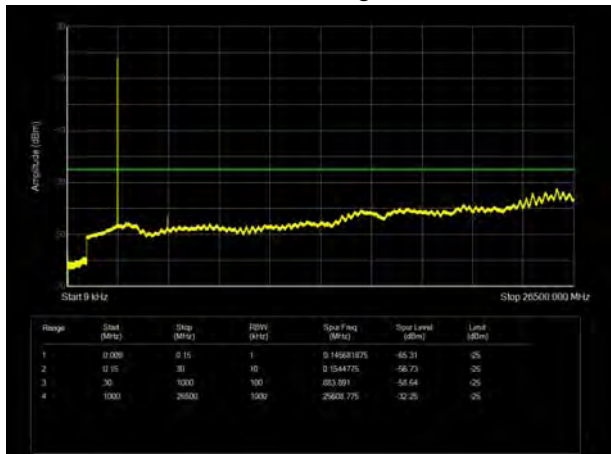
LTE Band 38 5MHz CH- Middle 9kHz~26.5GHz



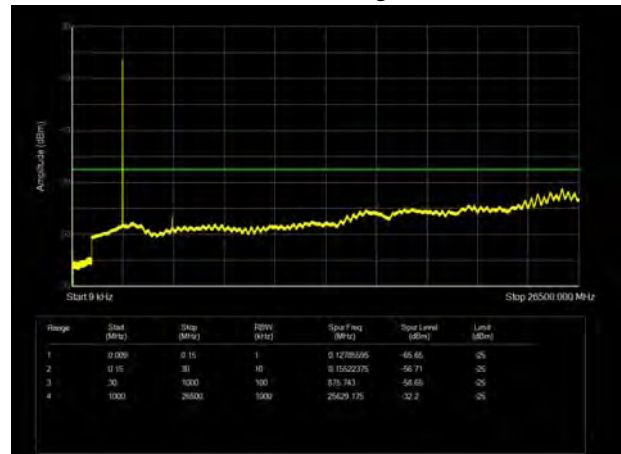
LTE Band 38 10MHz CH- Middle 9kHz~26.5GHz



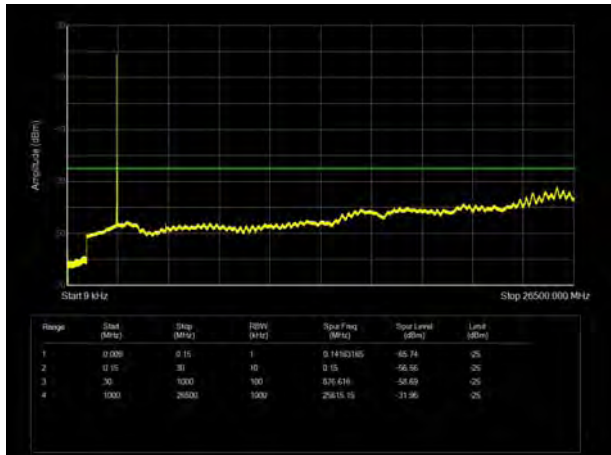
LTE Band 38 5MHz CH-High 9kHz~26.5GHz



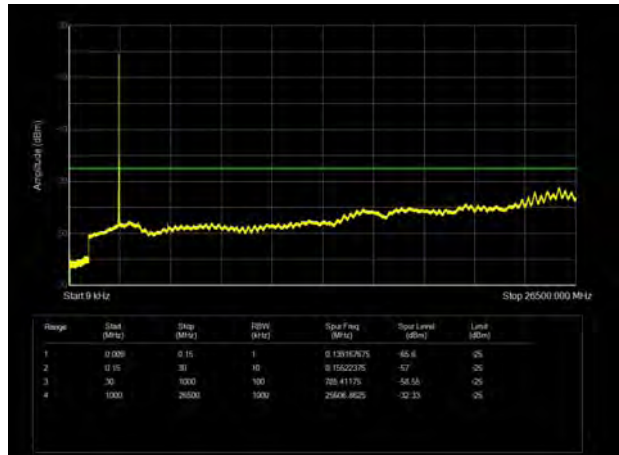
LTE Band 38 10MHz CH- High 9kHz~26.5GHz



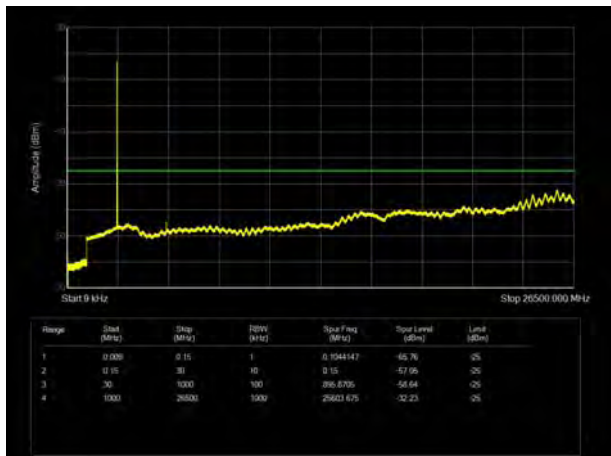
LTE Band 38 15MHz CH- Low 9kHz~26.5GHz



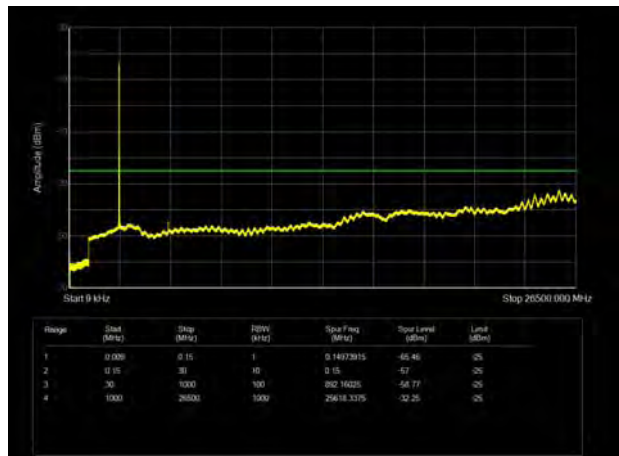
LTE Band 38 20MHz CH-Low 9kHz~26.5GHz



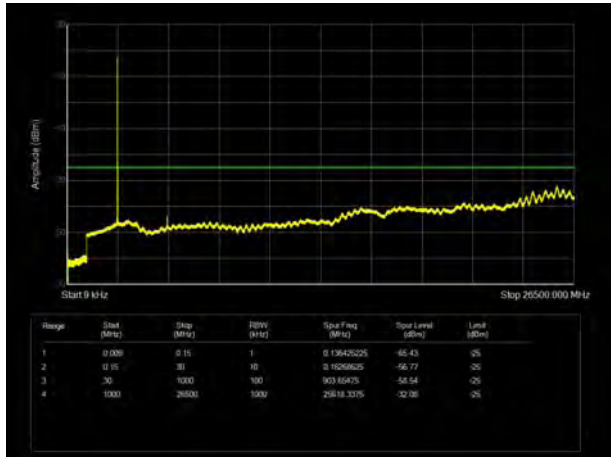
LTE Band 38 15MHz CH- Middle 9kHz~26.5GHz



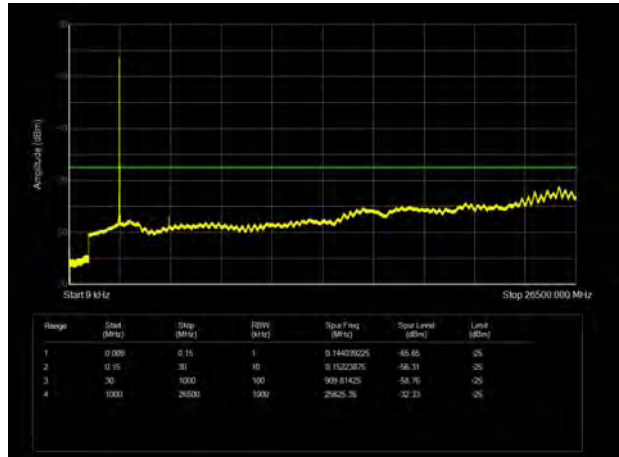
LTE Band 38 20MHz CH- Middle 9kHz~26.5GHz



LTE Band 38 15MHz CH-High 9kHz~26.5GHz

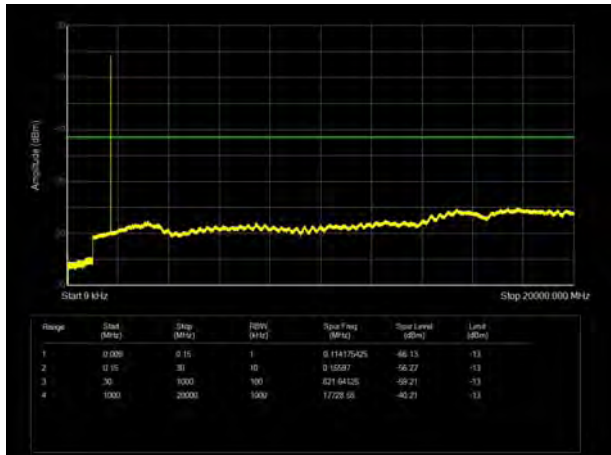


LTE Band 38 20MHz CH- High 9kHz~26.5GHz

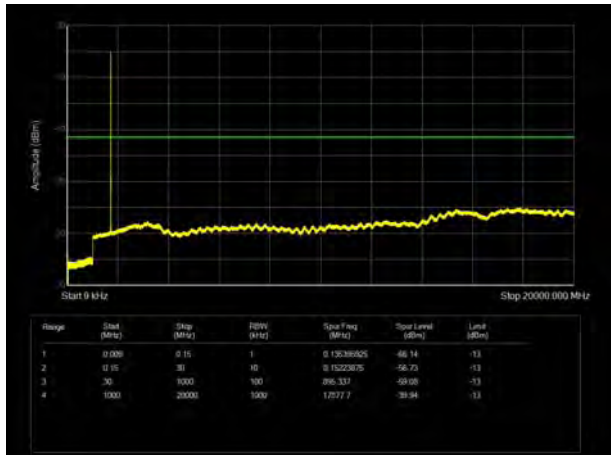




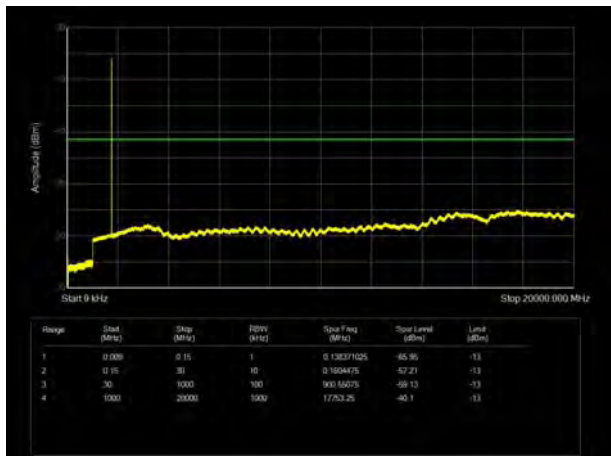
LTE Band 66 1.4MHz CH-Low 9kHz~20GHz



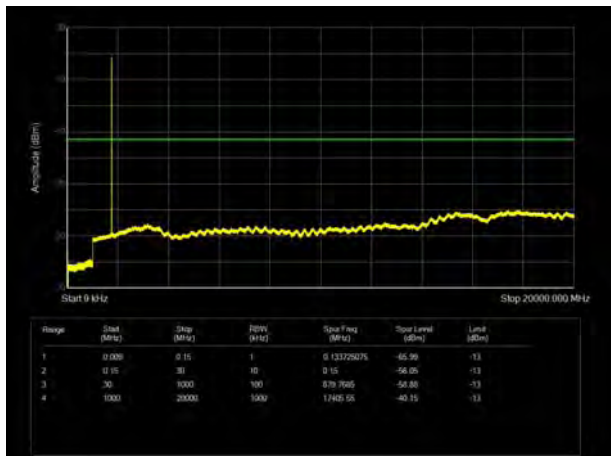
LTE Band 66 3MHz CH- Low 9kHz~20GHz



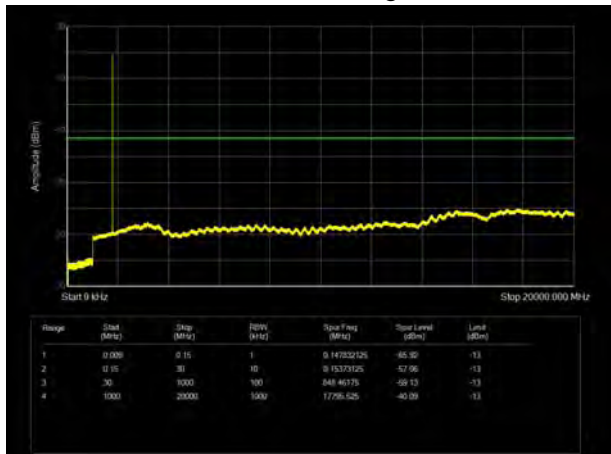
LTE Band 66 1.4MHz CH- Middle 9kHz~20GHz



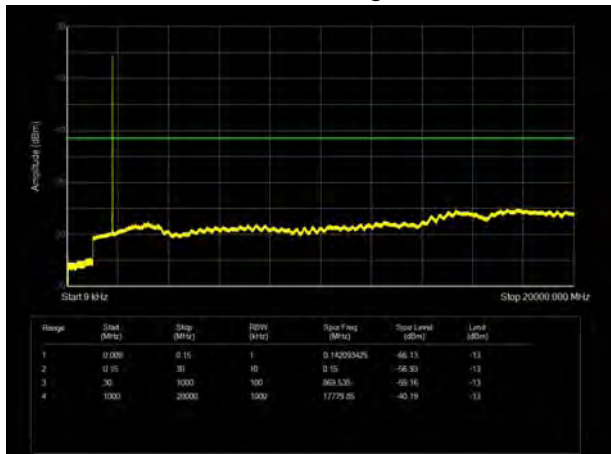
LTE Band 66 3MHz CH- Middle 9kHz~20GHz



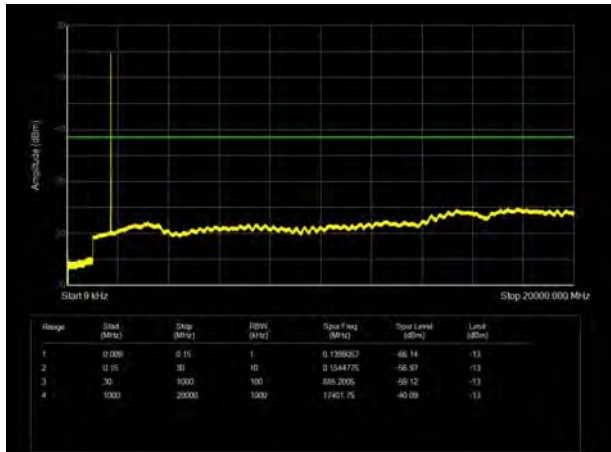
LTE Band 66 1.4MHz CH- High 9kHz~20GHz



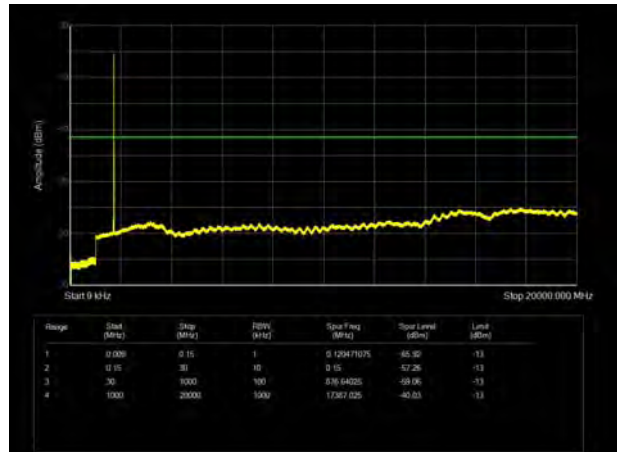
LTE Band 66 3MHz CH-High 9kHz~20GHz



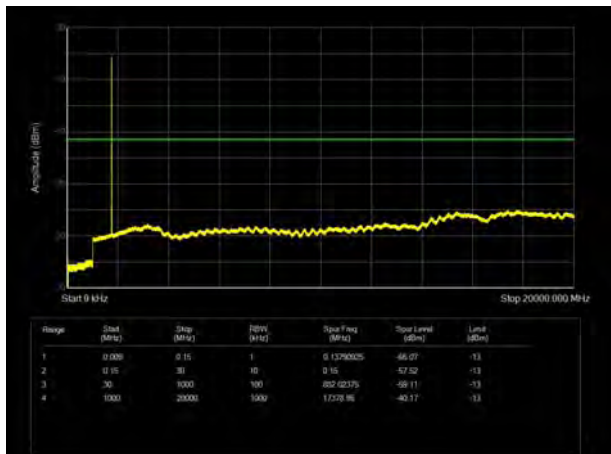
LTE Band 66 5MHz CH- Low 9kHz~20GHz



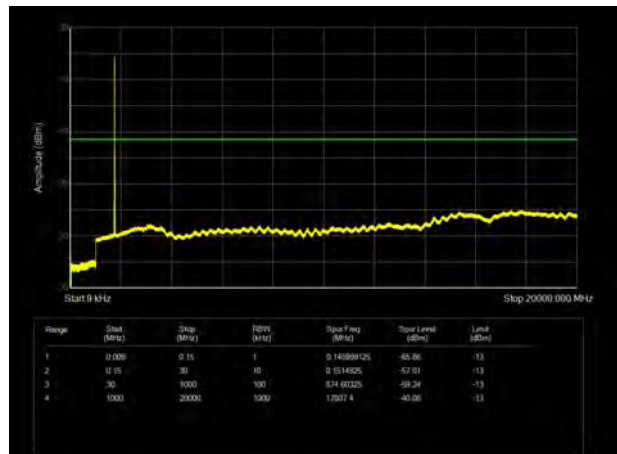
LTE Band 66 10MHz CH-Low 9kHz~20GHz



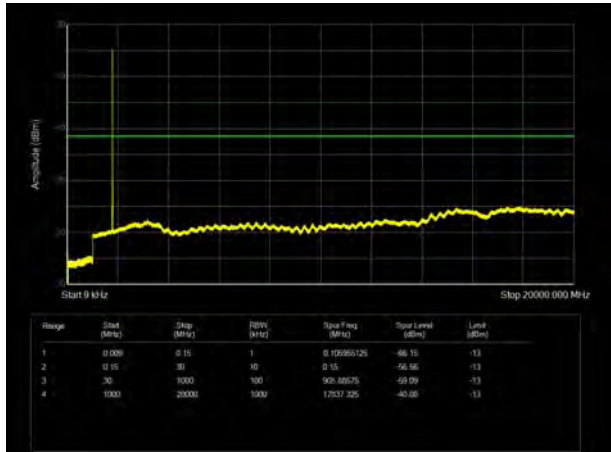
LTE Band 66 5MHz CH- Middle 9kHz~20GHz



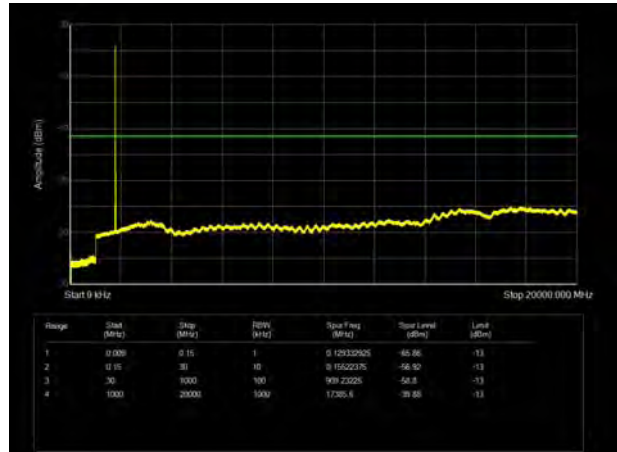
LTE Band 66 10MHz CH- Middle 9kHz~20GHz



LTE Band 66 5MHz CH-High 9kHz~20GHz

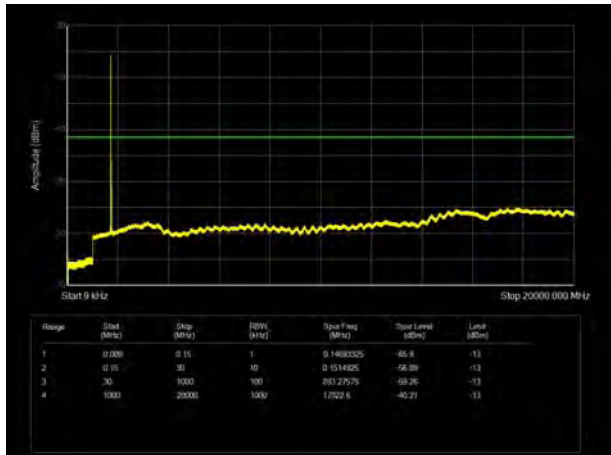


LTE Band 66 10MHz CH- High 9kHz~20GHz

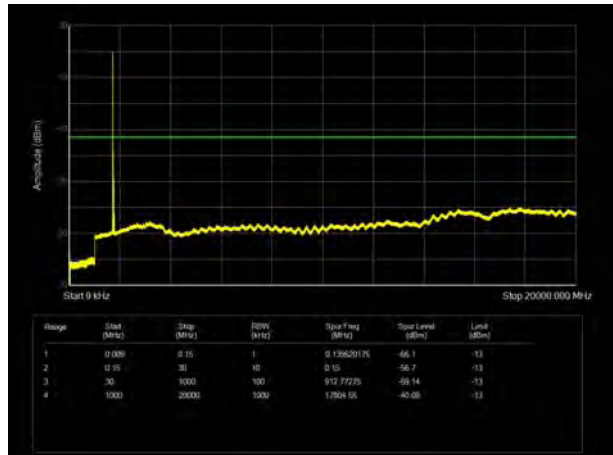




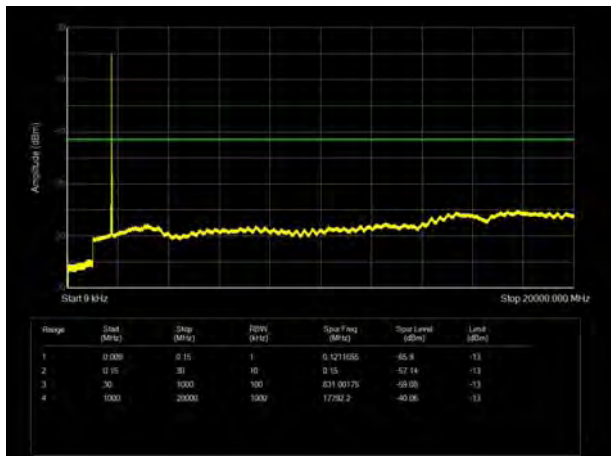
LTE Band 66 15MHz CH- Low 9kHz~20GHz



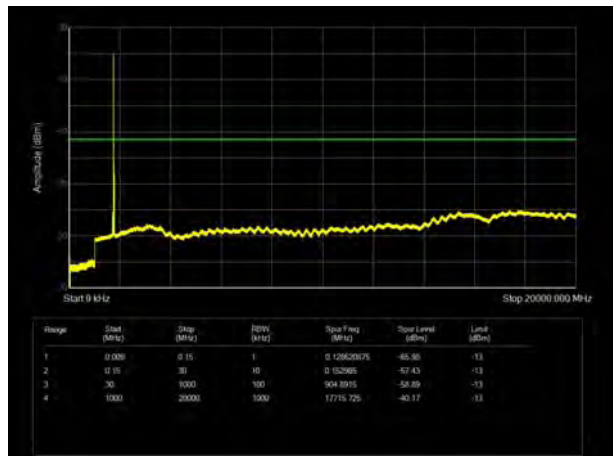
LTE Band 66 20MHz CH-Low 9kHz~20GHz



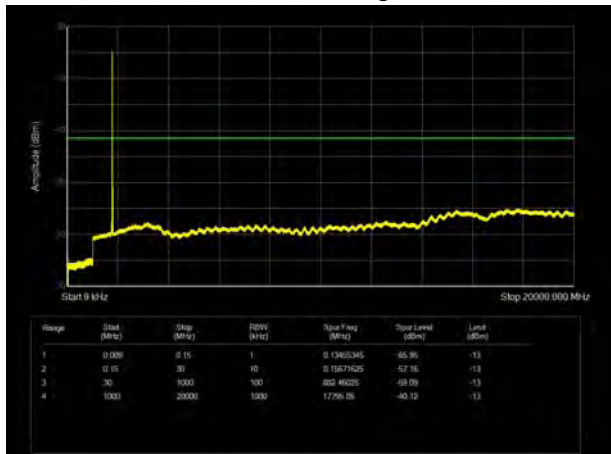
LTE Band 66 15MHz CH- Middle 9kHz~20GHz



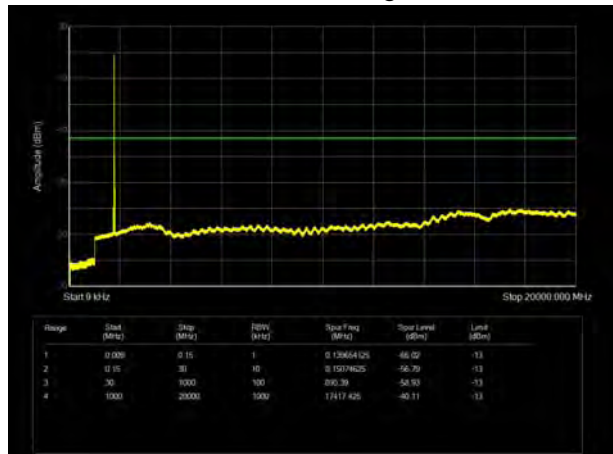
LTE Band 66 20MHz CH- Middle 9kHz~20GHz



LTE Band 66 15MHz CH-High 9kHz~20GHz



LTE Band 66 20MHz CH- High 9kHz~20GHz





5.7 Radiates Spurious Emission

Ambient condition

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

Method of Measurement

- The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI C63.26 (2015).
- Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
- A loop antenna, A log-periodic antenna or horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
- The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=100kHz, VBW=300kHz for 30MHz to 1GHz and RBW=1MHz, VBW=3MHz for above 1GHz, and the maximum value of the receiver should be recorded as (Pr).
- The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
- A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
- The measurement results are obtained as described below:

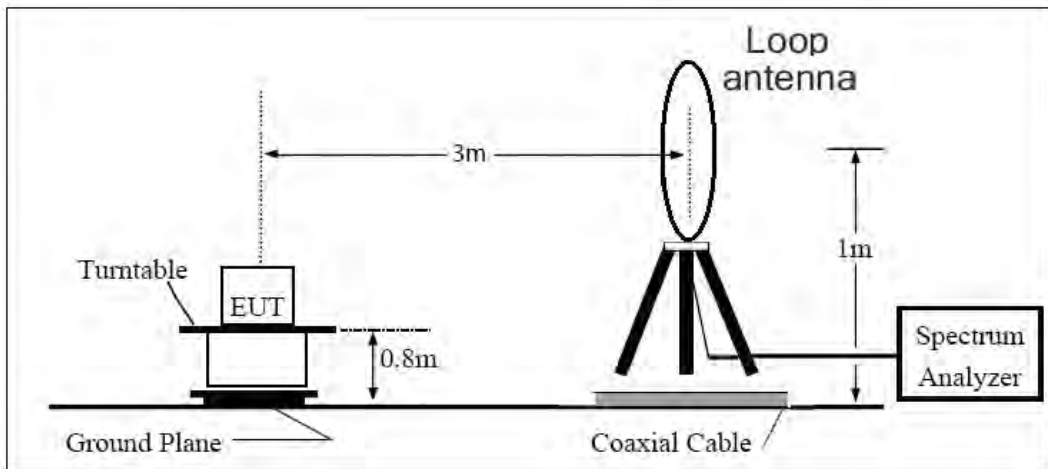
$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$$
 The measurement results are amend as described below:

$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
- This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$.

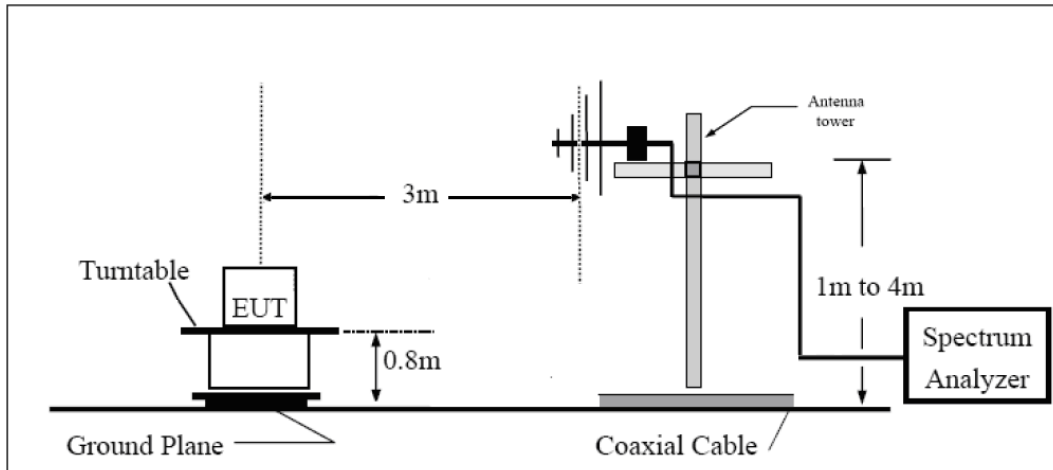
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

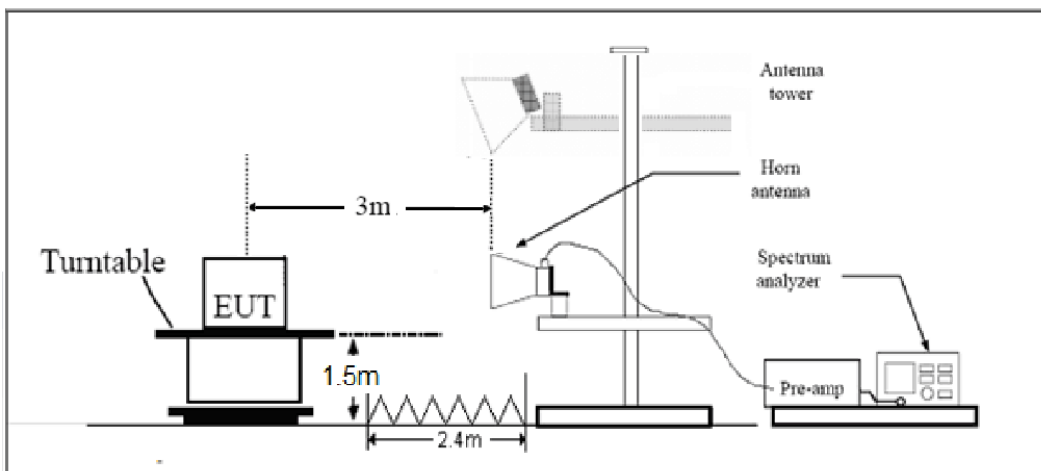
9KHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

Limits



Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB.”

Rule Part 27.53(m) $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(4) of this section.

Part 27.53(m) Limit	-25 dBm
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = \pm 1.96$, $U = \pm 3.55$ dB.

**Test Result**

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions below the noise floor will not be recorded in the report.

WCDMA Band IV CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3465.20	-67.05	2.70	12.70	Horizontal	-57.05	-13.00	44.05	0
3	5197.80	-60.92	3.20	12.50	Horizontal	-51.62	-13.00	38.62	45
4	6930.40	-61.56	4.20	11.80	Horizontal	-53.96	-13.00	40.96	90
5	8662.50	-56.13	4.40	12.50	Horizontal	-48.03	-13.00	35.03	45
6	10395.60	-48.77	4.70	11.30	Horizontal	-42.17	-13.00	29.17	315
7	12128.20	-52.01	5.20	13.80	Horizontal	-43.41	-13.00	30.41	90
8	13860.80	-48.56	5.70	11.30	Horizontal	-42.96	-13.00	29.96	45
9	15593.40	-51.85	6.10	16.80	Horizontal	-41.15	-13.00	28.15	180
10	17326.00	-48.60	6.10	14.20	Horizontal	-40.50	-13.00	27.50	90

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.

LTE Band 4 QPSK 1.4MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3464.25	-36.54	2.70	12.70	Horizontal	-26.54	-13.00	13.54	0
3	5197.50	-50.67	3.20	12.50	Horizontal	-41.37	-13.00	28.37	225
4	6930.00	-56.14	4.20	11.80	Horizontal	-48.54	-13.00	35.54	225
5	8662.50	-54.03	4.40	12.50	Horizontal	-45.93	-13.00	32.93	45
6	10395.00	-50.43	4.70	11.30	Horizontal	-43.83	-13.00	30.83	135
7	12127.50	-52.91	5.20	13.80	Horizontal	-44.31	-13.00	31.31	90
8	13860.00	-48.77	5.70	11.30	Horizontal	-43.17	-13.00	30.17	315
9	15592.50	-53.73	6.10	16.80	Horizontal	-43.03	-13.00	30.03	0
10	17325.00	-48.35	6.10	14.20	Horizontal	-40.25	-13.00	27.25	45

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.



LTE Band 4 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3460.50	-39.31	2.70	12.70	Horizontal	-29.31	-13.00	16.31	0
3	5191.50	-49.68	3.20	12.50	Horizontal	-40.38	-13.00	27.38	135
4	6930.00	-56.90	4.20	11.80	Horizontal	-49.30	-13.00	36.30	45
5	8662.50	-55.78	4.40	12.50	Horizontal	-47.68	-13.00	34.68	135
6	10395.00	-50.63	4.70	11.30	Horizontal	-44.03	-13.00	31.03	0
7	12127.50	-51.92	5.20	13.80	Horizontal	-43.32	-13.00	30.32	90
8	13860.00	-49.56	5.70	11.30	Horizontal	-43.96	-13.00	30.96	45
9	15592.50	-52.85	6.10	16.80	Horizontal	-42.15	-13.00	29.15	225
10	17325.00	-48.32	6.10	14.20	Horizontal	-40.22	-13.00	27.22	135

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.

LTE Band 4 QPSK 20MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3445.00	-40.58	2.70	12.70	Horizontal	-30.58	-13.00	17.58	45
3	5167.50	-50.73	3.20	12.50	Horizontal	-41.43	-13.00	28.43	90
4	6890.00	-53.00	4.20	11.80	Horizontal	-45.40	-13.00	32.40	45
5	8612.50	-55.93	4.40	12.50	Horizontal	-47.83	-13.00	34.83	135
6	10335.00	-49.42	4.70	11.30	Horizontal	-42.82	-13.00	29.82	0
7	12057.50	-51.32	5.20	13.80	Horizontal	-42.72	-13.00	29.72	90
8	13780.00	-48.48	5.70	11.30	Horizontal	-42.88	-13.00	29.88	45
9	15502.50	-53.41	6.10	16.80	Horizontal	-42.71	-13.00	29.71	90
10	17225.00	-49.91	6.10	14.20	Horizontal	-41.81	-13.00	28.81	45

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.



LTE Band 7 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5065.80	-51.77	3.40	12.50	Horizontal	-42.67	-25.00	17.67	45
3	7598.60	-44.36	4.40	12.20	Horizontal	-36.56	-25.00	11.56	135
4	10130.63	-40.20	4.70	11.30	Horizontal	-33.60	-25.00	8.60	0
5	12675.00	-43.66	5.40	13.20	Horizontal	-35.86	-25.00	10.86	90
6	15210.00	-47.22	6.10	13.10	Horizontal	-40.22	-25.00	15.22	45
7	17745.00	-49.52	6.10	14.20	Horizontal	-41.42	-25.00	16.42	90
8	20280.00	-	-	-	-	-	-	-	-
9	22815.00	-	-	-	-	-	-	-	-
10	25350.00	-	-	-	-	-	-	-	-

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.

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

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5052.38	-50.25	3.40	12.50	Horizontal	-41.15	-25.00	16.15	90
3	7575.00	-41.55	4.40	12.20	Horizontal	-33.75	-25.00	8.75	45
4	10100.00	-39.71	4.70	11.30	Horizontal	-33.11	-25.00	8.11	90
5	12625.00	-42.94	5.40	13.20	Horizontal	-35.14	-25.00	10.14	90
6	15150.00	-47.22	6.10	13.10	Horizontal	-40.22	-25.00	15.22	45
7	17675.00	-49.38	6.10	14.20	Horizontal	-41.28	-25.00	16.28	135
8	20280.00	-	-	-	-	-	-	-	-
9	22815.00	-	-	-	-	-	-	-	-
10	25350.00	-	-	-	-	-	-	-	-

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.



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

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5180.00	-44.59	3.20	12.50	Horizontal	-35.29	-25.00	10.29	90
3	7770.00	-51.18	4.40	12.30	Horizontal	-43.28	-25.00	18.28	225
4	10360.00	-45.05	4.70	11.80	Horizontal	-37.95	-25.00	12.95	315
5	12950.00	-50.10	5.40	14.00	Horizontal	-41.50	-25.00	16.50	45
6	15540.00	-52.37	6.10	16.80	Horizontal	-41.67	-25.00	16.67	90
7	18130.00	-	-	-	-	-	-	-	-
8	20720.00	-	-	-	-	-	-	-	-
9	23310.00	-	-	-	-	-	-	-	-
10	25900.00	-	-	-	-	-	-	-	-

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.



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

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5170.00	-44.18	3.20	12.50	Horizontal	-34.88	-25.00	9.88	90
3	7755.00	-52.51	4.40	12.30	Horizontal	-44.61	-25.00	19.61	315
4	10340.00	-44.85	4.70	11.80	Horizontal	-37.75	-25.00	12.75	45
5	12925.00	-48.60	5.40	14.00	Horizontal	-40.00	-25.00	15.00	225
6	15510.00	-52.27	6.10	16.80	Horizontal	-41.57	-25.00	16.57	0
7	18095.00	-	-	-	-	-	-	-	-
8	20680.00	-	-	-	-	-	-	-	-
9	23265.00	-	-	-	-	-	-	-	-
10	25850.00	-	-	-	-	-	-	-	-

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.

LTE Band 66 QPSK 1.4MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3488.60	-40.13	2.70	12.70	Horizontal	-30.13	-13.00	17.13	90
3	5232.90	-47.15	3.20	12.50	Horizontal	-37.85	-13.00	24.85	45
4	6977.20	-57.54	4.20	11.80	Horizontal	-49.94	-13.00	36.94	270
5	8721.50	-51.77	4.40	12.50	Horizontal	-43.67	-13.00	30.67	180
6	10465.80	-49.08	4.70	11.80	Horizontal	-41.98	-13.00	28.98	135
7	12210.10	-48.63	5.20	13.80	Horizontal	-40.03	-13.00	27.03	270
8	13954.40	-49.91	5.70	13.20	Horizontal	-42.41	-13.00	29.41	90
9	15698.70	-51.87	6.10	16.80	Horizontal	-41.17	-13.00	28.17	45
10	17443.00	-48.32	6.10	14.20	Horizontal	-40.22	-13.00	27.22	315

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.



LTE Band 66 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3485.00	-40.79	2.70	12.70	Horizontal	-30.79	-13.00	17.79	45
3	5227.50	-49.40	3.20	12.50	Horizontal	-40.10	-13.00	27.10	225
4	6970.00	-57.45	4.20	11.80	Horizontal	-49.85	-13.00	36.85	90
5	8712.50	-52.82	4.40	12.50	Horizontal	-44.72	-13.00	31.72	0
6	10455.00	-49.65	4.70	11.80	Horizontal	-42.55	-13.00	29.55	0
7	12197.50	-49.20	5.20	13.80	Horizontal	-40.60	-13.00	27.60	45
8	13940.00	-50.71	5.70	13.20	Horizontal	-43.21	-13.00	30.21	180
9	15682.50	-54.10	6.10	16.80	Horizontal	-43.40	-13.00	30.40	90
10	17425.00	-48.67	6.10	14.20	Horizontal	-40.57	-13.00	27.57	270

Note: 1. The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.

LTE Band 66 QPSK 20MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3470.00	-43.95	2.70	12.70	Horizontal	-33.95	-13.00	20.95	225
3	5205.00	-53.26	3.20	12.50	Horizontal	-43.96	-13.00	30.96	45
4	6940.00	-54.96	4.20	11.80	Horizontal	-47.36	-13.00	34.36	315
5	8675.00	-52.70	4.40	12.50	Horizontal	-44.60	-13.00	31.60	90
6	10410.00	-49.03	4.70	11.80	Horizontal	-41.93	-13.00	28.93	0
7	12145.00	-50.06	5.20	13.80	Horizontal	-41.46	-13.00	28.46	0
8	13880.00	-50.09	5.70	13.20	Horizontal	-42.59	-13.00	29.59	45
9	15615.00	-50.72	6.10	16.80	Horizontal	-40.02	-13.00	27.02	315
10	17350.00	-47.59	6.10	14.20	Horizontal	-39.49	-13.00	26.49	90

Note: 1. The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.



6 Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Horn Antenna	Schwarzbeck	BBHA 9120D	01799	2019-09-21	2022-09-20
Signal Analyzer	R&S	FSV30	100815	2020-12-17	2021-12-16
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	01439	2021-06-30	2024-06-29
Software	R&S	EMC32	10.35.10	/	/
Universal Radio Communication Tester	R&S	CMW500	150415	2021-05-15	2022-05-14
Spectrum Analyzer	Keysight	N9020A	MY52330084	2021-05-15	2022-05-14
Universal Radio Communication Tester	Agilent	E5515C	GB44400275	2021-05-15	2022-05-14
Spectrum Analyzer	R&S	FSV3030	101411	2020-12-13	2021-12-12

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



ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.



ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.