



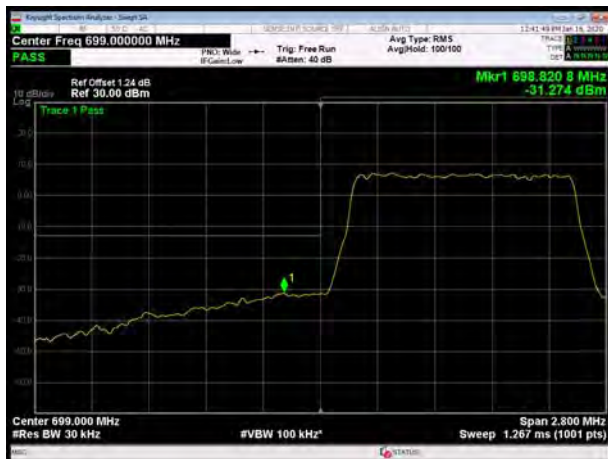
LTE Band 12 16QAM 1.4MHz CH-Low, 1 RB



LTE Band 12 16QAM 1.4MHz CH-High, 1 RB



LTE Band 12 16QAM 1.4MHz CH-Low, 100%RB



LTE Band 12 16QAM 1.4MHz CH-High, 100%RB



LTE Band 12 16QAM 3MHz CH-Low, 1 RB

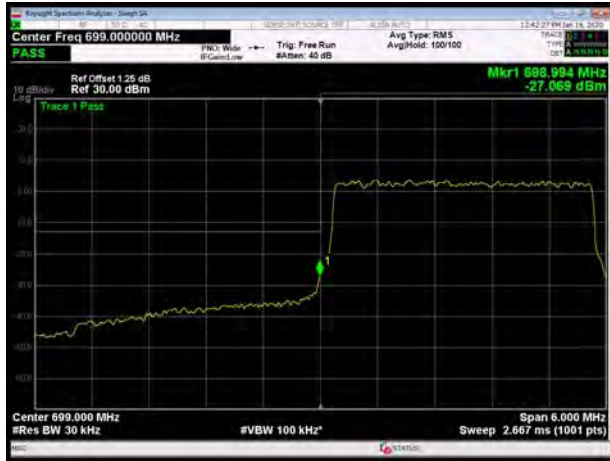


LTE Band 12 16QAM 3MHz CH-High, 1 RB





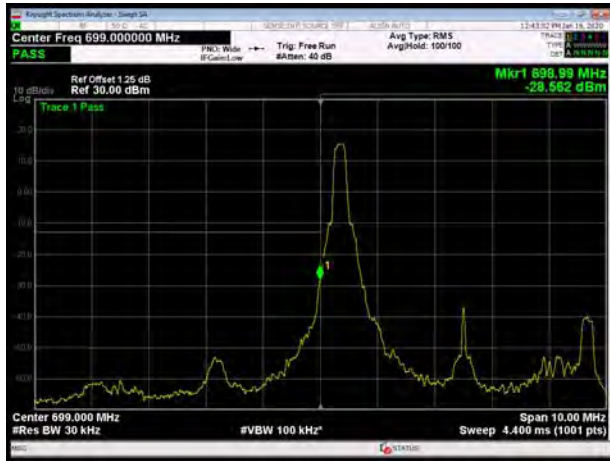
LTE Band 12 16QAM 3MHz CH-Low, 100%RB



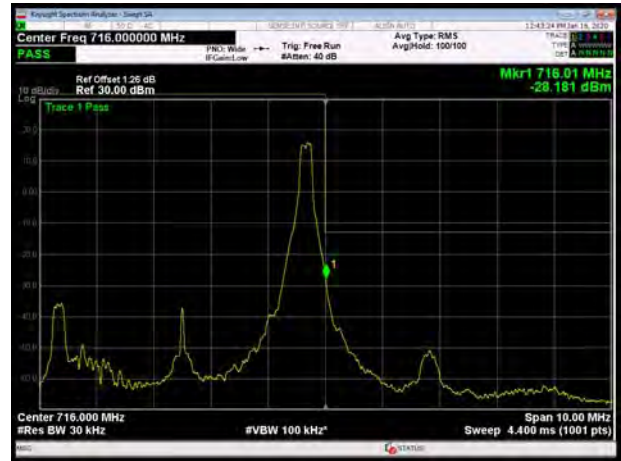
LTE Band 12 16QAM 3MHz CH-High, 100%RB



LTE Band 12 16QAM 5MHz CH-Low, 1 RB



LTE Band 12 16QAM 5MHz CH-High, 1 RB



LTE Band 12 16QAM 5MHz CH-Low, 100%RB

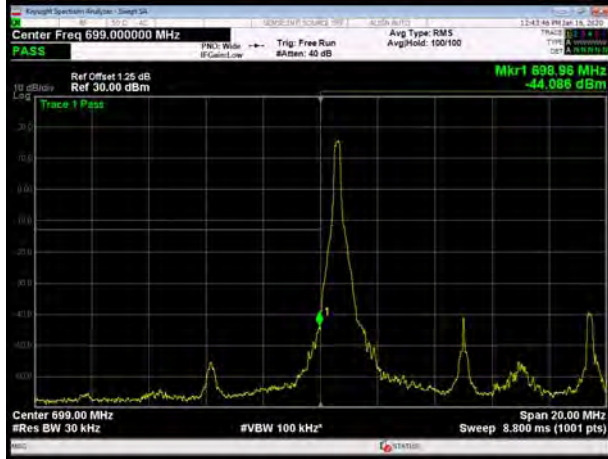


LTE Band 12 16QAM 5MHz CH-High, 100%RB

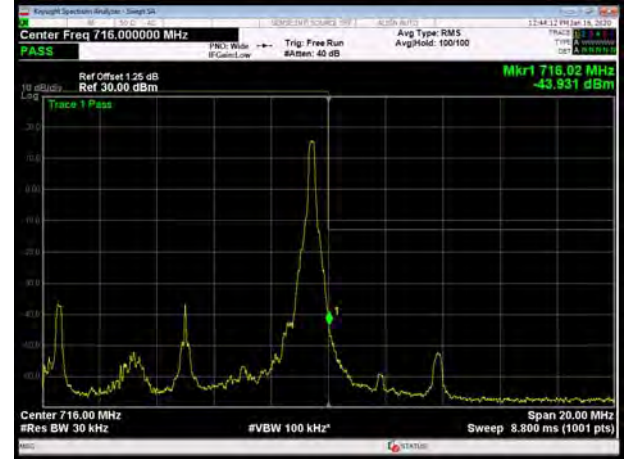




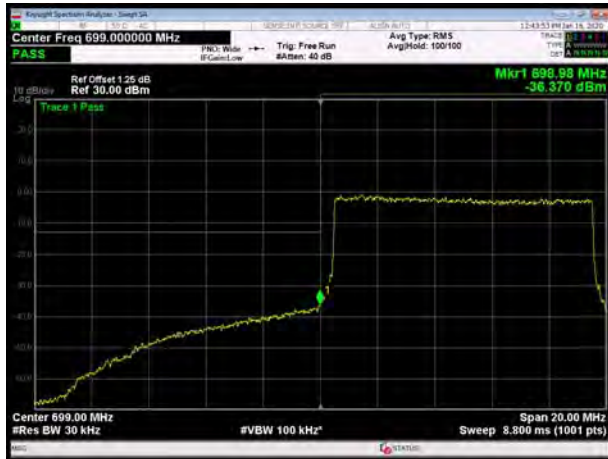
LTE Band 12 16QAM 10MHz CH-Low, 1 RB



LTE Band 12 16QAM 10MHz CH-High, 1 RB



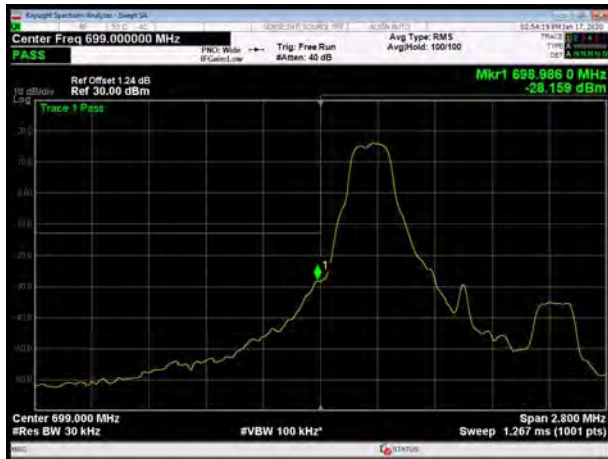
LTE Band 12 16QAM 10MHz CH-Low, 100%RB



LTE Band 12 16QAM 10MHz CH-High, 100%RB



LTE Band 12 64QAM 1.4MHz CH-Low, 1 RB



LTE Band 12 64QAM 1.4MHz CH-High, 1 RB





LTE Band 12 64QAM 1.4MHz CH-Low, 100%RB



LTE Band 12 64QAM 1.4MHz CH-High, 100%RB



LTE Band 12 64QAM 3MHz CH-Low, 1 RB



LTE Band 12 64QAM 3MHz CH-High, 1 RB



LTE Band 12 64QAM 3MHz CH-Low, 100%RB

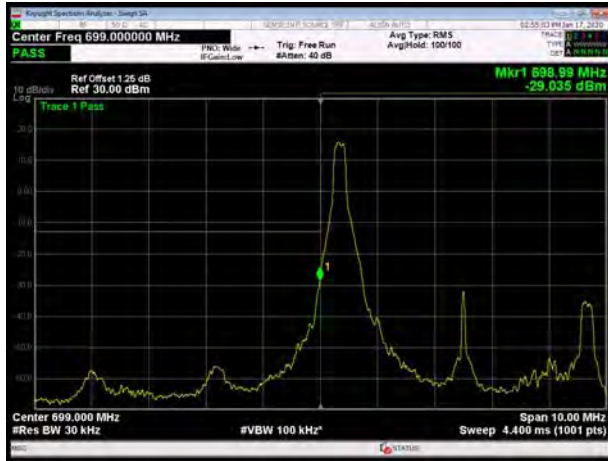


LTE Band 12 64QAM 3MHz CH-High, 100%RB

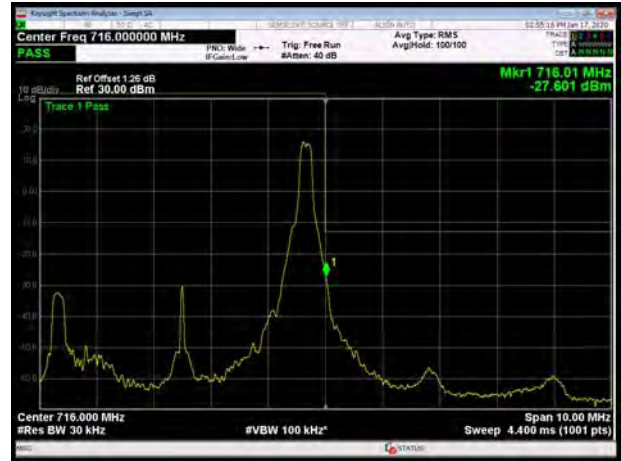




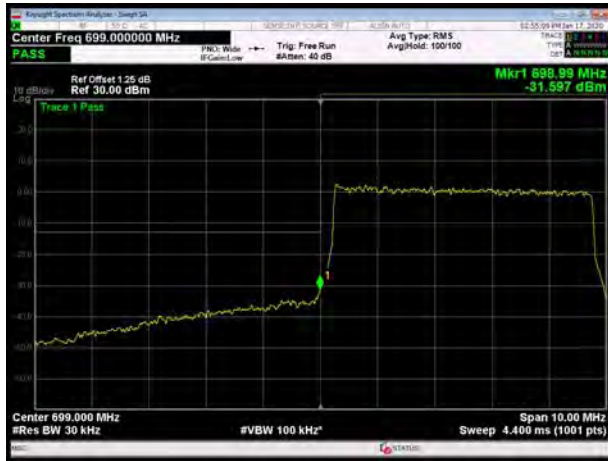
LTE Band 12 64QAM 5MHz CH-Low, 1 RB



LTE Band 12 64QAM 5MHz CH-High, 1 RB



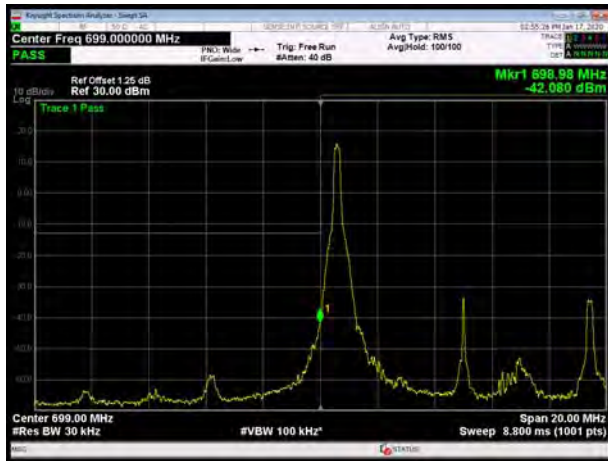
LTE Band 12 64QAM 5MHz CH-Low, 100%RB



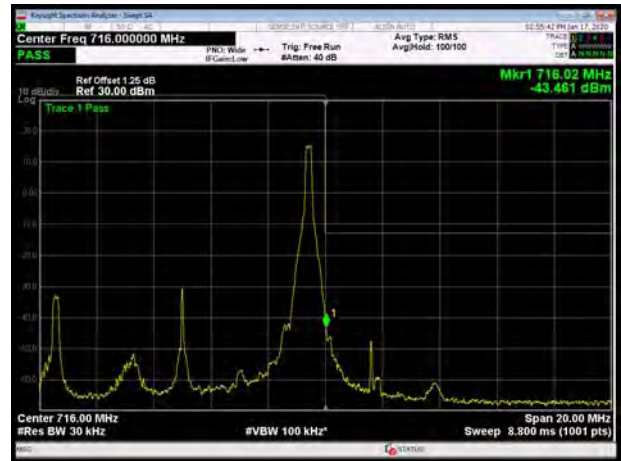
LTE Band 12 64QAM 5MHz CH-High, 100%RB



LTE Band 12 64QAM 10MHz CH-Low, 1 RB

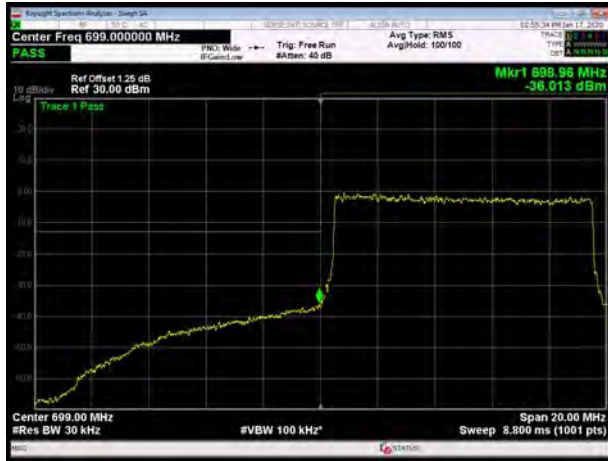


LTE Band 12 64QAM 10MHz CH-High, 1 RB





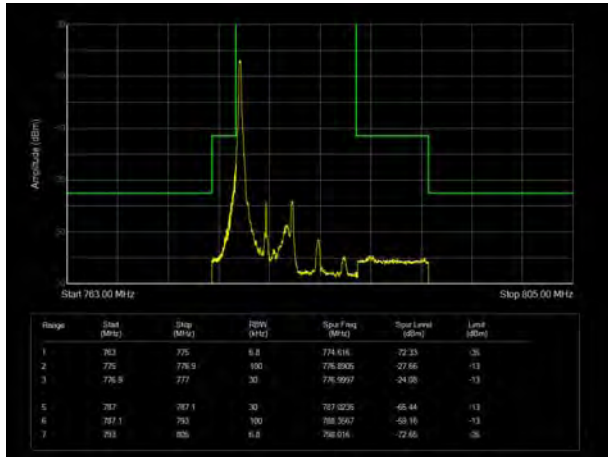
LTE Band 12 64QAM 10MHz CH-Low, 100%RB



LTE Band 12 64QAM 10MHz CH-High, 100%RB



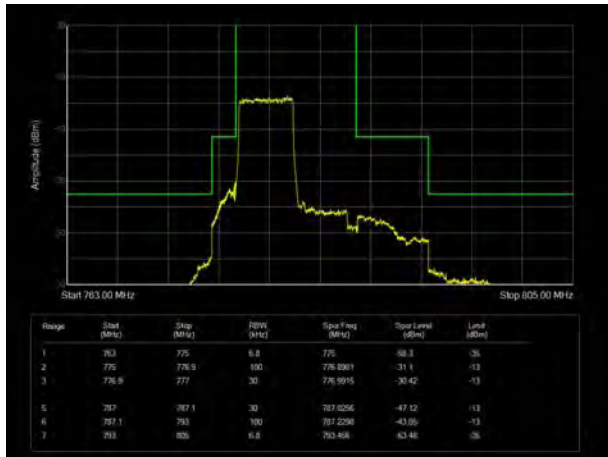
LTE Band 13 QPSK 5MHz CH-Low, 1 RB (763MHz ~793MHz)



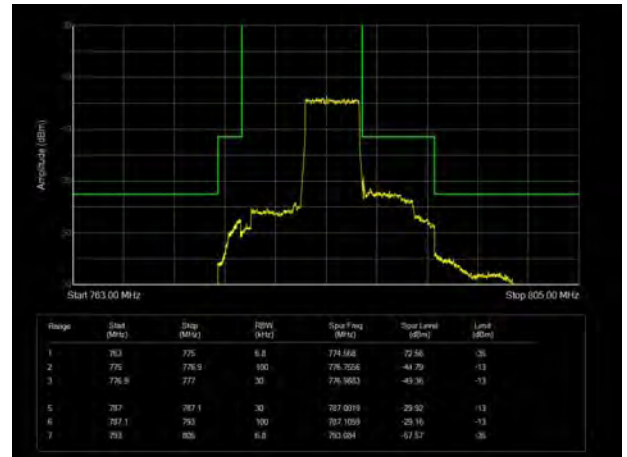
LTE Band 13 QPSK 5MHz CH-High, 1 RB (763MHz ~793MHz)



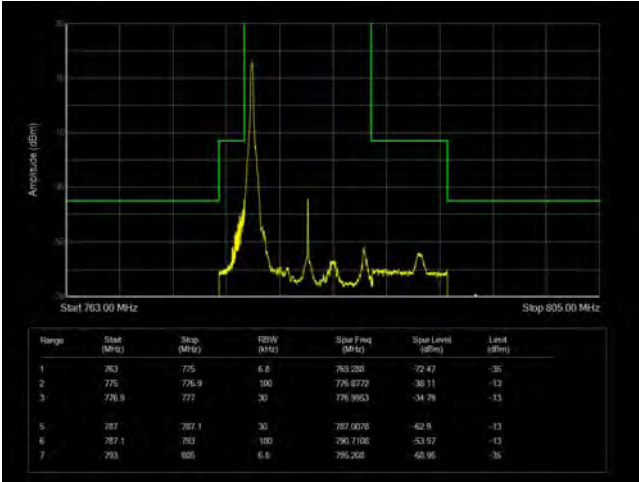
LTE Band 13 QPSK 5MHz CH-Low, 100%RB (763MHz ~793MHz)



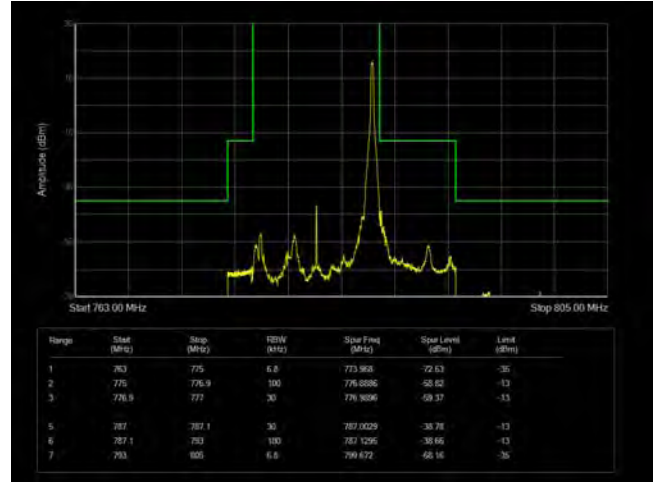
LTE Band 13 QPSK 5MHz CH-High, 100%RB (763MHz ~793MHz)



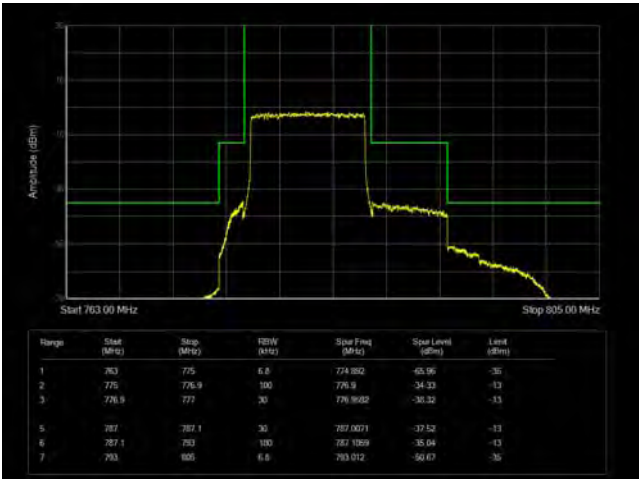
LTE Band 13 QPSK 10MHz CH-Low, 1 RB  
(763MHz ~793MHz)



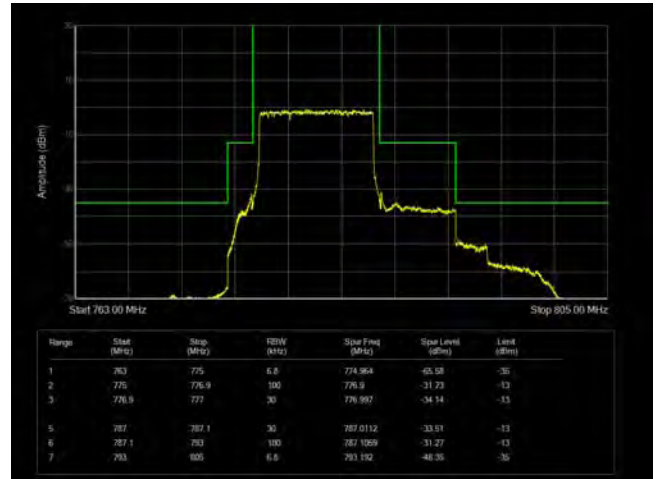
LTE Band 13 QPSK 10MHz CH-High, 1 RB  
(763MHz ~793MHz)



LTE Band 13 QPSK 10MHz CH-Low, 100%RB  
(763MHz ~793MHz)



LTE Band 13 QPSK 10MHz CH-High, 100%RB  
(763MHz ~793MHz)



LTE Band 13 16QAM 5MHz CH-Low, 1 RB  
(763MHz ~793MHz)

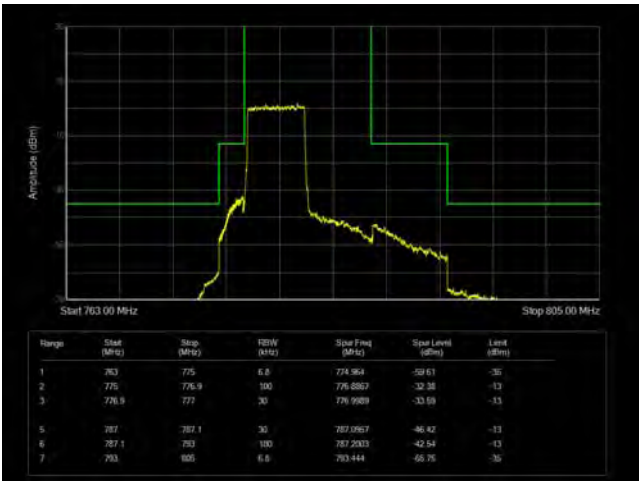


LTE Band 13 16QAM 5MHz CH-High, 1 RB  
(763MHz ~793MHz)

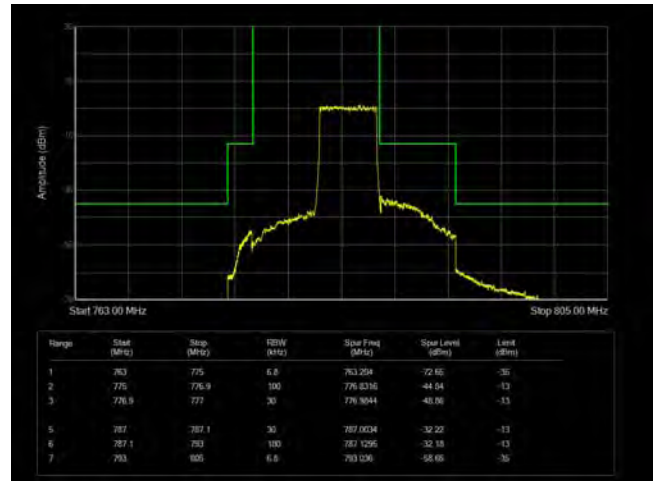




LTE Band 13 16QAM 5MHz CH-Low, 100%RB (763MHz ~793MHz)



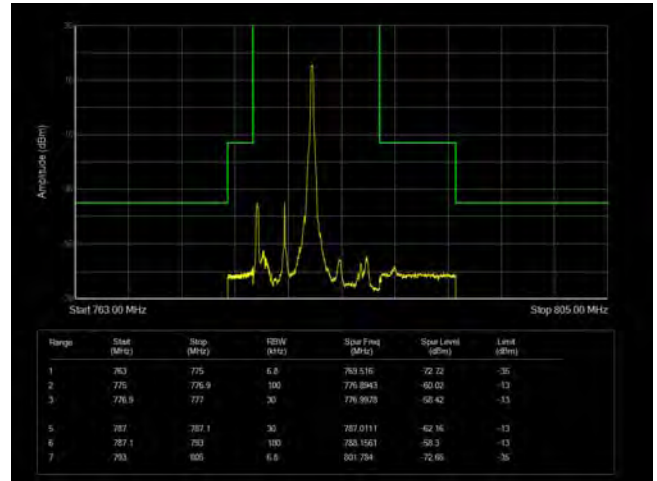
LTE Band 13 16QAM 5MHz CH-High, 100%RB (763MHz ~793MHz)



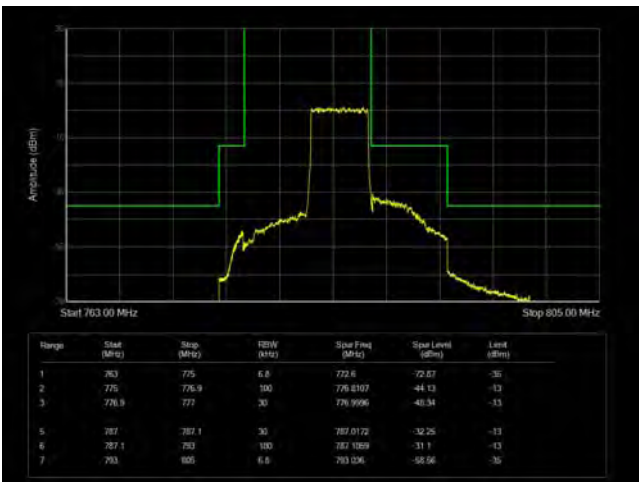
LTE Band 13 64QAM 5MHz CH-Low, 1 RB (763MHz ~793MHz)



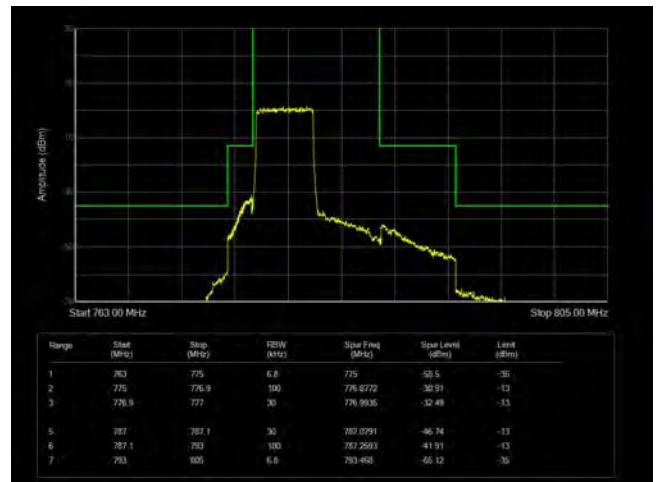
LTE Band 13 16QAM 5MHz CH-High, 1 RB (763MHz ~793MHz)



LTE Band 13 64QAM 5MHz CH-Low,100%RB (763MHz ~793MHz)



LTE Band 13 16QAM 5MHz CH-High,100%RB (763MHz ~793MHz)







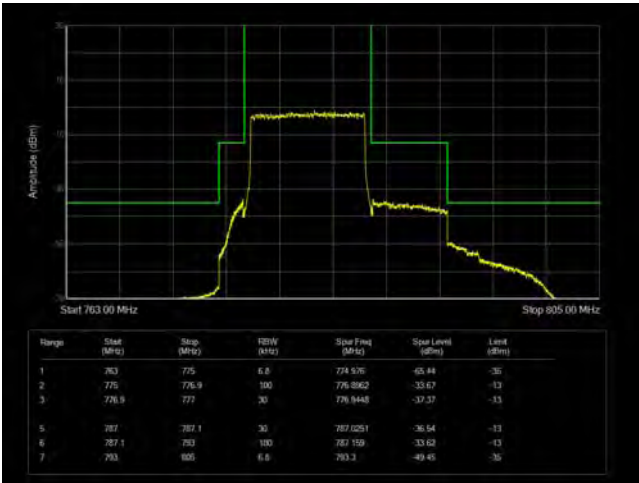
LTE Band 13 64QAM 10MHz CH-Low, 1 RB (763MHz ~793MHz)



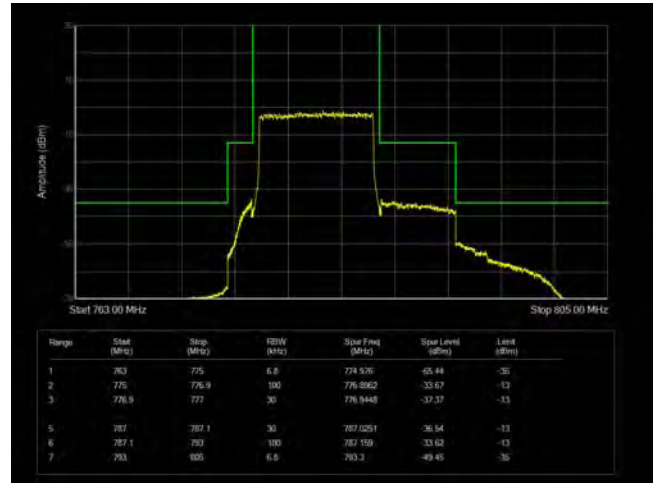
LTE Band 13 16QAM 10MHz CH-High, 1 RB (763MHz ~793MHz)



LTE Band 13 64QAM 10MHz CH-Low, 100%RB (763MHz ~793MHz)

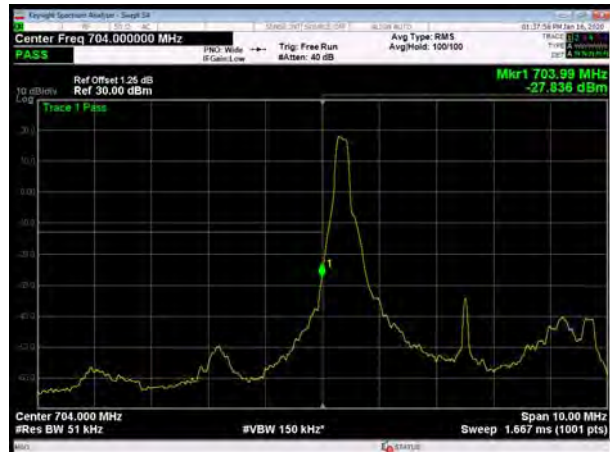


LTE Band 13 16QAM 10MHz CH-High, 100%RB (763MHz ~793MHz)

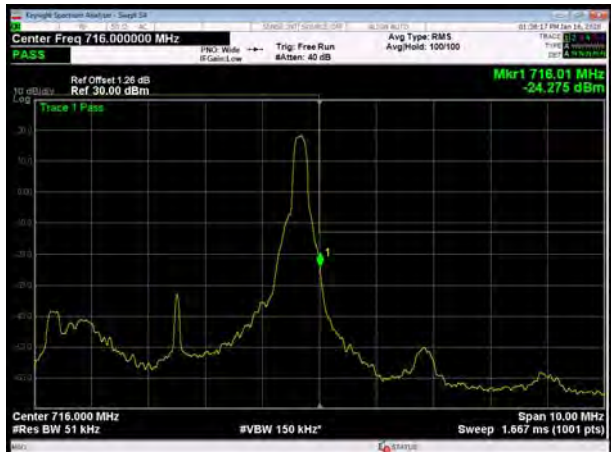




LTE Band 17 QPSK 5MHz CH-Low, 1 RB



LTE Band 17 QPSK 5MHz CH-High, 1 RB



LTE Band 17 QPSK 5MHz CH-Low, 100%RB



LTE Band 17 QPSK 5MHz CH-High, 100%RB



LTE Band 17 QPSK 10MHz CH-Low, 1 RB



LTE Band 17 QPSK 10MHz CH-High, 1 RB





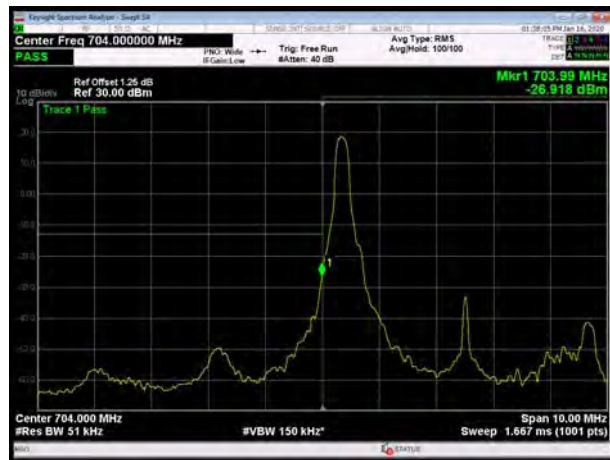
LTE Band 17 QPSK 10MHz CH-Low, 100%RB



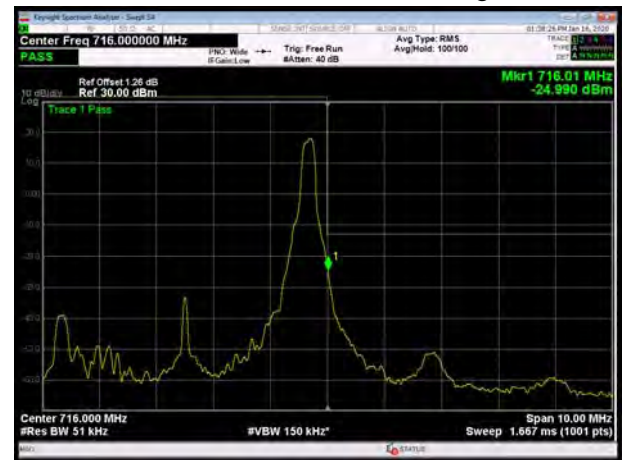
LTE Band 17 QPSK 10MHz CH-High, 100%RB



LTE Band 17 16QAM 5MHz CH-Low, 1 RB



LTE Band 17 16QAM 5MHz CH-High, 1 RB



LTE Band 17 16QAM 5MHz CH-Low, 100%RB



LTE Band 17 16QAM 5MHz CH-High, 100%RB

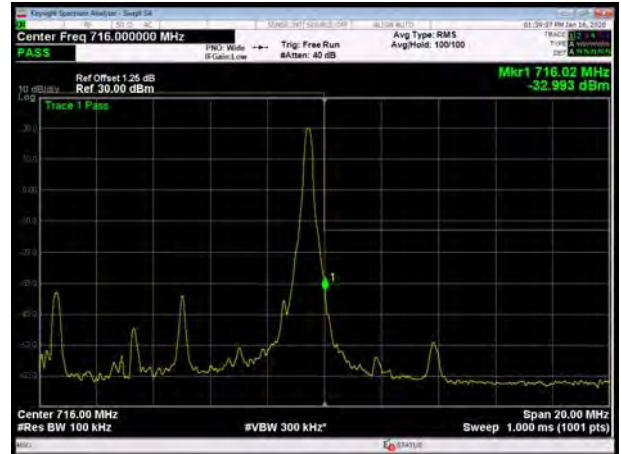




LTE Band 17 16QAM 10MHz CH-Low, 1 RB



LTE Band 17 16QAM 10MHz CH-High, 1 RB



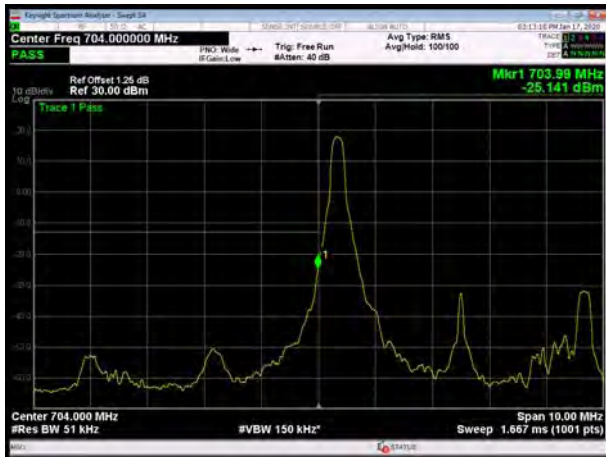
LTE Band 17 16QAM 10MHz CH-Low, 100%RB



LTE Band 17 16QAM 10MHz CH-High, 100%RB



LTE Band 17 64QAM 5MHz CH-Low, 1 RB



LTE Band 17 64QAM 5MHz CH-High, 1 RB





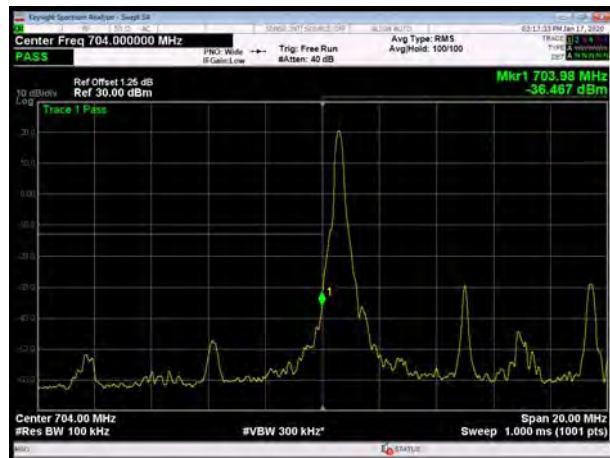
LTE Band 17 64QAM 5MHz CH-Low, 100%RB



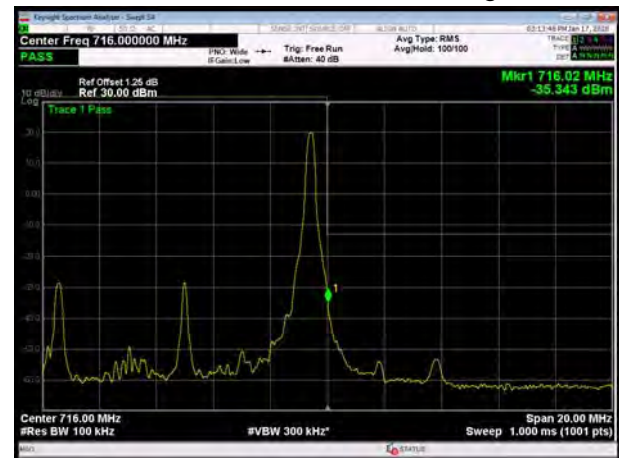
LTE Band 17 64QAM 5MHz CH-High, 100%RB



LTE Band 17 64QAM 10MHz CH-Low, 1 RB



LTE Band 17 64QAM 10MHz CH-High, 1 RB



LTE Band 17 64QAM 10MHz CH-Low, 100%RB



LTE Band 17 64QAM 10MHz 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

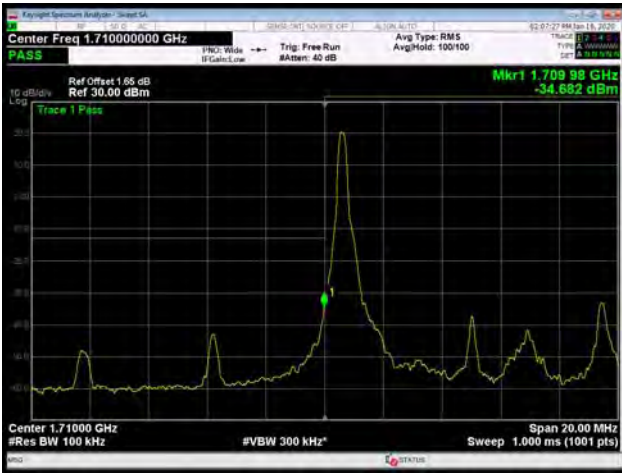


LTE Band 66 QPSK 5MHz CH-High, 100%RB

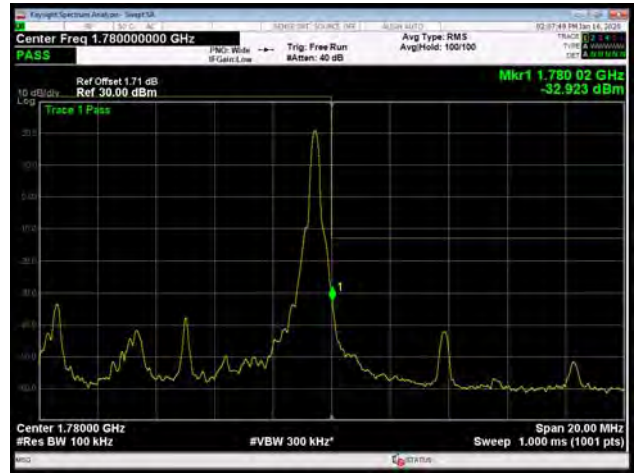




LTE Band 66 QPSK 10MHz CH-Low, 1 RB



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







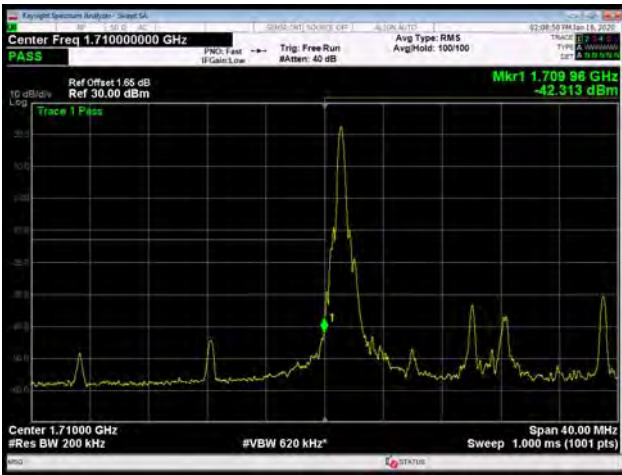
LTE Band 66 QPSK 15MHz CH-Low, 100%RB



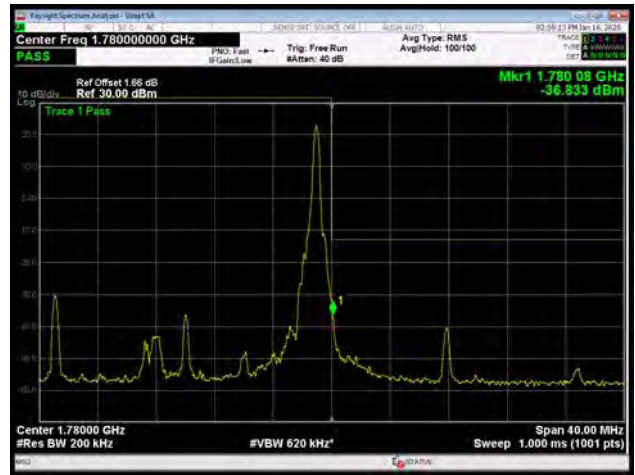
LTE Band 66 QPSK 15MHz CH-High, 100%RB



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





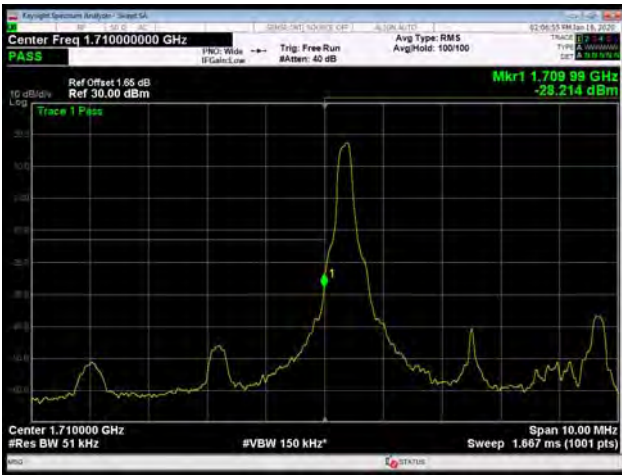
LTE Band 66 16QAM 3MHz CH-Low, 100%RB



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

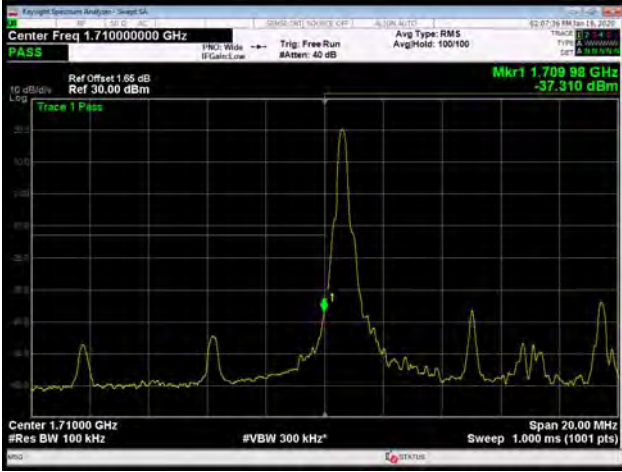


LTE Band 66 16QAM 5MHz CH-High, 100%RB

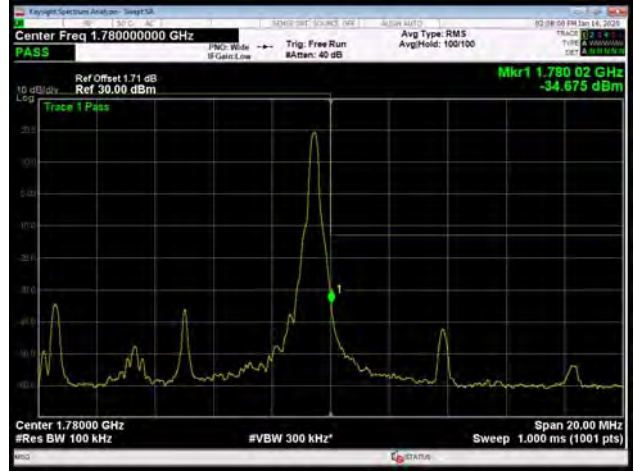




LTE Band 66 16QAM 10MHz CH-Low, 1 RB



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



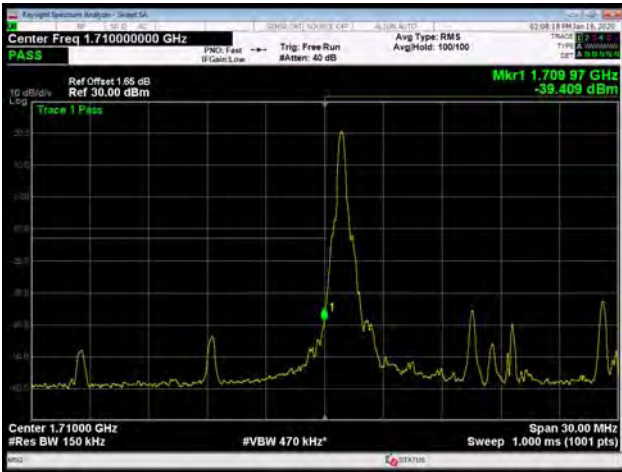
LTE Band 66 16QAM 10MHz CH-Low, 100%RB



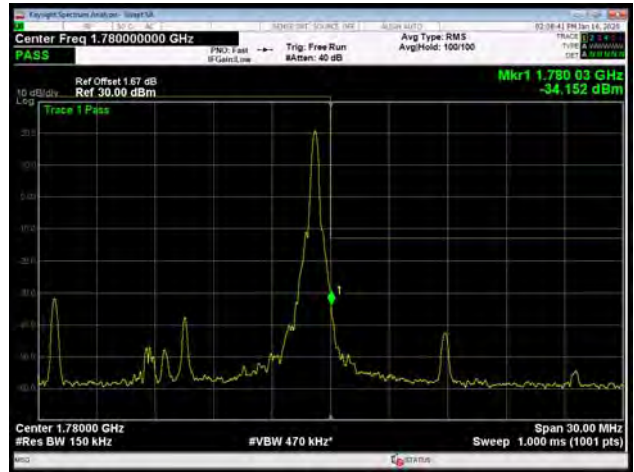
LTE Band 66 16QAM 10MHz CH-High, 100%RB



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

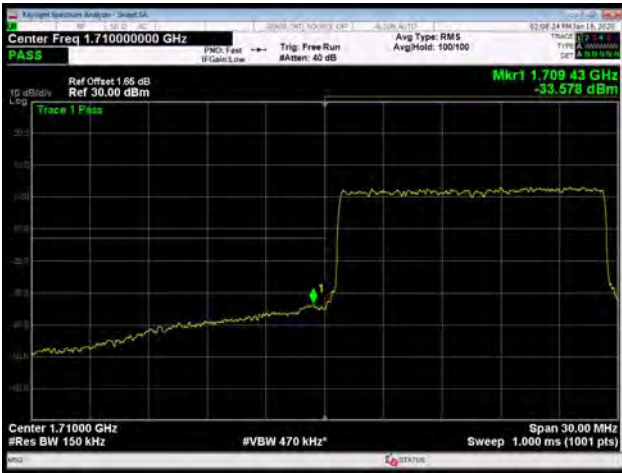


LTE Band 66 16QAM 15MHz CH-High, 1 RB





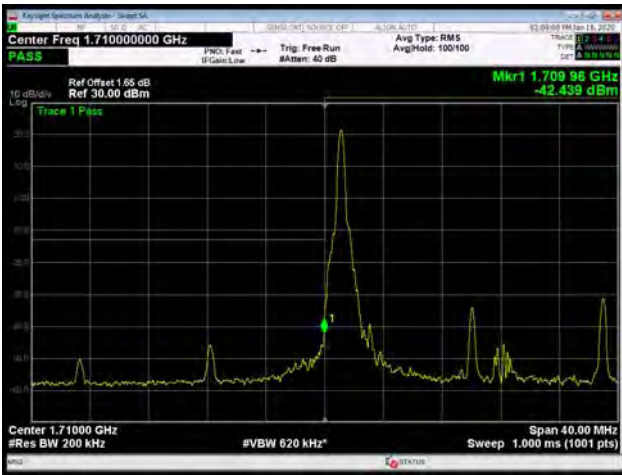
LTE Band 66 16QAM 15MHz CH-Low, 100%RB



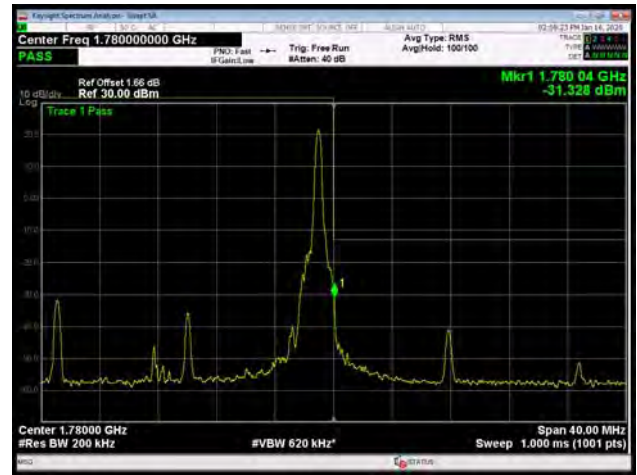
LTE Band 66 16QAM 15MHz CH-High, 100%RB



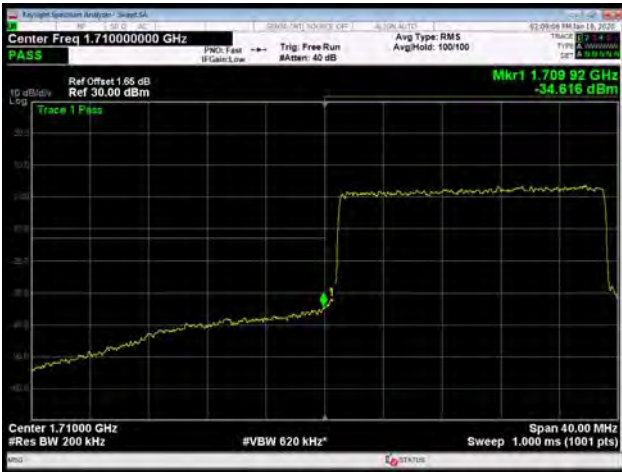
LTE Band 66 16QAM 20MHz CH-Low, 1 RB



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 64QAM 1.4MHz CH-High, 1 RB



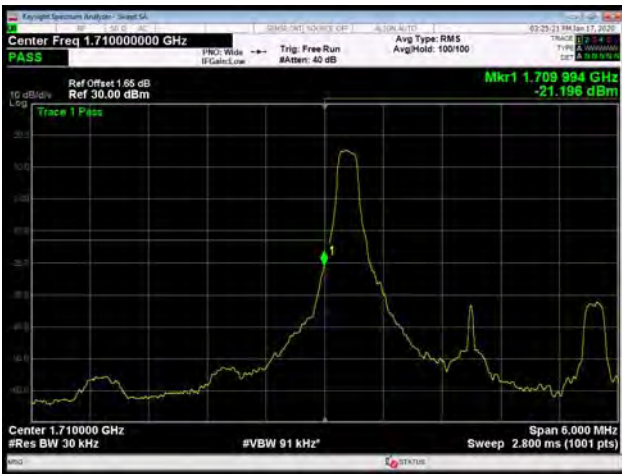
LTE Band 66 64QAM 1.4MHz CH-Low, 100%RB



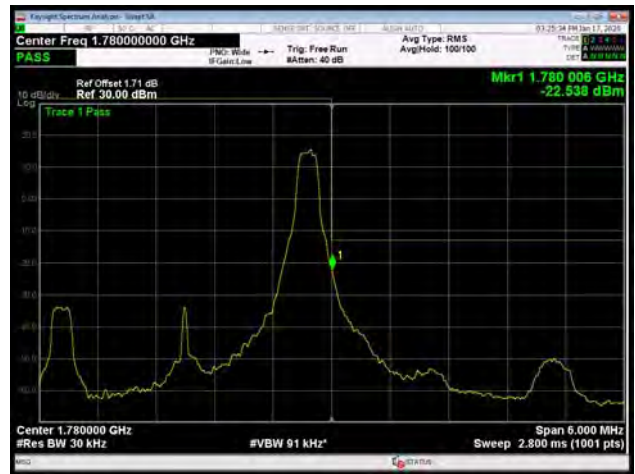
LTE Band 66 64QAM 1.4MHz CH-High, 100%RB



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



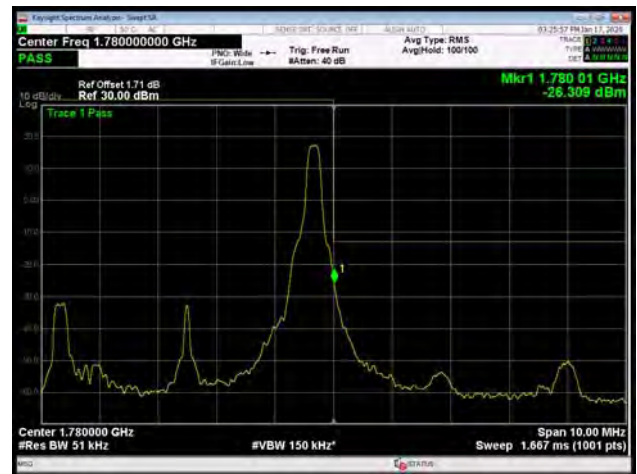
LTE Band 66 64QAM 3MHz CH-High, 100%RB



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

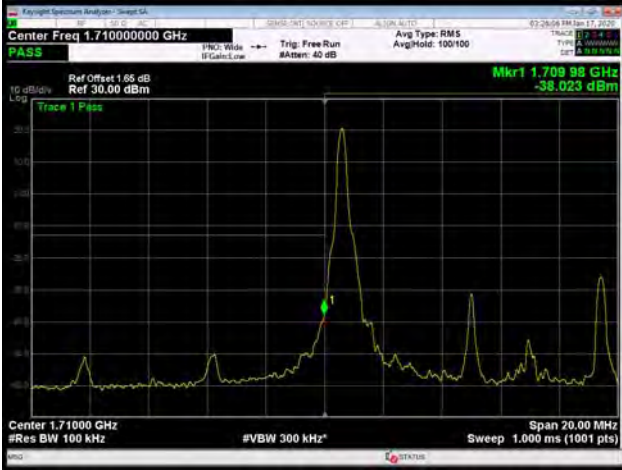


LTE Band 66 64QAM 5MHz CH-High, 100%RB

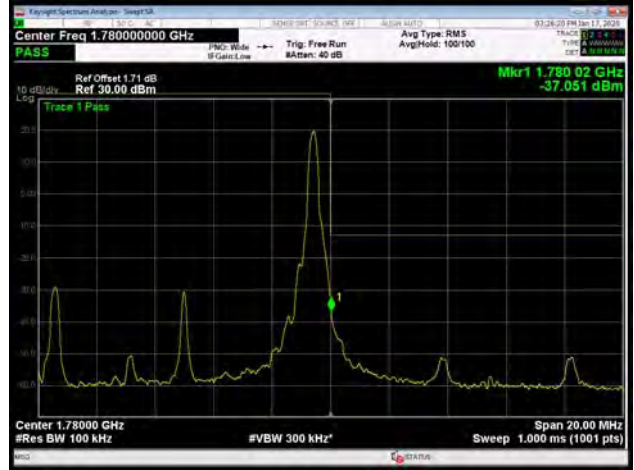




LTE Band 66 64QAM 10MHz CH-Low, 1 RB



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



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



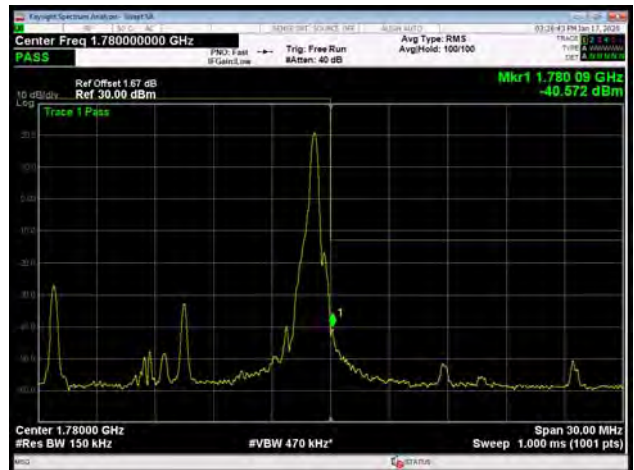
LTE Band 66 64QAM 10MHz CH-High, 100%RB



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



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







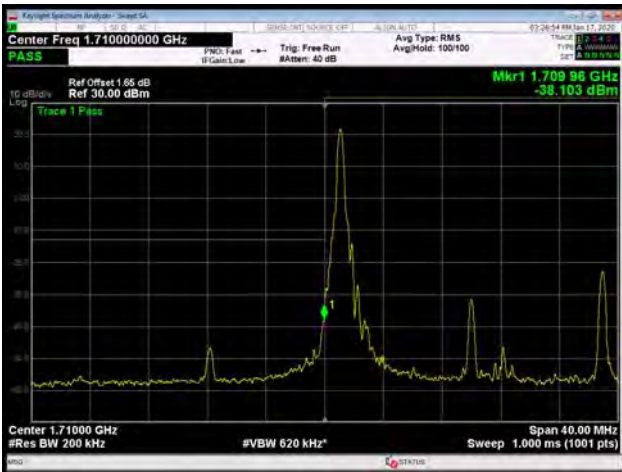
LTE Band 66 64QAM 15MHz CH-Low, 100%RB



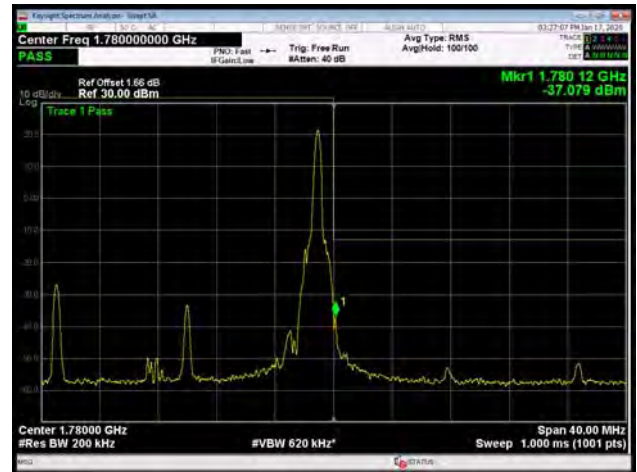
LTE Band 66 64QAM 15MHz CH-High, 100%RB



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

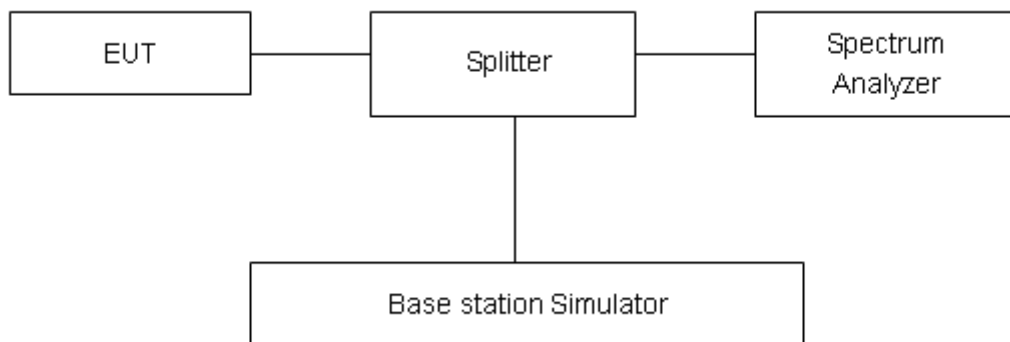
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### 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	25.83	22.78	3.05	≤13	PASS
	1413	1732.6	25.51	22.76	2.75	≤13	PASS
	1513	1752.6	25.68	22.68	3.00	≤13	PASS

LTE Band 4										
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion	
100%	QPSK	1.4M	19957	1710.7	27.06	21.87	5.19	≤13	PASS	
			20175	1732.5	26.73	22.02	4.71	≤13	PASS	
			20393	1754.3	27.03	21.95	5.08	≤13	PASS	
		3M	19965	1711.5	27.06	22.03	5.03	≤13	PASS	
			20175	1732.5	26.66	22.13	4.53	≤13	PASS	
			20385	1753.5	27.02	22.10	4.92	≤13	PASS	
		5M	19975	1712.5	27.29	22.03	5.26	≤13	PASS	
			20175	1732.5	26.83	22.14	4.69	≤13	PASS	
			20375	1752.5	27.22	22.13	5.09	≤13	PASS	
		10M	20000	1715	27.22	22.02	5.20	≤13	PASS	
			20175	1732.5	26.76	22.14	4.62	≤13	PASS	
			20350	1750	27.11	22.17	4.94	≤13	PASS	
		15M	20025	1717.5	27.39	22.08	5.31	≤13	PASS	
			20175	1732.5	26.86	22.09	4.77	≤13	PASS	
			20325	1747.5	27.11	22.13	4.98	≤13	PASS	
		20M	20050	1720	27.17	22.15	5.02	≤13	PASS	
			20175	1732.5	26.71	22.11	4.60	≤13	PASS	
			20300	1745	26.80	22.11	4.69	≤13	PASS	
		16QAM	1.4M	19957	1710.7	27.41	20.99	6.42	≤13	PASS
				20175	1732.5	26.90	21.11	5.79	≤13	PASS
				20393	1754.3	27.43	21.11	6.32	≤13	PASS
			3M	19965	1711.5	27.53	21.16	6.37	≤13	PASS
				20175	1732.5	27.01	21.19	5.82	≤13	PASS
				20385	1753.5	27.49	21.27	6.22	≤13	PASS
5M	19975		1712.5	27.57	21.19	6.38	≤13	PASS		
	20175		1732.5	27.02	21.23	5.79	≤13	PASS		
	20375		1752.5	27.44	21.26	6.18	≤13	PASS		
10M	20000		1715	27.57	21.17	6.40	≤13	PASS		
	20175		1732.5	26.99	21.22	5.77	≤13	PASS		
	20350		1750	27.33	21.24	6.09	≤13	PASS		
15M	20025		1717.5	27.65	21.22	6.43	≤13	PASS		
	20175		1732.5	27.09	21.23	5.86	≤13	PASS		



		20325	1747.5	27.28	21.21	6.07	≤13	PASS	
		20M	20050	1720	27.53	21.26	6.27	≤13	PASS
			20175	1732.5	27.00	21.20	5.80	≤13	PASS
			20300	1745	27.08	21.24	5.84	≤13	PASS
	64QAM	1.4M	19957	1710.7	27.44	21.15	6.29	≤13	PASS
			20175	1732.5	26.53	21.22	5.31	≤13	PASS
			20393	1754.3	27.13	20.98	6.15	≤13	PASS
		3M	19965	1711.5	27.55	21.32	6.23	≤13	PASS
			20175	1732.5	26.57	21.22	5.35	≤13	PASS
			20385	1753.5	27.21	21.12	6.09	≤13	PASS
		5M	19975	1712.5	27.59	21.34	6.25	≤13	PASS
			20175	1732.5	26.58	21.22	5.36	≤13	PASS
			20375	1752.5	26.93	21.09	5.84	≤13	PASS
	10M	20000	1715	27.56	21.33	6.23	≤13	PASS	
		20175	1732.5	26.60	21.21	5.39	≤13	PASS	
		20350	1750	26.79	21.05	5.74	≤13	PASS	
	15M	20025	1717.5	27.56	21.28	6.28	≤13	PASS	
		20175	1732.5	26.75	21.24	5.51	≤13	PASS	
		20325	1747.5	26.96	21.28	5.68	≤13	PASS	
	20M	20050	1720	27.37	21.29	6.08	≤13	PASS	
		20175	1732.5	26.73	21.20	5.53	≤13	PASS	
		20300	1745	26.87	21.26	5.61	≤13	PASS	

LTE Band 7									
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
100%	QPSK	5M	20775	2502.5	26.34	21.79	4.55	≤13	PASS
			21100	2535	26.07	21.44	4.63	≤13	PASS
			21425	2567.5	26.14	21.66	4.48	≤13	PASS
		10M	20800	2505	26.37	21.71	4.66	≤13	PASS
			21100	2535	26.02	21.43	4.59	≤13	PASS
			21400	2565	26.14	21.71	4.43	≤13	PASS
		15M	20825	2507.5	26.62	21.69	4.93	≤13	PASS
			21100	2535	26.25	21.47	4.78	≤13	PASS
			21375	2562.5	26.25	21.63	4.62	≤13	PASS
		20M	20850	2510	26.56	21.72	4.84	≤13	PASS
			21100	2535	26.15	21.47	4.68	≤13	PASS
			21350	2560	26.12	21.64	4.48	≤13	PASS
	16QAM	5M	20775	2502.5	26.46	20.86	5.60	≤13	PASS
			21100	2535	26.25	20.49	5.76	≤13	PASS
			21425	2567.5	26.28	20.71	5.57	≤13	PASS
		10M	20800	2505	26.57	20.78	5.79	≤13	PASS
			21100	2535	26.27	20.53	5.74	≤13	PASS



		15M	21400	2565	26.31	20.71	5.60	≤13	PASS
			20825	2507.5	26.77	20.79	5.98	≤13	PASS
			21100	2535	26.38	20.52	5.86	≤13	PASS
			21375	2562.5	26.42	20.67	5.75	≤13	PASS
		20M	20850	2510	26.80	20.78	6.02	≤13	PASS
			21100	2535	26.37	20.55	5.82	≤13	PASS
	21350		2560	26.41	20.70	5.71	≤13	PASS	
	64QAM	5M	20775	2502.5	26.57	20.98	5.59	≤13	PASS
			21100	2535	26.32	20.60	5.72	≤13	PASS
			21425	2567.5	26.36	20.74	5.62	≤13	PASS
		10M	20800	2505	26.62	20.83	5.79	≤13	PASS
			21100	2535	26.26	20.59	5.67	≤13	PASS
			21400	2565	26.38	20.73	5.65	≤13	PASS
		15M	20825	2507.5	26.86	20.87	5.99	≤13	PASS
			21100	2535	26.45	20.66	5.79	≤13	PASS
			21375	2562.5	26.46	20.67	5.79	≤13	PASS
		20M	20850	2510	26.84	20.85	5.99	≤13	PASS
			21100	2535	26.40	20.63	5.77	≤13	PASS
			21350	2560	26.45	20.70	5.75	≤13	PASS

LTE Band 12									
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
100%	QPSK	1.4M	23017	699.7	27.22	22.50	4.72	≤13	PASS
			23095	707.5	27.54	22.51	5.03	≤13	PASS
			23173	715.3	27.29	22.46	4.83	≤13	PASS
		3M	23025	700.5	27.12	22.58	4.54	≤13	PASS
			23095	707.5	27.49	22.62	4.87	≤13	PASS
			23165	714.5	27.24	22.56	4.68	≤13	PASS
		5M	23035	701.5	27.36	22.70	4.66	≤13	PASS
			23095	707.5	27.72	22.63	5.09	≤13	PASS
			23155	713.5	27.42	22.59	4.83	≤13	PASS
		10M	23060	704	27.54	22.70	4.84	≤13	PASS
			23095	707.5	27.60	22.65	4.95	≤13	PASS
			23130	711	27.29	22.62	4.67	≤13	PASS
	16QAM	1.4M	23017	699.7	27.45	21.55	5.90	≤13	PASS
			23095	707.5	27.86	21.64	6.22	≤13	PASS
			23173	715.3	27.64	21.57	6.07	≤13	PASS
		3M	23025	700.5	27.45	21.68	5.77	≤13	PASS
			23095	707.5	27.93	21.71	6.22	≤13	PASS
			23165	714.5	27.63	21.70	5.93	≤13	PASS
		5M	23035	701.5	27.51	21.80	5.71	≤13	PASS
			23095	707.5	27.96	21.76	6.20	≤13	PASS



	64QAM	10M	23155	713.5	27.63	21.73	5.90	≤13	PASS	
			23060	704	27.72	21.76	5.96	≤13	PASS	
			23095	707.5	27.87	21.76	6.11	≤13	PASS	
			23130	711	27.67	21.69	5.98	≤13	PASS	
	64QAM	1.4M		23017	699.7	27.45	21.63	5.82	≤13	PASS
				23095	707.5	27.91	21.77	6.14	≤13	PASS
				23173	715.3	27.78	21.81	5.97	≤13	PASS
		3M		23025	700.5	27.47	21.79	5.68	≤13	PASS
				23095	707.5	28.04	21.82	6.22	≤13	PASS
				23165	714.5	27.75	21.90	5.85	≤13	PASS
		5M		23035	701.5	27.53	21.90	5.63	≤13	PASS
				23095	707.5	28.06	21.88	6.18	≤13	PASS
				23155	713.5	27.70	21.81	5.89	≤13	PASS
	10M		23060	704	27.82	21.90	5.92	≤13	PASS	
			23095	707.5	27.92	21.84	6.08	≤13	PASS	
			23130	711	27.78	21.80	5.98	≤13	PASS	

LTE Band 13										
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion	
100%	QPSK	5M	23205	779.5	27.04	22.54	4.50	≤13	PASS	
			23230	782	27.01	22.50	4.51	≤13	PASS	
			23255	784.5	26.67	22.37	4.30	≤13	PASS	
	16QAM	10M	23230	782	27.05	22.51	4.54	≤13	PASS	
			5M	23205	779.5	27.14	21.57	5.57	≤13	PASS
				23230	782	27.15	21.59	5.56	≤13	PASS
				23255	784.5	26.77	21.44	5.33	≤13	PASS
	64QAM	10M	23230	782	27.17	21.54	5.63	≤13	PASS	
			5M	23205	779.5	27.20	21.66	5.54	≤13	PASS
				23230	782	27.21	21.65	5.56	≤13	PASS
				23255	784.5	26.76	21.49	5.27	≤13	PASS
			10M	23230	782	27.22	21.60	5.62	≤13	PASS



LTE Band 17									
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
100%	QPSK	5M	23755	706.5	27.66	22.61	5.05	≤13	PASS
			23790	710	27.50	22.59	4.91	≤13	PASS
			23825	713.5	27.44	22.58	4.86	≤13	PASS
		10M	23780	709	27.46	22.61	4.85	≤13	PASS
			23790	710	27.41	22.63	4.78	≤13	PASS
			23800	711	27.30	22.61	4.69	≤13	PASS
	16QAM	5M	23755	706.5	27.92	21.77	6.15	≤13	PASS
			23790	710	27.79	21.72	6.07	≤13	PASS
			23825	713.5	27.63	21.68	5.95	≤13	PASS
		10M	23780	709	27.74	21.69	6.05	≤13	PASS
			23790	710	27.73	21.70	6.03	≤13	PASS
			23800	711	27.66	21.68	5.98	≤13	PASS
	64QAM	5M	23755	706.5	27.92	21.80	6.12	≤13	PASS
			23790	710	27.76	21.73	6.03	≤13	PASS
			23825	713.5	27.61	21.72	5.89	≤13	PASS
		10M	23780	709	27.76	21.74	6.02	≤13	PASS
			23790	710	27.75	21.75	6.00	≤13	PASS
			23800	711	27.70	21.74	5.96	≤13	PASS

LTE Band 66									
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
100%	QPSK	1.4M	131979	1710.7	27.01	21.86	5.15	≤13	PASS
			132322	1745	26.94	22.23	4.71	≤13	PASS
			132665	1779.3	26.59	22.01	4.58	≤13	PASS
		3M	131987	1711.5	27.00	22.00	5.00	≤13	PASS
			132322	1745	26.74	22.29	4.45	≤13	PASS
			132657	1778.5	26.52	22.04	4.48	≤13	PASS
		5M	131997	1712.5	27.22	22.00	5.22	≤13	PASS
			132322	1745	26.87	22.25	4.62	≤13	PASS
			132647	1777.5	26.71	22.02	4.69	≤13	PASS
		10M	132022	1715	27.26	22.10	5.16	≤13	PASS
			132322	1745	27.00	22.27	4.73	≤13	PASS
			132622	1775	26.91	22.03	4.88	≤13	PASS
		15M	132047	1717.5	27.31	22.01	5.30	≤13	PASS
			132322	1745	27.13	22.23	4.90	≤13	PASS
			132597	1772.5	27.04	21.92	5.12	≤13	PASS
20M	132072	1720	27.14	22.12	5.02	≤13	PASS		



			132322	1745	27.05	22.30	4.75	≤13	PASS
			132572	1770	27.08	22.10	4.98	≤13	PASS
	16QAM	1.4M	131979	1710.7	27.36	21.00	6.36	≤13	PASS
			132322	1745	27.11	21.32	5.79	≤13	PASS
			132665	1779.3	26.87	21.08	5.79	≤13	PASS
		3M	131987	1711.5	27.47	21.12	6.35	≤13	PASS
			132322	1745	27.23	21.39	5.84	≤13	PASS
			132657	1778.5	26.88	21.10	5.78	≤13	PASS
		5M	131997	1712.5	27.49	21.12	6.37	≤13	PASS
			132322	1745	27.06	21.38	5.68	≤13	PASS
			132647	1777.5	26.89	21.10	5.79	≤13	PASS
		10M	132022	1715	27.62	21.26	6.36	≤13	PASS
			132322	1745	27.24	21.41	5.83	≤13	PASS
			132622	1775	27.18	21.14	6.04	≤13	PASS
		15M	132047	1717.5	27.57	21.13	6.44	≤13	PASS
			132322	1745	27.30	21.32	5.98	≤13	PASS
			132597	1772.5	27.27	21.06	6.21	≤13	PASS
		20M	132072	1720	27.50	21.24	6.26	≤13	PASS
			132322	1745	27.29	21.38	5.91	≤13	PASS
			132572	1770	27.43	21.27	6.16	≤13	PASS
	64QAM	1.4M	131979	1710.7	27.61	21.30	6.31	≤13	PASS
			132322	1745	26.94	21.59	5.35	≤13	PASS
			132665	1779.3	26.63	21.23	5.40	≤13	PASS
		3M	131987	1711.5	27.74	21.46	6.28	≤13	PASS
			132322	1745	26.95	21.55	5.40	≤13	PASS
			132657	1778.5	26.60	21.18	5.42	≤13	PASS
		5M	131997	1712.5	27.68	21.38	6.30	≤13	PASS
			132322	1745	26.96	21.54	5.42	≤13	PASS
			132647	1777.5	26.66	21.19	5.47	≤13	PASS
		10M	132022	1715	27.68	21.42	6.26	≤13	PASS
132322			1745	26.95	21.54	5.41	≤13	PASS	
132622			1775	26.84	21.30	5.54	≤13	PASS	
15M		132047	1717.5	27.64	21.33	6.31	≤13	PASS	
		132322	1745	27.16	21.59	5.57	≤13	PASS	
		132597	1772.5	27.08	21.27	5.81	≤13	PASS	
20M		132072	1720	27.63	21.53	6.10	≤13	PASS	
		132322	1745	27.16	21.57	5.59	≤13	PASS	
		132572	1770	27.19	21.29	5.90	≤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 +55°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 +55°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

#### Frequency Stability (Voltage Variation)

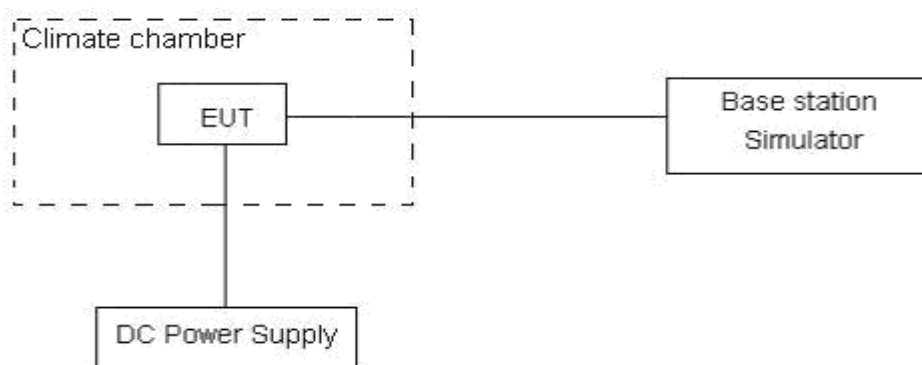
The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery-operating end point which shall be specified by the manufacturer.

This transceiver is specified to operate with an input voltage of between 3.6 V and 4.4 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	BPSK	QPSK	BPSK	QPSK	
Normal(25°C)	Normal	16.69	1.77	0.00888	0.00094	PASS
Extreme(55°C)		11.93	9.87	0.00635	0.00525	PASS
Extreme(50°C)		11.51	3.87	0.00612	0.00206	PASS
Extreme(40°C)		6.13	14.37	0.00326	0.00764	PASS
Extreme(30°C)		8.65	6.12	0.00460	0.00326	PASS
Extreme(20°C)		11.27	14.26	0.00600	0.00759	PASS
Extreme(10°C)		1.75	15.44	0.00093	0.00821	PASS
Extreme(0°C)		5.77	7.59	0.00307	0.00403	PASS
Extreme(-10°C)		14.59	14.54	0.00776	0.00773	PASS
Extreme(-20°C)		2.02	7.00	0.00108	0.00372	PASS
Extreme(-30°C)		5.36	9.77	0.00285	0.00520	PASS
25°C	LV	16.18	9.32	0.00861	0.00496	PASS
	HV	7.57	16.81	0.00402	0.00894	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	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	10.55	5.26	9.34	0.00561	0.00280	0.00497	PASS
Extreme(55°C)		4.44	8.61	9.05	0.00236	0.00458	0.00482	PASS
Extreme(50°C)		9.03	9.48	1.63	0.00480	0.00504	0.00087	PASS
Extreme(40°C)		1.96	6.86	9.98	0.00104	0.00365	0.00531	PASS
Extreme(30°C)		7.95	3.48	1.66	0.00423	0.00185	0.00088	PASS
Extreme(20°C)		14.19	13.93	7.30	0.00755	0.00741	0.00388	PASS
Extreme(10°C)		15.84	17.13	8.86	0.00843	0.00911	0.00471	PASS
Extreme(0°C)		12.48	2.70	3.31	0.00664	0.00144	0.00176	PASS
Extreme(-10°C)		1.10	3.03	5.09	0.00058	0.00161	0.00271	PASS
Extreme(-20°C)		2.97	4.86	6.88	0.00158	0.00259	0.00366	PASS
Extreme(-30°C)		11.58	17.75	12.27	0.00616	0.00944	0.00653	PASS
25°C	LV	9.87	4.29	17.84	0.00525	0.00228	0.00949	PASS
	HV	7.73	5.41	4.21	0.00411	0.00288	0.00224	PASS
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	



Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	9.62	17.65	6.33	0.00511	0.00939	0.00337	PASS
Extreme(55°C)		11.84	10.06	6.79	0.00630	0.00535	0.00361	PASS
Extreme(50°C)		14.26	2.82	16.83	0.00758	0.00150	0.00895	PASS
Extreme(40°C)		1.92	3.30	5.05	0.00102	0.00175	0.00269	PASS
Extreme(30°C)		11.56	12.51	15.72	0.00615	0.00666	0.00836	PASS
Extreme(20°C)		16.30	3.98	4.69	0.00867	0.00212	0.00250	PASS
Extreme(10°C)		6.95	10.38	5.94	0.00370	0.00552	0.00316	PASS
Extreme(0°C)		12.33	6.60	11.75	0.00656	0.00351	0.00625	PASS
Extreme(-10°C)		17.14	2.10	15.78	0.00911	0.00112	0.00839	PASS
Extreme(-20°C)		2.00	10.90	15.78	0.00106	0.00580	0.00839	PASS
Extreme(-30°C)		6.17	17.80	8.03	0.00328	0.00947	0.00427	PASS
25°C	LV	7.28	15.32	16.81	0.00387	0.00815	0.00894	PASS
	HV	8.86	5.36	6.64	0.00471	0.00285	0.00353	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	3.87	10.47	8.41	0.00206	0.00557	0.00448	PASS
Extreme(55°C)		15.84	16.44	2.97	0.00842	0.00875	0.00158	PASS
Extreme(50°C)		16.18	10.26	14.73	0.00861	0.00546	0.00783	PASS
Extreme(40°C)		16.90	3.13	3.31	0.00899	0.00167	0.00176	PASS
Extreme(30°C)		14.88	1.12	11.86	0.00792	0.00060	0.00631	PASS
Extreme(20°C)		15.97	1.97	5.05	0.00850	0.00105	0.00269	PASS
Extreme(10°C)		1.90	12.22	9.16	0.00101	0.00650	0.00487	PASS
Extreme(0°C)		11.63	3.82	17.23	0.00618	0.00203	0.00916	PASS
Extreme(-10°C)		4.80	4.52	13.25	0.00255	0.00241	0.00705	PASS
Extreme(-20°C)		10.07	6.59	13.38	0.00535	0.00351	0.00712	PASS
Extreme(-30°C)		10.80	5.15	2.61	0.00575	0.00274	0.00139	PASS
25°C	LV	3.62	7.58	4.54	0.00192	0.00403	0.00241	PASS
	HV	14.57	14.33	4.59	0.00775	0.00762	0.00244	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	13.65	9.35	9.45	0.00726	0.00498	0.00503	PASS
Extreme(55°C)		3.83	6.66	10.33	0.00204	0.00354	0.00550	PASS
Extreme(50°C)		12.59	9.11	12.95	0.00670	0.00485	0.00689	PASS
Extreme(40°C)		9.98	12.82	10.31	0.00531	0.00682	0.00548	PASS
Extreme(30°C)		1.37	2.00	8.91	0.00073	0.00106	0.00474	PASS
Extreme(20°C)		11.89	10.86	5.74	0.00632	0.00577	0.00305	PASS



Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	15MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Extreme(10°C)		13.49	11.42	17.57	0.00717	0.00607	0.00935	PASS
Extreme(0°C)		5.38	17.09	8.60	0.00286	0.00909	0.00458	PASS
Extreme(-10°C)		6.72	9.10	11.74	0.00357	0.00484	0.00625	PASS
Extreme(-20°C)		12.14	9.96	17.68	0.00646	0.00530	0.00941	PASS
Extreme(-30°C)		14.88	17.47	6.42	0.00792	0.00929	0.00341	PASS
25°C	LV	4.98	8.94	6.02	0.00265	0.00475	0.00320	PASS
	HV	9.46	8.48	11.74	0.00503	0.00451	0.00624	PASS
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	3.71	14.29	12.39	0.00198	0.00760	0.00659	PASS
Extreme(55°C)		4.27	13.80	8.62	0.00227	0.00734	0.00458	PASS
Extreme(50°C)		2.90	9.60	3.17	0.00154	0.00511	0.00168	PASS
Extreme(40°C)		6.08	17.96	4.87	0.00324	0.00955	0.00259	PASS
Extreme(30°C)		12.19	16.92	16.94	0.00649	0.00900	0.00901	PASS
Extreme(20°C)		1.64	15.80	3.68	0.00087	0.00840	0.00196	PASS
Extreme(10°C)		4.89	1.77	4.72	0.00260	0.00094	0.00251	PASS
Extreme(0°C)		11.44	8.73	15.26	0.00609	0.00465	0.00812	PASS
Extreme(-10°C)		8.93	3.46	13.06	0.00475	0.00184	0.00695	PASS
Extreme(-20°C)		7.63	6.89	15.17	0.00406	0.00366	0.00807	PASS
Extreme(-30°C)		9.21	14.32	9.53	0.00490	0.00762	0.00507	PASS
25°C		LV	10.03	4.42	8.03	0.00533	0.00235	0.00427
	HV	16.73	4.79	5.49	0.00890	0.00255	0.00292	PASS
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	7.31	17.84	5.43	0.00389	0.00949	0.00289	PASS
Extreme(55°C)		9.20	12.36	16.78	0.00489	0.00657	0.00892	PASS
Extreme(50°C)		14.54	6.86	7.96	0.00773	0.00365	0.00423	PASS
Extreme(40°C)		8.15	17.68	6.52	0.00433	0.00940	0.00347	PASS
Extreme(30°C)		11.92	10.19	13.85	0.00634	0.00542	0.00737	PASS
Extreme(20°C)		8.23	13.16	16.74	0.00438	0.00700	0.00890	PASS
Extreme(10°C)		14.60	15.49	1.10	0.00777	0.00824	0.00059	PASS
Extreme(0°C)		5.96	16.65	6.42	0.00317	0.00885	0.00341	PASS
Extreme(-10°C)		11.15	14.74	13.00	0.00593	0.00784	0.00691	PASS
Extreme(-20°C)		7.24	14.51	12.36	0.00385	0.00772	0.00657	PASS
Extreme(-30°C)		10.24	7.95	11.59	0.00545	0.00423	0.00617	PASS
25°C		LV	6.74	15.00	14.20	0.00358	0.00798	0.00755
	HV	16.16	17.92	16.34	0.00859	0.00953	0.00869	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	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	14.86	15.76	10.79	0.00790	0.00839	0.00574	PASS
Extreme(55°C)		5.91	16.13	17.03	0.00314	0.00858	0.00906	PASS
Extreme(50°C)		11.82	12.99	10.06	0.00629	0.00691	0.00535	PASS
Extreme(40°C)		13.86	2.94	12.55	0.00737	0.00156	0.00667	PASS
Extreme(30°C)		12.44	7.78	17.54	0.00662	0.00414	0.00933	PASS
Extreme(20°C)		13.56	4.65	7.11	0.00721	0.00247	0.00378	PASS
Extreme(10°C)		12.06	16.12	4.83	0.00641	0.00858	0.00257	PASS
Extreme(0°C)		2.81	4.64	14.62	0.00149	0.00247	0.00778	PASS
Extreme(-10°C)		6.04	4.52	2.83	0.00322	0.00241	0.00151	PASS
Extreme(-20°C)		1.64	13.45	4.86	0.00087	0.00715	0.00258	PASS
Extreme(-30°C)		8.18	10.86	13.86	0.00435	0.00577	0.00737	PASS
25°C	LV	16.89	15.67	14.77	0.00898	0.00834	0.00785	PASS
	HV	2.28	4.12	8.28	0.00121	0.00219	0.00440	PASS
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	12.51	2.47	13.61	0.00665	0.00131	0.00724	PASS
Extreme(55°C)		16.65	12.37	1.10	0.00886	0.00658	0.00058	PASS
Extreme(50°C)		17.24	4.78	8.73	0.00917	0.00254	0.00464	PASS
Extreme(40°C)		17.68	11.49	2.44	0.00940	0.00611	0.00130	PASS
Extreme(30°C)		12.04	16.10	11.23	0.00641	0.00856	0.00597	PASS
Extreme(20°C)		15.24	9.75	9.17	0.00811	0.00519	0.00488	PASS
Extreme(10°C)		1.54	9.35	5.88	0.00082	0.00497	0.00313	PASS
Extreme(0°C)		8.49	13.22	14.93	0.00452	0.00703	0.00794	PASS
Extreme(-10°C)		9.79	13.24	11.91	0.00521	0.00704	0.00633	PASS
Extreme(-20°C)		10.01	4.84	9.17	0.00533	0.00257	0.00488	PASS
Extreme(-30°C)		14.86	3.05	5.93	0.00790	0.00162	0.00315	PASS
25°C	LV	14.88	12.98	11.41	0.00792	0.00690	0.00607	PASS
	HV	7.80	17.48	17.05	0.00415	0.00930	0.00907	PASS
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	15MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	



Normal(25°C)	Normal	15.51	10.04	13.98	0.00825	0.00534	0.00743	PASS
Extreme(55°C)		6.62	9.21	8.25	0.00352	0.00490	0.00439	PASS
Extreme(50°C)		11.28	1.03	15.62	0.00600	0.00055	0.00831	PASS
Extreme(40°C)		13.41	2.78	13.62	0.00713	0.00148	0.00724	PASS
Extreme(30°C)		11.24	6.24	8.96	0.00598	0.00332	0.00477	PASS
Extreme(20°C)		9.71	1.13	2.06	0.00516	0.00060	0.00109	PASS
Extreme(10°C)		2.31	4.89	4.18	0.00123	0.00260	0.00222	PASS
Extreme(0°C)		2.26	13.75	17.11	0.00120	0.00731	0.00910	PASS
Extreme(-10°C)		16.77	5.48	9.28	0.00892	0.00292	0.00494	PASS
Extreme(-20°C)		6.72	2.34	10.83	0.00358	0.00124	0.00576	PASS
Extreme(-30°C)		1.53	2.59	13.72	0.00082	0.00138	0.00730	PASS
25°C		LV	13.82	15.09	16.31	0.00735	0.00803	0.00868
	HV	12.10	5.31	4.78	0.00644	0.00283	0.00254	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	8.55	8.83	1.84	0.00455	0.00469	0.00098	PASS
Extreme(55°C)		7.44	14.74	13.12	0.00396	0.00784	0.00698	PASS
Extreme(50°C)		15.40	6.59	12.36	0.00819	0.00350	0.00657	PASS
Extreme(40°C)		15.20	14.16	5.18	0.00809	0.00753	0.00275	PASS
Extreme(30°C)		4.26	6.93	12.14	0.00226	0.00369	0.00646	PASS
Extreme(20°C)		12.88	10.31	13.79	0.00685	0.00548	0.00733	PASS
Extreme(10°C)		6.83	16.37	17.84	0.00363	0.00871	0.00949	PASS
Extreme(0°C)		10.97	2.50	1.40	0.00583	0.00133	0.00074	PASS
Extreme(-10°C)		11.70	8.94	4.81	0.00622	0.00476	0.00256	PASS
Extreme(-20°C)		15.79	17.57	6.22	0.00840	0.00935	0.00331	PASS
Extreme(-30°C)		12.53	8.03	2.77	0.00666	0.00427	0.00147	PASS
25°C		LV	17.07	7.16	12.20	0.00908	0.00381	0.00649
	HV	10.11	7.74	14.80	0.00538	0.00412	0.00787	PASS

LTE Band 12								
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	2.28	12.92	3.03	0.00121	0.00687	0.00161	PASS
Extreme(55°C)		12.62	8.57	3.91	0.00671	0.00456	0.00208	PASS
Extreme(50°C)		11.18	10.02	14.52	0.00595	0.00533	0.00772	PASS
Extreme(40°C)		11.59	2.58	4.31	0.00616	0.00137	0.00229	PASS



Extreme(30°C)		2.13	8.62	5.52	0.00113	0.00459	0.00294	PASS
Extreme(20°C)		1.86	13.37	4.99	0.00099	0.00711	0.00266	PASS
Extreme(10°C)		17.13	12.84	13.70	0.00911	0.00683	0.00729	PASS
Extreme(0°C)		10.43	10.09	13.57	0.00555	0.00537	0.00722	PASS
Extreme(-10°C)		10.77	6.20	11.66	0.00573	0.00330	0.00620	PASS
Extreme(-20°C)		3.85	16.70	1.99	0.00205	0.00888	0.00106	PASS
Extreme(-30°C)		17.11	6.40	15.37	0.00910	0.00340	0.00817	PASS
25°C	LV	11.07	13.23	1.40	0.00589	0.00704	0.00075	PASS
	HV	1.08	12.13	1.43	0.00058	0.00645	0.00076	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	8.77	12.47	8.24	0.00466	0.00663	0.00438	PASS
Extreme(55°C)		5.05	12.50	9.91	0.00268	0.00665	0.00527	PASS
Extreme(50°C)		4.03	11.11	16.93	0.00214	0.00591	0.00900	PASS
Extreme(40°C)		5.22	13.69	13.26	0.00278	0.00728	0.00705	PASS
Extreme(30°C)		1.20	13.81	4.08	0.00064	0.00734	0.00217	PASS
Extreme(20°C)		6.85	8.65	12.76	0.00365	0.00460	0.00678	PASS
Extreme(10°C)		10.12	8.78	15.71	0.00538	0.00467	0.00836	PASS
Extreme(0°C)		5.33	8.00	14.09	0.00283	0.00426	0.00750	PASS
Extreme(-10°C)		13.91	13.31	4.37	0.00740	0.00708	0.00233	PASS
Extreme(-20°C)		6.90	3.68	12.99	0.00367	0.00196	0.00691	PASS
Extreme(-30°C)		6.21	1.12	6.36	0.00330	0.00059	0.00338	PASS
25°C		LV	5.59	14.78	6.56	0.00297	0.00786	0.00349
	HV	14.33	13.65	16.29	0.00762	0.00726	0.00867	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	14.89	12.63	7.71	0.00792	0.00672	0.00410	PASS
Extreme(55°C)		16.81	1.66	9.92	0.00894	0.00088	0.00528	PASS
Extreme(50°C)		4.69	3.00	6.73	0.00249	0.00160	0.00358	PASS
Extreme(40°C)		4.19	1.01	9.57	0.00223	0.00054	0.00509	PASS
Extreme(30°C)		16.61	9.57	3.00	0.00884	0.00509	0.00160	PASS
Extreme(20°C)		6.87	2.32	5.04	0.00365	0.00123	0.00268	PASS
Extreme(10°C)		6.17	2.06	16.61	0.00328	0.00110	0.00884	PASS
Extreme(0°C)		4.60	17.47	13.04	0.00245	0.00929	0.00694	PASS
Extreme(-10°C)		4.55	5.67	11.23	0.00242	0.00301	0.00597	PASS
Extreme(-20°C)		5.44	3.99	3.78	0.00289	0.00212	0.00201	PASS
Extreme(-30°C)		2.31	5.31	12.79	0.00123	0.00282	0.00680	PASS



Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
25°C	LV	12.33	5.19	7.71	0.00656	0.00276	0.00410	PASS
	HV	13.21	12.16	16.75	0.00703	0.00647	0.00891	PASS
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	5.41	15.47	9.41	0.00288	0.00823	0.00501	PASS
Extreme(55°C)		9.98	13.24	9.89	0.00531	0.00704	0.00526	PASS
Extreme(50°C)		1.28	16.98	15.38	0.00068	0.00903	0.00818	PASS
Extreme(40°C)		12.05	10.66	6.21	0.00641	0.00567	0.00330	PASS
Extreme(30°C)		2.18	11.61	8.96	0.00116	0.00617	0.00477	PASS
Extreme(20°C)		9.49	11.41	14.18	0.00505	0.00607	0.00754	PASS
Extreme(10°C)		16.05	1.67	2.16	0.00854	0.00089	0.00115	PASS
Extreme(0°C)		14.64	4.89	3.79	0.00779	0.00260	0.00202	PASS
Extreme(-10°C)		16.17	11.52	12.26	0.00860	0.00613	0.00652	PASS
Extreme(-20°C)		4.24	13.39	17.22	0.00226	0.00712	0.00916	PASS
Extreme(-30°C)		12.88	9.41	11.06	0.00685	0.00500	0.00588	PASS
25°C	LV	8.40	13.55	4.76	0.00447	0.00721	0.00253	PASS
	HV	17.82	5.84	8.93	0.00948	0.00311	0.00475	PASS

LTE Band 13								
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	6.36	10.90	4.84	0.00338	0.00580	0.00257	PASS
Extreme(55°C)		6.70	1.23	1.37	0.00356	0.00065	0.00073	PASS
Extreme(50°C)		9.99	14.73	14.20	0.00532	0.00784	0.00755	PASS
Extreme(40°C)		14.55	4.89	11.36	0.00774	0.00260	0.00604	PASS
Extreme(30°C)		8.88	16.31	10.48	0.00472	0.00868	0.00558	PASS
Extreme(20°C)		1.47	7.50	3.24	0.00078	0.00399	0.00172	PASS
Extreme(10°C)		2.93	11.55	10.52	0.00156	0.00614	0.00559	PASS
Extreme(0°C)		5.61	8.31	9.60	0.00299	0.00442	0.00510	PASS
Extreme(-10°C)		15.78	5.73	17.28	0.00839	0.00305	0.00919	PASS
Extreme(-20°C)		17.50	4.53	6.01	0.00931	0.00241	0.00319	PASS
Extreme(-30°C)		4.23	16.48	16.06	0.00225	0.00876	0.00854	PASS
25°C	LV	10.28	10.51	6.46	0.00547	0.00559	0.00343	PASS
	HV	11.68	11.00	3.73	0.00621	0.00585	0.00199	PASS
Condition		Freq. Error	Freq. Error	Freq. Error	Frequency Stability	Frequency Stability	Frequency Stability	Verdict





BANDWIDTH	10MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	12.21	13.49	8.87	0.00650	0.00718	0.00472	PASS
Extreme(55°C)		2.00	14.87	2.99	0.00107	0.00791	0.00159	PASS
Extreme(50°C)		16.48	2.80	13.24	0.00877	0.00149	0.00704	PASS
Extreme(40°C)		2.51	12.98	7.22	0.00133	0.00691	0.00384	PASS
Extreme(30°C)		14.67	1.49	12.44	0.00781	0.00079	0.00662	PASS
Extreme(20°C)		16.72	17.40	4.18	0.00889	0.00926	0.00222	PASS
Extreme(10°C)		2.67	4.45	10.03	0.00142	0.00237	0.00533	PASS
Extreme(0°C)		10.24	5.65	1.58	0.00545	0.00301	0.00084	PASS
Extreme(-10°C)		14.23	6.07	6.08	0.00757	0.00323	0.00324	PASS
Extreme(-20°C)		13.70	15.36	14.60	0.00729	0.00817	0.00776	PASS
Extreme(-30°C)		7.39	9.07	11.58	0.00393	0.00482	0.00616	PASS
25°C	LV	2.05	11.00	9.33	0.00109	0.00585	0.00496	PASS
	HV	7.98	15.72	15.46	0.00424	0.00836	0.00822	PASS

LTE Band 17								
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	11.44	11.62	13.65	0.00608	0.00618	0.00726	PASS
Extreme(55°C)		10.57	15.97	9.41	0.00562	0.00850	0.00501	PASS
Extreme(50°C)		1.66	15.77	9.82	0.00088	0.00839	0.00522	PASS
Extreme(40°C)		15.06	13.32	15.77	0.00801	0.00709	0.00839	PASS
Extreme(30°C)		16.14	5.19	15.59	0.00859	0.00276	0.00829	PASS
Extreme(20°C)		15.68	9.52	10.48	0.00834	0.00507	0.00558	PASS
Extreme(10°C)		14.03	9.29	12.76	0.00746	0.00494	0.00679	PASS
Extreme(0°C)		16.17	6.57	1.56	0.00860	0.00349	0.00083	PASS
Extreme(-10°C)		15.84	3.95	1.52	0.00843	0.00210	0.00081	PASS
Extreme(-20°C)		5.44	15.98	16.64	0.00290	0.00850	0.00885	PASS
Extreme(-30°C)		11.83	2.05	17.54	0.00629	0.00109	0.00933	PASS
25°C	LV	9.21	16.92	16.19	0.00490	0.00900	0.00861	PASS
	HV	6.71	14.24	16.32	0.00357	0.00758	0.00868	PASS
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	15.07	1.24	4.45	0.00801	0.00066	0.00236	PASS



Extreme(55°C)		17.62	11.51	15.47	0.00937	0.00612	0.00823	PASS
Extreme(50°C)		15.87	11.04	14.71	0.00844	0.00587	0.00783	PASS
Extreme(40°C)		12.60	7.62	4.51	0.00670	0.00405	0.00240	PASS
Extreme(30°C)		16.19	1.01	2.80	0.00861	0.00054	0.00149	PASS
Extreme(20°C)		7.49	8.98	8.53	0.00398	0.00478	0.00454	PASS
Extreme(10°C)		15.98	15.31	12.29	0.00850	0.00814	0.00654	PASS
Extreme(0°C)		7.65	16.01	12.43	0.00407	0.00851	0.00661	PASS
Extreme(-10°C)		17.32	2.24	15.65	0.00921	0.00119	0.00833	PASS
Extreme(-20°C)		8.55	6.32	9.16	0.00455	0.00336	0.00487	PASS
Extreme(-30°C)		4.33	14.36	4.51	0.00230	0.00764	0.00240	PASS
25°C	LV	9.58	7.37	15.89	0.00510	0.00392	0.00845	PASS
	HV	13.64	15.22	4.03	0.00725	0.00809	0.00214	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	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	10.08	7.49	6.45	0.00536	0.00399	0.00343	PASS
Extreme(55°C)		9.46	5.53	7.11	0.00503	0.00294	0.00378	PASS
Extreme(50°C)		4.75	4.46	8.30	0.00253	0.00237	0.00441	PASS
Extreme(40°C)		2.75	16.47	7.04	0.00146	0.00876	0.00374	PASS
Extreme(30°C)		11.65	12.70	1.70	0.00620	0.00675	0.00090	PASS
Extreme(20°C)		16.08	9.80	11.66	0.00855	0.00521	0.00620	PASS
Extreme(10°C)		3.33	9.88	7.55	0.00177	0.00525	0.00401	PASS
Extreme(0°C)		14.13	16.84	12.96	0.00752	0.00896	0.00690	PASS
Extreme(-10°C)		2.26	10.58	14.24	0.00120	0.00563	0.00757	PASS
Extreme(-20°C)		8.77	17.69	2.63	0.00466	0.00941	0.00140	PASS
Extreme(-30°C)	17.58	11.90	12.14	0.00935	0.00633	0.00646	PASS	
25°C	LV	15.50	17.63	12.56	0.00824	0.00938	0.00668	PASS
	HV	17.71	14.40	16.86	0.00942	0.00766	0.00897	PASS
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	9.32	11.77	1.38	0.00496	0.00626	0.00073	PASS
Extreme(55°C)		2.03	6.82	5.04	0.00108	0.00363	0.00268	PASS
Extreme(50°C)		3.23	13.02	14.37	0.00172	0.00693	0.00764	PASS
Extreme(40°C)		13.69	15.83	14.89	0.00728	0.00842	0.00792	PASS
Extreme(30°C)		3.35	7.40	15.84	0.00178	0.00393	0.00843	PASS
Extreme(20°C)		13.69	14.80	13.57	0.00728	0.00787	0.00722	PASS



Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Extreme(10°C)		16.44	4.85	1.47	0.00874	0.00258	0.00078	PASS
Extreme(0°C)		3.10	8.59	2.71	0.00165	0.00457	0.00144	PASS
Extreme(-10°C)		7.15	4.53	7.87	0.00380	0.00241	0.00419	PASS
Extreme(-20°C)		9.25	15.12	7.65	0.00492	0.00804	0.00407	PASS
Extreme(-30°C)		16.89	14.10	15.30	0.00898	0.00750	0.00814	PASS
25°C	LV	7.12	1.42	6.03	0.00379	0.00075	0.00321	PASS
	HV	6.02	4.19	14.11	0.00320	0.00223	0.00751	PASS
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	4.11	5.71	15.30	0.00219	0.00304	0.00814	PASS
Extreme(55°C)		14.54	10.04	11.75	0.00773	0.00534	0.00625	PASS
Extreme(50°C)		15.66	16.60	5.11	0.00833	0.00883	0.00272	PASS
Extreme(40°C)		11.91	2.83	9.62	0.00634	0.00151	0.00512	PASS
Extreme(30°C)		13.02	16.19	1.19	0.00692	0.00861	0.00063	PASS
Extreme(20°C)		5.21	17.38	16.88	0.00277	0.00925	0.00898	PASS
Extreme(10°C)		9.25	14.99	3.26	0.00492	0.00798	0.00173	PASS
Extreme(0°C)		4.55	5.17	16.51	0.00242	0.00275	0.00878	PASS
Extreme(-10°C)		7.50	4.34	4.44	0.00399	0.00231	0.00236	PASS
Extreme(-20°C)		15.39	15.03	8.31	0.00818	0.00800	0.00442	PASS
Extreme(-30°C)		14.61	13.21	2.10	0.00777	0.00703	0.00112	PASS
25°C		LV	16.28	3.53	15.73	0.00866	0.00188	0.00837
	HV	2.30	9.71	10.57	0.00123	0.00516	0.00562	PASS
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	16.32	2.19	13.78	0.00868	0.00117	0.00733	PASS
Extreme(55°C)		7.85	8.50	17.47	0.00417	0.00452	0.00929	PASS
Extreme(50°C)		14.20	17.39	16.25	0.00755	0.00925	0.00864	PASS
Extreme(40°C)		8.16	15.26	9.02	0.00434	0.00812	0.00480	PASS
Extreme(30°C)		10.70	12.23	4.12	0.00569	0.00650	0.00219	PASS
Extreme(20°C)		17.88	8.85	3.74	0.00951	0.00471	0.00199	PASS
Extreme(10°C)		6.12	13.56	11.34	0.00325	0.00721	0.00603	PASS
Extreme(0°C)		8.47	2.61	5.82	0.00450	0.00139	0.00309	PASS
Extreme(-10°C)		12.28	16.86	14.44	0.00653	0.00897	0.00768	PASS
Extreme(-20°C)		7.03	3.04	14.37	0.00374	0.00162	0.00764	PASS
Extreme(-30°C)		15.91	1.88	10.34	0.00846	0.00100	0.00550	PASS
25°C		LV	7.39	10.89	16.01	0.00393	0.00579	0.00852
	HV	16.07	5.70	7.17	0.00855	0.00303	0.00382	PASS



Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	15MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	3.23	14.96	16.57	0.00172	0.00796	0.00881	PASS
Extreme(55°C)		12.60	11.05	11.39	0.00670	0.00588	0.00606	PASS
Extreme(50°C)		1.82	4.14	10.38	0.00097	0.00220	0.00552	PASS
Extreme(40°C)		5.10	8.28	17.77	0.00271	0.00440	0.00945	PASS
Extreme(30°C)		1.61	7.31	7.40	0.00086	0.00389	0.00394	PASS
Extreme(20°C)		11.42	17.47	17.55	0.00607	0.00929	0.00934	PASS
Extreme(10°C)		10.48	16.46	12.79	0.00557	0.00875	0.00680	PASS
Extreme(0°C)		4.41	5.69	2.05	0.00235	0.00303	0.00109	PASS
Extreme(-10°C)		15.11	13.76	8.25	0.00804	0.00732	0.00439	PASS
Extreme(-20°C)		14.21	14.37	14.45	0.00756	0.00764	0.00768	PASS
Extreme(-30°C)		7.92	12.91	6.69	0.00421	0.00687	0.00356	PASS
25°C		LV	15.02	12.21	9.38	0.00799	0.00650	0.00499
	HV	5.31	12.36	6.95	0.00283	0.00657	0.00370	PASS
Condition		Freq. Error (Hz)	Freq. Error (Hz)	Freq. Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz	(Hz)	(Hz)	(Hz)	(ppm)	(ppm)	(ppm)	
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal(25°C)	Normal	3.07	9.36	10.28	0.00163	0.00498	0.00547	PASS
Extreme(55°C)		8.29	5.12	7.02	0.00441	0.00272	0.00373	PASS
Extreme(50°C)		9.16	17.82	12.40	0.00487	0.00948	0.00660	PASS
Extreme(40°C)		4.62	17.13	11.31	0.00246	0.00911	0.00602	PASS
Extreme(30°C)		16.74	17.01	9.41	0.00891	0.00905	0.00500	PASS
Extreme(20°C)		9.20	11.43	10.47	0.00490	0.00608	0.00557	PASS
Extreme(10°C)		1.03	4.08	11.73	0.00055	0.00217	0.00624	PASS
Extreme(0°C)		17.18	3.33	9.37	0.00914	0.00177	0.00499	PASS
Extreme(-10°C)		4.61	6.77	3.82	0.00245	0.00360	0.00203	PASS
Extreme(-20°C)		7.36	15.21	2.54	0.00392	0.00809	0.00135	PASS
Extreme(-30°C)		11.42	15.86	7.10	0.00608	0.00843	0.00378	PASS
25°C		LV	16.04	5.07	10.09	0.00853	0.00270	0.00537
	HV	3.34	12.93	8.47	0.00177	0.00688	0.00451	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.

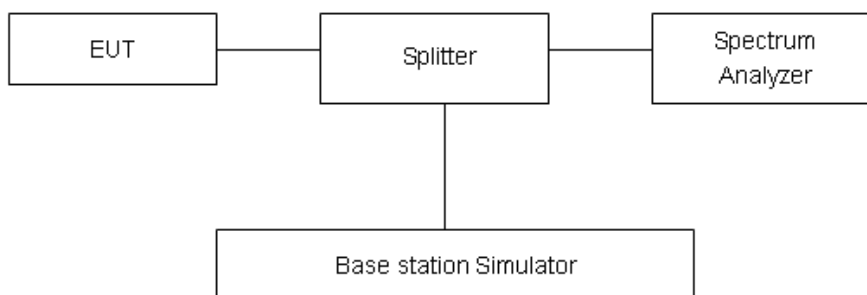
RBW is set to 100kHz, VBW is set to 300kHz for 30MHz~1GHz

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

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 (g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log(P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

Rule Part 27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to  $-70$  dBW/MHz equivalent isotropically



radiated power (EIRP) for wideband signals, and  $-80$  dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

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 (c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $76 + 10 \log (P)$  dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log (P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

Part 27.53 (h)/(g) Limit		-13 dBm
Part 27.53(f) Limit	Limit out of the band 1559-1610 MHz	-13 dBm
	Limit in the band 1559-1610 MHz	-40 dBm
Part 27.53(m) Limit		-25 dBm

### Measurement Uncertainty

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

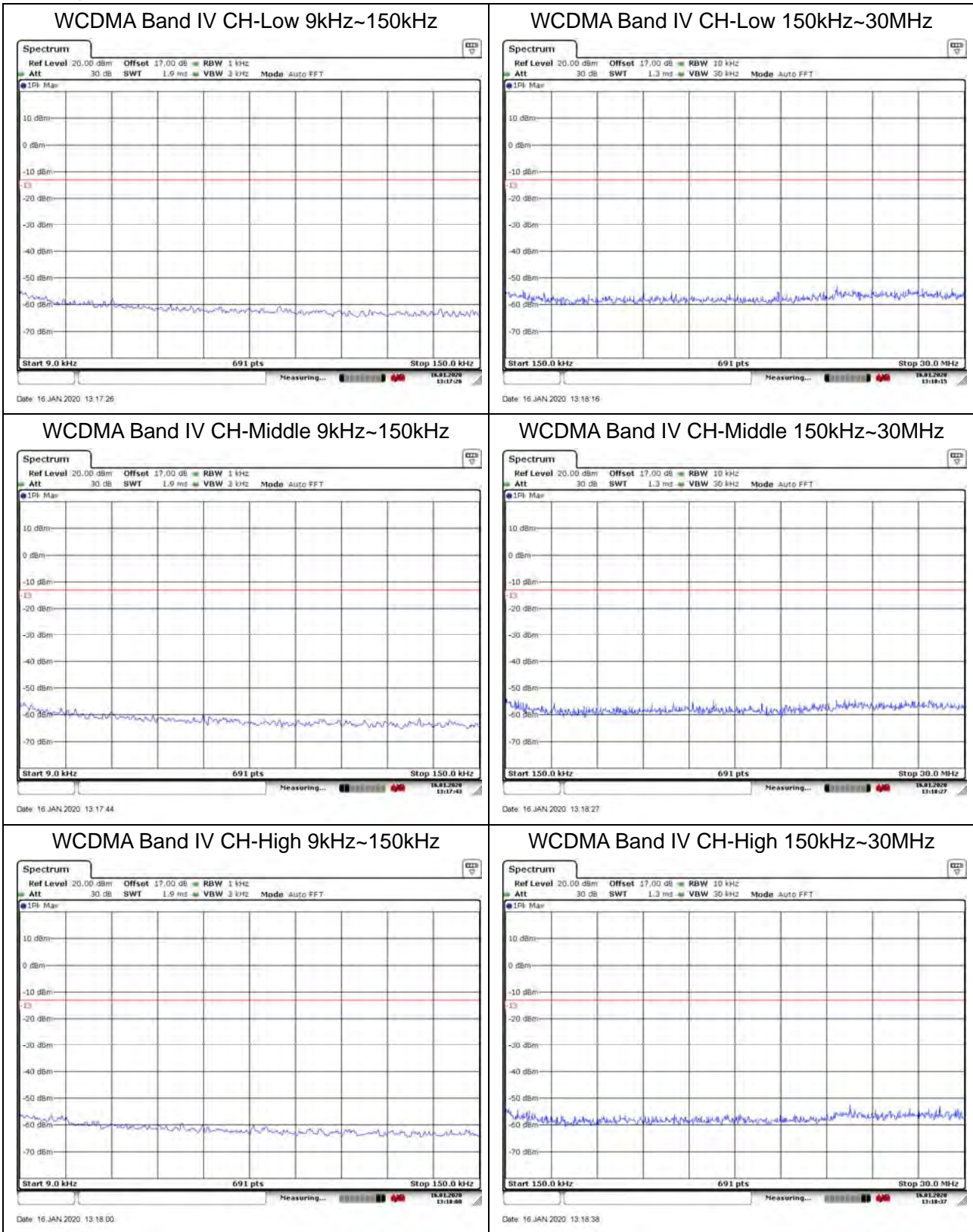
Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-27GHz	1.407 dB



### Test Result

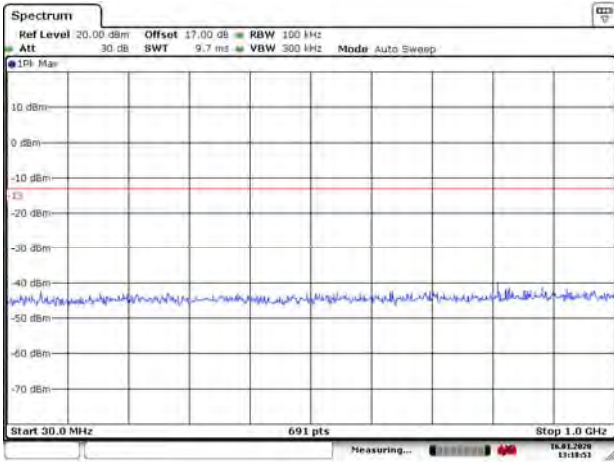
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

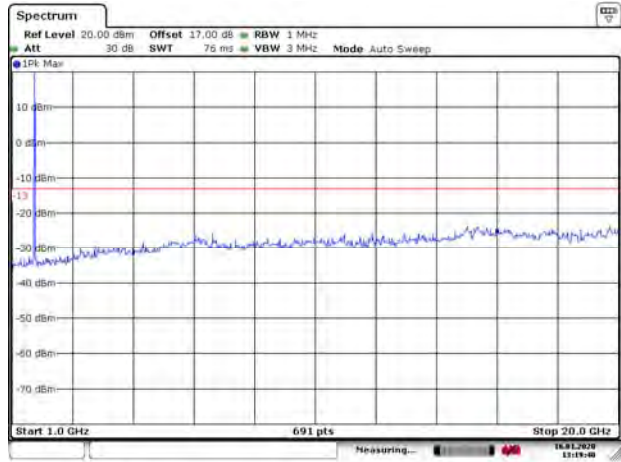




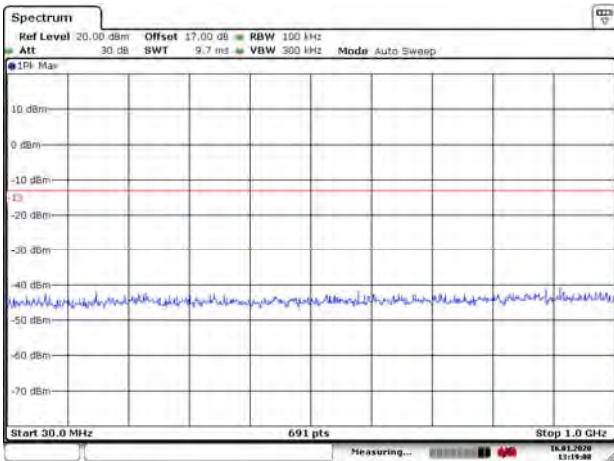
### WCDMA Band IV CH-Low 30MHz~1GHz



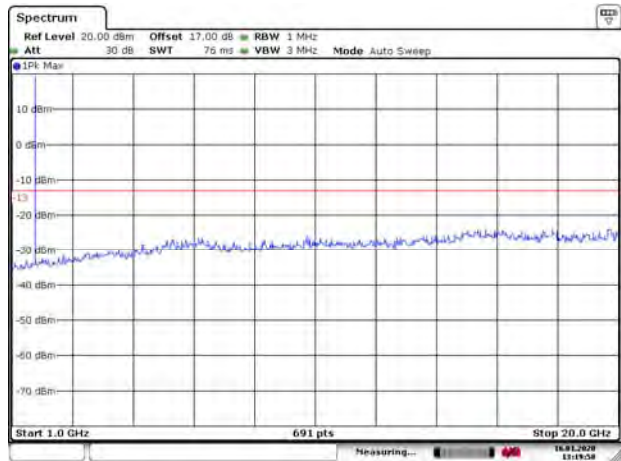
### WCDMA Band IV CH-Low 1GHz ~20GHz



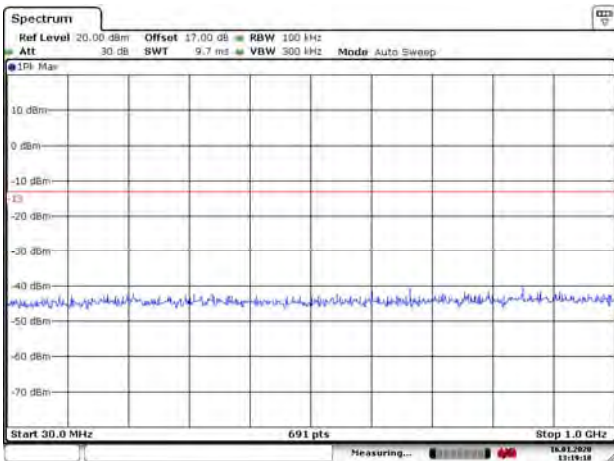
### WCDMA Band IV CH-Middle 30MHz~1GHz



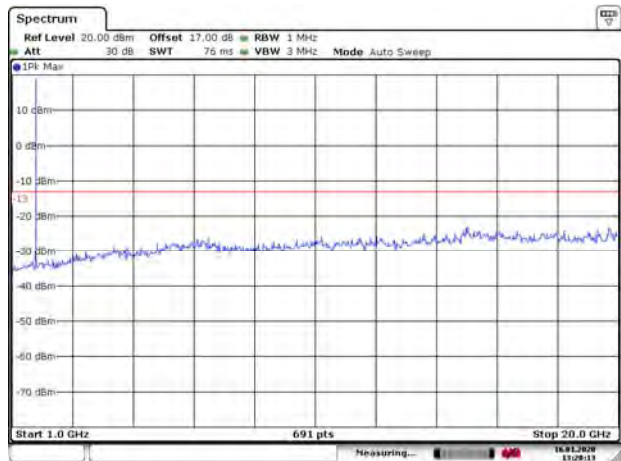
### WCDMA Band IV CH-Middle 1GHz ~20GHz



### WCDMA Band IV CH-High 30MHz~1GHz



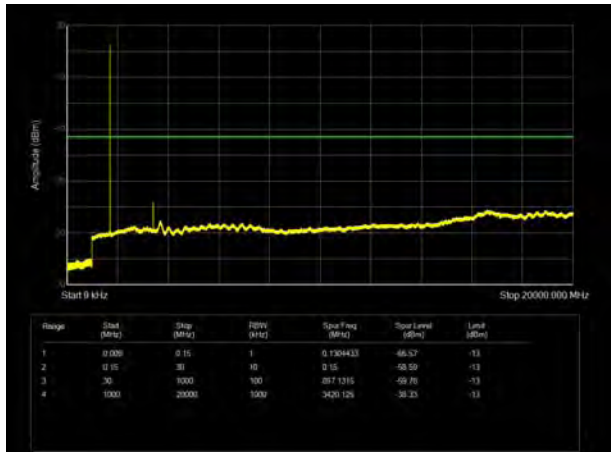
### WCDMA Band IV CH-High 1GHz ~20GHz



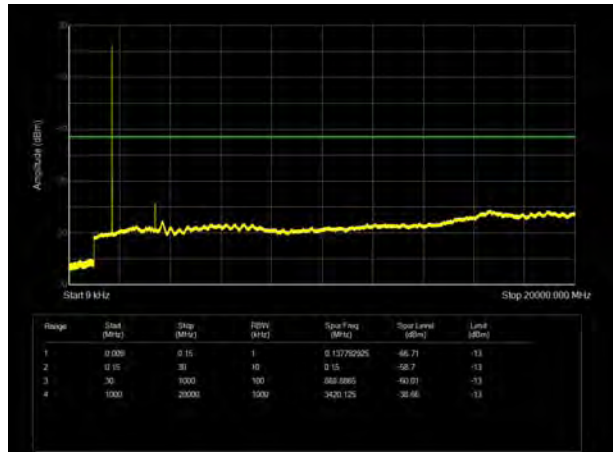




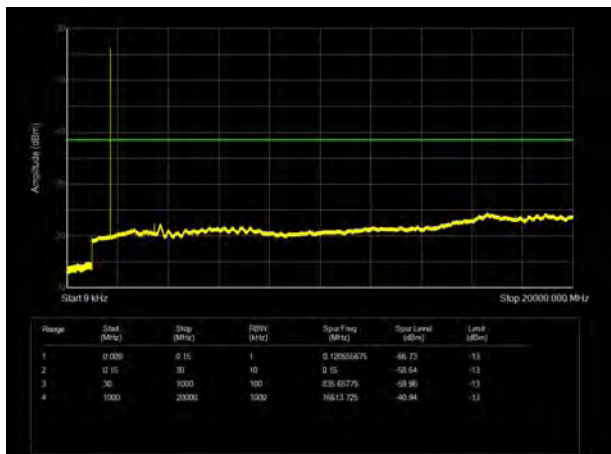
LTE Band 4 1.4MHz CH-Low 9kHz~20GHz



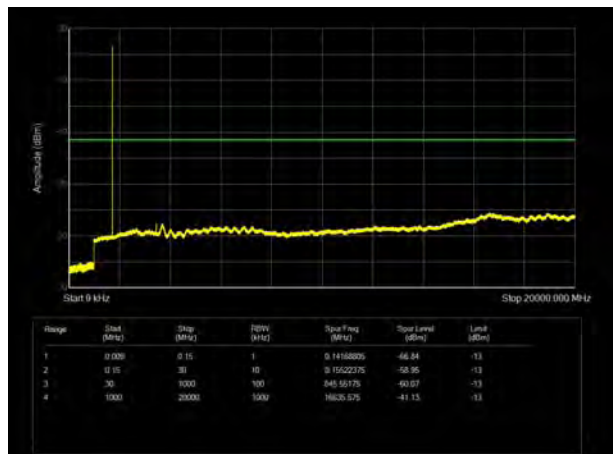
LTE Band 4 3MHz CH- Low 9kHz~20GHz



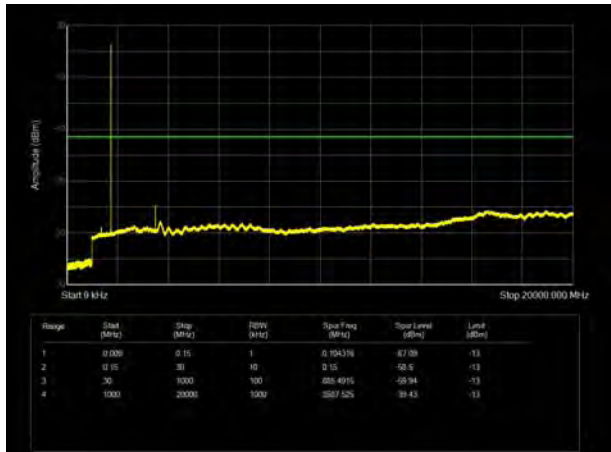
LTE Band 4 1.4MHz CH- Middle 9kHz~20GHz



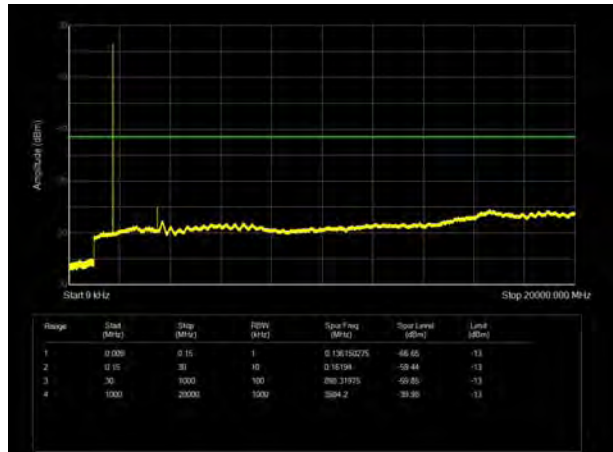
LTE Band 4 3MHz CH- Middle 9kHz~20GHz



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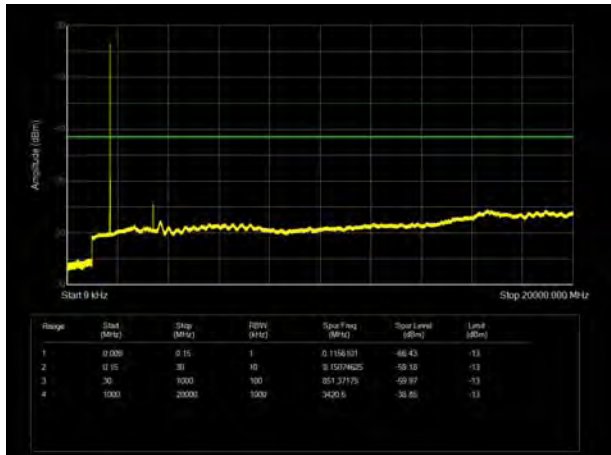


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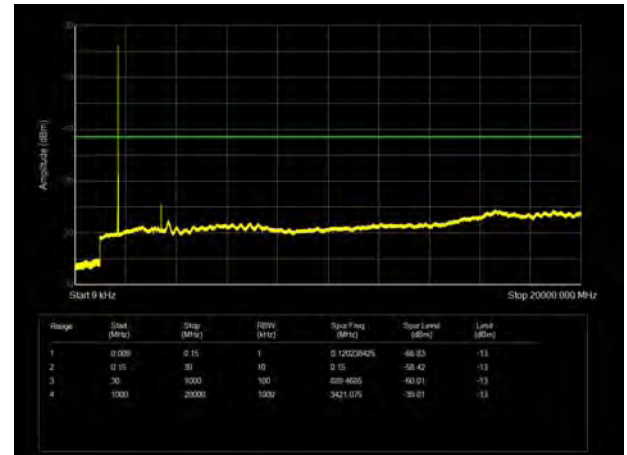




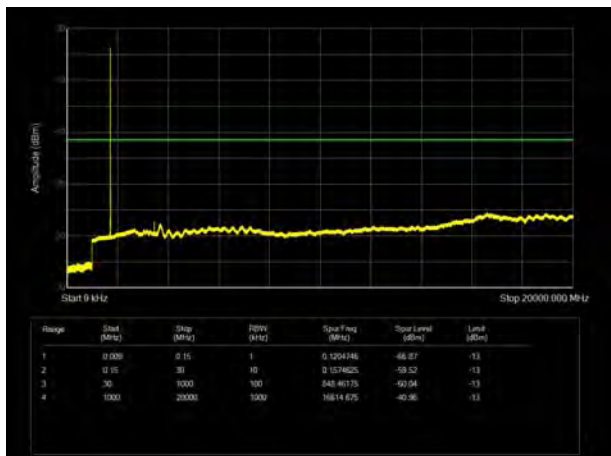
LTE Band 4 5MHz CH- Low 9kHz~20GHz



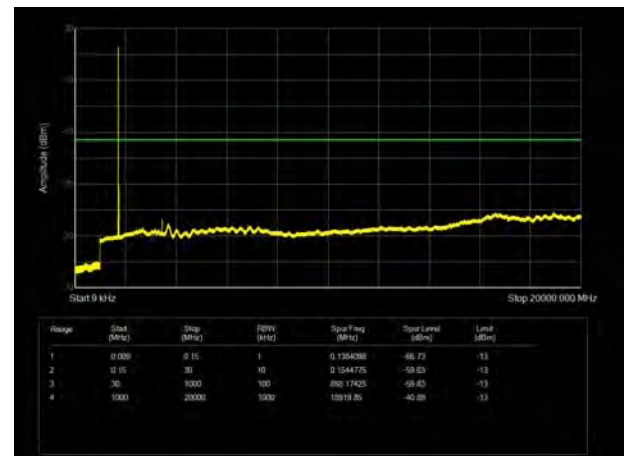
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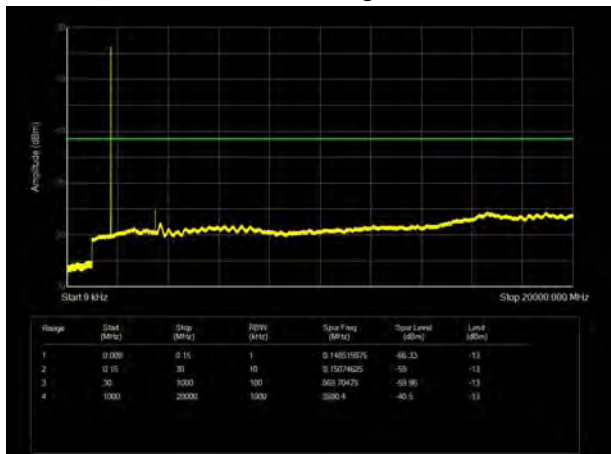
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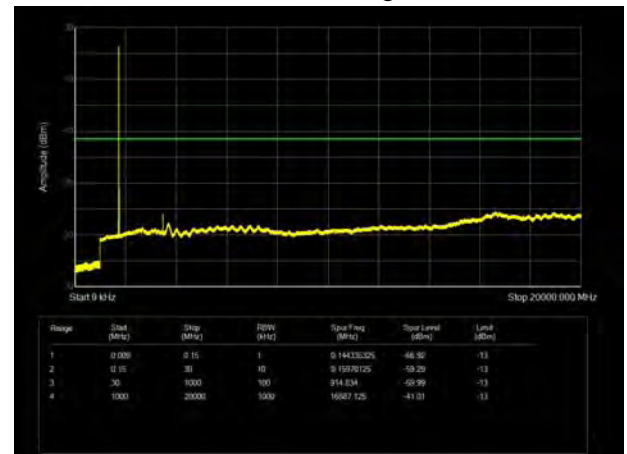
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LTE Band 4 5MHz CH-High 9kHz~20GHz

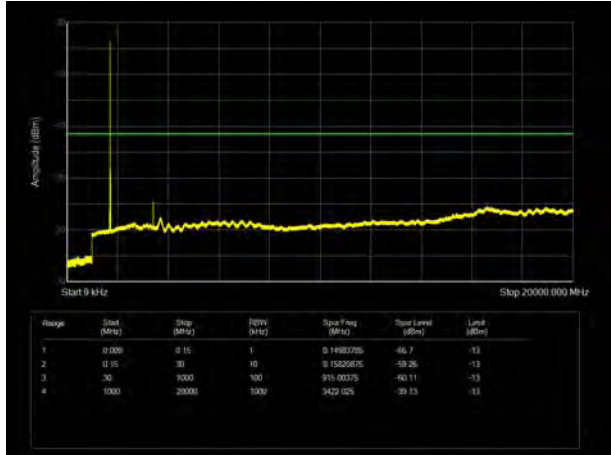


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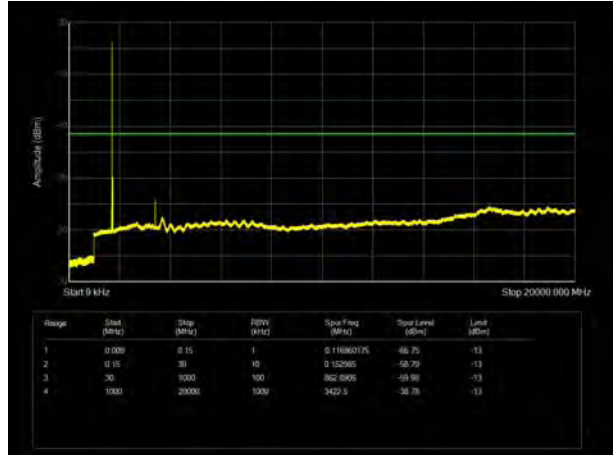




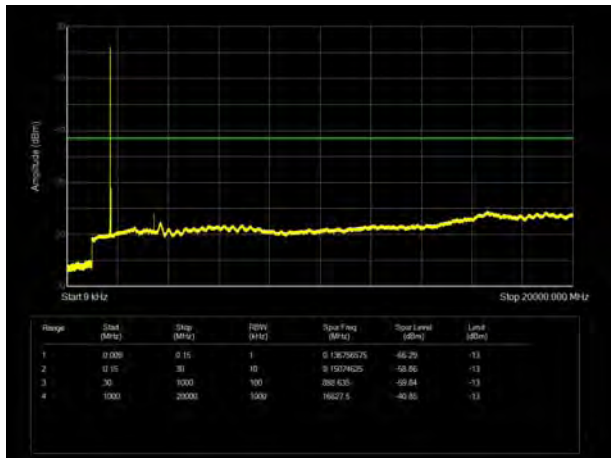
LTE Band 4 15MHz CH- Low 9kHz~20GHz



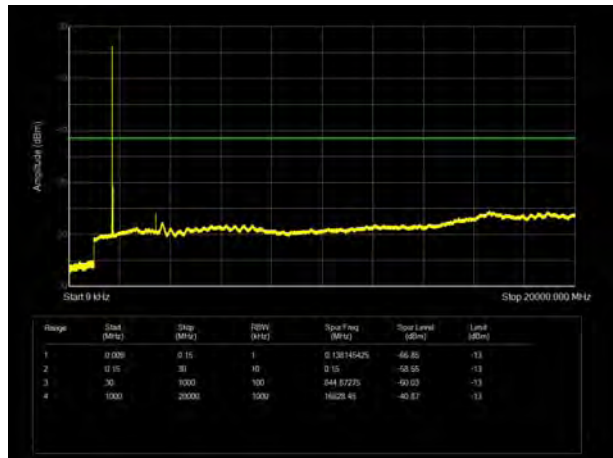
LTE Band 4 20MHz CH-Low 9kHz~20GHz



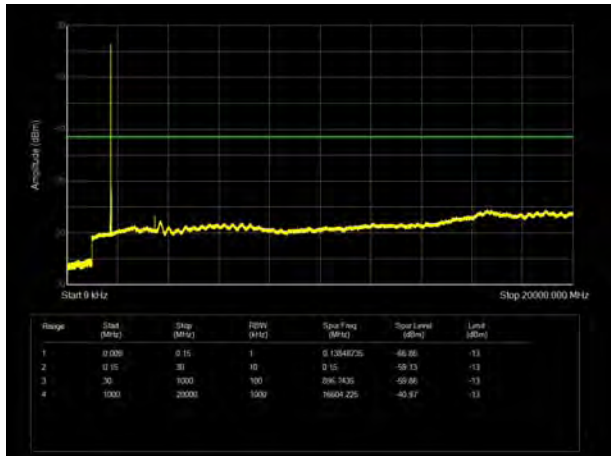
LTE Band 4 15MHz CH- Middle 9kHz~20GHz



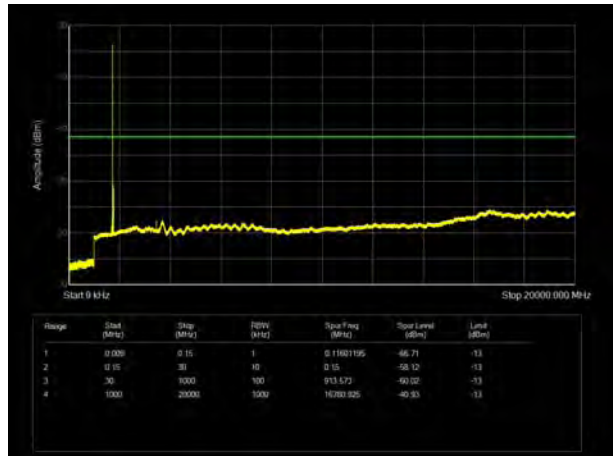
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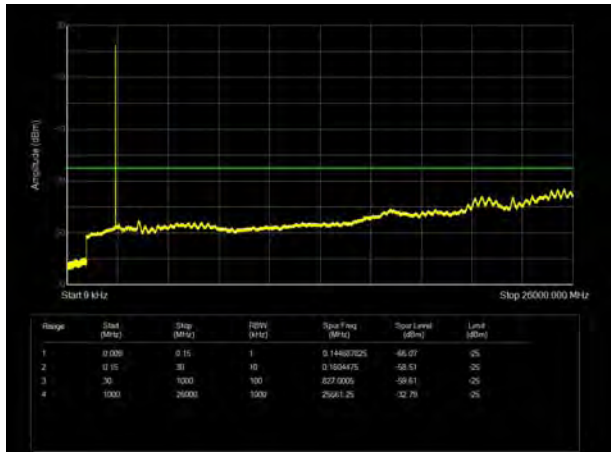


LTE Band 4 20MHz CH- High 9kHz~20GHz

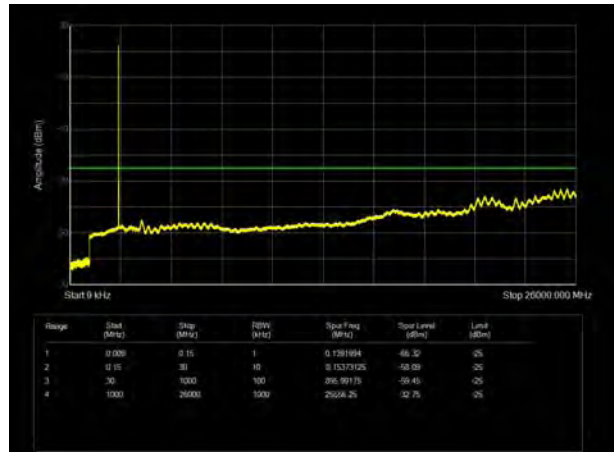




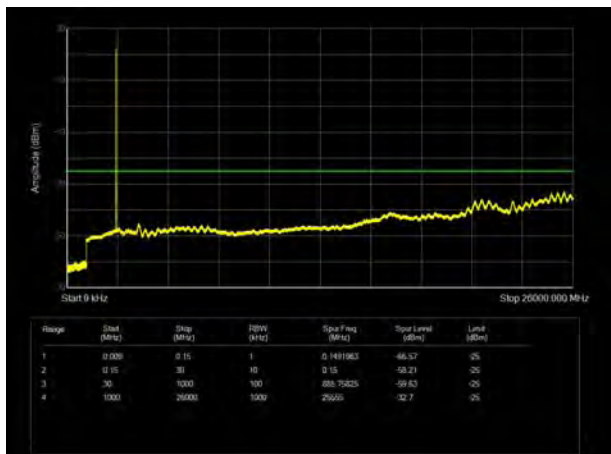
LTE Band 7 5MHz CH- Low 9kHz~26GHz



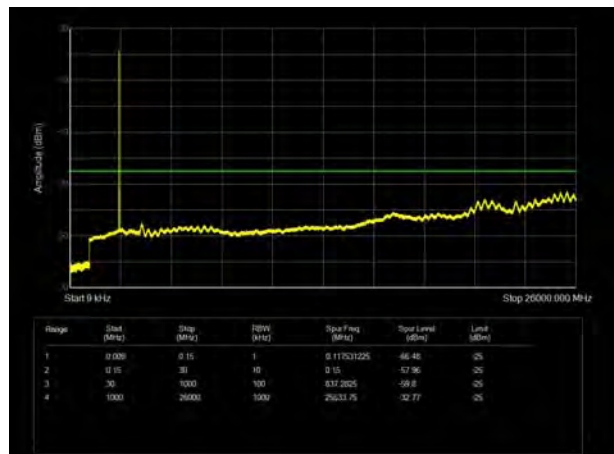
LTE Band 7 10MHz CH- Low 9kHz~26GHz



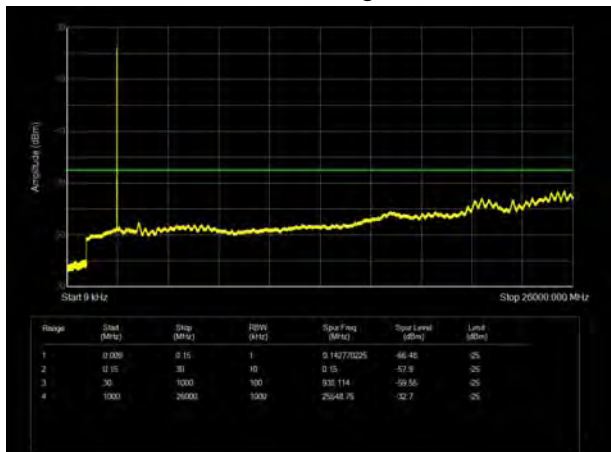
LTE Band 7 5MHz CH- Middle 9kHz~26GHz



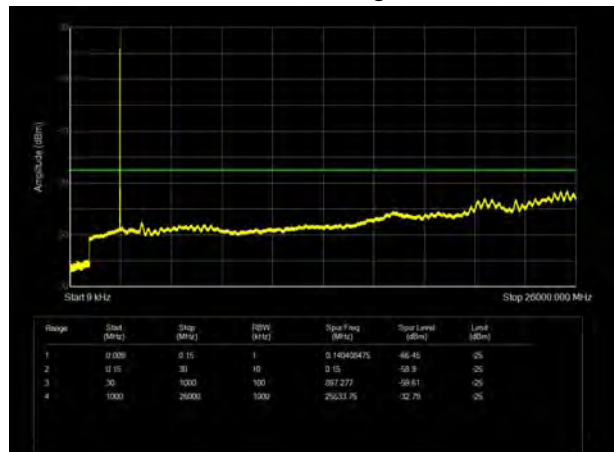
LTE Band 7 10MHz CH- Middle 9kHz~26GHz



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

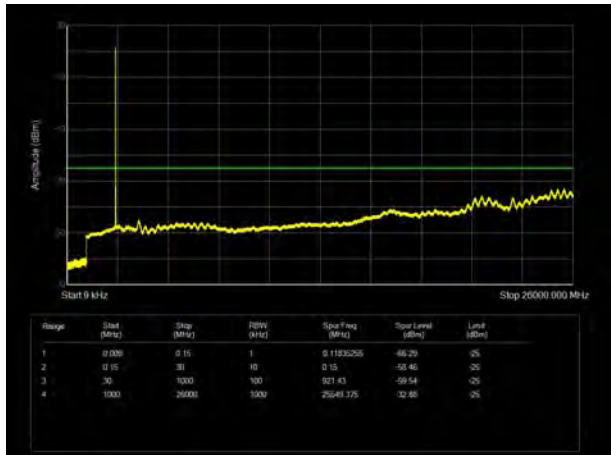


LTE Band 7 10MHz CH-High 9kHz~26GHz

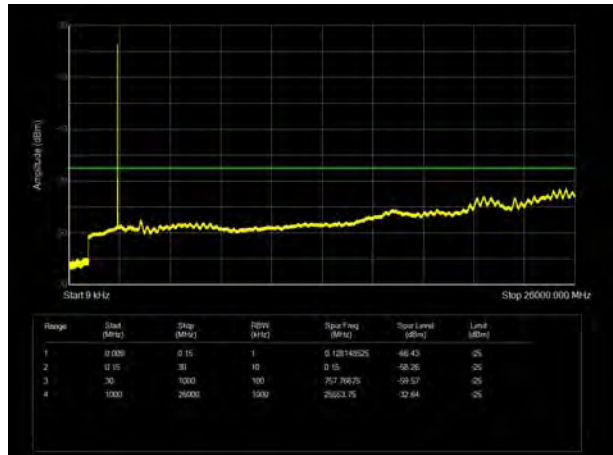




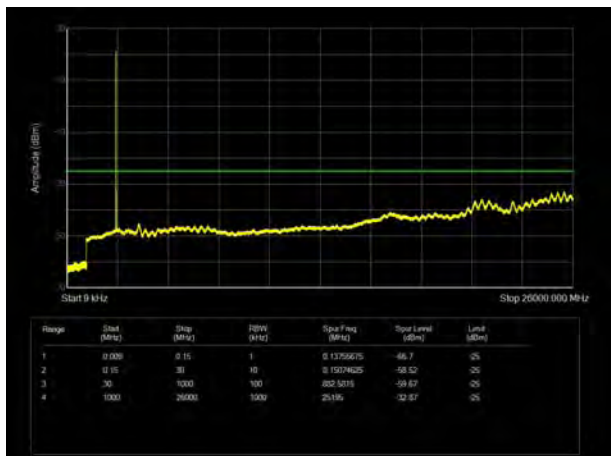
LTE Band 7 15MHz CH- Low 9kHz~26GHz



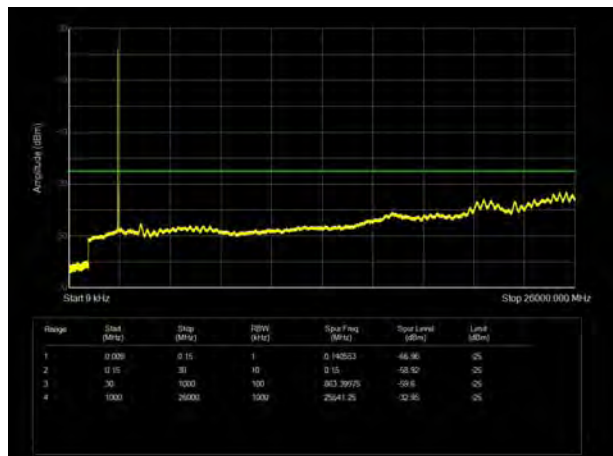
LTE Band 7 20MHz CH-Low 9kHz~26GHz



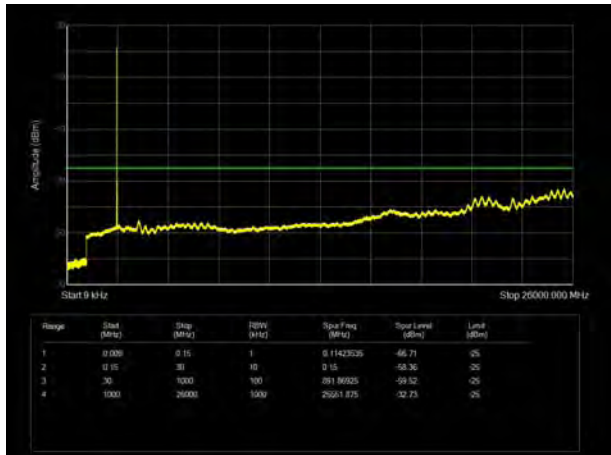
LTE Band 7 15MHz CH- Middle 9kHz~26GHz



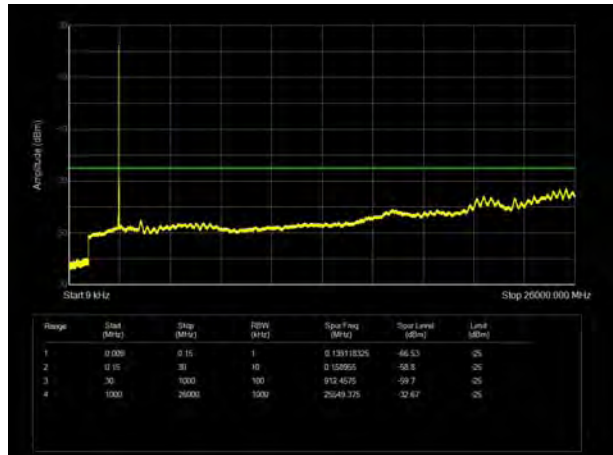
LTE Band 7 20MHz CH- Middle 9kHz~26GHz



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

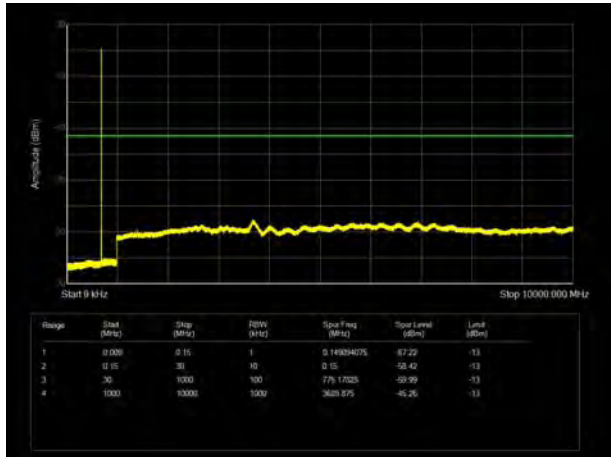


LTE Band 7 20MHz CH- High 9kHz~26GHz

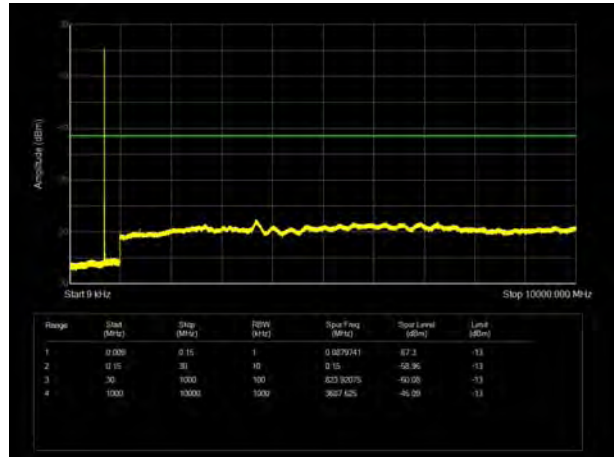




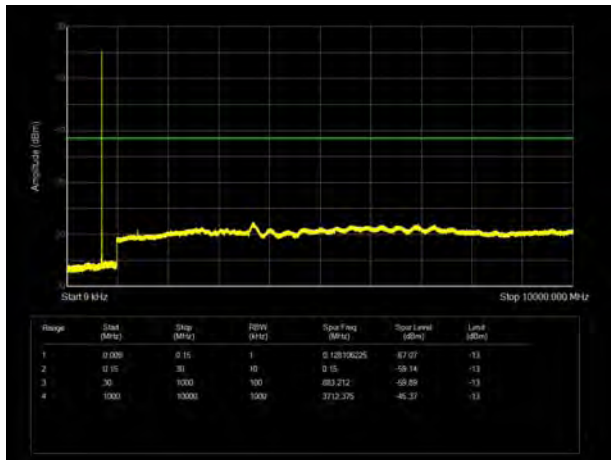
LTE Band 12 1.4MHz CH-Low 9kHz~10GHz



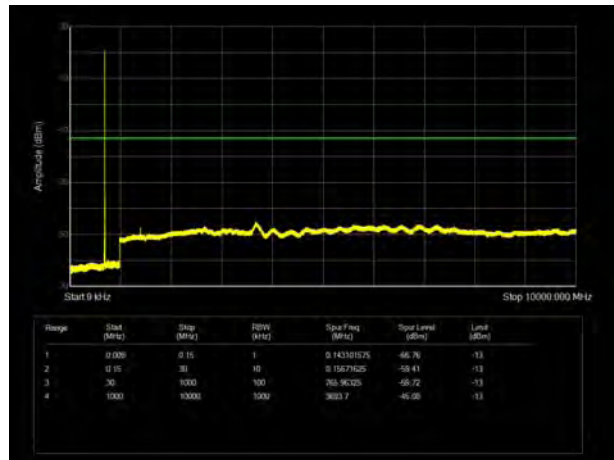
LTE Band 12 3MHz CH- Low 9kHz~10GHz



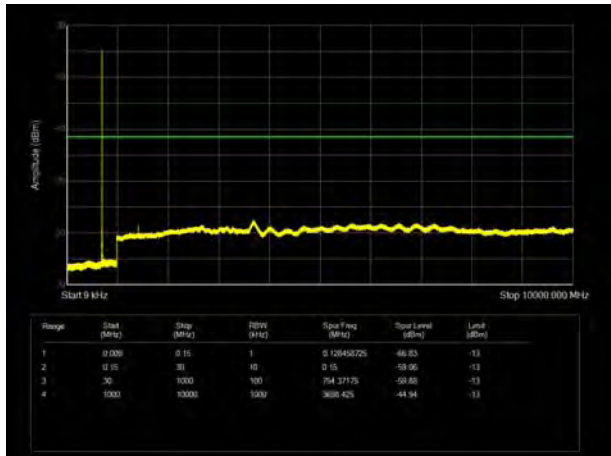
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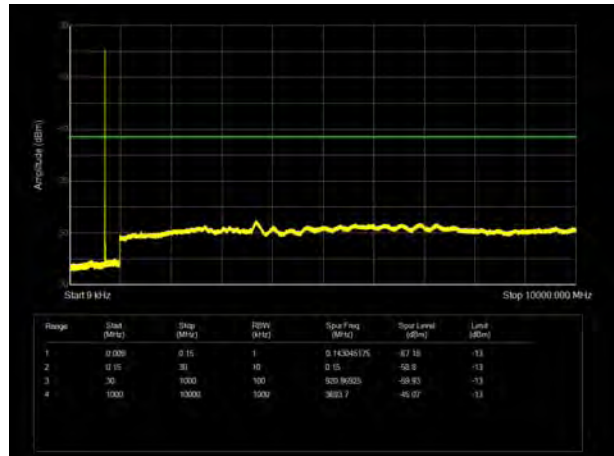
LTE Band 12 3MHz CH- Middle 9kHz~10GHz



LTE Band 12 1.4MHz CH- High 9kHz~10GHz

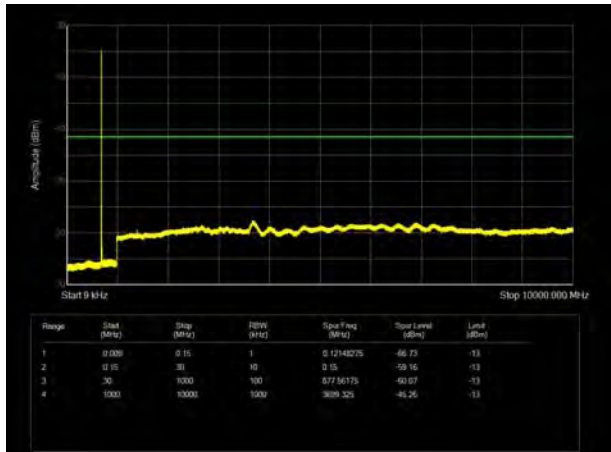


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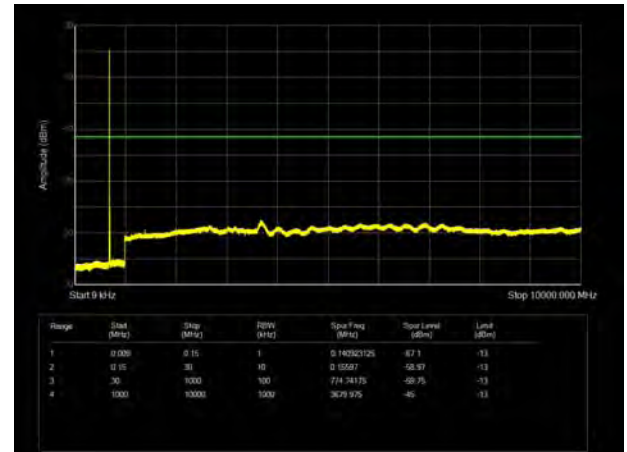




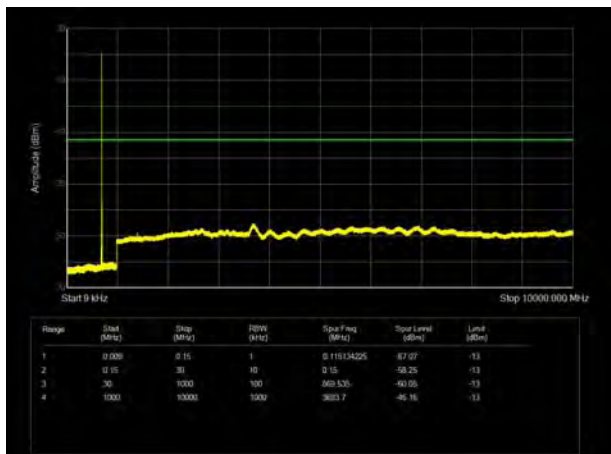
LTE Band 12 5MHz CH- Low 9kHz~10GHz



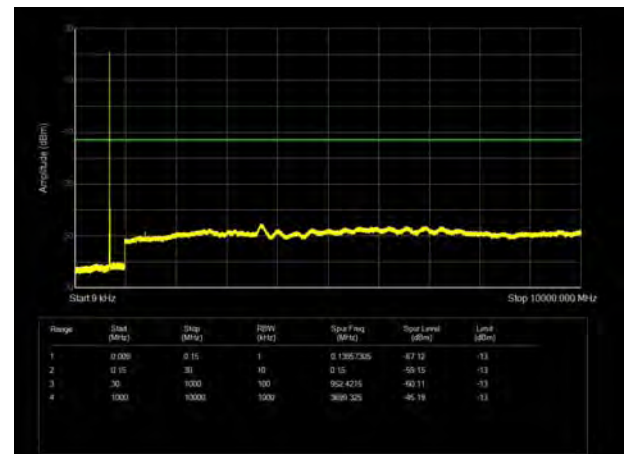
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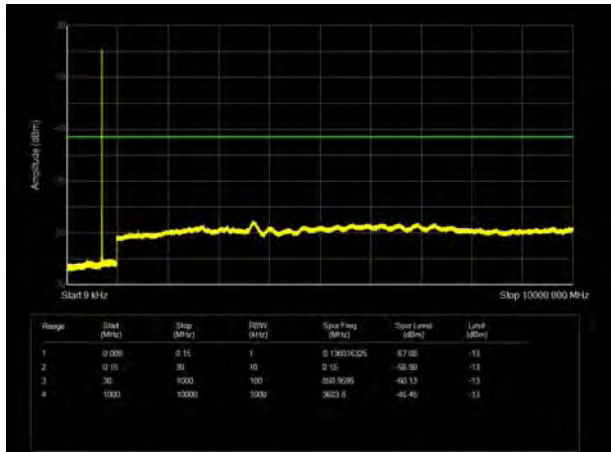
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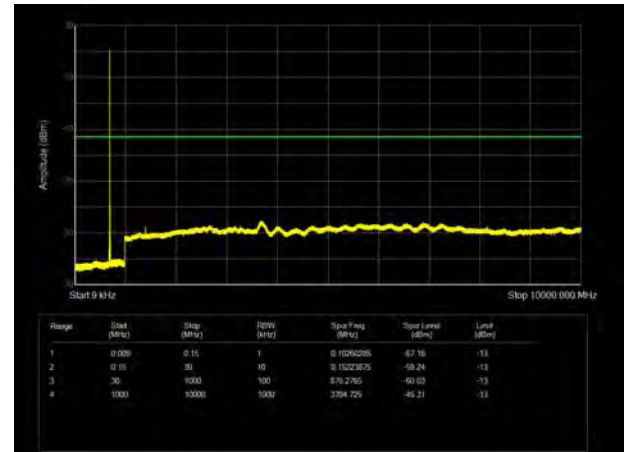
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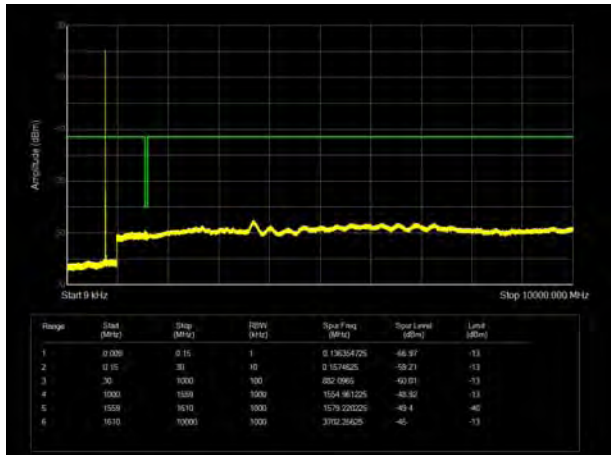


LTE Band 12 10MHz CH- High 9kHz~10GHz

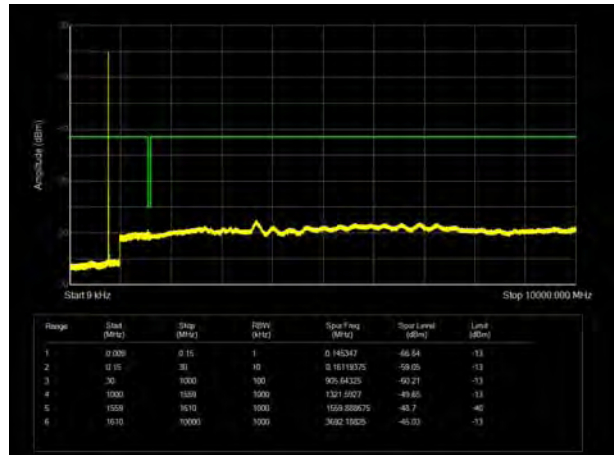




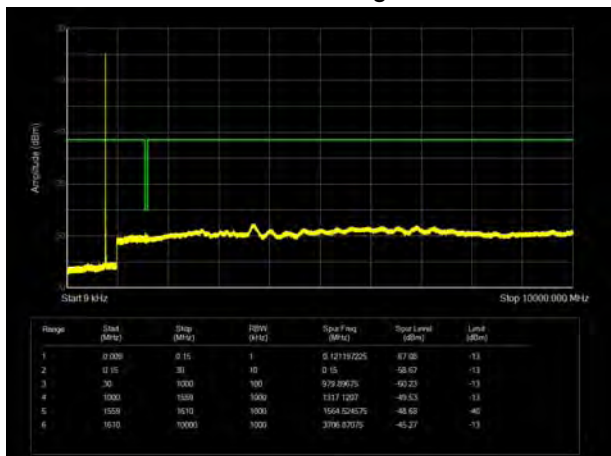
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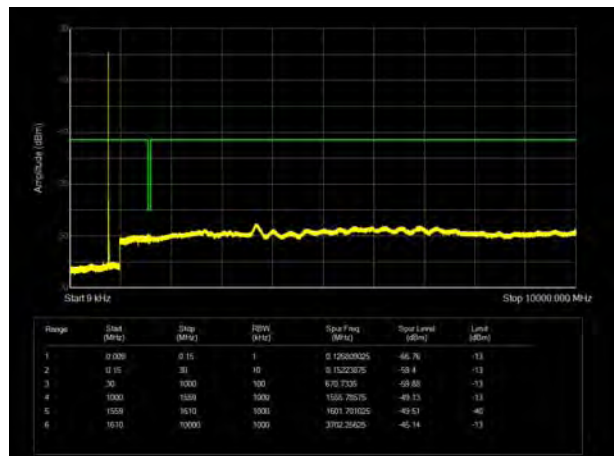
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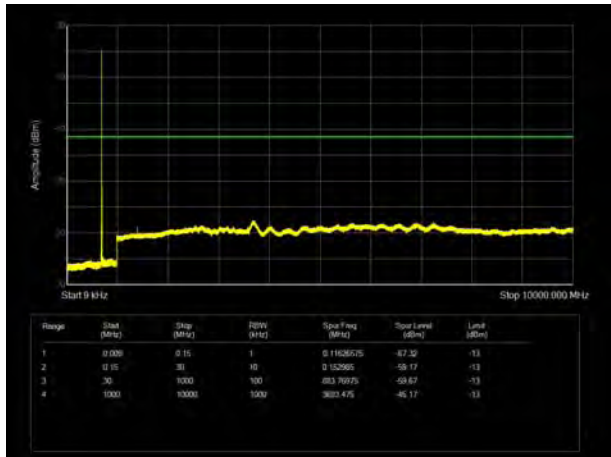
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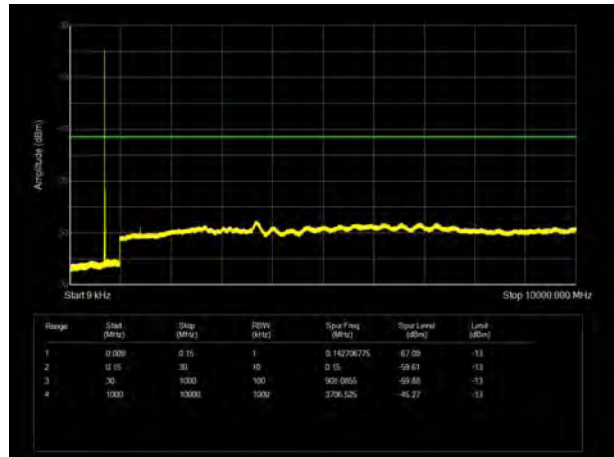
LTE Band 13 10MHz CH- Middle 9kHz~10GHz



LTE Band 17 5MHz CH- Low 9kHz~10GHz



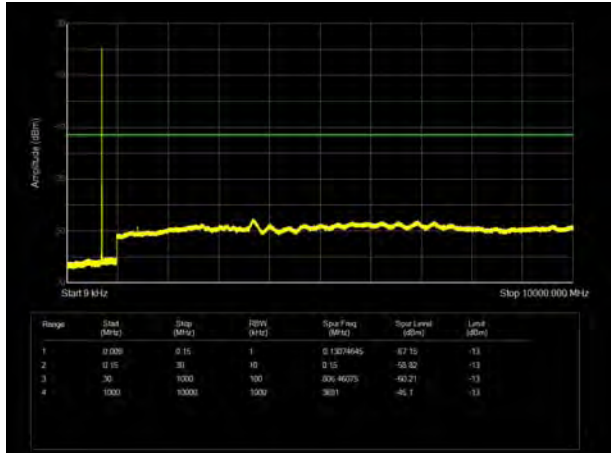
LTE Band 17 10MHz CH-Low 9kHz~10GHz



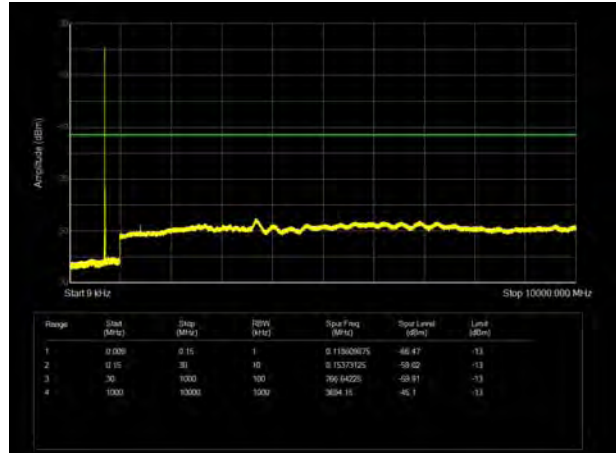




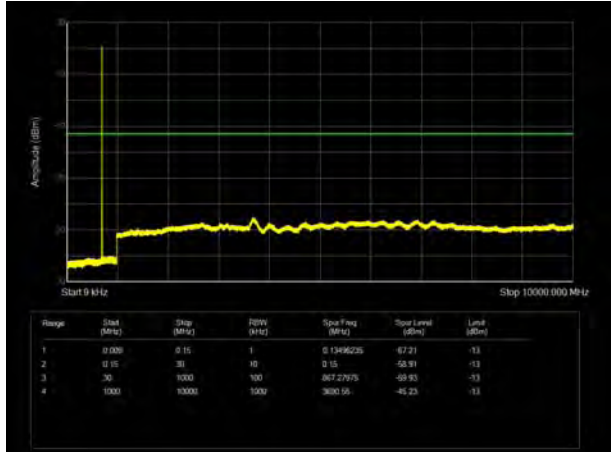
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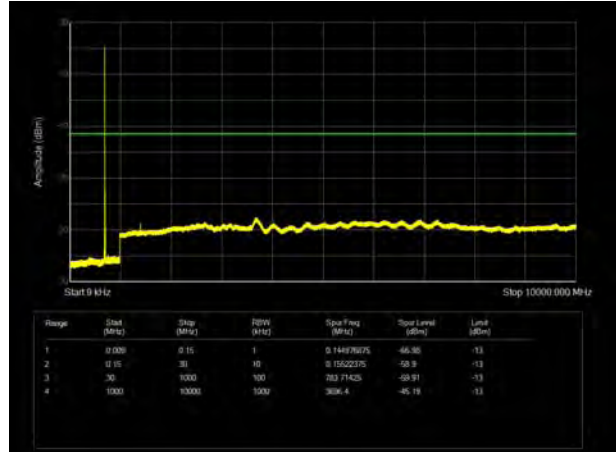
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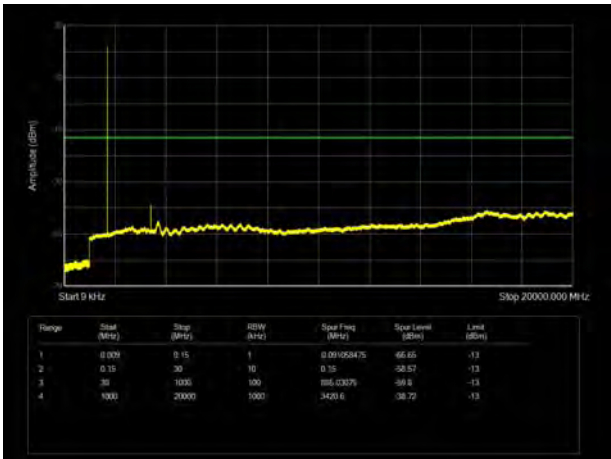
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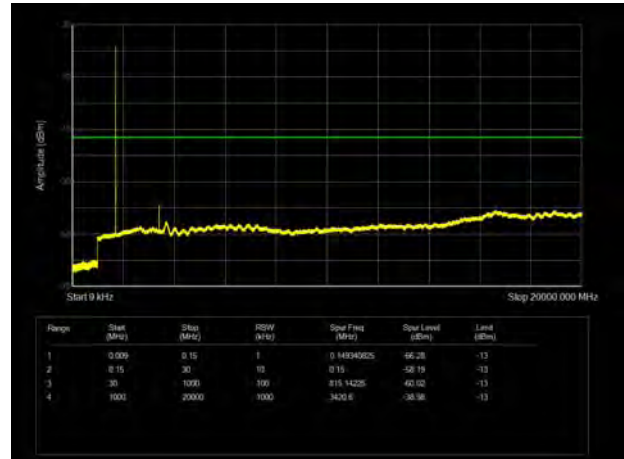
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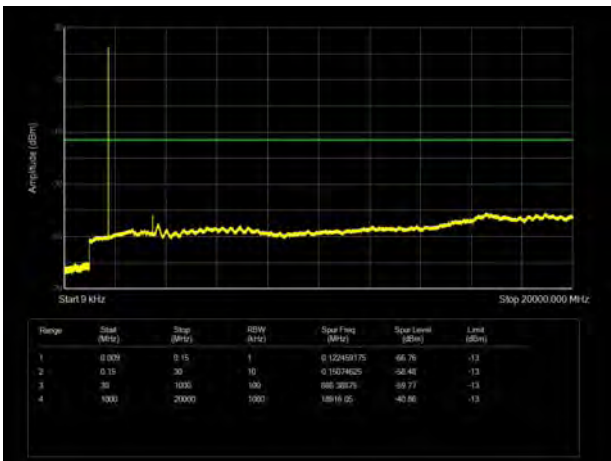
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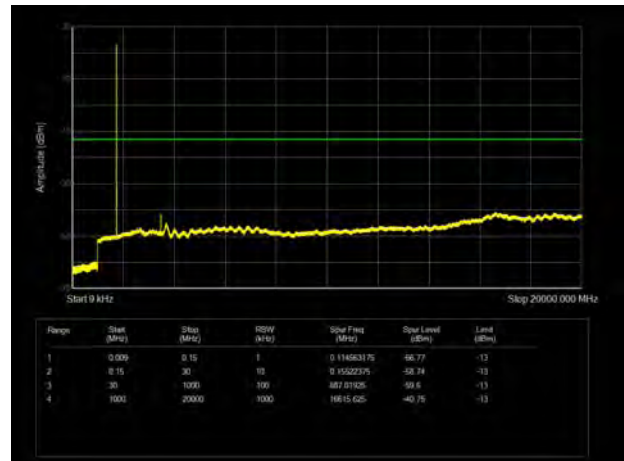
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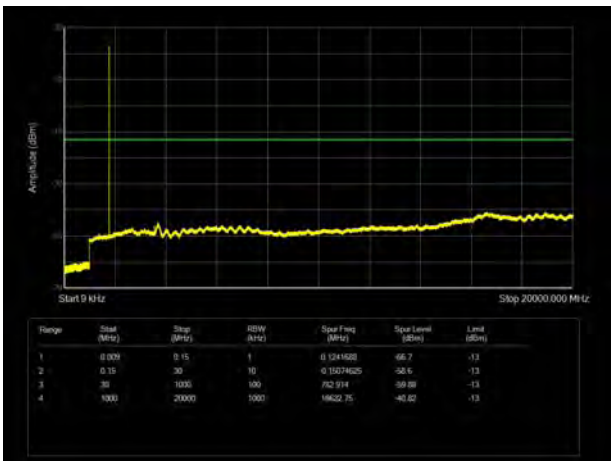
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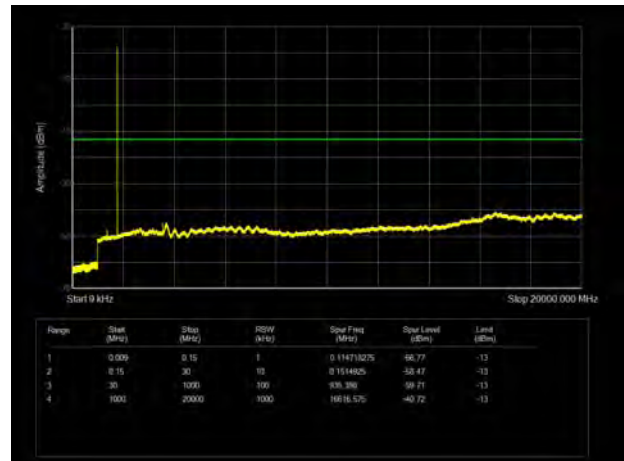
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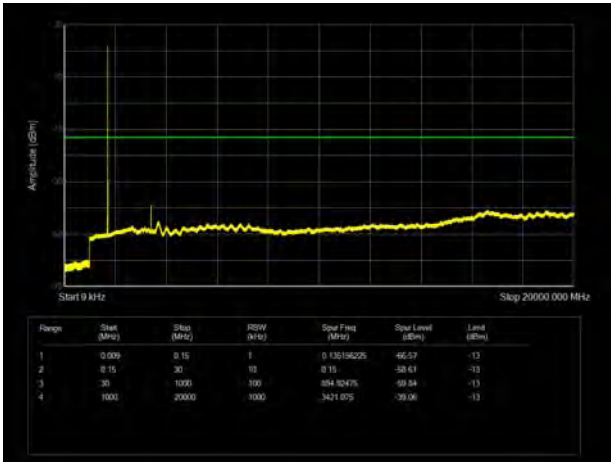
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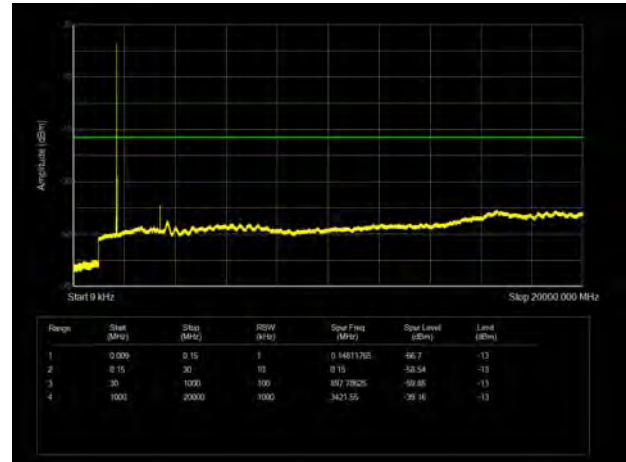
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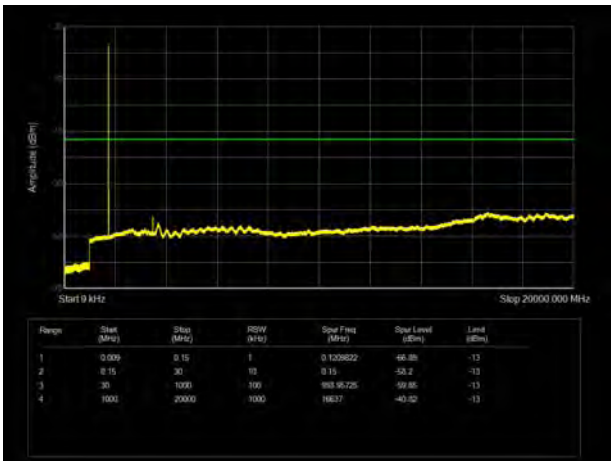
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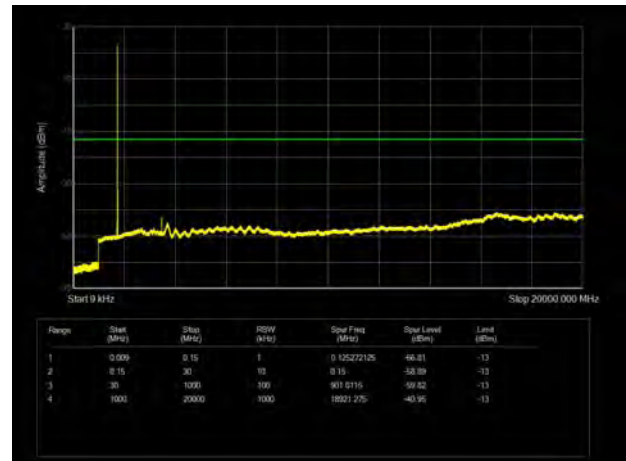
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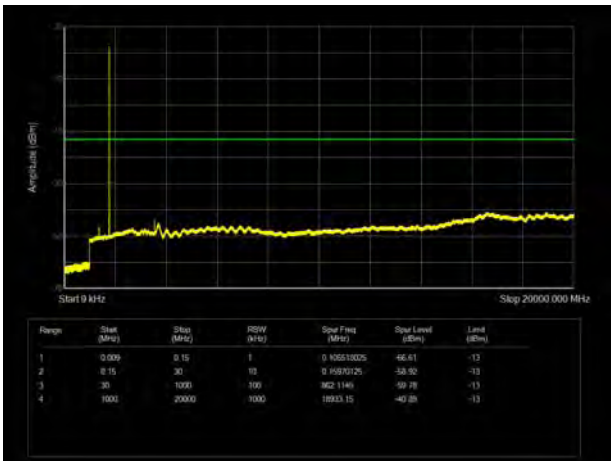
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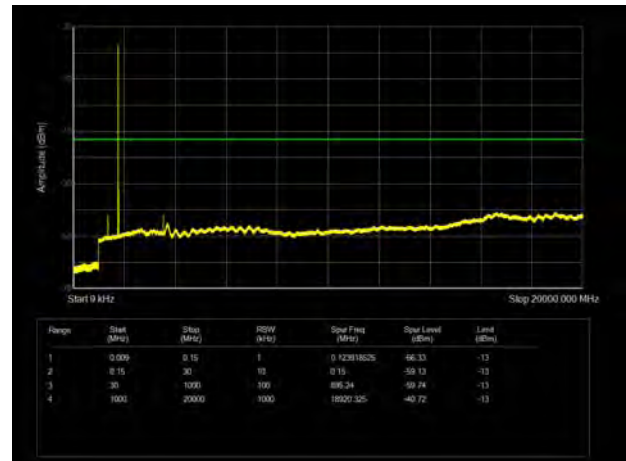
LTE Band 66 10MHz CH-Middle 9kHz~20GHz



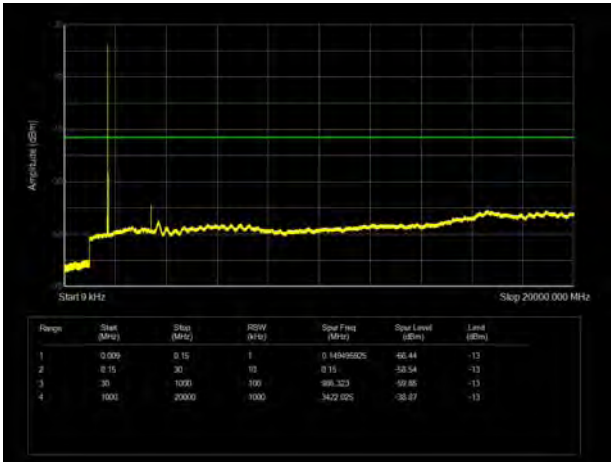
LTE Band 66 5MHz CH-High 9kHz~20GHz



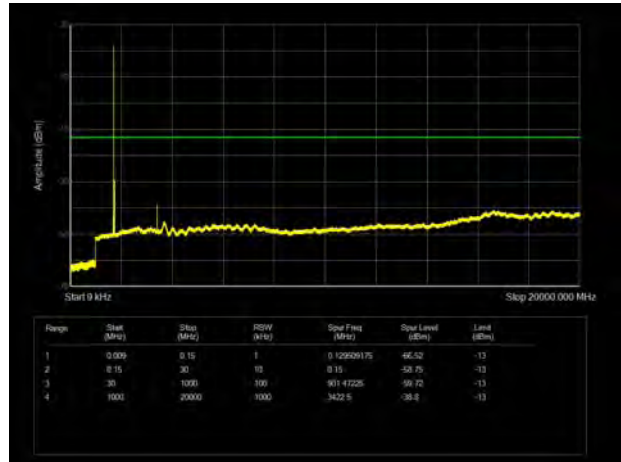
LTE Band 66 10MHz CH-High 9kHz~20GHz



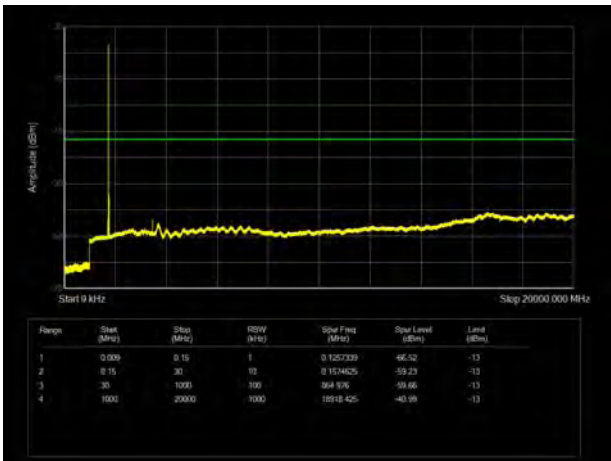
LTE Band 66 15MHz CH-Low 9kHz~20GHz



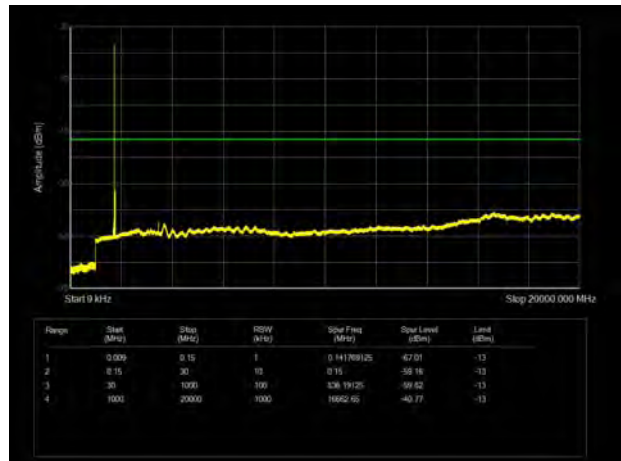
LTE Band 66 20MHz CH-Low 9kHz~20GHz



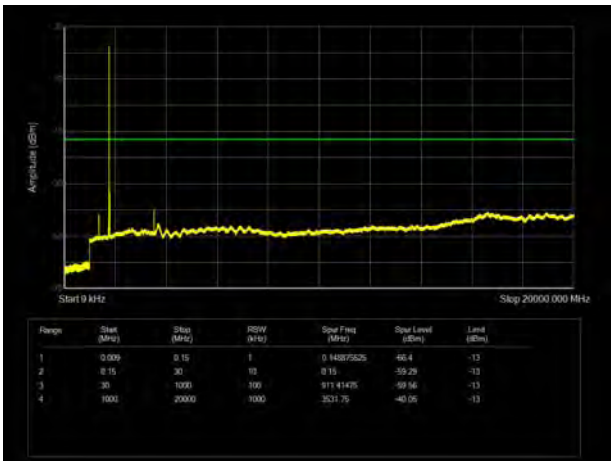
LTE Band 66 15MHz CH-Middle 9kHz~20GHz



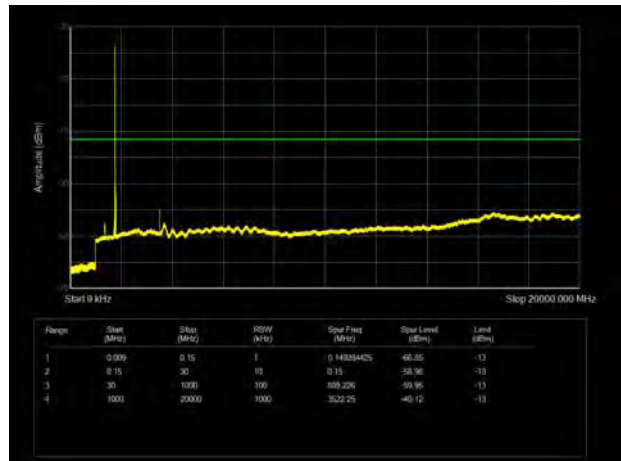
LTE Band 66 20MHz CH-Middle 9kHz~20GHz



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

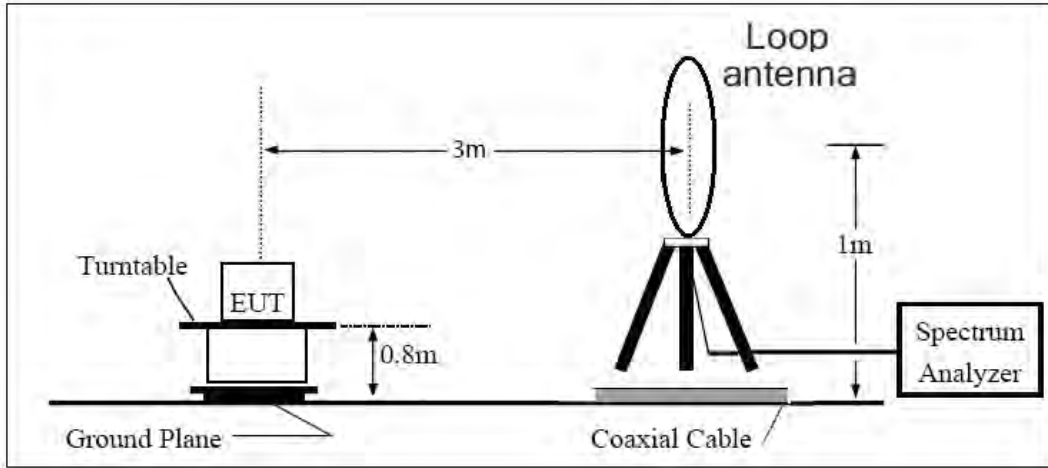
- The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI C63.26 (2015).
- Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable 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=200Hz,VBW=600Hz for 9kHz150kHz , RBW=10kHz, VBW=30kHz 150kHz-30MHz ,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:  
 $Power(EIRP)=PMea- PAg - Pcl + Ga$   
 The measurement results are amend as described below:  
 $Power(EIRP)=PMea- Pcl + Ga$
- 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, ERP

= EIRP-2.15dBi.

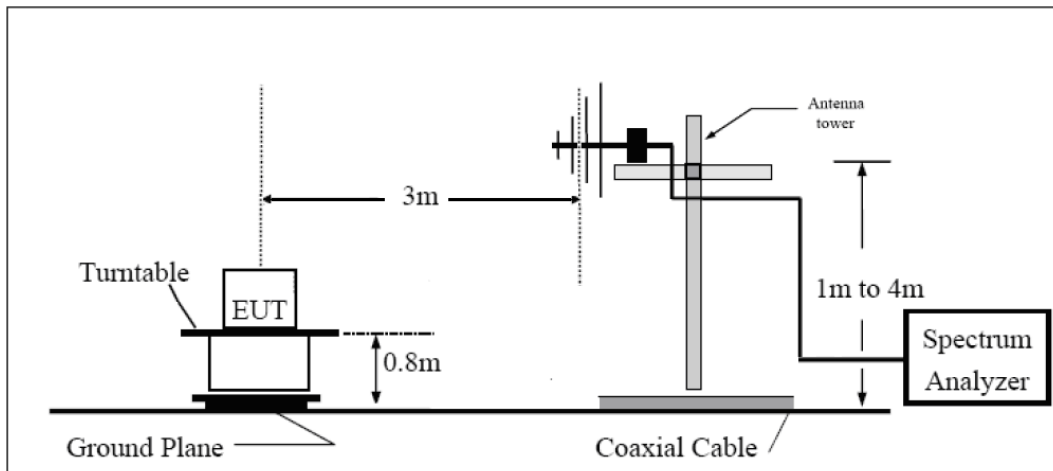
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

**Test setup**

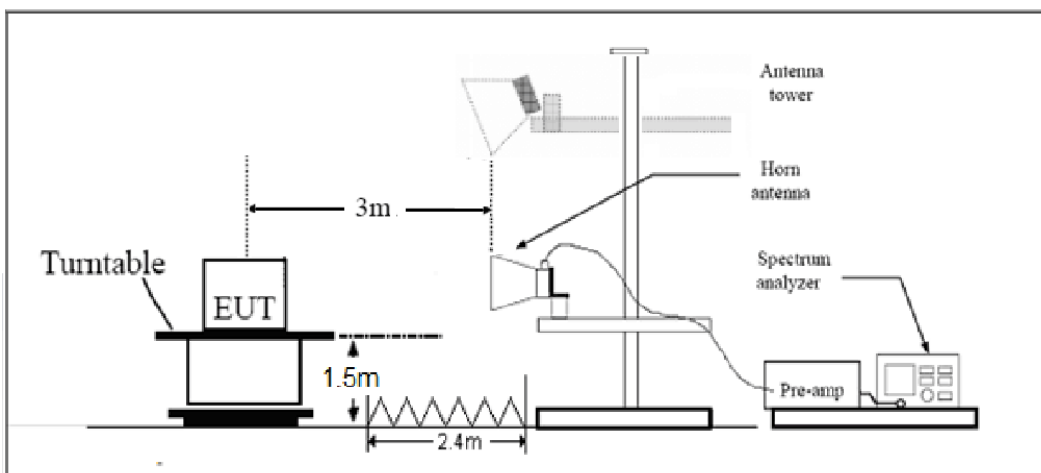
**9KHz ~ 30MHz**



**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 (g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log(P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

Rule Part 27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to  $-70$  dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and  $-80$  dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

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 (c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $76 + 10 \log(P)$  dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log(P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

Part 27.53(h)/(g) Limit		-13 dBm
Part 27.53(f) Limit	Limit out of the band 1559-1610 MHz	-13 dBm



	Limit in the band 1559-1610 MHz	-40 dBm
Part 27.53(m) Limit		-25 dBm

### 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	3465.2	-59.86	2.6	10.75	Horizontal	-51.71	-13.00	38.71	90
3	5197.8	-58.60	2.4	11.05	Horizontal	-49.95	-13.00	36.95	180
4	6930.4	-61.37	4.5	11.15	Horizontal	-54.72	-13.00	41.72	0
5	8663.0	-55.50	5.1	11.35	Horizontal	-49.25	-13.00	36.25	315
6	10395.6	-50.45	5.3	11.95	Horizontal	-43.80	-13.00	30.80	225
7	12128.2	-52.85	5.5	13.55	Horizontal	-44.80	-13.00	31.80	45
8	13860.8	-50.17	6.3	13.75	Horizontal	-42.72	-13.00	29.72	180
9	15593.4	-48.87	6.7	13.85	Horizontal	-41.72	-13.00	28.72	270
10	17326.0	-45.39	6.8	14.25	Horizontal	-37.94	-13.00	24.94	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 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	3464.3	-56.07	2.6	10.75	Horizontal	-47.92	-13.00	34.92	0
3	5197.5	-59.98	2.4	11.05	Horizontal	-51.33	-13.00	38.33	90
4	6930.0	-59.63	4.5	11.15	Horizontal	-52.98	-13.00	39.98	315
5	8662.5	-56.23	5.1	11.35	Horizontal	-49.98	-13.00	36.98	225
6	10395.0	-51.16	5.3	11.95	Horizontal	-44.51	-13.00	31.51	45
7	12127.5	-53.57	5.5	13.55	Horizontal	-45.52	-13.00	32.52	135
8	13860.0	-51.78	6.3	13.75	Horizontal	-44.33	-13.00	31.33	0
9	15592.5	-48.20	6.7	13.85	Horizontal	-41.05	-13.00	28.05	90
10	17325.0	-44.87	6.8	14.25	Horizontal	-37.42	-13.00	24.42	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 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	3460.5	-56.07	2.6	10.75	Horizontal	-47.92	-13.00	34.92	180
3	5191.5	-59.49	2.4	11.05	Horizontal	-50.84	-13.00	37.84	45
4	6930.0	-59.83	4.5	11.15	Horizontal	-53.18	-13.00	40.18	225
5	8662.5	-56.26	5.1	11.35	Horizontal	-50.01	-13.00	37.01	90
6	10395.0	-50.89	5.3	11.95	Horizontal	-44.24	-13.00	31.24	135
7	12127.5	-51.58	5.5	13.55	Horizontal	-43.53	-13.00	30.53	180
8	13860.0	-51.93	6.3	13.75	Horizontal	-44.48	-13.00	31.48	225
9	15592.5	-48.13	6.7	13.85	Horizontal	-40.98	-13.00	27.98	45
10	17325.0	-44.98	6.8	14.25	Horizontal	-37.53	-13.00	24.53	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 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	3465.0	-54.12	2.6	10.75	Horizontal	-45.97	-13.00	32.97	90
3	5170.9	-60.10	2.4	11.05	Horizontal	-51.45	-13.00	38.45	0
4	6930.0	-60.20	4.5	11.15	Horizontal	-53.55	-13.00	40.55	180
5	8662.5	-55.49	5.1	11.35	Horizontal	-49.24	-13.00	36.24	225
6	10395.0	-51.98	5.3	11.95	Horizontal	-45.33	-13.00	32.33	135
7	12127.5	-53.64	5.5	13.55	Horizontal	-45.59	-13.00	32.59	45
8	13860.0	-52.11	6.3	13.75	Horizontal	-44.66	-13.00	31.66	315
9	15592.5	-49.10	6.7	13.85	Horizontal	-41.95	-13.00	28.95	90
10	17325.0	-44.19	6.8	14.25	Horizontal	-36.74	-13.00	23.74	0

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	5065.8	-61.41	2.00	9.15	Horizontal	-54.26	-25.00	29.26	45
3	7598.6	-59.68	2.50	11.35	Horizontal	-50.83	-25.00	25.83	225
4	10130.6	-53.77	4.20	12.05	Horizontal	-45.92	-25.00	20.92	180
5	12675.0	-53.62	5.20	12.85	Horizontal	-45.97	-25.00	20.97	315
6	15210.0	-54.86	5.50	14.23	Horizontal	-46.13	-25.00	21.13	0
7	17745.0	-52.47	5.70	14.15	Horizontal	-44.02	-25.00	19.02	90
8	20280.0	--	--	--	--	--	--	--	--
9	22815.0	--	--	--	--	--	--	--	--
10	25350.0	--	--	--	--	--	--	--	--

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	5052.4	-61.93	2.00	10.15	Horizontal	-53.78	-25.00	28.78	315
3	7605.0	-58.84	2.50	11.35	Horizontal	-49.99	-25.00	24.99	180
4	10140.0	-53.47	4.20	12.05	Horizontal	-45.62	-25.00	20.62	315
5	12675.0	-55.24	5.20	14.85	Horizontal	-45.59	-25.00	20.59	270
6	15210.0	-52.48	5.50	13.23	Horizontal	-44.75	-25.00	19.75	135
7	17745.0	-49.40	5.70	12.15	Horizontal	-42.95	-25.00	17.95	225
8	20280.0	--	--	--	--	--	--	--	--
9	22815.0	--	--	--	--	--	--	--	--
10	25350.0	--	--	--	--	--	--	--	--

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 12 QPSK 1.4MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1415.0	-67.65	2.00	10.75	Horizontal	-61.05	-13.00	48.05	315
3	2122.5	-66.58	2.51	11.05	Horizontal	-60.19	-13.00	47.19	90
4	2830.0	-64.01	4.20	11.15	Horizontal	-59.21	-13.00	46.21	45
5	3537.5	-60.99	5.20	11.15	Horizontal	-57.19	-13.00	44.19	315
6	4245.0	-60.52	5.50	11.95	Horizontal	-56.22	-13.00	43.22	270
7	4952.5	-60.97	5.70	13.55	Horizontal	-55.27	-13.00	42.27	315
8	5660.0	-60.87	6.30	13.75	Horizontal	-55.57	-13.00	42.57	180
9	6367.5	-57.97	6.80	13.85	Horizontal	-53.07	-13.00	40.07	9045
10	7075.0	-55.48	6.90	14.25	Horizontal	-50.28	-13.00	37.28	180

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 12 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1415.0	-68.54	2.00	10.75	Horizontal	-61.94	-13.00	48.94	180
3	2122.5	-66.52	2.51	11.05	Horizontal	-60.13	-13.00	47.13	135
4	2830.0	-63.47	4.20	11.15	Horizontal	-58.67	-13.00	45.67	180
5	3537.5	-60.25	5.20	11.15	Horizontal	-56.45	-13.00	43.45	315
6	4245.0	-60.22	5.50	11.95	Horizontal	-55.92	-13.00	42.92	135
7	4952.5	-61.04	5.70	13.55	Horizontal	-55.34	-13.00	42.34	45
8	5660.0	-60.65	6.30	13.75	Horizontal	-55.35	-13.00	42.35	90
9	6367.5	-58.75	6.80	13.85	Horizontal	-53.85	-13.00	40.85	225
10	7075.0	-55.93	6.90	14.25	Horizontal	-50.73	-13.00	37.73	180

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 12 QPSK 10MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1415.0	-68.81	2.00	10.75	Horizontal	-62.21	-13.00	49.21	0
3	2122.5	-66.94	2.51	11.05	Horizontal	-60.55	-13.00	47.55	225
4	2830.0	-62.77	4.20	11.15	Horizontal	-57.97	-13.00	44.97	45
5	3537.5	-60.79	5.20	11.15	Horizontal	-56.99	-13.00	43.99	270
6	4245.0	-60.54	5.50	11.95	Horizontal	-56.24	-13.00	43.24	135
7	4952.5	-60.87	5.70	13.55	Horizontal	-55.17	-13.00	42.17	225
8	5660.0	-60.44	6.30	13.75	Horizontal	-55.14	-13.00	42.14	180
9	6367.5	-58.39	6.80	13.85	Horizontal	-53.49	-13.00	40.49	90
10	7075.0	-53.66	6.90	14.25	Horizontal	-48.46	-13.00	35.46	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 13 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1564.0	-67.37	2.00	10.75	Horizontal	-60.77	-40.00	20.77	180
3	2346.0	-64.77	2.51	11.05	Horizontal	-58.38	-13.00	45.38	315
4	3128.0	-50.84	4.20	11.15	Horizontal	-46.04	-13.00	33.04	0
5	3910.0	-59.68	5.20	11.15	Horizontal	-55.88	-13.00	42.88	45
6	4692.0	-59.32	5.50	11.95	Horizontal	-55.02	-13.00	42.02	180
7	5474.0	-57.79	5.70	13.55	Horizontal	-52.09	-13.00	39.09	270
8	6256.0	-58.48	6.30	13.75	Horizontal	-53.18	-13.00	40.18	45
9	7038.0	-54.21	6.80	13.85	Horizontal	-49.31	-13.00	36.31	90
10	7820.0	-54.64	6.90	14.25	Horizontal	-49.44	-13.00	36.44	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 13 QPSK 10MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1555.3	-67.61	2.00	10.75	Horizontal	-61.01	-40.00	21.01	135
3	2346.0	-64.93	2.51	11.05	Horizontal	-58.54	-13.00	45.54	225
4	3128.0	-61.47	4.20	11.15	Horizontal	-56.67	-13.00	43.67	315
5	3910.0	-51.80	5.20	11.15	Horizontal	-48.00	-13.00	35.00	90
6	4692.0	-59.19	5.50	11.95	Horizontal	-54.89	-13.00	41.89	45
7	5474.0	-60.86	5.70	13.55	Horizontal	-55.16	-13.00	42.16	180
8	6256.0	-58.16	6.30	13.75	Horizontal	-52.86	-13.00	39.86	135
9	7038.0	-55.28	6.80	13.85	Horizontal	-50.38	-13.00	37.38	180
10	7820.0	-54.79	6.90	14.25	Horizontal	-49.59	-13.00	36.59	0

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 17 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1420.0	-67.41	2.00	10.75	Horizontal	-60.81	-13.00	47.81	225
3	2130.0	-61.91	2.51	11.05	Horizontal	-55.52	-13.00	42.52	45
4	2840.0	-63.55	4.20	11.15	Horizontal	-58.75	-13.00	45.75	315
5	3550.0	-60.64	5.20	11.15	Horizontal	-56.84	-13.00	43.84	45
6	4260.0	-59.70	5.50	11.95	Horizontal	-55.40	-13.00	42.40	180
7	4970.0	-61.11	5.70	13.55	Horizontal	-55.41	-13.00	42.41	270
8	5680.0	-59.62	6.30	13.75	Horizontal	-54.32	-13.00	41.32	45
9	6390.0	-57.81	6.80	13.85	Horizontal	-52.91	-13.00	39.91	315
10	7100.0	-54.31	6.90	14.25	Horizontal	-49.11	-13.00	36.11	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 17 QPSK 10MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1420.0	-68.07	2.00	10.75	Horizontal	-61.47	-13.00	48.47	270
3	2130.0	-65.02	2.51	11.05	Horizontal	-58.63	-13.00	45.63	315
4	2840.0	-63.86	4.20	11.15	Horizontal	-59.06	-13.00	46.06	180
5	3550.0	-60.81	5.20	11.15	Horizontal	-57.01	-13.00	44.01	45
6	4260.0	-60.59	5.50	11.95	Horizontal	-56.29	-13.00	43.29	180
7	4970.0	-60.58	5.70	13.55	Horizontal	-54.88	-13.00	41.88	135
8	5680.0	-60.26	6.30	13.75	Horizontal	-54.96	-13.00	41.96	180
9	6390.0	-57.29	6.80	13.85	Horizontal	-52.39	-13.00	39.39	0
10	7100.0	-54.70	6.90	14.25	Horizontal	-49.50	-13.00	36.50	225

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	3464.3	-60.26	2.6	10.75	Horizontal	-52.11	-13.00	39.11	45
3	5197.5	-63.11	2.4	11.05	Horizontal	-54.46	-13.00	41.46	315
4	6930	-56.90	4.5	11.15	Horizontal	-50.25	-13.00	37.25	270
5	8662.5	-54.50	5.1	11.35	Horizontal	-48.25	-13.00	35.25	315
6	10395	-53.48	5.3	11.95	Horizontal	-46.83	-13.00	33.83	180
7	12127.5	-54.80	5.5	13.55	Horizontal	-46.75	-13.00	33.75	180
8	13860	-51.42	6.3	13.75	Horizontal	-43.97	-13.00	30.97	270
9	15592.5	-54.74	6.7	13.85	Horizontal	-47.59	-13.00	34.59	135
10	17325	-50.22	6.8	14.25	Horizontal	-42.77	-13.00	29.77	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 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	3460.5	-60.63	2.6	10.75	Horizontal	-52.48	-13.00	39.48	45
3	5191.5	-63.99	2.4	11.05	Horizontal	-55.34	-13.00	42.34	180
4	6930	-57.17	4.5	11.15	Horizontal	-50.52	-13.00	37.52	270
5	8662.5	-55.24	5.1	11.35	Horizontal	-48.99	-13.00	35.99	270
6	10395	-54.08	5.3	11.95	Horizontal	-47.43	-13.00	34.43	45
7	12127.5	-54.28	5.5	13.55	Horizontal	-46.23	-13.00	33.23	180
8	13860	-50.51	6.3	13.75	Horizontal	-43.06	-13.00	30.06	315
9	15592.5	-54.72	6.7	13.85	Horizontal	-47.57	-13.00	34.57	225
10	17325	-50.15	6.8	14.25	Horizontal	-42.70	-13.00	29.70	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 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	3447	-65.73	2.6	10.75	Horizontal	-57.58	-13.00	44.58	270
3	5170.5	-62.84	2.4	11.05	Horizontal	-54.19	-13.00	41.19	45
4	6930	-56.95	4.5	11.15	Horizontal	-50.30	-13.00	37.30	180
5	8662.5	-54.78	5.1	11.35	Horizontal	-48.53	-13.00	35.53	315
6	10395	-53.76	5.3	11.95	Horizontal	-47.11	-13.00	34.11	225
7	12127.5	-54.68	5.5	13.55	Horizontal	-46.63	-13.00	33.63	90
8	13860	-51.98	6.3	13.75	Horizontal	-44.53	-13.00	31.53	180
9	15592.5	-54.01	6.7	13.85	Horizontal	-46.86	-13.00	33.86	45
10	17325	-49.60	6.8	14.25	Horizontal	-42.15	-13.00	29.15	180

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
Base Station Simulator	R&S	CMW500	113824	2019-05-19	2020-05-18
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2019-05-19	2020-05-18
Signal Analyzer	R&S	FSV40	101298	2019-05-19	2020-05-18
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2017-09-26	2020-09-25
Trilog Antenna	SCHWARZBECK	VUBL 9163	9163-201	2017-11-18	2020-11-17
Horn Antenna	R&S	HF907	100126	2018-07-07	2020-07-06
Horn Antenna	ETS-Lindgren	3160-09	00102643	2018-06-20	2020-06-19
Signal generator	R&S	SMB 100A	102594	2019-05-19	2020-05-18
Climatic Chamber	ESPEC	SU-242	93000506	2017-12-17	2020-12-16
Preamplifier	R&S	SCU18	102327	2019-05-19	2020-05-18
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2019-05-19	2020-05-18
RF Cable	Agilent	SMA 15cm	0001	2019-12-13	2020-6-12
Software	R&S	EMC32	9.26.0	/	/

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