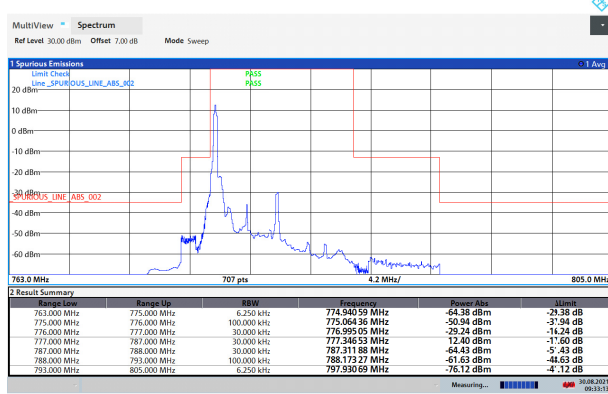


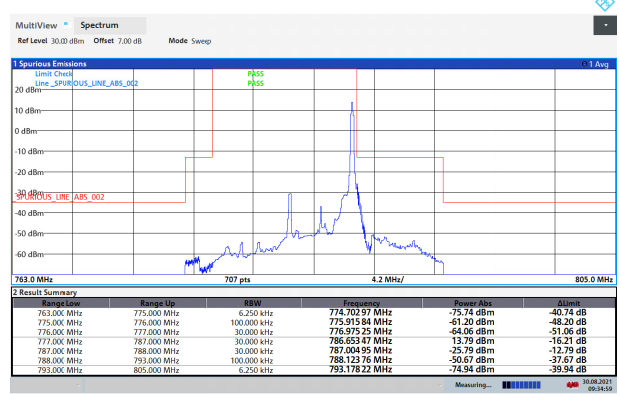


LTE Band 13 64QAM 5MHz CH-Low, 1 RB



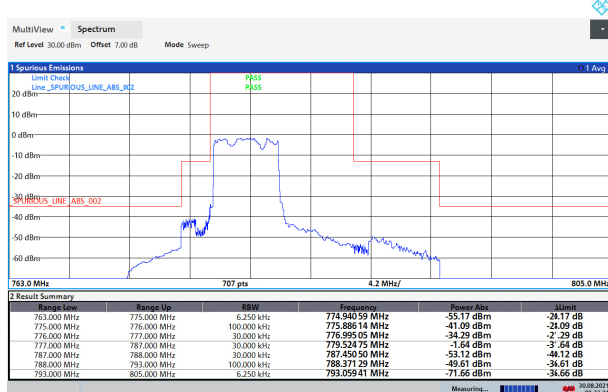
09:33:13 30.08.2021

LTE Band 13 64QAM 5MHz CH-High, 1 RB



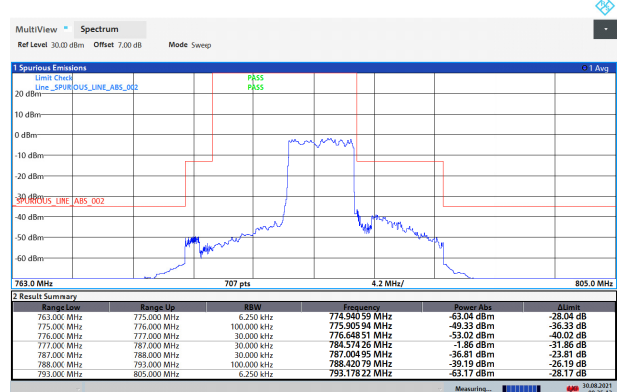
09:35:00 30.08.2021

LTE Band 13 64QAM 5MHz CH-Low, 100%RB



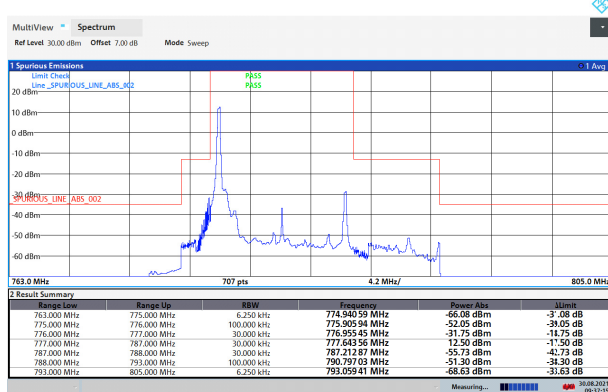
09:33:25 30.08.2021

LTE Band 13 64QAM 5MHz CH-High, 100%RB



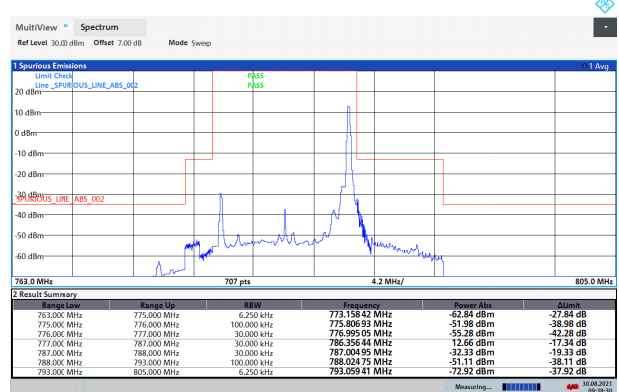
09:35:14 30.08.2021

LTE Band 13 64QAM 10MHz CH-Low, 1 RB



09:37:16 30.08.2021

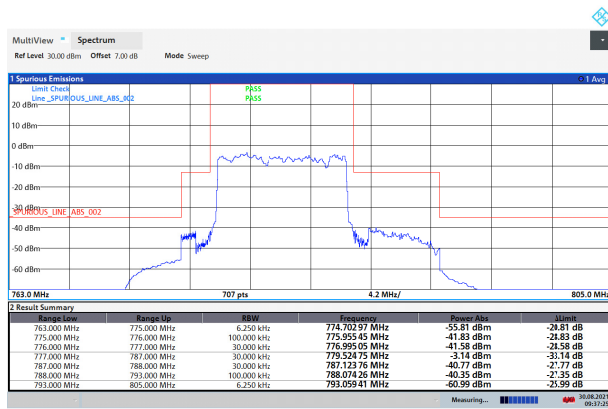
LTE Band 13 64QAM 10MHz CH-High, 1 RB



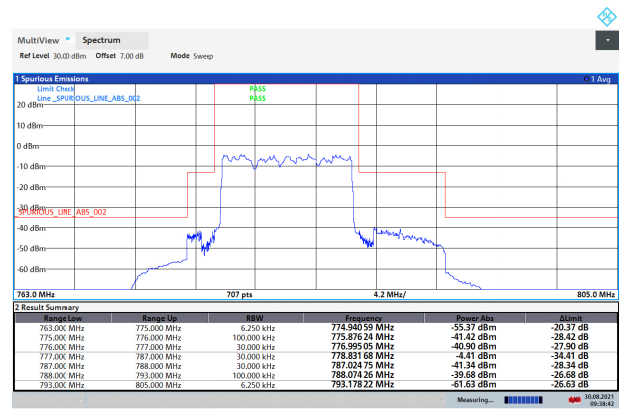
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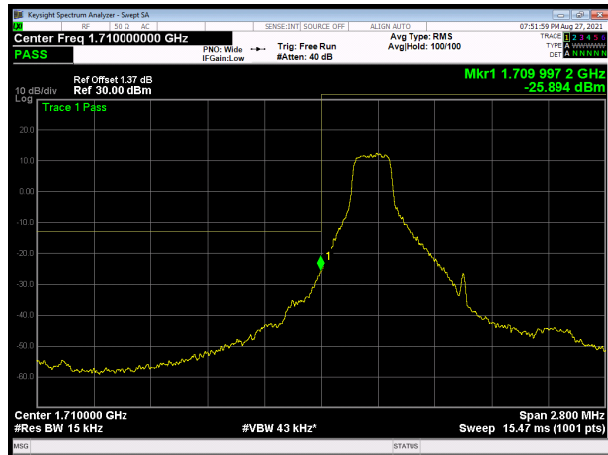
LTE Band 13 64QAM 10MHz CH-Low, 100%RB



LTE Band 13 64QAM 10MHz CH-High, 100%RB



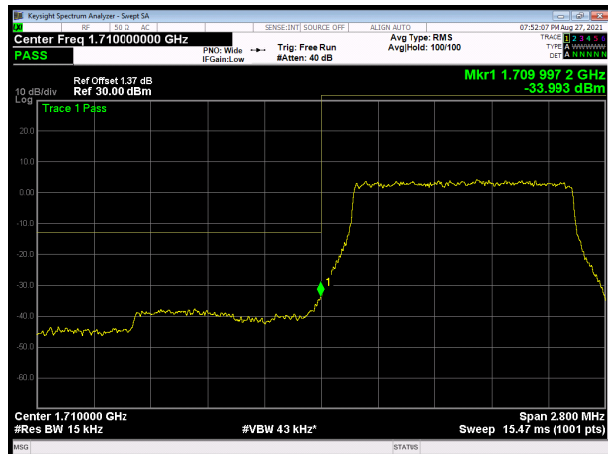
LTE Band 66 QPSK 1.4MHz CH-Low, 1 RB



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



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

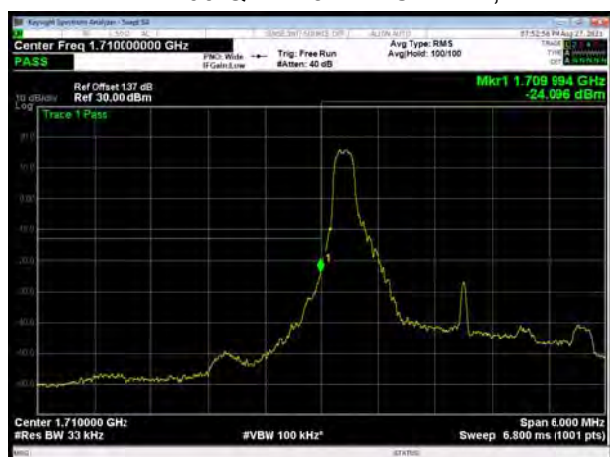


LTE Band 66 QPSK 1.4MHz CH-High, 100%RB

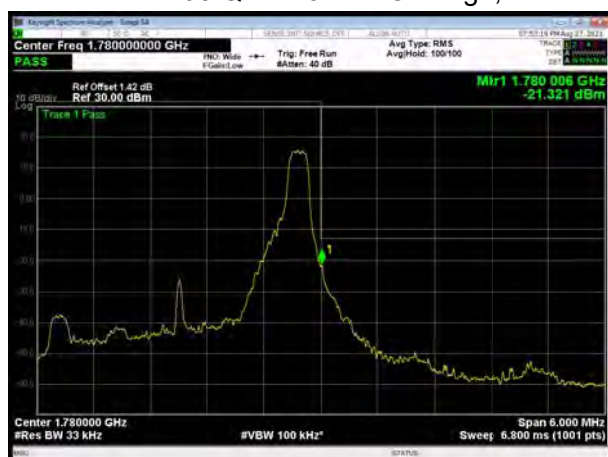




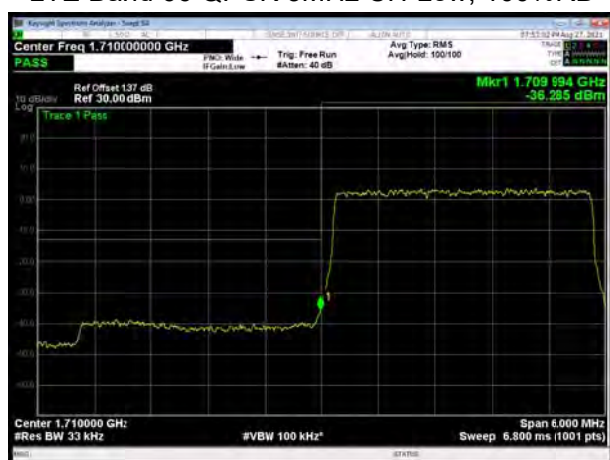
LTE Band 66 QPSK 3MHz CH-Low, 1 RB



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



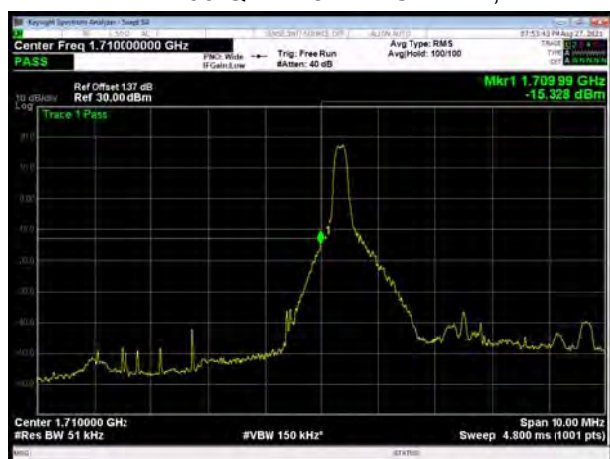
LTE Band 66 QPSK 3MHz CH-Low, 100%RB



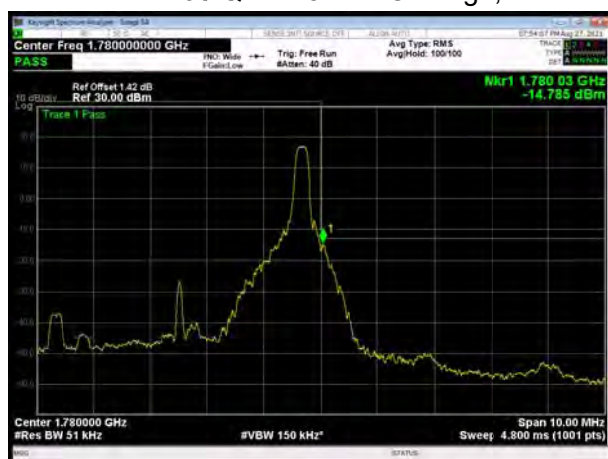
LTE Band 66 QPSK 3MHz CH-High, 100%RB



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



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





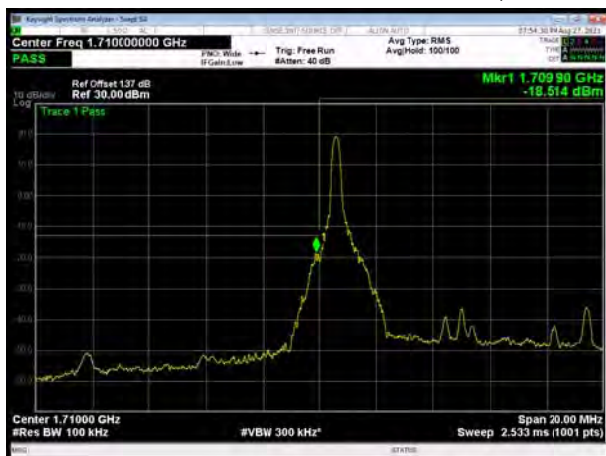
LTE Band 66 QPSK 5MHz CH-Low, 100%RB



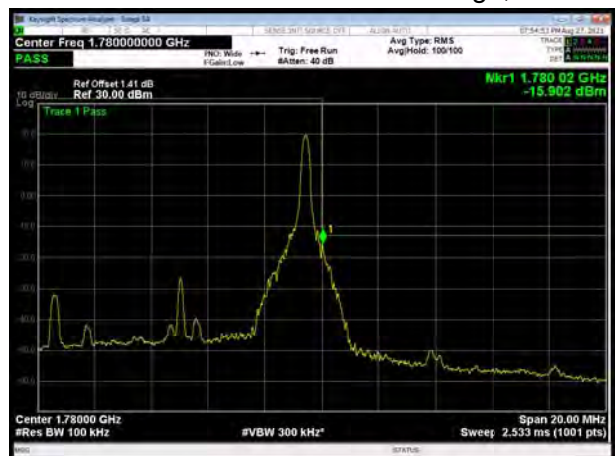
LTE Band 66 QPSK 5MHz CH-High, 100%RB



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



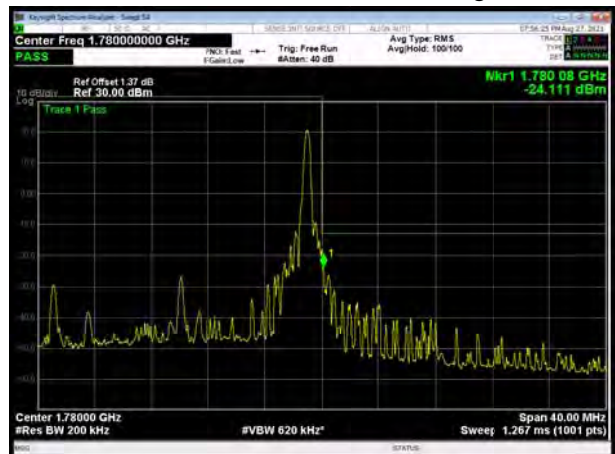
LTE Band 66 QPSK 15MHz CH-High, 100%RB



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



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





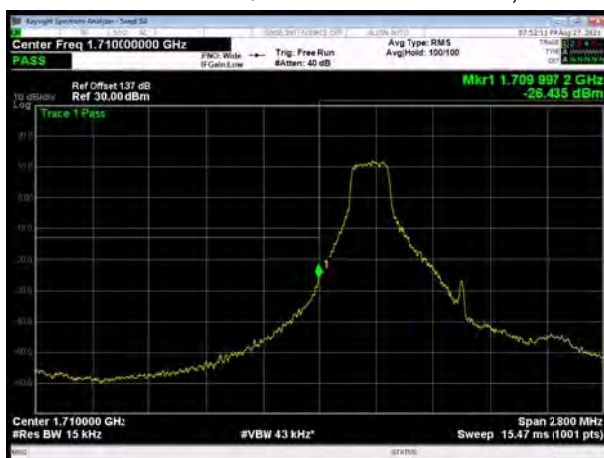
LTE Band 66 QPSK 20MHz CH-Low, 100%RB



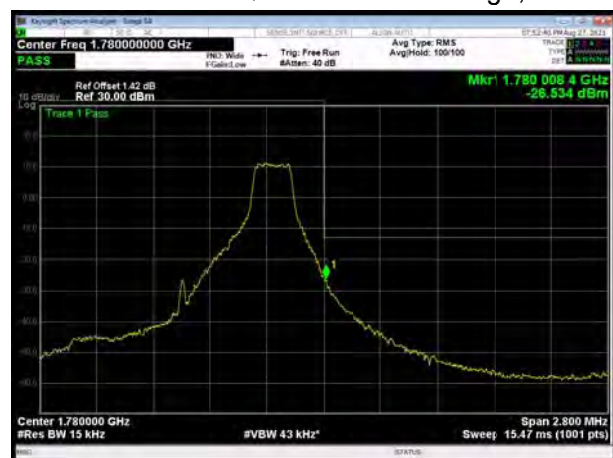
LTE Band 66 QPSK 20MHz CH-High, 100%RB



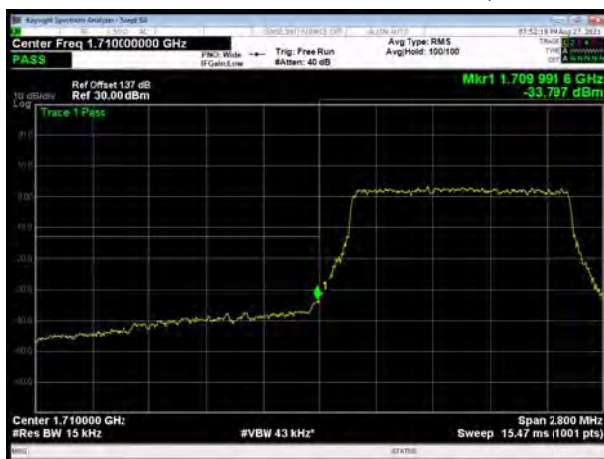
LTE Band 66 16QAM 1.4MHz CH-Low, 1 RB



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





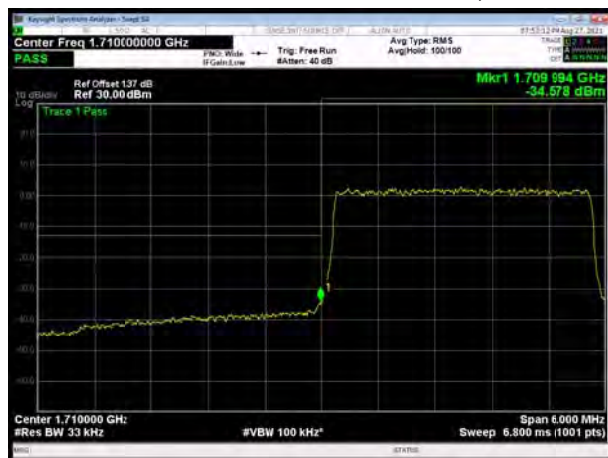
LTE Band 66 16QAM 3MHz CH-Low, 1 RB



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



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



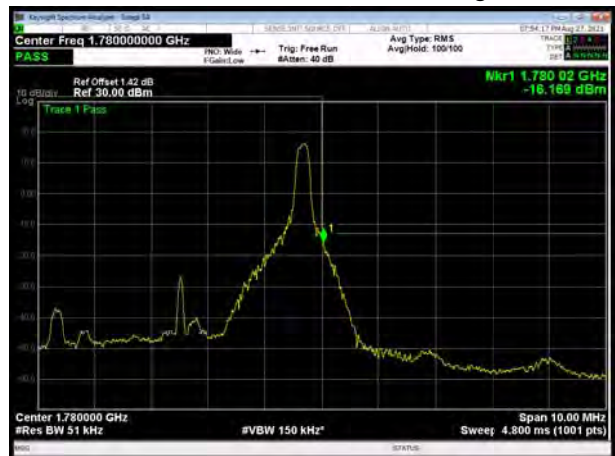
LTE Band 66 16QAM 3MHz CH-High, 100%RB



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

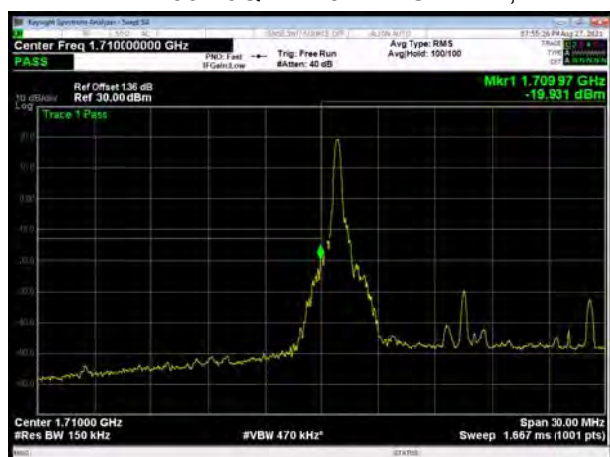


LTE Band 66 16QAM 10MHz CH-High, 100%RB

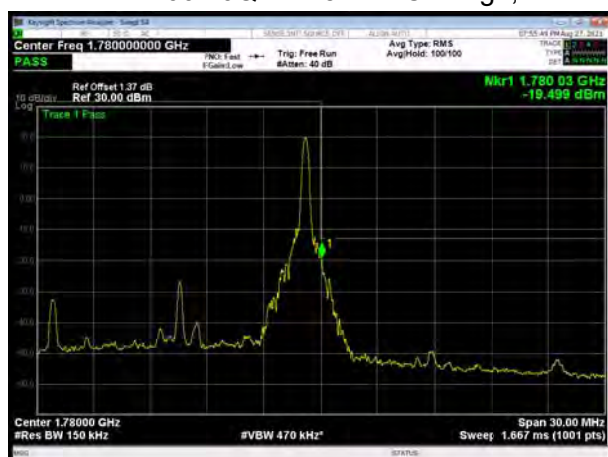




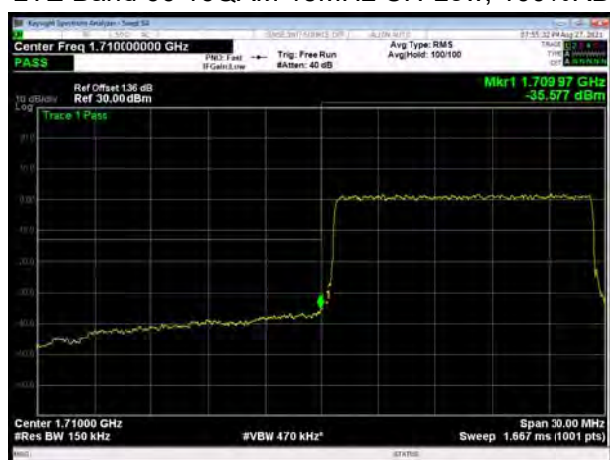
LTE Band 66 16QAM 15MHz CH-Low, 1 RB



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



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



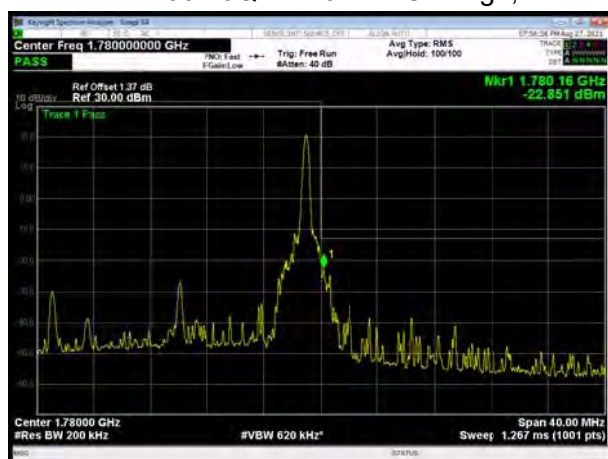
LTE Band 66 16QAM 15MHz CH-High, 100%RB



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



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





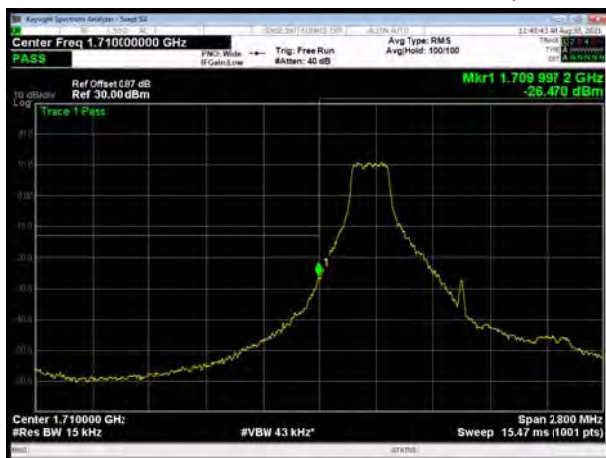
LTE Band 66 16QAM 20MHz CH-Low, 100%RB



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



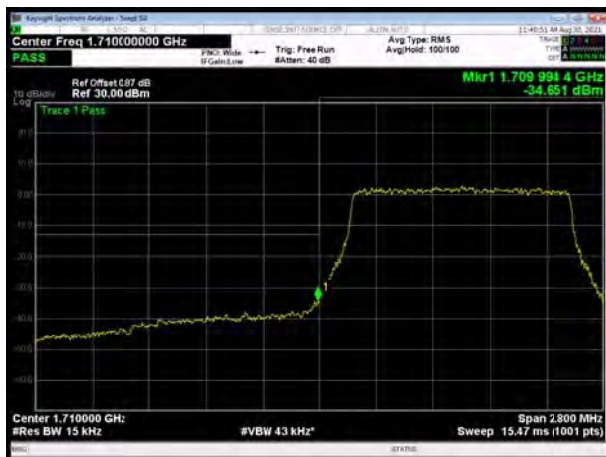
LTE Band 66 64QAM 1.4MHz CH-Low, 1 RB



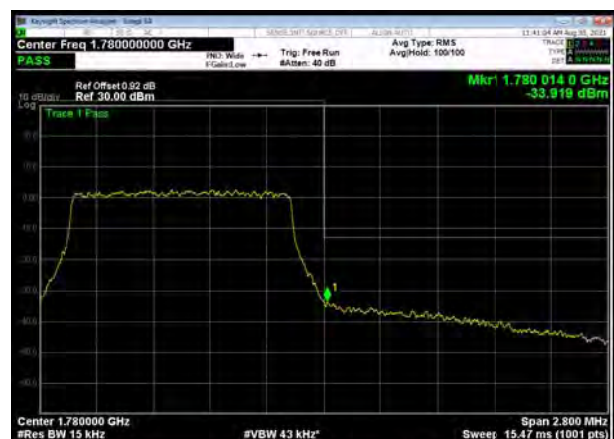
LTE Band 66 64QAM 1.4MHz CH-High, 1 RB



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



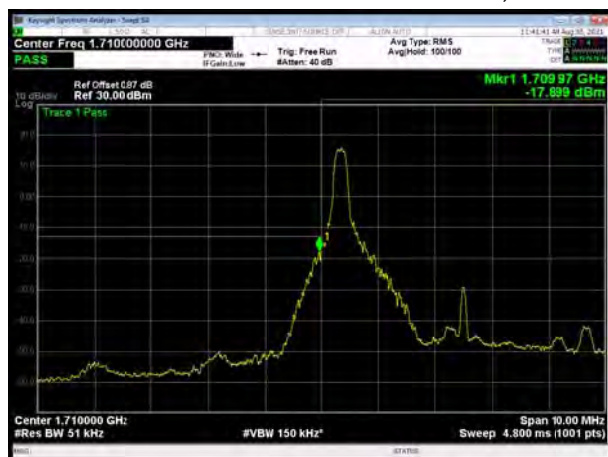
LTE Band 66 64QAM 3MHz CH-Low, 100%RB



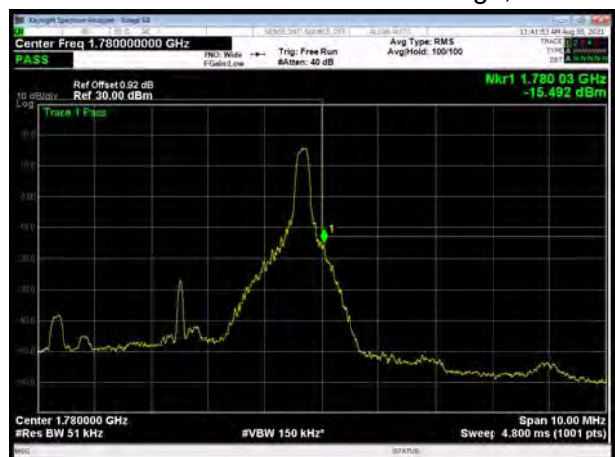
LTE Band 66 64QAM 3MHz CH-High, 100%RB



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



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





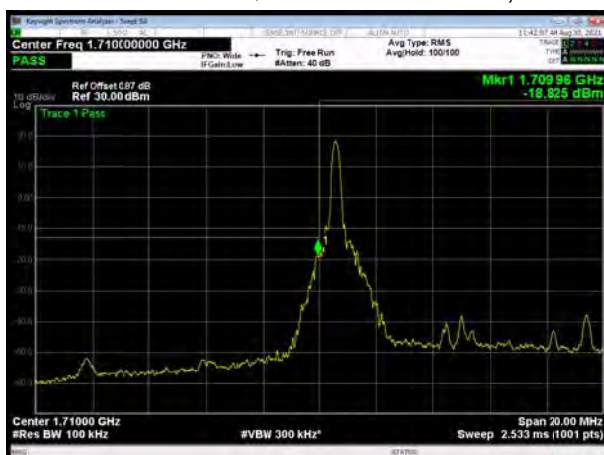
LTE Band 66 64QAM 5MHz CH-Low, 100%RB



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

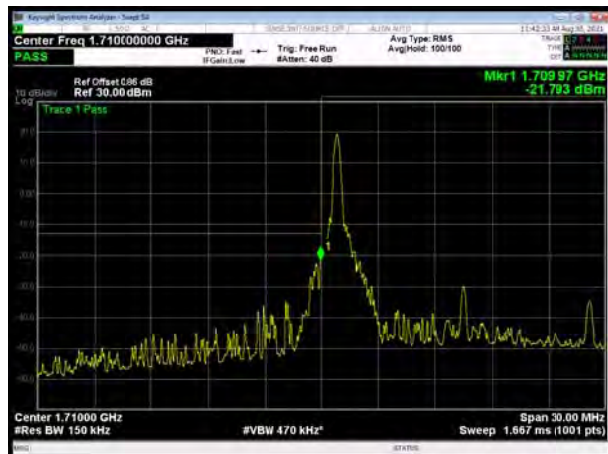


LTE Band 66 64QAM 10MHz CH-High, 100%RB





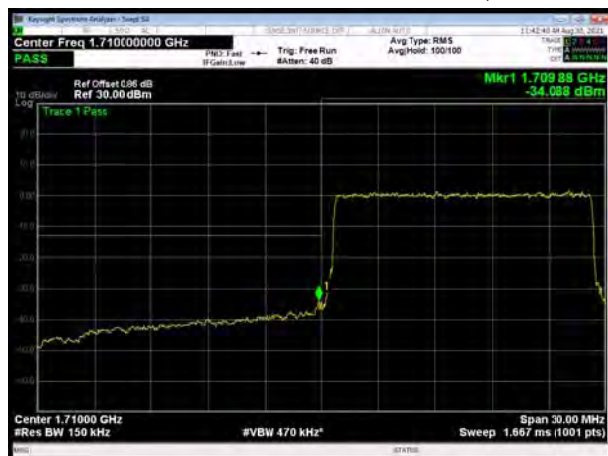
LTE Band 66 64QAM 15MHz CH-Low, 1 RB



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



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



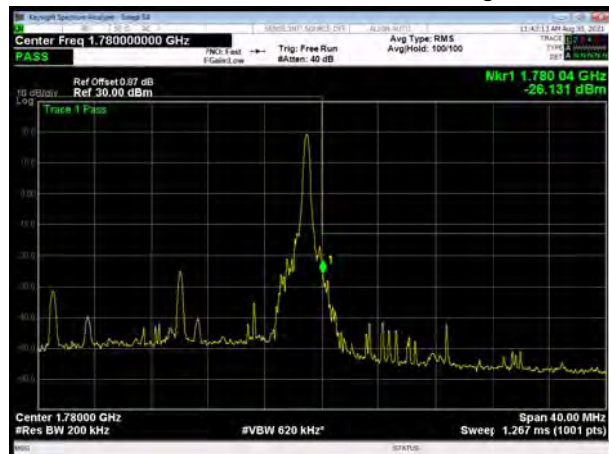
LTE Band 66 64QAM 15MHz CH-High, 100%RB



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

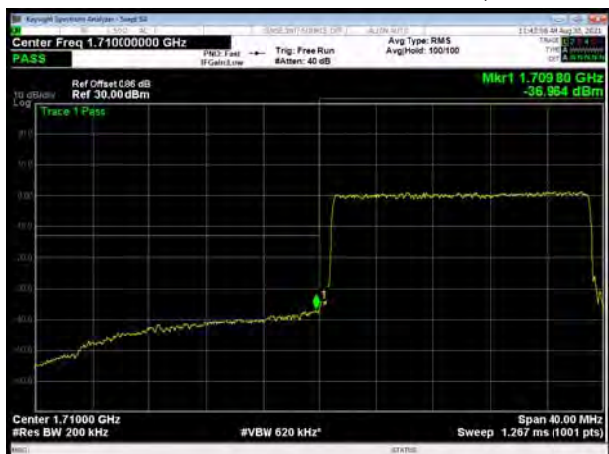


LTE Band 66 64QAM 20MHz CH-High, 1 RB

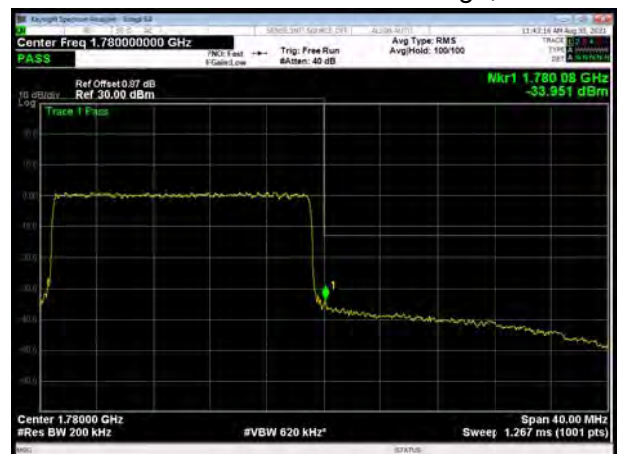




LTE Band 66 64QAM 20MHz CH-Low, 100%RB



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



5.4 Peak-to-Average Power Ratio (PAPR)

Ambient condition

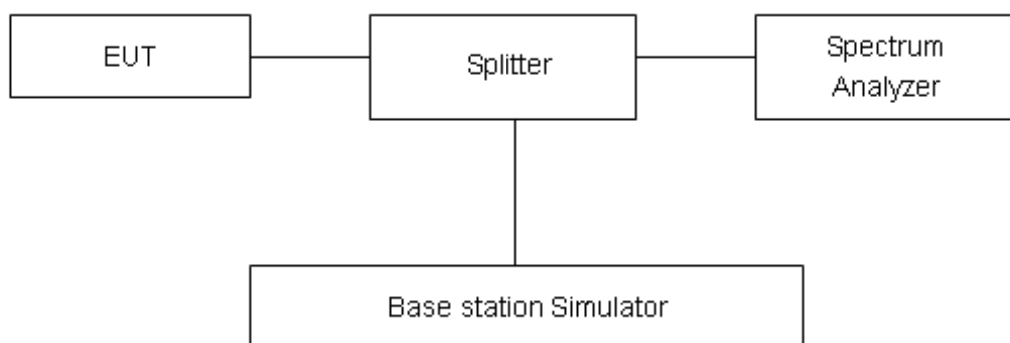
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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:

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

Test Setup



Limits

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

Measurement Uncertainty

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



Test Results

WCDMA Band IV	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
RMC	1312	1712.4	25.53	22.25	3.28	≤13	PASS
	1413	1732.6	25.33	22.28	3.05	≤13	PASS
	1513	1752.6	25.46	22.29	3.17	≤13	PASS

LTE Band 4								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	19957	1710.7	26.64	20.99	5.65	≤13	PASS
		20175	1732.5	26.42	20.97	5.45	≤13	PASS
		20393	1754.3	26.28	20.85	5.43	≤13	PASS
	3	19965	1711.5	26.67	20.99	5.68	≤13	PASS
		20175	1732.5	26.34	20.92	5.42	≤13	PASS
		20385	1753.5	26.30	20.81	5.49	≤13	PASS
	5	19975	1712.5	26.69	20.97	5.72	≤13	PASS
		20175	1732.5	26.39	20.89	5.50	≤13	PASS
		20375	1752.5	26.42	20.80	5.62	≤13	PASS
	10	20000	1715	26.71	21.01	5.70	≤13	PASS
		20175	1732.5	26.37	20.92	5.45	≤13	PASS
		20350	1750	26.35	20.82	5.53	≤13	PASS
	15	20025	1717.5	27.03	20.97	6.06	≤13	PASS
		20175	1732.5	26.70	20.92	5.78	≤13	PASS
		20325	1747.5	26.60	20.85	5.75	≤13	PASS
	20	20050	1720	26.74	20.99	5.75	≤13	PASS
		20175	1732.5	26.40	20.86	5.54	≤13	PASS
		20300	1745	26.40	20.84	5.56	≤13	PASS
16QAM	1.4	19957	1710.7	26.38	20.02	6.36	≤13	PASS
		20175	1732.5	26.04	19.97	6.07	≤13	PASS
		20393	1754.3	26.11	19.89	6.22	≤13	PASS
	3	19965	1711.5	26.41	19.99	6.42	≤13	PASS
		20175	1732.5	26.10	19.90	6.20	≤13	PASS
		20385	1753.5	26.05	19.83	6.22	≤13	PASS
	5	19975	1712.5	26.40	20.00	6.40	≤13	PASS
		20175	1732.5	26.00	19.88	6.12	≤13	PASS
		20375	1752.5	26.12	19.81	6.31	≤13	PASS
	10	20000	1715	26.43	20.02	6.41	≤13	PASS
		20175	1732.5	26.01	19.87	6.14	≤13	PASS
		20350	1750	26.06	19.80	6.26	≤13	PASS



	15	20025	1717.5	26.50	19.99	6.51	≤13	PASS
		20175	1732.5	26.16	19.90	6.26	≤13	PASS
		20325	1747.5	26.05	19.83	6.22	≤13	PASS
	20	20050	1720	26.42	19.99	6.43	≤13	PASS
		20175	1732.5	26.12	19.90	6.22	≤13	PASS
		20300	1745	26.00	19.81	6.19	≤13	PASS
64QAM	1.4	19957	1710.7	26.06	19.67	6.39	≤13	PASS
		20175	1732.5	25.74	19.62	6.12	≤13	PASS
		20393	1754.3	25.83	19.54	6.29	≤13	PASS
	3	19965	1711.5	26.13	19.65	6.48	≤13	PASS
		20175	1732.5	25.75	19.56	6.19	≤13	PASS
		20385	1753.5	25.76	19.49	6.27	≤13	PASS
	5	19975	1712.5	26.10	19.62	6.48	≤13	PASS
		20175	1732.5	25.71	19.54	6.17	≤13	PASS
		20375	1752.5	25.78	19.47	6.31	≤13	PASS
	10	20000	1715	26.15	19.65	6.50	≤13	PASS
		20175	1732.5	25.74	19.54	6.20	≤13	PASS
		20350	1750	25.66	19.46	6.20	≤13	PASS
	15	20025	1717.5	26.15	19.60	6.55	≤13	PASS
		20175	1732.5	25.79	19.54	6.25	≤13	PASS
		20325	1747.5	25.76	19.49	6.27	≤13	PASS
	20	20050	1720	26.11	19.65	6.46	≤13	PASS
		20175	1732.5	25.77	19.49	6.28	≤13	PASS
		20300	1745	25.69	19.48	6.21	≤13	PASS

LTE Band 7								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	5	20775	2502.5	25.58	20.49	5.09	≤13	PASS
		21100	2535	25.29	19.85	5.44	≤13	PASS
		21425	2567.5	25.52	20.17	5.35	≤13	PASS
	10	20800	2505	25.69	20.44	5.25	≤13	PASS
		21100	2535	25.21	19.84	5.37	≤13	PASS
		21400	2565	25.39	20.08	5.31	≤13	PASS
	15	20825	2507.5	26.20	20.50	5.70	≤13	PASS
		21100	2535	25.61	19.87	5.74	≤13	PASS
		21375	2562.5	25.81	20.08	5.73	≤13	PASS
	20	20850	2510	26.09	20.49	5.60	≤13	PASS



16QAM		21100	2535	25.35	19.80	5.55	≤13	PASS
		21350	2560	25.51	20.01	5.50	≤13	PASS
	5	20775	2502.5	25.36	19.47	5.89	≤13	PASS
		21100	2535	24.90	18.83	6.07	≤13	PASS
		21425	2567.5	25.23	19.18	6.05	≤13	PASS
	10	20800	2505	25.43	19.44	5.99	≤13	PASS
		21100	2535	24.93	18.81	6.12	≤13	PASS
		21400	2565	25.17	19.08	6.09	≤13	PASS
	15	20825	2507.5	25.68	19.47	6.21	≤13	PASS
		21100	2535	24.99	18.81	6.18	≤13	PASS
		21375	2562.5	25.26	19.05	6.21	≤13	PASS
	20	20850	2510	25.73	19.46	6.27	≤13	PASS
		21100	2535	24.97	18.80	6.17	≤13	PASS
		21350	2560	25.19	18.99	6.20	≤13	PASS
64QAM	5	20775	2502.5	24.70	18.81	5.89	≤13	PASS
		21100	2535	24.17	18.08	6.09	≤13	PASS
		21425	2567.5	24.44	18.36	6.08	≤13	PASS
	10	20800	2505	24.78	18.77	6.01	≤13	PASS
		21100	2535	24.23	18.06	6.17	≤13	PASS
		21400	2565	24.38	18.26	6.12	≤13	PASS
	15	20825	2507.5	25.05	18.79	6.26	≤13	PASS
		21100	2535	24.26	18.07	6.19	≤13	PASS
		21375	2562.5	24.48	18.25	6.23	≤13	PASS
	20	20850	2510	25.10	18.81	6.29	≤13	PASS
		21100	2535	24.28	18.07	6.21	≤13	PASS
		21350	2560	24.44	18.22	6.22	≤13	PASS

LTE Band 12								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	23017	699.7	27.24	21.94	5.30	≤13	PASS
		23095	707.5	27.16	21.80	5.36	≤13	PASS
		23173	715.3	26.94	21.64	5.30	≤13	PASS
	3	23025	700.5	27.29	21.89	5.40	≤13	PASS
		23095	707.5	27.18	21.75	5.43	≤13	PASS
		23165	714.5	27.09	21.66	5.43	≤13	PASS



	5	23035	701.5	27.34	21.92	5.42	≤13	PASS
		23095	707.5	27.18	21.77	5.41	≤13	PASS
		23155	713.5	27.24	21.69	5.55	≤13	PASS
	10	23060	704	27.35	21.92	5.43	≤13	PASS
		23095	707.5	27.11	21.74	5.37	≤13	PASS
		23130	711	27.28	21.78	5.50	≤13	PASS
16QAM	1.4	23017	699.7	27.00	20.96	6.04	≤13	PASS
		23095	707.5	26.88	20.84	6.04	≤13	PASS
		23173	715.3	27.01	20.75	6.26	≤13	PASS
	3	23025	700.5	27.09	20.96	6.13	≤13	PASS
		23095	707.5	26.97	20.78	6.19	≤13	PASS
		23165	714.5	26.93	20.69	6.24	≤13	PASS
	5	23035	701.5	27.14	20.99	6.15	≤13	PASS
		23095	707.5	26.90	20.81	6.09	≤13	PASS
		23155	713.5	26.92	20.74	6.18	≤13	PASS
	10	23060	704	27.10	20.96	6.14	≤13	PASS
		23095	707.5	26.89	20.80	6.09	≤13	PASS
		23130	711	27.03	20.80	6.23	≤13	PASS
64QAM	1.4	23017	699.7	26.07	20.04	6.03	≤13	PASS
		23095	707.5	26.38	20.30	6.08	≤13	PASS
		23173	715.3	26.47	20.20	6.27	≤13	PASS
	3	23025	700.5	26.52	20.40	6.12	≤13	PASS
		23095	707.5	26.39	20.26	6.13	≤13	PASS
		23165	714.5	26.41	20.14	6.27	≤13	PASS
	5	23035	701.5	26.49	20.37	6.12	≤13	PASS
		23095	707.5	26.37	20.22	6.15	≤13	PASS
		23155	713.5	26.37	20.16	6.21	≤13	PASS
	10	23060	704	26.53	20.36	6.17	≤13	PASS
		23095	707.5	26.28	20.19	6.09	≤13	PASS
		23130	711	26.47	20.26	6.21	≤13	PASS

LTE Band 13								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	5	23205	779.5	26.90	21.12	5.78	≤13	PASS
		23230	782	27.00	21.15	5.85	≤13	PASS
		23255	784.5	27.00	21.16	5.84	≤13	PASS
	10	23230	782	26.99	21.20	5.79	≤13	PASS
16QAM	5	23205	779.5	26.57	20.12	6.45	≤13	PASS
		23230	782	26.67	20.16	6.51	≤13	PASS



64QAM	10	23255	784.5	26.61	20.14	6.47	≤13	PASS
		23230	782	26.72	20.21	6.51	≤13	PASS
	5	23205	779.5	26.12	19.65	6.47	≤13	PASS
		23230	782	26.12	19.68	6.44	≤13	PASS
		23255	784.5	26.16	19.67	6.49	≤13	PASS
	10	23230	782	26.23	19.72	6.51	≤13	PASS

LTE Band 66								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	131979	1710.7	26.80	21.19	5.61	≤13	PASS
		132322	1745	26.26	21.10	5.16	≤13	PASS
		132665	1779.3	26.55	21.22	5.33	≤13	PASS
	3	131987	1711.5	26.74	21.10	5.64	≤13	PASS
		132322	1745	26.23	21.02	5.21	≤13	PASS
		132657	1778.5	26.55	21.16	5.39	≤13	PASS
	5	131997	1712.5	26.85	21.11	5.74	≤13	PASS
		132322	1745	26.37	21.03	5.34	≤13	PASS
		132647	1777.5	26.86	21.20	5.66	≤13	PASS
	10	132022	1715	26.86	21.12	5.74	≤13	PASS
		132322	1745	26.36	21.05	5.31	≤13	PASS
		132622	1775	26.80	21.18	5.62	≤13	PASS
	15	132047	1717.5	27.18	21.11	6.07	≤13	PASS
		132322	1745	26.75	21.07	5.68	≤13	PASS
		132597	1772.5	27.05	21.11	5.94	≤13	PASS
	20	132072	1720	26.92	21.13	5.79	≤13	PASS
		132322	1745	26.60	21.05	5.55	≤13	PASS
		132572	1770	26.76	21.09	5.67	≤13	PASS
16QAM	1.4	131979	1710.7	26.51	20.18	6.33	≤13	PASS
		132322	1745	26.00	20.10	5.90	≤13	PASS
		132665	1779.3	26.48	20.27	6.21	≤13	PASS
	3	131987	1711.5	26.56	20.10	6.46	≤13	PASS
		132322	1745	26.07	20.04	6.03	≤13	PASS
		132657	1778.5	26.37	20.17	6.20	≤13	PASS
	5	131997	1712.5	26.54	20.11	6.43	≤13	PASS
		132322	1745	26.04	20.02	6.02	≤13	PASS
		132647	1777.5	26.51	20.19	6.32	≤13	PASS
	10	132022	1715	26.64	20.15	6.49	≤13	PASS
		132322	1745	26.11	20.03	6.08	≤13	PASS
		132622	1775	26.46	20.16	6.30	≤13	PASS



	15	132047	1717.5	26.59	20.11	6.48	≤13	PASS
		132322	1745	26.21	20.03	6.18	≤13	PASS
		132597	1772.5	26.51	20.10	6.41	≤13	PASS
	20	132072	1720	26.56	20.13	6.43	≤13	PASS
		132322	1745	26.19	20.03	6.16	≤13	PASS
		132572	1770	26.50	20.12	6.38	≤13	PASS
64QAM	1.4	131979	1710.7	25.85	19.56	6.29	≤13	PASS
		132322	1745	25.45	19.46	5.99	≤13	PASS
		132665	1779.3	25.80	19.56	6.24	≤13	PASS
	3	131987	1711.5	25.89	19.47	6.42	≤13	PASS
		132322	1745	25.44	19.37	6.07	≤13	PASS
		132657	1778.5	25.76	19.47	6.29	≤13	PASS
	5	131997	1712.5	25.93	19.48	6.45	≤13	PASS
		132322	1745	25.47	19.38	6.09	≤13	PASS
		132647	1777.5	25.79	19.50	6.29	≤13	PASS
	10	132022	1715	25.98	19.49	6.49	≤13	PASS
		132322	1745	25.49	19.36	6.13	≤13	PASS
		132622	1775	25.83	19.46	6.37	≤13	PASS
	15	132047	1717.5	26.00	19.46	6.54	≤13	PASS
		132322	1745	25.60	19.36	6.24	≤13	PASS
		132597	1772.5	25.82	19.40	6.42	≤13	PASS
	20	132072	1720	25.96	19.48	6.48	≤13	PASS
		132322	1745	25.60	19.36	6.24	≤13	PASS
		132572	1770	25.88	19.43	6.45	≤13	PASS

5.5 Frequency Stability

Ambient condition

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

Method of Measurement

Frequency Stability (Temperature Variation)

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

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

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

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

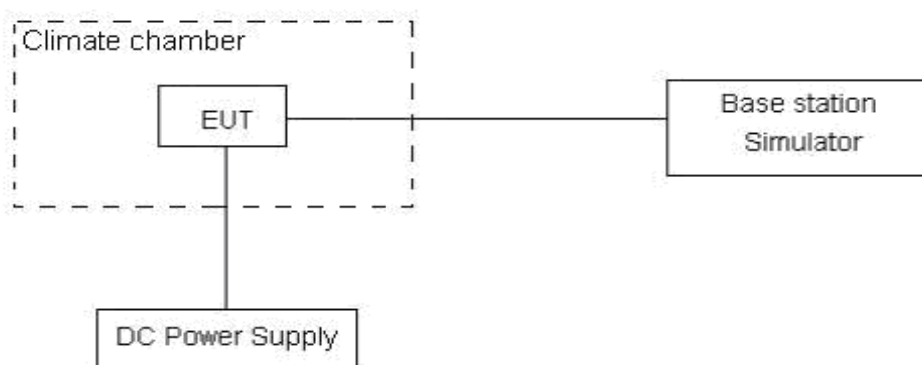
Frequency Stability (Voltage Variation)

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

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

This transceiver is specified to operate with an input voltage of between 3.6 V and 4.3 V, with a nominal voltage of 4.0 V.

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 B4						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	BPSK	QPSK	BPSK	QPSK	
Normal (25℃)	Normal	10.57	2.06	0.00610	0.00119	PASS
Extreme (50℃)		3.52	9.33	0.00203	0.00539	PASS
Extreme (40℃)		5.62	7.62	0.00324	0.00440	PASS
Extreme (30℃)		3.52	3.11	0.00203	0.00179	PASS
Extreme (20℃)		4.28	1.97	0.00247	0.00113	PASS
Extreme (10℃)		14.11	1.87	0.00814	0.00108	PASS
Extreme (0℃)		17.27	8.35	0.00997	0.00482	PASS
Extreme (-10℃)		13.51	16.58	0.00780	0.00957	PASS
Extreme (-20℃)		4.19	2.56	0.00242	0.00148	PASS
Extreme (-30℃)		3.88	16.93	0.00224	0.00977	PASS
25℃	LV	8.98	16.19	0.00518	0.00934	PASS
	HV	4.55	8.95	0.00263	0.00517	PASS

LTE Band 4								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	1.4MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	5.37	10.60	4.21	0.00310	0.00612	0.00243	PASS
Extreme (50℃)		15.05	14.26	10.83	0.00868	0.00823	0.00625	PASS
Extreme (40℃)		1.75	3.52	6.71	0.00101	0.00203	0.00388	PASS
Extreme (30℃)		10.53	16.55	15.06	0.00608	0.00955	0.00869	PASS
Extreme (20℃)		13.90	6.61	7.04	0.00802	0.00382	0.00406	PASS
Extreme (10℃)		11.69	3.44	8.09	0.00675	0.00199	0.00467	PASS
Extreme (0℃)		12.08	8.24	16.73	0.00697	0.00475	0.00965	PASS
Extreme (-10℃)		6.02	4.42	16.62	0.00347	0.00255	0.00959	PASS
Extreme (-20℃)		8.15	4.47	17.21	0.00470	0.00258	0.00994	PASS
Extreme (-30℃)		3.92	2.47	9.93	0.00227	0.00142	0.00573	PASS
25℃	LV	13.29	9.87	12.80	0.00767	0.00570	0.00739	PASS
	HV	3.56	16.24	9.33	0.00205	0.00937	0.00539	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	16.37	13.47	17.83	0.00945	0.00777	0.01029	PASS
Extreme (50℃)		14.23	12.69	15.80	0.00822	0.00732	0.00912	PASS
Extreme (40℃)		3.91	17.29	4.19	0.00226	0.00998	0.00242	PASS



Extreme (30℃)		7.95	16.85	5.08	0.00459	0.00973	0.00293	PASS
Extreme (20℃)		16.08	16.82	11.53	0.00928	0.00971	0.00666	PASS
Extreme (10℃)		5.33	6.56	11.74	0.00308	0.00379	0.00677	PASS
Extreme (0℃)		17.92	16.82	12.39	0.01034	0.00971	0.00715	PASS
Extreme (-10℃)		6.40	9.94	9.08	0.00369	0.00574	0.00524	PASS
Extreme (-20℃)		7.05	17.00	12.04	0.00407	0.00981	0.00695	PASS
Extreme (-30℃)		13.36	2.08	9.61	0.00771	0.00120	0.00555	PASS
25℃	LV	14.85	6.38	4.88	0.00857	0.00368	0.00281	PASS
	HV	17.02	1.58	12.98	0.00983	0.00091	0.00749	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	9.18	16.71	15.42	0.00530	0.00965	0.00890	PASS
Extreme (50℃)		6.93	11.60	1.58	0.00400	0.00670	0.00091	PASS
Extreme (40℃)		3.91	12.70	6.80	0.00226	0.00733	0.00393	PASS
Extreme (30℃)		9.31	11.19	8.47	0.00537	0.00646	0.00489	PASS
Extreme (20℃)		14.97	17.03	11.19	0.00864	0.00983	0.00646	PASS
Extreme (10℃)		13.93	7.50	9.49	0.00804	0.00433	0.00548	PASS
Extreme (0℃)		7.58	8.49	6.76	0.00437	0.00490	0.00390	PASS
Extreme (-10℃)		4.44	1.02	7.65	0.00257	0.00059	0.00441	PASS
Extreme (-20℃)		11.76	2.41	6.05	0.00679	0.00139	0.00349	PASS
Extreme (-30℃)		7.17	11.58	6.98	0.00414	0.00668	0.00403	PASS
25℃	LV	12.43	8.89	2.73	0.00718	0.00513	0.00158	PASS
	HV	13.65	15.36	2.20	0.00788	0.00887	0.00127	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	7.75	15.62	13.94	0.00448	0.00902	0.00805	PASS
Extreme (50℃)		14.45	16.25	12.92	0.00834	0.00938	0.00746	PASS
Extreme (40℃)		12.16	2.61	6.24	0.00702	0.00150	0.00360	PASS
Extreme (30℃)		7.94	3.39	15.24	0.00458	0.00196	0.00879	PASS
Extreme (20℃)		17.06	14.48	4.44	0.00985	0.00836	0.00256	PASS
Extreme (10℃)		13.40	15.67	17.96	0.00774	0.00904	0.01036	PASS
Extreme (0℃)		2.30	4.23	12.78	0.00133	0.00244	0.00738	PASS
Extreme (-10℃)		11.01	12.10	2.70	0.00635	0.00699	0.00156	PASS
Extreme (-20℃)		17.69	10.90	17.21	0.01021	0.00629	0.00993	PASS
Extreme (-30℃)		15.26	9.41	11.52	0.00881	0.00543	0.00665	PASS
25℃	LV	7.33	11.63	7.49	0.00423	0.00671	0.00432	PASS
	HV	9.90	10.55	10.93	0.00572	0.00609	0.00631	PASS



Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	15MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	6.78	7.58	2.24	0.00391	0.00438	0.00129	PASS
Extreme (50℃)		2.85	3.78	10.98	0.00164	0.00218	0.00634	PASS
Extreme (40℃)		13.94	4.65	14.71	0.00805	0.00269	0.00849	PASS
Extreme (30℃)		14.82	6.60	4.01	0.00855	0.00381	0.00231	PASS
Extreme (20℃)		7.38	9.49	4.95	0.00426	0.00548	0.00286	PASS
Extreme (10℃)		4.28	7.57	2.51	0.00247	0.00437	0.00145	PASS
Extreme (0℃)		17.41	12.43	6.51	0.01005	0.00717	0.00376	PASS
Extreme (-10℃)		9.16	15.45	17.97	0.00529	0.00892	0.01037	PASS
Extreme (-20℃)		5.09	1.72	2.95	0.00294	0.00100	0.00170	PASS
Extreme (-30℃)		4.22	15.61	4.09	0.00244	0.00901	0.00236	PASS
25℃	LV	14.59	15.49	16.19	0.00842	0.00894	0.00935	PASS
	HV	8.80	9.77	7.94	0.00508	0.00564	0.00458	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	9.38	1.03	15.19	0.00541	0.00060	0.00877	PASS
Extreme (50℃)		16.54	8.88	1.32	0.00955	0.00512	0.00076	PASS
Extreme (40℃)		1.60	11.45	12.04	0.00092	0.00661	0.00695	PASS
Extreme (30℃)		7.00	1.43	4.25	0.00404	0.00082	0.00246	PASS
Extreme (20℃)		16.81	3.78	13.66	0.00970	0.00218	0.00789	PASS
Extreme (10℃)		1.67	9.26	3.59	0.00096	0.00534	0.00207	PASS
Extreme (0℃)		16.22	12.06	13.12	0.00936	0.00696	0.00757	PASS
Extreme (-10℃)		1.13	17.54	14.77	0.00065	0.01013	0.00853	PASS
Extreme (-20℃)		11.34	7.32	17.71	0.00655	0.00422	0.01022	PASS
Extreme (-30℃)		9.15	12.90	5.92	0.00528	0.00745	0.00341	PASS
25℃	LV	8.46	6.01	1.52	0.00489	0.00347	0.00087	PASS
	HV	17.30	13.76	6.39	0.00998	0.00794	0.00369	PASS

LTE Band 7								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	11.63	1.18	5.84	0.00459	0.00047	0.00230	PASS
Extreme (50℃)		13.30	8.84	6.14	0.00525	0.00349	0.00242	PASS
Extreme (40℃)		2.03	7.74	2.79	0.00080	0.00306	0.00110	PASS
Extreme (30℃)		10.43	16.79	5.04	0.00412	0.00662	0.00199	PASS
Extreme (20℃)		15.55	2.36	5.31	0.00613	0.00093	0.00210	PASS



Extreme (10℃)		6.97	12.88	16.98	0.00275	0.00508	0.00670	PASS
Extreme (0℃)		9.15	13.08	10.04	0.00361	0.00516	0.00396	PASS
Extreme (-10℃)		9.61	5.59	1.12	0.00379	0.00221	0.00044	PASS
Extreme (-20℃)		13.13	4.66	5.88	0.00518	0.00184	0.00232	PASS
Extreme (-30℃)		1.90	8.09	1.70	0.00075	0.00319	0.00067	PASS
25℃	LV	14.54	11.40	2.02	0.00574	0.00450	0.00080	PASS
	HV	1.28	13.15	3.54	0.00050	0.00519	0.00140	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	16.98	10.59	2.42	0.00670	0.00418	0.00096	PASS
Extreme (50℃)		12.83	4.55	1.50	0.00506	0.00180	0.00059	PASS
Extreme (40℃)		9.53	2.28	8.39	0.00376	0.00090	0.00331	PASS
Extreme (30℃)		7.73	12.77	2.14	0.00305	0.00504	0.00084	PASS
Extreme (20℃)		3.30	14.21	4.21	0.00130	0.00561	0.00166	PASS
Extreme (10℃)		15.26	14.88	11.29	0.00602	0.00587	0.00445	PASS
Extreme (0℃)		10.34	3.66	17.81	0.00408	0.00144	0.00703	PASS
Extreme (-10℃)		11.40	7.78	10.69	0.00450	0.00307	0.00422	PASS
Extreme (-20℃)		7.75	10.95	2.16	0.00306	0.00432	0.00085	PASS
Extreme (-30℃)		3.60	15.78	2.47	0.00142	0.00623	0.00098	PASS
25℃	LV	14.46	8.10	17.23	0.00570	0.00319	0.00680	PASS
	HV	12.53	16.68	16.85	0.00494	0.00658	0.00665	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	15MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	6.33	12.22	2.93	0.00250	0.00482	0.00116	PASS
Extreme (50℃)		13.65	1.36	14.81	0.00538	0.00054	0.00584	PASS
Extreme (40℃)		9.63	1.22	6.51	0.00380	0.00048	0.00257	PASS
Extreme (30℃)		10.93	9.41	16.49	0.00431	0.00371	0.00650	PASS
Extreme (20℃)		15.64	10.94	4.59	0.00617	0.00432	0.00181	PASS
Extreme (10℃)		10.05	12.06	14.97	0.00396	0.00476	0.00590	PASS
Extreme (0℃)		5.99	15.28	10.07	0.00236	0.00603	0.00397	PASS
Extreme (-10℃)		3.37	7.77	10.62	0.00133	0.00307	0.00419	PASS
Extreme (-20℃)		11.60	10.12	15.08	0.00458	0.00399	0.00595	PASS
Extreme (-30℃)		2.62	3.04	5.93	0.00103	0.00120	0.00234	PASS
25℃	LV	1.61	8.44	11.56	0.00063	0.00333	0.00456	PASS
	HV	11.92	16.69	5.54	0.00470	0.00658	0.00219	PASS



Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	7.57	1.15	15.94	0.00299	0.00045	0.00629	PASS
Extreme (50℃)		13.04	9.70	13.57	0.00514	0.00383	0.00535	PASS
Extreme (40℃)		17.24	2.49	8.23	0.00680	0.00098	0.00324	PASS
Extreme (30℃)		4.25	15.53	2.87	0.00168	0.00612	0.00113	PASS
Extreme (20℃)		15.28	15.37	8.51	0.00603	0.00606	0.00336	PASS
Extreme (10℃)		6.51	8.36	16.33	0.00257	0.00330	0.00644	PASS
Extreme (0℃)		6.02	11.69	5.25	0.00238	0.00461	0.00207	PASS
Extreme (-10℃)		4.87	16.44	3.67	0.00192	0.00649	0.00145	PASS
Extreme (-20℃)		14.56	10.62	10.86	0.00574	0.00419	0.00428	PASS
Extreme (-30℃)		11.73	2.63	10.31	0.00463	0.00104	0.00407	PASS
25℃	LV	4.27	12.44	13.92	0.00168	0.00491	0.00549	PASS
	HV	11.36	9.17	14.20	0.00448	0.00362	0.00560	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℃)	Normal	13.36	14.91	4.20	0.01889	0.02107	0.00594	PASS
Extreme (50℃)		8.77	1.65	1.41	0.01240	0.00234	0.00199	PASS
Extreme (40℃)		15.59	13.43	17.15	0.02203	0.01898	0.02424	PASS
Extreme (30℃)		3.48	5.72	7.34	0.00492	0.00808	0.01037	PASS
Extreme (20℃)		5.94	2.03	4.19	0.00840	0.00286	0.00592	PASS
Extreme (10℃)		5.41	2.35	12.72	0.00764	0.00332	0.01798	PASS
Extreme (0℃)		16.55	14.96	8.03	0.02339	0.02115	0.01134	PASS
Extreme (-10℃)		4.33	4.20	13.49	0.00612	0.00594	0.01907	PASS
Extreme (-20℃)		4.52	8.95	13.85	0.00639	0.01266	0.01958	PASS
Extreme (-30℃)		15.91	16.58	3.25	0.02248	0.02344	0.00459	PASS
25℃	LV	7.57	3.82	10.69	0.01070	0.00539	0.01511	PASS
	HV	9.48	2.78	4.98	0.01339	0.00393	0.00704	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	17.79	4.22	15.59	0.02515	0.00597	0.02204	PASS
Extreme (50℃)		5.39	13.55	11.98	0.00761	0.01915	0.01694	PASS
Extreme (40℃)		15.33	4.02	9.47	0.02167	0.00568	0.01338	PASS
Extreme (30℃)		14.02	6.78	11.03	0.01982	0.00958	0.01559	PASS
Extreme (20℃)		17.95	15.92	13.78	0.02537	0.02250	0.01947	PASS



Extreme (10℃)		2.70	8.58	11.99	0.00382	0.01213	0.01695	PASS
Extreme (0℃)		13.90	11.84	15.22	0.01965	0.01673	0.02151	PASS
Extreme (-10℃)		13.87	17.24	2.57	0.01961	0.02437	0.00363	PASS
Extreme (-20℃)		1.27	2.57	13.82	0.00180	0.00364	0.01954	PASS
Extreme (-30℃)		14.20	2.26	11.01	0.02008	0.00319	0.01557	PASS
25℃	LV	6.73	1.30	7.85	0.00952	0.00184	0.01110	PASS
	HV	16.46	1.49	6.58	0.02327	0.00210	0.00929	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	15.90	14.74	2.89	0.02247	0.02083	0.00409	PASS
Extreme (50℃)		16.73	15.02	5.34	0.02365	0.02123	0.00754	PASS
Extreme (40℃)		4.12	10.32	12.50	0.00583	0.01459	0.01767	PASS
Extreme (30℃)		5.47	10.55	8.69	0.00773	0.01492	0.01229	PASS
Extreme (20℃)		14.68	15.72	14.21	0.02076	0.02222	0.02009	PASS
Extreme (10℃)		4.36	14.14	5.59	0.00616	0.01998	0.00791	PASS
Extreme (0℃)		7.76	2.52	9.57	0.01096	0.00357	0.01353	PASS
Extreme (-10℃)		4.16	6.26	4.13	0.00588	0.00884	0.00583	PASS
Extreme (-20℃)		6.89	7.64	5.88	0.00974	0.01079	0.00831	PASS
Extreme (-30℃)		6.79	4.27	7.58	0.00959	0.00604	0.01072	PASS
25℃	LV	11.29	2.38	9.95	0.01595	0.00336	0.01407	PASS
	HV	1.03	2.89	2.20	0.00145	0.00409	0.00311	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	15.61	14.47	15.23	0.02206	0.02046	0.02153	PASS
Extreme (50℃)		14.80	13.87	10.03	0.02092	0.01961	0.01418	PASS
Extreme (40℃)		6.01	14.63	2.23	0.00850	0.02067	0.00315	PASS
Extreme (30℃)		15.44	14.01	9.11	0.02183	0.01981	0.01288	PASS
Extreme (20℃)		14.07	8.19	17.61	0.01989	0.01158	0.02489	PASS
Extreme (10℃)		10.91	7.50	4.89	0.01541	0.01061	0.00691	PASS
Extreme (0℃)		13.72	4.19	3.53	0.01940	0.00593	0.00499	PASS
Extreme (-10℃)		11.83	10.44	17.83	0.01673	0.01476	0.02520	PASS
Extreme (-20℃)		10.35	4.69	6.30	0.01463	0.00663	0.00891	PASS
Extreme (-30℃)		13.66	12.82	14.09	0.01931	0.01812	0.01991	PASS
25℃	LV	10.18	7.95	17.90	0.01438	0.01123	0.02529	PASS
	HV	4.45	14.97	9.33	0.00629	0.02116	0.01319	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	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Temperature	Voltage							
Normal (25℃)	Normal	2.35	9.13	4.93	0.00300	0.01168	0.00631	PASS
Extreme (50℃)		4.06	13.50	17.91	0.00520	0.01726	0.02291	PASS
Extreme (40℃)		3.98	13.74	9.52	0.00509	0.01757	0.01217	PASS
Extreme (30℃)		12.84	12.93	6.78	0.01642	0.01654	0.00866	PASS
Extreme (20℃)		8.23	10.56	9.40	0.01053	0.01350	0.01202	PASS
Extreme (10℃)		5.00	11.20	11.32	0.00640	0.01432	0.01448	PASS
Extreme (0℃)		5.06	1.57	14.00	0.00648	0.00200	0.01791	PASS
Extreme (-10℃)		11.34	11.90	3.27	0.01450	0.01521	0.00418	PASS
Extreme (-20℃)		15.63	2.11	8.24	0.01999	0.00270	0.01054	PASS
Extreme (-30℃)		6.20	9.88	9.26	0.00793	0.01264	0.01184	PASS
25℃	LV	4.23	1.40	14.22	0.00541	0.00179	0.01818	PASS
	HV	1.36	14.35	3.31	0.00174	0.01835	0.00423	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Temperature	Voltage							
Normal (25℃)	Normal	9.18	12.49	9.77	0.01174	0.01598	0.01250	PASS
Extreme (50℃)		2.51	9.90	10.53	0.00321	0.01266	0.01347	PASS
Extreme (40℃)		5.66	9.94	5.88	0.00724	0.01271	0.00752	PASS
Extreme (30℃)		13.32	14.13	2.61	0.01703	0.01807	0.00334	PASS
Extreme (20℃)		17.61	16.04	7.50	0.02251	0.02051	0.00960	PASS
Extreme (10℃)		3.87	14.68	2.36	0.00495	0.01877	0.00302	PASS
Extreme (0℃)		3.71	7.98	1.96	0.00474	0.01021	0.00251	PASS
Extreme (-10℃)		11.12	17.16	11.45	0.01422	0.02194	0.01464	PASS
Extreme (-20℃)		1.13	13.74	15.89	0.00144	0.01756	0.02033	PASS
Extreme (-30℃)		1.39	17.66	12.99	0.00178	0.02258	0.01661	PASS
25℃	LV	6.99	9.18	17.39	0.00894	0.01174	0.02223	PASS
	HV	15.34	9.25	13.02	0.01962	0.01183	0.01665	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	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Temperature	Voltage							
Normal (25℃)	Normal							
Extreme (50℃)		12.00	16.00	11.00	0.00688	0.00917	0.00630	PASS
Extreme (40℃)		17.00	13.00	16.00	0.00974	0.00745	0.00917	PASS



Extreme (30℃)		2.00	7.00	14.00	0.00115	0.00401	0.00802	PASS
Extreme (20℃)		14.00	15.00	1.00	0.00802	0.00860	0.00057	PASS
Extreme (10℃)		13.00	12.00	12.00	0.00745	0.00688	0.00688	PASS
Extreme (0℃)		4.00	9.00	4.00	0.00229	0.00516	0.00229	PASS
Extreme (-10℃)		4.00	6.00	1.00	0.00229	0.00344	0.00057	PASS
Extreme (-20℃)		6.00	5.00	14.00	0.00344	0.00287	0.00802	PASS
Extreme (-30℃)		6.00	4.00	15.00	0.00344	0.00229	0.00860	PASS
25℃	LV	9.00	5.00	6.00	0.00516	0.00287	0.00344	PASS
	HV	1.00	11.00	11.00	0.00057	0.00630	0.00630	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	1.00	13.00	2.00	0.00057	0.00745	0.00115	PASS
Extreme (50℃)		9.00	4.00	6.00	0.00516	0.00229	0.00344	PASS
Extreme (40℃)		13.00	2.00	11.00	0.00745	0.00115	0.00630	PASS
Extreme (30℃)		10.00	1.00	11.00	0.00573	0.00057	0.00630	PASS
Extreme (20℃)		14.00	8.00	10.00	0.00802	0.00458	0.00573	PASS
Extreme (10℃)		11.00	5.00	9.00	0.00630	0.00287	0.00516	PASS
Extreme (0℃)		9.00	14.00	7.00	0.00516	0.00802	0.00401	PASS
Extreme (-10℃)		6.00	9.00	12.00	0.00344	0.00516	0.00688	PASS
Extreme (-20℃)		3.00	2.00	1.00	0.00172	0.00115	0.00057	PASS
Extreme (-30℃)		15.00	4.00	6.00	0.00860	0.00229	0.00344	PASS
25℃	LV	12.00	14.00	9.00	0.00688	0.00802	0.00516	PASS
	HV	3.00	4.00	4.00	0.00172	0.00229	0.00229	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	15.00	4.00	4.00	0.00860	0.00229	0.00229	PASS
Extreme (50℃)		9.00	9.00	1.00	0.00516	0.00516	0.00057	PASS
Extreme (40℃)		9.00	16.00	15.00	0.00516	0.00917	0.00860	PASS
Extreme (30℃)		14.00	5.00	7.00	0.00802	0.00287	0.00401	PASS
Extreme (20℃)		3.00	11.00	13.00	0.00172	0.00630	0.00745	PASS
Extreme (10℃)		7.00	5.00	4.00	0.00401	0.00287	0.00229	PASS
Extreme (0℃)		15.00	13.00	10.00	0.00860	0.00745	0.00573	PASS
Extreme (-10℃)		1.00	12.00	3.00	0.00057	0.00688	0.00172	PASS
Extreme (-20℃)		11.00	15.00	4.00	0.00630	0.00860	0.00229	PASS
Extreme (-30℃)		2.00	7.00	17.00	0.00115	0.00401	0.00974	PASS
25℃	LV	2.00	2.00	14.00	0.00115	0.00115	0.00802	PASS
	HV	15.00	2.00	2.00	0.00860	0.00115	0.00115	PASS



Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	3.00	3.00	2.00	0.00172	0.00172	0.00115	PASS
Extreme (50℃)		16.00	10.00	14.00	0.00917	0.00573	0.00802	PASS
Extreme (40℃)		15.00	14.00	4.00	0.00860	0.00802	0.00229	PASS
Extreme (30℃)		13.00	12.00	15.00	0.00745	0.00688	0.00860	PASS
Extreme (20℃)		8.00	17.00	17.00	0.00458	0.00974	0.00974	PASS
Extreme (10℃)		16.00	4.00	8.00	0.00917	0.00229	0.00458	PASS
Extreme (0℃)		4.00	16.00	3.00	0.00229	0.00917	0.00172	PASS
Extreme (-10℃)		9.00	10.00	14.00	0.00516	0.00573	0.00802	PASS
Extreme (-20℃)		12.00	16.00	10.00	0.00688	0.00917	0.00573	PASS
Extreme (-30℃)		2.00	14.00	14.00	0.00115	0.00802	0.00802	PASS
25℃	LV	8.00	17.00	10.00	0.00458	0.00974	0.00573	PASS
	HV	1.00	6.00	8.00	0.00057	0.00344	0.00458	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	15MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	1.00	16.00	11.00	0.00057	0.00917	0.00630	PASS
Extreme (50℃)		1.00	15.00	6.00	0.00057	0.00860	0.00344	PASS
Extreme (40℃)		12.00	17.00	6.00	0.00688	0.00974	0.00344	PASS
Extreme (30℃)		9.00	14.00	4.00	0.00516	0.00802	0.00229	PASS
Extreme (20℃)		12.00	1.00	6.00	0.00688	0.00057	0.00344	PASS
Extreme (10℃)		1.00	3.00	12.00	0.00057	0.00172	0.00688	PASS
Extreme (0℃)		14.00	11.00	5.00	0.00802	0.00630	0.00287	PASS
Extreme (-10℃)		1.00	14.00	1.00	0.00057	0.00802	0.00057	PASS
Extreme (-20℃)		6.00	17.00	3.00	0.00344	0.00974	0.00172	PASS
Extreme (-30℃)		11.00	9.00	14.00	0.00630	0.00516	0.00802	PASS
25℃	LV	9.00	6.00	4.00	0.00516	0.00344	0.00229	PASS
	HV	6.00	3.00	1.00	0.00344	0.00172	0.00057	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	17.00	4.00	14.00	0.00974	0.00229	0.00802	PASS
Extreme (50℃)		17.00	5.00	7.00	0.00974	0.00287	0.00401	PASS
Extreme (40℃)		3.00	17.00	7.00	0.00172	0.00974	0.00401	PASS
Extreme (30℃)		10.00	5.00	10.00	0.00573	0.00287	0.00573	PASS
Extreme (20℃)		15.00	6.00	17.00	0.00860	0.00344	0.00974	PASS
Extreme (10℃)		4.00	10.00	1.00	0.00229	0.00573	0.00057	PASS
Extreme (0℃)		15.00	16.00	5.00	0.00860	0.00917	0.00287	PASS



Extreme (-10℃)		17.00	2.00	7.00	0.00974	0.00115	0.00401	PASS
Extreme (-20℃)		8.00	1.00	11.00	0.00458	0.00057	0.00630	PASS
Extreme (-30℃)		2.00	17.00	17.00	0.00115	0.00974	0.00974	PASS
25℃	LV	16.00	4.00	13.00	0.00917	0.00229	0.00745	PASS
	HV	16.00	17.00	6.00	0.00917	0.00974	0.00344	PASS

5.6 Spurious Emissions at Antenna Terminals

Ambient condition

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

Method of Measurement

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

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

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

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

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

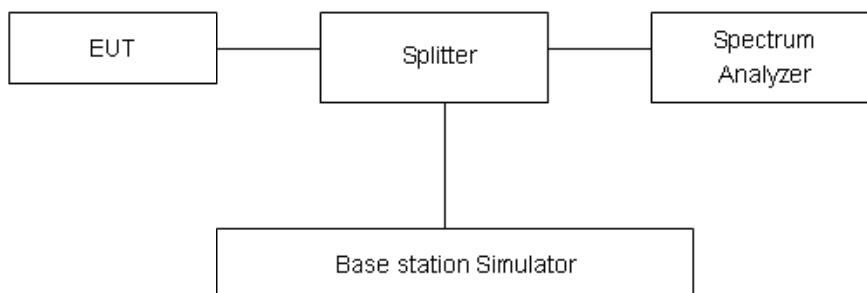
RBW is set to 100 kHz (30MHz~1000 MHz)

RBW is set to 1000 kHz (above 1000MHz)

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

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

Test setup



Limits

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

Rule Part 27.53 (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(a)/(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 $k = 1.96$.

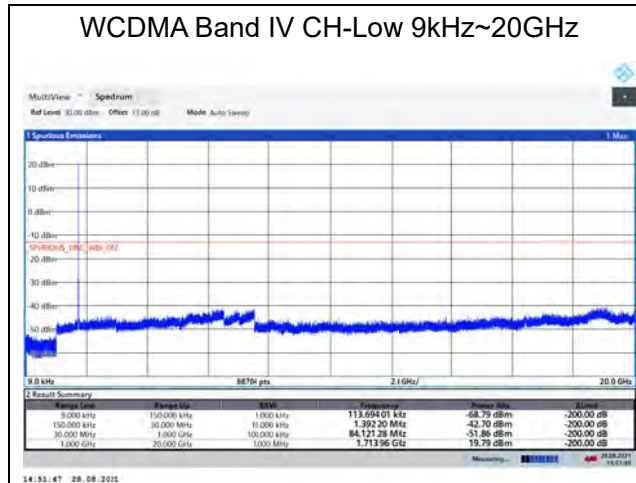
Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-27GHz	1.407 dB

Test Result

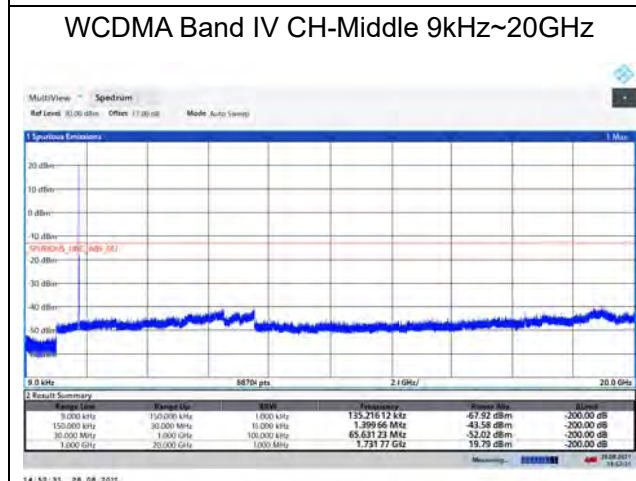
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

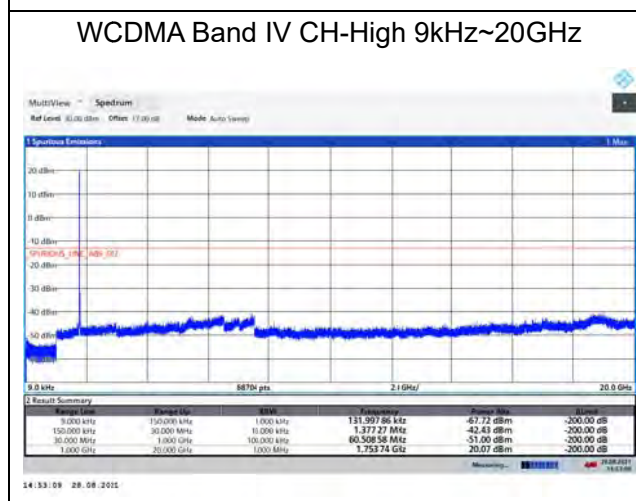
WCDMA Band IV CH-Low 9kHz~20GHz



WCDMA Band IV CH-Middle 9kHz~20GHz

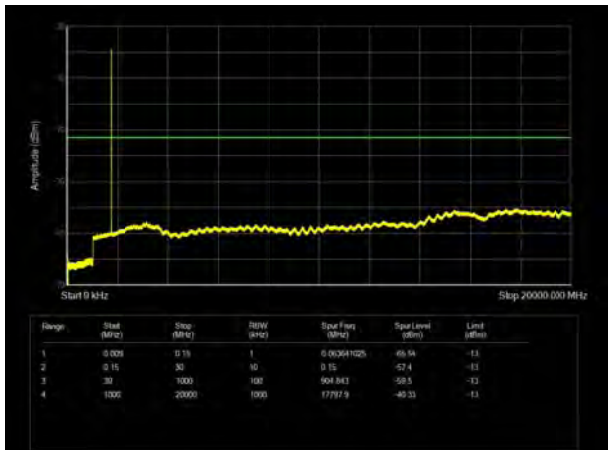


WCDMA Band IV CH-High 9kHz~20GHz

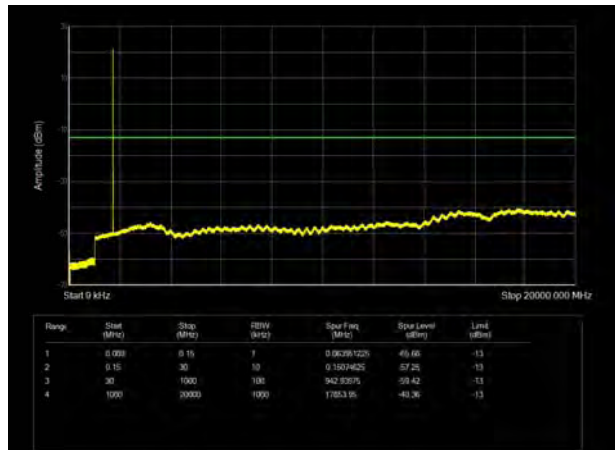




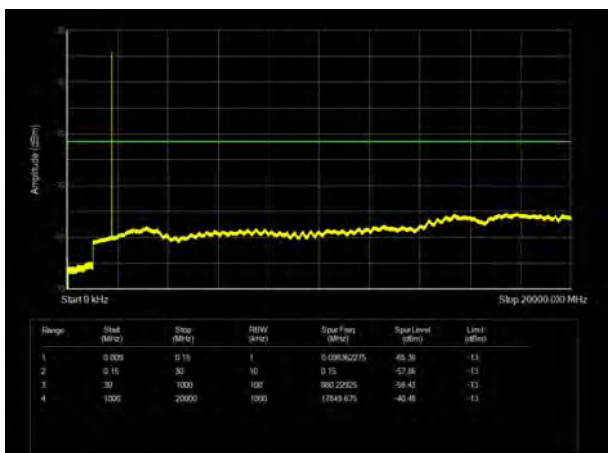
LTE Band 4 1.4MHz CH-Low 9kHz~20GHz



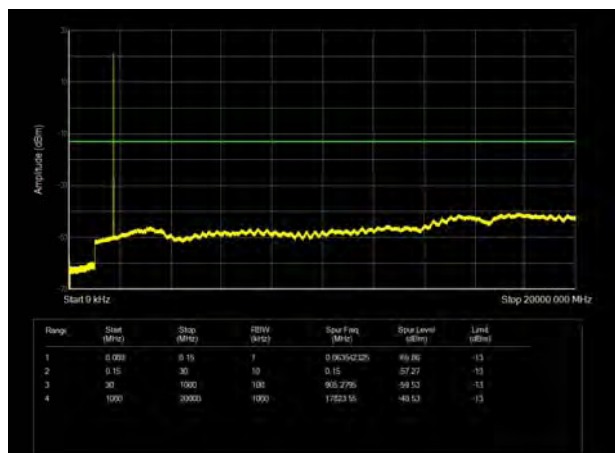
LTE Band 4 3MHz CH- Low 9kHz~20GHz



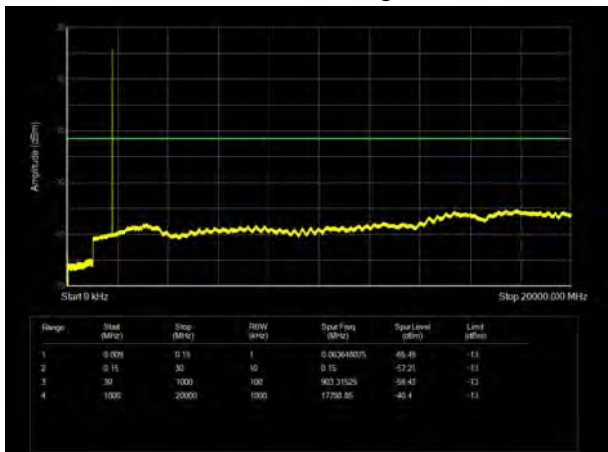
LTE Band 4 1.4MHz CH- Middle 9kHz~20GHz



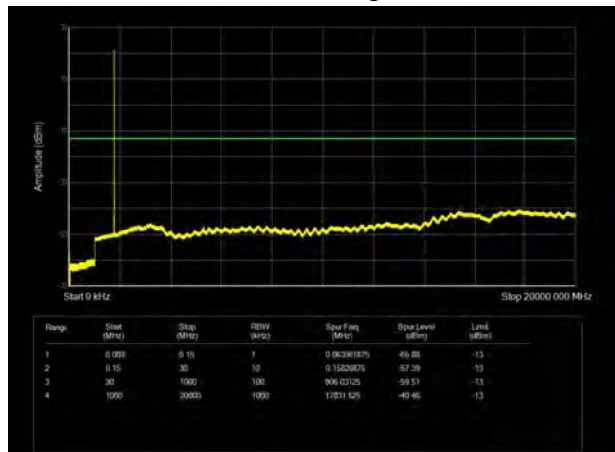
LTE Band 4 3MHz CH- Middle 9kHz~20GHz



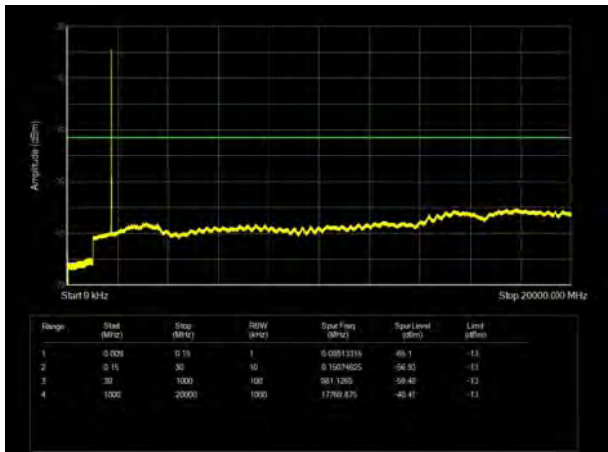
LTE Band 4 1.4MHz CH- High 9kHz~20GHz



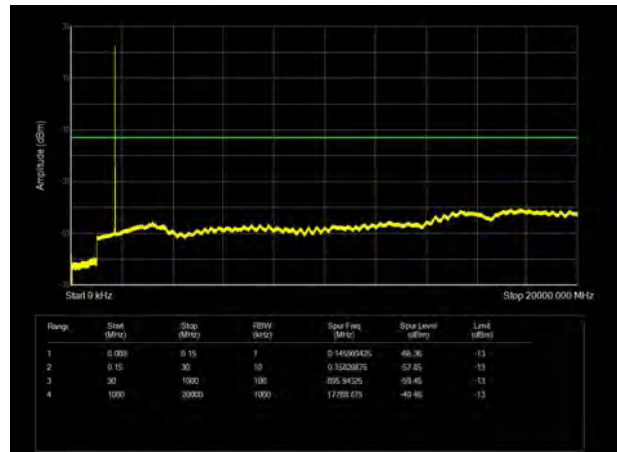
LTE Band 4 3MHz CH-High 9kHz~20GHz



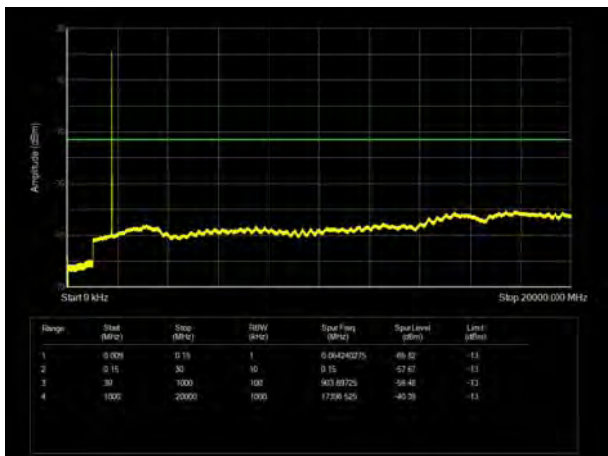
LTE Band 4 5MHz CH- Low 9kHz~20GHz



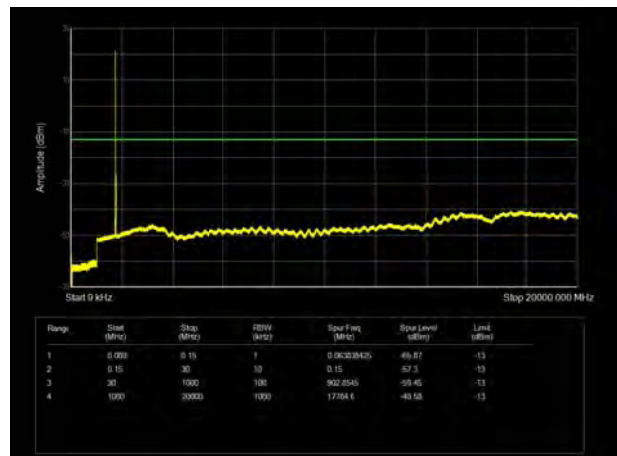
LTE Band 4 10MHz CH-Low 9kHz~20GHz



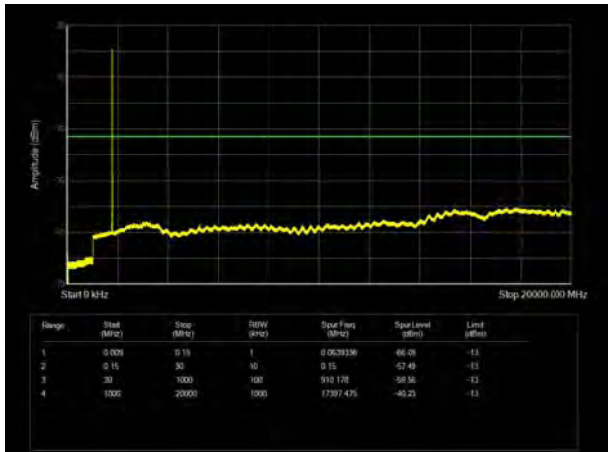
LTE Band 4 5MHz CH- Middle 9kHz~20GHz



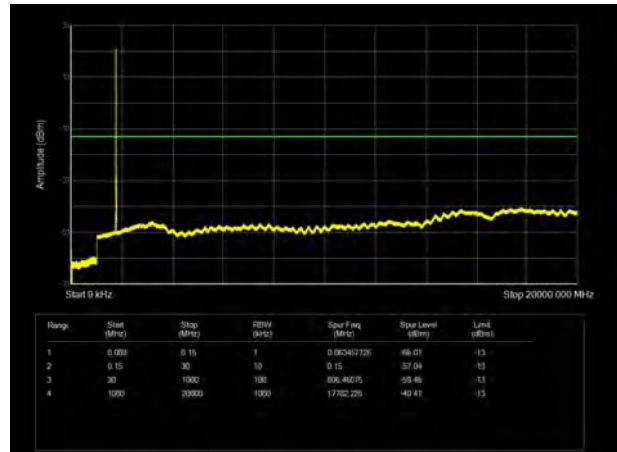
LTE Band 4 10MHz CH- Middle 9kHz~20GHz



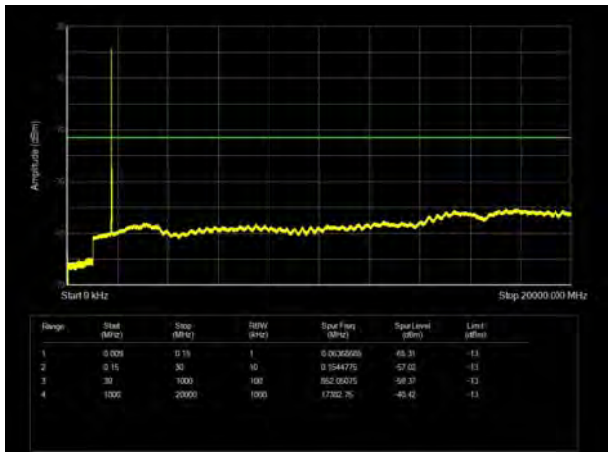
LTE Band 4 5MHz CH-High 9kHz~20GHz



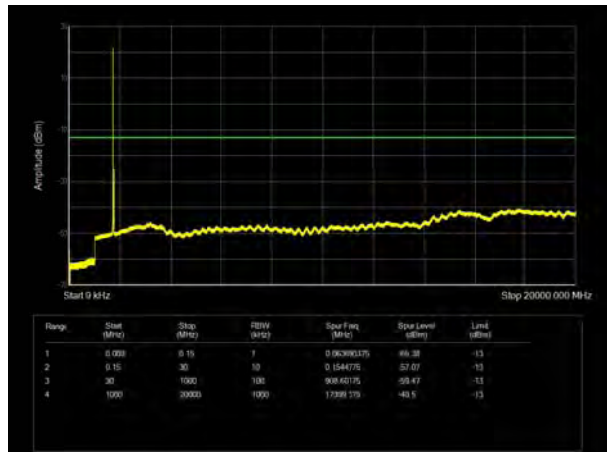
LTE Band 4 10MHz CH- High 9kHz~20GHz



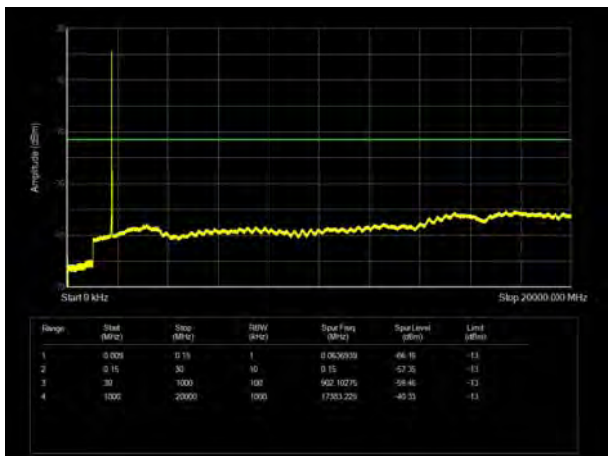
LTE Band 4 15MHz CH- Low 9kHz~20GHz



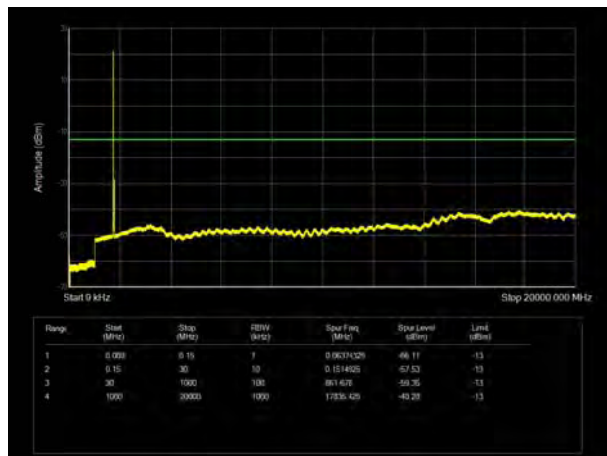
LTE Band 4 20MHz CH-Low 9kHz~20GHz



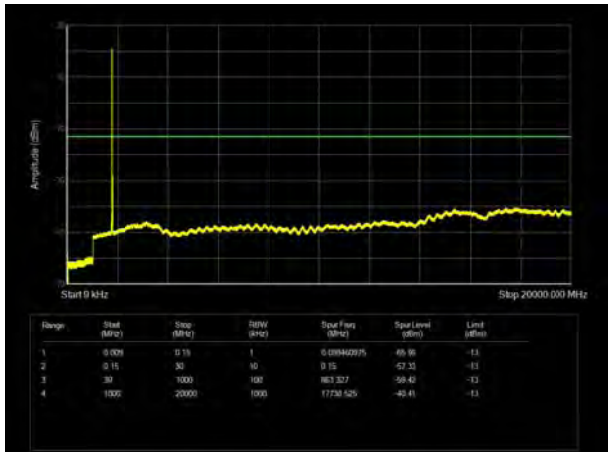
LTE Band 4 15MHz CH- Middle 9kHz~20GHz



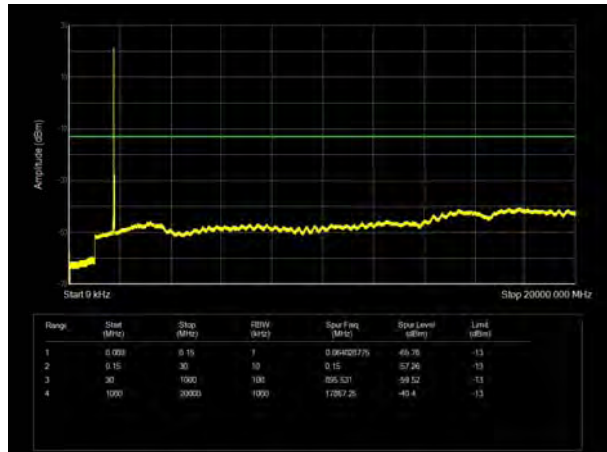
LTE Band 4 20MHz CH- Middle 9kHz~20GHz



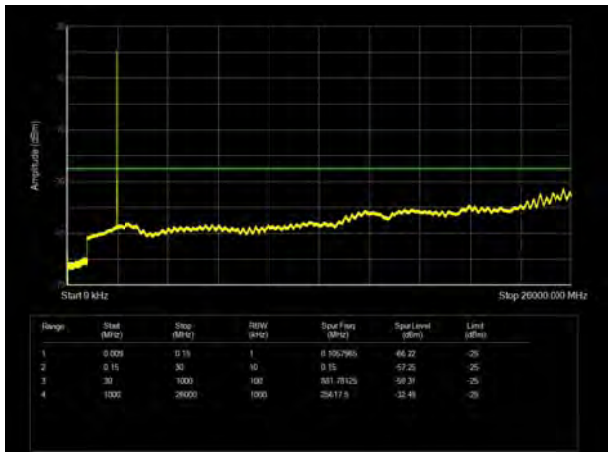
LTE Band 4 15MHz CH-High 9kHz~20GHz



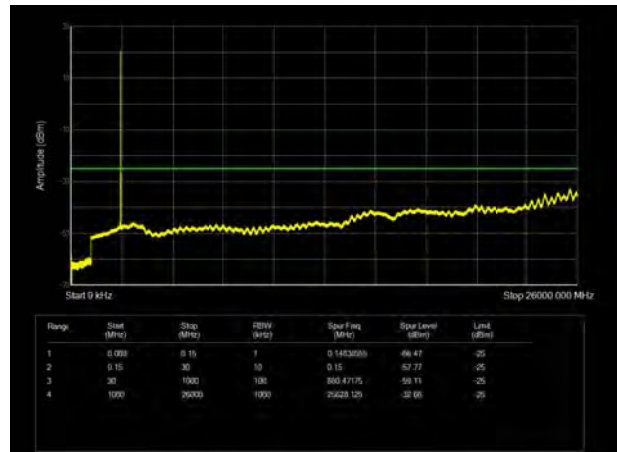
LTE Band 4 20MHz CH- High 9kHz~20GHz



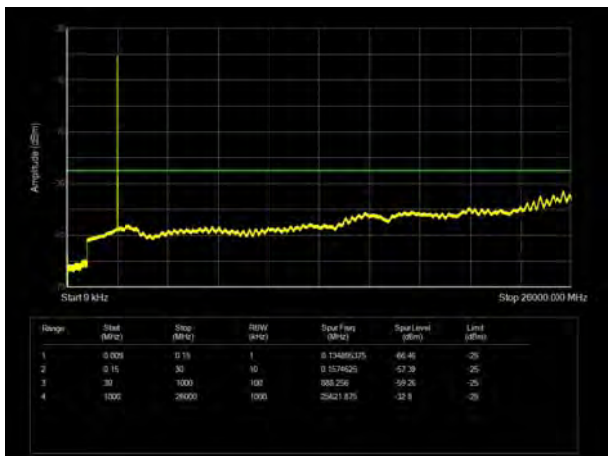
LTE Band 7 5MHz CH- Low 9kHz~26GHz



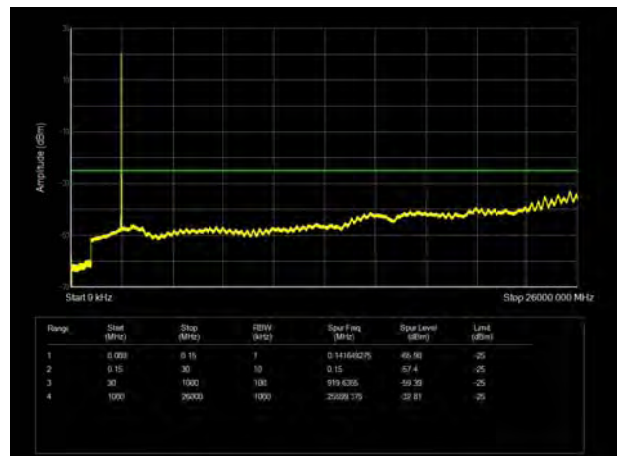
LTE Band 7 10MHz CH-Low 9kHz~26GHz



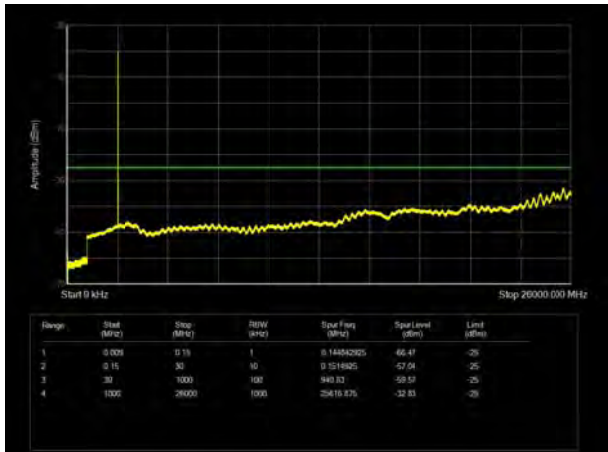
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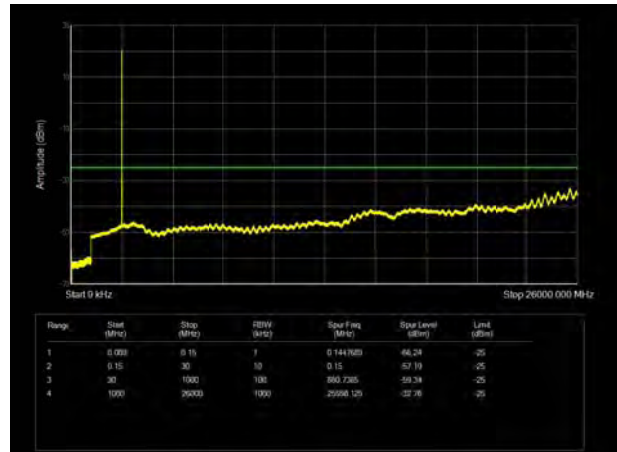
LTE Band 7 10MHz CH- Middle 9kHz~26GHz



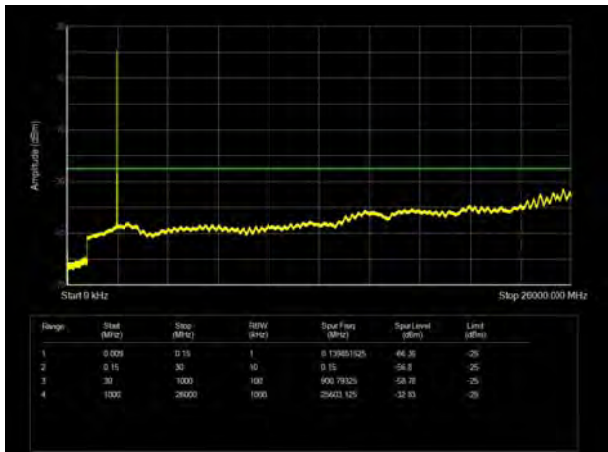
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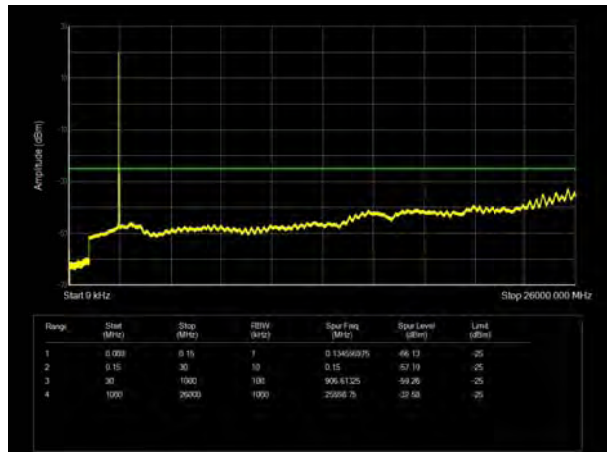
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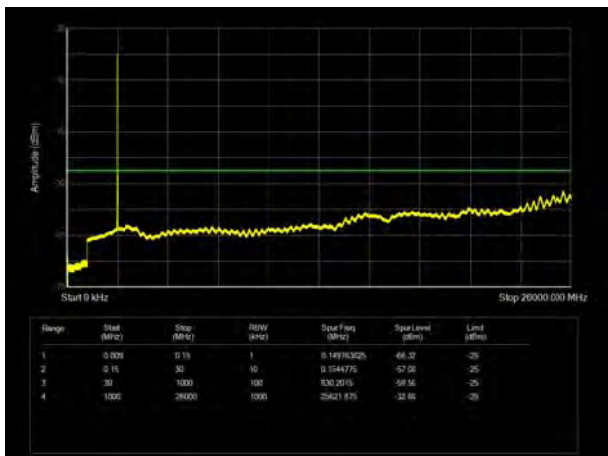
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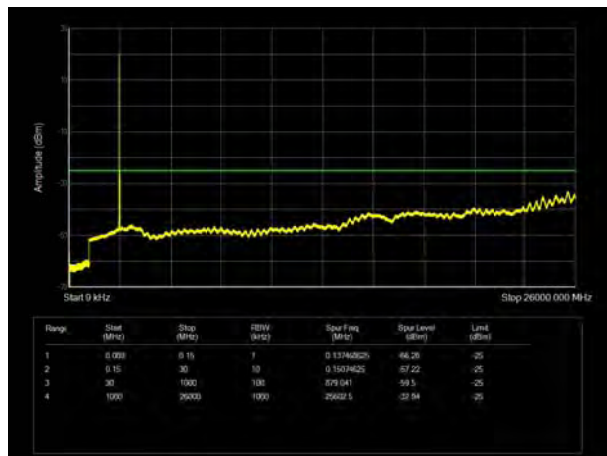
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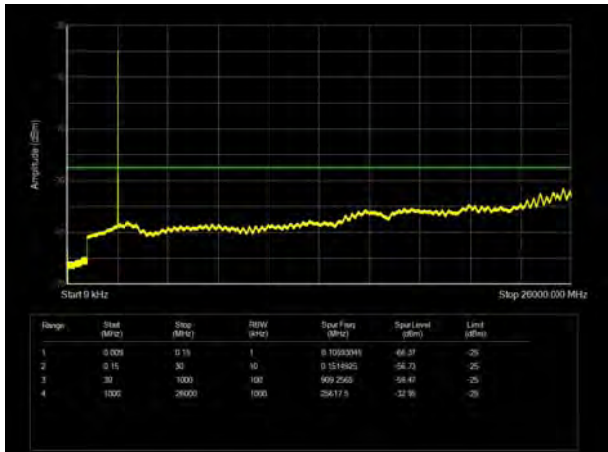
LTE Band 7 15MHz CH- Middle 9kHz~26GHz



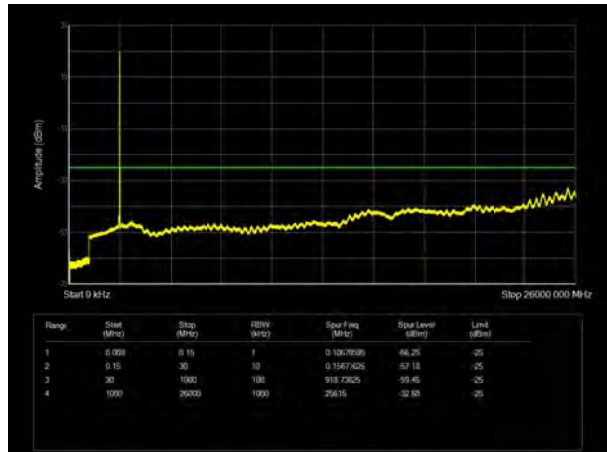
LTE Band 7 20MHz CH- Middle 9kHz~26GHz



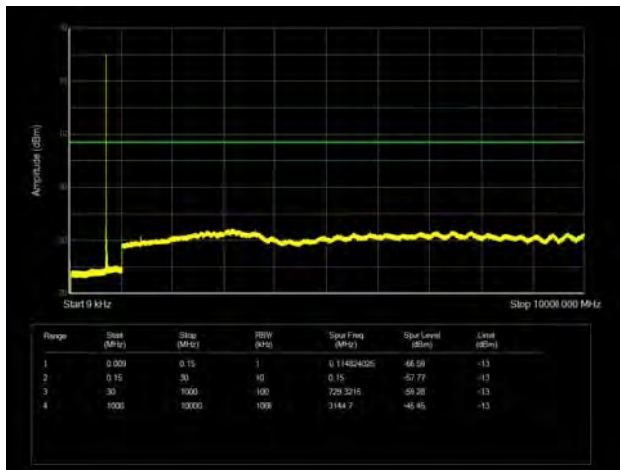
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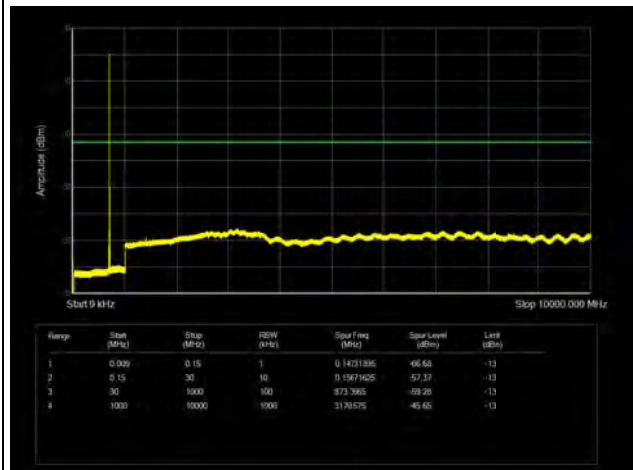
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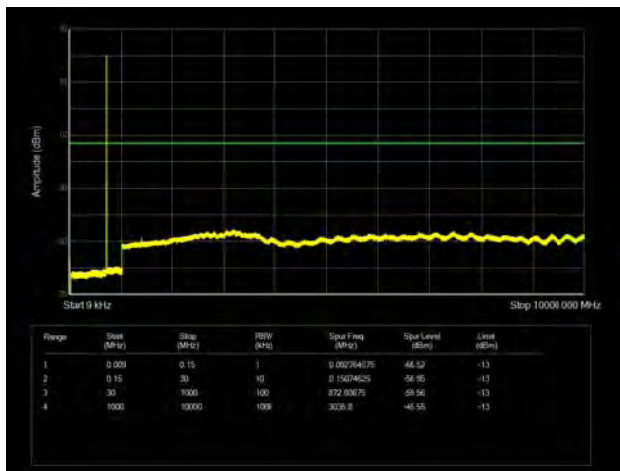
LTE Band 12 1.4MHz CH-Low 9kHz ~10GHz



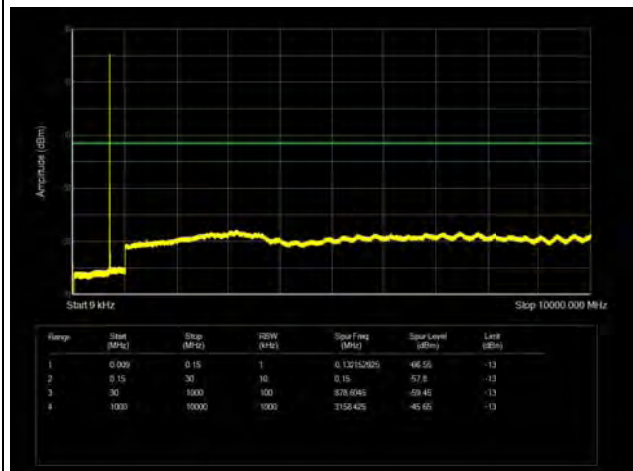
LTE Band 12 3MHz CH-Low 9kHz ~10GHz



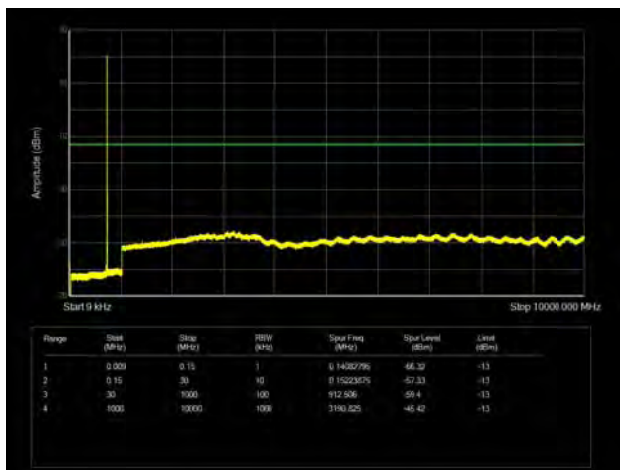
LTE Band 12 1.4MHz CH- Middle 9kHz ~10GHz



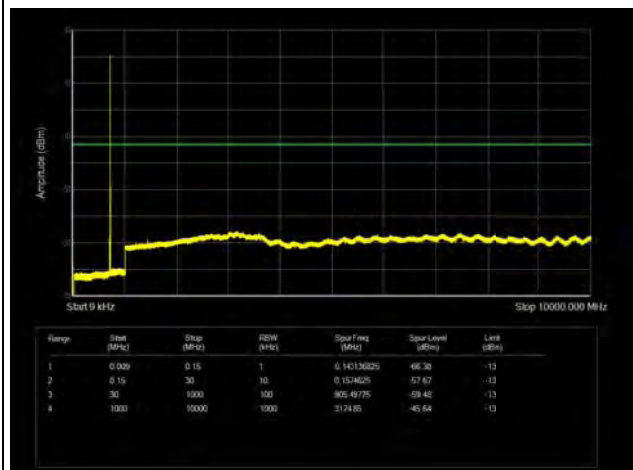
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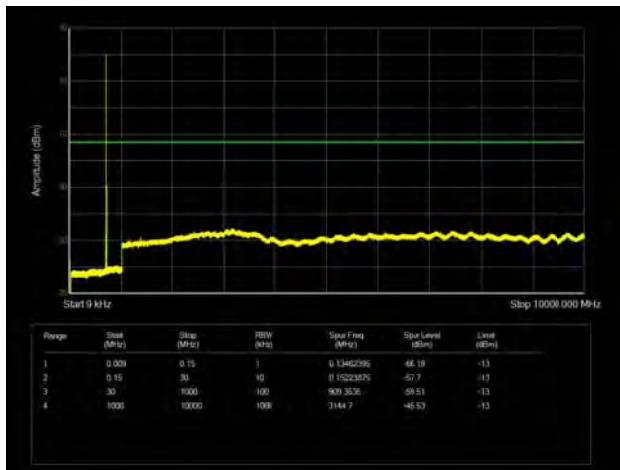
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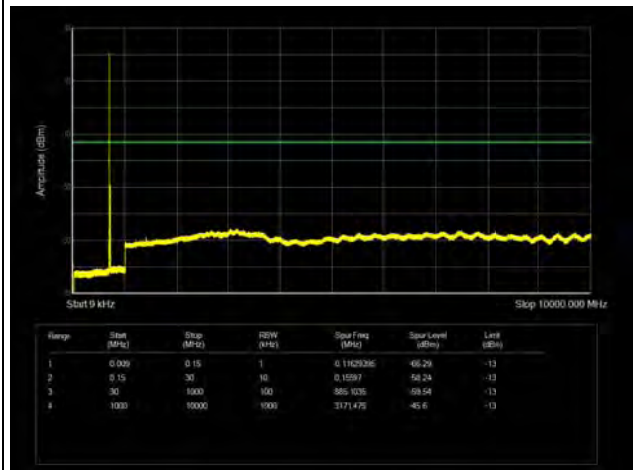
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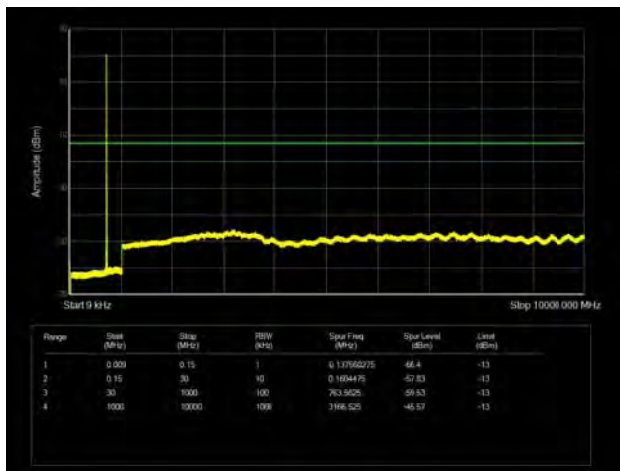
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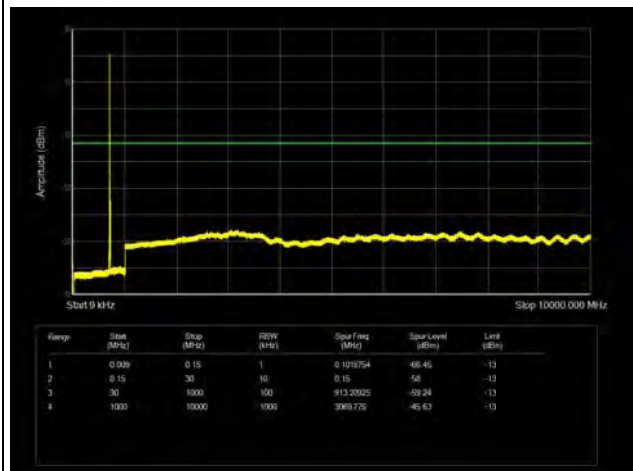
LTE Band 12 10MHz CH-Low 9kHz ~10GHz



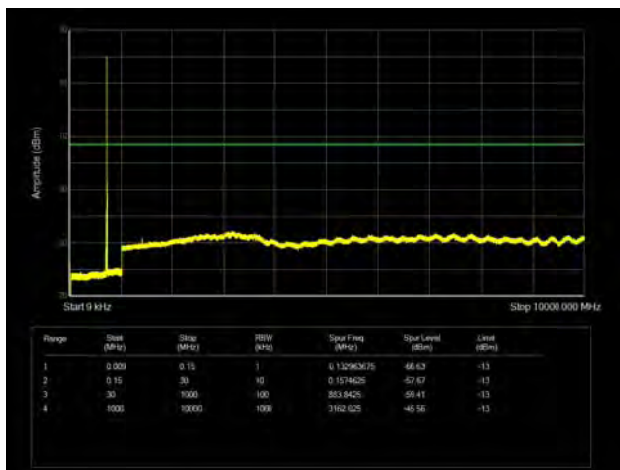
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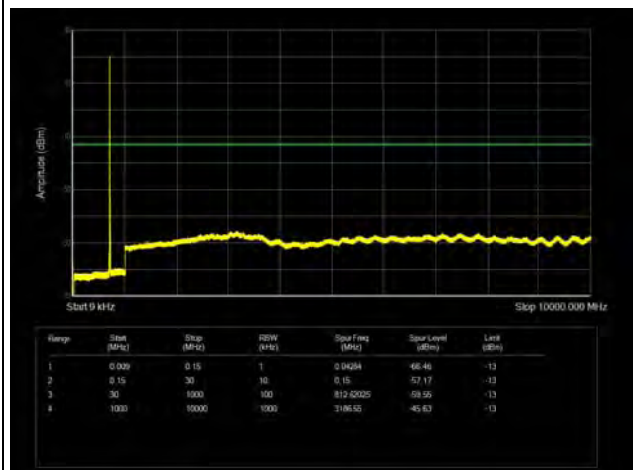
LTE Band 12 10MHz CH- Middle 9kHz ~10GHz



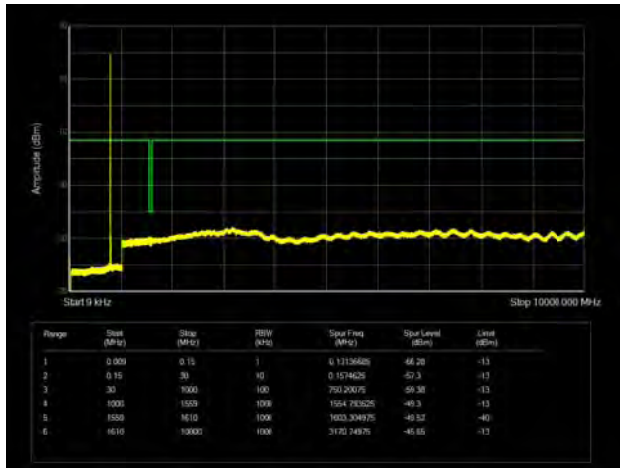
LTE Band 12 5MHz CH-High 9kHz ~10GHz



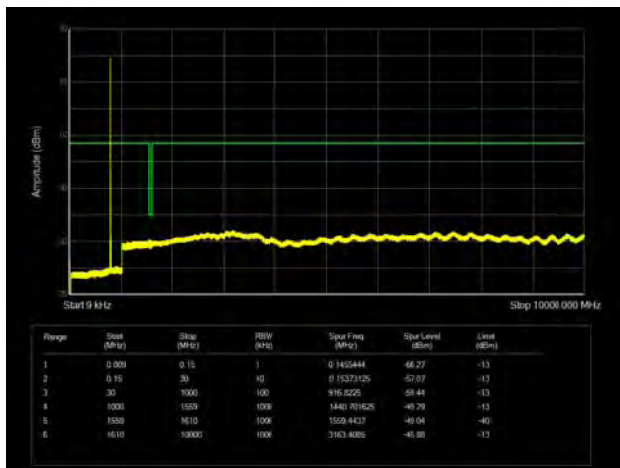
LTE Band 12 10MHz CH-High 9kHz ~10GHz



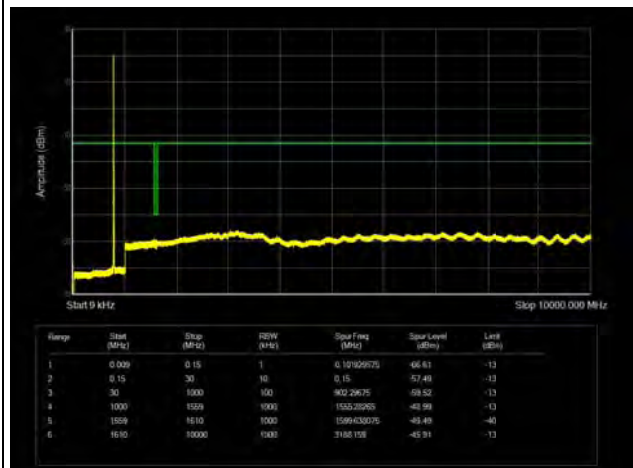
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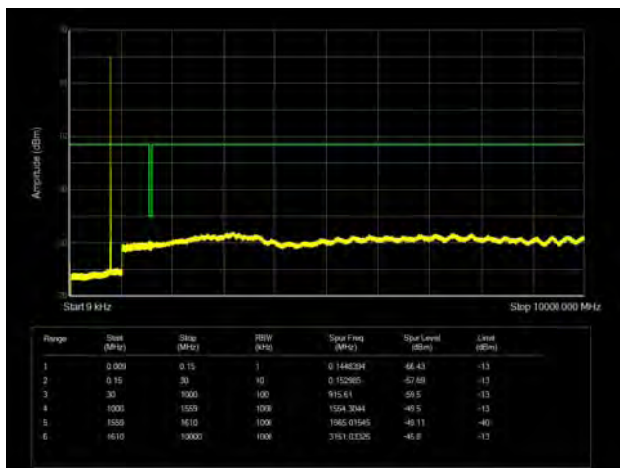
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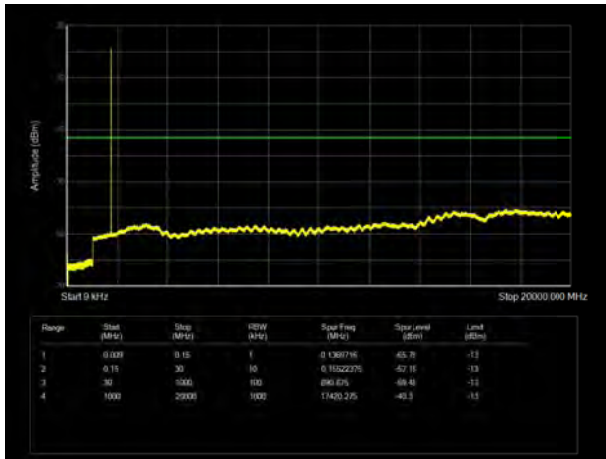
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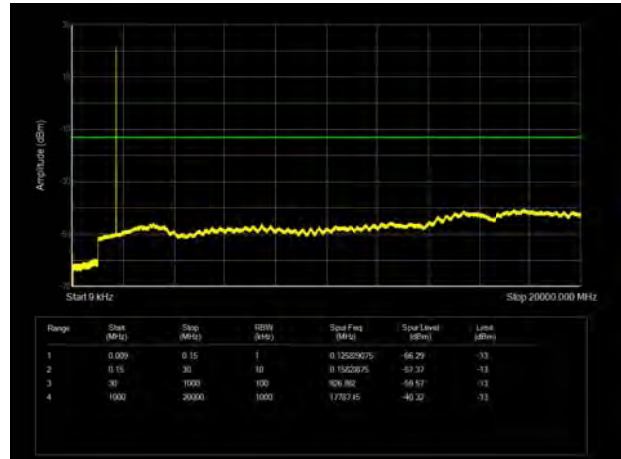
LTE Band 13 5MHz CH-High 9kHz ~10GHz



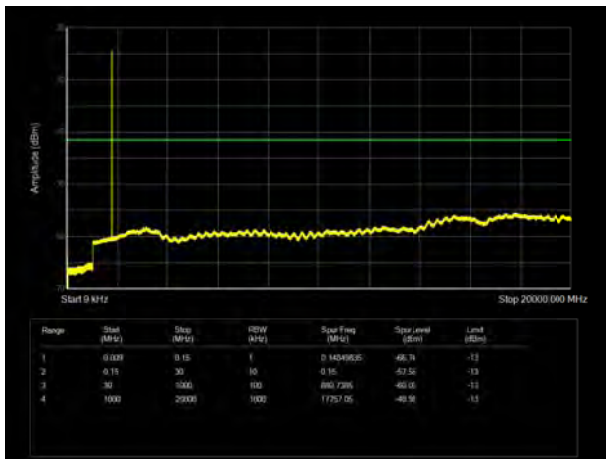
LTE Band 66 1.4MHz CH-Low 9kHz ~20GHz



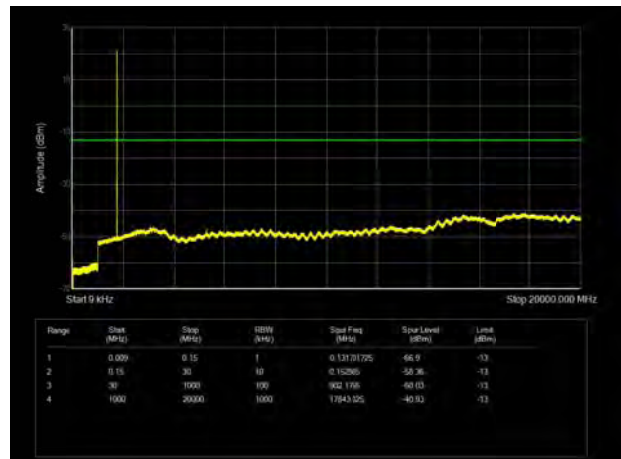
LTE Band 66 3MHz CH-Low 9kHz ~20GHz



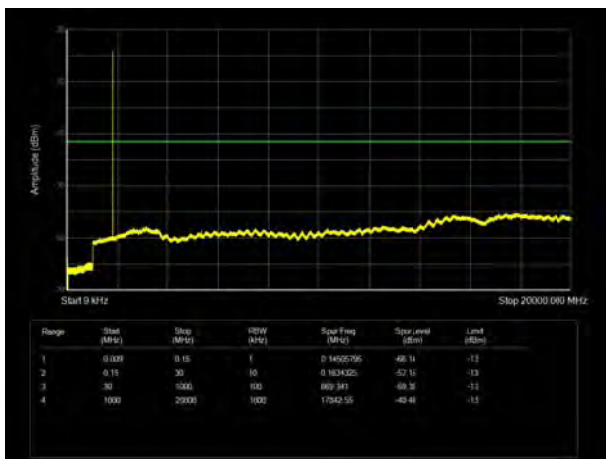
LTE Band 66 1.4MHz CH-Middle 9kHz ~20GHz



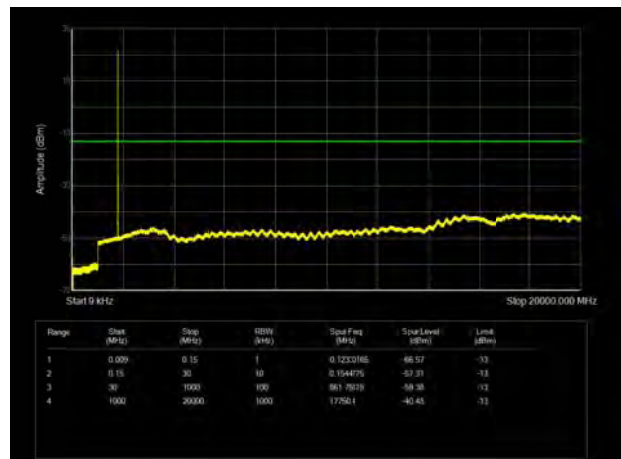
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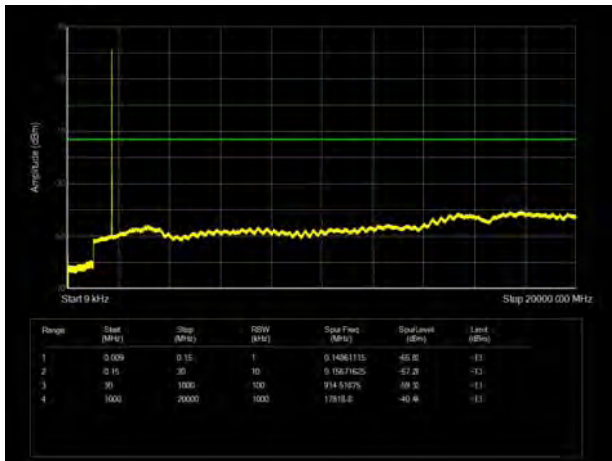
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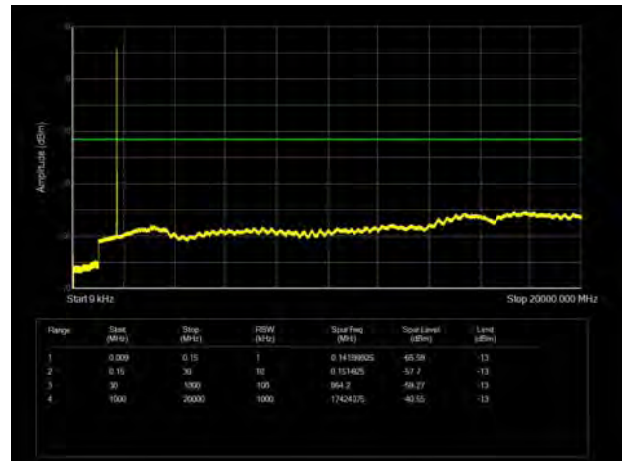
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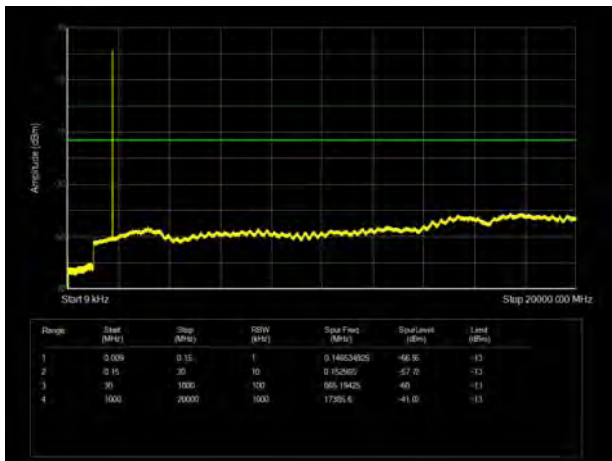
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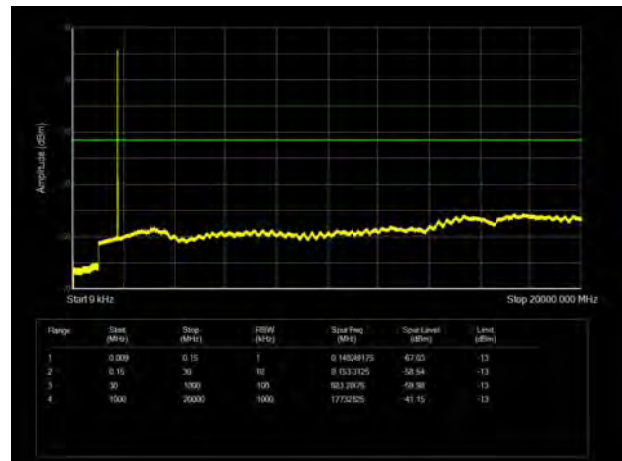
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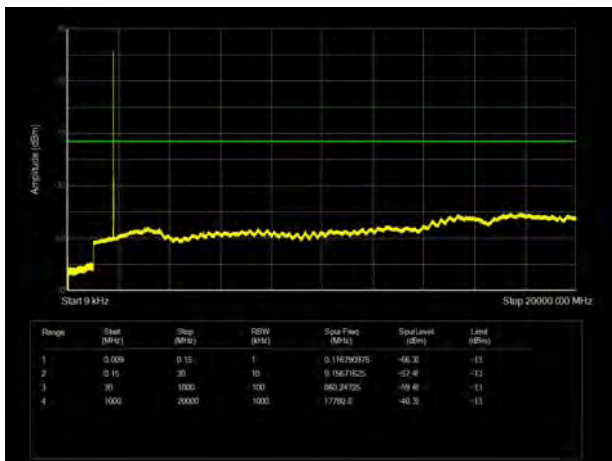
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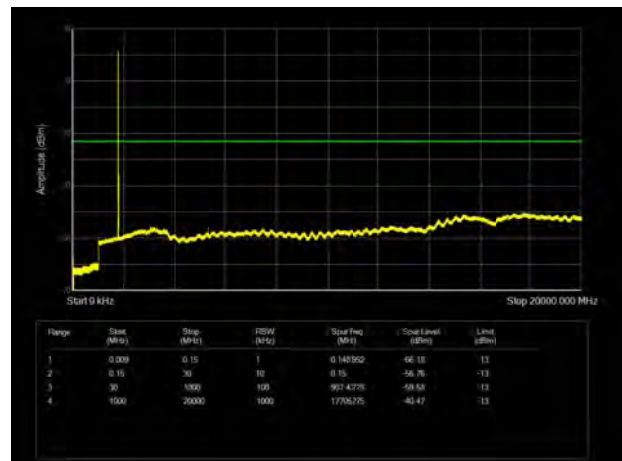
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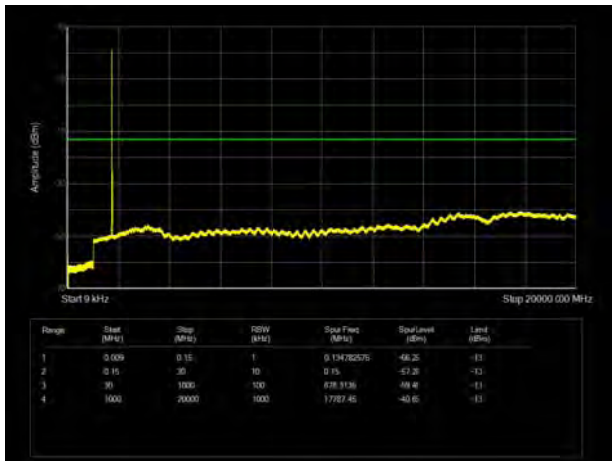
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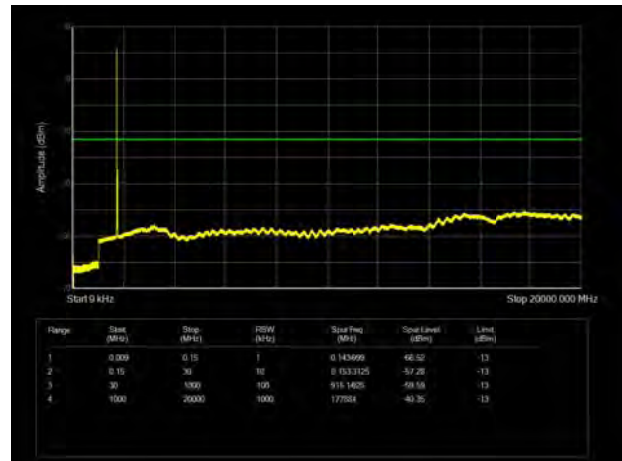
LTE Band 66 10MHz CH-High 9kHz ~20GHz



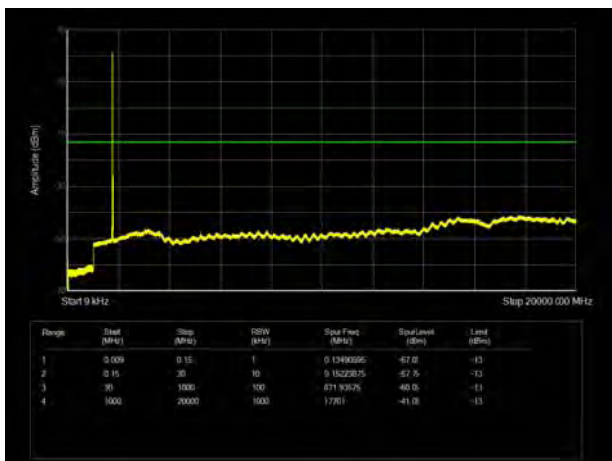
LTE Band 66 15MHz CH-Low 9kHz ~20GHz



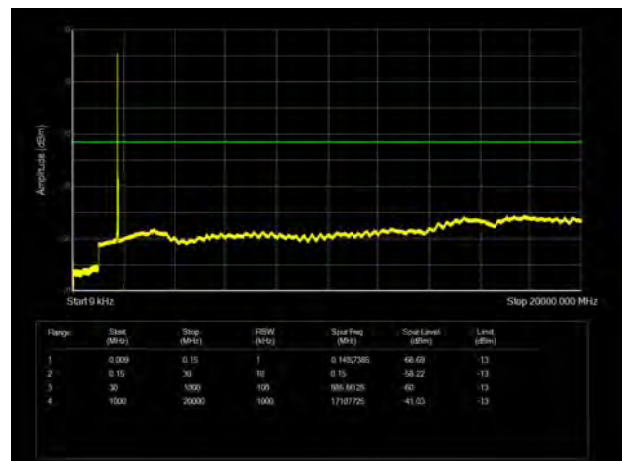
LTE Band 66 20MHz CH-Low 9kHz ~20GHz



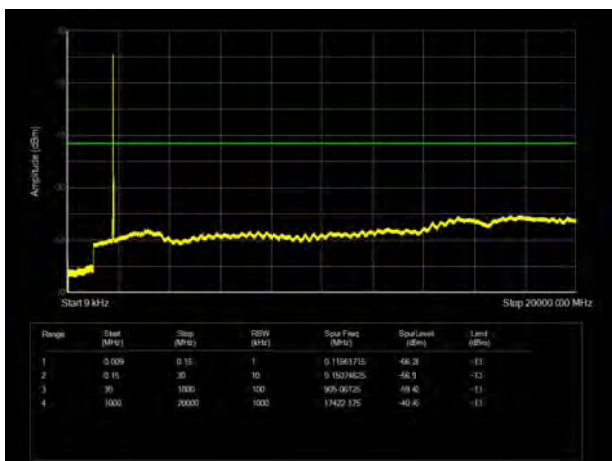
LTE Band 66 15MHz CH-Middle 9kHz ~20GHz



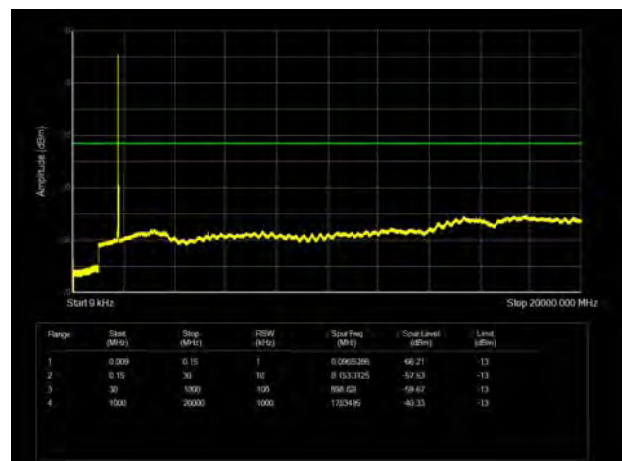
LTE Band 66 20MHz CH-Middle 9kHz ~20GHz



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

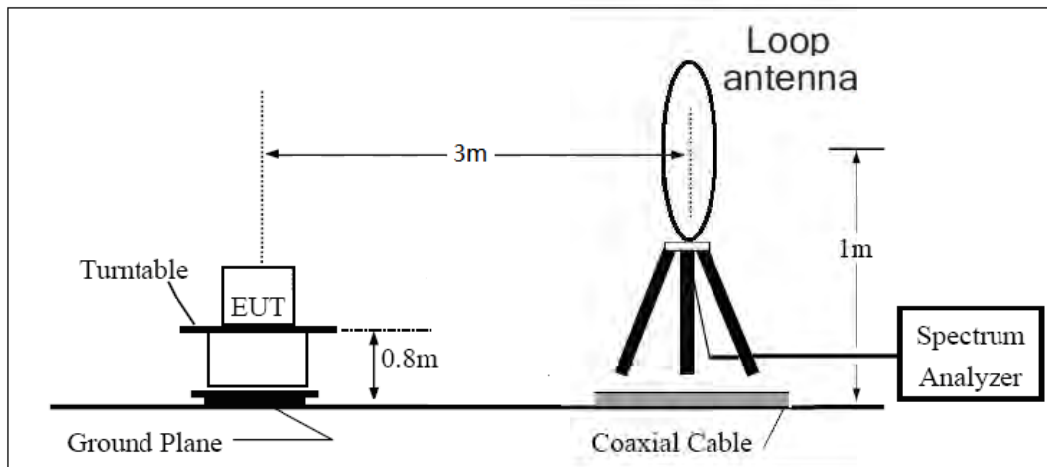
1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable 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).
3. 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.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=100kHz, VBW=300kHz for 30MHz to 1GHz and RBW=1MHz, VBW=3MHz for above 1GHz, and the maximum value of the receiver should be recorded as (Pr).
5. 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.
6. 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.
7. The measurement results are obtained as described below:
$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$$

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

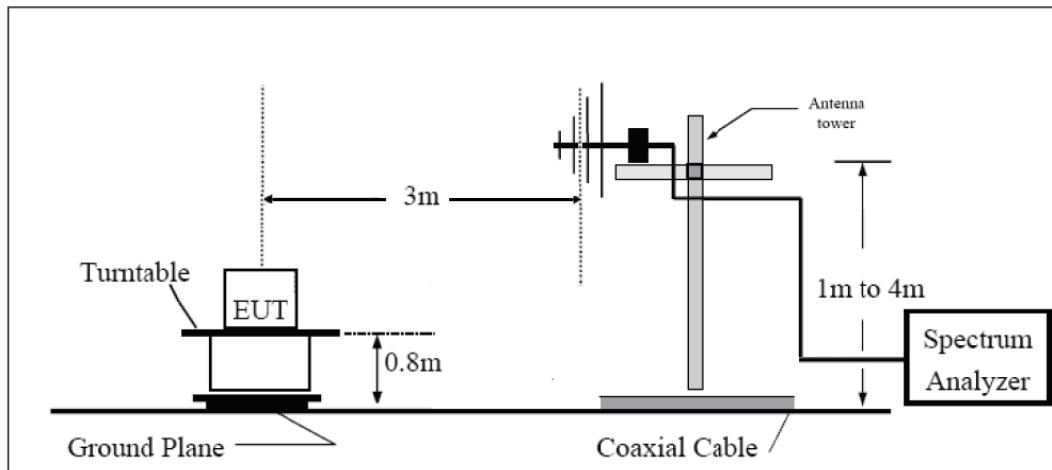
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

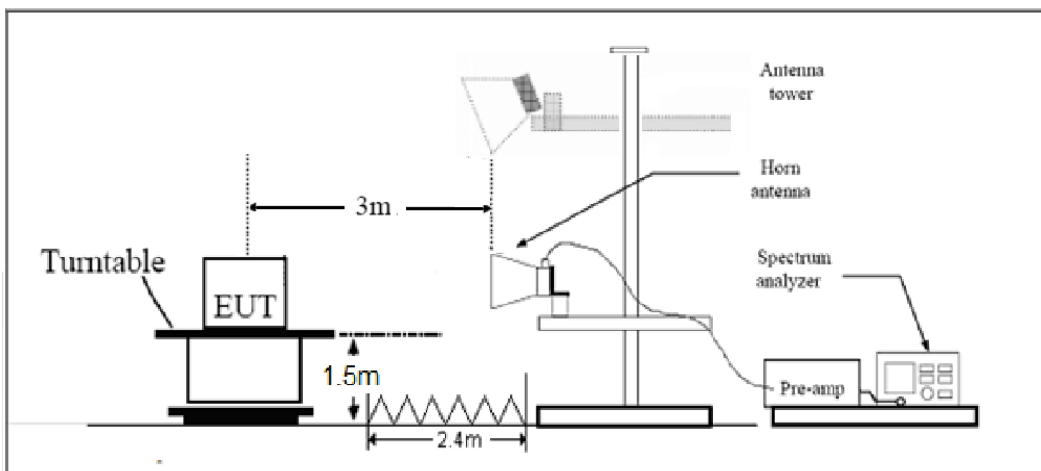
9KHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

**Limits**

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

Rule Part 27.53 (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(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.

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.

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(a)/(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	3465.20	-65.36	2.70	12.70	Horizontal	-55.36	-13.00	42.36	135
3	5197.80	-60.78	3.20	12.50	Horizontal	-51.48	-13.00	38.48	225
4	6930.40	-57.17	4.20	11.80	Horizontal	-49.57	-13.00	36.57	90
5	8663.00	-54.46	4.40	12.50	Horizontal	-46.36	-13.00	33.36	0
6	10395.60	-48.58	4.70	11.30	Horizontal	-41.98	-13.00	28.98	225
7	12128.20	-50.30	5.20	13.80	Horizontal	-41.70	-13.00	28.70	45
8	13860.80	-46.08	5.70	11.30	Horizontal	-40.48	-13.00	27.48	135
9	15593.40	-51.74	6.10	16.80	Horizontal	-41.04	-13.00	28.04	225
10	17526.00	-46.76	6.10	14.20	Horizontal	-38.66	-13.00	25.66	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 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	3463.60	-61.77	2.70	12.70	Horizontal	-51.77	-13.00	38.77	0
3	5197.50	-60.95	3.20	12.50	Horizontal	-51.65	-13.00	38.65	135
4	6930.00	-56.53	4.20	11.80	Horizontal	-48.93	-13.00	35.93	0
5	8662.50	-53.52	4.40	12.50	Horizontal	-45.42	-13.00	32.42	0
6	10395.00	-49.14	4.70	11.30	Horizontal	-42.54	-13.00	29.54	45
7	12127.50	-51.57	5.20	13.80	Horizontal	-42.97	-13.00	29.97	90
8	13860.00	-42.80	5.70	11.30	Horizontal	-37.20	-13.00	24.20	45
9	15592.50	-50.38	6.10	16.80	Horizontal	-39.68	-13.00	26.68	45
10	17325.00	-44.91	6.10	14.20	Horizontal	-36.81	-13.00	23.81	270

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



LTE Band 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	3460.40	-61.59	2.70	12.70	Horizontal	-51.59	-13.00	38.59	90
3	5197.50	-61.12	3.20	12.50	Horizontal	-51.82	-13.00	38.82	90
4	6930.00	-55.80	4.20	11.80	Horizontal	-48.20	-13.00	35.20	0
5	8662.50	-53.49	4.40	12.50	Horizontal	-45.39	-13.00	32.39	225
6	10395.00	-49.64	4.70	11.30	Horizontal	-43.04	-13.00	30.04	0
7	12127.50	-50.93	5.20	13.80	Horizontal	-42.33	-13.00	29.33	270
8	13860.00	-43.12	5.70	11.30	Horizontal	-37.52	-13.00	24.52	180
9	15592.50	-51.31	6.10	16.80	Horizontal	-40.61	-13.00	27.61	225
10	17325.00	-44.41	6.10	14.20	Horizontal	-36.31	-13.00	23.31	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 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	3446.90	-60.94	2.70	12.70	Horizontal	-50.94	-13.00	37.94	315
3	5197.50	-60.54	3.20	12.50	Horizontal	-51.24	-13.00	38.24	45
4	6930.00	-54.54	4.20	11.80	Horizontal	-46.94	-13.00	33.94	45
5	8662.50	-53.69	4.40	12.50	Horizontal	-45.59	-13.00	32.59	315
6	10395.00	-49.32	4.70	11.30	Horizontal	-42.72	-13.00	29.72	135
7	12127.50	-51.02	5.20	13.80	Horizontal	-42.42	-13.00	29.42	0
8	13860.00	-43.37	5.70	11.30	Horizontal	-37.77	-13.00	24.77	0
9	15592.50	-50.96	6.10	16.80	Horizontal	-40.26	-13.00	27.26	270
10	17325.00	-44.82	6.10	14.20	Horizontal	-36.72	-13.00	23.72	45
Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor. 2. The worst emission was found in the antenna is Horizontal position.									



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

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5070.00	-59.76	3.40	12.50	Horizontal	-50.66	-25.00	25.66	135
3	7605.00	-55.52	4.40	12.20	Horizontal	-47.72	-25.00	22.72	45
4	10140.00	-48.67	4.70	11.30	Horizontal	-42.07	-25.00	17.07	45
5	12675.00	-50.13	5.40	13.20	Horizontal	-42.33	-25.00	17.33	180
6	15210.00	-47.15	6.10	13.10	Horizontal	-40.15	-25.00	15.15	315
7	17745.00	-46.00	6.10	14.20	Horizontal	-37.90	-25.00	12.90	270
8	20280.00	--	--	--	--	--	--	--	--
9	22815.00	--	--	--	--	--	--	--	--
10	25350.00	--	--	--	--	--	--	--	--

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

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

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

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5070.00	-60.26	3.40	12.50	Horizontal	-51.16	-25.00	26.16	135
3	7605.00	-55.52	4.40	12.20	Horizontal	-47.72	-25.00	22.72	90
4	10140.00	-47.78	4.70	11.30	Horizontal	-41.18	-25.00	16.18	180
5	12675.00	-50.06	5.40	13.20	Horizontal	-42.26	-25.00	17.26	225
6	15210.00	-45.71	6.10	13.10	Horizontal	-38.71	-25.00	13.71	90
7	17745.00	-46.49	6.10	14.20	Horizontal	-38.39	-25.00	13.39	0
8	20280.00	--	--	--	--	--	--	--	--
9	22815.00	--	--	--	--	--	--	--	--
10	25350.00	--	--	--	--	--	--	--	--

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

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



LTE Band 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	1413.90	-60.12	1.70	8.70	Horizontal	-55.27	-13.00	42.27	225
3	2121.10	-42.97	2.10	11.10	Horizontal	-36.12	-13.00	23.12	135
4	2830.40	-65.72	2.30	13.10	Horizontal	-57.07	-13.00	44.07	315
5	3537.50	-61.58	2.60	12.70	Horizontal	-53.63	-13.00	40.63	180
6	4245.00	-61.02	3.30	12.50	Horizontal	-53.97	-13.00	40.97	135
7	4952.50	-59.63	3.40	12.50	Horizontal	-52.68	-13.00	39.68	90
8	5660.00	-54.47	3.30	12.50	Horizontal	-47.42	-13.00	34.42	90
9	6367.50	-55.00	3.80	11.50	Horizontal	-49.45	-13.00	36.45	315
10	7075.00	-52.07	4.20	11.80	Horizontal	-46.62	-13.00	33.62	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	1410.90	-60.20	1.70	8.70	Horizontal	-55.35	-13.00	42.35	180
3	2116.10	-41.98	2.10	11.10	Horizontal	-35.13	-13.00	22.13	45
4	2825.10	-63.76	2.30	13.10	Horizontal	-55.11	-13.00	42.11	270
5	3537.50	-62.63	2.60	12.70	Horizontal	-54.68	-13.00	41.68	90
6	4245.00	-60.27	3.30	12.50	Horizontal	-53.22	-13.00	40.22	45
7	4952.50	-59.20	3.40	12.50	Horizontal	-52.25	-13.00	39.25	225
8	5660.00	-54.80	3.30	12.50	Horizontal	-47.75	-13.00	34.75	180
9	6367.50	-55.22	3.80	11.50	Horizontal	-49.67	-13.00	36.67	0
10	7075.00	-51.00	4.20	11.80	Horizontal	-45.55	-13.00	32.55	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 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	1406.15	-61.98	1.70	8.70	Horizontal	-57.13	-13.00	44.13	135
3	2109.25	-42.78	2.10	11.10	Horizontal	-35.93	-13.00	22.93	45
4	2830.25	-65.42	2.30	13.10	Horizontal	-56.77	-13.00	43.77	45
5	3537.50	-62.37	2.60	12.70	Horizontal	-54.42	-13.00	41.42	180
6	4245.00	-61.28	3.30	12.50	Horizontal	-54.23	-13.00	41.23	270
7	4952.50	-59.65	3.40	12.50	Horizontal	-52.70	-13.00	39.70	0
8	5660.00	-53.91	3.30	12.50	Horizontal	-46.86	-13.00	33.86	270
9	6367.50	-55.62	3.80	11.50	Horizontal	-50.07	-13.00	37.07	90
10	7075.00	-51.97	4.20	11.80	Horizontal	-46.52	-13.00	33.52	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 13 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	1559.50	-55.29	1.70	8.70	Horizontal	-50.44	-40.00	10.44	315
3	2339.20	-49.83	2.10	12.00	Horizontal	-42.08	-13.00	29.08	45
4	3128.00	-65.05	2.30	13.10	Horizontal	-56.40	-13.00	43.40	135
5	3710.00	-61.15	2.90	12.50	Horizontal	-53.70	-13.00	40.70	225
6	4692.00	-61.27	3.10	12.50	Horizontal	-54.02	-13.00	41.02	135
7	5474.00	-61.04	3.30	12.50	Horizontal	-53.99	-13.00	40.99	90
8	6256.00	-58.66	3.50	12.80	Horizontal	-51.51	-13.00	38.51	45
9	7038.00	-54.22	4.20	11.80	Horizontal	-48.77	-13.00	35.77	225
10	7820.00	-52.42	4.40	12.30	Horizontal	-46.67	-13.00	33.67	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 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	1550.00	-54.26	1.70	8.70	Horizontal	-49.41	-13.00	36.41	135
3	2332.50	-49.04	2.10	12.00	Horizontal	-41.29	-13.00	28.29	0
4	3128.00	-63.46	2.30	13.10	Horizontal	-54.81	-13.00	41.81	135
5	3710.00	-61.83	2.90	12.50	Horizontal	-54.38	-13.00	41.38	225
6	4692.00	-60.24	3.10	12.50	Horizontal	-52.99	-13.00	39.99	90
7	5474.00	-60.65	3.30	12.50	Horizontal	-53.60	-13.00	40.60	180
8	6256.00	-59.20	3.50	12.80	Horizontal	-52.05	-13.00	39.05	45
9	7038.00	-53.82	4.20	11.80	Horizontal	-48.37	-13.00	35.37	135
10	7820.00	-54.25	4.40	12.30	Horizontal	-48.50	-13.00	35.50	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 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	3490.00	-64.48	2.70	12.70	Horizontal	-54.48	-13.00	41.48	45
3	5235.00	-53.29	3.20	12.50	Horizontal	-43.99	-13.00	30.99	135
4	6980.00	-54.28	4.20	11.80	Horizontal	-46.68	-13.00	33.68	225
5	8725.00	-54.13	4.40	12.50	Horizontal	-46.03	-13.00	33.03	180
6	10470.00	-49.61	4.70	11.80	Horizontal	-42.51	-13.00	29.51	135
7	12215.00	-49.93	5.20	13.80	Horizontal	-41.33	-13.00	28.33	135
8	13960.00	-46.85	5.70	13.20	Horizontal	-39.35	-13.00	26.35	270
9	15705.00	-50.14	6.10	16.80	Horizontal	-39.44	-13.00	26.44	135
10	17450.00	-46.02	6.10	14.20	Horizontal	-37.92	-13.00	24.92	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 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	3490.00	-64.39	2.70	12.70	Horizontal	-54.39	-13.00	41.39	135
3	5235.00	-54.56	3.20	12.50	Horizontal	-45.26	-13.00	32.26	180
4	6980.00	-53.66	4.20	11.80	Horizontal	-46.06	-13.00	33.06	45
5	8725.00	-52.56	4.40	12.50	Horizontal	-44.46	-13.00	31.46	270
6	10470.00	-49.65	4.70	11.80	Horizontal	-42.55	-13.00	29.55	45
7	12215.00	-50.50	5.20	13.80	Horizontal	-41.90	-13.00	28.90	135
8	13960.00	-46.54	5.70	13.20	Horizontal	-39.04	-13.00	26.04	135
9	15705.00	-50.87	6.10	16.80	Horizontal	-40.17	-13.00	27.17	315
10	17450.00	-46.48	6.10	14.20	Horizontal	-38.38	-13.00	25.38	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 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	3490.00	-64.46	2.70	12.70	Horizontal	-54.46	-13.00	41.46	180
3	5235.00	-56.17	3.20	12.50	Horizontal	-46.87	-13.00	33.87	45
4	6980.00	-53.26	4.20	11.80	Horizontal	-45.66	-13.00	32.66	225
5	8725.00	-54.09	4.40	12.50	Horizontal	-45.99	-13.00	32.99	270
6	10470.00	-49.23	4.70	11.80	Horizontal	-42.13	-13.00	29.13	135
7	12215.00	-50.18	5.20	13.80	Horizontal	-41.58	-13.00	28.58	180
8	13960.00	-45.76	5.70	13.20	Horizontal	-38.26	-13.00	25.26	225
9	15705.00	-51.16	6.10	16.80	Horizontal	-40.46	-13.00	27.46	225
10	17450.00	-45.79	6.10	14.20	Horizontal	-37.69	-13.00	24.69	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
Climate Chamber	Weiss	VT4002	58226119450010	2021-05-15	2022-05-14
Base Station Simulator	R&S	CMW500	113824	2021-05-15	2022-05-14
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2021-05-15	2022-05-14
Signal Analyzer	R&S	FSV3030	101411	2020-12-13	2021-12-12
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2020-04-02	2023-04-01
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9163	391	2019-12-16	2022-12-15
Horn Antenna	R&S	HF907	102723	2020-08-11	2023-08-10
Horn Antenna	ETS-Lindgren	3160-09	00102643	2018-06-20	2023-06-19
Signal generator	R&S	SMB 100A	102594	2021-05-15	2022-05-14
Climatic Chamber	ESPEC	SU-242	93000506	2020-12-13	2021-12-12
Preamplifier	R&S	SCU18	102327	2021-05-15	2022-05-14
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2021-06-09	2021-12-08
RF Cable	Agilent	SMA 15cm	0001	2021-06-09	2021-12-08
Software	R&S	EMC32	9.26.0	/	/

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



ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.



ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.