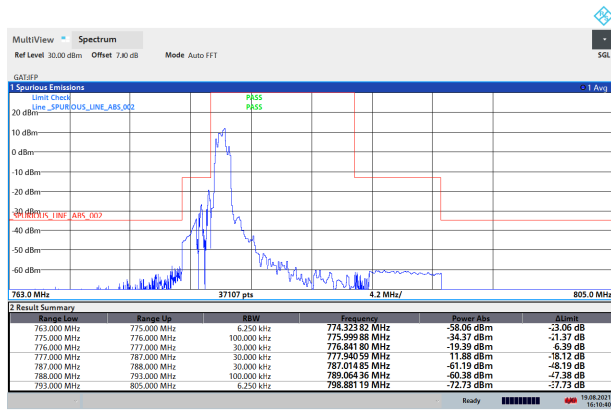
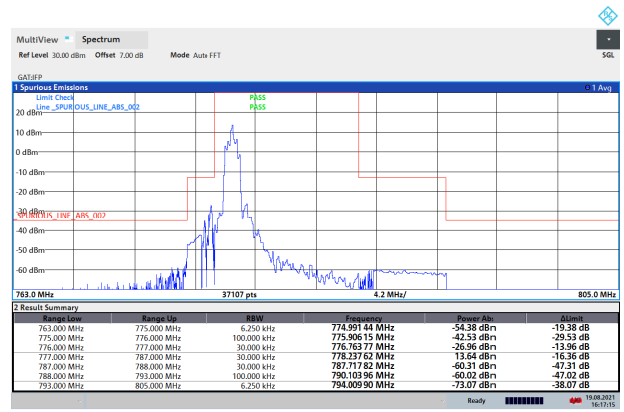
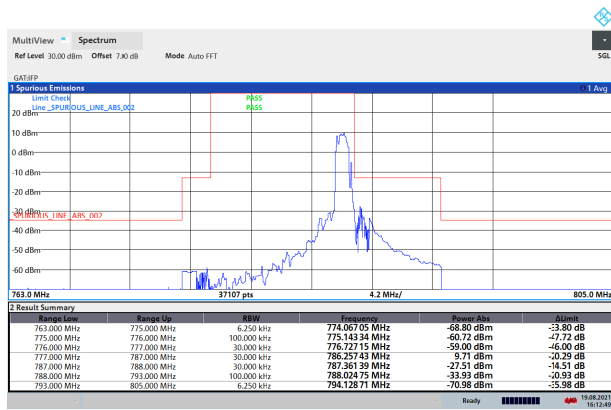


LTE Band 13 QPSK 5MHz CH-Low, 100%RB
(763MHz ~775MHz)

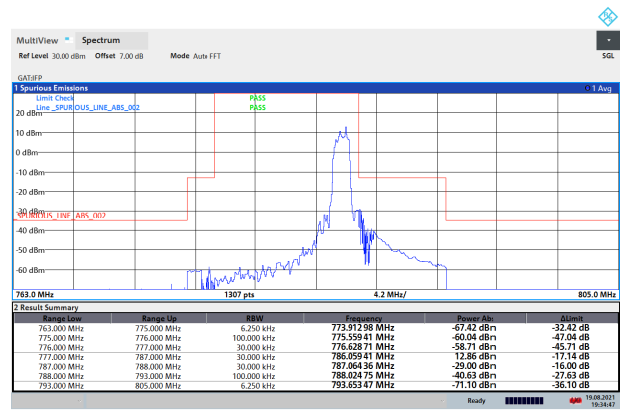
16:10:40 19.08.2021

LTE Band 13 QPSK 10MHz CH-Low, 100%RB
(775MHz ~777MHz)

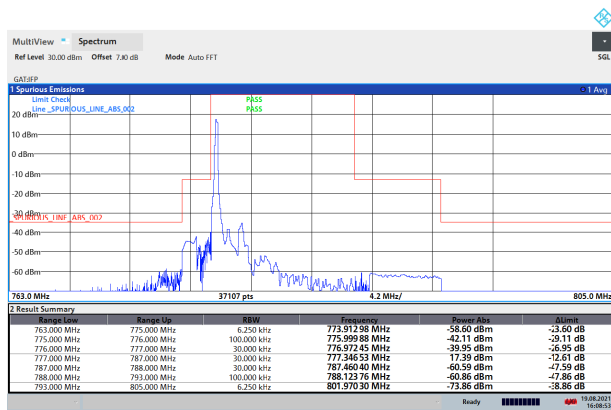
16:17:15 19.08.2021

LTE Band 13 QPSK 5MHz CH-High, 100%RB
(787MHz ~793MHz)

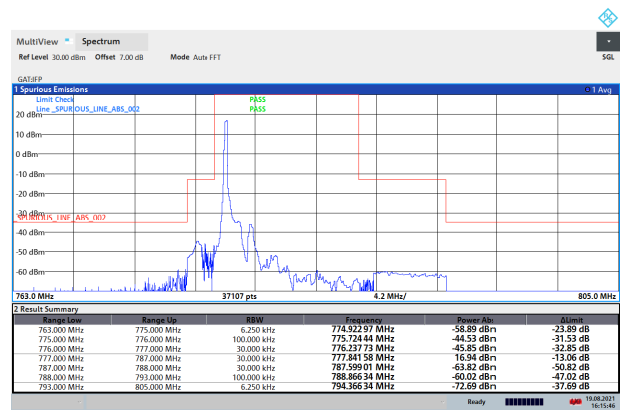
16:12:50 19.08.2021

LTE Band 13 QPSK 10MHz CH-High, 100%RB
(793MHz ~805MHz)

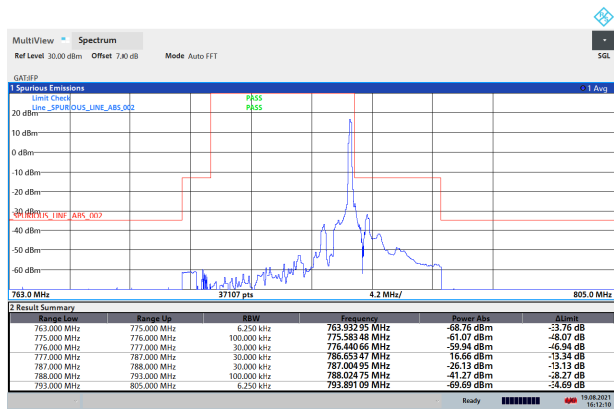
19:34:47 19.08.2021

LTE Band 13 16QAM 5MHz CH-Low, 1 RB
(763MHz ~775MHz)

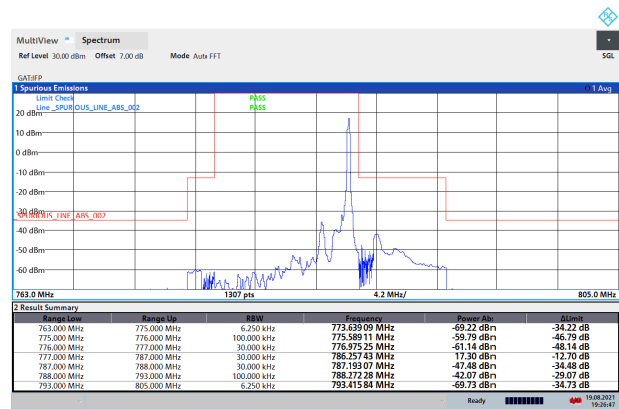
16:08:54 19.08.2021

LTE Band 13 16QAM 10MHz CH-Low, 1 RB
(775MHz ~777MHz)

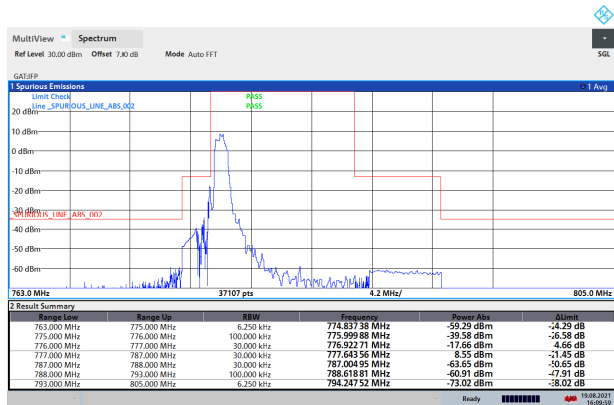
16:15:47 19.08.2021

LTE Band 13 16QAM 5MHz CH-High, 1 RB
(787MHz ~793MHz)

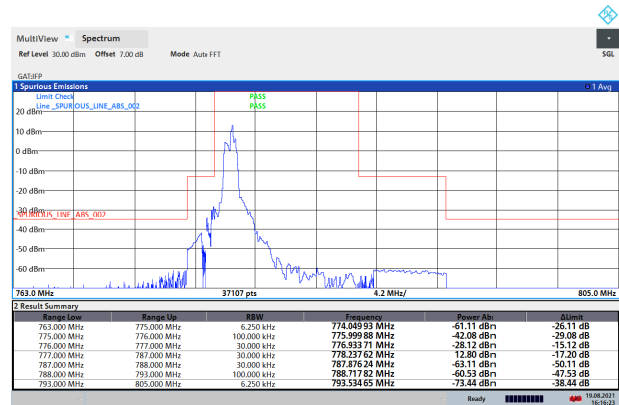
16:12:11 19.08.2021

LTE Band 13 16QAM 10MHz CH-High, 1 RB
(793MHz ~805MHz)

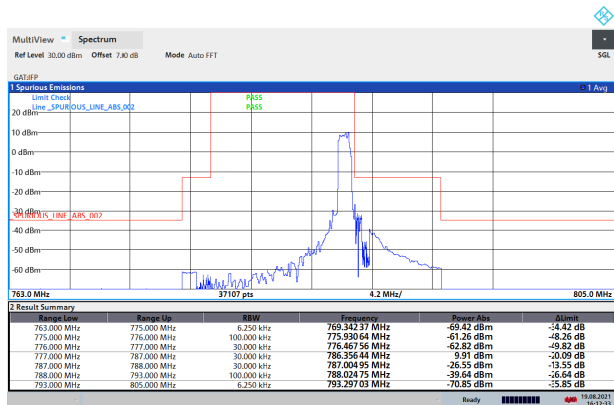
19:26:47 19.08.2021

LTE Band 13 16QAM 5MHz CH-Low, 100%RB
(763MHz ~775MHz)

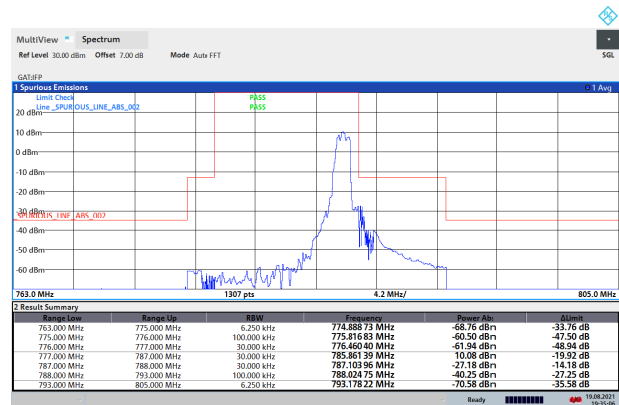
16:09:59 19.08.2021

LTE Band 13 16QAM 10MHz CH-Low, 100%RB
(775MHz ~777MHz)

16:16:24 19.08.2021

LTE Band 13 16QAM 5MHz CH-High, 100%RB
(787MHz ~793MHz)

16:12:34 19.08.2021

LTE Band 13 16QAM 10MHz CH-High, 100%RB
(793MHz ~805MHz)

19:35:06 19.08.2021



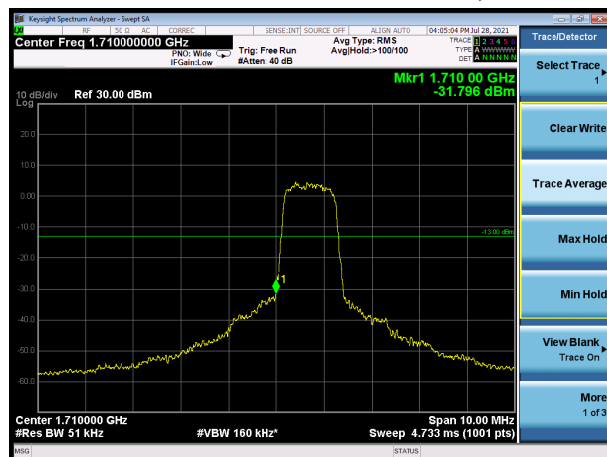
LTE Band 66 QPSK 1.4MHz CH-Low, 1 RB



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



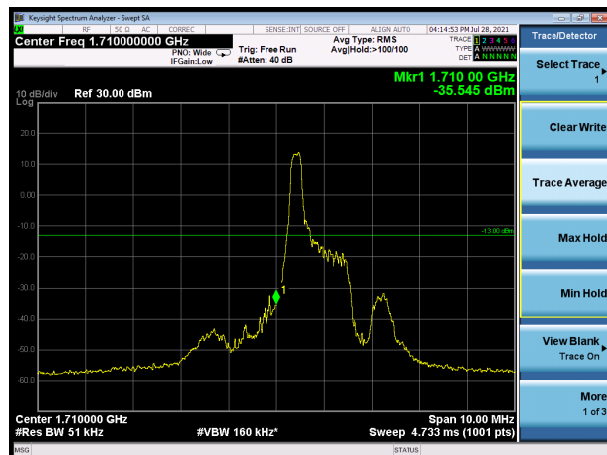
LTE Band 66 QPSK 1.4MHz CH-Low, 100%RB



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



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

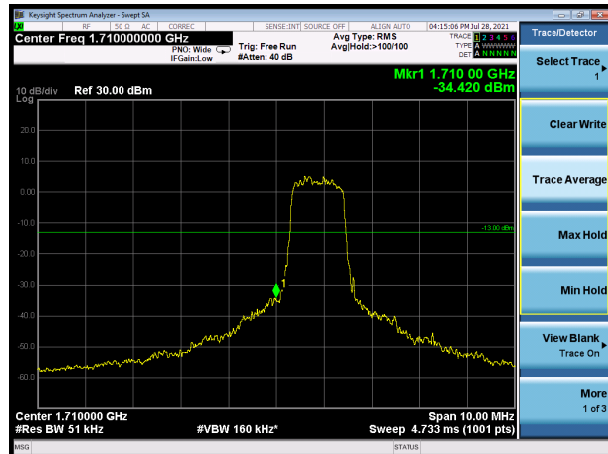


LTE Band 66 QPSK 3MHz CH-High, 1 RB

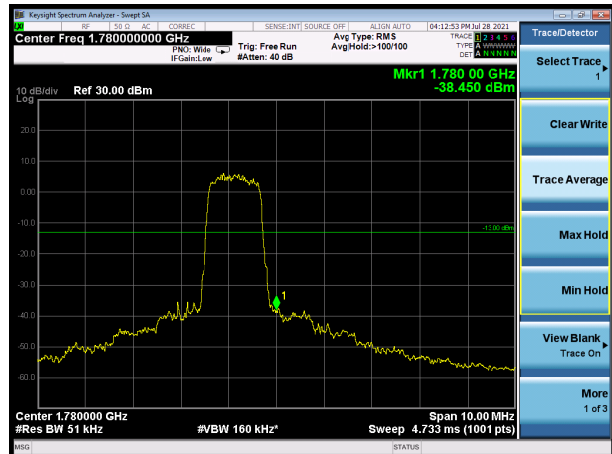




LTE Band 66 QPSK 3MHz CH-Low, 100%RB



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



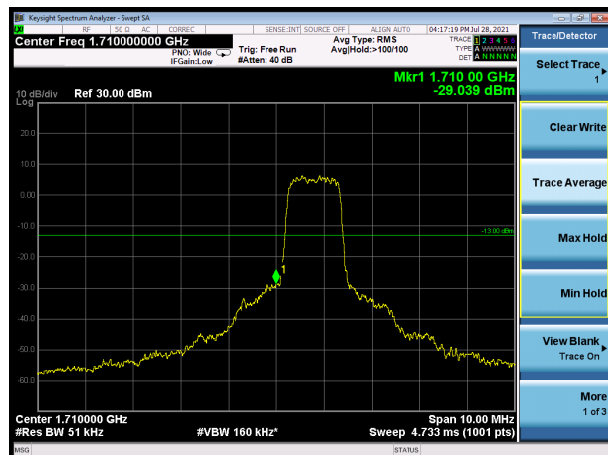
LTE Band 66 QPSK 5MHz CH-Low, 1 RB



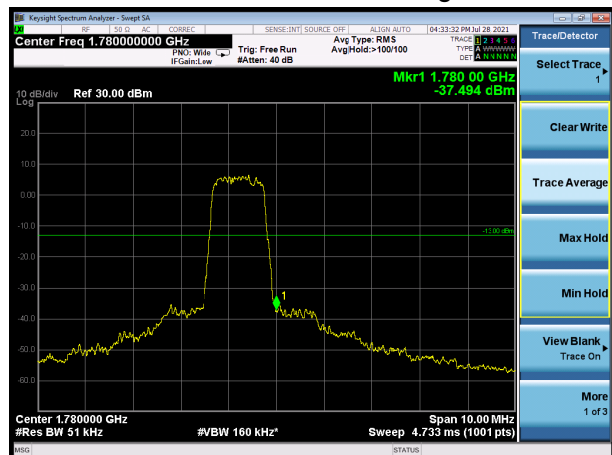
LTE Band 66 QPSK 5MHz CH-High, 1 RB



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

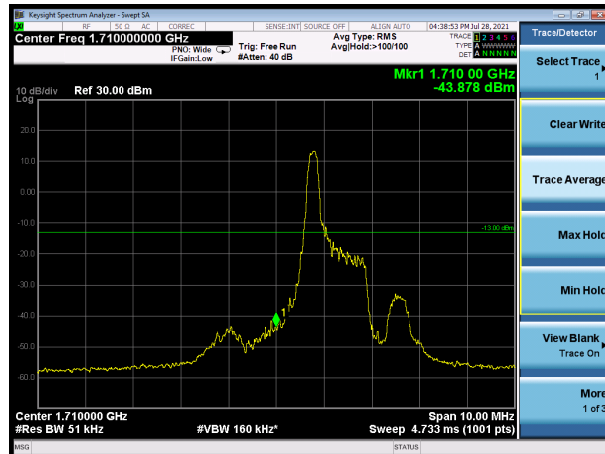


LTE Band 66 QPSK 5MHz CH-High, 100%RB





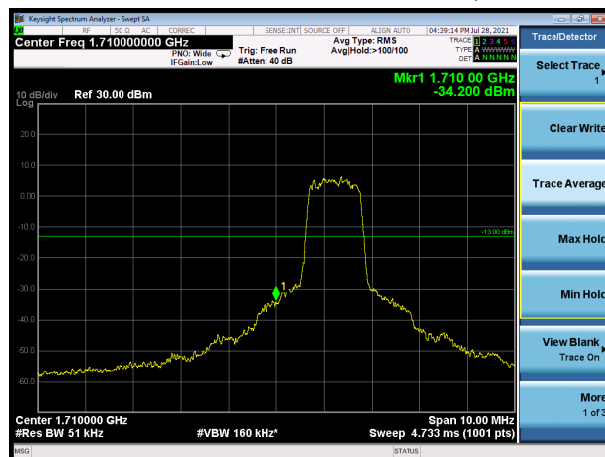
LTE Band 66 QPSK 10MHz CH-Low, 1 RB



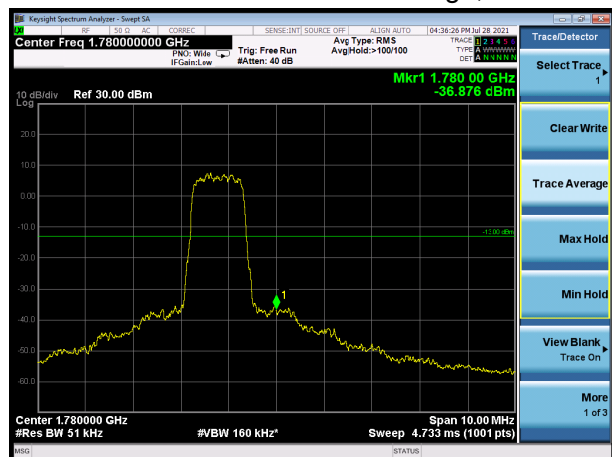
LTE Band 66 QPSK 10MHz CH-High, 1 RB



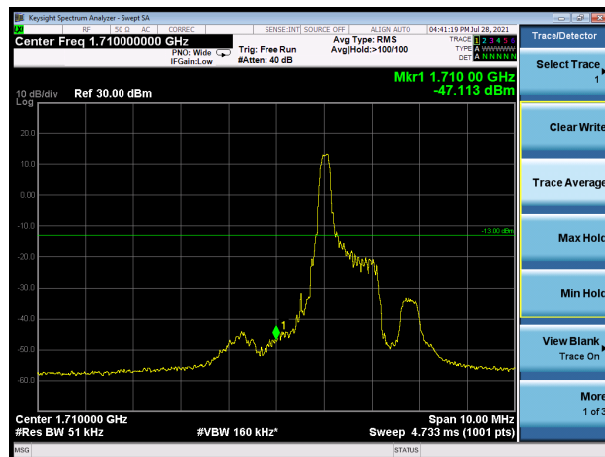
LTE Band 66 QPSK 10MHz CH-Low, 100%RB



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



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

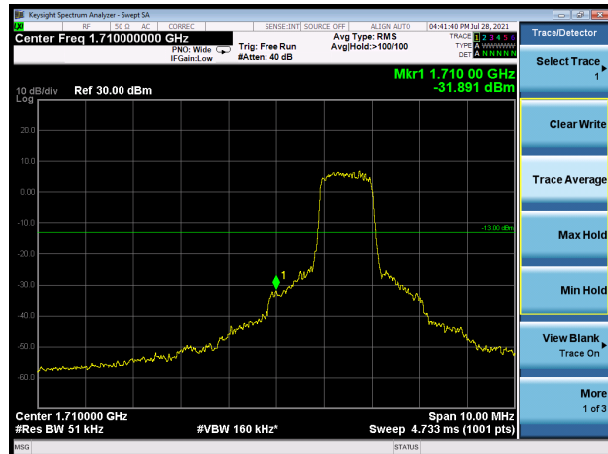


LTE Band 66 QPSK 15MHz CH-High, 1 RB

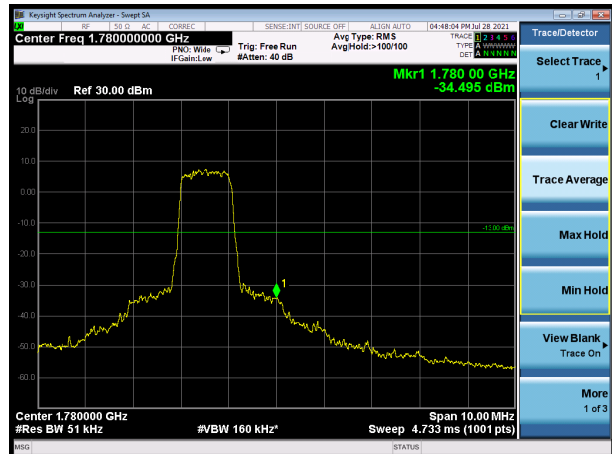




LTE Band 66 QPSK 15MHz CH-Low, 100%RB



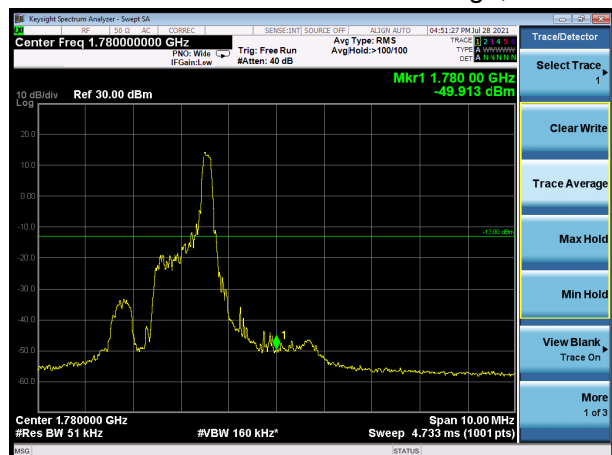
LTE Band 66 QPSK 15MHz CH-High, 100%RB



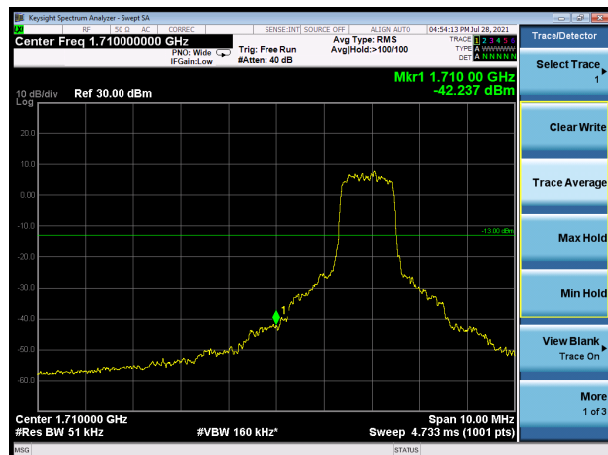
LTE Band 66 QPSK 20MHz CH-Low, 1 RB



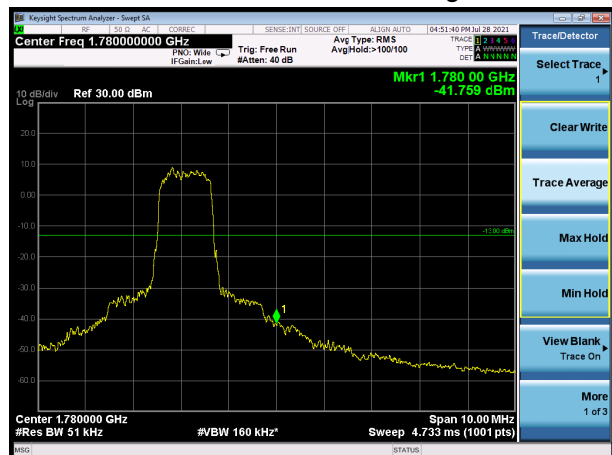
LTE Band 66 QPSK 20MHz CH-High, 1 RB



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



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





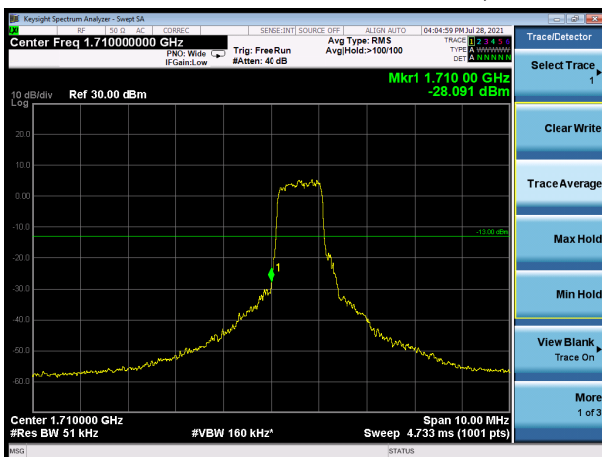
LTE Band 66 16QAM 1.4MHz CH-Low, 1 RB



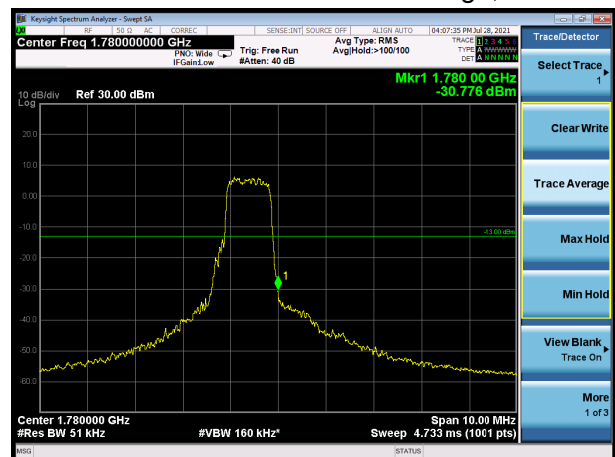
LTE Band 66 16QAM 1.4MHz CH-High, 1 RB



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

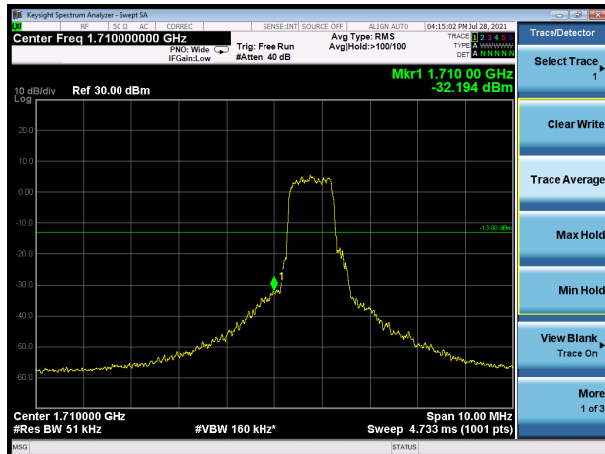


LTE Band 66 16QAM 3MHz CH-High, 1 RB

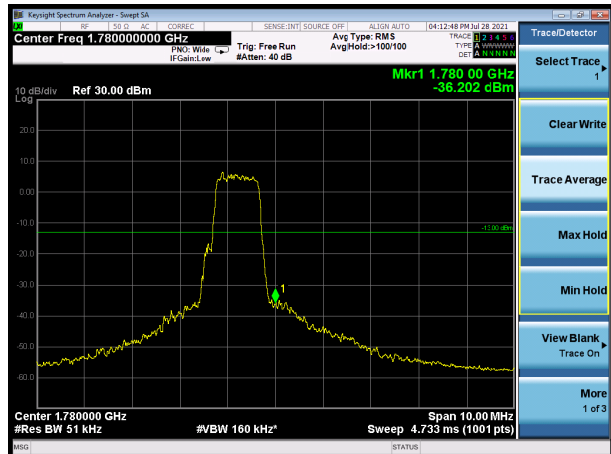




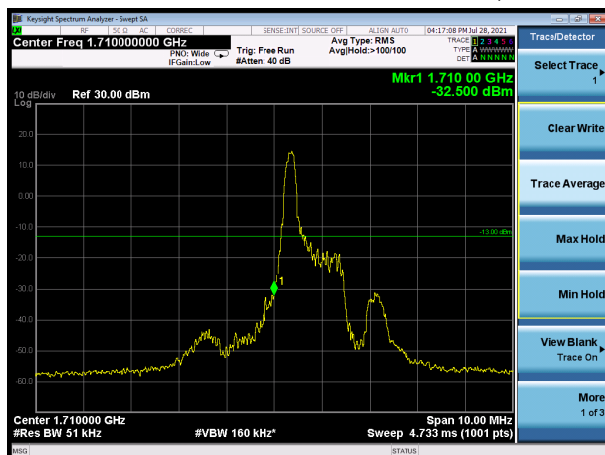
LTE Band 66 16QAM 3MHz CH-Low, 100%RB



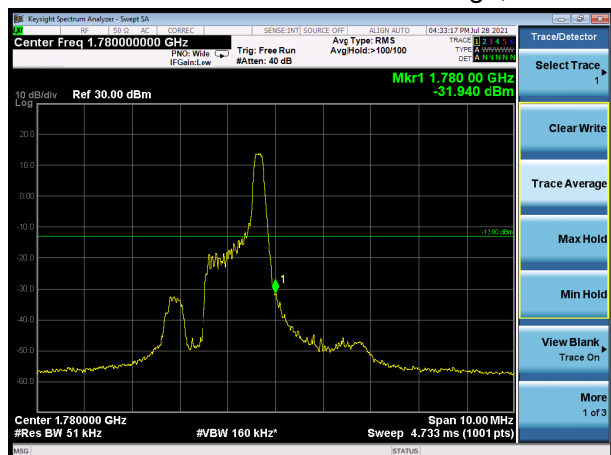
LTE Band 66 16QAM 3MHz CH-High, 100%RB



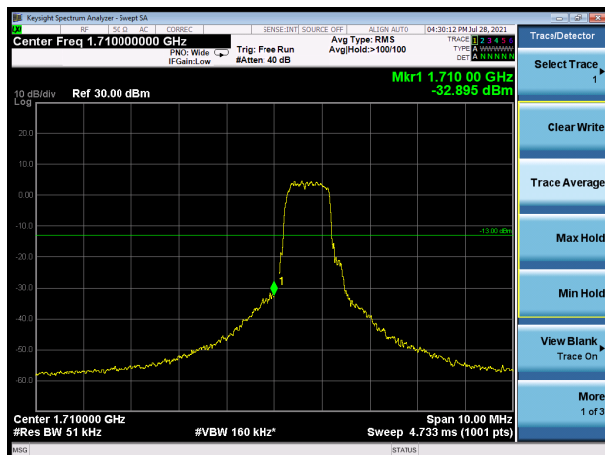
LTE Band 66 16QAM 5MHz CH-Low, 1 RB



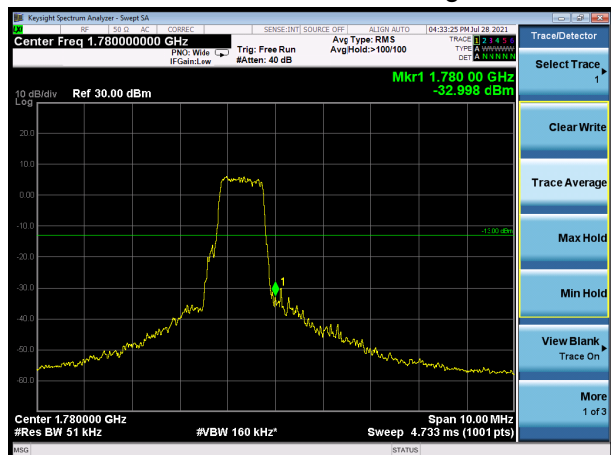
LTE Band 66 16QAM 5MHz CH-High, 1 RB



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



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

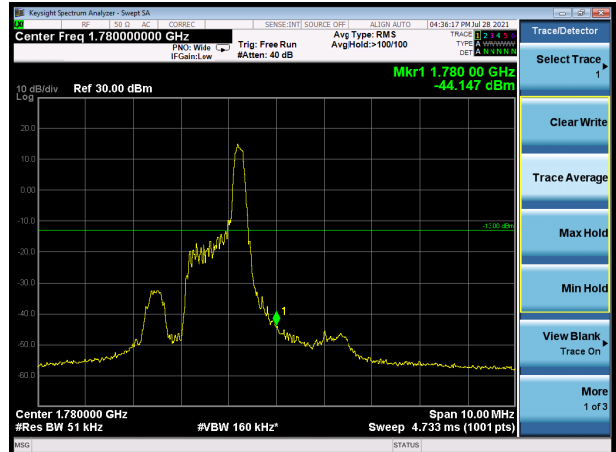




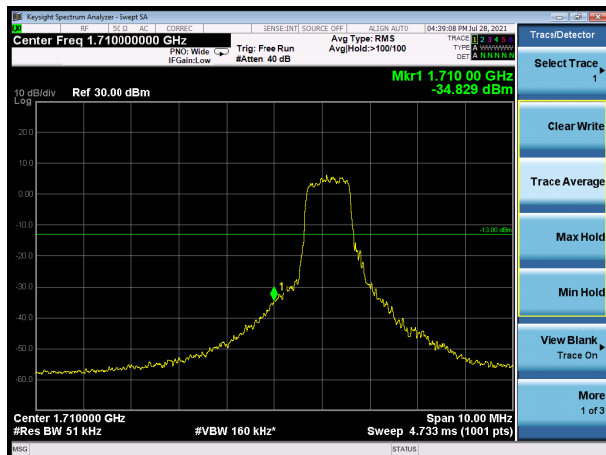
LTE Band 66 16QAM 10MHz CH-Low, 1 RB



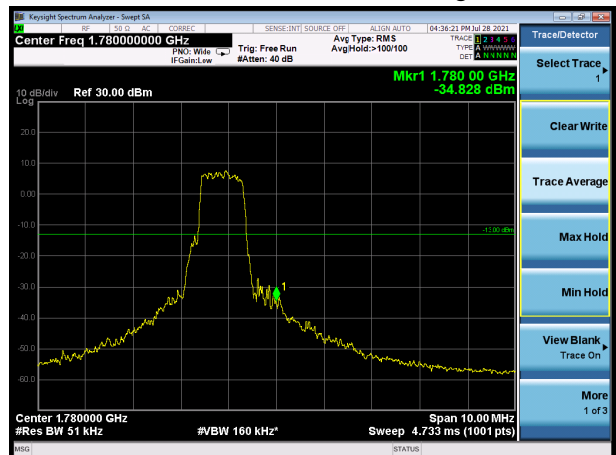
LTE Band 66 16QAM 10MHz CH-High, 1 RB



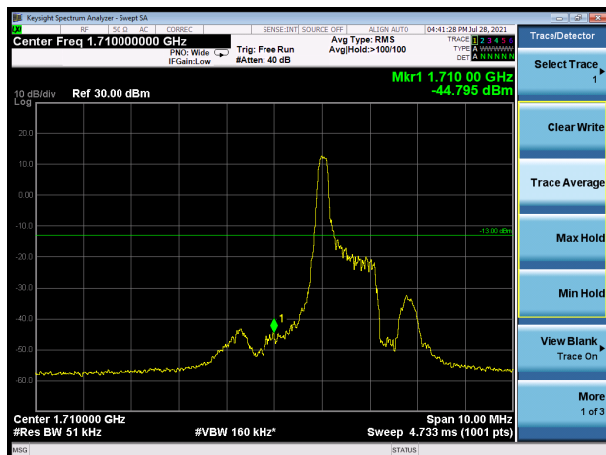
LTE Band 66 16QAM 10MHz CH-Low, 100%RB



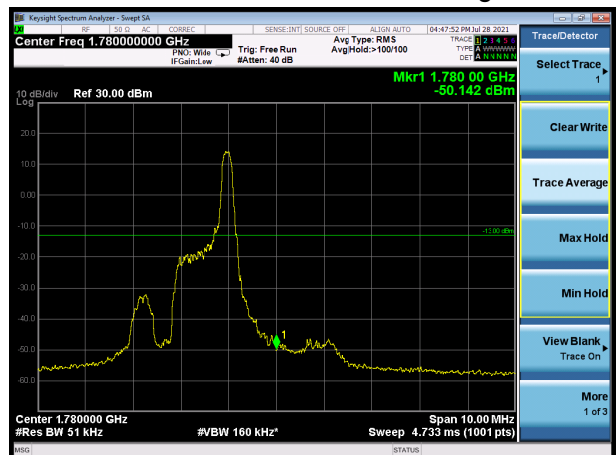
LTE Band 66 16QAM 10MHz CH-High, 100%RB



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

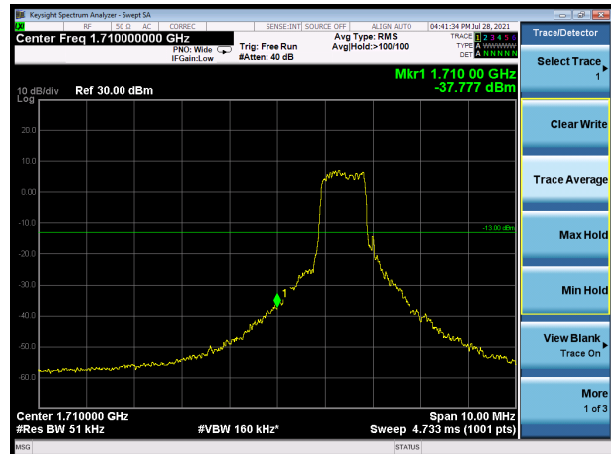


LTE Band 66 16QAM 15MHz CH-High, 1 RB

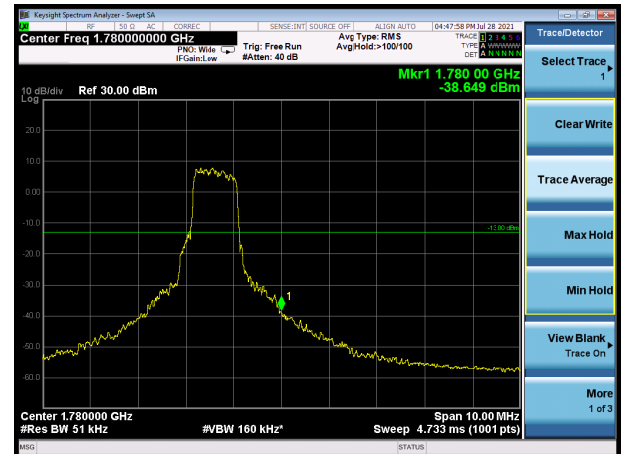




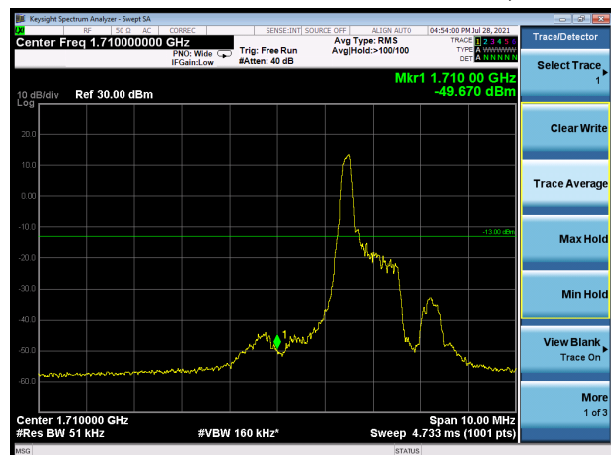
LTE Band 66 16QAM 15MHz CH-Low, 100%RB



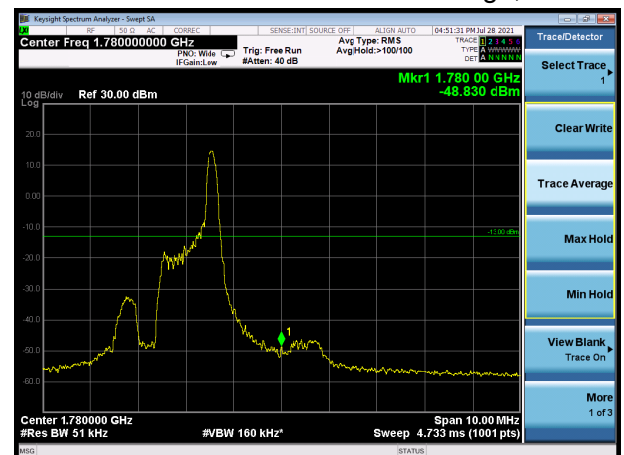
LTE Band 66 16QAM 15MHz CH-High, 100%RB



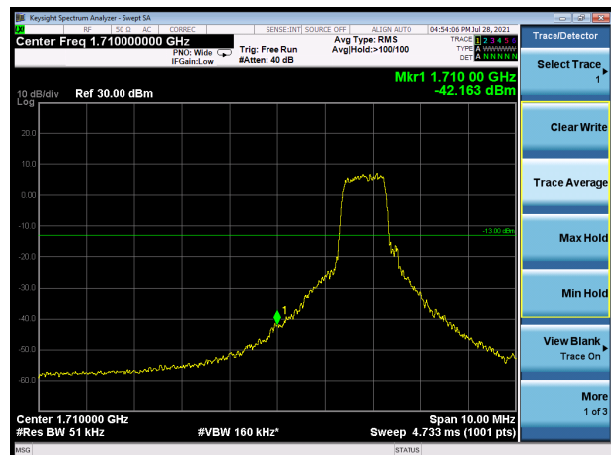
LTE Band 66 16QAM 20MHz CH-Low, 1 RB



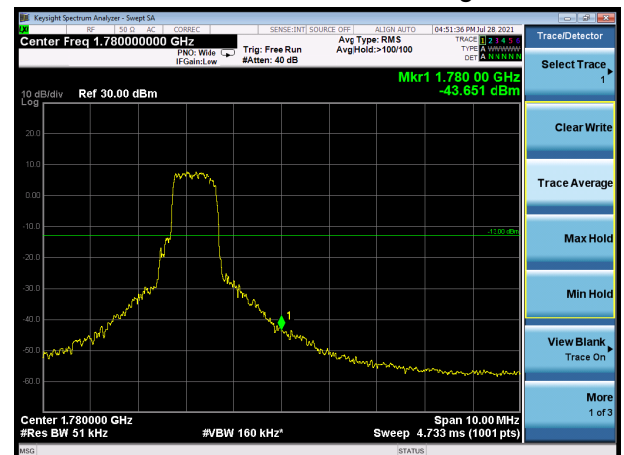
LTE Band 66 16QAM 20MHz CH-High, 1 RB



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



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



5.4 Peak-to-Average Power Ratio (PAPR)

Ambient condition

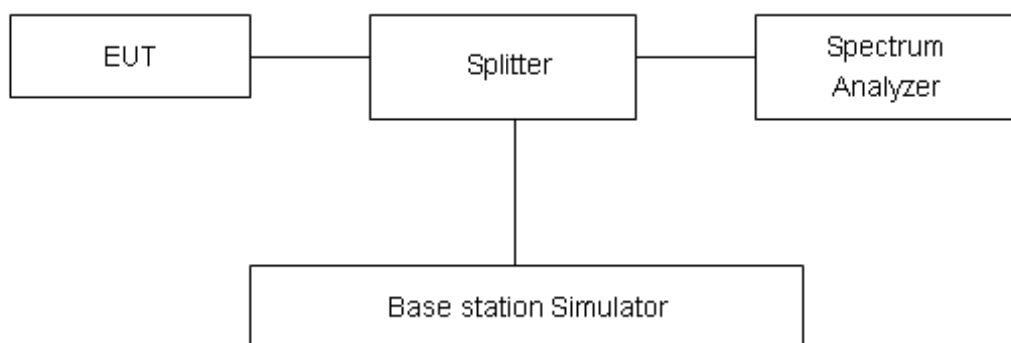
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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

Mode	Bandwidth	Modulation	Channel/ Frequency(MHz)	Peak-to-Average Power Ratio (PAPR)			Limit (dB)	Conclusion
				Peak(dBm)	Avg(dBm)	PAPR(dB)		
LTE Band4	1.4MHz	QPSK	20175/1732.5	25.80	14.65	11.15	≤13	PASS
		16QAM	20175/1732.5	26.42	14.34	12.08	≤13	PASS
	3MHz	QPSK	20175/1732.5	25.96	16.00	9.96	≤13	PASS
		16QAM	20175/1732.5	26.67	16.70	9.97	≤13	PASS
	5MHz	QPSK	20175/1732.5	26.94	17.21	9.73	≤13	PASS
		16QAM	20175/1732.5	26.60	15.47	11.13	≤13	PASS
	10MHz	QPSK	20175/1732.5	27.05	18.01	9.04	≤13	PASS
		16QAM	20175/1732.5	27.23	15.98	11.25	≤13	PASS
	15MHz	QPSK	20175/1732.5	27.72	19.22	8.50	≤13	PASS
		16QAM	20175/1732.5	28.01	18.32	9.69	≤13	PASS
LTE Band12	1.4MHz	QPSK	23095/707.5	27.39	17.59	9.80	≤13	PASS
		16QAM	23095/707.5	27.23	16.29	10.94	≤13	PASS
	3MHz	QPSK	23095/707.5	26.79	17.19	9.60	≤13	PASS
		16QAM	23095/707.5	27.16	15.36	11.80	≤13	PASS
	5MHz	QPSK	23095/707.5	27.38	17.59	9.79	≤13	PASS
		16QAM	23095/707.5	27.44	17.28	10.16	≤13	PASS
	10MHz	QPSK	23095/707.5	27.52	17.82	9.70	≤13	PASS
		16QAM	23095/707.5	27.90	17.42	10.48	≤13	PASS
LTE Band13	5MHz	QPSK	23230/782	27.59	18.03	9.56	≤13	PASS
		16QAM	23230/782	27.69	17.35	10.34	≤13	PASS
	10MHz	QPSK	23230/782	27.68	18.17	9.51	≤13	PASS
		16QAM	23230/782	28.15	18.03	10.12	≤13	PASS
LTE Band66	1.4MHz	QPSK	132322/1745	26.48	17.09	9.39	≤13	PASS
		16QAM	132322/1745	26.93	16.37	10.56	≤13	PASS
	3MHz	QPSK	132322/1745	26.03	15.19	10.84	≤13	PASS
		16QAM	132322/1745	26.93	16.83	10.10	≤13	PASS
	5MHz	QPSK	132322/1745	27.13	17.65	9.48	≤13	PASS



	10MHz	16QAM	132322/1745	26.80	15.62	11.18	≤13	PASS
		QPSK	132322/1745	27.14	17.78	9.36	≤13	PASS
		16QAM	132322/1745	27.64	17.89	9.75	≤13	PASS
	15MHz	QPSK	132322/1745	27.84	19.22	8.62	≤13	PASS
		16QAM	132322/1745	28.12	16.86	11.26	≤13	PASS
	20MHz	QPSK	132322/1745	27.82	18.97	8.85	≤13	PASS
		16QAM	132322/1745	28.25	18.47	9.78	≤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 -35°C to +75°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 -35°C to +75°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

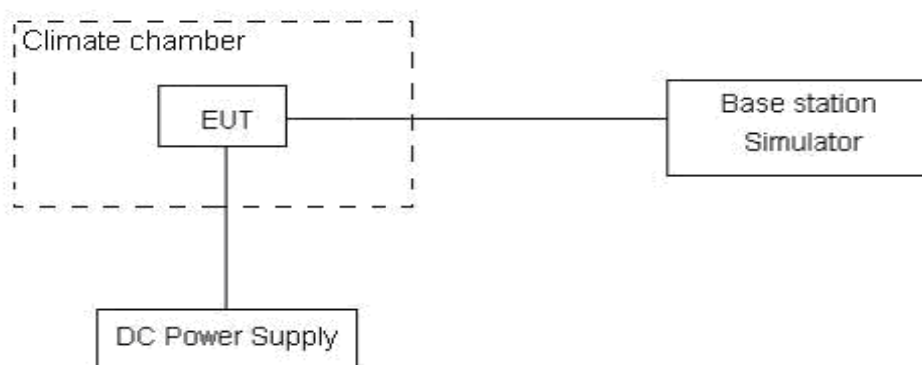
Frequency Stability (Voltage Variation)

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 2.2V and 4.35 V, with a nominal voltage of 3.3V.

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

LTE Band 4						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	1.4MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)	Normal	5.85	12.77	0.00337	0.00737	PASS
Extreme (75℃)		11.94	16.39	0.00689	0.00946	PASS
Extreme (70℃)		12.23	10.20	0.00706	0.00589	PASS
Extreme (60℃)		7.71	16.19	0.00445	0.00935	PASS
Extreme (50℃)		16.17	14.58	0.00933	0.00841	PASS
Extreme (40℃)		14.54	11.41	0.00839	0.00658	PASS
Extreme (30℃)		9.77	13.26	0.00564	0.00765	PASS
Extreme (20℃)		4.83	11.07	0.00279	0.00639	PASS
Extreme (10℃)		5.88	16.75	0.00340	0.00967	PASS
Extreme (0℃)		3.03	7.94	0.00175	0.00458	PASS
Extreme (-10℃)		7.87	8.31	0.00454	0.00480	PASS
Extreme (-20℃)		5.02	7.26	0.00290	0.00419	PASS
Extreme (-30℃)		6.83	5.50	0.00394	0.00317	PASS
Extreme (-35℃)			10.13	8.37	0.00584	0.00483
25℃	LV	10.52	6.25	0.00607	0.00361	PASS
	HV	10.45	5.57	0.00603	0.00322	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)	Normal	16.44	11.35	0.00949	0.00655	PASS
Extreme (75℃)		12.97	1.37	0.00748	0.00079	PASS
Extreme (70℃)		5.12	2.29	0.00295	0.00132	PASS
Extreme (60℃)		1.16	2.54	0.00067	0.00146	PASS
Extreme (50℃)		17.20	1.82	0.00993	0.00105	PASS
Extreme (40℃)		2.46	15.90	0.00142	0.00918	PASS
Extreme (30℃)		8.35	15.64	0.00482	0.00903	PASS
Extreme (20℃)		17.53	2.63	0.01012	0.00152	PASS
Extreme (10℃)		15.46	4.93	0.00892	0.00285	PASS
Extreme (0℃)		8.59	1.65	0.00496	0.00095	PASS
Extreme (-10℃)		11.32	3.87	0.00653	0.00223	PASS
Extreme (-20℃)		9.28	3.30	0.00536	0.00190	PASS
Extreme (-30℃)		13.71	3.65	0.00791	0.00210	PASS
Extreme (-35℃)			1.91	15.21	0.00110	0.00878
25℃	LV	17.20	9.24	0.00993	0.00533	PASS
	HV	2.71	16.40	0.00156	0.00947	PASS



Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)	Normal	8.76	3.93	0.00506	0.00227	PASS
Extreme (75℃)		7.90	11.78	0.00456	0.00680	PASS
Extreme (70℃)		5.19	8.13	0.00300	0.00469	PASS
Extreme (60℃)		16.67	1.98	0.00962	0.00114	PASS
Extreme (50℃)		14.64	5.52	0.00845	0.00319	PASS
Extreme (40℃)		1.57	7.73	0.00091	0.00446	PASS
Extreme (30℃)		2.44	10.75	0.00141	0.00620	PASS
Extreme (20℃)		9.64	1.05	0.00556	0.00061	PASS
Extreme (10℃)		9.06	17.27	0.00523	0.00997	PASS
Extreme (0℃)		7.49	17.14	0.00432	0.00989	PASS
Extreme (-10℃)		2.50	13.00	0.00144	0.00750	PASS
Extreme (-20℃)		8.63	6.08	0.00498	0.00351	PASS
Extreme (-30℃)		12.11	9.04	0.00699	0.00522	PASS
Extreme (-35℃)		1.17	3.99	0.00068	0.00230	PASS
25℃	LV	15.73	15.59	0.00908	0.00900	PASS
	HV	9.70	5.38	0.00560	0.00310	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)	Normal	2.23	2.99	0.00129	0.00173	PASS
Extreme (75℃)		3.32	16.49	0.00192	0.00952	PASS
Extreme (70℃)		10.81	16.01	0.00624	0.00924	PASS
Extreme (60℃)		8.79	9.82	0.00508	0.00567	PASS
Extreme (50℃)		10.37	3.47	0.00598	0.00200	PASS
Extreme (40℃)		15.18	7.87	0.00876	0.00454	PASS
Extreme (30℃)		11.51	1.19	0.00664	0.00069	PASS
Extreme (20℃)		9.00	2.44	0.00519	0.00141	PASS
Extreme (10℃)		10.03	6.60	0.00579	0.00381	PASS
Extreme (0℃)		9.88	7.87	0.00570	0.00454	PASS
Extreme (-10℃)		16.36	16.40	0.00944	0.00947	PASS
Extreme (-20℃)		2.61	15.12	0.00151	0.00873	PASS
Extreme (-30℃)		5.70	8.36	0.00329	0.00483	PASS
Extreme (-35℃)		5.78	12.08	0.00334	0.00697	PASS
25℃	LV	11.63	6.36	0.00671	0.00367	PASS
	HV	12.08	8.00	0.00697	0.00462	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability	Frequency Stability	Verdict



BANDWIDTH	15MHz			(ppm)	(ppm)	
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)	Normal	11.12	3.01	0.00642	0.00174	PASS
Extreme (75℃)		11.71	5.74	0.00676	0.00331	PASS
Extreme (70℃)		11.49	7.90	0.00663	0.00456	PASS
Extreme (60℃)		17.84	10.75	0.01029	0.00620	PASS
Extreme (50℃)		12.12	3.91	0.00699	0.00226	PASS
Extreme (40℃)		9.54	12.12	0.00551	0.00699	PASS
Extreme (30℃)		15.61	10.21	0.00901	0.00589	PASS
Extreme (20℃)		3.72	17.46	0.00215	0.01008	PASS
Extreme (10℃)		4.27	5.81	0.00247	0.00335	PASS
Extreme (0℃)		16.46	15.29	0.00950	0.00882	PASS
Extreme (-10℃)		11.54	4.79	0.00666	0.00277	PASS
Extreme (-20℃)		14.65	7.35	0.00846	0.00424	PASS
Extreme (-30℃)		4.12	14.00	0.00238	0.00808	PASS
Extreme (-35℃)		14.97	10.30	0.00864	0.00595	PASS
25℃	LV	5.66	1.36	0.00327	0.00079	PASS
	HV	12.65	3.75	0.00730	0.00216	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)		12.47	4.10	0.00720	0.00237	PASS
Extreme (75℃)		3.02	6.67	0.00175	0.00385	PASS
Extreme (70℃)		2.31	8.53	0.00133	0.00492	PASS
Extreme (60℃)	Normal	1.67	16.73	0.00097	0.00966	PASS
Extreme (50℃)		6.16	3.54	0.00356	0.00204	PASS
Extreme (40℃)		14.12	11.48	0.00815	0.00663	PASS
Extreme (30℃)		2.65	10.23	0.00153	0.00590	PASS
Extreme (20℃)		14.79	13.49	0.00854	0.00779	PASS
Extreme (10℃)		7.34	14.56	0.00423	0.00841	PASS
Extreme (0℃)		4.85	1.16	0.00280	0.00067	PASS
Extreme (-10℃)		6.11	13.13	0.00353	0.00758	PASS
Extreme (-20℃)		10.30	9.27	0.00594	0.00535	PASS
Extreme (-30℃)		6.77	14.45	0.00391	0.00834	PASS
Extreme (-35℃)		2.10	10.93	0.00121	0.00631	PASS
25℃	LV	3.19	15.74	0.00184	0.00909	PASS
	HV	3.29	12.31	0.00190	0.00711	PASS



LTE Band 12						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	1.4MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)	Normal	16.28	7.14	0.02300	0.01009	PASS
Extreme (75℃)		11.12	14.47	0.01571	0.02045	PASS
Extreme (70℃)		5.25	1.70	0.00741	0.00240	PASS
Extreme (60℃)		12.24	4.01	0.01730	0.00566	PASS
Extreme (50℃)		15.70	13.04	0.02219	0.01843	PASS
Extreme (40℃)		10.90	9.34	0.01541	0.01320	PASS
Extreme (30℃)		9.74	2.13	0.01376	0.00302	PASS
Extreme (20℃)		13.91	6.76	0.01967	0.00956	PASS
Extreme (10℃)		17.91	7.01	0.02531	0.00990	PASS
Extreme (0℃)		1.89	7.87	0.00267	0.01112	PASS
Extreme (-10℃)		7.49	15.42	0.01059	0.02179	PASS
Extreme (-20℃)		15.37	9.25	0.02173	0.01308	PASS
Extreme (-30℃)		7.91	4.10	0.01118	0.00580	PASS
Extreme (-35℃)			1.71	16.71	0.00242	0.02361
25℃	LV	14.24	16.94	0.02012	0.02395	PASS
	HV	14.02	11.83	0.01981	0.01672	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)	Normal	16.15	9.41	0.02283	0.01330	PASS
Extreme (75℃)		12.53	14.47	0.01771	0.02045	PASS
Extreme (70℃)		14.74	4.20	0.02083	0.00594	PASS
Extreme (60℃)		7.35	13.63	0.01039	0.01926	PASS
Extreme (50℃)		11.61	12.01	0.01640	0.01697	PASS
Extreme (40℃)		7.27	1.79	0.01027	0.00253	PASS
Extreme (30℃)		13.43	13.96	0.01899	0.01973	PASS
Extreme (20℃)		10.15	13.58	0.01435	0.01920	PASS
Extreme (10℃)		14.81	9.66	0.02093	0.01365	PASS
Extreme (0℃)		3.24	14.59	0.00458	0.02062	PASS
Extreme (-10℃)		9.44	16.18	0.01334	0.02287	PASS
Extreme (-20℃)		14.40	6.77	0.02036	0.00957	PASS
Extreme (-30℃)		11.57	10.94	0.01636	0.01547	PASS
Extreme (-35℃)			6.45	2.58	0.00912	0.00364
25℃	LV	11.02	16.66	0.01557	0.02355	PASS
	HV	14.49	8.43	0.02049	0.01191	PASS



Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)	Normal	10.32	2.74	0.01458	0.00387	PASS
Extreme (75℃)		2.93	7.51	0.00414	0.01062	PASS
Extreme (70℃)		14.16	16.34	0.02001	0.02310	PASS
Extreme (60℃)		14.75	17.18	0.02085	0.02428	PASS
Extreme (50℃)		10.45	13.70	0.01477	0.01936	PASS
Extreme (40℃)		5.37	9.48	0.00759	0.01339	PASS
Extreme (30℃)		1.51	14.42	0.00213	0.02038	PASS
Extreme (20℃)		1.76	15.10	0.00249	0.02134	PASS
Extreme (10℃)		9.12	15.63	0.01288	0.02209	PASS
Extreme (0℃)		9.64	11.95	0.01362	0.01689	PASS
Extreme (-10℃)		7.56	3.83	0.01068	0.00542	PASS
Extreme (-20℃)		11.38	16.48	0.01608	0.02329	PASS
Extreme (-30℃)		17.32	9.17	0.02448	0.01296	PASS
Extreme (-35℃)		1.37	12.47	0.00193	0.01763	PASS
25℃	LV	5.34	15.50	0.00755	0.02191	PASS
	HV	5.72	17.06	0.00809	0.02411	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)	Normal	5.92	15.90	0.00836	0.02248	PASS
Extreme (75℃)		1.52	13.10	0.00215	0.01851	PASS
Extreme (70℃)		14.62	3.00	0.02066	0.00425	PASS
Extreme (60℃)		12.04	2.21	0.01701	0.00312	PASS
Extreme (50℃)		14.53	3.05	0.02054	0.00431	PASS
Extreme (40℃)		17.02	6.96	0.02406	0.00984	PASS
Extreme (30℃)		7.21	11.00	0.01018	0.01555	PASS
Extreme (20℃)		10.95	3.57	0.01548	0.00504	PASS
Extreme (10℃)		10.10	6.51	0.01428	0.00920	PASS
Extreme (0℃)		14.90	4.08	0.02107	0.00577	PASS
Extreme (-10℃)		10.45	7.36	0.01477	0.01040	PASS
Extreme (-20℃)		6.72	14.96	0.00950	0.02115	PASS
Extreme (-30℃)		3.36	13.58	0.00475	0.01919	PASS
Extreme (-35℃)		8.00	8.10	0.01130	0.01145	PASS
25℃	LV	12.40	4.15	0.01753	0.00587	PASS
	HV	11.60	3.05	0.01639	0.00430	PASS



LTE Band 13						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)	Normal	4.98	2.16	0.00636	0.00115	PASS
Extreme (75℃)		6.61	10.04	0.00846	0.00534	PASS
Extreme (70℃)		2.14	15.80	0.00273	0.00840	PASS
Extreme (60℃)		2.61	4.19	0.00334	0.00223	PASS
Extreme (50℃)		1.62	15.21	0.00207	0.00809	PASS
Extreme (40℃)		3.13	2.35	0.00400	0.00125	PASS
Extreme (30℃)		3.51	4.67	0.00449	0.00248	PASS
Extreme (20℃)		5.66	4.57	0.00724	0.00243	PASS
Extreme (10℃)		2.80	6.38	0.00359	0.00339	PASS
Extreme (0℃)		13.62	11.30	0.01742	0.00601	PASS
Extreme (-10℃)		9.15	14.89	0.01170	0.00792	PASS
Extreme (-20℃)		5.71	6.58	0.00731	0.00350	PASS
Extreme (-30℃)		10.94	13.39	0.01400	0.00712	PASS
Extreme (-35℃)			13.75	6.41	0.01758	0.00341
25℃	LV	7.34	12.59	0.00939	0.00670	PASS
	HV	16.56	1.20	0.02118	0.00064	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)	Normal	7.76	3.67	0.00992	0.00195	PASS
Extreme (75℃)		3.18	10.13	0.00407	0.00539	PASS
Extreme (70℃)		8.78	11.03	0.01122	0.00587	PASS
Extreme (60℃)		8.79	6.77	0.01124	0.00360	PASS
Extreme (50℃)		3.88	15.09	0.00497	0.00802	PASS
Extreme (40℃)		14.44	8.45	0.01846	0.00449	PASS
Extreme (30℃)		2.87	6.80	0.00367	0.00361	PASS
Extreme (20℃)		4.04	4.84	0.00516	0.00258	PASS
Extreme (10℃)		10.31	11.39	0.01318	0.00606	PASS
Extreme (0℃)		14.51	8.75	0.01855	0.00466	PASS
Extreme (-10℃)		11.03	13.33	0.01410	0.00709	PASS
Extreme (-20℃)		6.74	5.73	0.00861	0.00305	PASS
Extreme (-30℃)		15.25	12.26	0.01950	0.00652	PASS
Extreme (-35℃)			9.62	17.71	0.01230	0.00942
25℃	LV	6.91	7.40	0.00884	0.00393	PASS
	HV	10.76	13.61	0.01377	0.00724	PASS



LTE Band 66						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	1.4MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)	Normal	2.27	11.39	0.00130	0.00653	PASS
Extreme (75℃)		16.29	12.71	0.00934	0.00729	PASS
Extreme (70℃)		1.79	2.72	0.00103	0.00156	PASS
Extreme (60℃)		10.16	13.90	0.00583	0.00796	PASS
Extreme (50℃)		1.46	5.74	0.00084	0.00329	PASS
Extreme (40℃)		10.20	10.21	0.00584	0.00585	PASS
Extreme (30℃)		17.58	1.07	0.01007	0.00061	PASS
Extreme (20℃)		12.10	10.35	0.00693	0.00593	PASS
Extreme (10℃)		6.51	14.97	0.00373	0.00858	PASS
Extreme (0℃)		4.82	3.48	0.00276	0.00200	PASS
Extreme (-10℃)		16.30	2.30	0.00934	0.00132	PASS
Extreme (-20℃)		15.32	12.90	0.00878	0.00739	PASS
Extreme (-30℃)		11.97	9.04	0.00686	0.00518	PASS
Extreme (-35℃)			4.23	10.31	0.00243	0.00591
25℃	LV	13.05	2.34	0.00748	0.00134	PASS
	HV	17.15	10.25	0.00983	0.00587	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)	Normal	2.96	4.12	0.00170	0.00236	PASS
Extreme (75℃)		16.44	15.30	0.00942	0.00877	PASS
Extreme (70℃)		2.29	11.70	0.00131	0.00671	PASS
Extreme (60℃)		2.35	7.10	0.00134	0.00407	PASS
Extreme (50℃)		7.93	3.14	0.00455	0.00180	PASS
Extreme (40℃)		14.13	4.96	0.00810	0.00284	PASS
Extreme (30℃)		14.23	17.77	0.00816	0.01018	PASS
Extreme (20℃)		8.07	8.08	0.00463	0.00463	PASS
Extreme (10℃)		12.66	8.62	0.00725	0.00494	PASS
Extreme (0℃)		4.69	3.43	0.00269	0.00196	PASS
Extreme (-10℃)		7.88	14.73	0.00451	0.00844	PASS
Extreme (-20℃)		2.84	13.30	0.00163	0.00762	PASS
Extreme (-30℃)		11.37	12.82	0.00652	0.00735	PASS
Extreme (-35℃)			8.91	3.92	0.00511	0.00225
25℃	LV	17.38	2.82	0.00996	0.00161	PASS
	HV	8.85	16.74	0.00507	0.00959	PASS



Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)	Normal	10.79	5.45	0.00618	0.00312	PASS
Extreme (75℃)		10.85	16.40	0.00622	0.00940	PASS
Extreme (70℃)		6.20	3.75	0.00355	0.00215	PASS
Extreme (60℃)		13.95	15.96	0.00800	0.00915	PASS
Extreme (50℃)		5.26	10.90	0.00301	0.00624	PASS
Extreme (40℃)		17.73	3.23	0.01016	0.00185	PASS
Extreme (30℃)		13.29	9.84	0.00761	0.00564	PASS
Extreme (20℃)		9.01	4.96	0.00516	0.00284	PASS
Extreme (10℃)		3.05	12.47	0.00175	0.00715	PASS
Extreme (0℃)		10.91	15.47	0.00625	0.00886	PASS
Extreme (-10℃)		12.93	11.46	0.00741	0.00657	PASS
Extreme (-20℃)		7.38	2.85	0.00423	0.00163	PASS
Extreme (-30℃)		8.73	12.01	0.00500	0.00688	PASS
Extreme (-35℃)		1.93	14.99	0.00111	0.00859	PASS
25℃	LV	13.46	8.02	0.00771	0.00460	PASS
	HV	3.83	1.31	0.00220	0.00075	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)	Normal	15.47	14.78	0.00887	0.00847	PASS
Extreme (75℃)		8.54	10.02	0.00490	0.00574	PASS
Extreme (70℃)		14.35	17.81	0.00822	0.01021	PASS
Extreme (60℃)		4.37	3.41	0.00251	0.00195	PASS
Extreme (50℃)		3.13	4.06	0.00179	0.00233	PASS
Extreme (40℃)		11.61	13.47	0.00666	0.00772	PASS
Extreme (30℃)		6.21	7.03	0.00356	0.00403	PASS
Extreme (20℃)		10.52	2.12	0.00603	0.00122	PASS
Extreme (10℃)		2.46	6.03	0.00141	0.00346	PASS
Extreme (0℃)		8.58	2.30	0.00492	0.00132	PASS
Extreme (-10℃)		6.48	3.19	0.00371	0.00183	PASS
Extreme (-20℃)		13.91	9.40	0.00797	0.00539	PASS
Extreme (-30℃)		16.95	10.58	0.00972	0.00606	PASS
Extreme (-35℃)		6.44	16.31	0.00369	0.00935	PASS
25℃	LV	6.66	5.56	0.00382	0.00319	PASS
	HV	14.78	5.23	0.00847	0.00300	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability	Frequency Stability	Verdict



BANDWIDTH	15MHz			(ppm)	(ppm)	
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)	Normal	8.64	15.39	0.00495	0.00882	PASS
Extreme (75℃)		4.64	2.85	0.00266	0.00163	PASS
Extreme (70℃)		14.23	3.27	0.00815	0.00187	PASS
Extreme (60℃)		7.99	13.11	0.00458	0.00751	PASS
Extreme (50℃)		17.42	13.86	0.00998	0.00795	PASS
Extreme (40℃)		9.54	13.93	0.00547	0.00798	PASS
Extreme (30℃)		10.04	13.03	0.00575	0.00747	PASS
Extreme (20℃)		9.14	10.71	0.00524	0.00614	PASS
Extreme (10℃)		12.84	6.79	0.00736	0.00389	PASS
Extreme (0℃)		14.32	16.94	0.00820	0.00971	PASS
Extreme (-10℃)		8.00	16.06	0.00458	0.00921	PASS
Extreme (-20℃)		13.66	8.29	0.00783	0.00475	PASS
Extreme (-30℃)		9.72	14.31	0.00557	0.00820	PASS
Extreme (-35℃)		7.00	16.87	0.00401	0.00967	PASS
25℃	LV	9.29	8.93	0.00533	0.00512	PASS
	HV	2.96	12.13	0.00169	0.00695	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25℃)		16.09	7.78	0.00922	0.00446	PASS
Extreme (75℃)		1.30	15.24	0.00074	0.00874	PASS
Extreme (70℃)		4.76	4.54	0.00273	0.00260	PASS
Extreme (60℃)	Normal	16.15	11.85	0.00925	0.00679	PASS
Extreme (50℃)		15.85	14.28	0.00908	0.00818	PASS
Extreme (40℃)		5.96	12.55	0.00341	0.00719	PASS
Extreme (30℃)		8.76	4.11	0.00502	0.00235	PASS
Extreme (20℃)		10.91	14.17	0.00625	0.00812	PASS
Extreme (10℃)		14.87	3.50	0.00852	0.00200	PASS
Extreme (0℃)		15.45	9.56	0.00885	0.00548	PASS
Extreme (-10℃)		16.96	1.38	0.00972	0.00079	PASS
Extreme (-20℃)		9.22	6.39	0.00528	0.00366	PASS
Extreme (-30℃)		9.57	16.14	0.00548	0.00925	PASS
Extreme (-35℃)		3.89	11.04	0.00223	0.00633	PASS
25℃	LV	15.42	10.67	0.00884	0.00612	PASS
	HV	16.06	4.56	0.00921	0.00261	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)

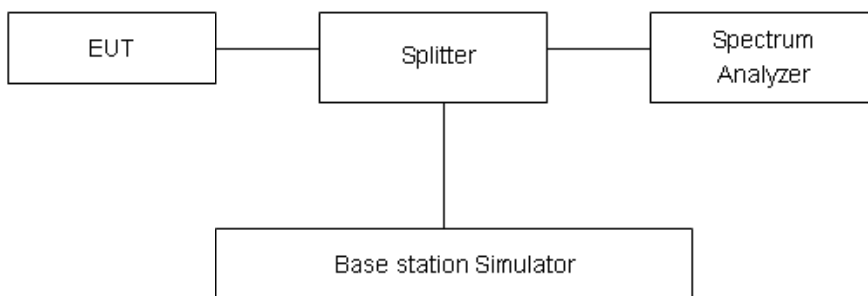
RBW is set to 100 kHz (30MHz~1000 MHz)

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.

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

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

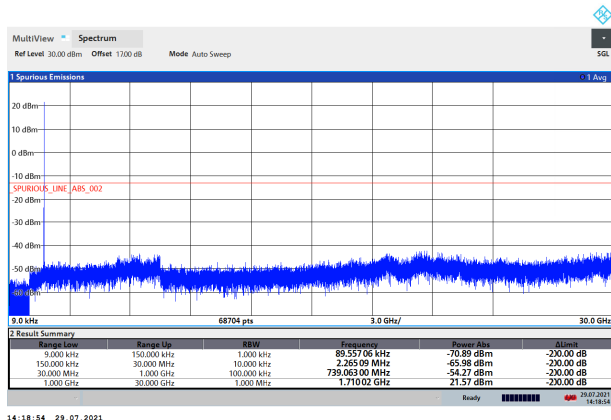


Test Result

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.

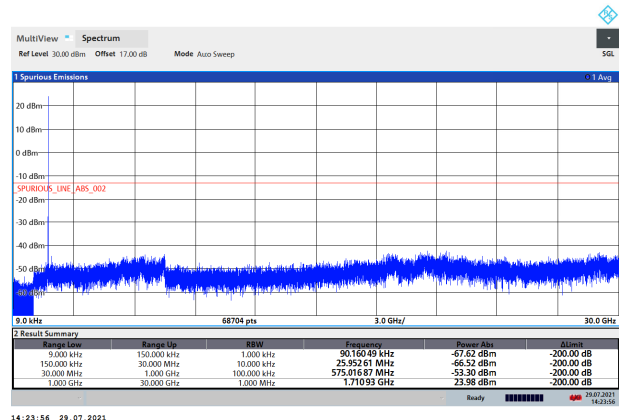
The signal beyond the limit is carrier.

LTE Band 4 1.4MHz CH-Low 9kHz~30GHz



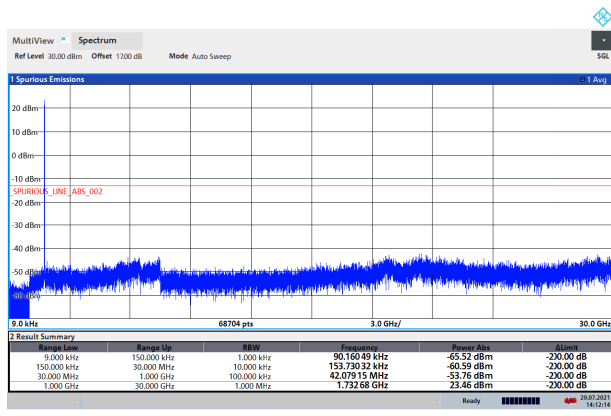
14:10:54 29.07.2021

LTE Band 4 3MHz CH-Low 9kHz~30GHz



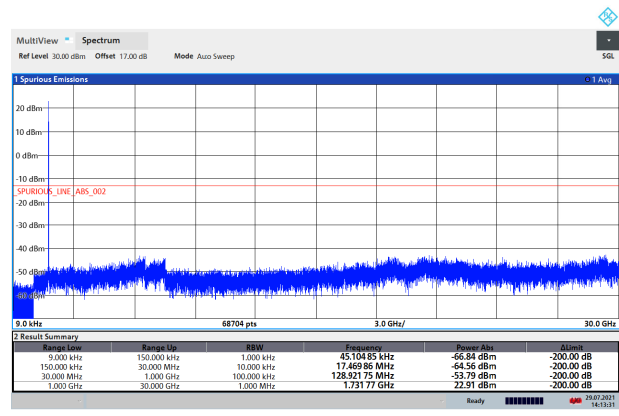
14:13:56 29.07.2021

LTE Band 4 1.4MHz CH-Middle 9kHz~30GHz



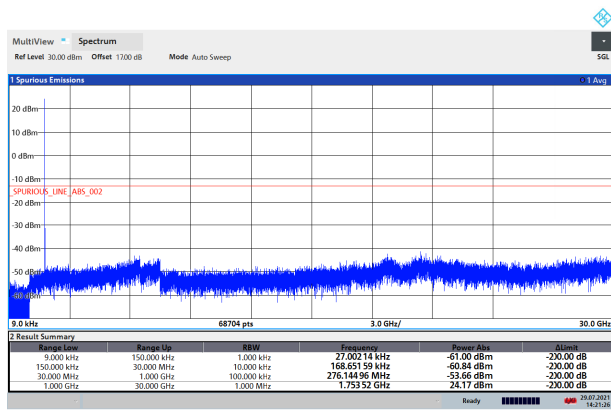
14:12:14 29.07.2021

LTE Band 4 3MHz CH-Middle 9kHz~30GHz



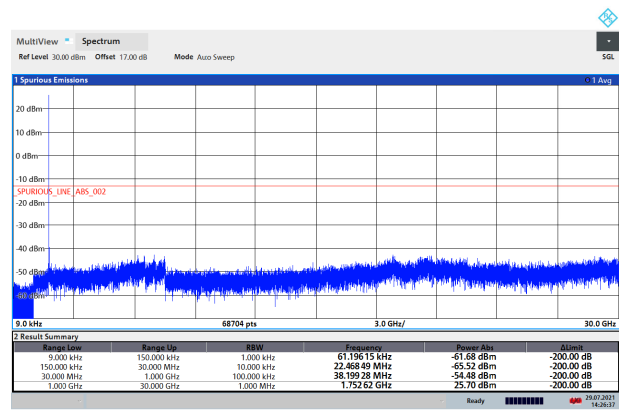
14:13:32 29.07.2021

LTE Band 4 1.4MHz CH-High 9kHz~30GHz



14:21:26 29.07.2021

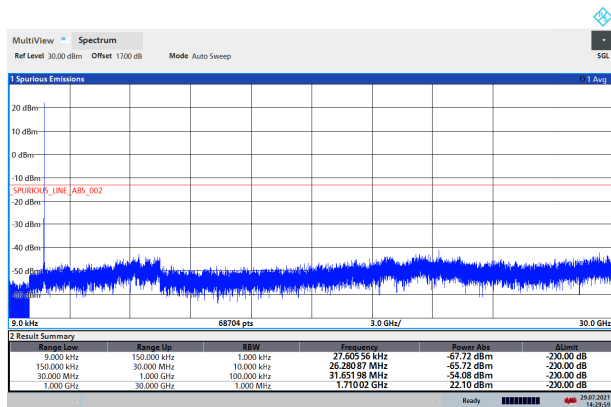
LTE Band 4 3MHz CH-High 9kHz~30GHz



14:26:38 29.07.2021

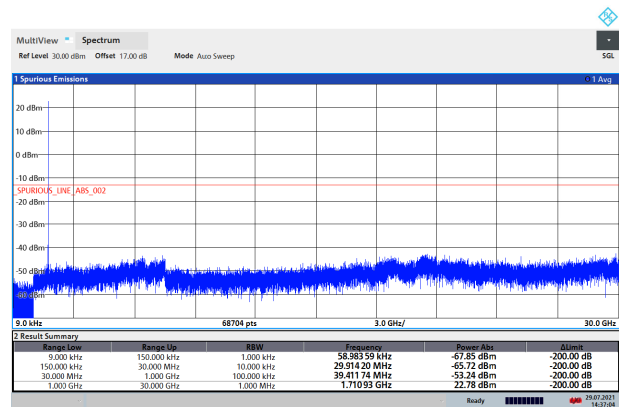


LTE Band 4 5MHz CH-Low 9kHz~30GHz



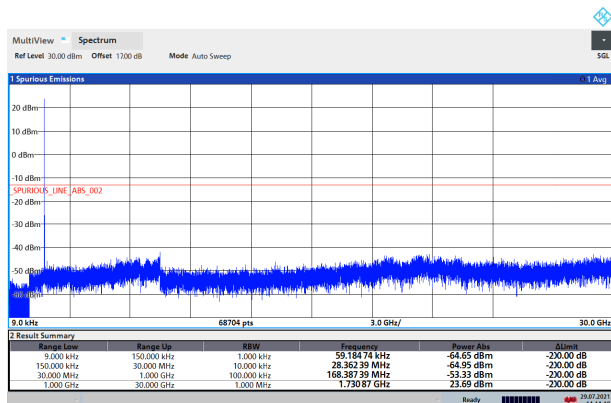
14:29:59 29.07.2021

LTE Band 4 10MHz CH-Low 9kHz~30GHz



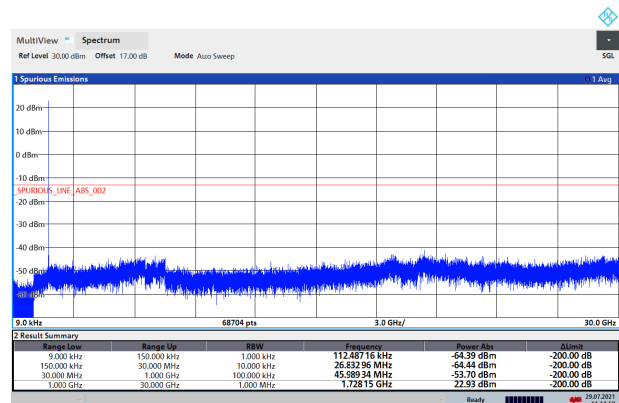
14:37:05 29.07.2021

LTE Band 4 5MHz CH-Middle 9kHz~30GHz



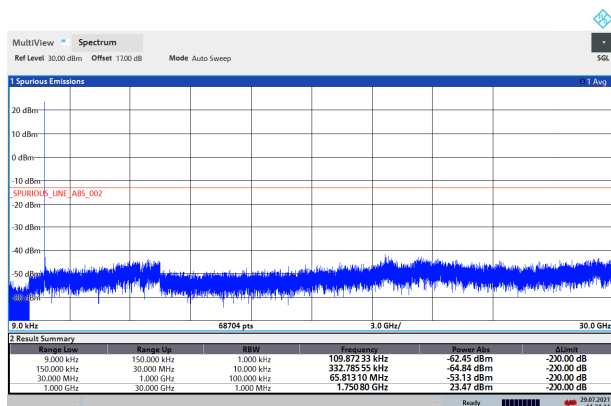
14:14:20 29.07.2021

LTE Band 4 10MHz CH-Middle 9kHz~30GHz



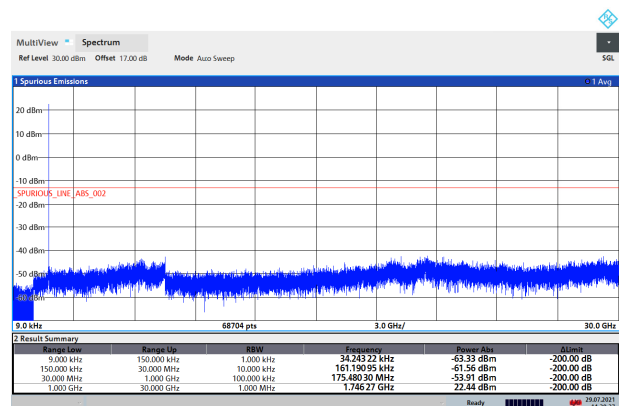
14:14:59 29.07.2021

LTE Band 4 5MHz CH-High 9kHz~30GHz



14:14:14 29.07.2021

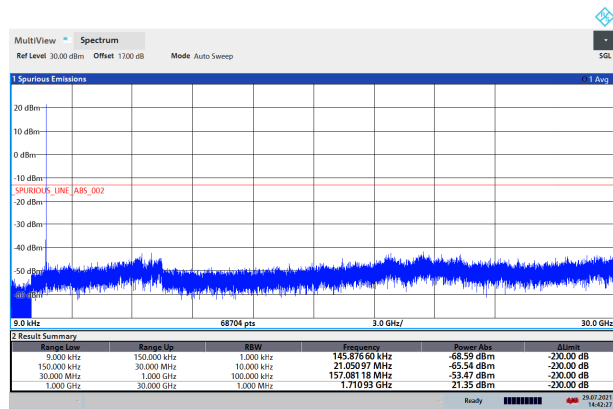
LTE Band 4 10MHz CH-High 9kHz~30GHz



14:19:37 29.07.2021

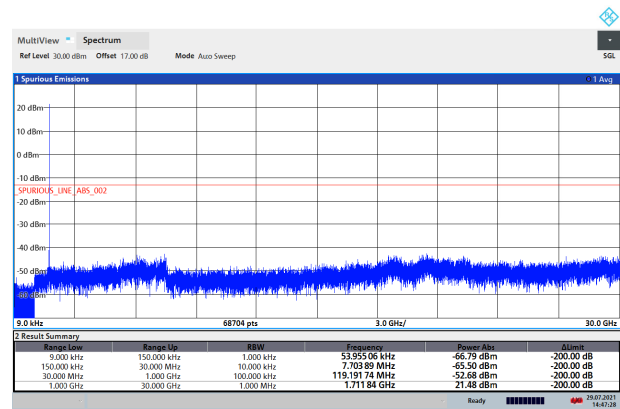


LTE Band 4 15MHz CH-Low 9kHz~30GHz



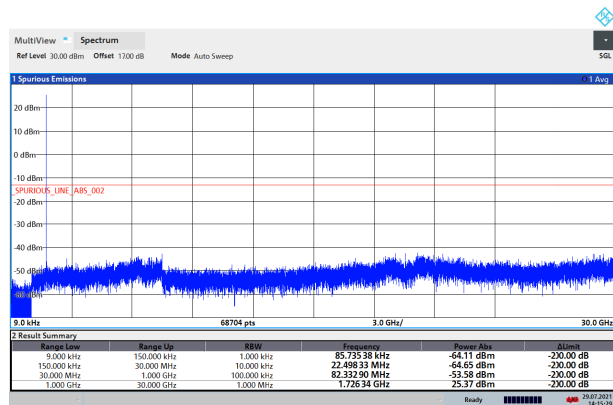
14:42:27 29.07.2021

LTE Band 4 20MHz CH-Low 9kHz~30GHz



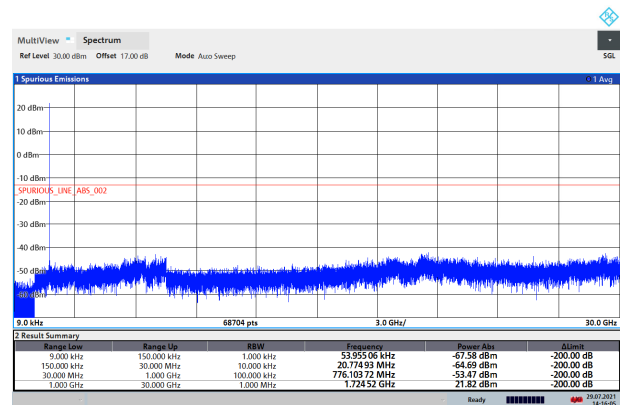
14:47:29 29.07.2021

LTE Band 4 15MHz CH-Middle 9kHz~30GHz



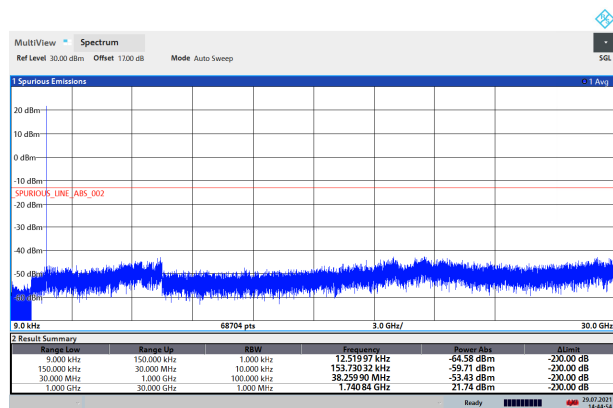
14:15:29 29.07.2021

LTE Band 4 20MHz CH-Middle 9kHz~30GHz



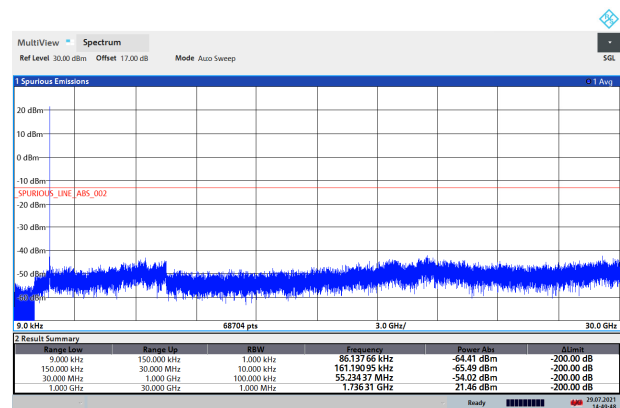
14:16:05 29.07.2021

LTE Band 4 15MHz CH-High 9kHz~30GHz



14:44:54 29.07.2021

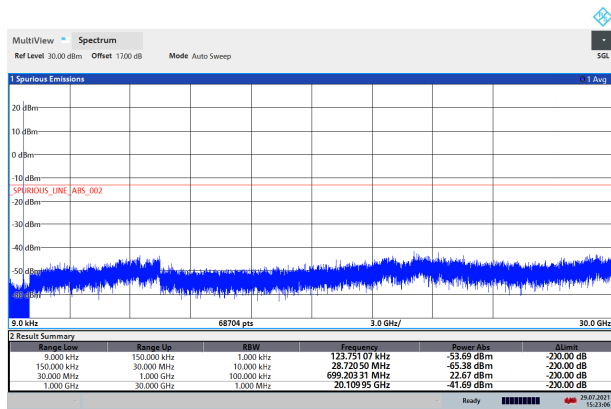
LTE Band 4 20MHz CH-High 9kHz~30GHz



14:49:48 29.07.2021

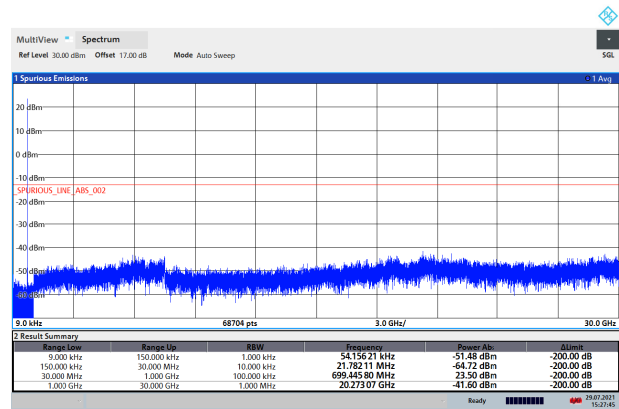


LTE Band 12 1.4MHz CH-Low 9kHz~30GHz



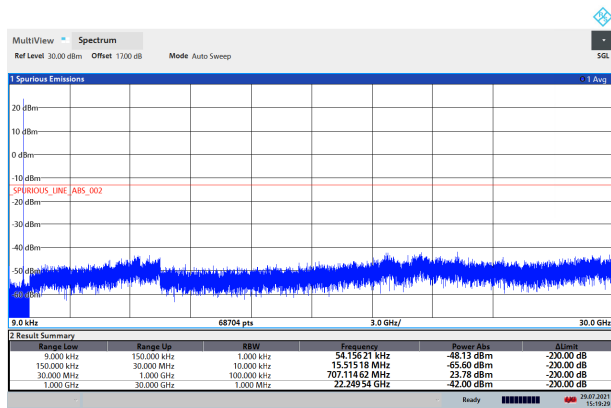
15:23:07 29.07.2021

LTE Band 12 3MHz CH-Low 9kHz~30GHz



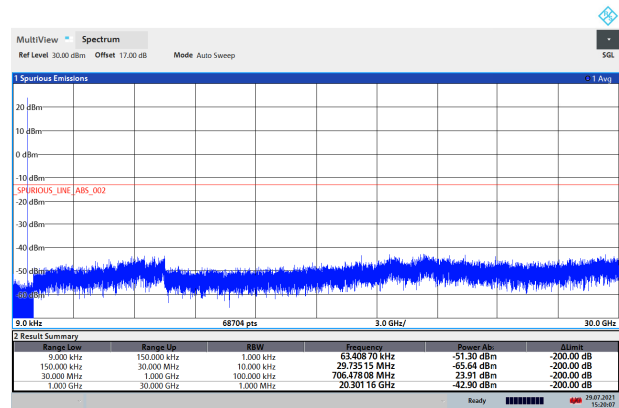
15:27:45 29.07.2021

LTE Band 12 1.4MHz CH-Middle 9kHz~30GHz



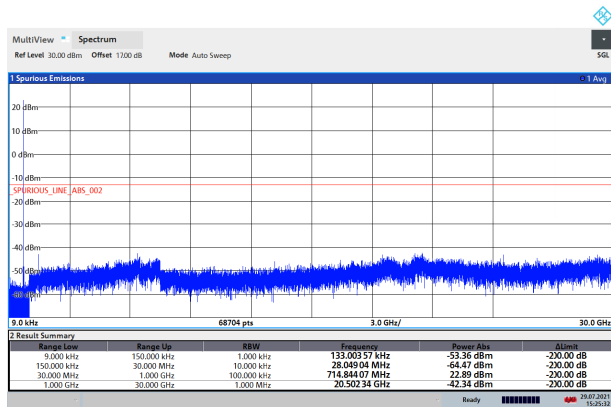
15:19:30 29.07.2021

LTE Band 12 3MHz CH-Middle 9kHz~30GHz



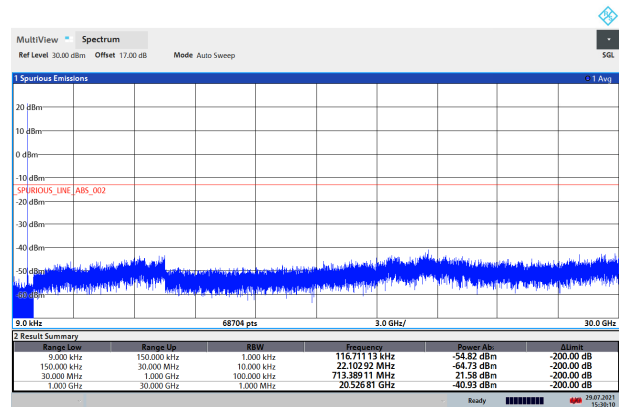
15:20:07 29.07.2021

LTE Band 12 1.4MHz CH-High 9kHz~30GHz



15:25:33 29.07.2021

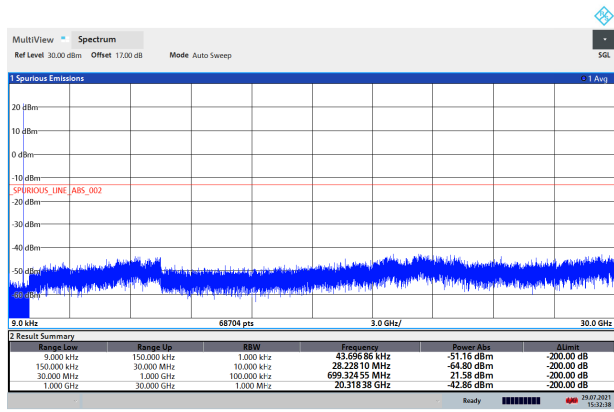
LTE Band 12 3MHz CH-High 9kHz~30GHz



15:30:10 29.07.2021

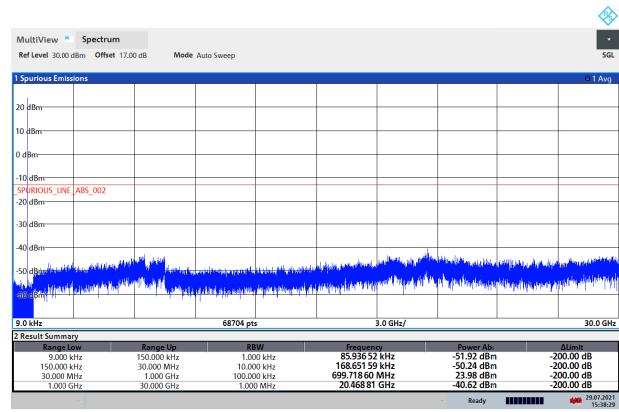


LTE Band 12 5MHz CH-Low 9kHz~30GHz



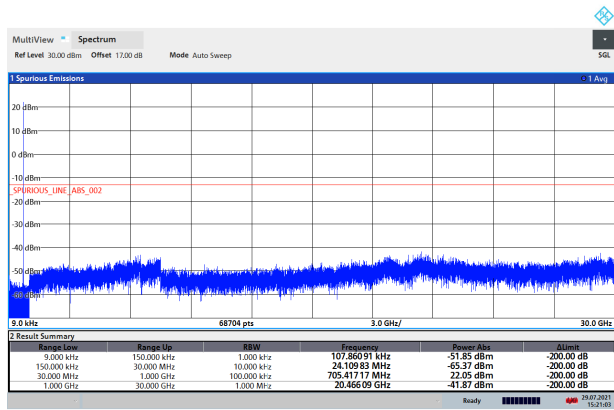
15:32:38 29.07.2021

LTE Band 12 10MHz CH-Low 9kHz~30GHz



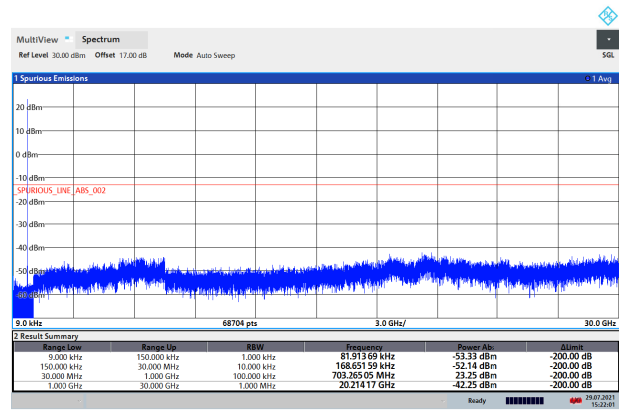
15:38:29 29.07.2021

LTE Band 12 5MHz CH-Middle 9kHz~30GHz



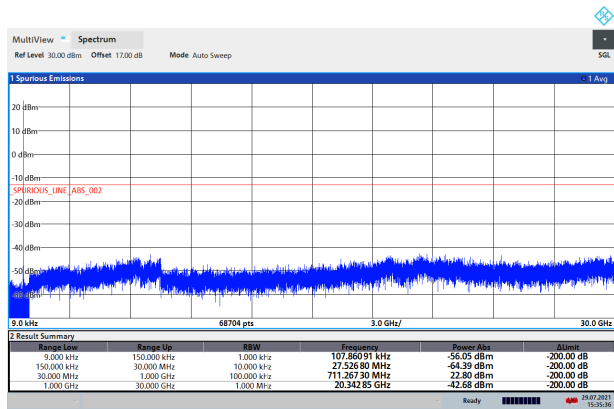
15:21:04 29.07.2021

LTE Band 12 10MHz CH-Middle 9kHz~30GHz



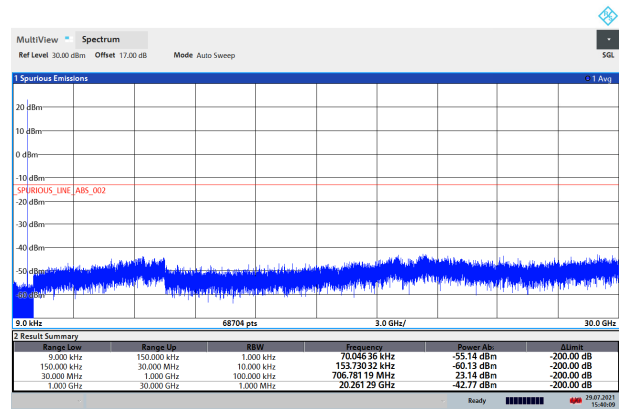
15:22:01 29.07.2021

LTE Band 12 5MHz CH-High 9kHz~30GHz



15:35:37 29.07.2021

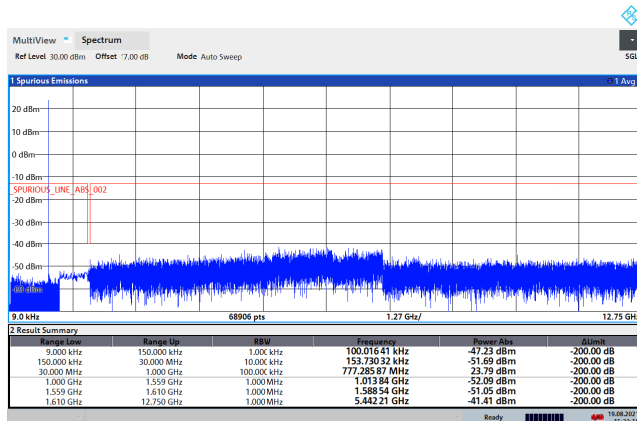
LTE Band 12 10MHz CH-High 9kHz~30GHz



15:40:09 29.07.2021

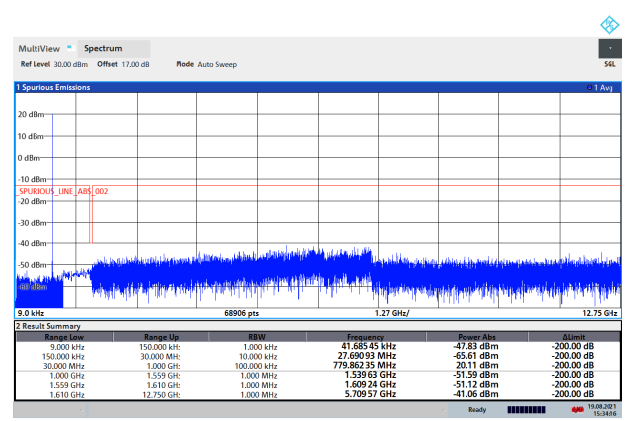


LTE Band 13 5MHz CH-Low 9kHz~12.75GHz



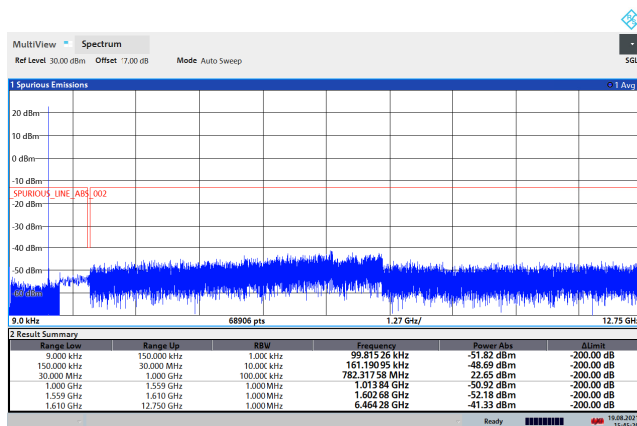
15:33:17 19.08.2021

LTE Band 13 5MHz CH-Middle 9kHz~12.75GHz



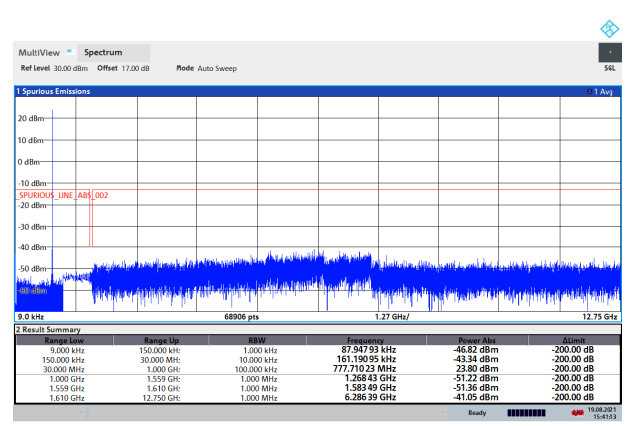
15:34:17 19.08.2021

LTE Band 13 5MHz CH-High 9kHz~12.75GHz



15:43:21 19.08.2021

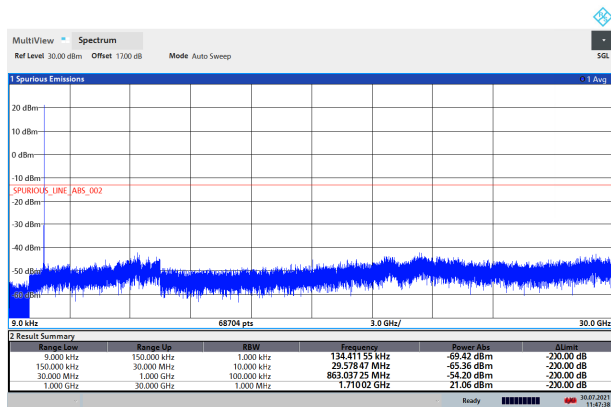
LTE Band 13 10MHz CH-Middle 9kHz~12.75GHz



15:43:14 19.08.2021

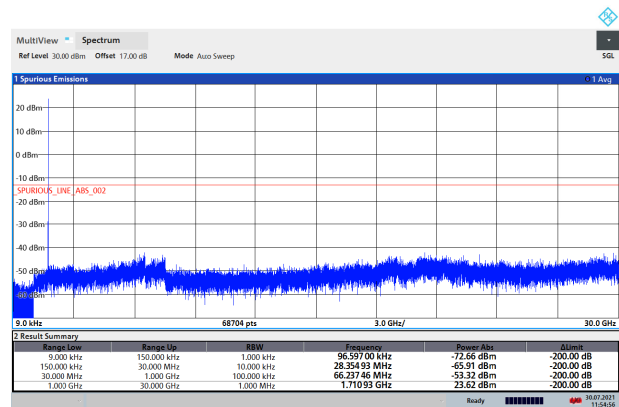


LTE Band 66 1.4MHz CH-Low 9kHz~30GHz



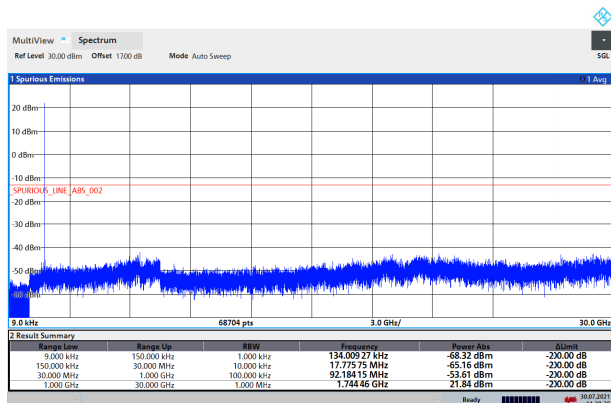
11:47:38 30.07.2021

LTE Band 66 3MHz CH-Low 9kHz~30GHz



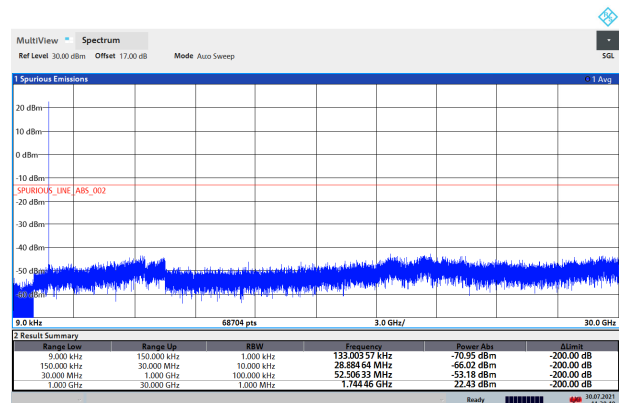
11:54:57 30.07.2021

LTE Band 66 1.4MHz CH-Middle 9kHz~30GHz



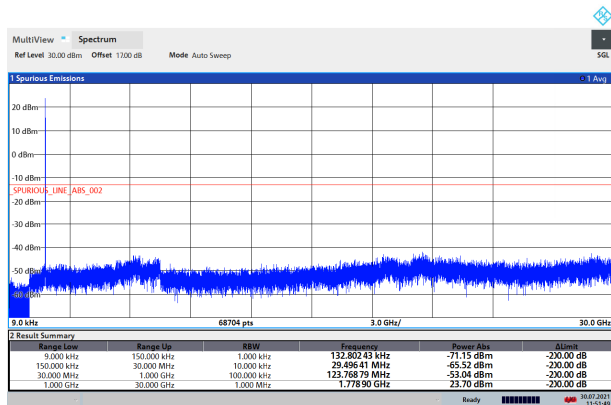
11:29:29 30.07.2021

LTE Band 66 3MHz CH-Middle 9kHz~30GHz



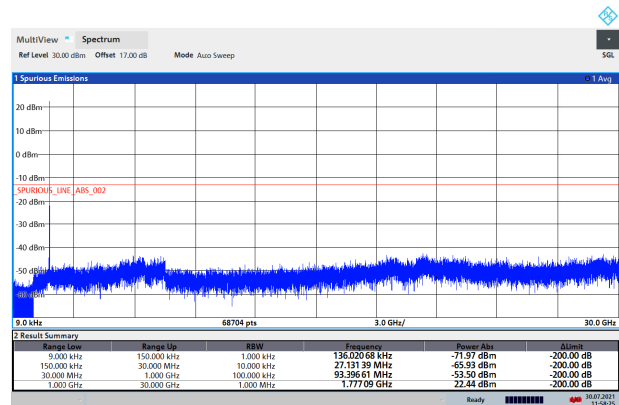
11:30:40 30.07.2021

LTE Band 66 1.4MHz CH-High 9kHz~30GHz



11:51:50 30.07.2021

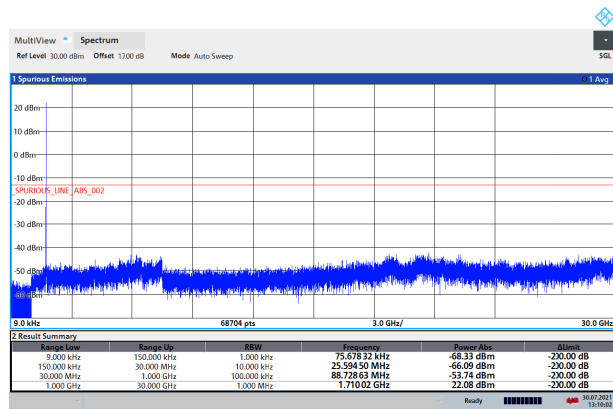
LTE Band 66 3MHz CH-High 9kHz~30GHz



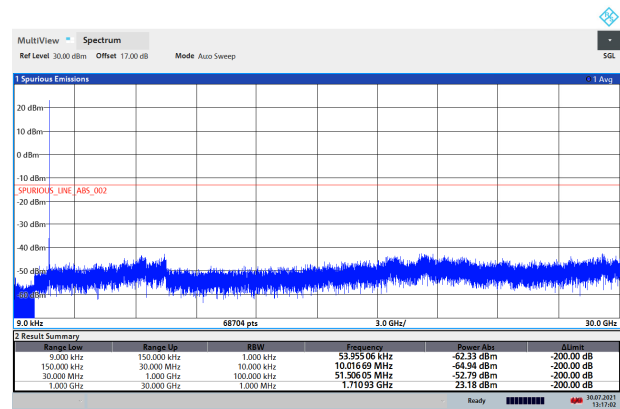
11:58:26 30.07.2021



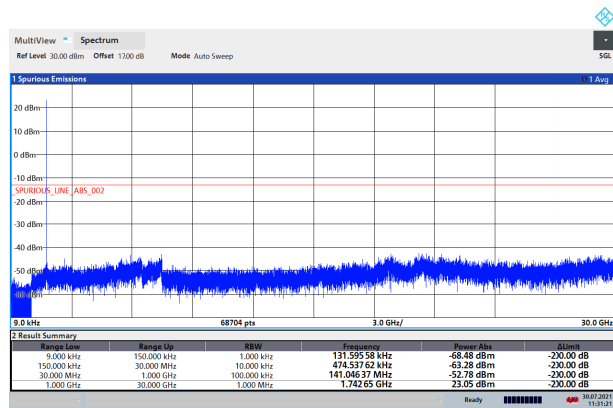
LTE Band 66 5MHz CH-Low 9kHz~30GHz



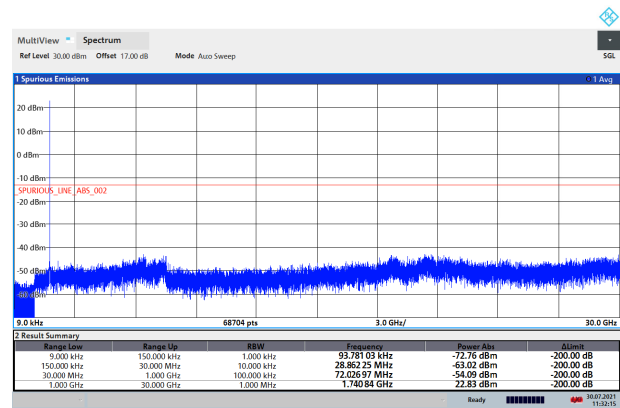
LTE Band 66 10MHz CH-Low 9kHz~30GHz



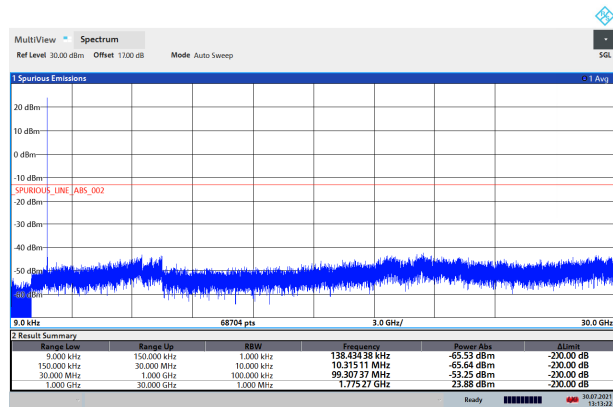
LTE Band 66 5MHz CH-Middle 9kHz~30GHz



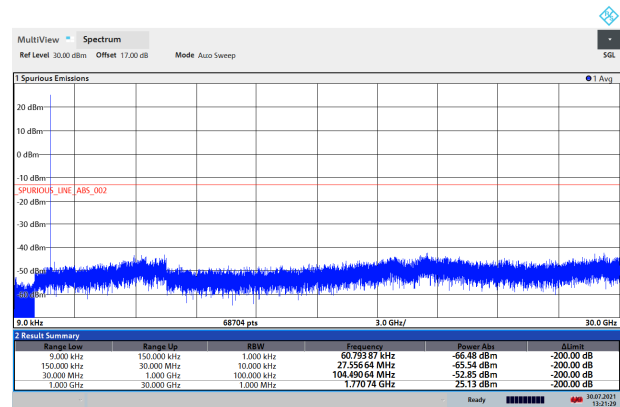
LTE Band 66 10MHz CH-Middle 9kHz~30GHz



LTE Band 66 5MHz CH-High 9kHz~30GHz

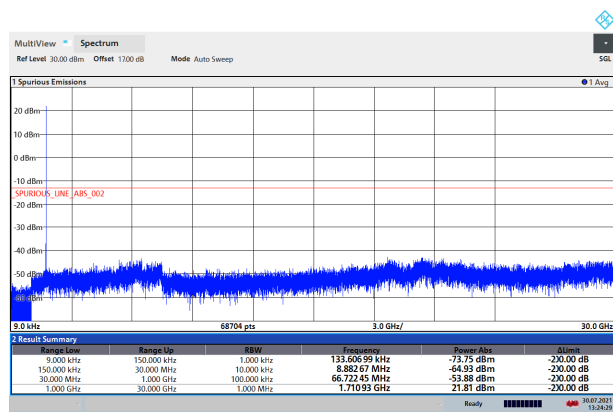


LTE Band 66 10MHz CH-High 9kHz~30GHz

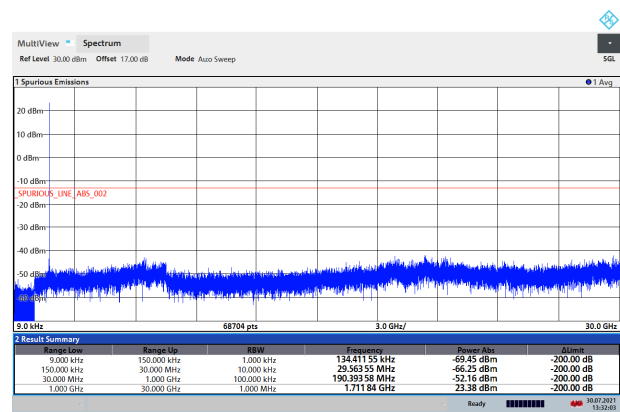




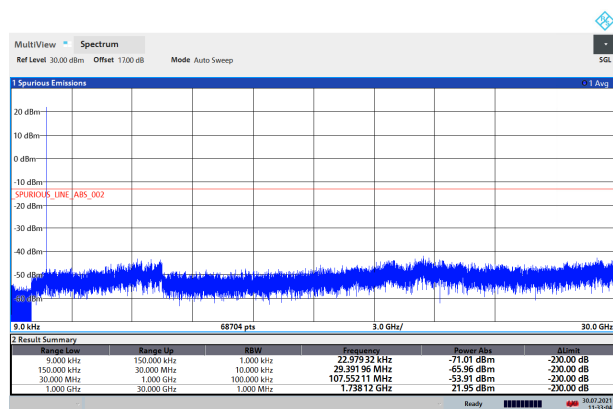
LTE Band 66 15MHz CH-Low 9kHz~30GHz



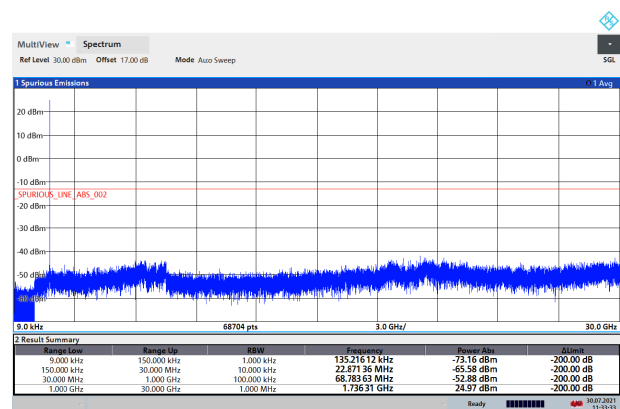
LTE Band 66 20MHz CH-Low 9kHz~30GHz



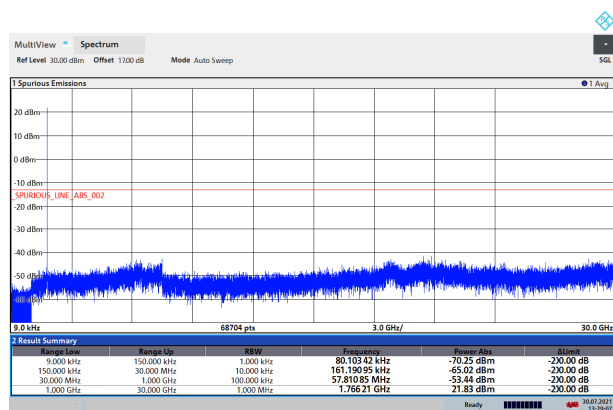
LTE Band 66 15MHz CH-Middle 9kHz~30GHz



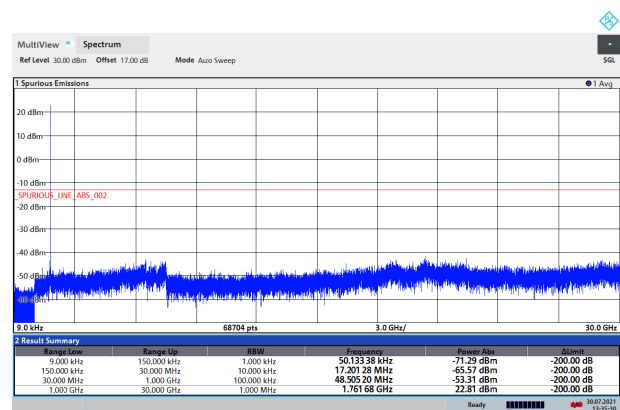
LTE Band 66 20MHz CH-Middle 9kHz~30GHz



LTE Band 66 15MHz CH-High 9kHz~30GHz



LTE Band 66 20MHz CH-High 9kHz~30GHz





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:
$$\text{Power(EIRP)} = \text{PMea} - \text{PAG} - \text{Pcl} + \text{Ga}$$

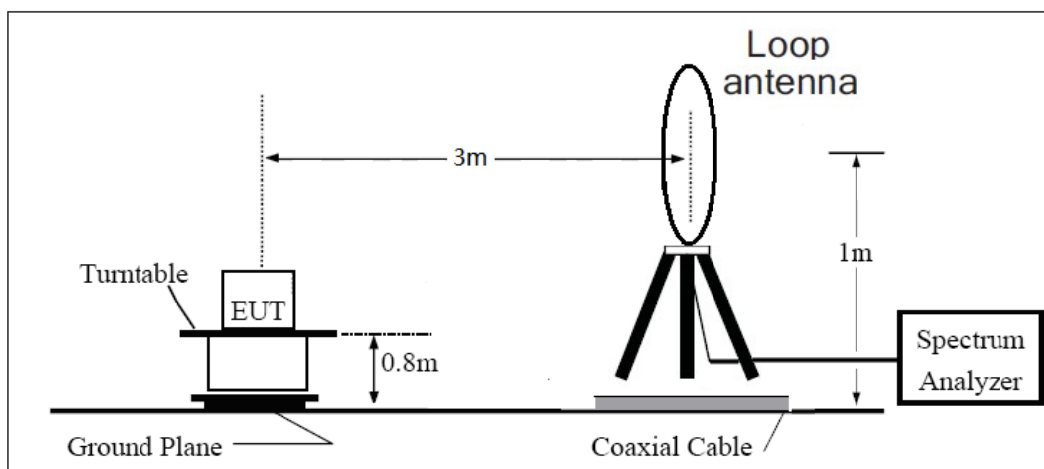
The measurement results are amend as described below:

$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
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, $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$.

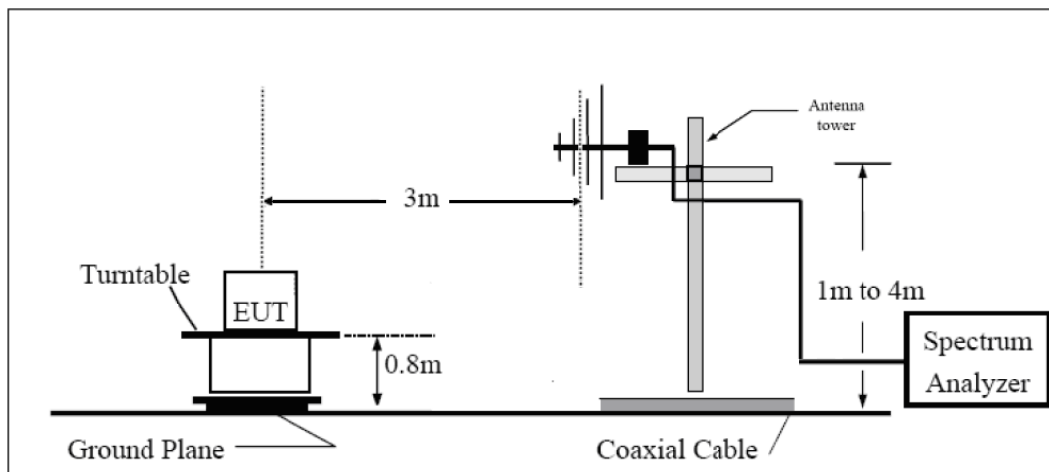
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

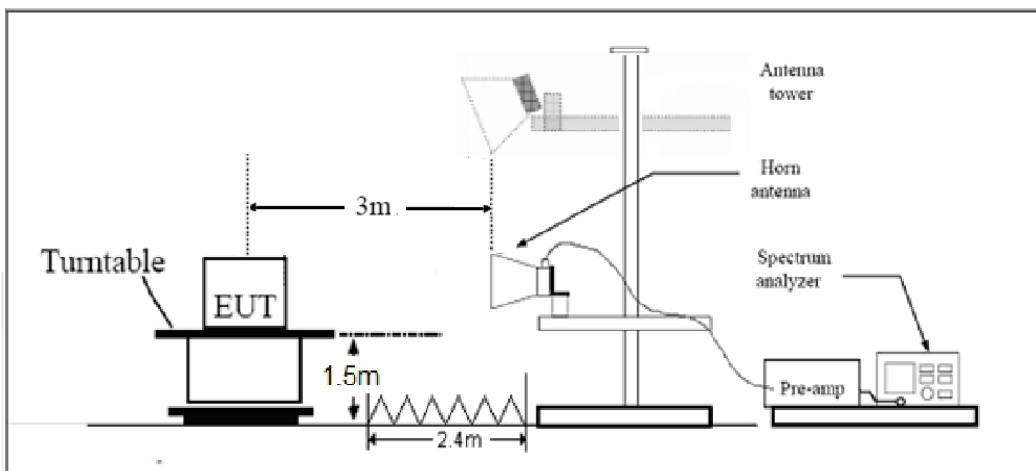
9KHz ~ 30MHz



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(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

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.

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

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3464.25	-55.36	2.70	12.70	Horizontal	-45.36	-13.00	32.36	45
3	5197.50	-42.06	3.20	12.50	Horizontal	-32.76	-13.00	19.76	270
4	6930.00	-51.69	4.20	11.80	Horizontal	-44.09	-13.00	31.09	90
5	8662.50	-56.06	4.40	12.50	Horizontal	-47.96	-13.00	34.96	135
6	10395.00	-49.83	4.70	11.30	Horizontal	-43.23	-13.00	30.23	90
7	12127.50	-50.85	5.20	13.80	Horizontal	-42.25	-13.00	29.25	0
8	13860.00	-50.23	5.70	11.30	Horizontal	-44.63	-13.00	31.63	90
9	15592.50	-51.38	6.10	16.80	Horizontal	-40.68	-13.00	27.68	180
10	17325.00	-48.44	6.10	14.20	Horizontal	-40.34	-13.00	27.34	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 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3460.50	-55.69	2.70	12.70	Horizontal	-45.69	-13.00	32.69	45
3	5191.50	-40.83	3.20	12.50	Horizontal	-31.53	-13.00	18.53	270
4	6930.00	-51.27	4.20	11.80	Horizontal	-43.67	-13.00	30.67	90
5	8662.50	-55.82	4.40	12.50	Horizontal	-47.72	-13.00	34.72	135
6	10395.00	-49.66	4.70	11.30	Horizontal	-43.06	-13.00	30.06	90
7	12127.50	-50.97	5.20	13.80	Horizontal	-42.37	-13.00	29.37	0
8	13860.00	-48.38	5.70	11.30	Horizontal	-42.78	-13.00	29.78	90
9	15592.50	-51.83	6.10	16.80	Horizontal	-41.13	-13.00	28.13	180
10	17325.00	-46.93	6.10	14.20	Horizontal	-38.83	-13.00	25.83	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	3447.75	-56.70	2.70	12.70	Horizontal	-46.70	-13.00	33.70	45
3	5170.88	-41.31	3.20	12.50	Horizontal	-32.01	-13.00	19.01	0
4	6930.00	-52.54	4.20	11.80	Horizontal	-44.94	-13.00	31.94	45
5	8662.50	-55.46	4.40	12.50	Horizontal	-47.36	-13.00	34.36	180
6	10395.00	-50.69	4.70	11.30	Horizontal	-44.09	-13.00	31.09	0
7	12127.50	-50.61	5.20	13.80	Horizontal	-42.01	-13.00	29.01	45
8	13860.00	-49.79	5.70	11.30	Horizontal	-44.19	-13.00	31.19	270
9	15592.50	-52.09	6.10	16.80	Horizontal	-41.39	-13.00	28.39	315
10	17325.00	-41.90	6.10	14.20	Horizontal	-33.80	-13.00	20.80	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 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	1415.00	-54.64	1.70	8.70	Horizontal	-49.79	-13.00	36.79	0
3	2122.50	-63.42	2.10	11.10	Horizontal	-56.57	-13.00	43.57	45
4	2830.00	-57.12	2.30	13.10	Horizontal	-48.47	-13.00	35.47	0
5	3537.50	-64.63	2.60	12.70	Horizontal	-56.68	-13.00	43.68	45
6	4245.00	-48.12	3.30	12.50	Horizontal	-41.07	-13.00	28.07	315
7	4952.50	-47.00	3.40	12.50	Horizontal	-40.05	-13.00	27.05	45
8	5660.00	-48.41	3.30	12.50	Horizontal	-41.36	-13.00	28.36	135
9	6367.50	-51.63	3.80	11.50	Horizontal	-46.08	-13.00	33.08	0
10	7075.00	-55.96	4.20	11.80	Horizontal	-50.51	-13.00	37.51	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 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	1410.60	-53.86	1.70	8.70	Horizontal	-49.01	-13.00	36.01	135
3	2115.90	-63.01	2.10	11.10	Horizontal	-56.16	-13.00	43.16	270
4	2821.20	-56.67	2.30	13.10	Horizontal	-48.02	-13.00	35.02	45
5	3512.50	-66.11	2.60	12.70	Horizontal	-58.16	-13.00	45.16	0
6	4215.00	-45.68	3.30	12.50	Horizontal	-38.63	-13.00	25.63	0
7	4917.50	-43.89	3.40	12.50	Horizontal	-36.94	-13.00	23.94	90
8	5620.00	-49.36	3.30	12.50	Horizontal	-42.31	-13.00	29.31	45
9	6322.50	-52.63	3.80	11.50	Horizontal	-47.08	-13.00	34.08	225
10	7025.00	-56.47	4.20	11.80	Horizontal	-51.02	-13.00	38.02	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 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	1406.40	-52.46	1.70	8.70	Horizontal	-47.61	-13.00	34.61	0
3	2109.60	-62.98	2.10	11.10	Horizontal	-56.13	-13.00	43.13	45
4	2812.80	-57.93	2.30	13.10	Horizontal	-49.28	-13.00	36.28	0
5	3537.50	-64.76	2.60	12.70	Horizontal	-56.81	-13.00	43.81	0
6	4245.00	-47.75	3.30	12.50	Horizontal	-40.70	-13.00	27.70	90
7	4952.50	-44.07	3.40	12.50	Horizontal	-37.12	-13.00	24.12	0
8	5660.00	-49.33	3.30	12.50	Horizontal	-42.28	-13.00	29.28	90
9	6367.50	-54.41	3.80	11.50	Horizontal	-48.86	-13.00	35.86	135
10	7075.00	-56.71	4.20	11.80	Horizontal	-51.26	-13.00	38.26	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 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	1564.00	-61.18	1.70	8.70	Horizontal	-56.33	-40.00	16.33	45
3	2346.00	-52.33	2.10	12.00	Horizontal	-44.58	-13.00	31.58	0
4	3120.00	-65.12	2.30	13.10	Horizontal	-56.47	-13.00	43.47	0
5	3901.00	-61.32	2.90	12.50	Horizontal	-53.87	-13.00	40.87	135
6	4692.00	-46.93	3.10	12.50	Horizontal	-39.68	-13.00	26.68	45
7	5474.00	-47.48	3.30	12.50	Horizontal	-40.43	-13.00	27.43	90
8	6256.00	-58.33	3.50	12.80	Horizontal	-51.18	-13.00	38.18	90
9	7038.00	-55.46	4.20	11.80	Horizontal	-50.01	-13.00	37.01	315
10	7820.00	-56.79	4.40	12.30	Horizontal	-51.04	-13.00	38.04	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 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	1555.25	-61.31	1.70	8.70	Horizontal	-56.46	-13.00	43.46	90
3	2346.00	-60.83	2.10	12.00	Horizontal	-53.08	-13.00	40.08	0
4	3128.00	-63.62	2.30	13.10	Horizontal	-54.97	-13.00	41.97	45
5	3910.00	-60.58	2.90	12.50	Horizontal	-53.13	-13.00	40.13	135
6	4692.00	-49.00	3.10	12.50	Horizontal	-41.75	-13.00	28.75	90
7	5474.00	-47.47	3.30	12.50	Horizontal	-40.42	-13.00	27.42	45
8	6256.00	-58.68	3.50	12.80	Horizontal	-51.53	-13.00	38.53	180
9	7038.00	-56.31	4.20	11.80	Horizontal	-50.86	-13.00	37.86	270
10	7820.00	-57.54	4.40	12.30	Horizontal	-51.79	-13.00	38.79	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	3509.25	-57.76	2.70	12.70	Horizontal	-47.76	-13.00	34.76	270
3	5262.50	-43.11	3.20	12.50	Horizontal	-33.81	-13.00	20.81	225
4	7018.00	-51.34	4.20	11.80	Horizontal	-43.74	-13.00	30.74	225
5	8772.50	-54.90	4.40	12.50	Horizontal	-46.80	-13.00	33.80	180
6	10527.00	-50.97	4.70	11.80	Horizontal	-43.87	-13.00	30.87	270
7	12281.50	-50.28	5.20	13.80	Horizontal	-41.68	-13.00	28.68	180
8	14036.00	-50.10	5.70	13.20	Horizontal	-42.60	-13.00	29.60	45
9	15790.50	-53.27	6.10	16.80	Horizontal	-42.57	-13.00	29.57	315
10	17545.00	-48.33	6.10	14.20	Horizontal	-40.23	-13.00	27.23	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	3486.00	-59.42	2.70	12.70	Horizontal	-49.42	-13.00	36.42	315
3	5229.00	-43.49	3.20	12.50	Horizontal	-34.19	-13.00	21.19	315
4	6972.00	-51.34	4.20	11.80	Horizontal	-43.74	-13.00	30.74	90
5	8715.00	-55.62	4.40	12.50	Horizontal	-47.52	-13.00	34.52	0
6	10458.00	-49.91	4.70	11.80	Horizontal	-42.81	-13.00	29.81	225
7	12201.00	-49.91	5.20	13.80	Horizontal	-41.31	-13.00	28.31	225
8	13944.00	-51.37	5.70	13.20	Horizontal	-43.87	-13.00	30.87	270
9	15687.00	-52.10	6.10	16.80	Horizontal	-41.40	-13.00	28.40	135
10	17430.00	-49.41	6.10	14.20	Horizontal	-41.31	-13.00	28.31	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 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	3472.88	-58.73	2.70	12.70	Horizontal	-48.73	-13.00	35.73	270
3	5209.00	-43.18	3.20	12.50	Horizontal	-33.88	-13.00	20.88	315
4	6945.75	-52.86	4.20	11.80	Horizontal	-45.26	-13.00	32.26	90
5	8682.00	-55.12	4.40	12.50	Horizontal	-47.02	-13.00	34.02	180
6	10418.63	-49.60	4.70	11.80	Horizontal	-42.50	-13.00	29.50	0
7	12455.00	-52.80	5.20	13.80	Horizontal	-44.20	-13.00	31.20	90
8	13891.50	-51.67	5.70	13.20	Horizontal	-44.17	-13.00	31.17	90
9	15627.00	-50.66	6.10	16.80	Horizontal	-39.96	-13.00	26.96	45
10	17364.38	-48.24	6.10	14.20	Horizontal	-40.14	-13.00	27.14	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	2021-05-15	2022-05-14
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Climate Chamber	Weiss	VT4002	582261194500 10	2021-05-15	2022-05-14
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	2018-08-11	2021-08-10
Horn Antenna	ETS-Lindgren	3160-09	00102644	2018-06-20	2023-06-19
Horn Antenna	STEATITE	QSH-SL-26-40- K-15	16779	2019-12-24	2022-12-23
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.



ANNEX C: Product Change Description

The Product Change Description are submitted separately.