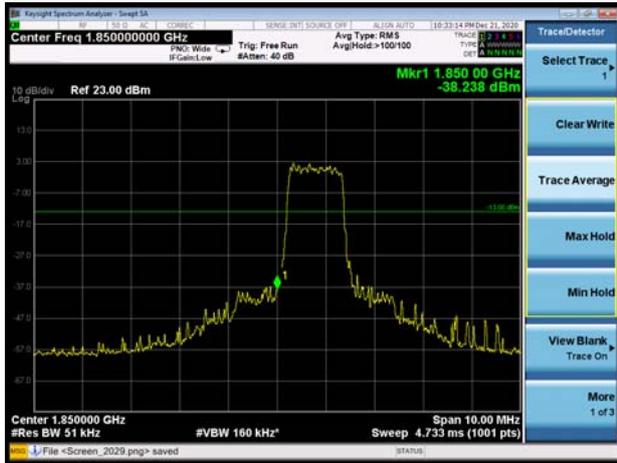




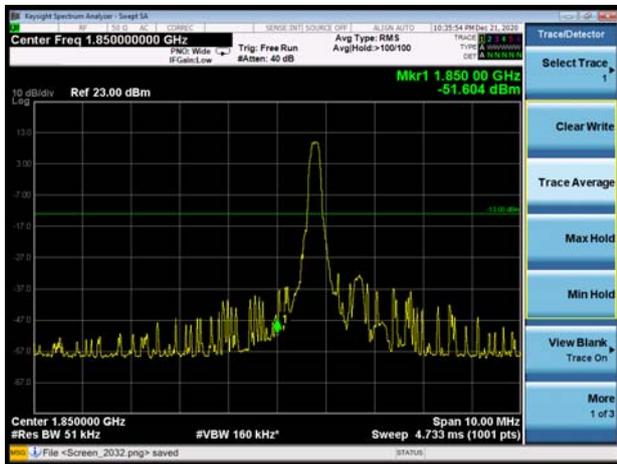
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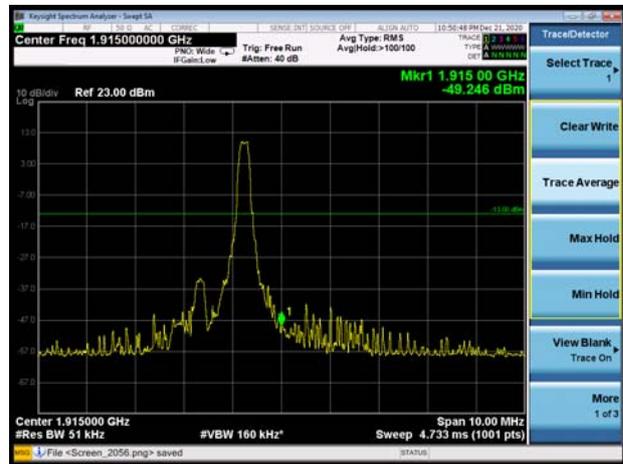
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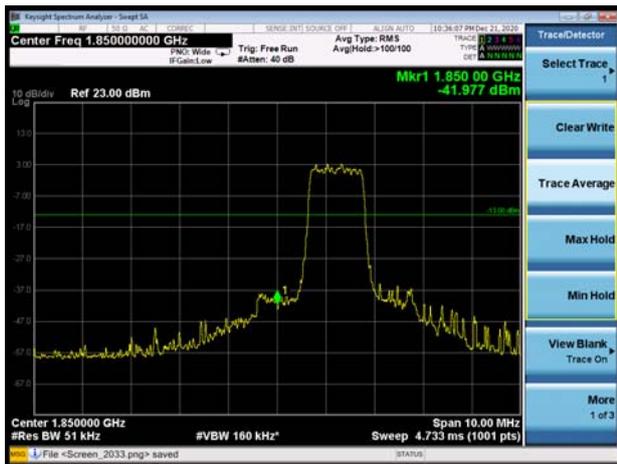
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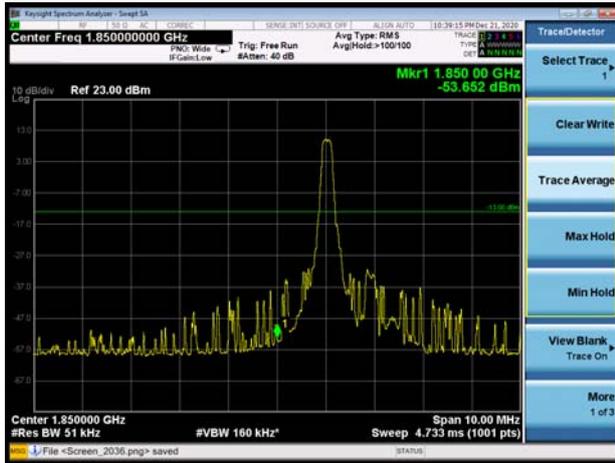
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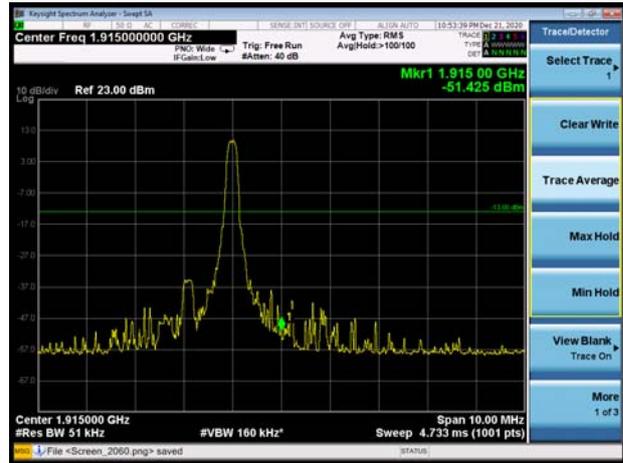
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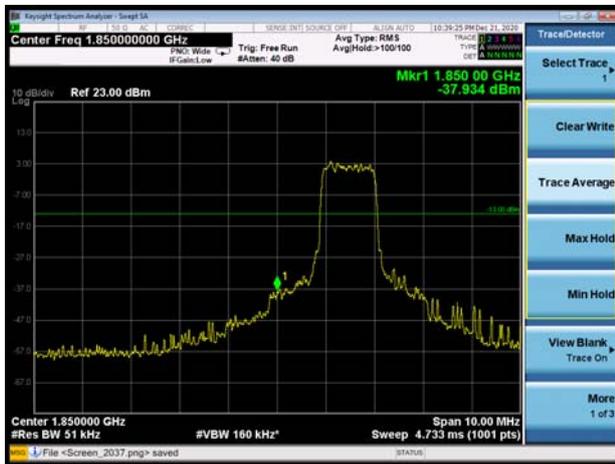
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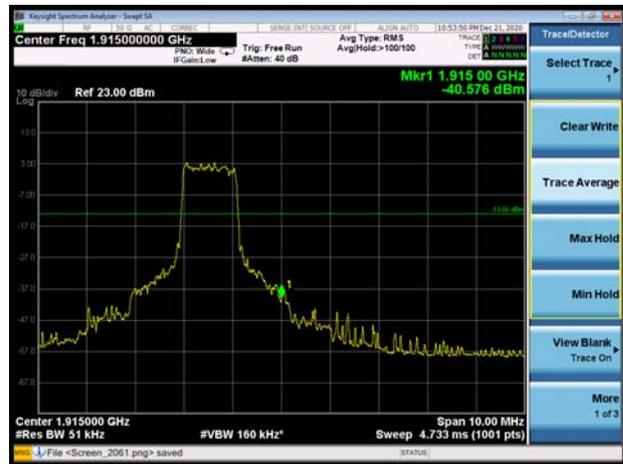
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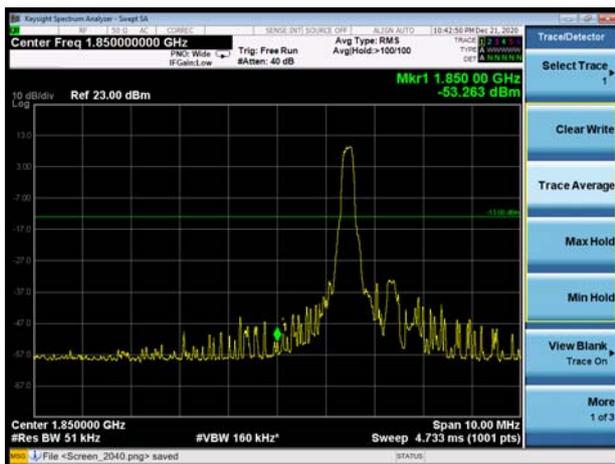
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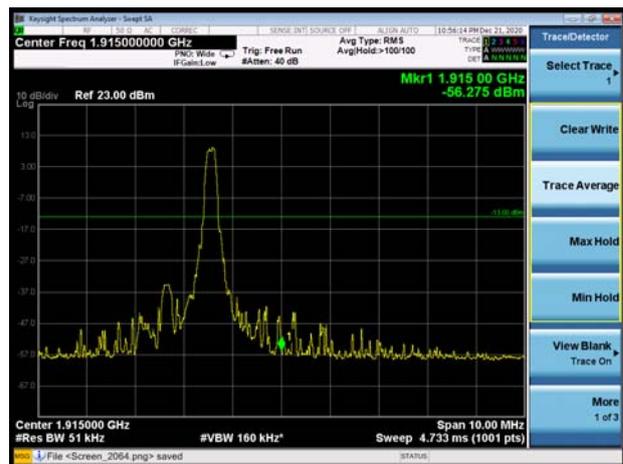
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LTE Band 25 20MHz QPSK 1RB CH-Low

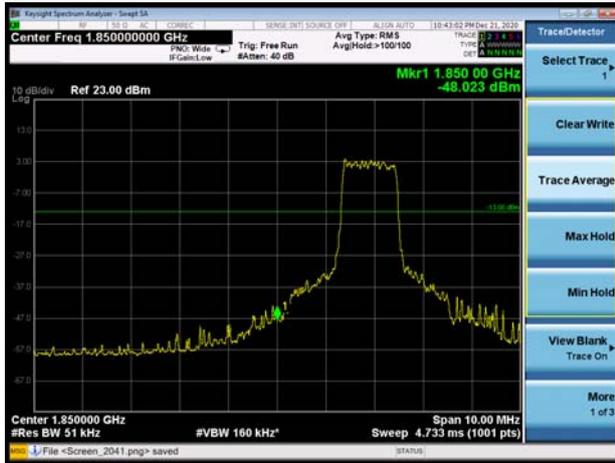


LTE Band 25 20MHz QPSK 1RB CH-High

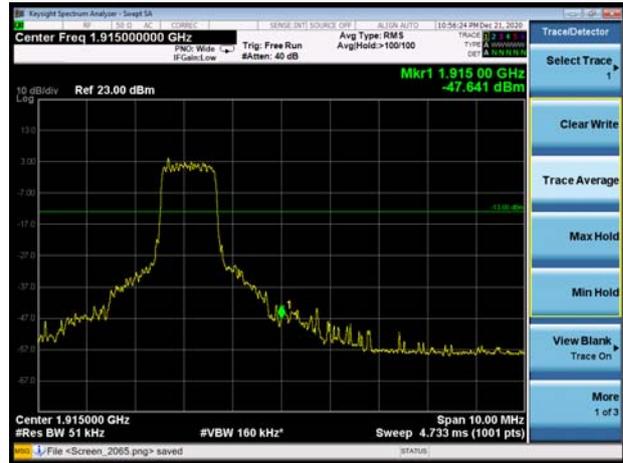




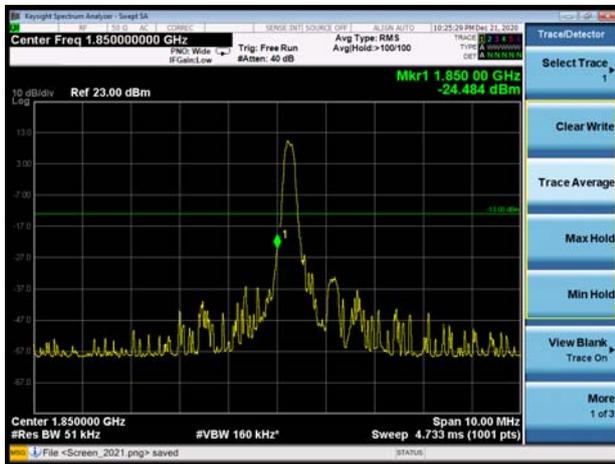
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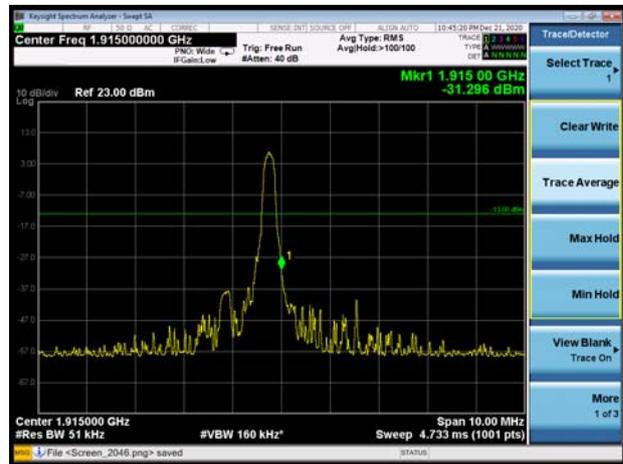
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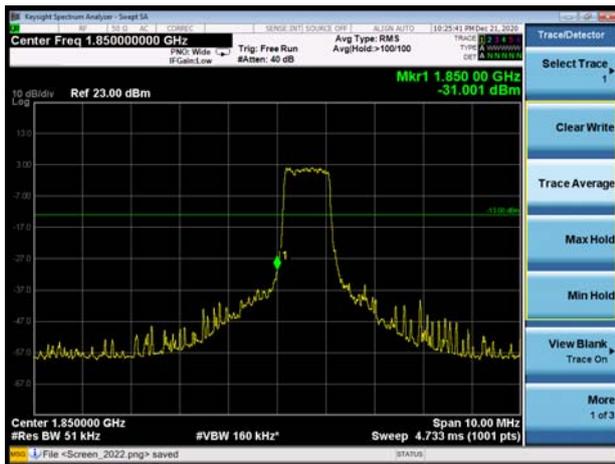
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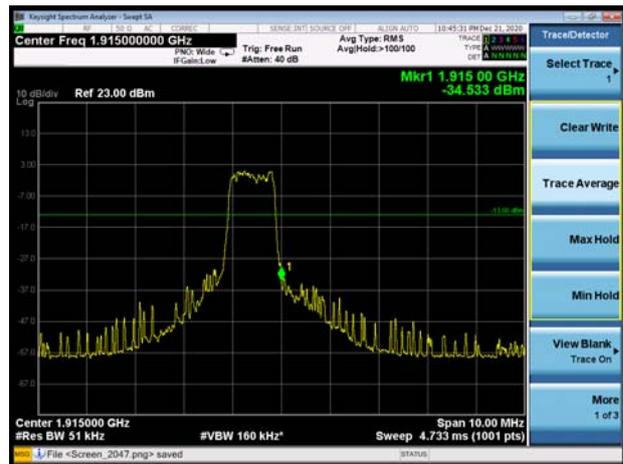
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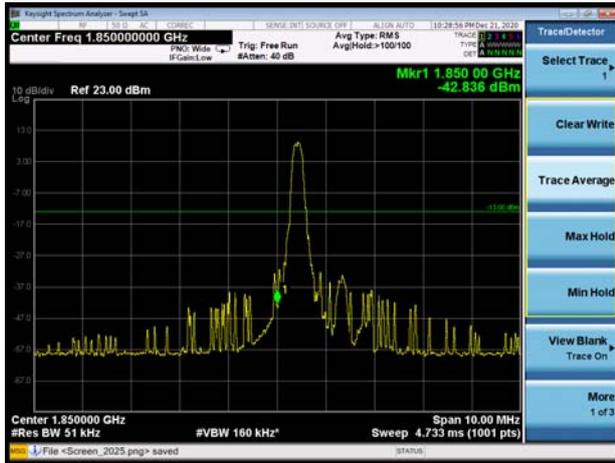
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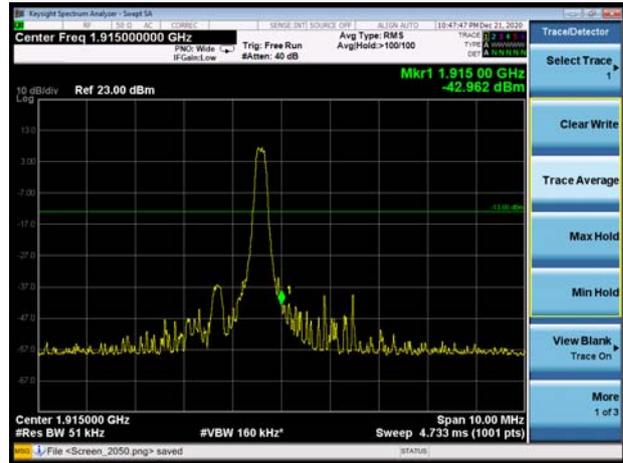
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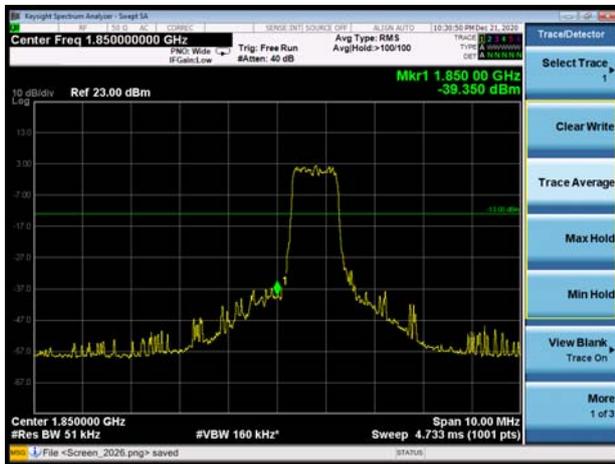
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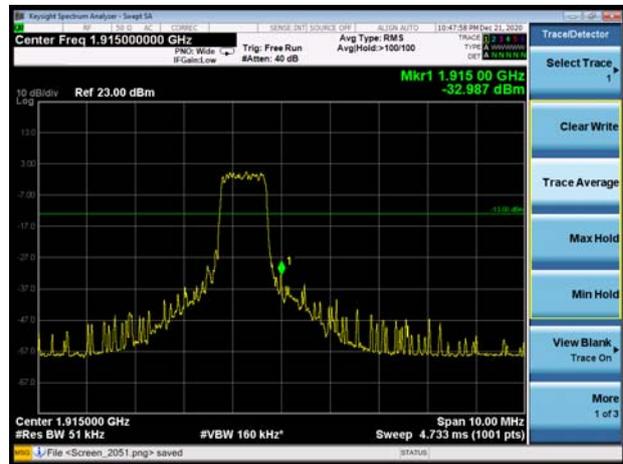
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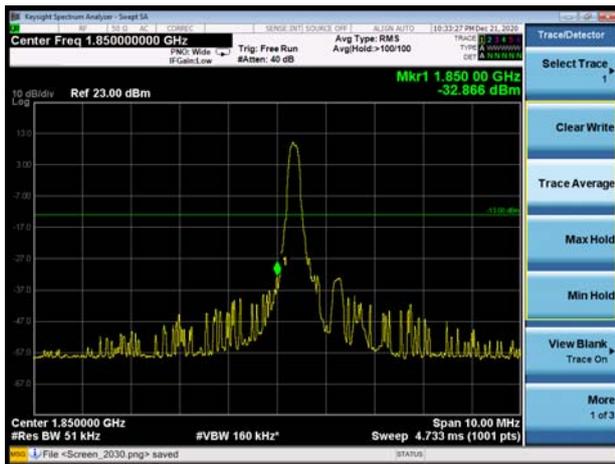
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LTE Band 25 3MHz 16QAM 100%RB CH-High



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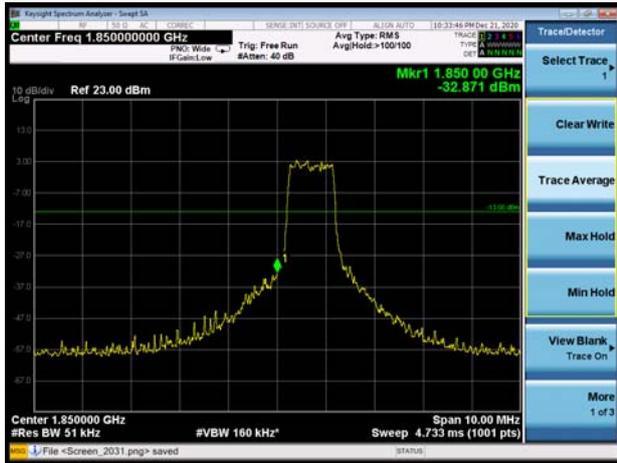


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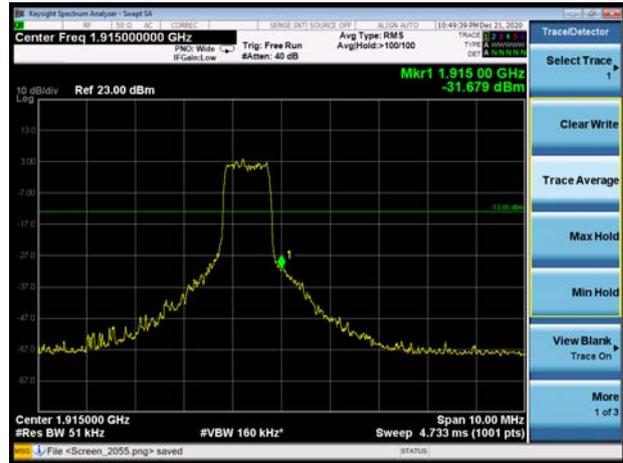




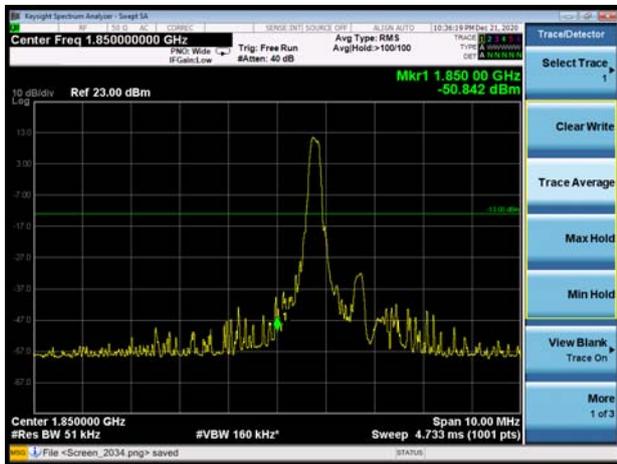
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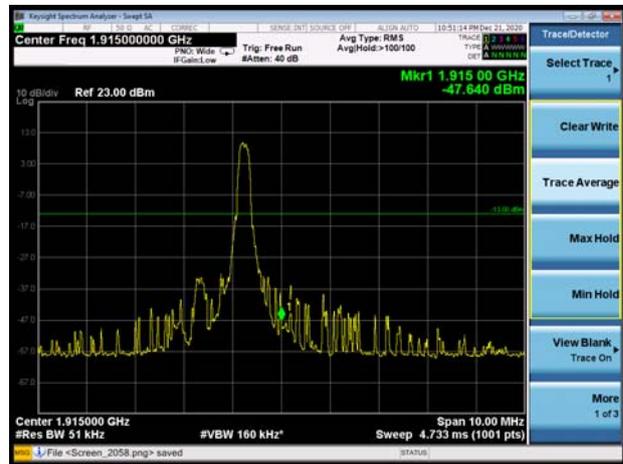
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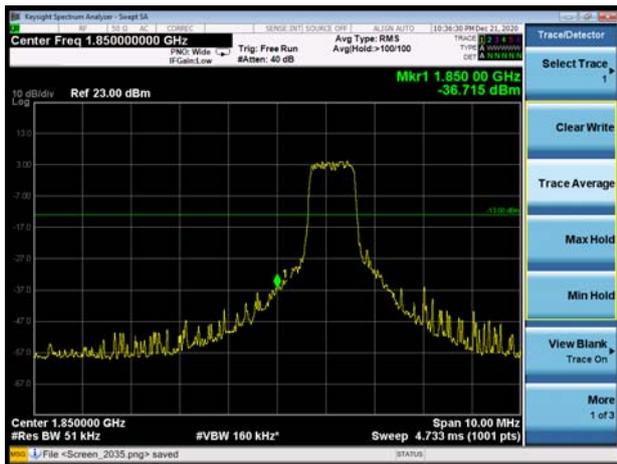
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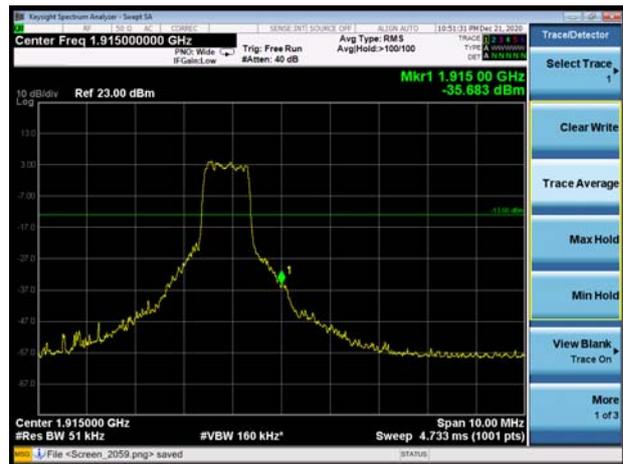
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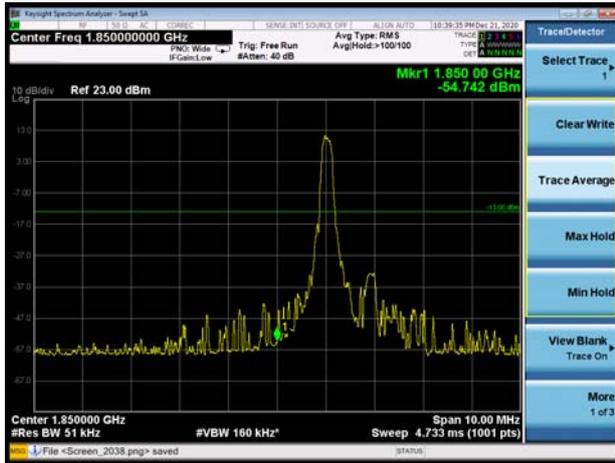
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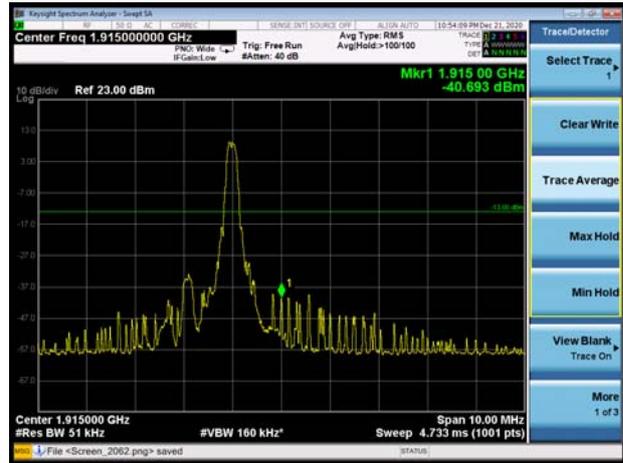
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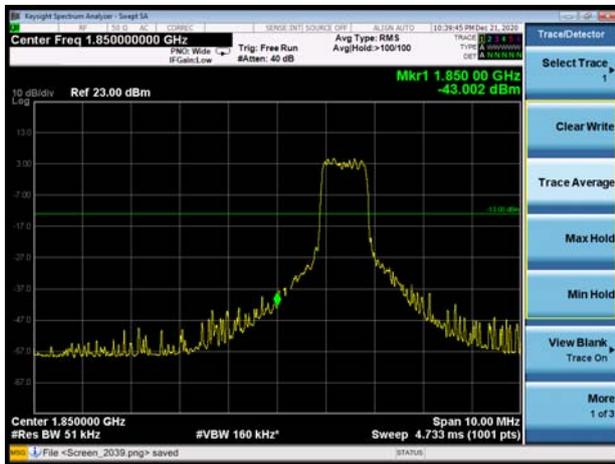
LTE Band 25 15MHz 16QAM 1RB CH-Low



LTE Band 25 15MHz 16QAM 1RB CH-High



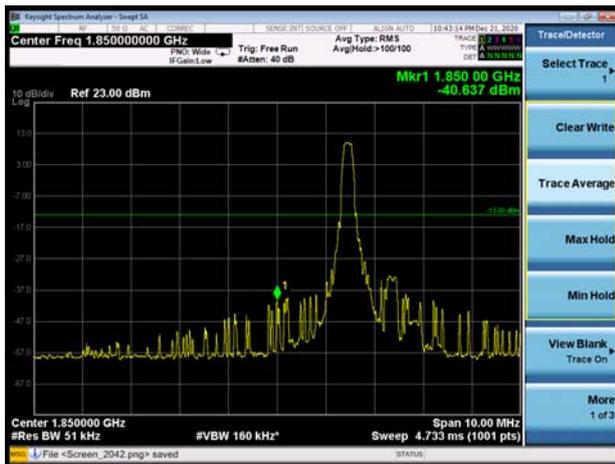
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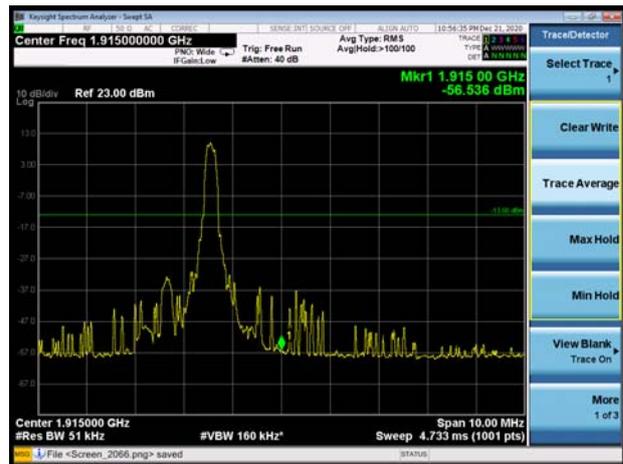
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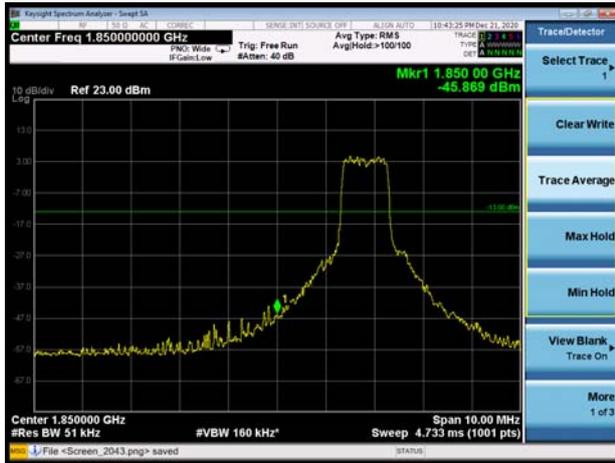
LTE Band 25 20MHz 16QAM 1RB CH-Low



LTE Band 25 20MHz 16QAM 1RB CH-High



LTE Band 25 20MHz 16QAM 100%RB CH-Low



LTE Band 25 20MHz 16QAM 100%RB CH-High



### 5.4. Peak-to-Average Power Ratio (PAPR)

#### Ambient condition

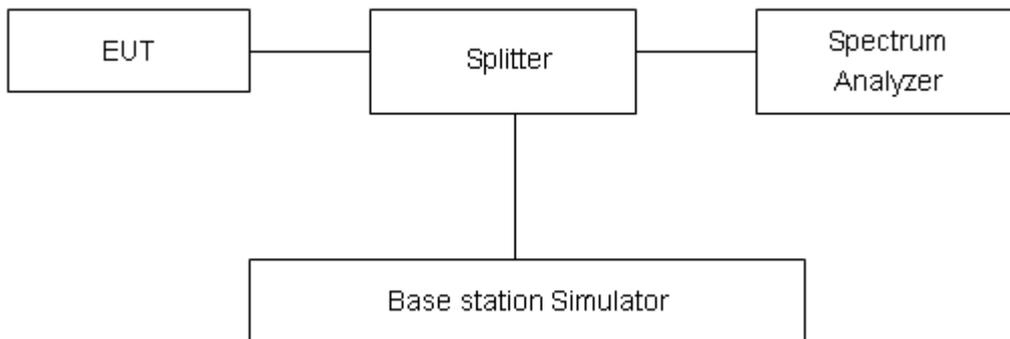
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### Methods of Measurement

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

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

#### Test Setup



#### Limits

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 in 24.232(d).

#### 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	Modulation	Sub-carrier spacing (kHz)	Channel/Frequency(MHz)	Peak-to-Average Power Ratio (PAPR)			Limit (dB)	Conclusion
				Peak(dBm)	Avg(dBm)	PAPR(dB)		
NB-IOT Band 2	BPSK	3.75	18900/1880.0	23.22	18.44	4.78	≤13	PASS
	QPSK	3.75	18900/1880.0	22.57	18.45	4.12	≤13	PASS
	BPSK	15	18900/1880.0	22.71	15.50	7.21	≤13	PASS
	QPSK	15	18900/1880.0	22.33	15.49	6.84	≤13	PASS

Mode	Modulation	Sub-carrier spacing (kHz)	Channel/Frequency(MHz)	Peak-to-Average Power Ratio (PAPR)			Limit (dB)	Conclusion
				Peak(dBm)	Avg(dBm)	PAPR(dB)		
NB-IOT Band 25	BPSK	3.75	26365/1882.5	28.59	23.82	4.77	≤13	PASS
	QPSK	3.75	26365/1882.5	28.11	20.94	7.17	≤13	PASS
	BPSK	15	26365/1882.5	27.97	23.81	4.16	≤13	PASS
	QPSK	15	26365/1882.5	27.77	20.91	6.86	≤13	PASS

Mode	Bandwidth	Modulation	Channel/Frequency (MHz)	Peak-to-Average Power Ratio (PAPR)			Limit (dB)	Conclusion
				Peak (dBm)	Avg (dBm)	PAPR (dB)		
LTE Band 2	1.4MHz	QPSK	18900/1880	22.76	12.93	9.83	≤13	PASS
		16QAM	18900/1880	23.40	12.57	10.83	≤13	PASS
	3MHz	QPSK	18900/1880	22.60	12.42	10.18	≤13	PASS
		16QAM	18900/1880	23.49	12.96	10.53	≤13	PASS
	5MHz	QPSK	18900/1880	23.53	13.89	9.64	≤13	PASS
		16QAM	18900/1880	24.20	14.06	10.14	≤13	PASS
	10MHz	QPSK	18900/1880	23.33	13.71	9.62	≤13	PASS
		16QAM	18900/1880	24.56	14.94	9.62	≤13	PASS
	15MHz	QPSK	18900/1880	24.27	15.08	9.19	≤13	PASS
		16QAM	18900/1880	24.76	15.48	9.28	≤13	PASS
	20MHz	QPSK	18900/1880	24.31	15.21	9.10	≤13	PASS
		16QAM	18900/1880	24.82	15.43	9.39	≤13	PASS



Mode	Bandwidth	Modulation	Channel/ Frequency (MHz)	Peak-to-Average Power Ratio (PAPR)			Limit (dB)	Conclusion
				Peak (dBm)	Avg (dBm)	PAPR (dB)		
LTE Band 25	1.4MHz	QPSK	26365/1882.5	23.27	13.42	9.85	≤13	PASS
		16QAM	26365/1882.5	23.89	13.58	10.31	≤13	PASS
	3MHz	QPSK	26365/1882.5	23.09	13.10	9.99	≤13	PASS
		16QAM	26365/1882.5	23.73	13.29	10.44	≤13	PASS
	5MHz	QPSK	26365/1882.5	23.93	14.28	9.65	≤13	PASS
		16QAM	26365/1882.5	24.54	14.72	9.82	≤13	PASS
	10MHz	QPSK	26365/1882.5	23.88	14.59	9.29	≤13	PASS
		16QAM	26365/1882.5	24.91	15.37	9.54	≤13	PASS
	15MHz	QPSK	26365/1882.5	24.48	15.57	8.91	≤13	PASS
		16QAM	26365/1882.5	24.96	16.04	8.92	≤13	PASS
	20MHz	QPSK	26365/1882.5	24.52	15.76	8.76	≤13	PASS
		16QAM	26365/1882.5	24.93	15.66	9.27	≤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 0°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.

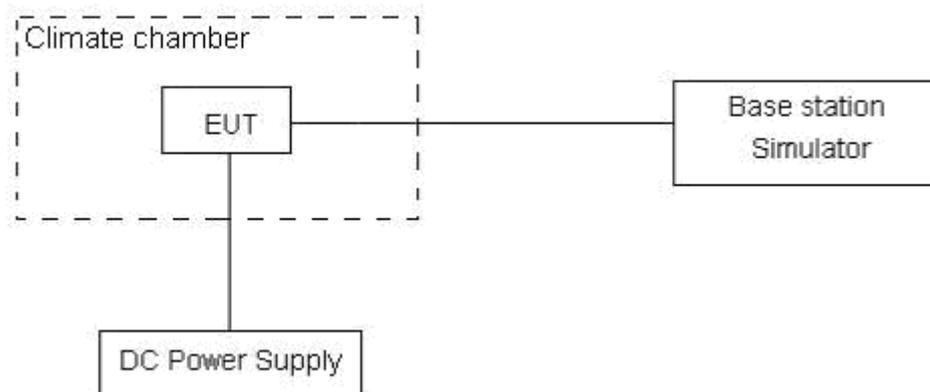
#### Frequency Stability (Voltage Variation)

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 3.23V and 4.37 V, with a nominal voltage of 3.8V.

### Test setup



**Limits**

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block

**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**

NB-IOT Band 2						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Sub-carrier spacing	3.75kHz					
Temperature	Voltage	BPSK	QPSK	BPSK	QPSK	
Normal (25°C)	Normal	15.50	17.21	0.00824	0.00916	PASS
Extreme (50°C)		13.60	11.10	0.00723	0.00590	PASS
Extreme (40°C)		12.40	17.93	0.00660	0.00954	PASS
Extreme (30°C)		6.92	5.44	0.00368	0.00289	PASS
Extreme (20°C)		6.87	4.34	0.00366	0.00231	PASS
Extreme (10°C)		7.60	17.92	0.00404	0.00953	PASS
Extreme (0°C)		2.58	13.41	0.00137	0.00713	PASS
Extreme (-10°C)		16.29	5.91	0.00867	0.00315	PASS
Extreme (-20°C)		7.80	9.96	0.00415	0.00530	PASS
Extreme (-30°C)		17.25	14.88	0.00918	0.00792	PASS
25°C	LV	17.24	15.02	0.00917	0.00799	PASS
	HV	3.16	15.41	0.00168	0.00820	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Sub-carrier spacing	15kHz					
Temperature	Voltage	BPSK	QPSK	BPSK	QPSK	
Normal (25°C)	Normal	1.18	12.11	0.00063	0.00644	PASS
Extreme (50°C)		10.81	2.48	0.00575	0.00132	PASS
Extreme (40°C)		10.23	6.12	0.00544	0.00326	PASS
Extreme (30°C)		14.76	1.50	0.00785	0.00080	PASS
Extreme (20°C)		7.03	9.89	0.00374	0.00526	PASS
Extreme (10°C)		7.44	6.37	0.00396	0.00339	PASS
Extreme (0°C)		14.27	16.53	0.00759	0.00879	PASS
Extreme (-10°C)		1.35	14.40	0.00072	0.00766	PASS
Extreme (-20°C)		9.64	10.83	0.00513	0.00576	PASS
Extreme (-30°C)		13.04	4.00	0.00694	0.00213	PASS
25°C	LV	4.07	6.95	0.00217	0.00370	PASS
	HV	16.99	17.24	0.00904	0.00917	PASS



NB-IOT Band 25						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Sub-carrier spacing	3.75kHz					
Temperature	Voltage	BPSK	QPSK	BPSK	QPSK	
Normal (25°C)	Normal	1.08	17.60	0.00058	0.00936	PASS
Extreme (50°C)		17.94	12.13	0.00954	0.00645	PASS
Extreme (40°C)		17.47	6.62	0.00929	0.00352	PASS
Extreme (30°C)		11.62	17.83	0.00618	0.00948	PASS
Extreme (20°C)		14.30	6.62	0.00761	0.00352	PASS
Extreme (10°C)		16.90	14.59	0.00899	0.00776	PASS
Extreme (0°C)		3.89	4.32	0.00207	0.00230	PASS
Extreme (-10°C)		16.06	6.57	0.00854	0.00350	PASS
Extreme (-20°C)		16.38	12.81	0.00871	0.00681	PASS
Extreme (-30°C)		4.45	13.22	0.00237	0.00703	PASS
25°C	LV	5.70	14.48	0.00303	0.00770	PASS
	HV	6.39	8.36	0.00340	0.00445	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Sub-carrier spacing	15kHz					
Temperature	Voltage	BPSK	QPSK	BPSK	QPSK	
Normal (25°C)	Normal	13.20	9.17	0.00702	0.00488	PASS
Extreme (50°C)		1.51	8.23	0.00080	0.00438	PASS
Extreme (40°C)		3.82	4.52	0.00203	0.00241	PASS
Extreme (30°C)		12.68	13.50	0.00675	0.00718	PASS
Extreme (20°C)		4.22	6.78	0.00225	0.00360	PASS
Extreme (10°C)		1.38	15.61	0.00073	0.00831	PASS
Extreme (0°C)		14.04	15.25	0.00747	0.00811	PASS
Extreme (-10°C)		5.54	12.76	0.00295	0.00679	PASS
Extreme (-20°C)		15.80	4.78	0.00840	0.00254	PASS
Extreme (-30°C)		11.99	8.45	0.00638	0.00449	PASS
25°C	LV	6.96	2.99	0.00370	0.00159	PASS
	HV	15.78	13.89	0.00839	0.00739	PASS



LTE Band 2						
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°C)	Normal	2.62	17.65	0.00139	0.00939	PASS
Extreme (50°C)		12.35	17.27	0.00657	0.00919	PASS
Extreme (40°C)		4.44	2.37	0.00236	0.00126	PASS
Extreme (30°C)		6.41	12.29	0.00341	0.00654	PASS
Extreme (20°C)		13.00	9.46	0.00692	0.00503	PASS
Extreme (10°C)		8.72	17.35	0.00464	0.00923	PASS
Extreme (0°C)		6.60	15.18	0.00351	0.00807	PASS
Extreme (-10°C)		2.35	16.00	0.00125	0.00851	PASS
Extreme (-20°C)		9.96	15.31	0.00530	0.00814	PASS
Extreme (-30°C)		11.11	8.35	0.00591	0.00444	PASS
25°C	LV	5.49	11.89	0.00292	0.00632	PASS
	HV	7.66	4.83	0.00407	0.00257	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°C)	Normal	6.60	3.32	0.00351	0.00177	PASS
Extreme (50°C)		15.50	9.12	0.00824	0.00485	PASS
Extreme (40°C)		14.14	13.42	0.00752	0.00714	PASS
Extreme (30°C)		16.29	8.68	0.00866	0.00462	PASS
Extreme (20°C)		11.48	15.70	0.00611	0.00835	PASS
Extreme (10°C)		8.49	14.19	0.00452	0.00755	PASS
Extreme (0°C)		1.72	15.22	0.00091	0.00810	PASS
Extreme (-10°C)		12.31	6.63	0.00655	0.00352	PASS
Extreme (-20°C)		13.64	16.77	0.00726	0.00892	PASS
Extreme (-30°C)		15.20	15.90	0.00808	0.00846	PASS
25°C	LV	15.25	17.64	0.00811	0.00938	PASS
	HV	13.55	11.39	0.00721	0.00606	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°C)	Normal	11.16	16.00	0.00593	0.00851	PASS
Extreme (50°C)		8.49	15.60	0.00451	0.00830	PASS
Extreme (40°C)		15.26	7.38	0.00812	0.00393	PASS
Extreme (30°C)		8.05	9.28	0.00428	0.00494	PASS



Extreme (20°C)		12.75	6.22	0.00678	0.00331	PASS	
Extreme (10°C)		7.00	1.83	0.00372	0.00097	PASS	
Extreme (0°C)		15.95	10.26	0.00848	0.00546	PASS	
Extreme (-10°C)		4.14	10.32	0.00220	0.00549	PASS	
Extreme (-20°C)		11.37	15.75	0.00605	0.00838	PASS	
Extreme (-30°C)		16.45	9.97	0.00875	0.00530	PASS	
25°C	LV	6.01	14.74	0.00320	0.00784	PASS	
	HV	17.38	9.71	0.00924	0.00516	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°C)	Normal	8.11	13.95	0.00431	0.00742		PASS
Extreme (50°C)		4.29	9.67	0.00228	0.00514		PASS
Extreme (40°C)		9.62	7.62	0.00512	0.00405		PASS
Extreme (30°C)		8.33	6.59	0.00443	0.00350		PASS
Extreme (20°C)		1.57	17.43	0.00083	0.00927	PASS	
Extreme (10°C)		12.24	8.95	0.00651	0.00476	PASS	
Extreme (0°C)		8.38	8.18	0.00446	0.00435	PASS	
Extreme (-10°C)		1.10	16.18	0.00058	0.00860	PASS	
Extreme (-20°C)		6.20	15.46	0.00330	0.00823	PASS	
Extreme (-30°C)		4.87	13.04	0.00259	0.00693	PASS	
25°C	LV	13.18	4.61	0.00701	0.00245	PASS	
	HV	13.39	12.22	0.00712	0.00650	PASS	
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict	
BANDWIDTH	15MHz						
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK		
Normal (25°C)	Normal	16.66	8.25	0.00886	0.00439		PASS
Extreme (50°C)		9.46	2.81	0.00503	0.00150		PASS
Extreme (40°C)		9.61	7.41	0.00511	0.00394		PASS
Extreme (30°C)		16.89	7.95	0.00898	0.00423		PASS
Extreme (20°C)		11.92	13.09	0.00634	0.00696	PASS	
Extreme (10°C)		8.18	2.46	0.00435	0.00131	PASS	
Extreme (0°C)		11.78	9.66	0.00627	0.00514	PASS	
Extreme (-10°C)		4.64	10.52	0.00247	0.00560	PASS	
Extreme (-20°C)		1.05	17.87	0.00056	0.00950	PASS	
Extreme (-30°C)		13.28	14.40	0.00706	0.00766	PASS	
25°C	LV	8.20	5.35	0.00436	0.00285	PASS	
	HV	12.08	2.55	0.00642	0.00135	PASS	
Condition		Freq.Error	Freq.Error	Frequency	Frequency	Verdict	



BANDWIDTH		20MHz	(Hz)	(Hz)	Stability (ppm)	Stability (ppm)	
Temperature		Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25°C)		Normal	6.56	3.13	0.00349	0.00167	PASS
Extreme (50°C)			5.68	5.56	0.00302	0.00296	PASS
Extreme (40°C)			1.76	16.80	0.00093	0.00894	PASS
Extreme (30°C)			7.07	13.13	0.00376	0.00698	PASS
Extreme (20°C)			12.80	2.36	0.00681	0.00126	PASS
Extreme (10°C)			4.40	10.40	0.00234	0.00553	PASS
Extreme (0°C)			13.72	12.26	0.00730	0.00652	PASS
Extreme (-10°C)			11.17	8.28	0.00594	0.00441	PASS
Extreme (-20°C)			5.33	14.80	0.00284	0.00787	PASS
Extreme (-30°C)			16.83	1.53	0.00895	0.00081	PASS
25°C		LV	8.35	1.94	0.00444	0.00103	PASS
		HV	9.34	10.84	0.00497	0.00577	PASS

LTE Band 25							
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°C)		Normal	5.66	17.33	0.00301	0.00922	PASS
Extreme (50°C)			17.59	5.25	0.00936	0.00279	PASS
Extreme (40°C)			9.41	14.14	0.00501	0.00752	PASS
Extreme (30°C)			2.73	17.33	0.00145	0.00922	PASS
Extreme (20°C)			15.46	5.62	0.00822	0.00299	PASS
Extreme (10°C)			7.70	4.83	0.00410	0.00257	PASS
Extreme (0°C)			14.58	11.46	0.00776	0.00610	PASS
Extreme (-10°C)			16.38	3.01	0.00871	0.00160	PASS
Extreme (-20°C)			1.30	5.35	0.00069	0.00285	PASS
Extreme (-30°C)			2.69	3.10	0.00143	0.00165	PASS
25°C		LV	16.77	11.98	0.00892	0.00637	PASS
		HV	14.32	14.97	0.00762	0.00796	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°C)		Normal	4.54	5.66	0.00241	0.00301	PASS
Extreme (50°C)			7.75	3.88	0.00412	0.00206	PASS
Extreme (40°C)			10.38	3.87	0.00552	0.00206	PASS
Extreme (30°C)			2.93	12.26	0.00156	0.00652	PASS



Extreme (20°C)		16.83	13.02	0.00895	0.00692	PASS
Extreme (10°C)		4.56	8.73	0.00242	0.00464	PASS
Extreme (0°C)		12.28	11.35	0.00653	0.00604	PASS
Extreme (-10°C)		7.72	10.17	0.00410	0.00541	PASS
Extreme (-20°C)		5.99	12.97	0.00318	0.00690	PASS
Extreme (-30°C)		8.72	3.88	0.00464	0.00206	PASS
25°C	LV	11.48	2.85	0.00611	0.00151	PASS
	HV	2.09	7.95	0.00111	0.00423	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°C)	Normal	5.69	15.68	0.00302	0.00834	
Extreme (50°C)		6.01	7.08	0.00320	0.00377	PASS
Extreme (40°C)		16.40	9.85	0.00872	0.00524	PASS
Extreme (30°C)		12.32	6.37	0.00655	0.00339	PASS
Extreme (20°C)		6.53	7.65	0.00347	0.00407	PASS
Extreme (10°C)		16.89	4.73	0.00898	0.00251	PASS
Extreme (0°C)		10.20	10.61	0.00543	0.00564	PASS
Extreme (-10°C)		10.08	6.96	0.00536	0.00370	PASS
Extreme (-20°C)		3.57	10.60	0.00190	0.00564	PASS
Extreme (-30°C)		5.02	17.11	0.00267	0.00910	PASS
25°C	LV	2.60	1.31	0.00138	0.00069	PASS
	HV	15.83	3.78	0.00842	0.00201	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°C)	Normal	13.69	10.21	0.00728	0.00543	
Extreme (50°C)		9.88	17.52	0.00526	0.00932	PASS
Extreme (40°C)		10.25	6.03	0.00545	0.00321	PASS
Extreme (30°C)		9.86	14.91	0.00525	0.00793	PASS
Extreme (20°C)		16.79	14.20	0.00893	0.00755	PASS
Extreme (10°C)		9.93	11.61	0.00528	0.00618	PASS
Extreme (0°C)		5.32	1.65	0.00283	0.00088	PASS
Extreme (-10°C)		9.05	4.74	0.00481	0.00252	PASS
Extreme (-20°C)		10.64	7.20	0.00566	0.00383	PASS
Extreme (-30°C)		16.12	10.58	0.00857	0.00563	PASS
25°C	LV	5.32	13.21	0.00283	0.00702	PASS
	HV	7.56	5.80	0.00402	0.00308	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°C)	Normal	7.88	13.40	0.00419	0.00713	PASS
Extreme (50°C)		10.73	5.45	0.00571	0.00290	PASS
Extreme (40°C)		13.03	16.55	0.00693	0.00880	PASS
Extreme (30°C)		16.08	5.67	0.00855	0.00302	PASS
Extreme (20°C)		8.58	3.21	0.00457	0.00171	PASS
Extreme (10°C)		7.77	12.89	0.00413	0.00686	PASS
Extreme (0°C)		2.92	5.47	0.00155	0.00291	PASS
Extreme (-10°C)		8.04	10.00	0.00428	0.00532	PASS
Extreme (-20°C)		1.56	6.47	0.00083	0.00344	PASS
Extreme (-30°C)		2.52	9.99	0.00134	0.00531	PASS
25°C		LV	1.73	10.35	0.00092	0.00550
	HV	16.05	7.64	0.00854	0.00406	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°C)	Normal	7.91	11.33	0.00421	0.00602	PASS
Extreme (50°C)		10.12	17.58	0.00538	0.00935	PASS
Extreme (40°C)		5.09	4.62	0.00271	0.00246	PASS
Extreme (30°C)		2.10	2.50	0.00112	0.00133	PASS
Extreme (20°C)		13.30	15.70	0.00707	0.00835	PASS
Extreme (10°C)		17.91	8.26	0.00952	0.00440	PASS
Extreme (0°C)		15.09	3.06	0.00803	0.00163	PASS
Extreme (-10°C)		12.65	17.37	0.00673	0.00924	PASS
Extreme (-20°C)		14.96	16.46	0.00796	0.00875	PASS
Extreme (-30°C)		6.99	12.38	0.00372	0.00658	PASS
25°C		LV	4.23	14.01	0.00225	0.00745
	HV	6.39	4.06	0.00340	0.00216	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 1 kHz (0.009MHz~ 0.15 MHz),

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

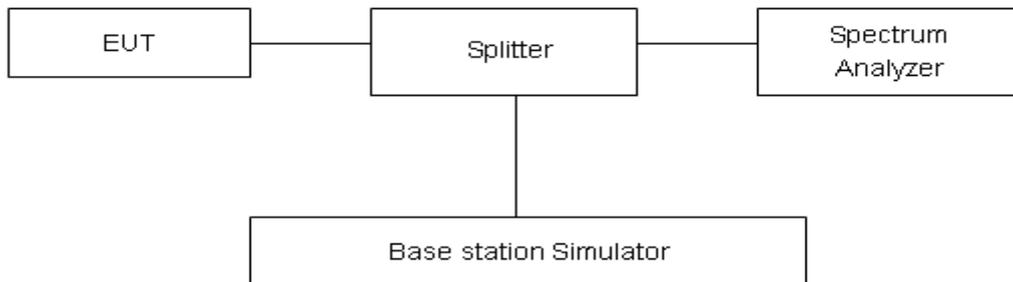
RBW is set to 100 kHz (30MHz~1000 MHz),

RBW is set to 1000 kHz (above 1000MHz),

Sweep is set to ATUO.

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

#### Test setup



#### Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee’s frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log<sub>10</sub> (P) dB.”

Limit	-13 dBm
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#### Measurement Uncertainty

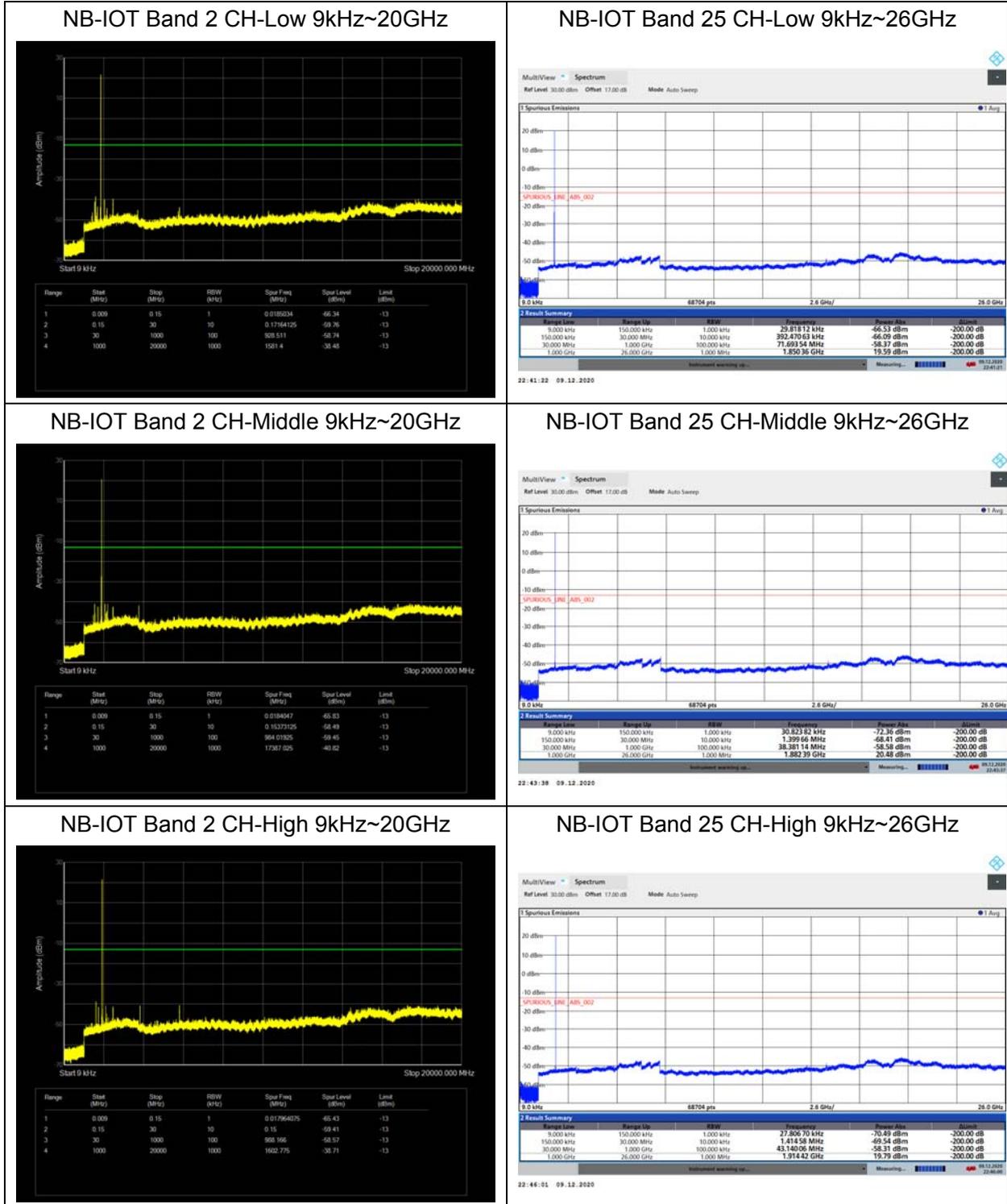
The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ .

Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-20GHz	1.407 dB

**Test Result**

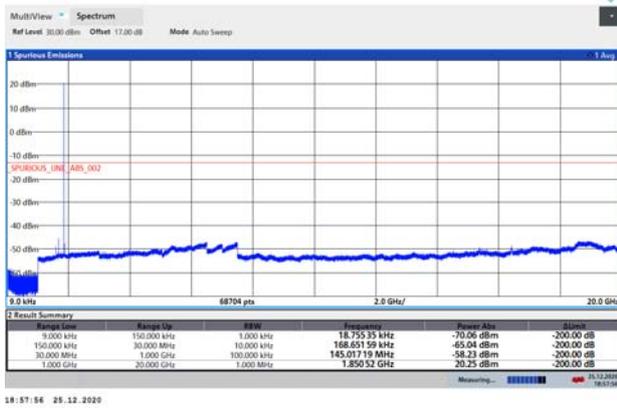
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

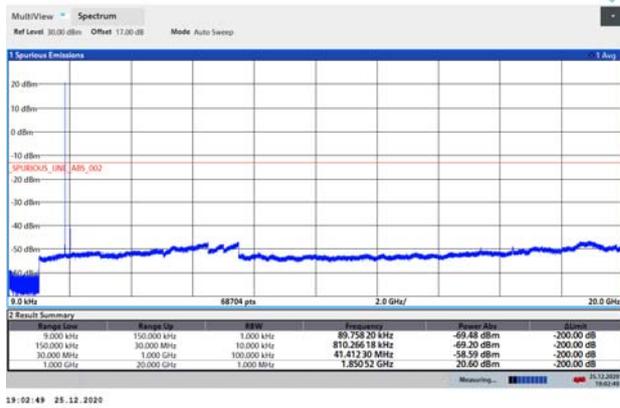




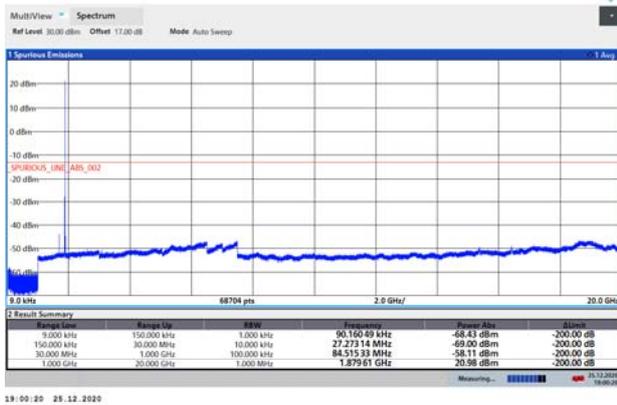
### LTE Band 2 1.4MHz CH-Low 9kHz~20GHz



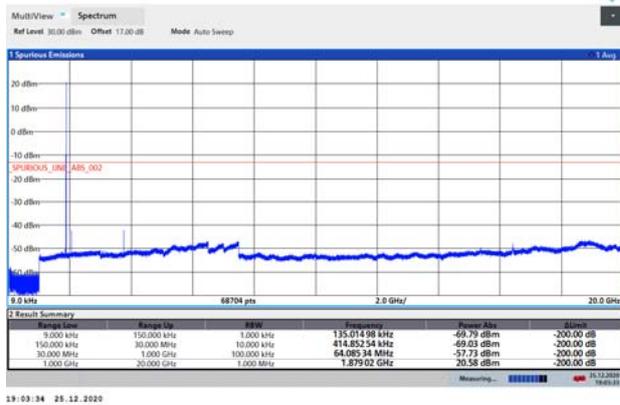
### LTE Band 2 3MHz CH-Low 9kHz~20GHz



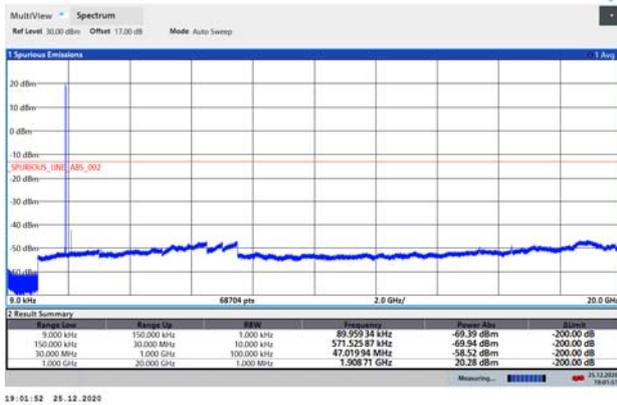
### LTE Band 2 1.4MHz CH-Middle 9kHz~20GHz



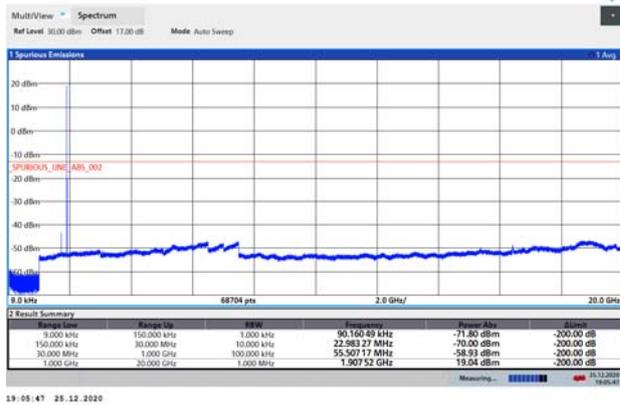
### LTE Band 2 3MHz CH-Middle 9kHz~20GHz



### LTE Band 2 1.4MHz CH-High 9kHz~20GHz

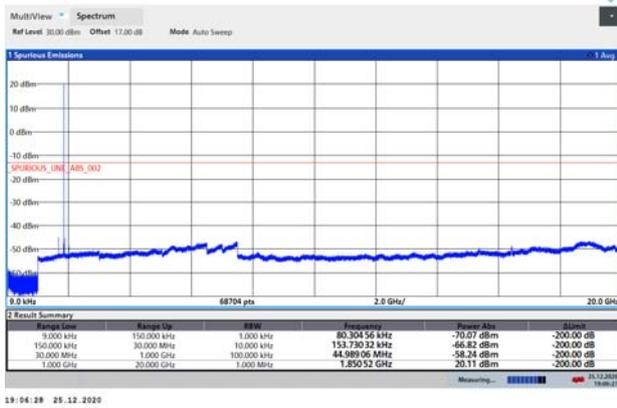


### LTE Band 2 3MHz CH-High 9kHz~20GHz

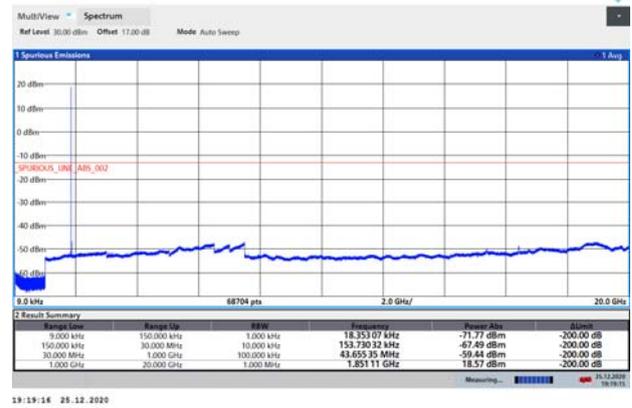




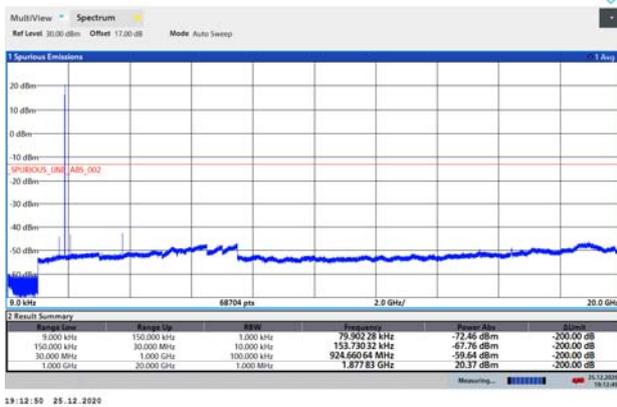
### LTE Band 2 5MHz CH-Low 9kHz~20GHz



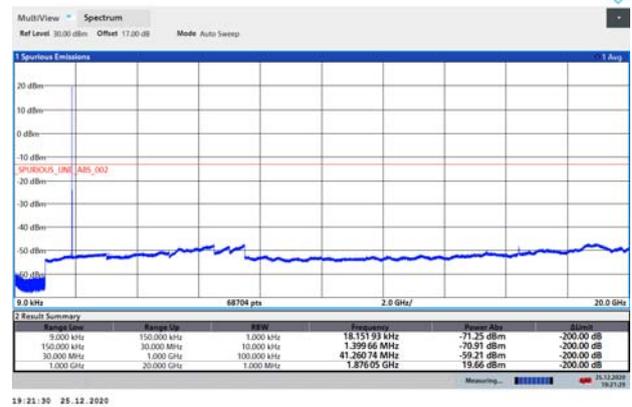
### LTE Band 2 10MHz CH-Low 9kHz~20GHz



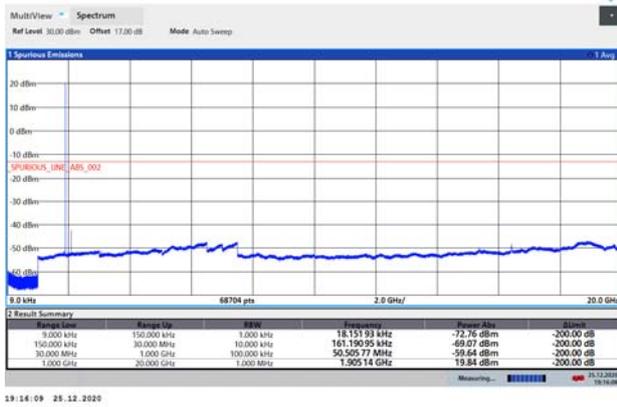
### LTE Band 2 5MHz CH-Middle 9kHz~20GHz



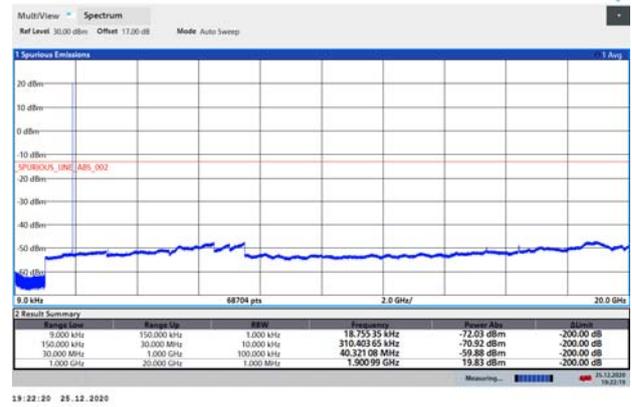
### LTE Band 2 10MHz CH-Middle 9kHz~20GHz



### LTE Band 2 5MHz CH-High 9kHz~20GHz

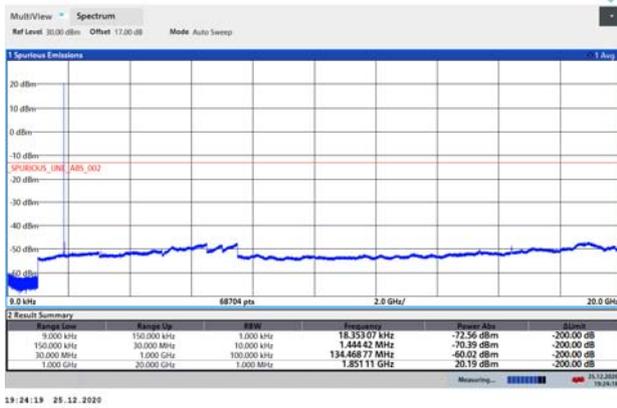


### LTE Band 2 10MHz CH-High 9kHz~20GHz



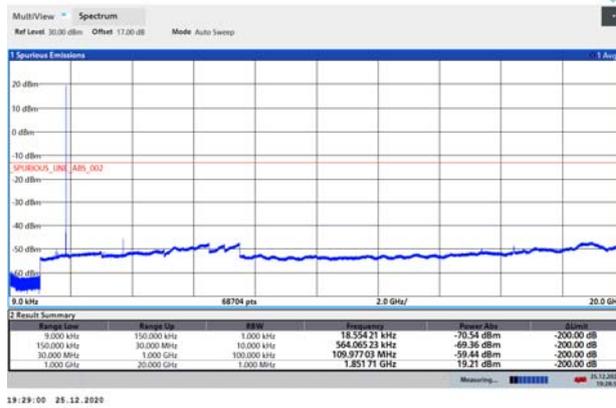


### LTE Band 2 15MHz CH-Low 9kHz~20GHz



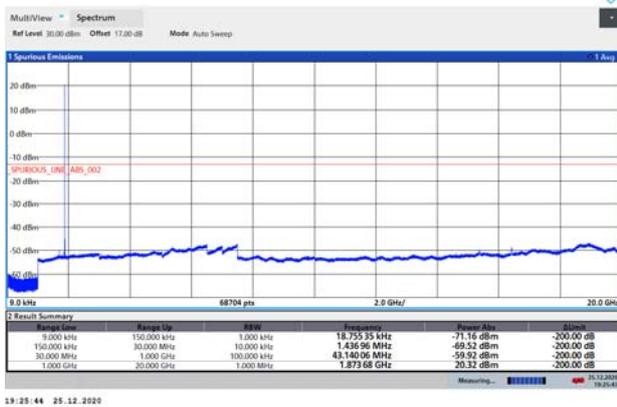
19:24:19 25.12.2020

### LTE Band 2 20MHz CH-Low 9kHz~20GHz



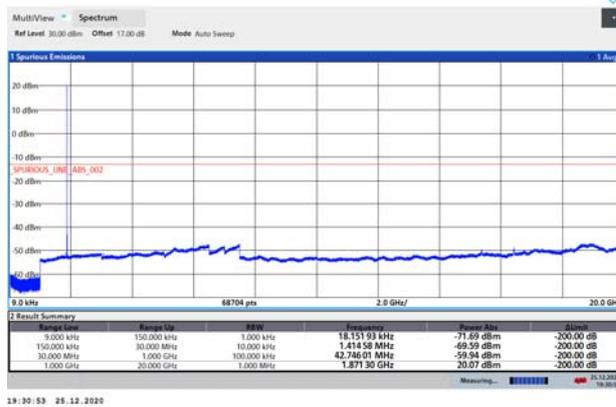
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### LTE Band 2 15MHz CH-Middle 9kHz~20GHz



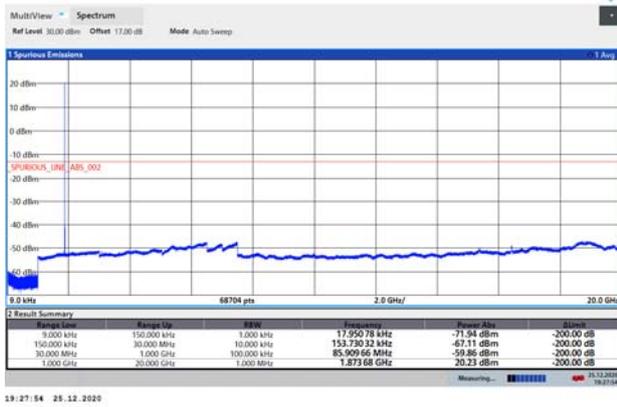
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### LTE Band 2 20MHz CH-Middle 9kHz~20GHz



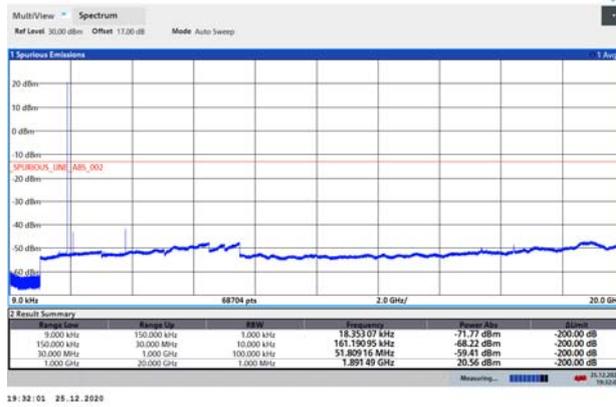
19:30:53 25.12.2020

### LTE Band 2 15MHz CH-High 9kHz~20GHz



19:27:54 25.12.2020

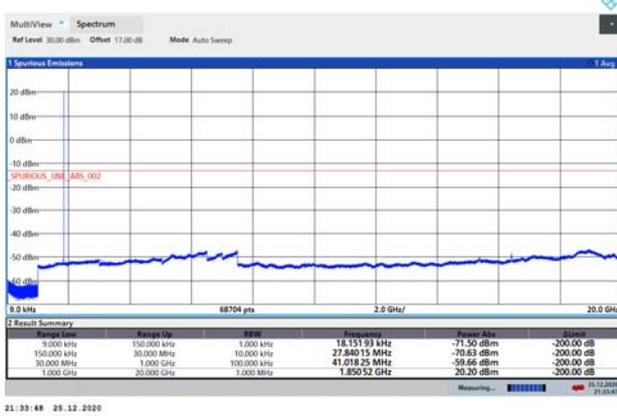
### LTE Band 2 20MHz CH-High 9kHz~20GHz



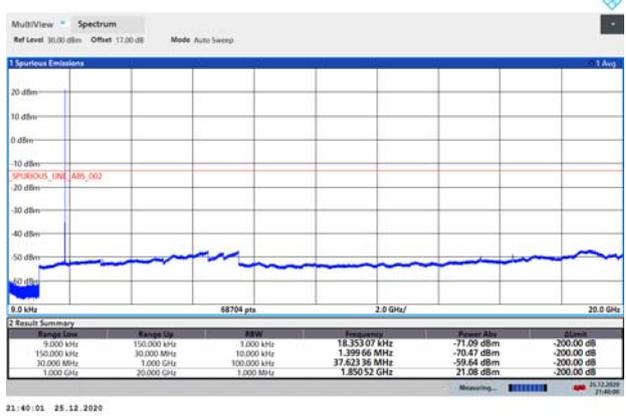
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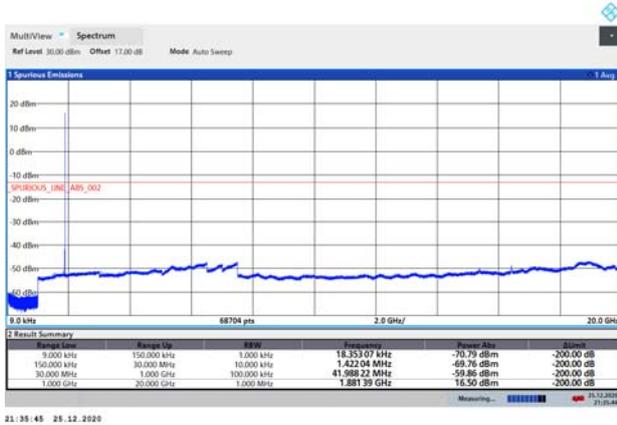
### LTE Band 25 1.4MHz CH-Low 9kHz~20GHz



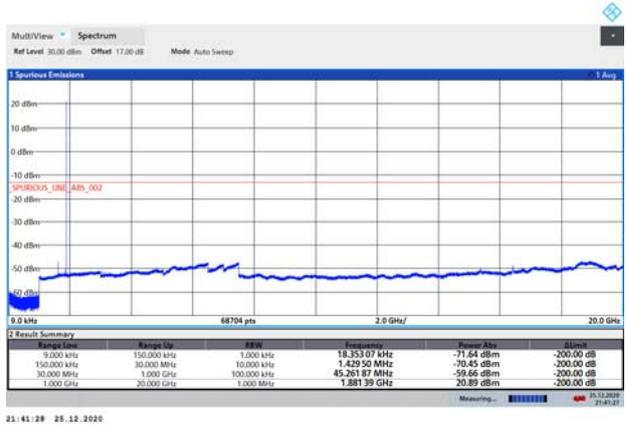
### LTE Band 25 3MHz CH-Low 9kHz~20GHz



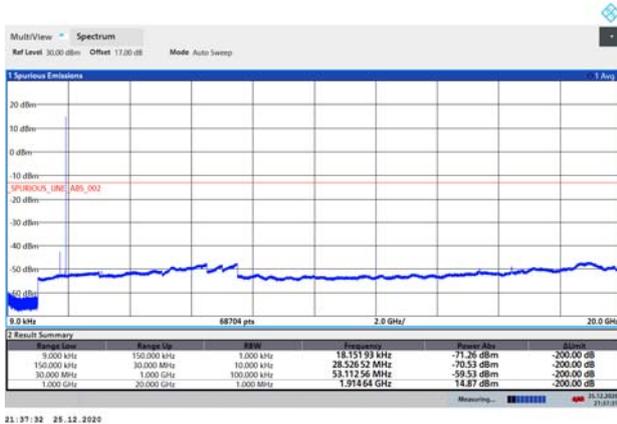
### LTE Band 25 1.4MHz CH-Middle 9kHz~20GHz



### LTE Band 25 3MHz CH-Middle 9kHz~20GHz



### LTE Band 25 1.4MHz CH-High 9kHz~20GHz

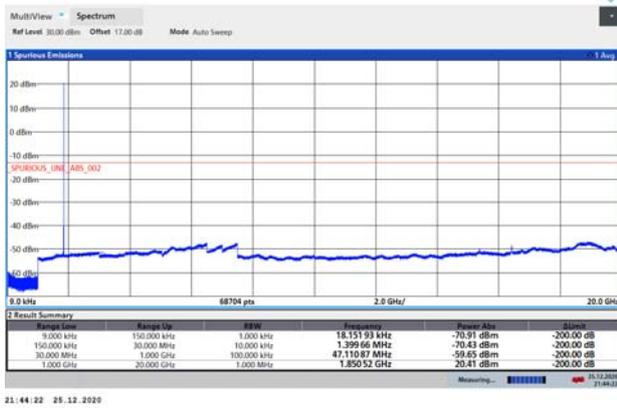


### LTE Band 25 3MHz CH-High 9kHz~20GHz





### LTE Band 25 5MHz CH-Low 9kHz~20GHz



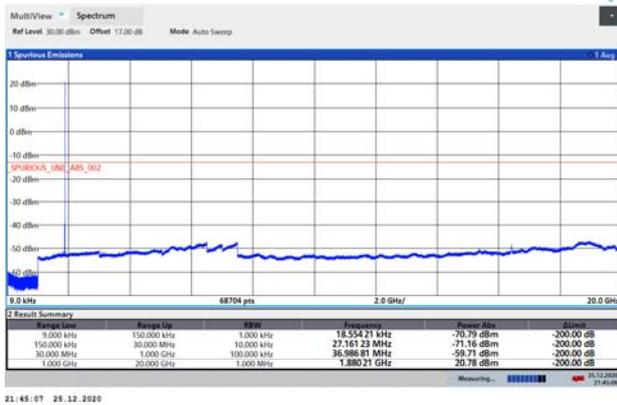
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### LTE Band 25 10MHz CH-Low 9kHz~20GHz



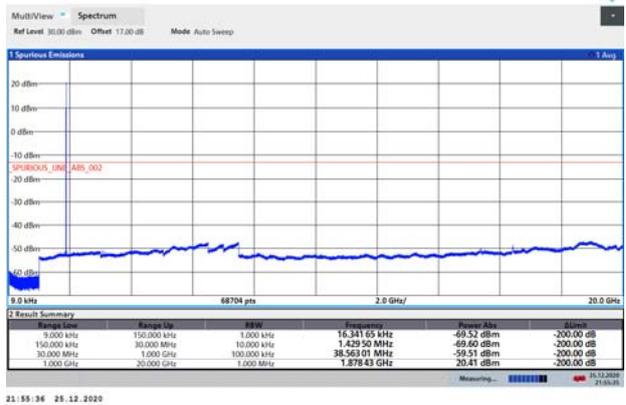
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### LTE Band 25 5MHz CH-Middle 9kHz~20GHz



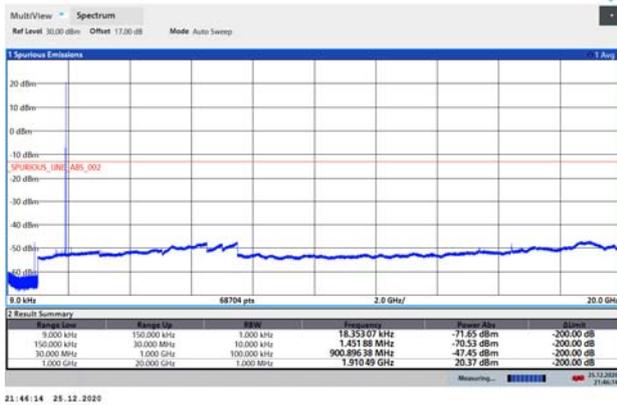
21:45:07 25.12.2020

### LTE Band 25 10MHz CH-Middle 9kHz~20GHz



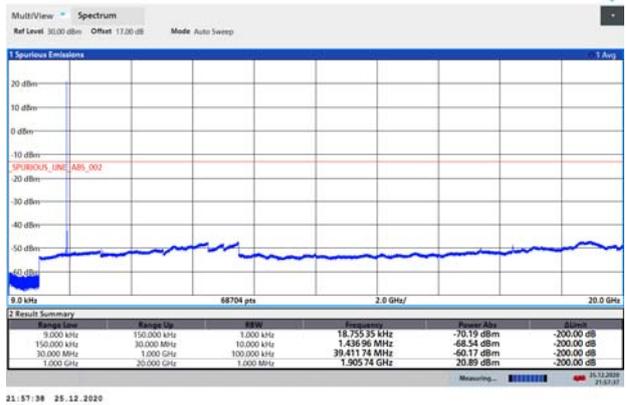
21:55:36 25.12.2020

### LTE Band 25 5MHz CH-High 9kHz~20GHz



21:44:14 25.12.2020

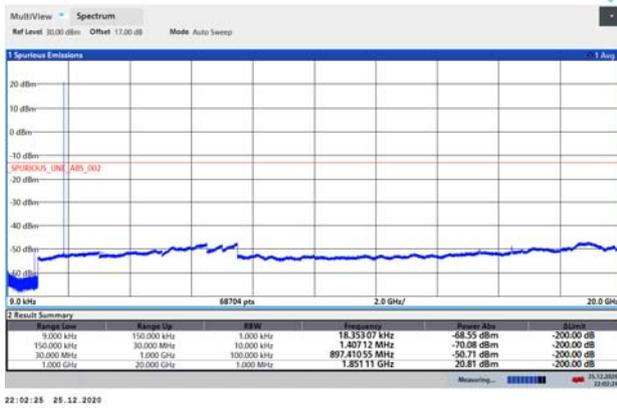
### LTE Band 25 10MHz CH-High 9kHz~20GHz



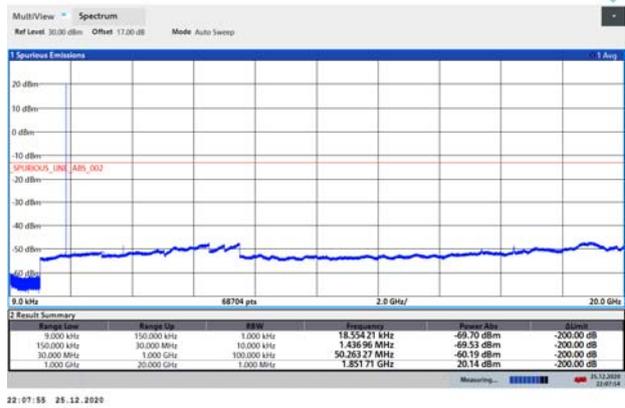
21:57:38 25.12.2020



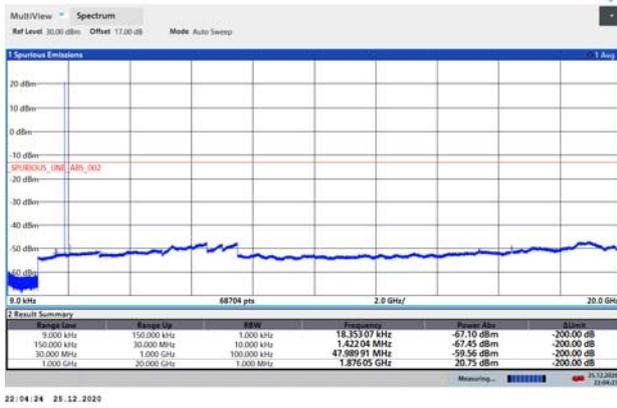
### LTE Band 25 15MHz CH-Low 9kHz~20GHz



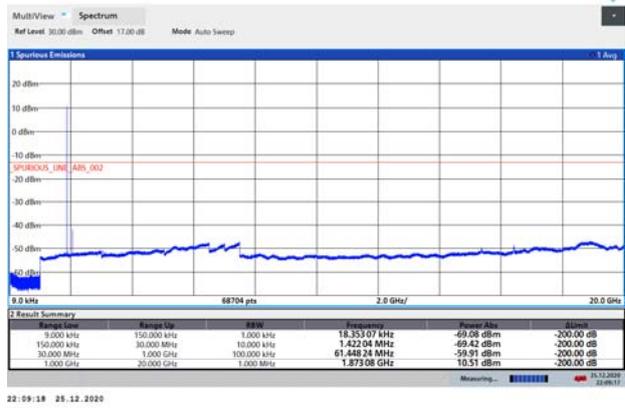
### LTE Band 25 20MHz CH-Low 9kHz~20GHz



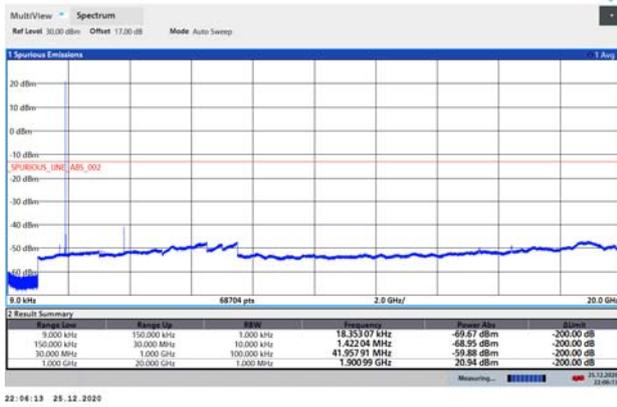
### LTE Band 25 15MHz CH-Middle 9kHz~20GHz



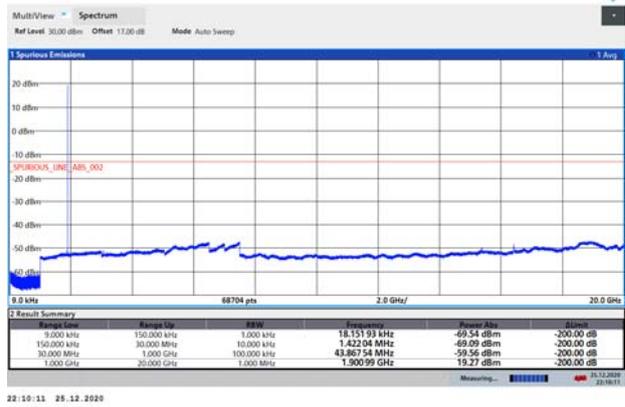
### LTE Band 25 20MHz CH-Middle 9kHz~20GHz



### LTE Band 25 15MHz CH-High 9kHz~20GHz



### LTE Band 25 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

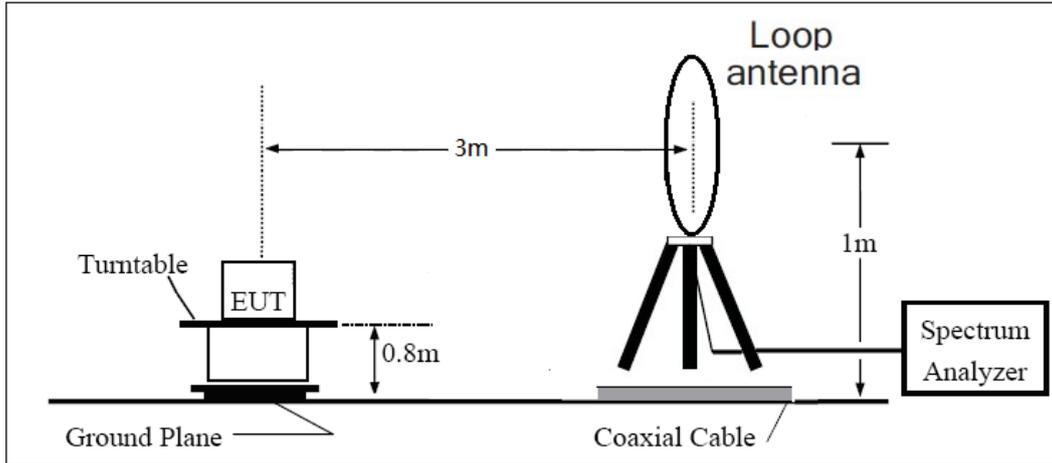
1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable 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=200Hz,VBW=600Hz for 9kHz-150kHz , RBW=10kHz, VBW=30kHz 150kHz-30MHz , RBW=100kHz,VBW=300kHz for 30MHz to 1GHz and RBW=1MHz, VBW=3MHz for above 1GHz, And the maximum value of the receiver should be recorded as (Pr).
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,  $ERP = EIRP - 2.15\text{dBi}$ .

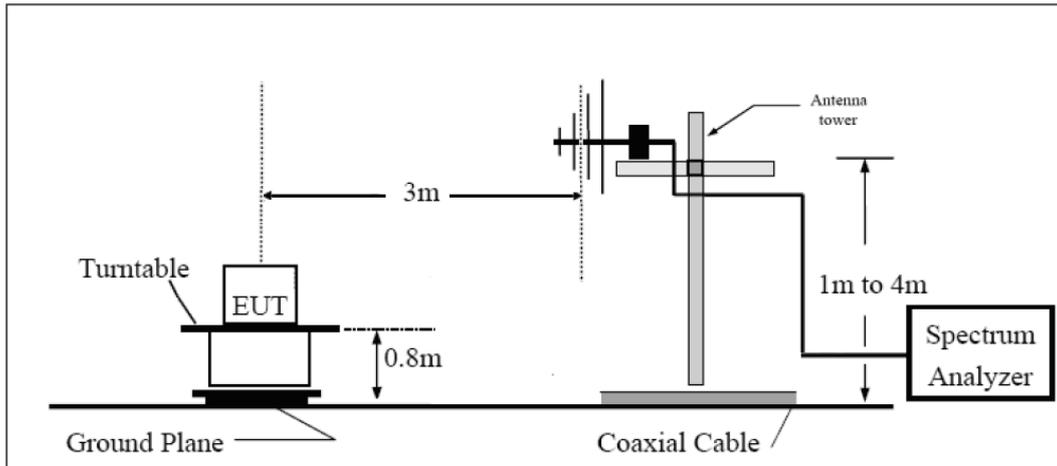
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

**Test setup**

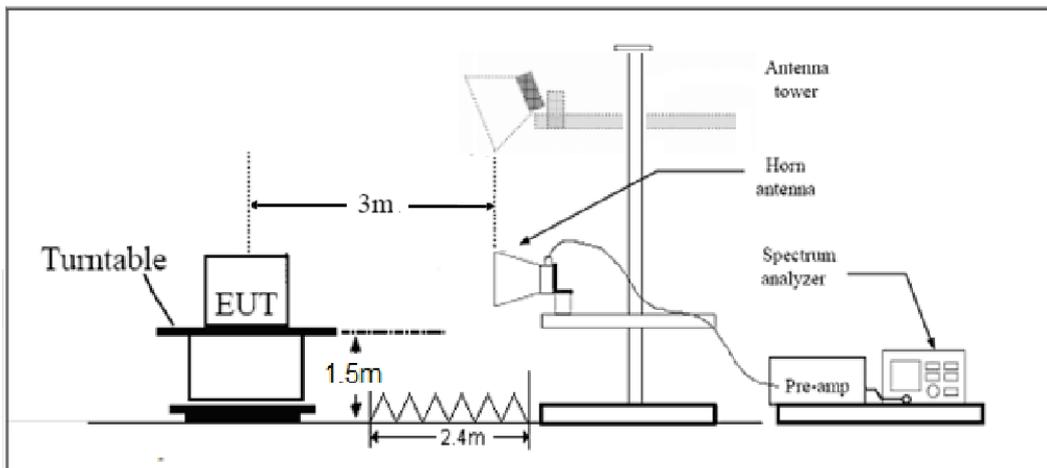
**9KHz ~ 30MHz**



**30MHz ~ 1GHz**



**Above 1GHz**





Note: Area side: 2.4mX3.6m

### Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10}(P)$  dB.”

Limit	-13 dBm
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### Measurement Uncertainty

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

**NB-IOT Band 2 3.75kHz CH-Low**

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3700.2	-38.01	5.10	11.05	Horizontal	-32.06	-13.00	19.06	90
3	5550.3	-24.62	5.42	12.65	Horizontal	-17.39	-13.00	4.39	45
4	7400.4	-58.22	6.70	13.85	Horizontal	-51.07	-13.00	38.07	270
5	9250.5	-53.36	7.01	14.75	Horizontal	-45.62	-13.00	32.62	0
6	11100.6	-51.69	7.48	15.95	Horizontal	-43.22	-13.00	30.22	0
7	12950.7	-52.82	7.51	16.55	Horizontal	-43.78	-13.00	30.78	315
8	14800.8	-51.62	8.24	15.35	Horizontal	-44.51	-13.00	31.51	135
9	16650.9	-48.39	8.41	14.95	Horizontal	-41.85	-13.00	28.85	45
10	18501.0	-	-	-	-	-	-	-	-

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.

**NB-IOT Band 2 3.75kHz CH-Middle**

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3760.00	-38.32	5.10	11.05	Horizontal	-32.37	-13.00	19.37	90
3	5640.00	-24.62	5.42	12.65	Horizontal	-17.39	-13.00	4.39	45
4	7520.00	-55.99	6.70	13.85	Horizontal	-48.84	-13.00	35.84	45
5	9400.00	-53.58	7.01	14.75	Horizontal	-45.84	-13.00	32.84	315
6	11280.00	-52.49	7.48	15.95	Horizontal	-44.02	-13.00	31.02	0
7	13160.00	-52.79	7.51	16.55	Horizontal	-43.75	-13.00	30.75	45
8	15040.00	-50.14	8.24	15.35	Horizontal	-43.03	-13.00	30.03	45
9	16920.00	-44.88	8.41	14.95	Horizontal	-38.34	-13.00	25.34	270
10	18800.00	-	-	-	-	-	-	-	-

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.



## NB-IOT Band 2 3.75kHz CH-High

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3819.8	-39.05	5.10	11.05	Horizontal	-33.10	-13.00	20.10	270
3	5729.7	-25.34	5.42	12.65	Horizontal	-18.11	-13.00	5.11	45
4	7639.6	-55.51	6.70	13.85	Horizontal	-48.36	-13.00	35.36	90
5	9549.5	-53.81	7.01	14.75	Horizontal	-46.07	-13.00	33.07	90
6	11459.4	-51.51	7.48	15.95	Horizontal	-43.04	-13.00	30.04	0
7	13369.3	-52.65	7.51	16.55	Horizontal	-43.61	-13.00	30.61	315
8	15279.2	-50.29	8.24	15.35	Horizontal	-43.18	-13.00	30.18	180
9	17189.1	-45.31	8.41	14.95	Horizontal	-38.77	-13.00	25.77	45
10	19099.0	-	-	-	-	-	-	-	-

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.

## NB-IOT Band 25 3.75kHz CH-Low

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3700.20	-39.44	5.10	11.05	Horizontal	-33.49	-13.00	20.49	90
3	5550.30	-25.36	5.42	12.65	Horizontal	-18.13	-13.00	5.13	135
4	7400.40	-55.45	6.70	13.85	Horizontal	-48.30	-13.00	35.30	180
5	9250.50	-54.01	7.01	14.75	Horizontal	-46.27	-13.00	33.27	315
6	11100.60	-51.48	7.48	15.95	Horizontal	-43.01	-13.00	30.01	45
7	12950.70	-55.67	7.51	16.55	Horizontal	-46.63	-13.00	33.63	270
8	14800.80	-51.43	8.24	15.35	Horizontal	-44.32	-13.00	31.32	180
9	16650.90	-49.27	8.41	14.95	Horizontal	-42.73	-13.00	29.73	225
10	18501.00	-	-	-	-	-	-	-	-

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.



## NB-IOT Band 25 3.75kHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3765.00	-38.85	5.10	11.05	Horizontal	-32.90	-13.00	19.90	225
3	5647.50	-24.95	5.42	12.65	Horizontal	-17.72	-13.00	4.72	0
4	7530.00	-56.70	6.70	13.85	Horizontal	-49.55	-13.00	36.55	180
5	9412.50	-53.85	7.01	14.75	Horizontal	-46.11	-13.00	33.11	315
6	11295.00	-52.71	7.48	15.95	Horizontal	-44.24	-13.00	31.24	90
7	13177.50	-52.29	7.51	16.55	Horizontal	-43.25	-13.00	30.25	45
8	15060.00	-50.24	8.24	15.35	Horizontal	-43.13	-13.00	30.13	315
9	16942.50	-44.85	8.41	14.95	Horizontal	-38.31	-13.00	25.31	180
10	18825.00	-	-	-	-	-	-	-	-

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.

## NB-IOT Band 25 3.75kHz CH-High

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3829.80	-36.37	5.10	11.05	Horizontal	-30.42	-13.00	17.42	135
3	5744.70	-24.58	5.42	12.65	Horizontal	-17.35	-13.00	4.35	45
4	7659.60	-56.77	6.70	13.85	Horizontal	-49.62	-13.00	36.62	0
5	9574.50	-54.58	7.01	14.75	Horizontal	-46.84	-13.00	33.84	90
6	11489.40	-51.72	7.48	15.95	Horizontal	-43.25	-13.00	30.25	180
7	13404.30	-53.08	7.51	16.55	Horizontal	-44.04	-13.00	31.04	315
8	15319.20	-51.55	8.24	15.35	Horizontal	-44.44	-13.00	31.44	270
9	17234.10	-46.34	8.41	14.95	Horizontal	-39.80	-13.00	26.80	225
10	19149.00	-	-	-	-	-	-	-	-

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 2 1.4MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3759.00	-61.02	5.10	11.05	Horizontal	-55.07	-13.00	42.07	225
3	5638.88	-60.19	5.42	12.65	Horizontal	-52.96	-13.00	39.96	90
4	7520.00	-58.41	6.70	13.85	Horizontal	-51.26	-13.00	38.26	315
5	9400.00	-54.93	7.01	14.75	Horizontal	-47.19	-13.00	34.19	225
6	11280.00	-54.56	7.48	15.95	Horizontal	-46.09	-13.00	33.09	45
7	13160.00	-55.00	7.51	16.55	Horizontal	-45.96	-13.00	32.96	0
8	15040.00	-53.93	8.24	15.35	Horizontal	-46.82	-13.00	33.82	90
9	16920.00	-48.05	8.41	14.95	Horizontal	-41.51	-13.00	28.51	45
10	18800.00	-	-	-	-	-	-	-	-

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 2 5MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3755.63	-61.84	5.10	11.05	Horizontal	-55.89	-13.00	42.89	315
3	5633.63	-60.40	5.42	12.65	Horizontal	-53.17	-13.00	40.17	45
4	7520.00	-57.61	6.70	13.85	Horizontal	-50.46	-13.00	37.46	315
5	9400.00	-56.01	7.01	14.75	Horizontal	-48.27	-13.00	35.27	0
6	11280.00	-55.03	7.48	15.95	Horizontal	-46.56	-13.00	33.56	315
7	13160.00	-54.18	7.51	16.55	Horizontal	-45.14	-13.00	32.14	45
8	15040.00	-53.36	8.24	15.35	Horizontal	-46.25	-13.00	33.25	315
9	16920.00	-47.97	8.41	14.95	Horizontal	-41.43	-13.00	28.43	90
10	18800.00	-	-	-	-	-	-	-	-

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 2 20MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3742.13	-61.12	5.10	11.05	Horizontal	-55.17	-13.00	42.17	225
3	5613.38	-58.53	5.42	12.65	Horizontal	-51.30	-13.00	38.30	135
4	7484.63	-56.02	6.70	13.85	Horizontal	-48.87	-13.00	35.87	270
5	9400.00	-55.59	7.01	14.75	Horizontal	-47.85	-13.00	34.85	90
6	11280.00	-54.60	7.48	15.95	Horizontal	-46.13	-13.00	33.13	315
7	13160.00	-53.95	7.51	16.55	Horizontal	-44.91	-13.00	31.91	135
8	15040.00	-52.70	8.24	15.35	Horizontal	-45.59	-13.00	32.59	270
9	16920.00	-48.04	8.41	14.95	Horizontal	-41.50	-13.00	28.50	180
10	18800.00	-	-	-	-	-	-	-	-

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 25 1.4MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3765.00	-46.76	5.10	11.05	Horizontal	-40.81	-13.00	27.81	90
3	5647.50	-58.89	5.42	12.65	Horizontal	-51.66	-13.00	38.66	225
4	7530.00	-55.92	6.70	13.85	Horizontal	-48.77	-13.00	35.77	315
5	9412.50	-53.29	7.01	14.75	Horizontal	-45.55	-13.00	32.55	270
6	11295.00	-52.35	7.48	15.95	Horizontal	-43.88	-13.00	30.88	135
7	13177.50	-51.99	7.51	16.55	Horizontal	-42.95	-13.00	29.95	270
8	15060.00	-50.66	8.24	15.35	Horizontal	-43.55	-13.00	30.55	135
9	16942.50	-44.96	8.41	14.95	Horizontal	-38.42	-13.00	25.42	45
10	18825.00	-	-	-	-	-	-	-	-

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 25 5MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3765.00	-48.29	5.10	11.05	Horizontal	-42.34	-13.00	29.34	90
3	5647.50	-59.95	5.42	12.65	Horizontal	-52.72	-13.00	39.72	135
4	7530.00	-56.96	6.70	13.85	Horizontal	-49.81	-13.00	36.81	225
5	9412.50	-53.37	7.01	14.75	Horizontal	-45.63	-13.00	32.63	180
6	11295.00	-52.63	7.48	15.95	Horizontal	-44.16	-13.00	31.16	315
7	13177.50	-52.14	7.51	16.55	Horizontal	-43.10	-13.00	30.10	45
8	15060.00	-50.53	8.24	15.35	Horizontal	-43.42	-13.00	30.42	180
9	16942.50	-44.77	8.41	14.95	Horizontal	-38.23	-13.00	25.23	270
10	18825.00	-	-	-	-	-	-	-	-

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 25 20MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3748.13	-46.10	5.10	11.05	Horizontal	-40.15	-13.00	27.15	45
3	5622.00	-56.04	5.42	12.65	Horizontal	-48.81	-13.00	35.81	270
4	7496.00	-56.31	6.70	13.85	Horizontal	-49.16	-13.00	36.16	180
5	9370.00	-53.66	7.01	14.75	Horizontal	-45.92	-13.00	32.92	315
6	11244.00	-51.82	7.48	15.95	Horizontal	-43.35	-13.00	30.35	225
7	13118.00	-52.92	7.51	16.55	Horizontal	-43.88	-13.00	30.88	135
8	14992.00	-49.78	8.24	15.35	Horizontal	-42.67	-13.00	29.67	90
9	16866.00	-43.73	8.41	14.95	Horizontal	-37.19	-13.00	24.19	0
10	18740.00	-	-	-	-	-	-	-	-

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.

## 6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMU200	118133	2020-05-17	2021-05-16
Base Station Simulator	R&S	CMW500	113824	2020-05-18	2021-05-17
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2020-05-18	2021-05-17
Universal Radio Communication Tester	Key sight	E5515C	MY48367192	2020-05-27	2021-05-26
Signal Analyzer	R&S	FSV30	100815	2019-12-15	2020-12-14
				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	2021-12-15
Horn Antenna	R&S	HF907	102723	2018-08-11	2021-08-10
Horn Antenna	ETS-Lindgren	3160-09	00102643	2018-06-20	2021-06-19
Signal generator	R&S	SMB 100A	102594	2020-05-18	2021-05-17
Climatic Chamber	ESPEC	SU-242	93000506	2017-12-17	2020-12-16
				2020-12-13	2021-12-12
Preampfier	R&S	SCU18	102327	2020-05-18	2021-05-17
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2020-05-18	2021-05-17
RF Cable	Agilent	SMA 15cm	0001	2020-06-12	2020-12-11
				2020-12-10	2021-06-09
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.**