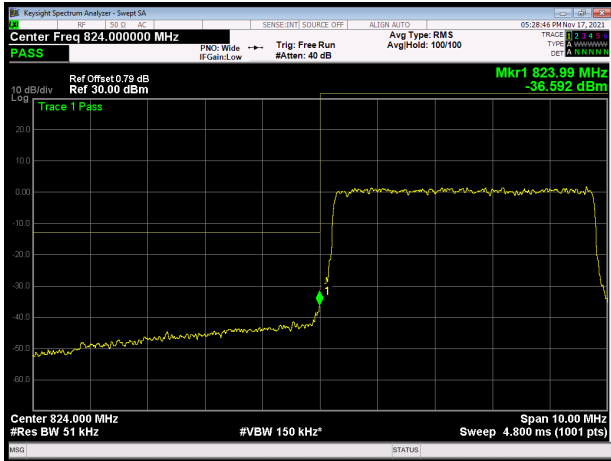
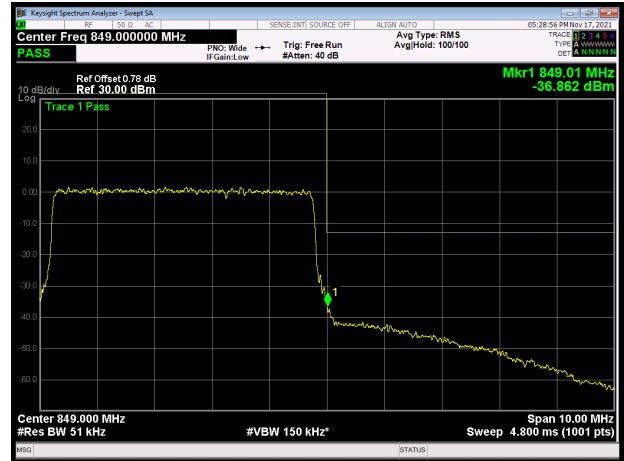




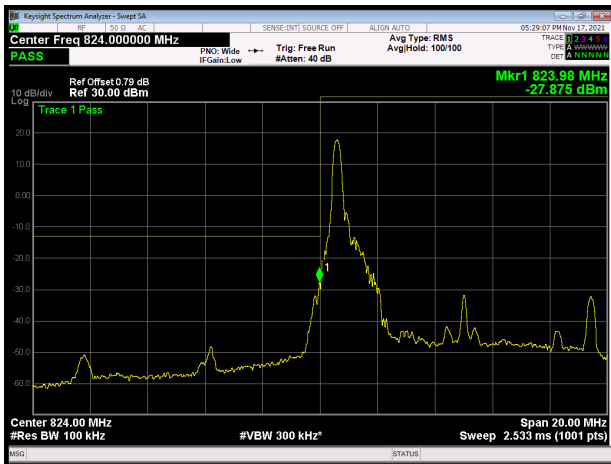
LTE Band 5 64QAM 5MHz CH-Low 100%RB



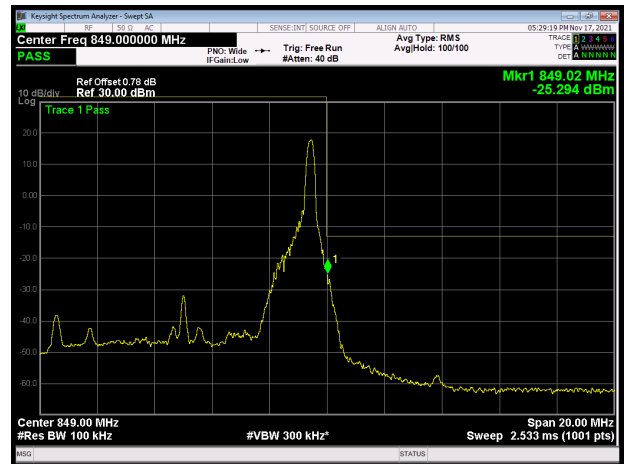
LTE Band 5 64QAM 5MHz CH-High 100%RB



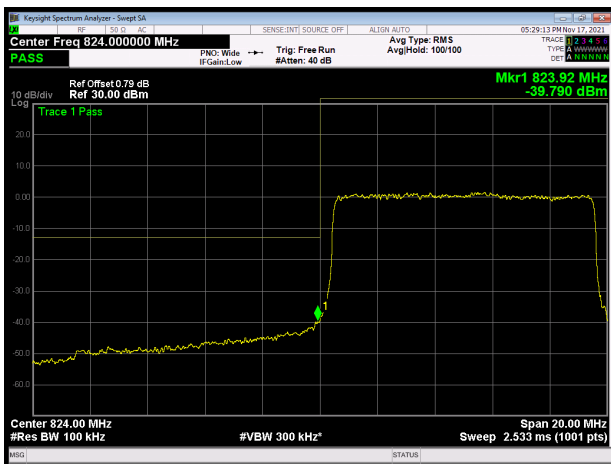
LTE Band 5 64QAM 10MHz CH-Low 1RB



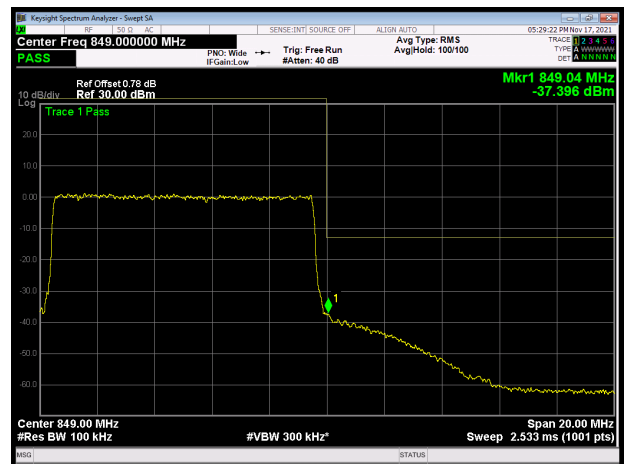
LTE Band 5 64QAM 10MHz CH-High 1RB



LTE Band 5 64QAM 10MHz CH-Low 100%RB

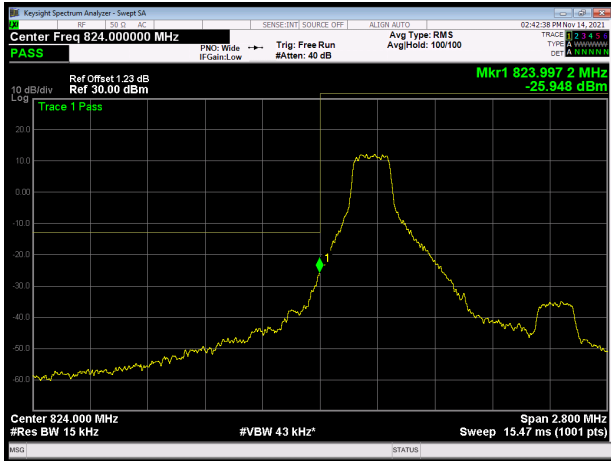


LTE Band 5 64QAM 10MHz CH-High 100%RB





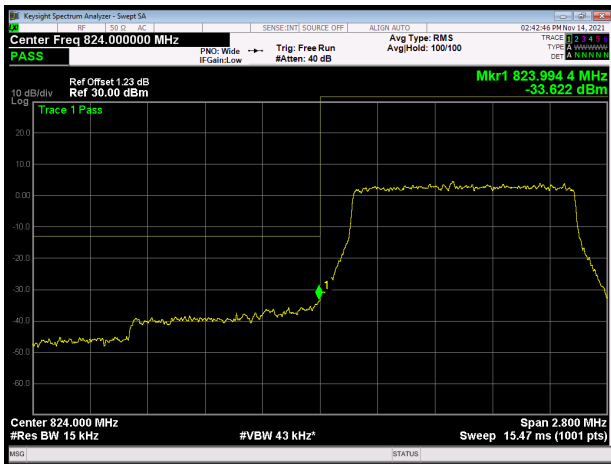
LTE Band 26 QPSK 1.4MHz CH-Low 1RB



LTE Band 26 QPSK 1.4MHz CH-High 1RB



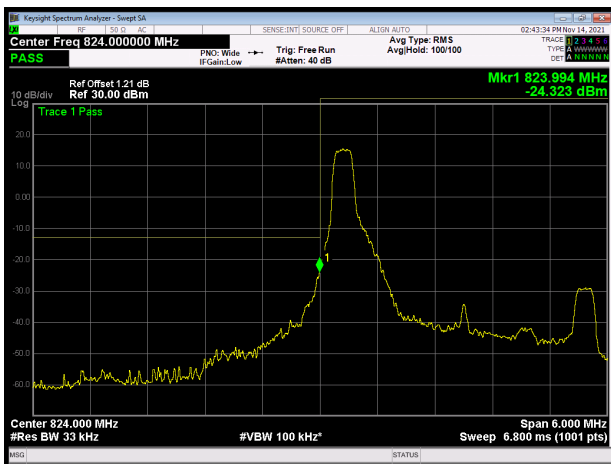
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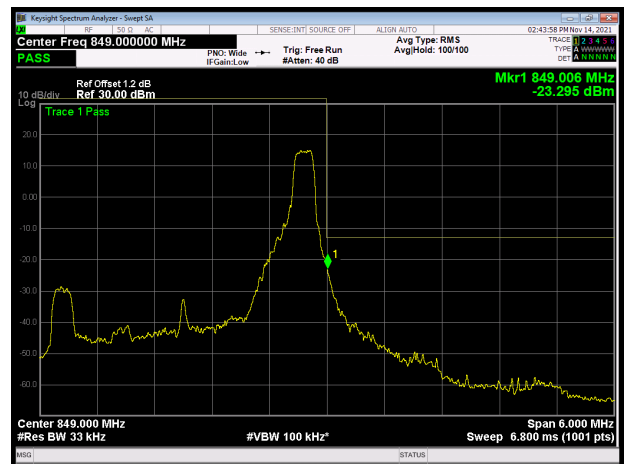
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LTE Band 26 QPSK 3MHz CH-Low 1RB

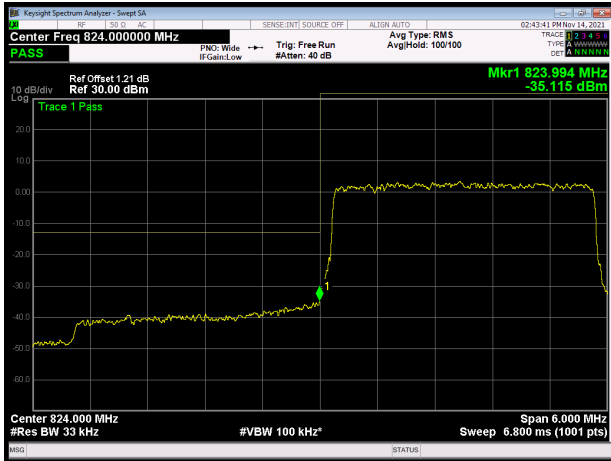


LTE Band 26 QPSK 3MHz CH-High 1RB

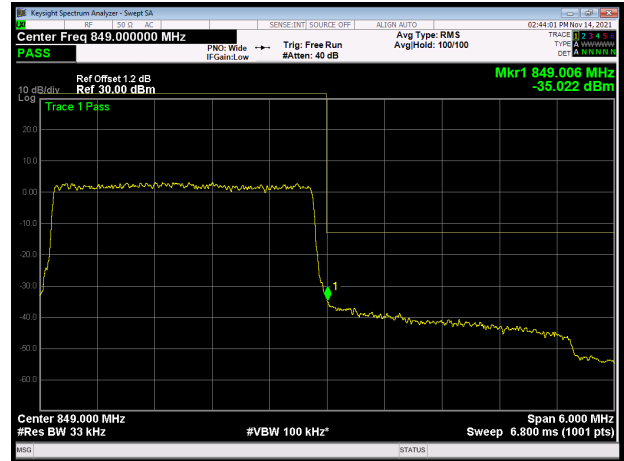




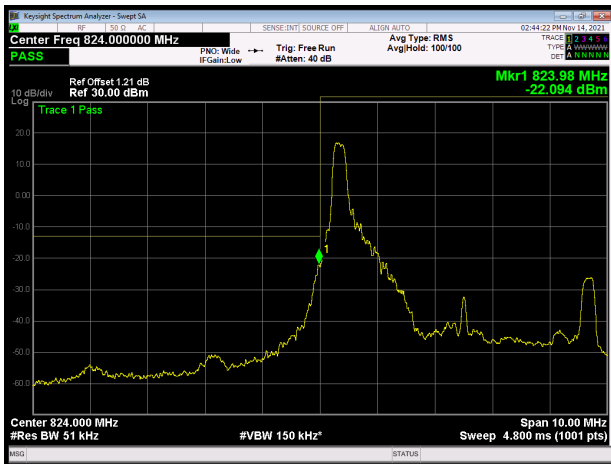
LTE Band 26 QPSK 3MHz CH-Low 100%RB



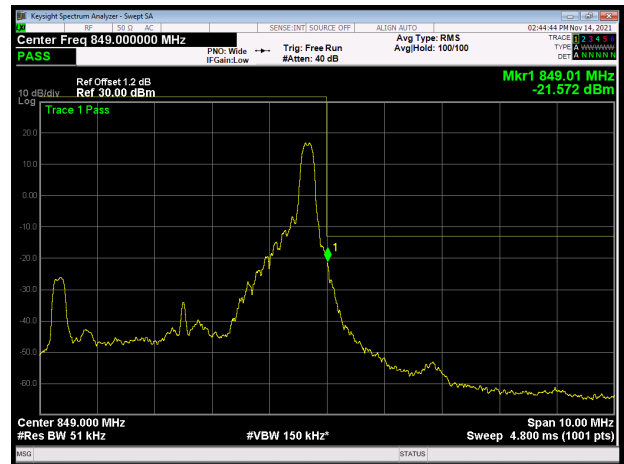
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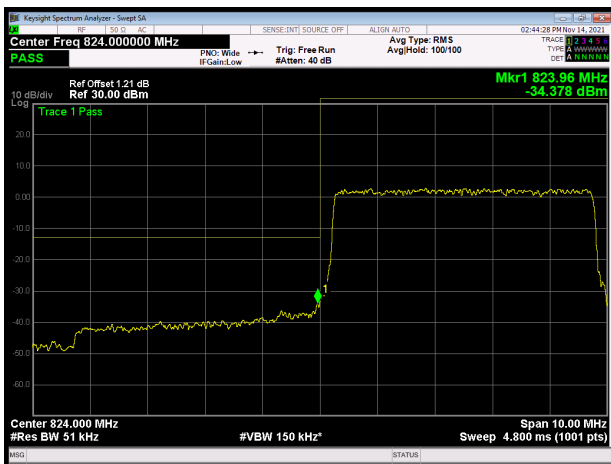
LTE Band 26 QPSK 5MHz CH-Low 1RB



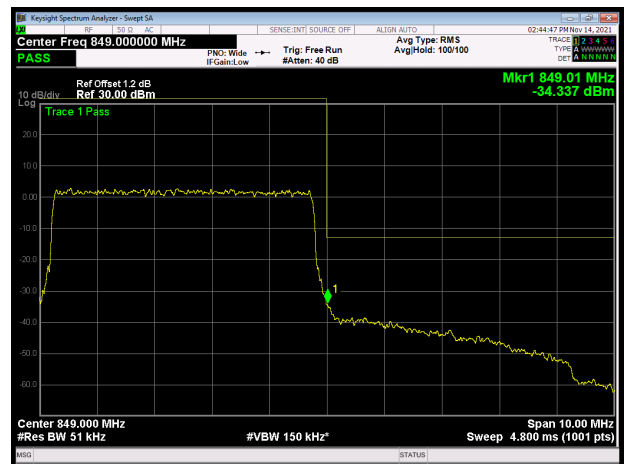
LTE Band 26 QPSK 5MHz CH-High 1RB



LTE Band 26 QPSK 5MHz CH-Low 100%RB

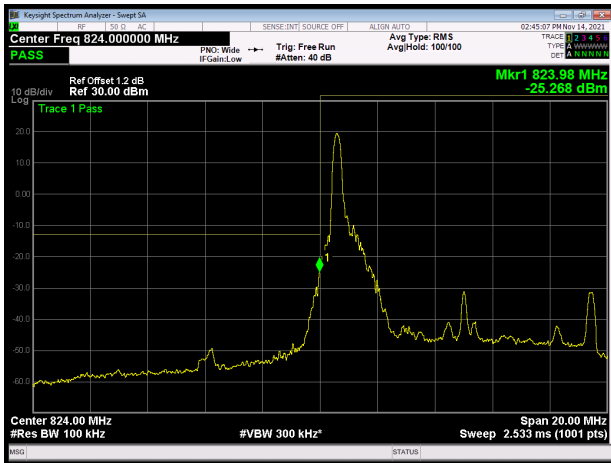


LTE Band 26 QPSK 5MHz CH-High 100%RB

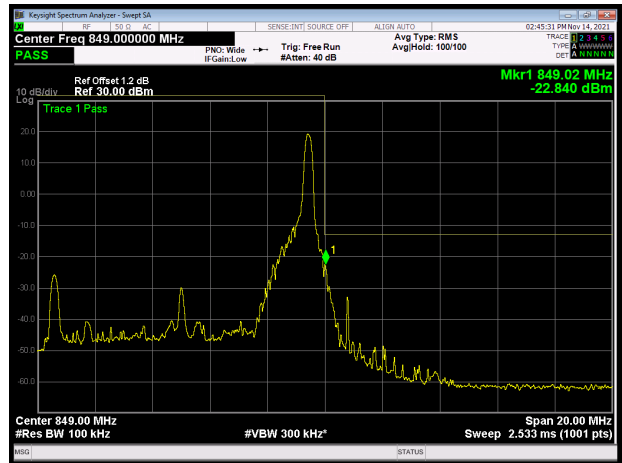




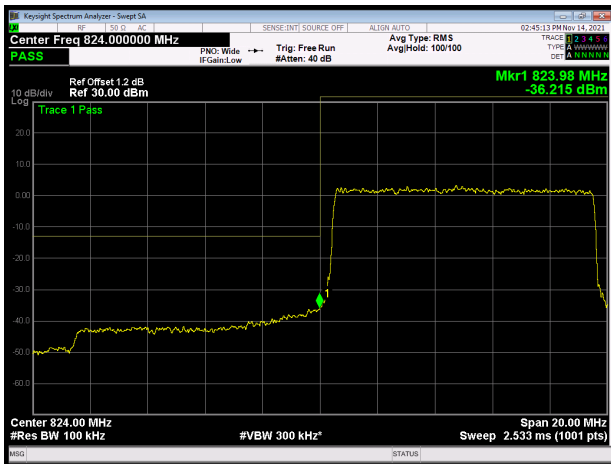
LTE Band 26 QPSK 10MHz CH-Low 1RB



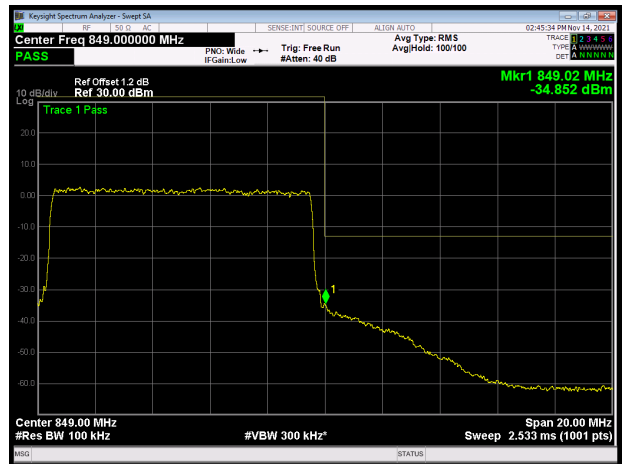
LTE Band 26 QPSK 10MHz CH-High 1RB



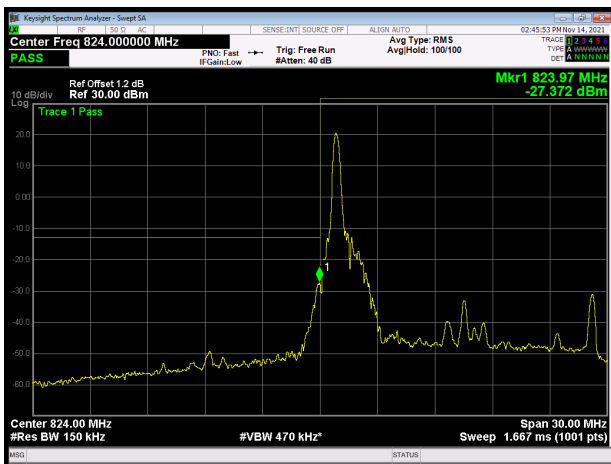
LTE Band 26 QPSK 10MHz CH-Low 100%RB



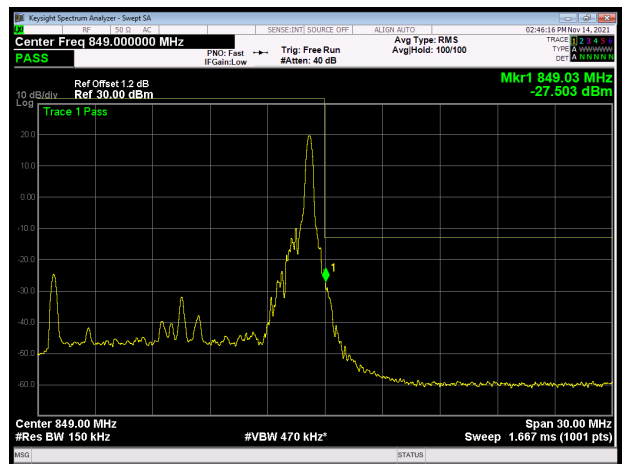
LTE Band 26 QPSK 10MHz CH-High 100%RB



LTE Band 26 QPSK 15MHz CH-Low 1RB

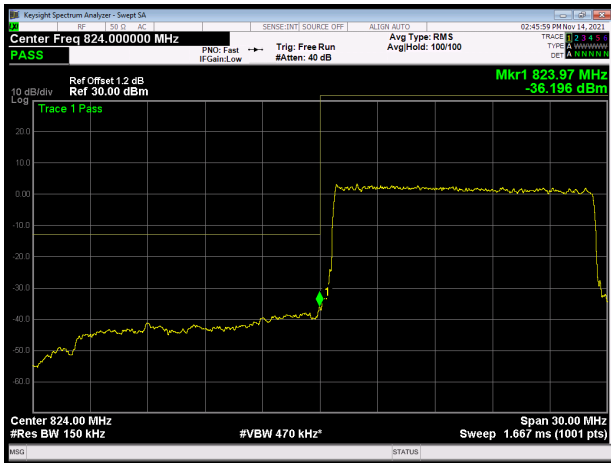


LTE Band 26 QPSK 15MHz CH-High 1RB





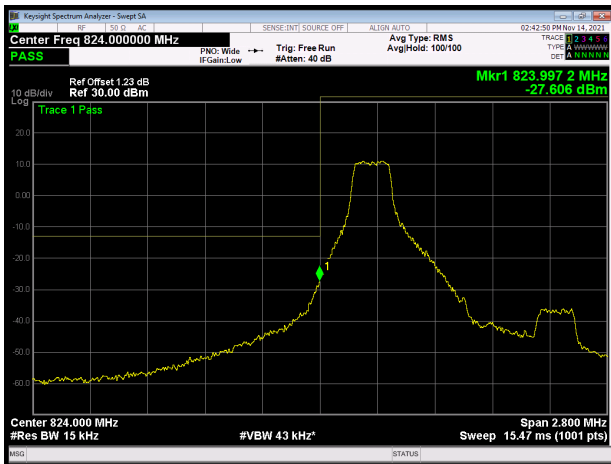
LTE Band 26 QPSK 15MHz CH-Low 100%RB



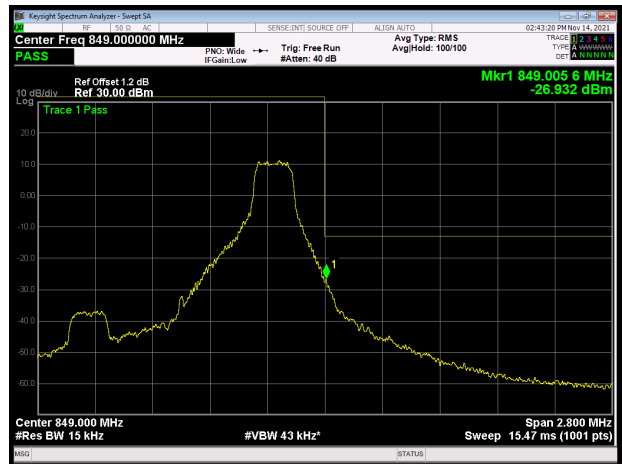
LTE Band 26 QPSK 15MHz CH-High 100%RB



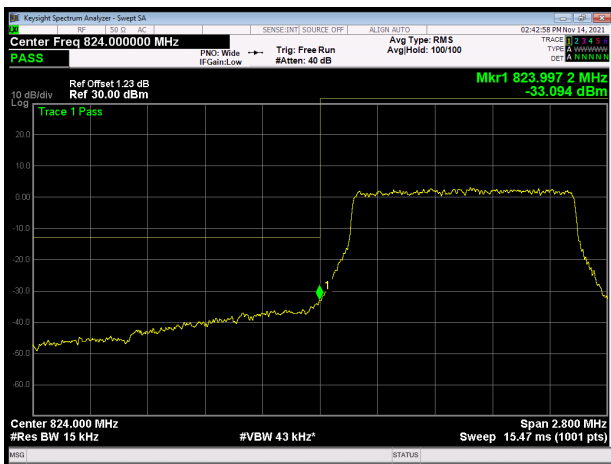
LTE Band 26 16QAM 1.4MHz CH-Low 1RB



LTE Band 26 16QAM 1.4MHz CH-High 1RB



LTE Band 26 16QAM 1.4MHz CH-Low 100%RB

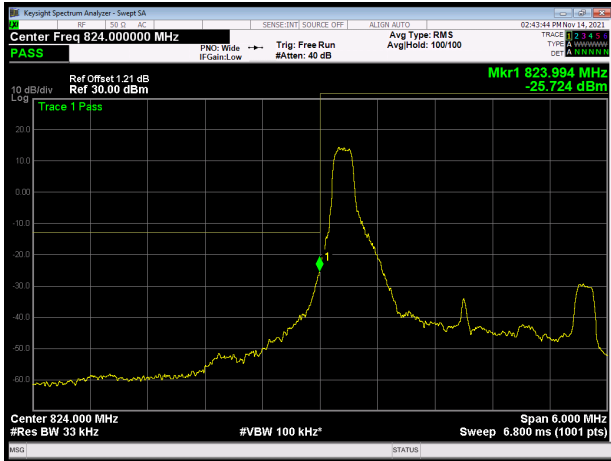


LTE Band 26 16QAM 1.4MHz CH-High 100%RB

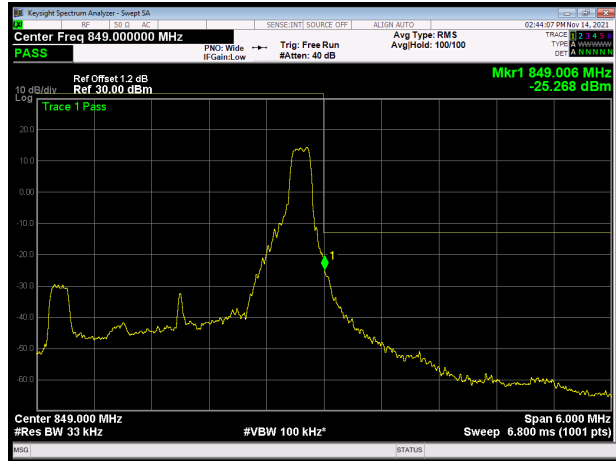




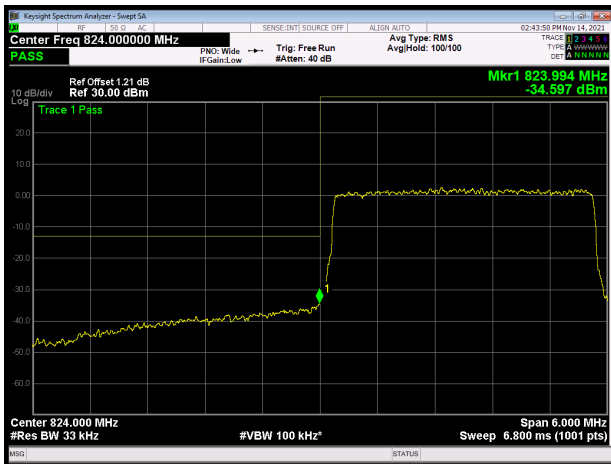
LTE Band 26 16QAM 3MHz CH-Low 1RB



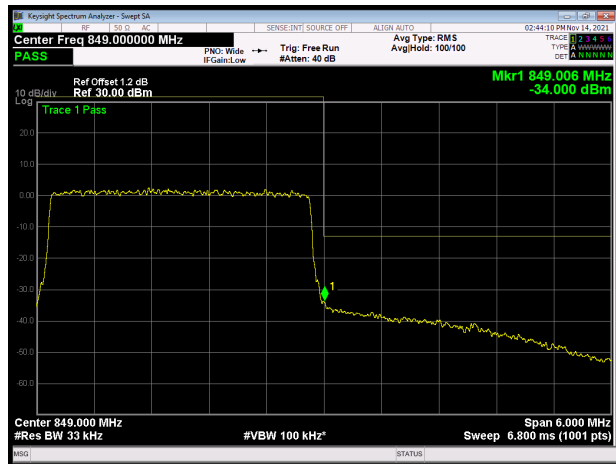
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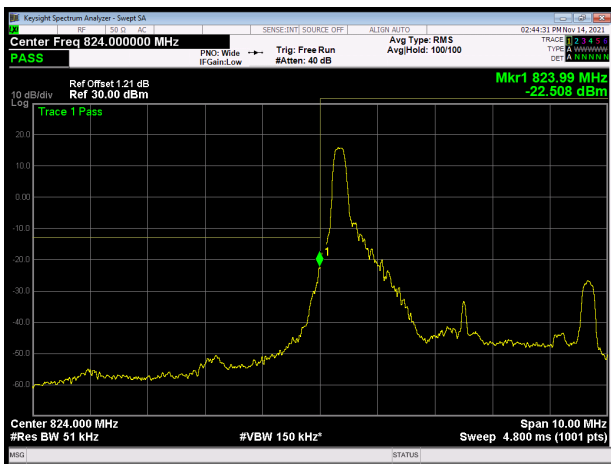
LTE Band 26 16QAM 3MHz CH-Low 100%RB



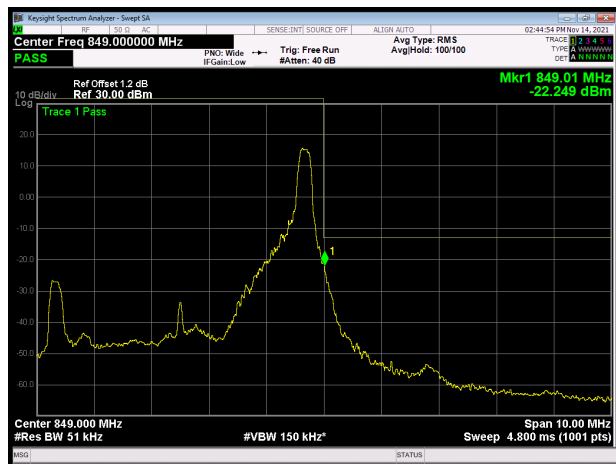
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LTE Band 26 16QAM 5MHz CH-Low 1RB

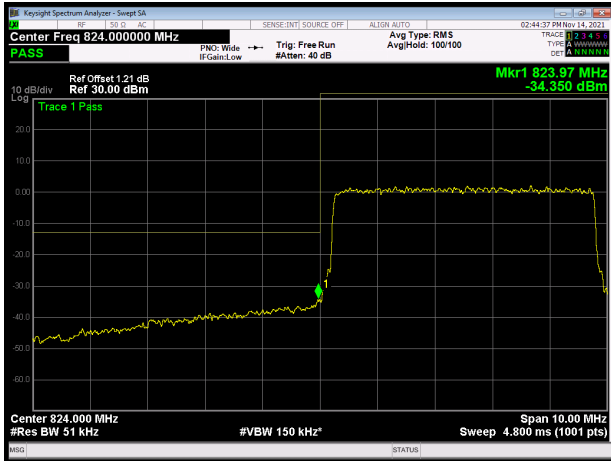


LTE Band 26 16QAM 5MHz CH-High 1RB

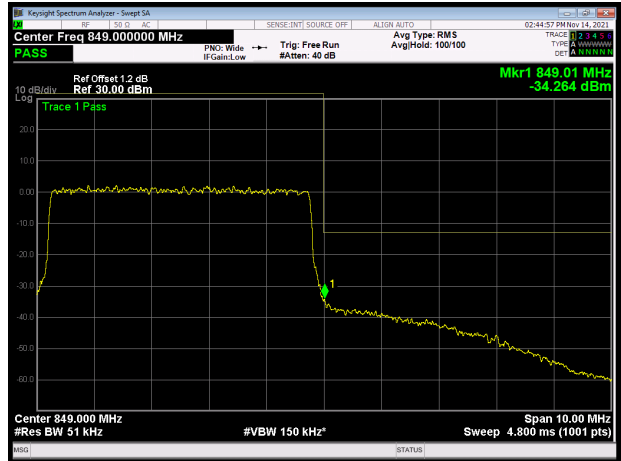




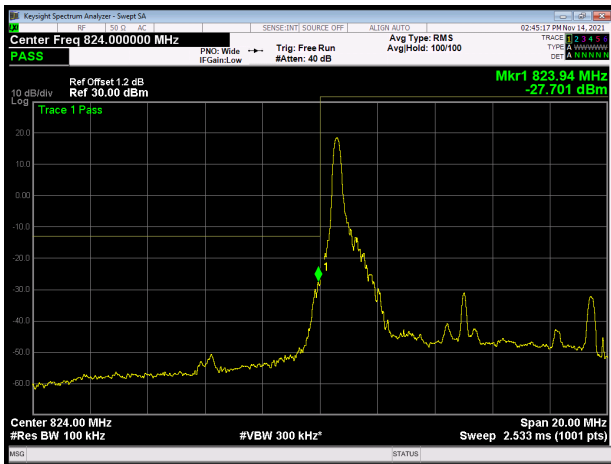
LTE Band 26 16QAM 5MHz CH-Low 100%RB



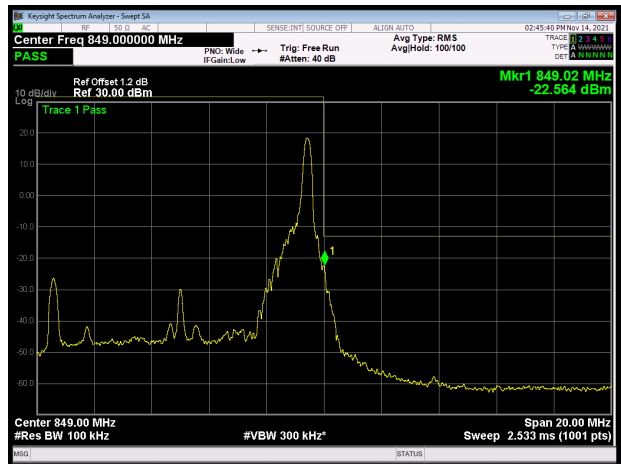
LTE Band 26 16QAM 5MHz CH-High 100%RB



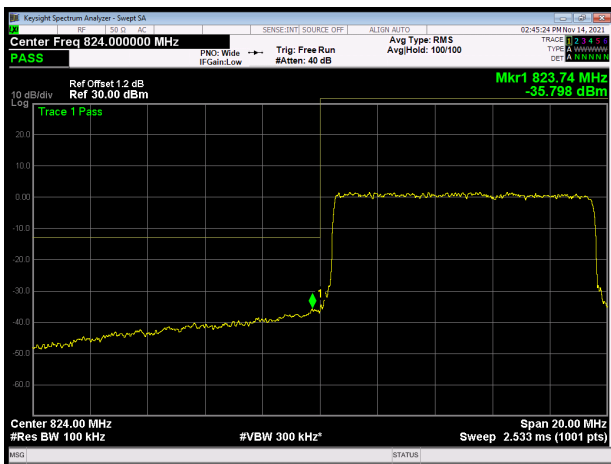
LTE Band 26 16QAM 10MHz CH-Low 1RB



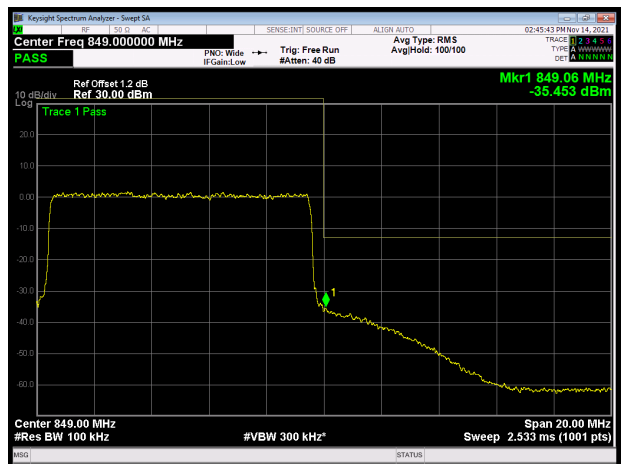
LTE Band 26 16QAM 10MHz CH-High 1RB



LTE Band 26 16QAM 10MHz CH-Low 100%RB

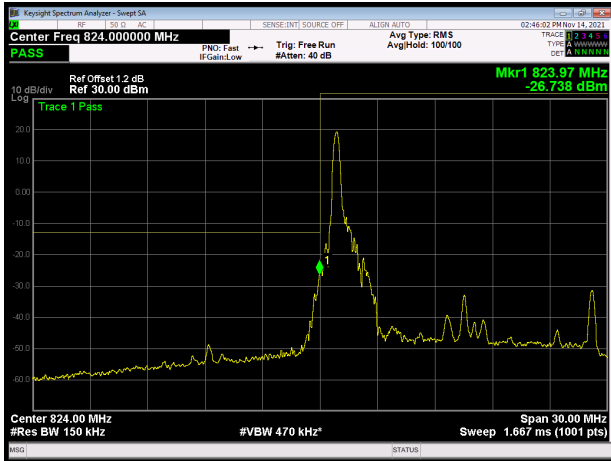


LTE Band 26 16QAM 10MHz CH-High 100%RB

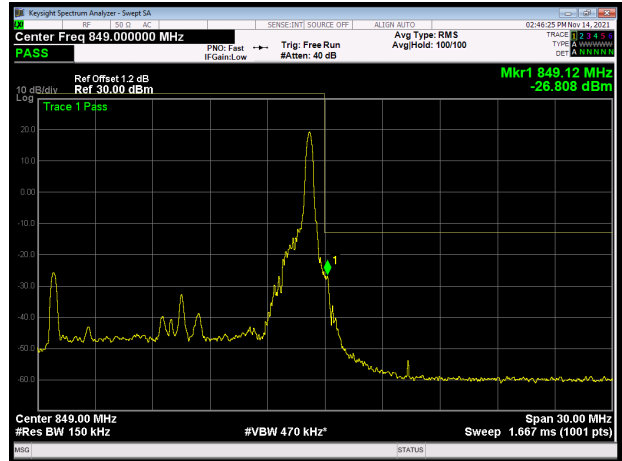




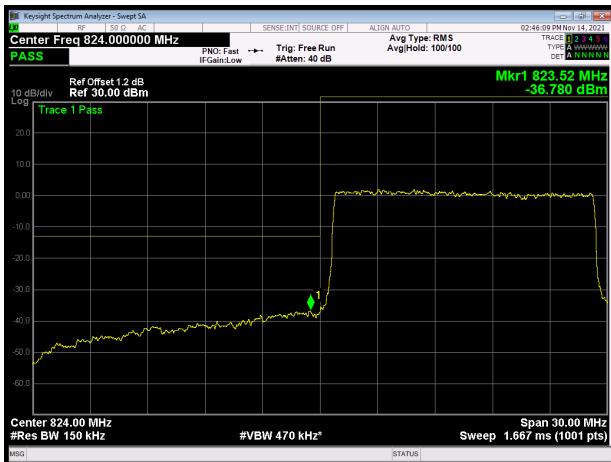
LTE Band 26 16QAM 15MHz CH-Low 1RB



LTE Band 26 16QAM 15MHz CH-High 1RB



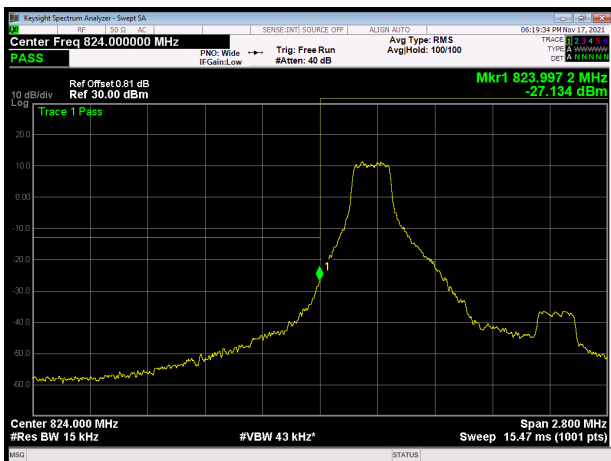
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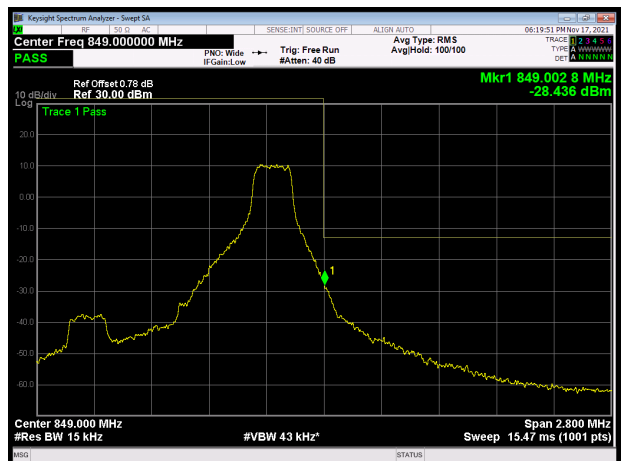
LTE Band 26 16QAM 15MHz CH-High 100%RB



LTE Band 26 64QAM 1.4MHz CH-Low 1RB

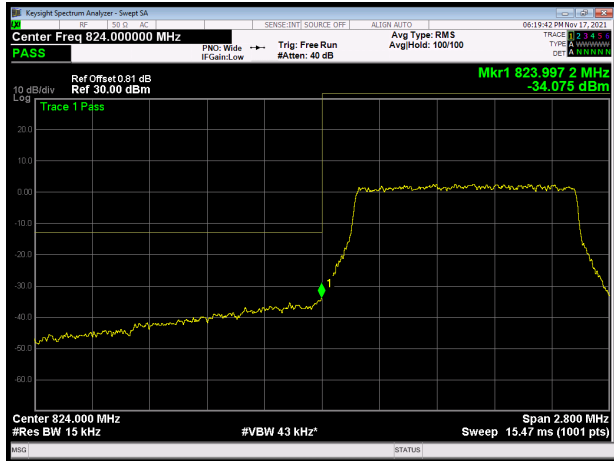


LTE Band 26 64QAM 1.4MHz CH-High 1RB

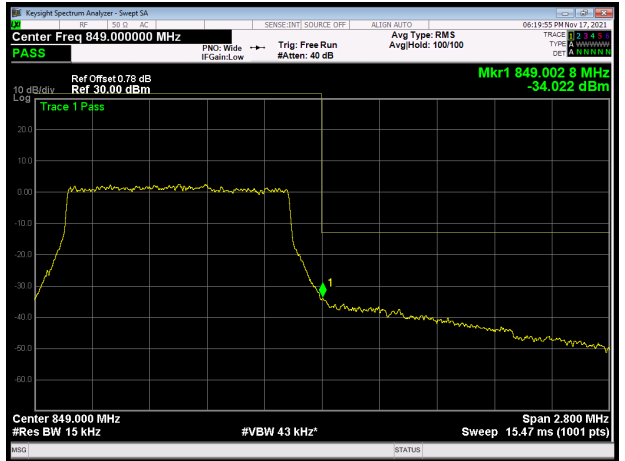




LTE Band 26 64QAM 1.4MHz CH-Low 100%RB



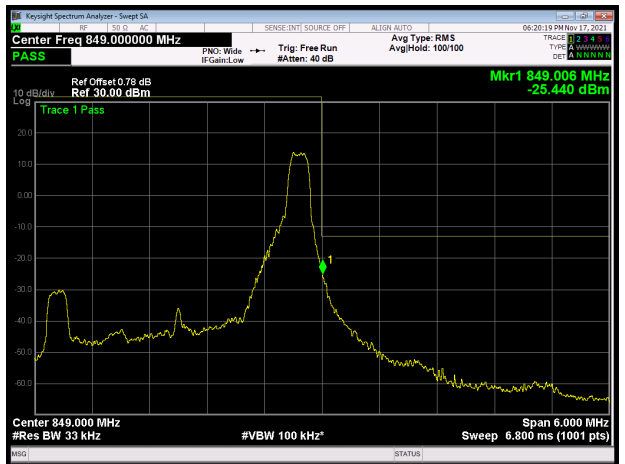
LTE Band 26 64QAM 1.4MHz CH-High 100%RB



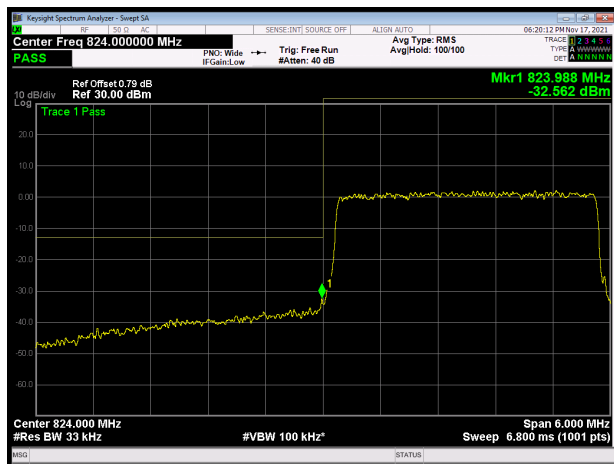
LTE Band 26 64QAM 3MHz CH-Low 1RB



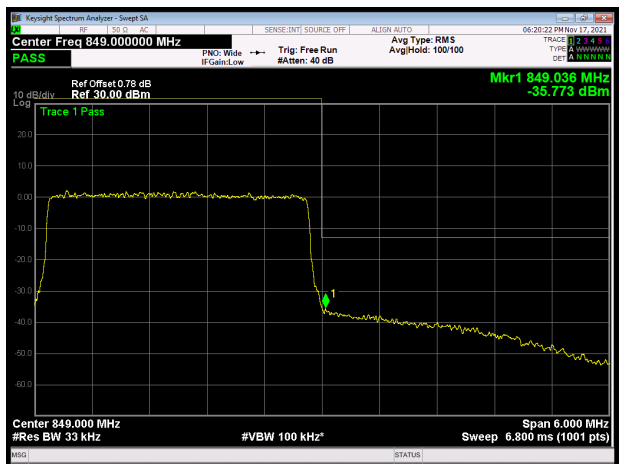
LTE Band 26 64QAM 3MHz CH-High 1RB



LTE Band 26 64QAM 3MHz CH-Low 100%RB

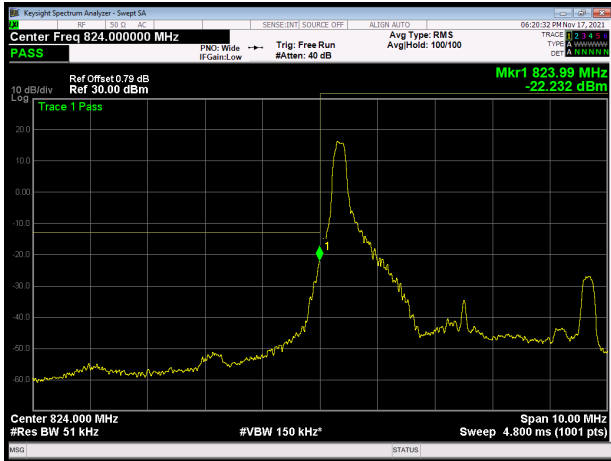


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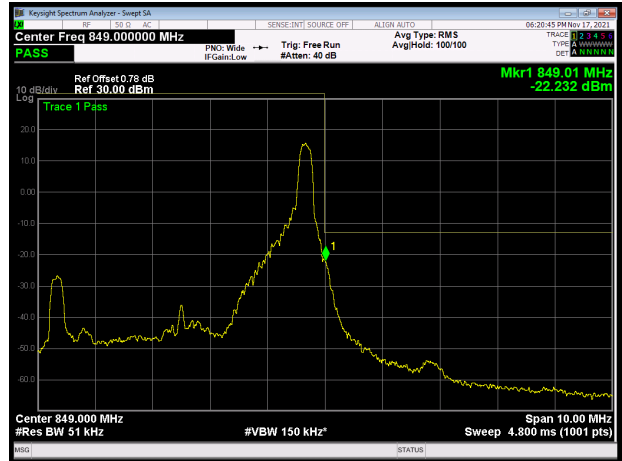




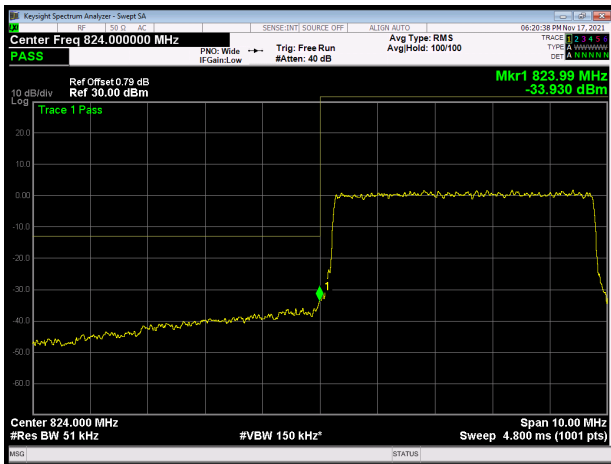
LTE Band 26 64QAM 5MHz CH-Low 1RB



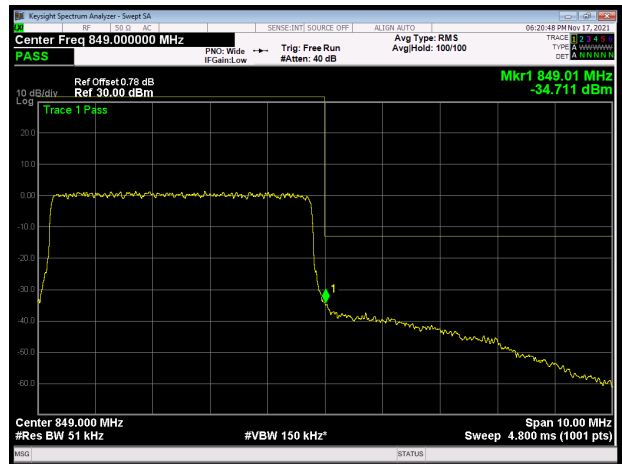
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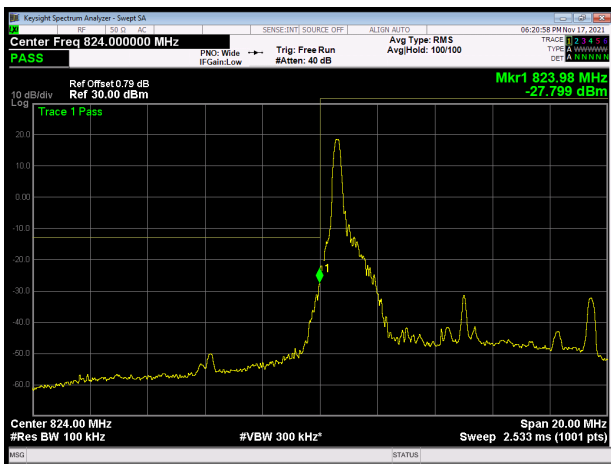
LTE Band 26 64QAM 5MHz CH-Low 100%RB



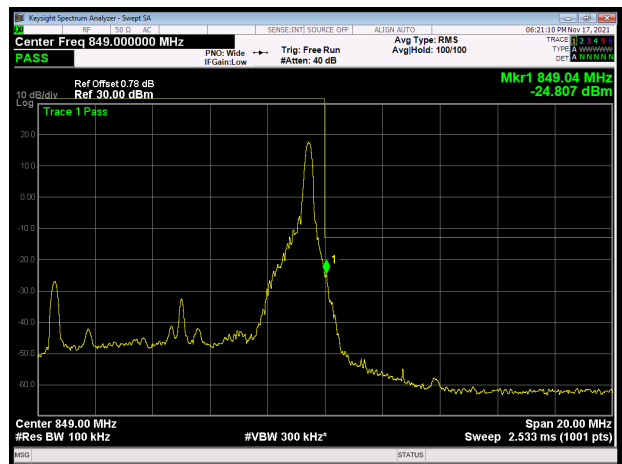
LTE Band 26 64QAM 5MHz CH-High 100%RB



LTE Band 26 64QAM 10MHz CH-Low 1RB

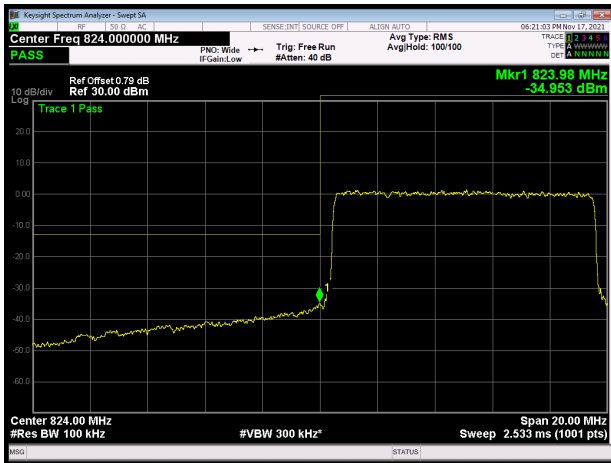


LTE Band 26 64QAM 10MHz CH-High 1RB





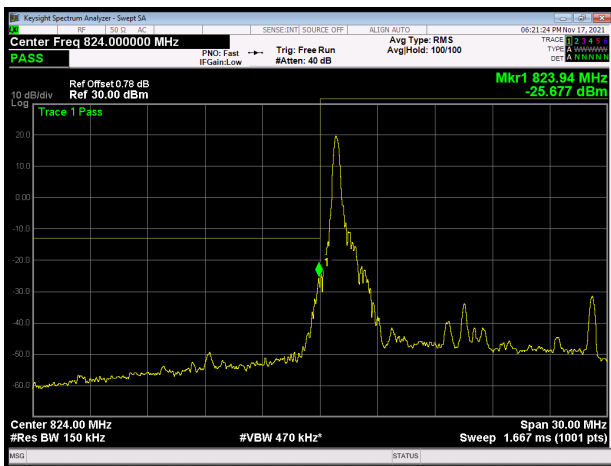
LTE Band 26 64QAM 10MHz CH-Low 100%RB



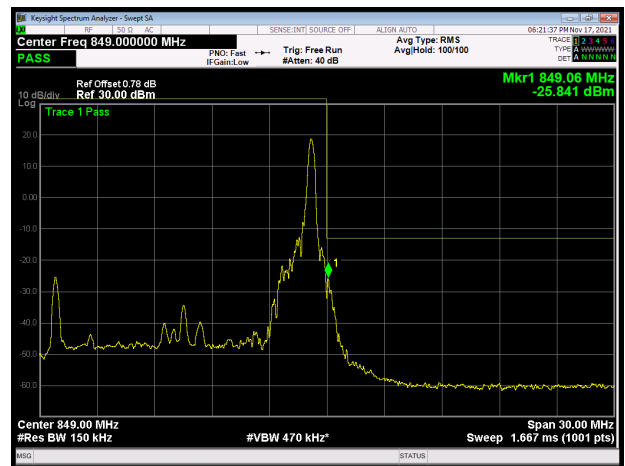
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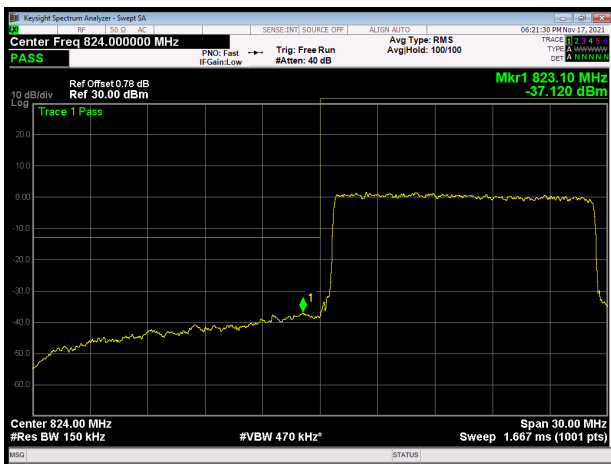
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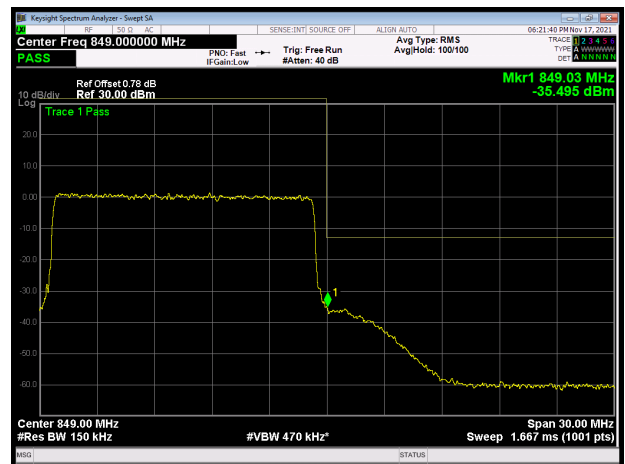
LTE Band 26 64QAM 15MHz CH-High 1RB



LTE Band 26 64QAM 15MHz CH-Low 100%RB



LTE Band 26 64QAM 15MHz CH-High 100%RB



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

Ambient condition

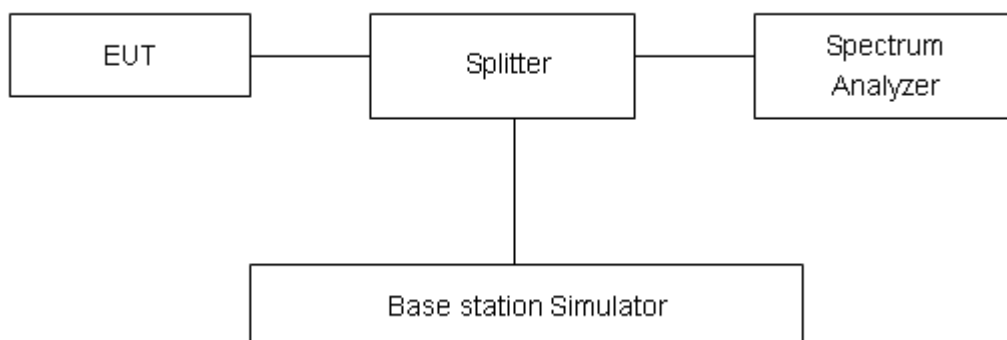
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

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

$$PAPR (dB) = P_{Pk} (dBm) - P_{Avg} (dBm).$$

Test Setup



Limits

According to the Sec. 22.913(d), The peak-to-average ratio (PAR) of the transmission must 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	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
GSM 850 (GMSK)	128	824.2	31.82	29.19	2.63	≤13	PASS
	190	836.6	31.84	29.22	2.62	≤13	PASS
	251	848.8	31.87	29.25	2.62	≤13	PASS
GPRS 850 (GMSK)	128	824.2	31.82	29.19	2.63	≤13	PASS
	190	836.6	31.86	29.23	2.63	≤13	PASS
	251	848.8	31.91	29.28	2.63	≤13	PASS
EGPRS 850 (8PSK)	128	824.2	27.41	22.14	5.27	≤13	PASS
	190	836.6	27.42	22.07	5.35	≤13	PASS
	251	848.8	27.51	22.18	5.33	≤13	PASS
WCDMA Band V (RMC)	4132	826.4	24.86	21.83	3.03	≤13	PASS
	4183	836.6	24.97	21.82	3.15	≤13	PASS
	4233	846.6	24.93	21.78	3.15	≤13	PASS

LTE Band 5								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	20407	824.7	26.53	21.05	5.48	≤13	PASS
		20525	836.5	26.56	20.90	5.66	≤13	PASS
		20643	848.3	26.10	20.86	5.24	≤13	PASS
	3	20415	825.5	26.52	21.03	5.49	≤13	PASS
		20525	836.5	26.55	20.95	5.60	≤13	PASS
		20635	847.5	26.22	20.83	5.39	≤13	PASS
	5	20425	826.5	26.52	21.03	5.49	≤13	PASS
		20525	836.5	26.61	20.97	5.64	≤13	PASS
		20625	846.5	26.47	20.89	5.58	≤13	PASS
	10	20450	829	26.47	20.99	5.48	≤13	PASS
		20525	836.5	26.65	21.00	5.65	≤13	PASS
		20600	844	26.66	20.96	5.70	≤13	PASS
16QAM	1.4	20407	824.7	26.28	20.08	6.20	≤13	PASS
		20525	836.5	26.32	19.97	6.35	≤13	PASS
		20643	848.3	26.14	19.94	6.20	≤13	PASS
	3	20415	825.5	26.40	20.08	6.32	≤13	PASS
		20525	836.5	26.41	20.00	6.41	≤13	PASS



	5	20635	847.5	26.12	19.91	6.21	≤13	PASS	
		20425	826.5	26.28	20.07	6.21	≤13	PASS	
		20525	836.5	26.41	20.03	6.38	≤13	PASS	
		20625	846.5	26.31	19.94	6.37	≤13	PASS	
	10	20450	829	26.29	20.04	6.25	≤13	PASS	
		20525	836.5	26.41	20.04	6.37	≤13	PASS	
		20600	844	26.37	19.96	6.41	≤13	PASS	
	64QAM	1.4	20407	824.7	25.89	19.67	6.22	≤13	PASS
			20525	836.5	25.86	19.50	6.36	≤13	PASS
20643			848.3	25.51	19.42	6.09	≤13	PASS	
3		20415	825.5	25.90	19.63	6.27	≤13	PASS	
		20525	836.5	25.99	19.53	6.46	≤13	PASS	
		20635	847.5	25.68	19.41	6.27	≤13	PASS	
5		20425	826.5	25.85	19.60	6.25	≤13	PASS	
		20525	836.5	25.89	19.55	6.34	≤13	PASS	
		20625	846.5	25.81	19.47	6.34	≤13	PASS	
10		20450	829	25.78	19.57	6.21	≤13	PASS	
		20525	836.5	26.01	19.60	6.41	≤13	PASS	
		20600	844	25.96	19.52	6.44	≤13	PASS	

LTE Band 26								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	26797	824.7	26.45	20.88	5.57	≤13	PASS
		26915	836.5	26.56	20.76	5.80	≤13	PASS
		27033	848.3	26.02	20.69	5.33	≤13	PASS
	3	26805	825.5	26.34	20.86	5.48	≤13	PASS
		26915	836.5	26.47	20.78	5.69	≤13	PASS
		27025	847.5	26.11	20.69	5.42	≤13	PASS
	5	26815	826.5	26.39	20.84	5.55	≤13	PASS
		26915	836.5	26.50	20.79	5.71	≤13	PASS
		27015	846.5	26.42	20.74	5.68	≤13	PASS
	10	26840	829	26.31	20.83	5.48	≤13	PASS
		26915	836.5	26.57	20.86	5.71	≤13	PASS
		26990	844	26.46	20.74	5.72	≤13	PASS
	15	26865	831.5	26.76	20.87	5.89	≤13	PASS
		26915	836.5	26.88	20.83	6.05	≤13	PASS
		26965	841.5	26.80	20.76	6.04	≤13	PASS
16QAM	1.4	26797	824.7	26.21	19.92	6.29	≤13	PASS



		26915	836.5	26.17	19.81	6.36	≤13	PASS
		27033	848.3	26.06	19.82	6.24	≤13	PASS
	3	26805	825.5	26.19	19.93	6.26	≤13	PASS
		26915	836.5	26.26	19.83	6.43	≤13	PASS
		27025	847.5	26.04	19.74	6.30	≤13	PASS
	5	26815	826.5	26.14	19.89	6.25	≤13	PASS
		26915	836.5	26.17	19.83	6.34	≤13	PASS
		27015	846.5	26.15	19.80	6.35	≤13	PASS
	10	26840	829	26.12	19.84	6.28	≤13	PASS
		26915	836.5	26.29	19.89	6.40	≤13	PASS
		26990	844	26.28	19.81	6.47	≤13	PASS
	15	26865	831.5	26.23	19.88	6.35	≤13	PASS
		26915	836.5	26.34	19.84	6.50	≤13	PASS
		26965	841.5	26.34	19.82	6.52	≤13	PASS
	64QAM	1.4	26797	824.7	25.93	19.61	6.32	≤13
26915			836.5	25.73	19.40	6.33	≤13	PASS
27033			848.3	25.60	19.36	6.24	≤13	PASS
3		26805	825.5	26.15	19.91	6.24	≤13	PASS
		26915	836.5	25.85	19.39	6.46	≤13	PASS
		27025	847.5	25.62	19.32	6.30	≤13	PASS
5		26815	826.5	26.13	19.97	6.16	≤13	PASS
		26915	836.5	25.79	19.42	6.37	≤13	PASS
		27015	846.5	25.74	19.38	6.36	≤13	PASS
10		26840	829	26.11	19.92	6.19	≤13	PASS
		26915	836.5	25.89	19.50	6.39	≤13	PASS
		26990	844	25.84	19.38	6.46	≤13	PASS
15		26865	831.5	26.23	19.94	6.29	≤13	PASS
		26915	836.5	26.08	19.54	6.54	≤13	PASS
		26965	841.5	25.91	19.38	6.53	≤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.

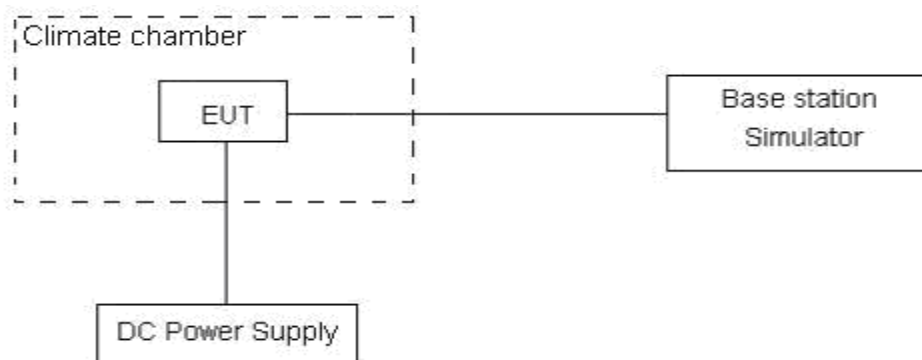
(3) Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements. Frequency Stability (Voltage Variation)

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 3.4 V and 4.33 V, with a nominal voltage of 3.85V.

Test setup



Limits

According to the Sec. 22.355, the frequency stability of the carrier shall be accurate to within 2.5 ppm of the received frequency for mobile stations.

Limits	≤ 2.5 ppm
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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 $k = 3$, $U = 0.01\text{ppm}$.

Test Result

GSM 850						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	GMSK	8PSK	GMSK	8PSK	
Normal (25°C)	Normal	13.71	5.40	0.01639	0.00646	PASS
Extreme (50°C)		3.62	11.29	0.00433	0.01349	PASS
Extreme (40°C)		12.49	1.66	0.01493	0.00199	PASS
Extreme (30°C)		1.27	6.36	0.00152	0.00760	PASS
Extreme (20°C)		16.36	6.23	0.01956	0.00745	PASS
Extreme (10°C)		11.83	8.51	0.01414	0.01017	PASS
Extreme (0°C)		3.79	2.24	0.00454	0.00268	PASS
Extreme (-10°C)		15.85	4.23	0.01894	0.00505	PASS
Extreme (-20°C)		17.73	2.23	0.02120	0.00267	PASS
Extreme (-30°C)		11.77	12.12	0.01407	0.01449	PASS
25°C	LV	3.48	13.75	0.00416	0.01644	PASS
	HV	13.83	17.51	0.01653	0.02093	PASS

WCDMA band V						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	BPSK	QPSK	BPSK	QPSK	
Normal (25°C)	Normal	17.09	11.74	0.02043	0.01404	PASS
Extreme (50°C)		14.00	10.66	0.01673	0.01275	PASS
Extreme (40°C)		13.61	7.78	0.01627	0.00929	PASS
Extreme (30°C)		16.33	15.63	0.01952	0.01869	PASS
Extreme (20°C)		3.78	15.39	0.00452	0.01839	PASS
Extreme (10°C)		10.11	12.36	0.01208	0.01478	PASS
Extreme (0°C)		8.63	17.94	0.01031	0.02145	PASS
Extreme (-10°C)		14.02	5.14	0.01676	0.00614	PASS
Extreme (-20°C)		6.92	10.04	0.00827	0.01201	PASS
Extreme (-30°C)		2.81	5.17	0.00336	0.00618	PASS
25°C	LV	15.83	2.91	0.01892	0.00348	PASS
	HV	8.84	12.55	0.01057	0.01500	PASS



LTE band 5								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Bandwidth	1.4MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	13.36	6.15	16.64	0.01597	0.00736	0.01990	PASS
Extreme (50°C)		12.16	17.70	5.33	0.01454	0.02117	0.00637	PASS
Extreme (40°C)		2.81	10.77	2.77	0.00336	0.01287	0.00331	PASS
Extreme (30°C)		15.68	8.94	8.60	0.01875	0.01068	0.01028	PASS
Extreme (20°C)		11.61	3.85	3.33	0.01388	0.00461	0.00398	PASS
Extreme (10°C)		13.93	2.23	9.63	0.01666	0.00267	0.01151	PASS
Extreme (0°C)		9.02	17.38	13.57	0.01078	0.02078	0.01622	PASS
Extreme (-10°C)		2.15	12.98	12.11	0.00257	0.01552	0.01448	PASS
Extreme (-20°C)		5.42	10.28	13.48	0.00648	0.01229	0.01612	PASS
Extreme (-30°C)		12.91	17.65	15.93	0.01543	0.02110	0.01905	PASS
25°C		LV	16.44	2.49	13.35	0.01966	0.00297	0.01596
	HV	8.49	1.07	5.04	0.01015	0.00128	0.00603	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Bandwidth	3MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	11.71	4.77	2.22	0.01400	0.00570	0.00265	PASS
Extreme (50°C)		10.51	15.67	4.29	0.01256	0.01874	0.00513	PASS
Extreme (40°C)		16.79	7.59	8.59	0.02007	0.00907	0.01027	PASS
Extreme (30°C)		9.28	16.79	2.83	0.01109	0.02007	0.00338	PASS
Extreme (20°C)		5.98	9.76	8.13	0.00714	0.01167	0.00972	PASS
Extreme (10°C)		14.16	14.04	2.75	0.01693	0.01679	0.00329	PASS
Extreme (0°C)		15.08	15.30	14.58	0.01803	0.01829	0.01743	PASS
Extreme (-10°C)		12.66	5.40	6.91	0.01513	0.00646	0.00826	PASS
Extreme (-20°C)		4.07	17.59	11.34	0.00487	0.02103	0.01355	PASS
Extreme (-30°C)		12.85	15.18	10.96	0.01536	0.01814	0.01310	PASS
25°C		LV	13.88	9.53	5.59	0.01659	0.01139	0.00668
	HV	9.63	11.46	7.66	0.01152	0.01369	0.00916	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Bandwidth	5MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	3.98	11.72	14.23	0.00476	0.01402	0.01701	PASS
Extreme (50°C)		11.57	5.17	12.34	0.01383	0.00619	0.01475	PASS



Extreme (40°C)		1.22	12.27	4.33	0.00145	0.01467	0.00518	PASS
Extreme (30°C)		11.30	1.78	9.38	0.01351	0.00213	0.01122	PASS
Extreme (20°C)		8.18	11.36	1.73	0.00978	0.01359	0.00207	PASS
Extreme (10°C)		7.94	5.38	12.33	0.00949	0.00643	0.01474	PASS
Extreme (0°C)		2.63	1.30	7.27	0.00315	0.00155	0.00869	PASS
Extreme (-10°C)		15.62	13.77	6.57	0.01867	0.01646	0.00786	PASS
Extreme (-20°C)		14.63	4.83	14.39	0.01749	0.00577	0.01721	PASS
Extreme (-30°C)		12.52	10.94	16.89	0.01496	0.01308	0.02020	PASS
25°C	LV	10.35	6.75	2.99	0.01237	0.00807	0.00358	PASS
	HV	2.90	17.81	1.45	0.00347	0.02129	0.00173	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Bandwidth	10MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	16.80	15.45	2.67	0.02009	0.01847	0.00320	PASS
Extreme (50°C)		6.28	6.38	6.51	0.00751	0.00763	0.00778	PASS
Extreme (40°C)		6.48	7.64	4.89	0.00774	0.00913	0.00585	PASS
Extreme (30°C)		15.61	17.94	1.82	0.01866	0.02145	0.00218	PASS
Extreme (20°C)		5.91	10.67	1.05	0.00706	0.01276	0.00125	PASS
Extreme (10°C)		3.97	1.04	16.66	0.00475	0.00125	0.01992	PASS
Extreme (0°C)		17.44	12.87	9.80	0.02085	0.01539	0.01171	PASS
Extreme (-10°C)		16.60	1.66	3.47	0.01984	0.00198	0.00415	PASS
Extreme (-20°C)		1.34	13.35	1.09	0.00160	0.01596	0.00130	PASS
Extreme (-30°C)		2.96	15.10	14.55	0.00354	0.01805	0.01739	PASS
25°C	LV	11.47	8.80	11.48	0.01371	0.01052	0.01372	PASS
	HV	13.31	16.43	8.37	0.01591	0.01964	0.01000	PASS

LTE band 26								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Bandwidth	1.4MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	7.81	16.41	7.53	0.00934	0.01962	0.00900	PASS
Extreme (50°C)		2.40	13.04	8.36	0.00286	0.01559	0.00999	PASS
Extreme (40°C)		11.82	15.97	12.93	0.01413	0.01909	0.01546	PASS
Extreme (30°C)		17.48	17.24	17.31	0.02089	0.02061	0.02069	PASS
Extreme (20°C)		16.22	1.18	5.62	0.01939	0.00141	0.00672	PASS
Extreme (10°C)		12.76	6.73	3.01	0.01526	0.00804	0.00360	PASS
Extreme (0°C)		6.03	7.04	1.05	0.00721	0.00842	0.00125	PASS



Extreme (-10°C)		10.34	14.20	7.27	0.01236	0.01697	0.00870	PASS
Extreme (-20°C)		2.92	1.73	4.85	0.00349	0.00207	0.00580	PASS
Extreme (-30°C)		6.15	17.53	8.35	0.00736	0.02096	0.00999	PASS
25°C	LV	9.69	1.65	1.26	0.01158	0.00197	0.00150	PASS
	HV	14.93	4.69	1.84	0.01785	0.00561	0.00220	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Bandwidth	3MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	6.73	13.36	12.26	0.00804	0.01597	0.01466	PASS
Extreme (50°C)		4.33	1.77	6.53	0.00517	0.00212	0.00781	PASS
Extreme (40°C)		10.02	4.81	4.33	0.01197	0.00575	0.00518	PASS
Extreme (30°C)		8.08	8.87	8.98	0.00966	0.01060	0.01073	PASS
Extreme (20°C)		13.80	14.14	5.96	0.01649	0.01690	0.00713	PASS
Extreme (10°C)		9.47	3.62	3.34	0.01132	0.00433	0.00399	PASS
Extreme (0°C)		1.52	8.95	12.13	0.00181	0.01070	0.01450	PASS
Extreme (-10°C)		5.04	6.52	16.02	0.00603	0.00779	0.01915	PASS
Extreme (-20°C)		6.64	6.07	12.09	0.00794	0.00725	0.01445	PASS
Extreme (-30°C)		8.08	2.24	15.34	0.00966	0.00268	0.01834	PASS
25°C		LV	3.50	3.86	3.43	0.00419	0.00461	0.00410
	HV	17.32	5.24	5.51	0.02070	0.00626	0.00659	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Bandwidth	5MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	5.89	15.04	11.56	0.00704	0.01799	0.01382	PASS
Extreme (50°C)		13.45	3.49	11.60	0.01608	0.00417	0.01387	PASS
Extreme (40°C)		2.41	3.45	5.00	0.00288	0.00412	0.00598	PASS
Extreme (30°C)		9.93	1.28	3.73	0.01187	0.00153	0.00446	PASS
Extreme (20°C)		9.22	15.07	2.95	0.01102	0.01801	0.00352	PASS
Extreme (10°C)		16.67	3.98	7.79	0.01993	0.00476	0.00931	PASS
Extreme (0°C)		10.60	17.72	3.08	0.01267	0.02118	0.00369	PASS
Extreme (-10°C)		6.01	9.31	10.01	0.00719	0.01113	0.01197	PASS
Extreme (-20°C)		11.08	17.81	1.09	0.01325	0.02129	0.00130	PASS
Extreme (-30°C)		12.82	6.28	13.42	0.01533	0.00750	0.01605	PASS
25°C		LV	7.89	5.74	7.89	0.00944	0.00686	0.00943
	HV	12.62	13.31	3.04	0.01509	0.01591	0.00364	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Bandwidth	10MHz							



Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	2.33	7.35	11.43	0.00279	0.00878	0.01366	PASS
Extreme (50°C)		5.66	3.42	14.79	0.00677	0.00409	0.01768	PASS
Extreme (40°C)		13.42	15.28	17.74	0.01604	0.01827	0.02121	PASS
Extreme (30°C)		6.40	1.64	12.60	0.00765	0.00196	0.01506	PASS
Extreme (20°C)		3.11	10.65	10.23	0.00371	0.01273	0.01223	PASS
Extreme (10°C)		15.78	3.00	15.18	0.01886	0.00359	0.01815	PASS
Extreme (0°C)		3.15	2.73	10.88	0.00377	0.00327	0.01301	PASS
Extreme (-10°C)		6.52	4.97	10.05	0.00779	0.00594	0.01201	PASS
Extreme (-20°C)		16.03	16.37	11.08	0.01917	0.01958	0.01325	PASS
Extreme (-30°C)		1.06	10.06	7.23	0.00127	0.01202	0.00865	PASS
25°C		LV	8.76	6.61	9.49	0.01047	0.00790	0.01134
	HV	12.23	8.64	2.76	0.01462	0.01032	0.00330	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Bandwidth	15MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	9.00	16.00	13.00	0.01076	0.01913	0.01554	PASS
Extreme (50°C)		17.00	10.00	5.00	0.02032	0.01195	0.00598	PASS
Extreme (40°C)		6.00	12.00	7.00	0.00717	0.01435	0.00837	PASS
Extreme (30°C)		9.00	15.00	5.00	0.01076	0.01793	0.00598	PASS
Extreme (20°C)		4.00	2.00	6.00	0.00478	0.00239	0.00717	PASS
Extreme (10°C)		11.00	3.00	13.00	0.01315	0.00359	0.01554	PASS
Extreme (0°C)		17.00	13.00	9.00	0.02032	0.01554	0.01076	PASS
Extreme (-10°C)		11.00	14.00	4.00	0.01315	0.01674	0.00478	PASS
Extreme (-20°C)		2.00	3.00	17.00	0.00239	0.00359	0.02032	PASS
Extreme (-30°C)		6.00	9.00	4.00	0.00717	0.01076	0.00478	PASS
25°C		LV	13.00	1.00	16.00	0.01554	0.00120	0.01913
	HV	7.00	14.00	11.00	0.00837	0.01674	0.01315	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 are set to 100 kHz and VBW are set to 300 kHz for below 1G, RBW are set to 1MHz and VBW are set to 3MHz for above 1G, Sweep is set to ATUO.

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

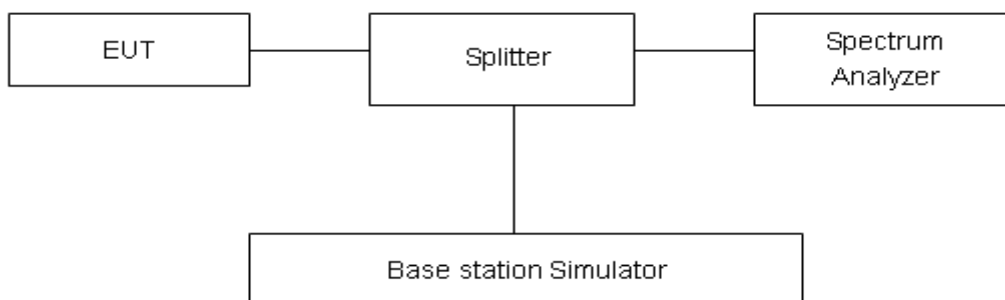
RBW is set to 10 kHz (0.15 MHz~ 30 MHz)

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

RBW is set to 1000 kHz (above 1000MHz)

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

Test setup



Limits

Rule Part 22.917(a) specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.”

Limit	-13 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-20GHz	1.407 dB

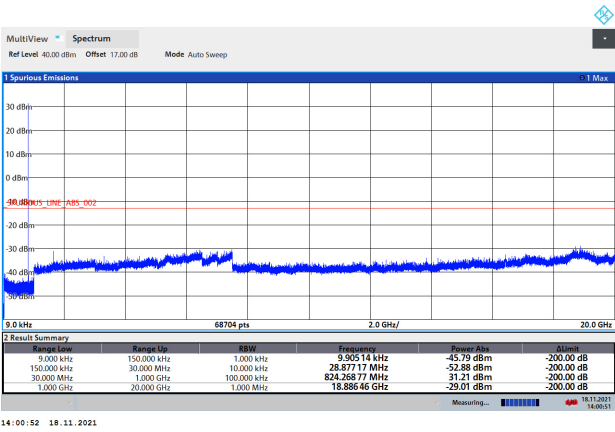


Test Result

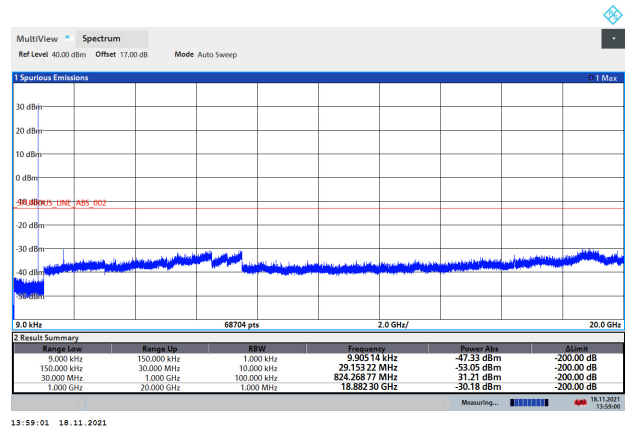
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

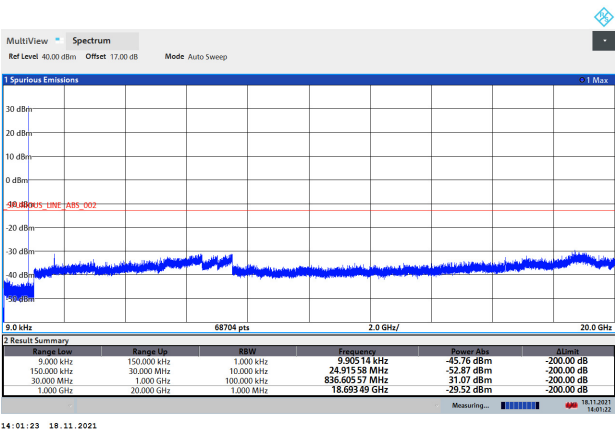
GSM 850 CH-Low 9kHz ~ 20GHz



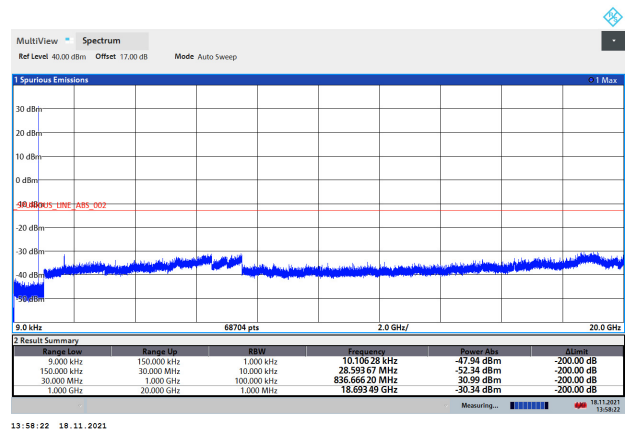
GPRS 850 CH-Low 9kHz ~ 20GHz



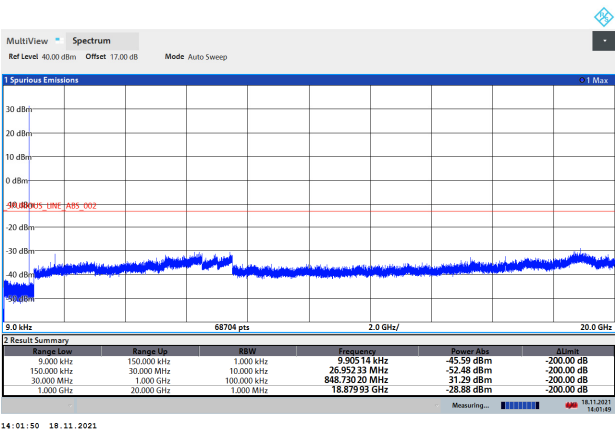
GSM 850 CH-Middle 9kHz ~ 20GHz



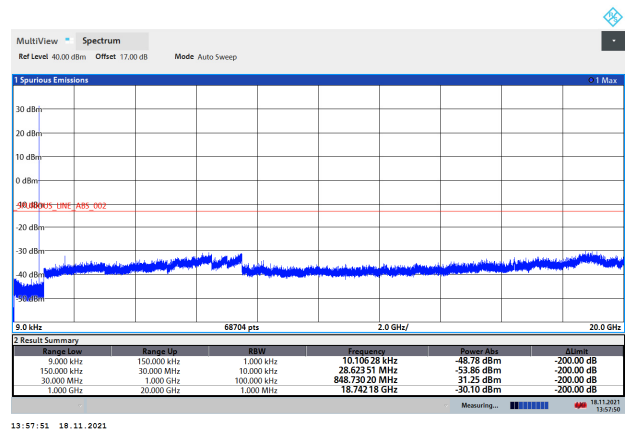
GPRS 850 CH-Middle 9kHz ~ 20GHz



GSM 850 CH-High 9kHz ~ 20GHz

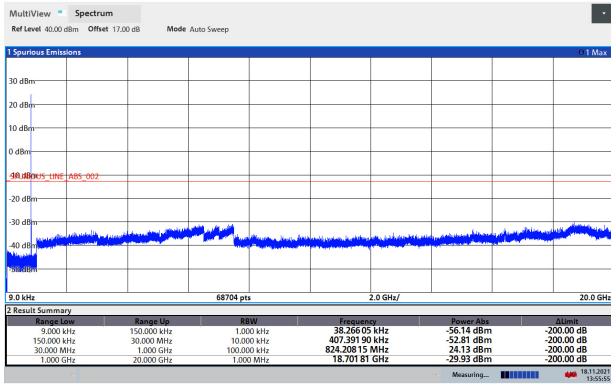


GPRS 850 CH-High 9kHz ~ 20GHz



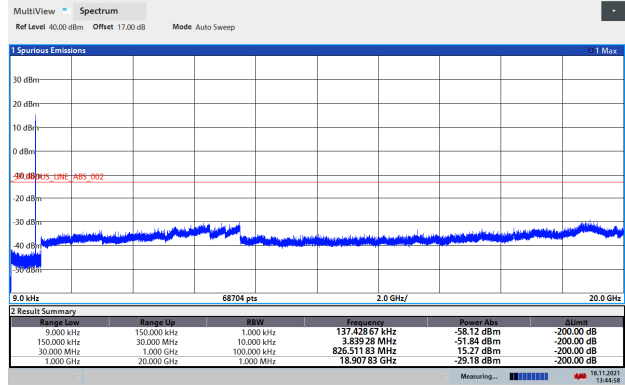


EGPRS 850 CH-Low 9kHz ~ 20GHz



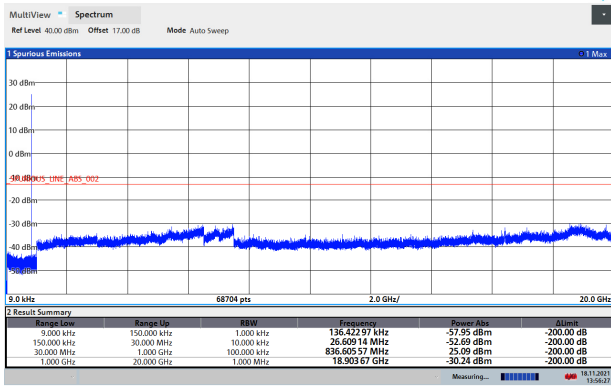
13:55:55 18.11.2021

WCDMA BAND V CH-Low 9kHz ~ 20GHz



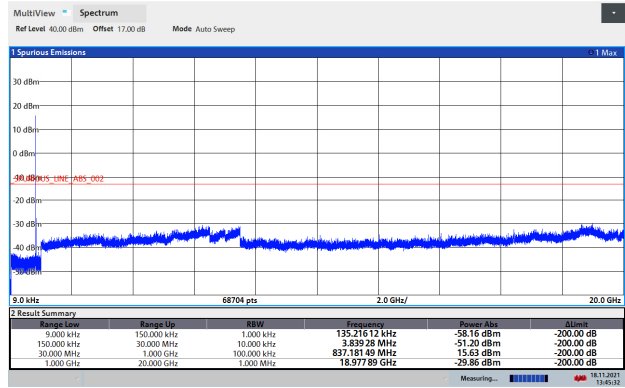
13:44:58 18.11.2021

EGPRS 850 CH-Middle 9kHz ~ 20GHz



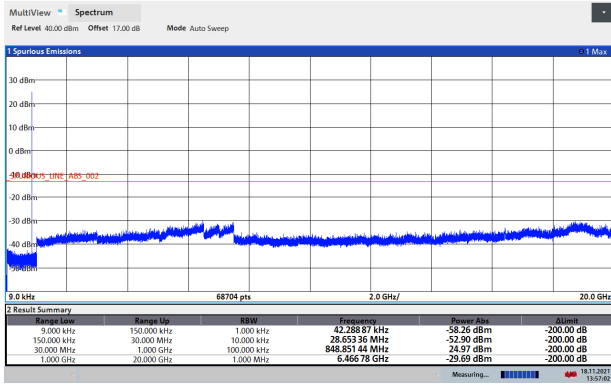
13:56:28 18.11.2021

WCDMA BAND V CH-Middle 9kHz ~ 20GHz



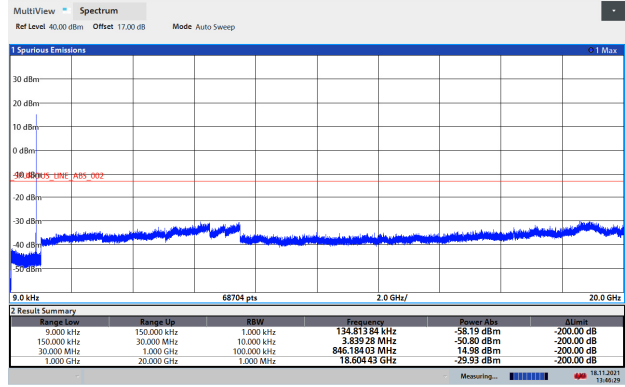
13:44:32 18.11.2021

EGPRS 850 CH-High 9kHz ~ 20GHz



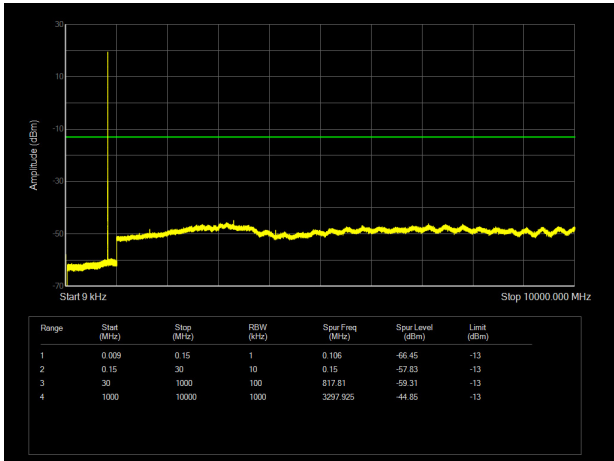
13:57:03 18.11.2021

WCDMA BAND V CH-High 9kHz ~ 20GHz

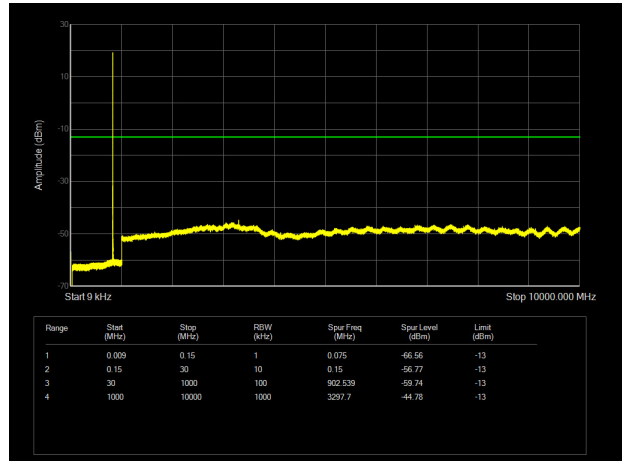


13:44:30 18.11.2021

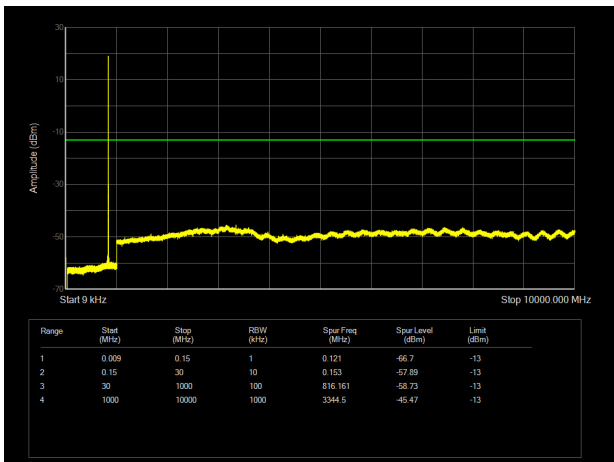
LTE Band 5 1.4MHz CH-Low 9kHz~10GHz



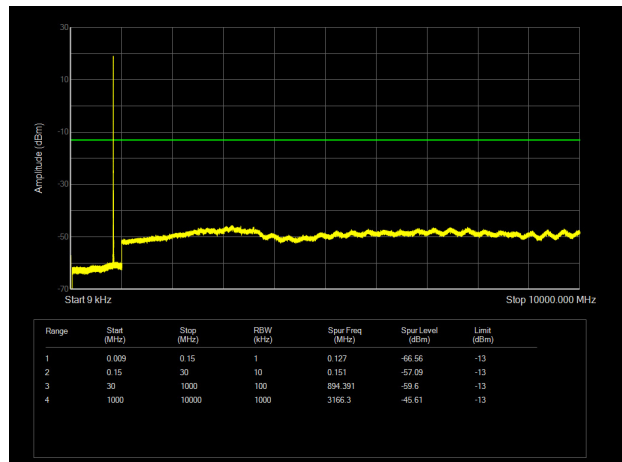
LTE Band 5 3MHz CH-Low 9kHz~10GHz



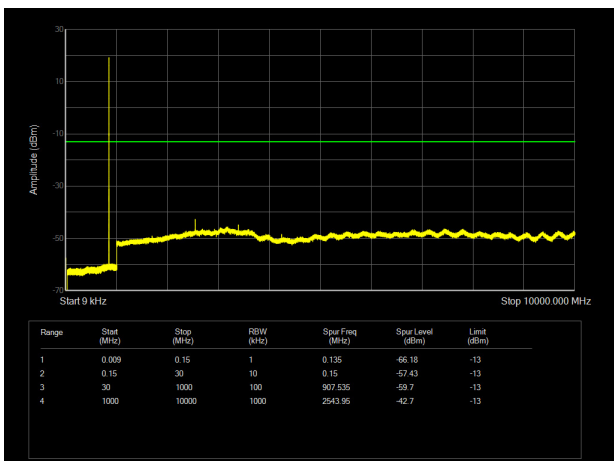
LTE Band 5 1.4MHz CH-Middle 9kHz~10GHz



LTE Band 5 3MHz CH-Middle 9kHz~10GHz



LTE Band 5 1.4MHz CH-High 9kHz~10GHz



LTE Band 5 3MHz CH-High 9kHz~10GHz

