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Appendix B.5

LTE Band 13



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Effective (Isotropic) Radiated Power Output Data

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dBm)	ERP(dBm)	Limit(dBm)	Verdict
Band13	5MHz	QPSK	23205	1RB#0	23.01	22.96	34.77	PASS
Band13	5MHz	QPSK	23205	1RB#12	22.84	22.79	34.77	PASS
Band13	5MHz	QPSK	23205	1RB#24	23.36	23.31	34.77	PASS
Band13	5MHz	QPSK	23205	25RB#0	22.01	21.96	34.77	PASS
Band13	5MHz	QPSK	23230	1RB#0	23.07	23.02	34.77	PASS
Band13	5MHz	QPSK	23230	1RB#12	23.4	23.35	34.77	PASS
Band13	5MHz	QPSK	23230	1RB#24	23.39	23.34	34.77	PASS
Band13	5MHz	QPSK	23230	25RB#0	22.4	22.35	34.77	PASS
Band13	5MHz	QPSK	23255	1RB#0	23.34	23.29	34.77	PASS
Band13	5MHz	QPSK	23255	1RB#12	23.31	23.26	34.77	PASS
Band13	5MHz	QPSK	23255	1RB#24	23.06	23.01	34.77	PASS
Band13	5MHz	QPSK	23255	25RB#0	22.22	22.17	34.77	PASS
Band13	5MHz	16QAM	23205	1RB#0	21.75	21.7	34.77	PASS
Band13	5MHz	16QAM	23205	1RB#12	22.26	22.21	34.77	PASS
Band13	5MHz	16QAM	23205	1RB#24	22.59	22.54	34.77	PASS
Band13	5MHz	16QAM	23205	25RB#0	21.12	21.07	34.77	PASS
Band13	5MHz	16QAM	23230	1RB#0	22.42	22.37	34.77	PASS
Band13	5MHz	16QAM	23230	1RB#12	22.66	22.61	34.77	PASS
Band13	5MHz	16QAM	23230	1RB#24	22.71	22.66	34.77	PASS
Band13	5MHz	16QAM	23230	25RB#0	21.4	21.35	34.77	PASS
Band13	5MHz	16QAM	23255	1RB#0	22.83	22.78	34.77	PASS
Band13	5MHz	16QAM	23255	1RB#12	22.65	22.6	34.77	PASS
Band13	5MHz	16QAM	23255	1RB#24	22.46	22.41	34.77	PASS
Band13	5MHz	16QAM	23255	25RB#0	21.37	21.32	34.77	PASS
Band13	10MHz	QPSK	23230	1RB#0	23.24	23.19	34.77	PASS
Band13	10MHz	QPSK	23230	1RB#24	23.37	23.32	34.77	PASS
Band13	10MHz	QPSK	23230	1RB#49	23.13	23.08	34.77	PASS



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Band13	10MHz	QPSK	23230	50RB#0	22.31	22.26	34.77	PASS
Band13	10MHz	16QAM	23230	1RB#0	22.06	22.01	34.77	PASS
Band13	10MHz	16QAM	23230	1RB#24	22.77	22.72	34.77	PASS
Band13	10MHz	16QAM	23230	1RB#49	22.47	22.42	34.77	PASS
Band13	10MHz	16QAM	23230	27RB#0	22.64	22.59	34.77	PASS



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Peak-to-Average Ratio(CCDF)

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band13	10MHz	QPSK	23230	50RB#0	5.52	13	PASS



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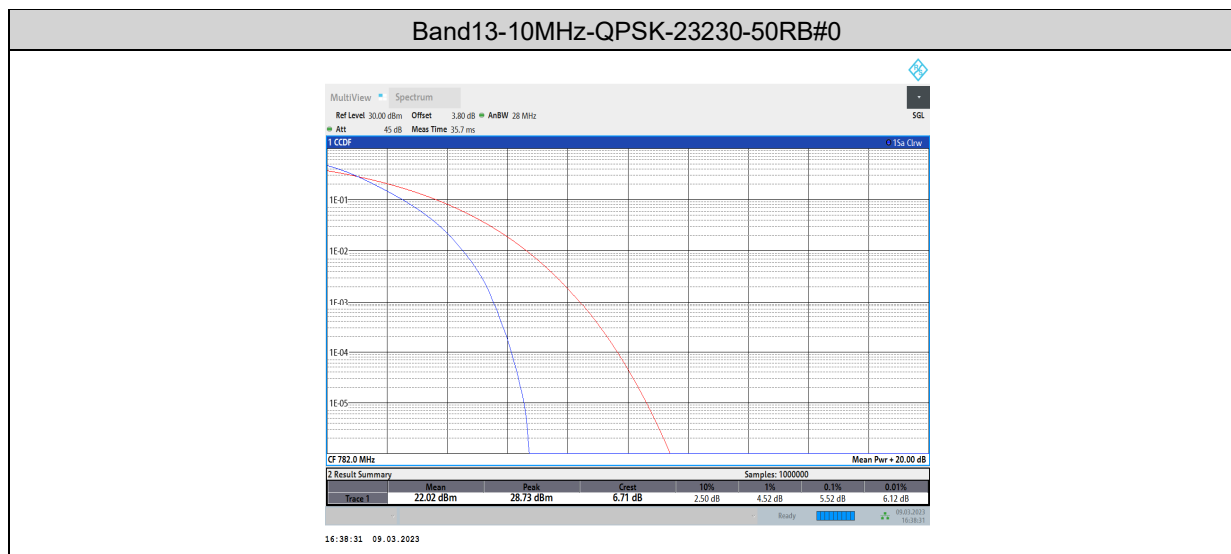
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Test Graphs



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Modulation Characteristics

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result	Verdict
Band13	5MHz	QPSK	23230	25RB#0	PASS	PASS
Band13	5MHz	16QAM	23230	25RB#0	PASS	PASS



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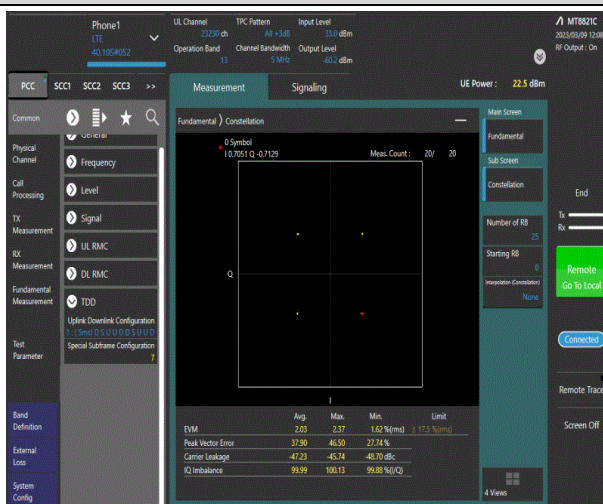
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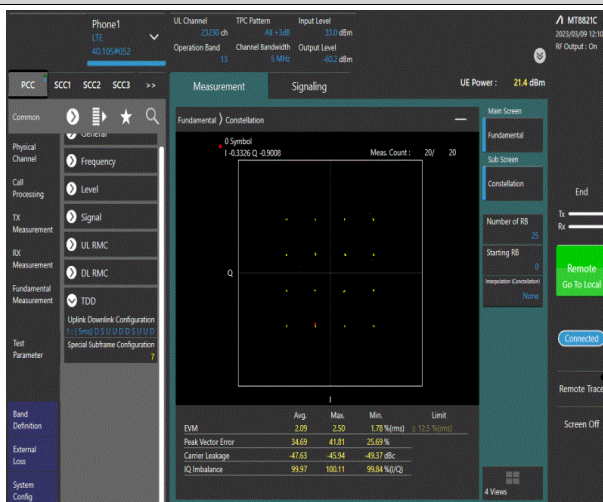
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Test Graphs

Band13-5MHz-QPSK-23230-50RB#0



Band13-5MHz-16QAM-23230-50RB#0



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26dB Bandwidth and Occupied Bandwidth

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band13	5MHz	QPSK	23205	25RB#0	4.464	4.93	PASS
Band13	5MHz	QPSK	23230	25RB#0	4.469	4.93	PASS
Band13	5MHz	QPSK	23255	25RB#0	4.465	4.93	PASS
Band13	5MHz	16QAM	23205	25RB#0	4.465	4.99	PASS
Band13	5MHz	16QAM	23230	25RB#0	4.468	5.00	PASS
Band13	5MHz	16QAM	23255	25RB#0	4.466	4.98	PASS
Band13	10MHz	QPSK	23230	50RB#0	8.923	9.86	PASS
Band13	10MHz	16QAM	23230	27RB#0	4.886	5.78	PASS



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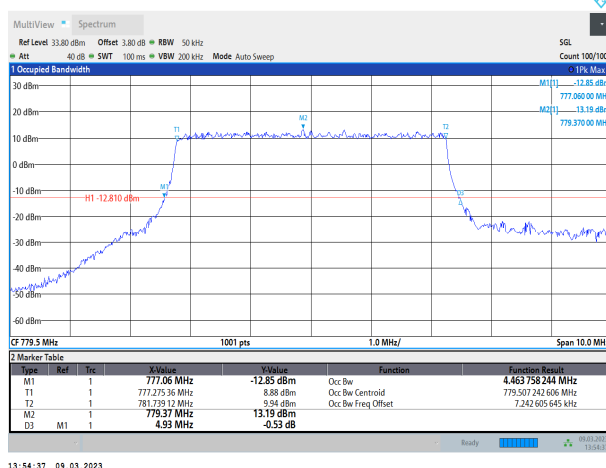
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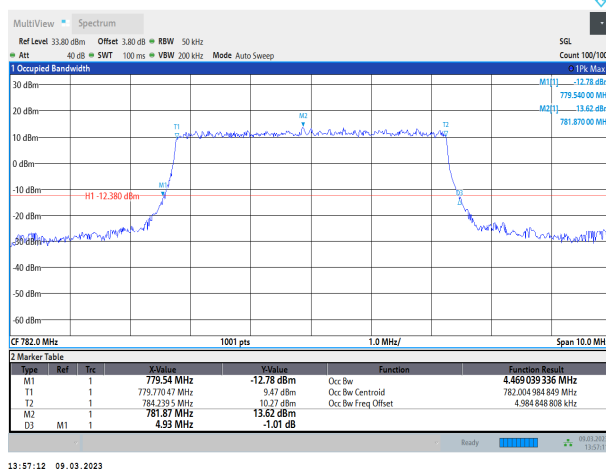
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Test Graphs

Band13-5MHz-QPSK-23205-25RB#0



Band13-5MHz-QPSK-23230-25RB#0

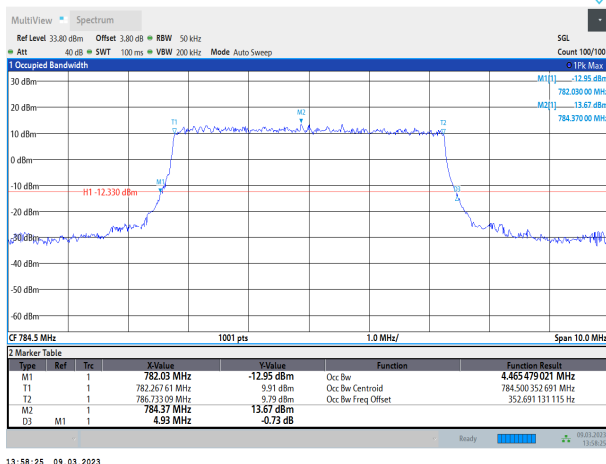


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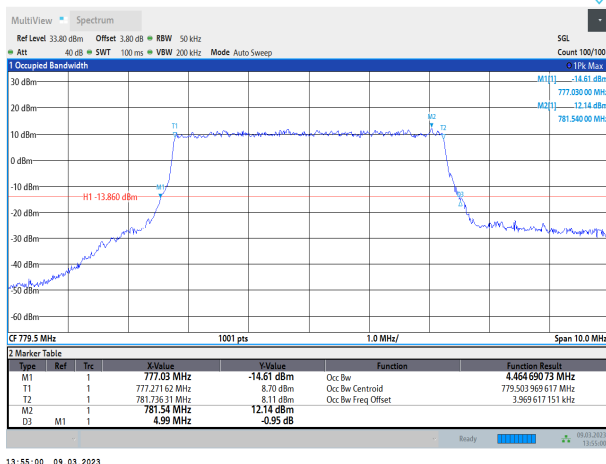
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Band13-5MHz-QPSK-23255-25RB#0



Band13-5MHz-16QAM-23205-25RB#0



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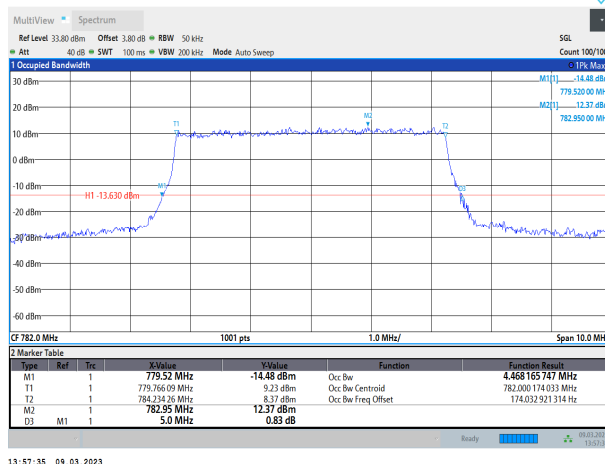
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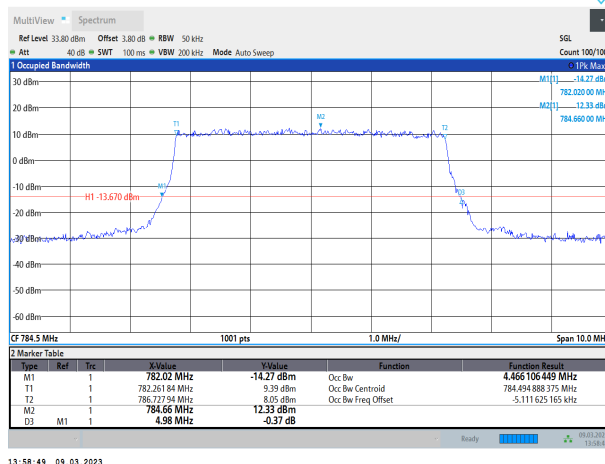
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Band13-5MHz-16QAM-23230-25RB#0



Band13-5MHz-16QAM-23255-25RB#0

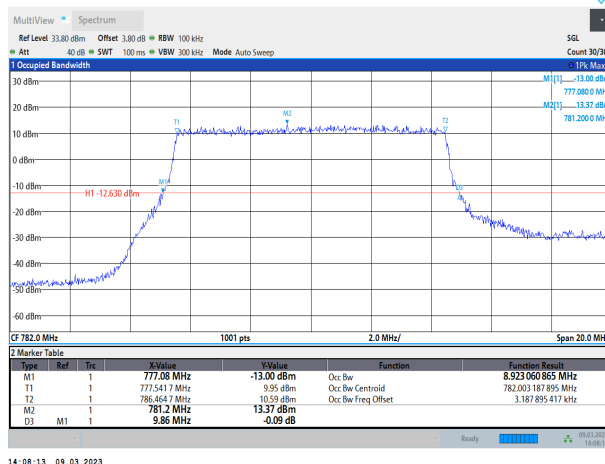


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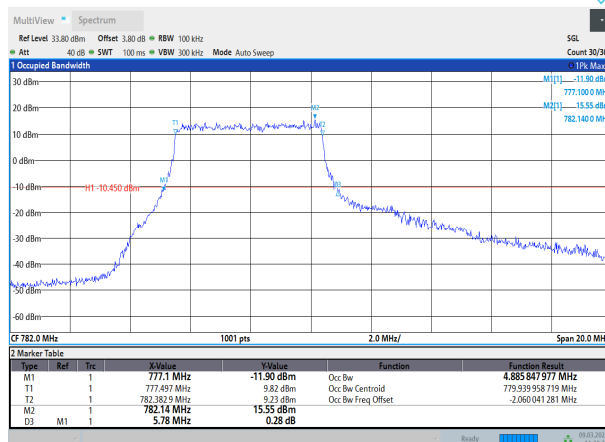
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Band13-10MHz-QPSK-23230-50RB#0



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Band13-10MHz-16QAM-23230-27RB#0



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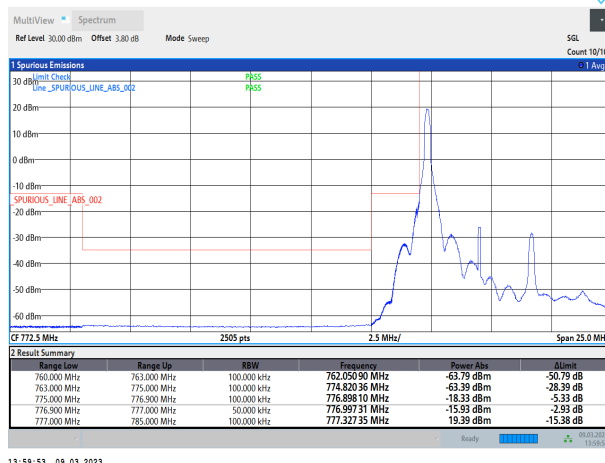
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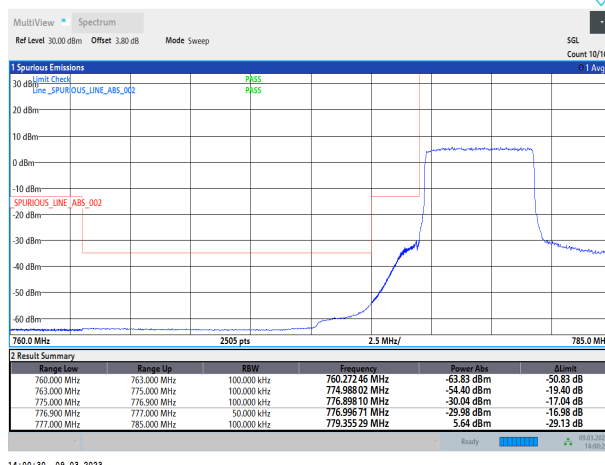
Band Edge

Test Graphs

Band13-5MHz-QPSK-23205-1RB#0



Band13-5MHz-QPSK-23205-25RB#0

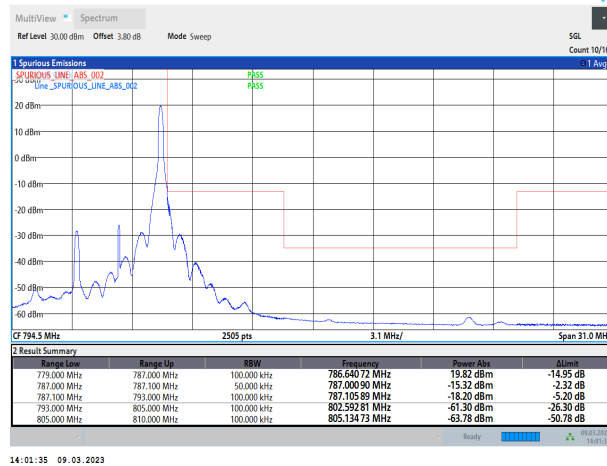


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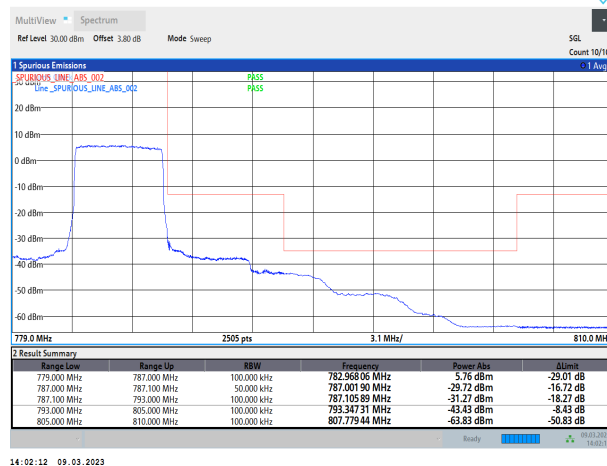
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Band13-5MHz-QPSK-23255-1RB#24



Band13-5MHz-QPSK-23255-25RB#0



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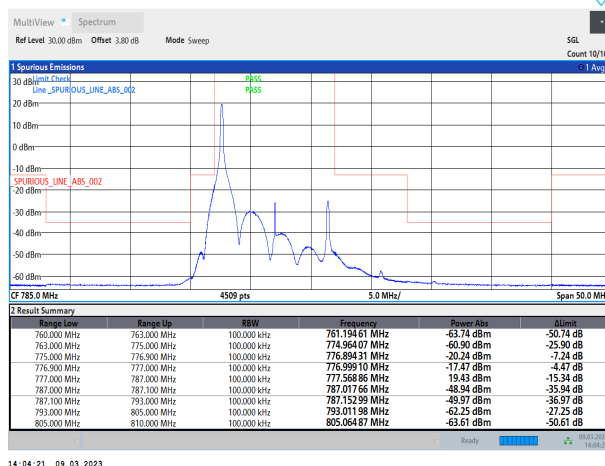
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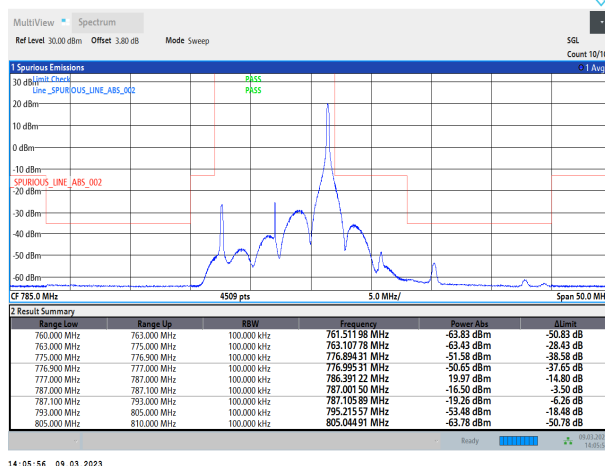
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Band13-10MHz-QPSK-23230-1RB#0



Band13-10MHz-QPSK-23230-1RB#49

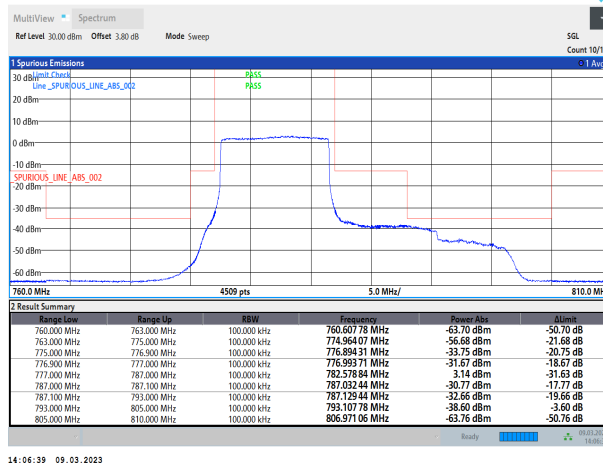


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Band13-10MHz-QPSK-23230-50RB#0



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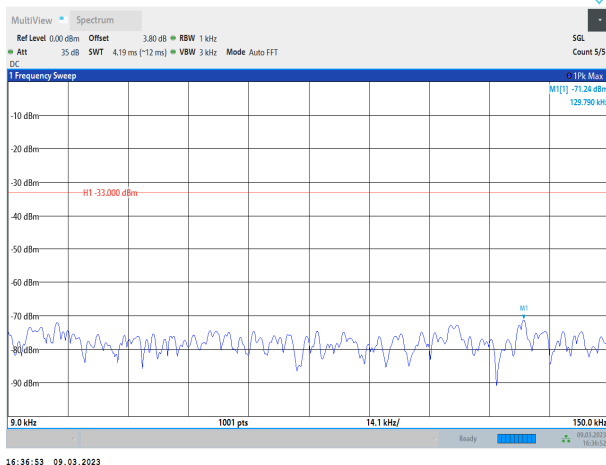
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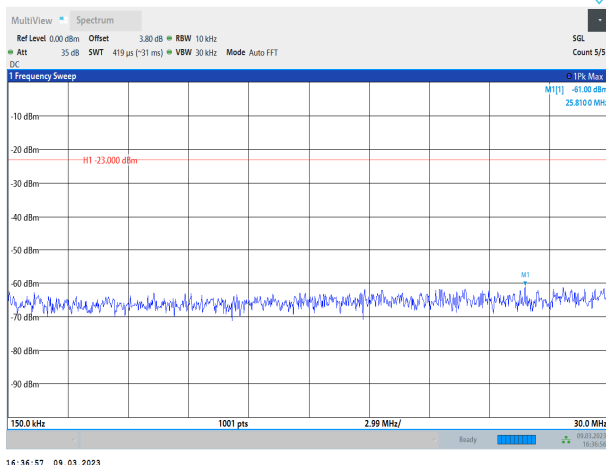
Conducted Spurious Emission

Test Graphs

Band13-10MHz-QPSK-23230-1RB#0-Range1:0.009~0.15MHz



Band13-10MHz-QPSK-23230-1RB#0-Range2:0.15~30MHz



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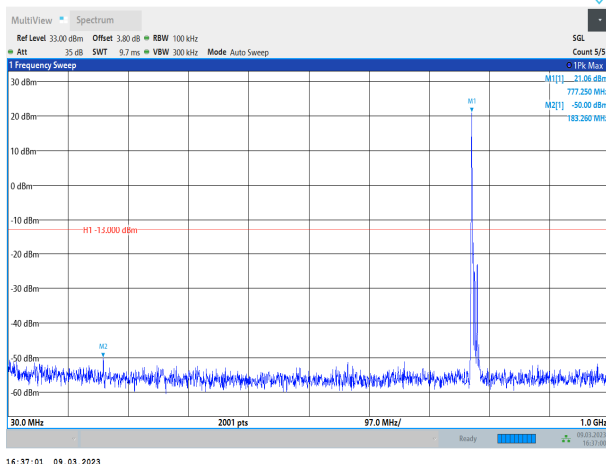
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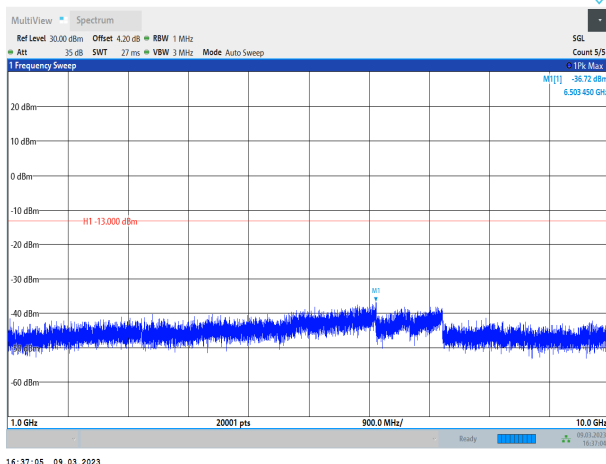
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Band13-10MHz-QPSK-23230-1RB#0-Range3:30~1000MHz



Band13-10MHz-QPSK-23230-1RB#0-Range4:1000~10000MHz



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Field Strength of Spurious Radiation

Test Band = LTE Band 13_QPSK_10MHz_TM1
Test Channel = Mid Channel

Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF[dB/m]	Level [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1555.18	48.19	-48.51	25.56	-70.02	-13.00	57.02	200	0	Horizontal
2	2332.77	57.14	-47.62	27.57	-58.17	-13.00	45.17	100	256	Horizontal
3	3110.36	51.27	-46.51	29.56	-60.95	-13.00	47.95	100	90	Horizontal
4	3887.95	42.99	-45.54	30.33	-67.48	-13.00	54.48	300	308	Horizontal
5	4665.54	41.71	-44.58	31.80	-66.33	-13.00	53.33	100	46	Horizontal
6	5443.13	40.93	-43.83	32.60	-65.56	-13.00	52.56	196	360	Horizontal

Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF[dB/m]	Level [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1555.18	46.16	-48.51	25.56	-72.05	-13.00	59.05	300	191	Vertical
2	2332.77	71.39	-47.62	27.57	-43.92	-13.00	30.92	100	200	Vertical
3	3110.36	55.04	-46.51	29.56	-57.18	-13.00	44.18	100	51	Vertical
4	3887.95	45.43	-45.54	30.33	-65.04	-13.00	52.04	100	125	Vertical
5	4665.54	42.18	-44.58	31.80	-65.86	-13.00	52.86	100	111	Vertical
6	5443.13	41.36	-43.83	32.60	-65.13	-13.00	52.13	200	273	Vertical



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Test Band = LTE Band 13_QPSK_5MHz_TM1**Test Channel = Low Channel****Final Data List**

NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF[dB/m]	Level [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2332	58.76	-47.62	27.56	-56.55	-13.00	43.55	296	308	Horizontal
2	1554.68	46.76	-48.51	25.56	-71.45	-13.00	58.45	285	2	Horizontal
3	3109.36	50.43	-46.51	29.56	-61.79	-13.00	48.79	241	83	Horizontal
4	3886.7	42.88	-45.54	30.33	-67.59	-13.00	54.59	174	319	Horizontal
5	4664.04	41.59	-44.58	31.79	-66.45	-13.00	53.45	142	245	Horizontal
6	5441.38	40.72	-43.83	32.60	-65.77	-13.00	52.77	263	168	Horizontal

Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF[dB/m]	Level [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2332	73.81	-47.62	27.56	-41.50	-13.00	28.50	296	3	Vertical
2	1554.68	47.22	-48.51	25.56	-70.99	-13.00	57.99	285	318	Vertical
3	3109.36	54.30	-46.51	29.56	-57.92	-13.00	44.92	241	50	Vertical
4	3886.7	44.89	-45.54	30.33	-65.58	-13.00	52.58	142	124	Vertical
5	4664.04	41.98	-44.58	31.79	-66.06	-13.00	53.06	263	345	Vertical
6	5441.38	40.96	-43.83	32.60	-65.53	-13.00	52.53	285	11	Vertical



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Test Band = LTE Band 13_QPSK_5MHz_TM1
Test Channel = Mid Channel
Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF[dB/m]	Level [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1559.68	51.03	-48.51	25.56	-67.18	-40.00	27.18	296	5	Horizontal
2	2339.52	45.74	-47.61	27.58	-69.55	-13.00	56.55	285	245	Horizontal
3	3119.36	47.76	-46.49	29.55	-64.44	-13.00	51.44	241	94	Horizontal
4	3899.2	42.37	-45.53	30.36	-68.06	-13.00	55.06	142	322	Horizontal
5	4679.04	41.80	-44.57	31.83	-66.20	-13.00	53.20	255	205	Horizontal
6	5458.88	40.99	-43.82	32.60	-65.49	-13.00	52.49	286	259	Horizontal

Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF[dB/m]	Level [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2339.5	62.31	-47.61	27.58	-52.99	-13.00	39.99	201	192	Vertical
2	1559.68	46.64	-48.51	25.56	-71.57	-40.00	31.57	174	5	Vertical
3	3119.36	52.67	-46.49	29.55	-59.53	-13.00	46.53	142	52	Vertical
4	3899.2	43.63	-45.53	30.36	-66.80	-13.00	53.80	255	2	Vertical
5	4679.04	41.78	-44.57	31.83	-66.22	-13.00	53.22	263	176	Vertical
6	5458.88	40.63	-43.82	32.60	-65.85	-13.00	52.85	268	295	Vertical



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Test Band = LTE Band 13_QPSK_5MHz_TM1
Test Channel = High Channel
Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF[dB/m]	Level [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1564.68	47.41	-48.51	25.57	-70.79	-40.00	30.79	365	1	Horizontal
2	2347.02	43.99	-47.61	27.60	-71.29	-13.00	58.29	241	332	Horizontal
3	3129.36	48.09	-46.46	29.55	-64.08	-13.00	51.08	175	29	Horizontal
4	3911.7	42.47	-45.53	30.39	-67.93	-13.00	54.93	255	322	Horizontal
5	4694.04	41.73	-44.55	31.87	-66.22	-13.00	53.22	286	99	Horizontal
6	5476.38	40.74	-43.80	32.60	-65.72	-13.00	52.72	224	29	Horizontal

Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF[dB/m]	Level [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2347	57.72	-47.61	27.59	-57.56	-13.00	44.56	296	209	Vertical
2	1564.68	45.89	-48.51	25.57	-72.31	-40.00	32.31	285	301	Vertical
3	3129.36	51.31	-46.46	29.55	-60.86	-13.00	47.86	241	60	Vertical
4	3911.7	43.61	-45.53	30.39	-66.79	-13.00	53.79	142	13	Vertical
5	4694.04	41.76	-44.55	31.87	-66.19	-13.00	53.19	263	4	Vertical
6	5476.38	40.49	-43.80	32.60	-65.97	-13.00	52.97	258	359	Vertical

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & AMP. The basic equation with a sample calculation is as follows:

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Preamp (dB)

Level = Reading Level + AF + Factor -95.26

Margin = Limit – Level



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Frequency Stability

Test Result

Band	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Verdict
Band13	10MHz	QPSK	23230	50RB#0	VL	NT	-3.60	-0.004604	PASS
Band13	10MHz	QPSK	23230	50RB#0	VN	NT	-4.50	-0.005754	PASS
Band13	10MHz	QPSK	23230	50RB#0	VH	NT	-2.50	-0.003197	PASS

Band	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Verdict
Band13	10MHz	QPSK	23230	50RB#0	NV	-30	-1.00	-0.001279	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	-20	-3.40	-0.004348	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	-10	-5.00	-0.006394	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	0	-1.10	-0.001407	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	10	-2.50	-0.003197	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	20	-6.00	-0.007673	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	30	-4.00	-0.005115	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	40	-4.50	-0.005754	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	50	-3.40	-0.004348	PASS

---End of Attachment---



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