



Appendix B

E-UTRA BAND 13



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1. Effective (Isotropic) Radiated Power

1.1. Test Result

BAND	Bandwidth	Modulation	Channel	RB Configuration	Result (dBm)	ERP (dBm)	Limit (dBm)	Verdict
Band13	5MHz	QPSK	23205	1RB#0	23.68	25.98	34.77	PASS
Band13	5MHz	QPSK	23205	1RB#12	23.28	25.58	34.77	PASS
Band13	5MHz	QPSK	23205	1RB#24	23.63	25.93	34.77	PASS
Band13	5MHz	QPSK	23205	12RB#0	22.62	24.92	34.77	PASS
Band13	5MHz	QPSK	23205	12RB#6	22.61	24.91	34.77	PASS
Band13	5MHz	QPSK	23205	12RB#13	22.55	24.85	34.77	PASS
Band13	5MHz	QPSK	23205	25RB#0	22.65	24.95	34.77	PASS
Band13	5MHz	QPSK	23230	1RB#0	23.67	25.97	34.77	PASS
Band13	5MHz	QPSK	23230	1RB#12	23.85	26.15	34.77	PASS
Band13	5MHz	QPSK	23230	1RB#24	23.82	26.12	34.77	PASS
Band13	5MHz	QPSK	23230	12RB#0	22.54	24.84	34.77	PASS
Band13	5MHz	QPSK	23230	12RB#6	22.74	25.04	34.77	PASS
Band13	5MHz	QPSK	23230	12RB#13	22.72	25.02	34.77	PASS
Band13	5MHz	QPSK	23230	25RB#0	22.60	24.90	34.77	PASS
Band13	5MHz	QPSK	23255	1RB#0	23.62	25.92	34.77	PASS
Band13	5MHz	QPSK	23255	1RB#12	24.13	26.43	34.77	PASS
Band13	5MHz	QPSK	23255	1RB#24	23.75	26.05	34.77	PASS
Band13	5MHz	QPSK	23255	12RB#0	22.52	24.82	34.77	PASS
Band13	5MHz	QPSK	23255	12RB#6	22.67	24.97	34.77	PASS
Band13	5MHz	QPSK	23255	12RB#13	22.65	24.95	34.77	PASS
Band13	5MHz	QPSK	23255	25RB#0	22.58	24.88	34.77	PASS
Band13	5MHz	16QAM	23205	1RB#0	22.19	24.49	34.77	PASS
Band13	5MHz	16QAM	23205	1RB#12	22.60	24.90	34.77	PASS
Band13	5MHz	16QAM	23205	1RB#24	21.89	24.19	34.77	PASS
Band13	5MHz	16QAM	23205	12RB#0	21.54	23.84	34.77	PASS
Band13	5MHz	16QAM	23205	12RB#6	21.56	23.86	34.77	PASS
Band13	5MHz	16QAM	23205	12RB#13	21.61	23.91	34.77	PASS
Band13	5MHz	16QAM	23205	25RB#0	21.68	23.98	34.77	PASS
Band13	5MHz	16QAM	23230	1RB#0	22.11	24.41	34.77	PASS
Band13	5MHz	16QAM	23230	1RB#12	22.29	24.59	34.77	PASS
Band13	5MHz	16QAM	23230	1RB#24	22.04	24.34	34.77	PASS
Band13	5MHz	16QAM	23230	12RB#0	21.66	23.96	34.77	PASS



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Band13	5MHz	16QAM	23230	12RB#6	21.64	23.94	34.77	PASS
Band13	5MHz	16QAM	23230	12RB#13	21.50	23.80	34.77	PASS
Band13	5MHz	16QAM	23230	25RB#0	21.72	24.02	34.77	PASS
Band13	5MHz	16QAM	23255	1RB#0	22.23	24.53	34.77	PASS
Band13	5MHz	16QAM	23255	1RB#12	22.44	24.74	34.77	PASS
Band13	5MHz	16QAM	23255	1RB#24	22.19	24.49	34.77	PASS
Band13	5MHz	16QAM	23255	12RB#0	21.48	23.78	34.77	PASS
Band13	5MHz	16QAM	23255	12RB#6	21.55	23.85	34.77	PASS
Band13	5MHz	16QAM	23255	12RB#13	21.31	23.61	34.77	PASS
Band13	5MHz	16QAM	23255	25RB#0	21.51	23.81	34.77	PASS
Band13	10MHz	QPSK	23230	1RB#0	23.60	25.90	34.77	PASS
Band13	10MHz	QPSK	23230	1RB#24	23.95	26.25	34.77	PASS
Band13	10MHz	QPSK	23230	1RB#49	23.62	25.92	34.77	PASS
Band13	10MHz	QPSK	23230	25RB#0	22.53	24.83	34.77	PASS
Band13	10MHz	QPSK	23230	25RB#12	22.71	25.01	34.77	PASS
Band13	10MHz	QPSK	23230	25RB#25	22.50	24.80	34.77	PASS
Band13	10MHz	QPSK	23230	50RB#0	22.58	24.88	34.77	PASS
Band13	10MHz	16QAM	23230	1RB#0	22.30	24.60	34.77	PASS
Band13	10MHz	16QAM	23230	1RB#24	22.34	24.64	34.77	PASS
Band13	10MHz	16QAM	23230	1RB#49	22.31	24.61	34.77	PASS
Band13	10MHz	16QAM	23230	25RB#0	21.59	23.89	34.77	PASS
Band13	10MHz	16QAM	23230	25RB#12	21.58	23.88	34.77	PASS
Band13	10MHz	16QAM	23230	25RB#25	21.60	23.90	34.77	PASS
Band13	10MHz	16QAM	23230	50RB#0	21.70	24.00	34.77	PASS

Remark:

a: For getting the EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should be taken to calculate it,

$$\text{ERP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBd]}$$

$$\text{EIRP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBi]}$$

b: SGP=Signal Generator Level



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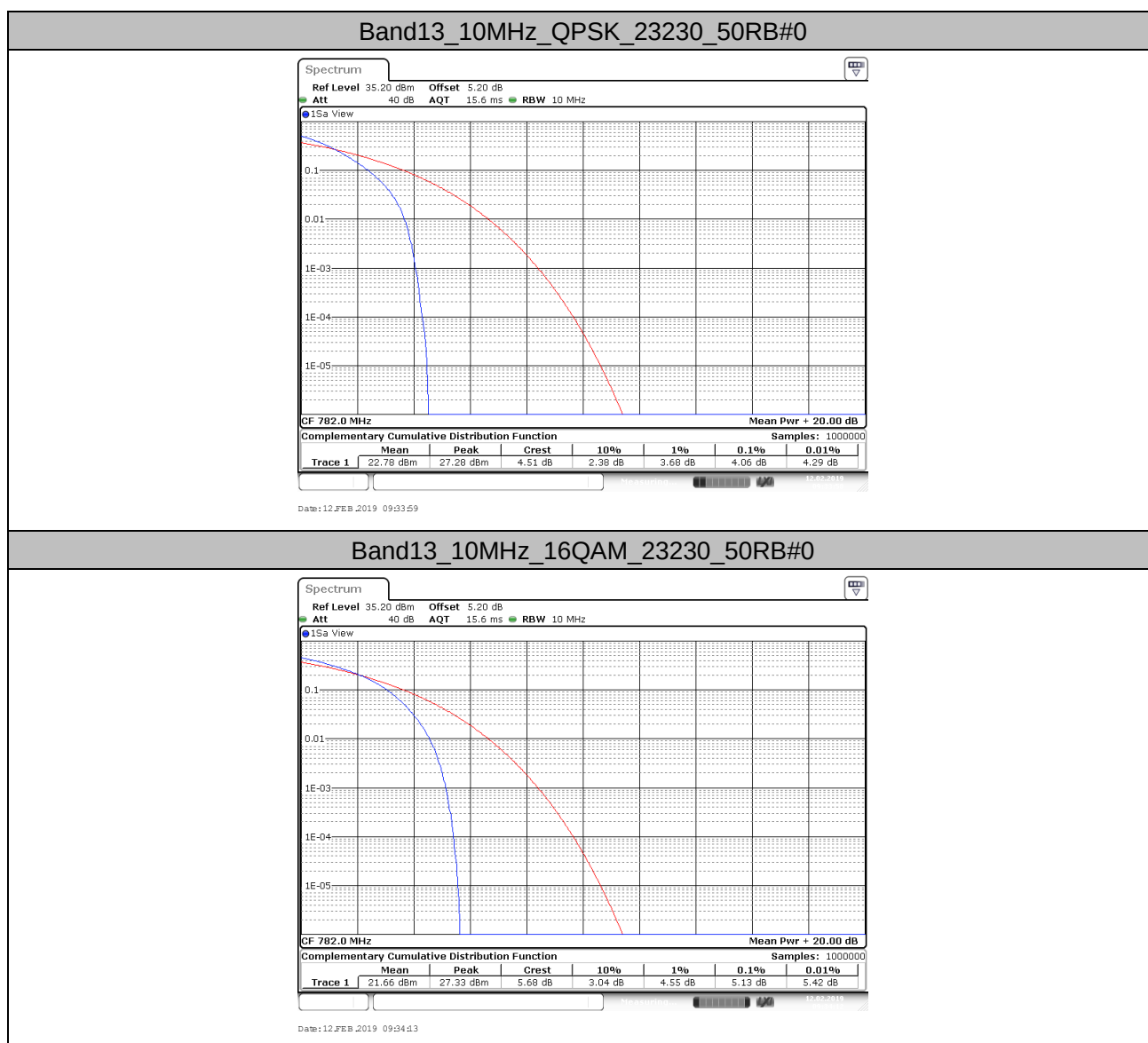


2. Peak-to-Average Ratio(CCDF)

2.1. Test Result

BAND	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band13	10MHz	QPSK	23230	50RB#0	4.06	13	PASS
Band13	10MHz	16QAM	23230	50RB#0	5.13	13	PASS

2.2. Test Plots



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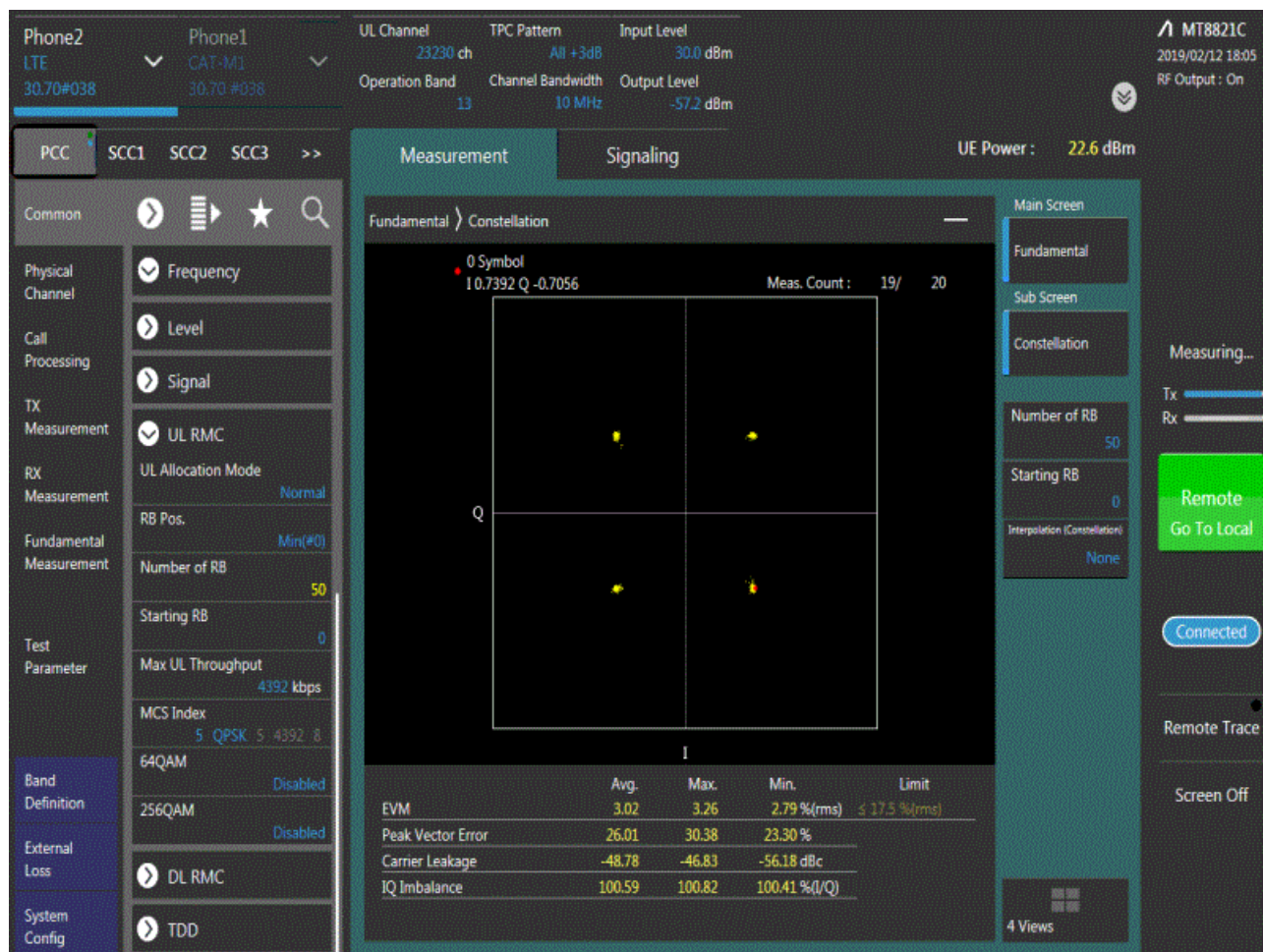
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3. Modulation Characteristics

3.1. Test BAND = LTE BAND13

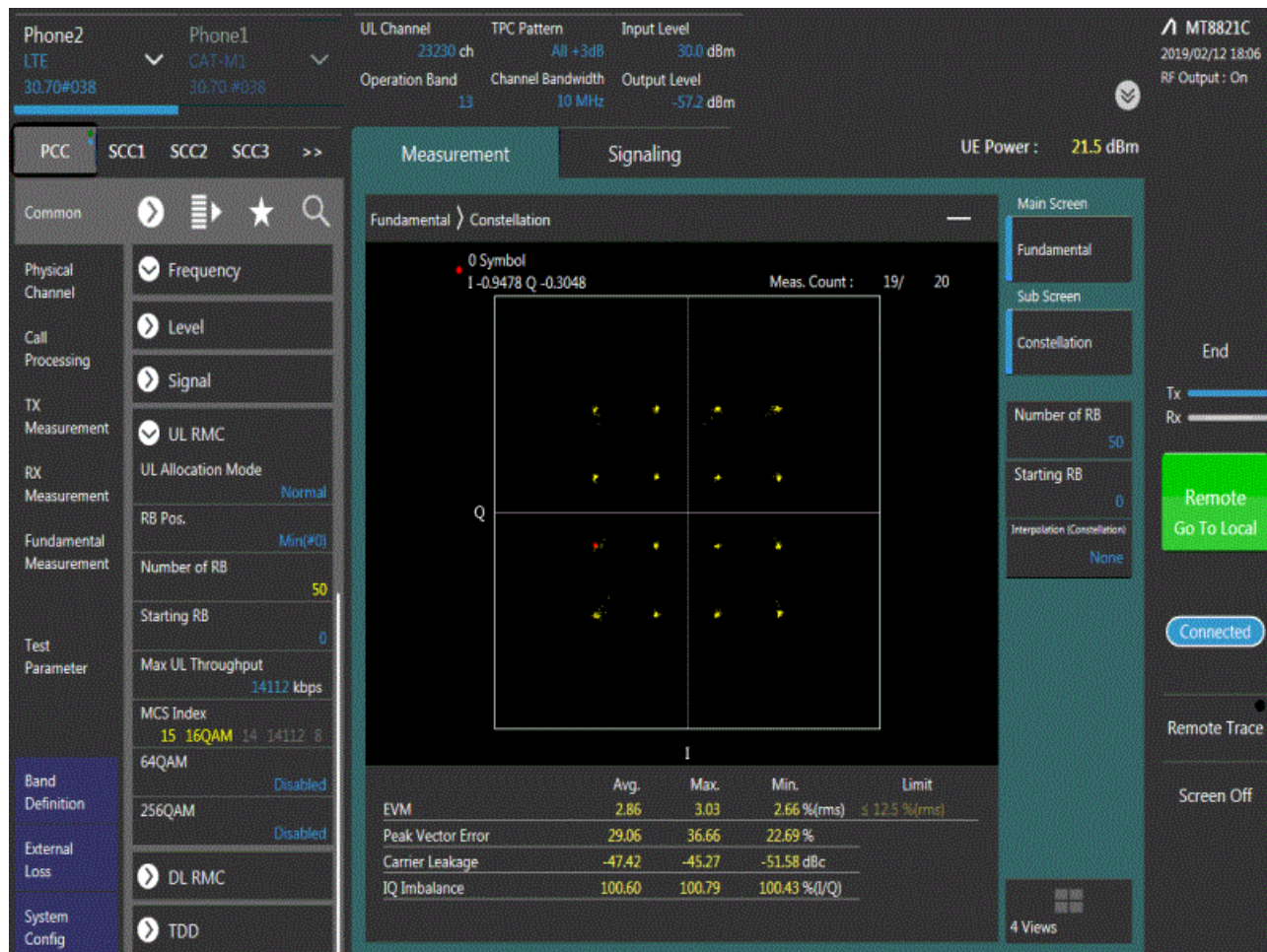
3.1.1. Test Mode = LTE /TM1 10MHz

3.1.1.1. Test Channel = MCH



3.1.2. Test Mode = LTE /TM2 10MHz

3.1.2.1. Test Channel = MCH



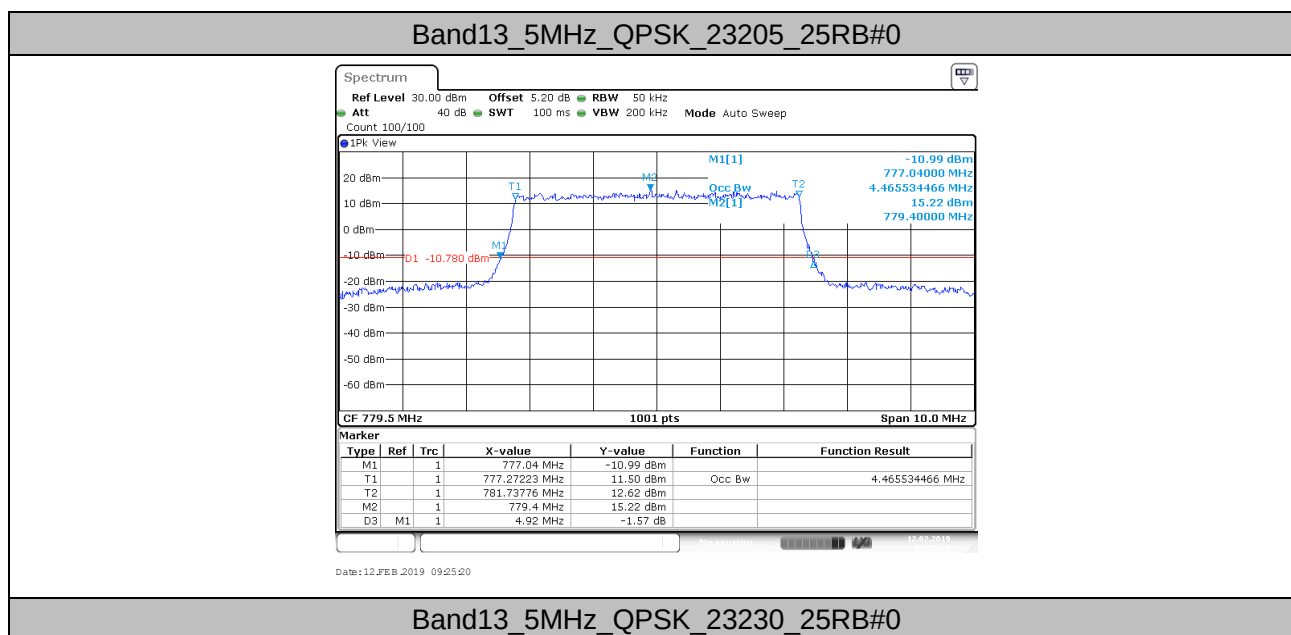


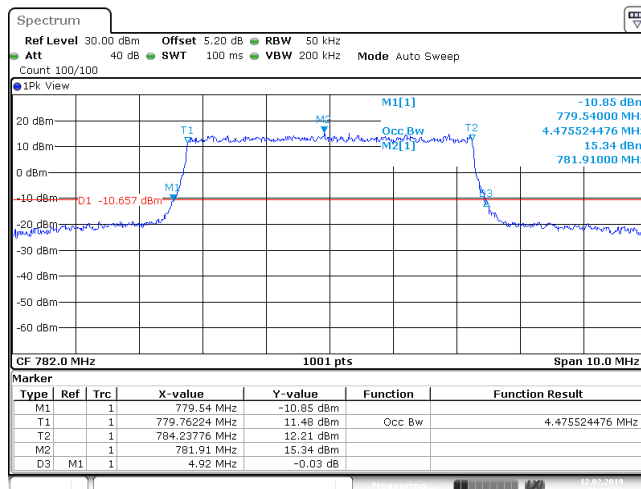
4. 26dB Bandwidth and Occupied Bandwidth

4.1. Test Result

BAND	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band13	5MHz	QPSK	23205	25RB#0	4.466	4.920	PASS
Band13	5MHz	QPSK	23230	25RB#0	4.476	4.920	PASS
Band13	5MHz	QPSK	23255	25RB#0	4.476	4.950	PASS
Band13	5MHz	16QAM	23205	25RB#0	4.486	4.960	PASS
Band13	5MHz	16QAM	23230	25RB#0	4.486	4.970	PASS
Band13	5MHz	16QAM	23255	25RB#0	4.496	4.970	PASS
Band13	10MHz	QPSK	23230	50RB#0	8.911	9.640	PASS
Band13	10MHz	16QAM	23230	50RB#0	8.911	9.740	PASS

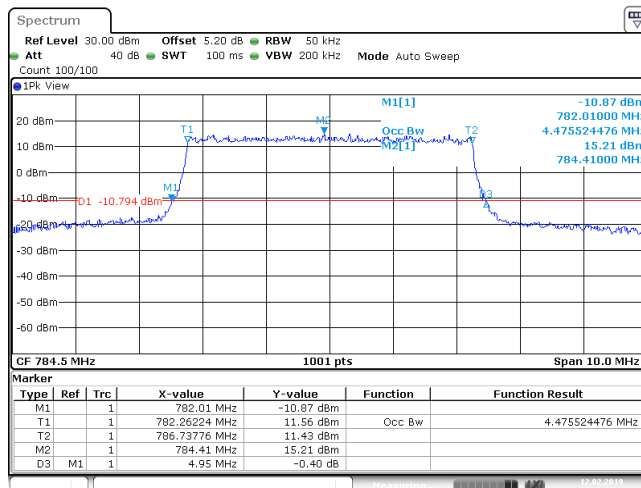
4.2. Test Plots





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Band13_5MHz_QPSK_23255_25RB#0



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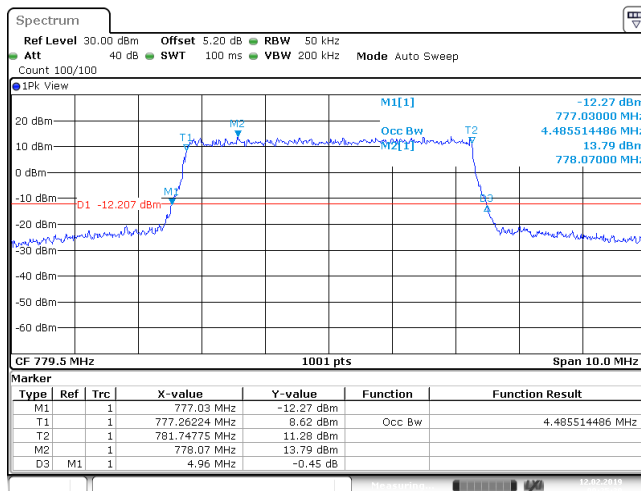
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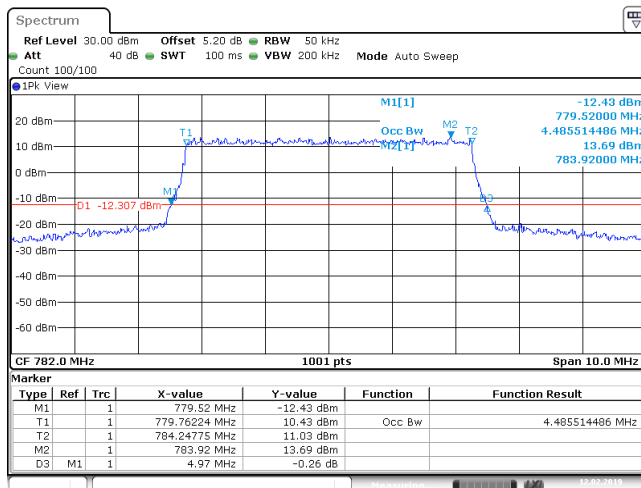
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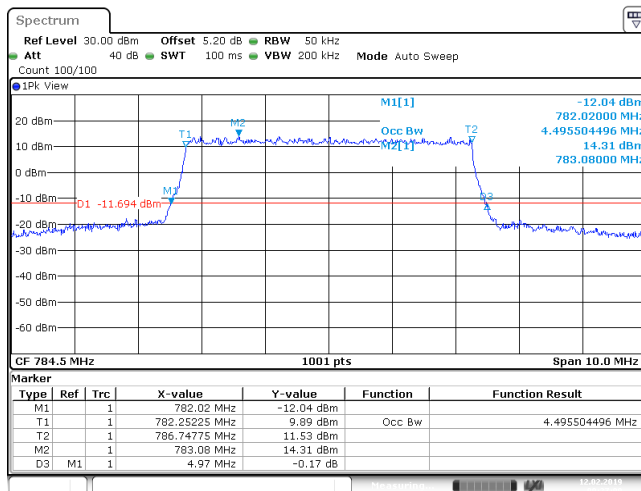
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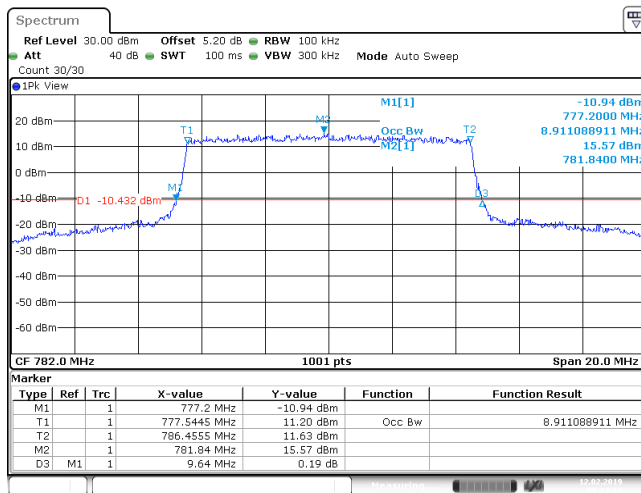
Band13_5MHz_16QAM_23255_25RB#0





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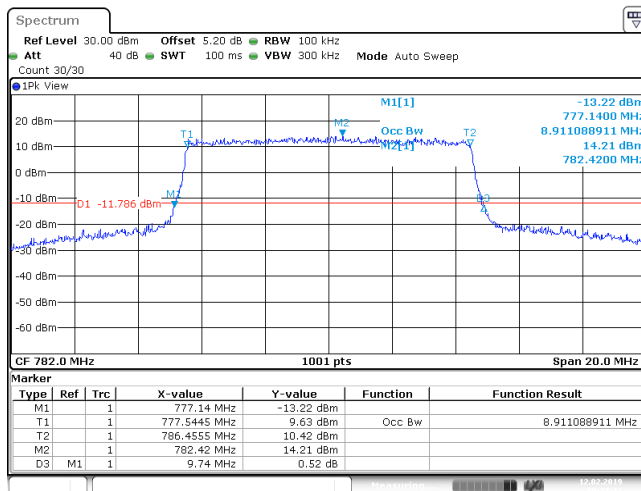
Band13_10MHz_QPSK_23230_50RB#0



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Band13_10MHz_16QAM_23230_50RB#0





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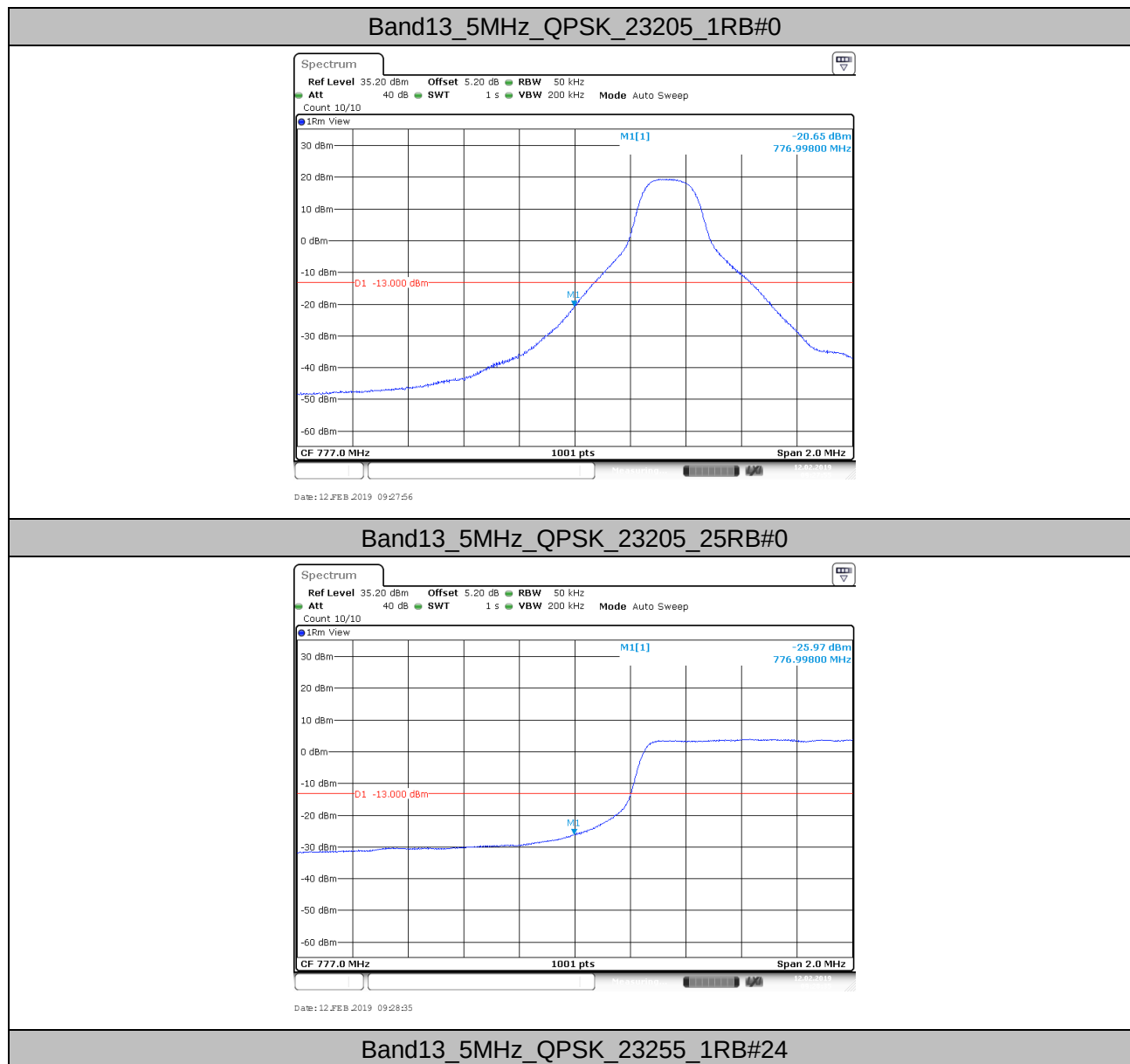
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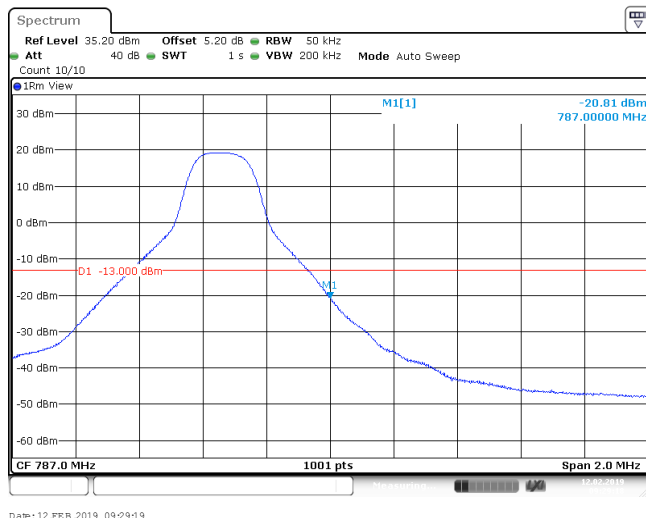
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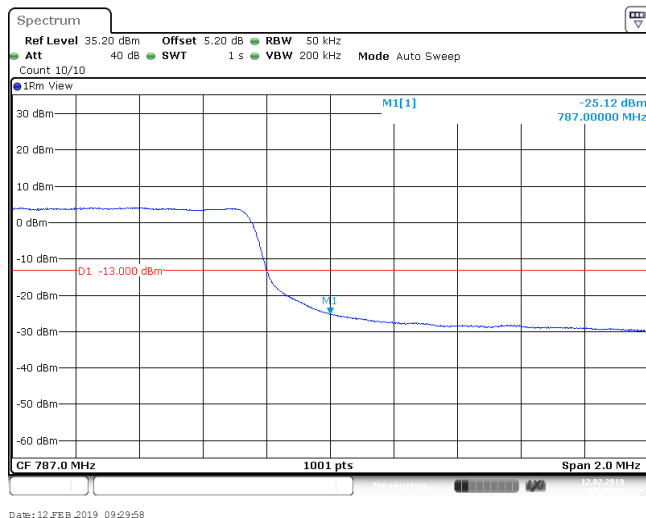
5. Band Edge Compliance

5.1. Test Plots





Band13_5MHz_QPSK_23255_25RB#0

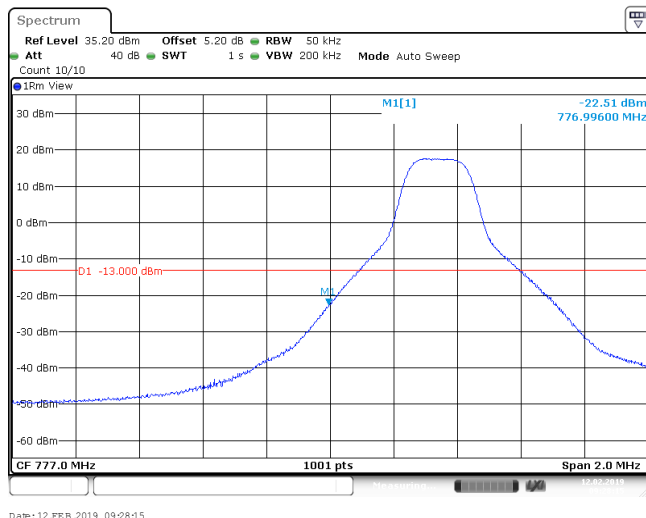


Band13_5MHz_16QAM_23205_1RB#0

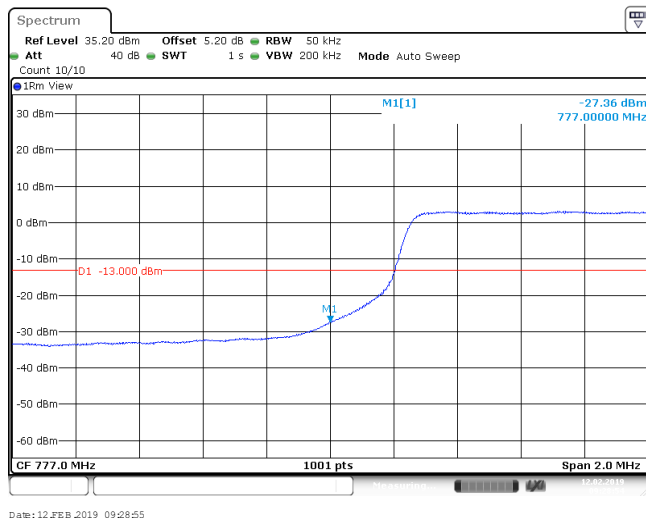


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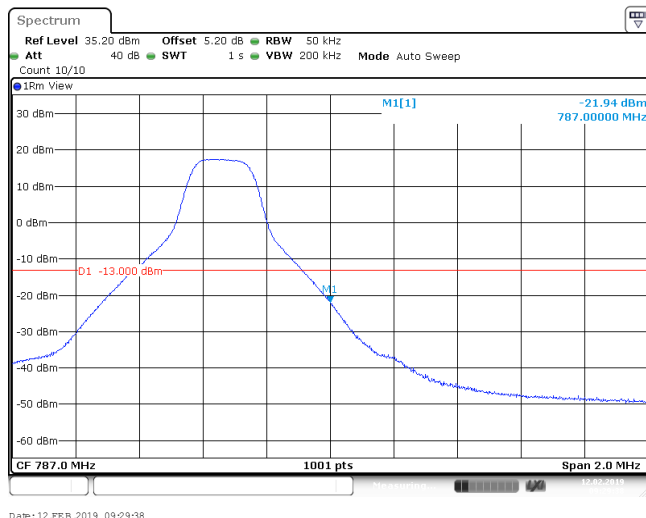


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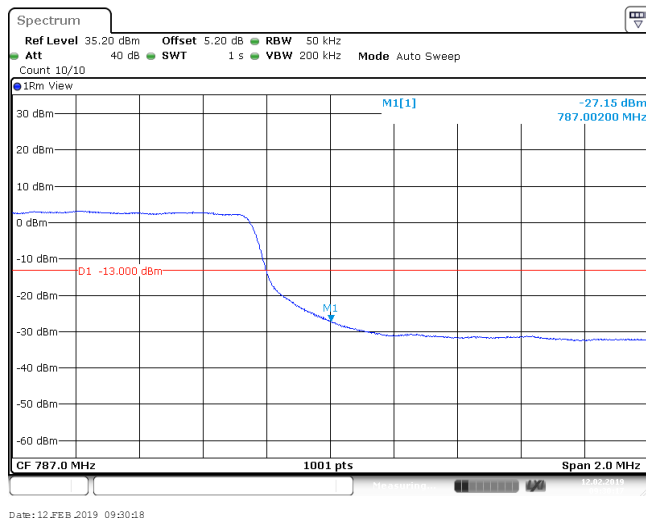


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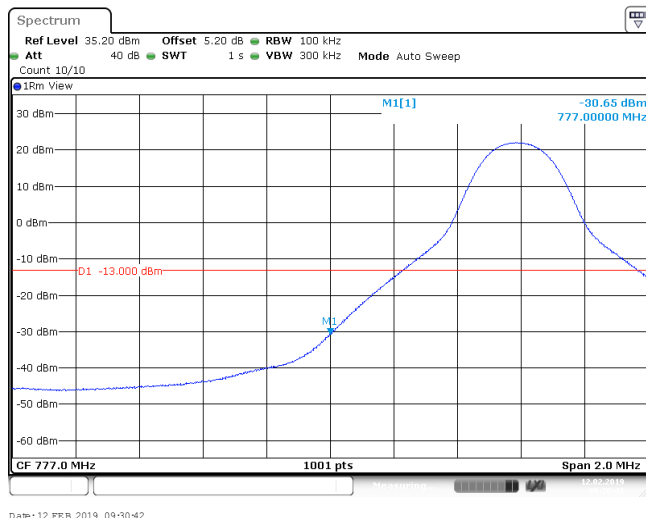


Band13_5MHz_16QAM_23255_25RB#0

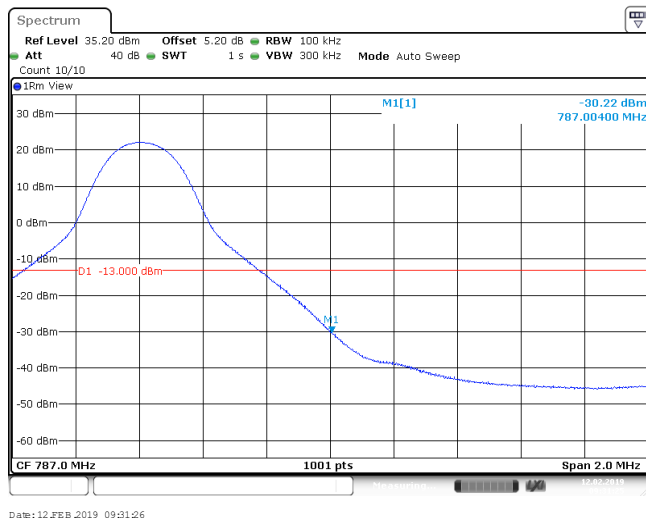


Band13_10MHz_QPSK_23230_Left_1RB#0





Band13_10MHz_QPSK_23230_Right_1RB#49



Band13_10MHz_QPSK_23230_Right_50RB#0

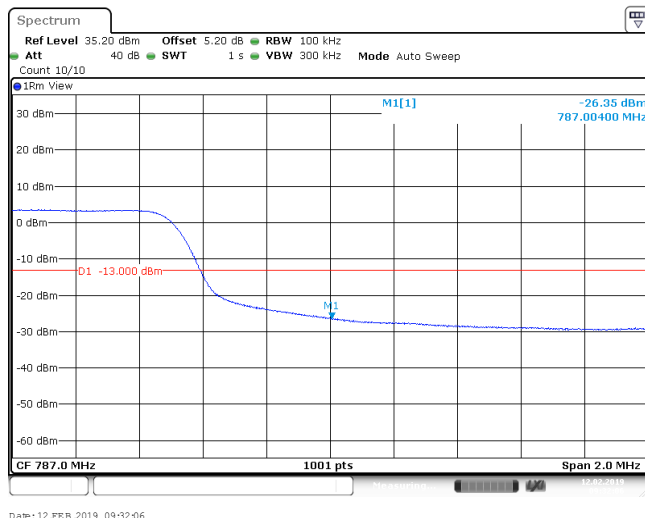


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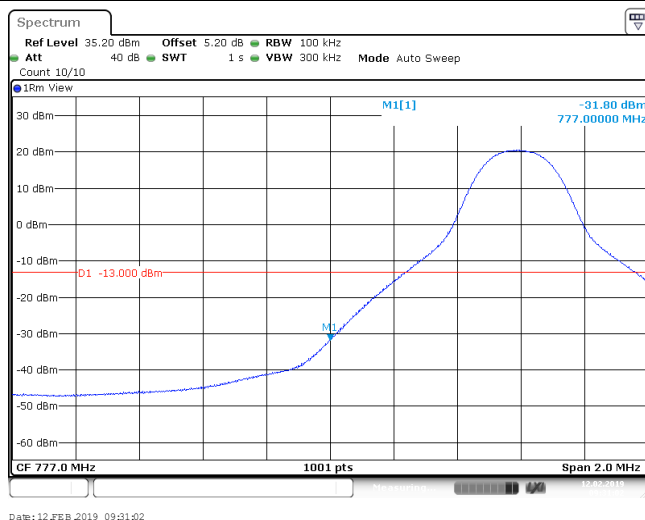
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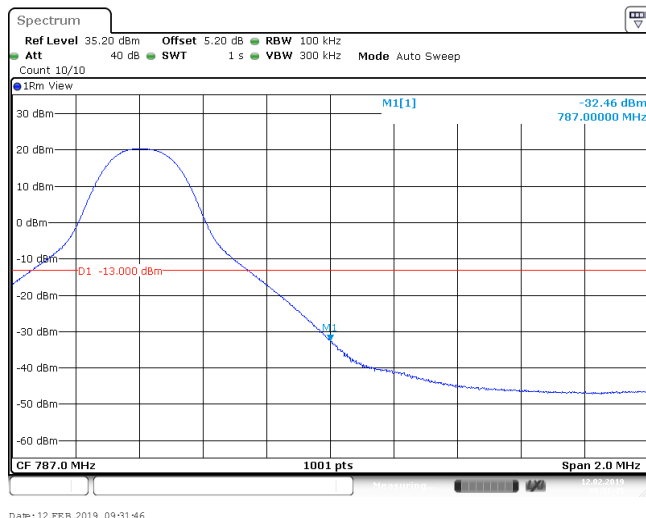


Band13_10MHz_16QAM_23230_Left_1RB#0

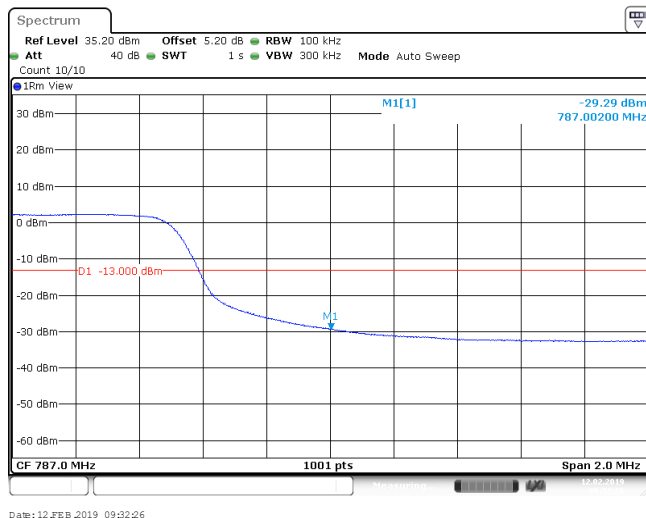


Band13_10MHz_16QAM_23230_Right_1RB#49





Band13_10MHz_16QAM_23230_Right_50RB#0



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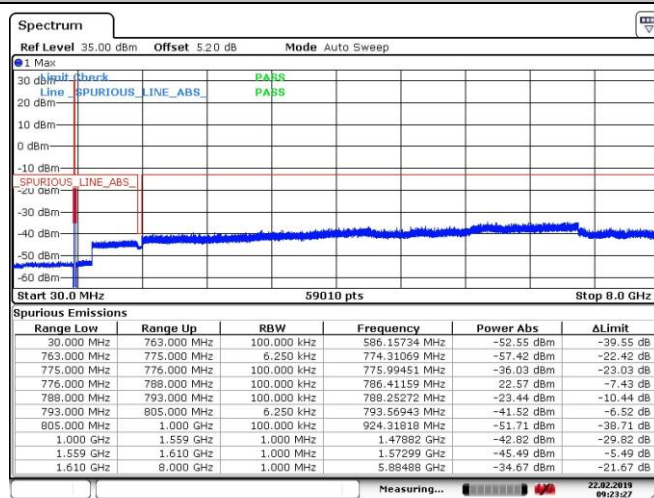
6. Spurious Emission at Antenna Terminal

Remark1: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of $< RBW/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k * (\text{Span} / RBW)$ " with k between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

Remark2: only the worst case data displayed in this report.

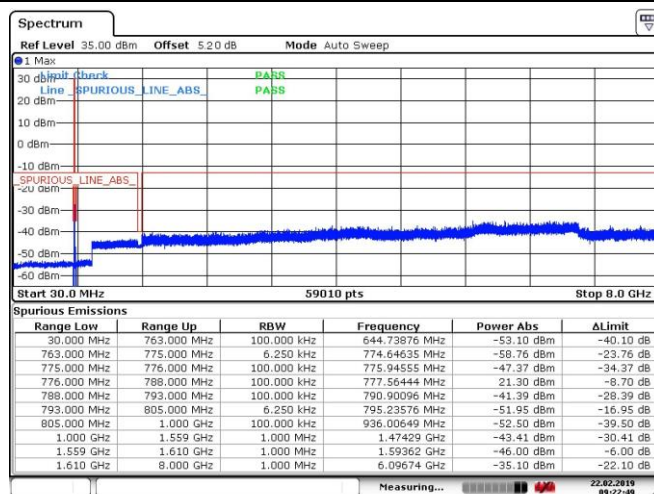
6.1. Test Plots

Band13_10MHz_QPSK_23230_1RB#0



Date: 22 FEB 2019 09:23:27

Band13_10MHz_QPSK_23230_1RB#0



Date: 22 FEB 2019 09:22:49





7. Field Strength of Spurious Radiation

7.1. Test BAND = LTE BAND 13

7.1.1. Test Mode = LTE/TM1 10MHz

7.1.1.1. Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
77.6294	-69.42	-13.00	56.42	Vertical
106.2458	-65.71	-13.00	52.71	Vertical
468.1224	-67.33	-13.00	54.33	Vertical
1559.7119	-59.56	-40.00	19.56	Vertical
4678.8672	-50.47	-13.00	37.47	Vertical
17998.8000	-33.28	-13.00	20.28	Vertical
43.8717	-65.04	-13.00	52.04	Horizontal
165.8068	-69.77	-13.00	56.77	Horizontal
644.0892	-64.23	-13.00	51.23	Horizontal
1559.7119	-60.84	-40.00	20.84	Horizontal
3119.4048	-56.02	-13.00	43.02	Horizontal
17995.1998	-38.55	-13.00	25.55	Horizontal

7.1.1.2. Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
67.6379	-69.66	-13.00	56.66	Vertical
118.9534	-65.74	-13.00	52.74	Vertical
467.0554	-67.31	-13.00	54.31	Vertical
1554.5109	-56.14	-13.00	43.14	Vertical
4663.8666	-50.34	-13.00	37.34	Vertical
17995.7998	-33.46	-13.00	20.46	Vertical
45.7633	-65.15	-13.00	52.15	Horizontal
150.9165	-69.18	-13.00	56.18	Horizontal



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378.8779	-67.67	-13.00	54.67	Horizontal
1554.5109	-56.93	-13.00	43.93	Horizontal
4663.8666	-54.66	-13.00	41.66	Horizontal
16393.1357	-39.02	-13.00	26.02	Horizontal

7.1.1.3. Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
65.6008	-69.84	-13.00	56.84	Vertical
119.5355	-65.61	-13.00	52.61	Vertical
442.7556	-67.56	-13.00	54.56	Vertical
1564.5129	-59.83	-40.00	19.83	Vertical
4693.8678	-51.24	-13.00	38.24	Vertical
17988.5995	-33.65	-13.00	20.65	Vertical
44.8417	-64.04	-13.00	51.04	Horizontal
164.8367	-69.86	-13.00	56.86	Horizontal
517.1584	-66.49	-13.00	53.49	Horizontal
1564.5129	-59.64	-40.00	19.64	Horizontal
4693.8678	-55.94	-13.00	42.94	Horizontal
16387.7355	-38.56	-13.00	25.56	Horizontal

7.1.1.4. Spot Check worse mode

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
71.4696	-68.45	-13.00	55.45	Vertical
110.5625	-64.00	-13.00	51.00	Vertical
384.8437	-67.50	-13.00	54.50	Vertical
1564.9110	-48.42	-40.00	8.42	Vertical
3110.4044	-48.93	-13.00	35.93	Vertical
17993.9998	-33.73	-13.00	20.73	Vertical
41.9316	-63.93	-13.00	50.93	Horizontal
149.5100	-67.76	-13.00	54.76	Horizontal



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243.1197	-67.55	-13.00	54.55	Horizontal
1564.9110	-51.43	-40.00	11.43	Horizontal
3110.4044	-52.29	-13.00	39.29	Horizontal
16401.5361	-38.71	-13.00	25.71	Horizontal

Remark:

- 1) The disturbance below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the worst case data had been displayed.
- 2) We have tested all modulation and all Bandwidth , but only the worst case data presented in this report.





8. Frequency Stability

8.1. Frequency Vs Voltage

Voltage										
BAND	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band13	10MHz	QPSK	23230	50RB#0	VL	NT	-1.10	-0.001407	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	VN	NT	0.20	0.000256	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	VH	NT	-2.50	-0.003197	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	VL	NT	-0.40	-0.000512	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	VN	NT	-1.30	-0.001662	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	VH	NT	-0.90	-0.001151	±2.5	PASS

8.2. Frequency Vs Temperature

Temperature										
BAND	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band13	10MHz	QPSK	23230	50RB#0	NV	-30	-1.80	-0.002302	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	-20	0.70	0.000895	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	0	-0.20	-0.000256	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	10	-0.80	-0.001023	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	20	0.20	0.000256	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	30	-1.60	-0.002046	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	40	-1.90	-0.002430	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	50	-1.70	-0.002174	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	-30	0.40	0.000512	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	-20	-1.00	-0.001279	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	0	0.60	0.000767	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	10	-0.40	-0.000512	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	20	0.20	0.000256	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	30	1.10	0.001407	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	40	0.40	0.000512	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	50	-0.50	-0.000639	±2.5	PASS

The End

