Appendix B

E-UTRA BAND 13

CONTENT

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	22.98	18.53	36.98	PASS
Band13	5MHz	QPSK	23205	1RB#12	23.48	19.03	36.98	PASS
Band13	5MHz	QPSK	23205	1RB#24	24.24	19.79	36.98	PASS
Band13	5MHz	QPSK	23205	12RB#0	22.06	17.61	36.98	PASS
Band13	5MHz	QPSK	23205	12RB#6	22.47	18.02	36.98	PASS
Band13	5MHz	QPSK	23205	12RB#13	22.85	18.40	36.98	PASS
Band13	5MHz	QPSK	23205	25RB#0	22.50	18.05	36.98	PASS
Band13	5MHz	QPSK	23230	1RB#0	23.50	19.05	36.98	PASS
Band13	5MHz	QPSK	23230	1RB#12	23.94	19.49	36.98	PASS
Band13	5MHz	QPSK	23230	1RB#24	23.48	19.03	36.98	PASS
Band13	5MHz	QPSK	23230	12RB#0	22.93	18.48	36.98	PASS
Band13	5MHz	QPSK	23230	12RB#6	22.97	18.52	36.98	PASS
Band13	5MHz	QPSK	23230	12RB#13	22.73	18.28	36.98	PASS
Band13	5MHz	QPSK	23230	25RB#0	22.85	18.40	36.98	PASS
Band13	5MHz	QPSK	23255	1RB#0	24.02	19.57	36.98	PASS
Band13	5MHz	QPSK	23255	1RB#12	23.44	18.99	36.98	PASS
Band13	5MHz	QPSK	23255	1RB#24	22.60	18.15	36.98	PASS
Band13	5MHz	QPSK	23255	12RB#0	22.78	18.33	36.98	PASS
Band13	5MHz	QPSK	23255	12RB#6	22.45	18.00	36.98	PASS
Band13	5MHz	QPSK	23255	12RB#13	21.81	17.36	36.98	PASS
Band13	5MHz	QPSK	23255	25RB#0	22.35	17.90	36.98	PASS
Band13	5MHz	16QAM	23205	1RB#0	22.12	17.67	36.98	PASS
Band13	5MHz	16QAM	23205	1RB#12	22.66	18.21	36.98	PASS
Band13	5MHz	16QAM	23205	1RB#24	23.17	18.72	36.98	PASS
Band13	5MHz	16QAM	23205	12RB#0	21.12	16.67	36.98	PASS
Band13	5MHz	16QAM	23205	12RB#6	21.48	17.03	36.98	PASS
Band13	5MHz	16QAM	23205	12RB#13	21.97	17.52	36.98	PASS
Band13	5MHz	16QAM	23205	25RB#0	22.14	17.69	36.98	PASS
Band13	5MHz	16QAM	23230	1RB#0	22.64	18.19	36.98	PASS
Band13	5MHz	16QAM	23230	1RB#12	23.09	18.64	36.98	PASS
Band13	5MHz	16QAM	23230	1RB#24	22.68	18.23	36.98	PASS
Band13	5MHz	16QAM	23230	12RB#0	21.97	17.52	36.98	PASS
Band13	5MHz	16QAM	23230	12RB#6	22.05	17.60	36.98	PASS
Band13	5MHz	16QAM	23230	12RB#13	21.71	17.26	36.98	PASS
Band13	5MHz	16QAM	23230	25RB#0	22.44	18.69	36.98	PASS
Band13	5MHz	16QAM	23255	1RB#0	23.11	18.66	36.98	PASS

Band13	5MHz	16QAM	23255	1RB#12	22.76	18.31	36.98	PASS
Band13	5MHz	16QAM	23255	1RB#24	21.77	17.32	36.98	PASS
Band13	5MHz	16QAM	23255	12RB#0	21.68	17.23	36.98	PASS
Band13	5MHz	16QAM	23255	12RB#6	21.41	16.96	36.98	PASS
Band13	5MHz	16QAM	23255	12RB#13	20.84	16.39	36.98	PASS
Band13	5MHz	16QAM	23255	25RB#0	22.47	18.52	36.98	PASS
Band13	10MHz	QPSK	23230	1RB#0	22.62	18.17	36.98	PASS
Band13	10MHz	QPSK	23230	1RB#24	24.35	19.90	36.98	PASS
Band13	10MHz	QPSK	23230	1RB#49	22.56	18.11	36.98	PASS
Band13	10MHz	QPSK	23230	25RB#0	22.66	18.21	36.98	PASS
Band13	10MHz	QPSK	23230	25RB#12	23.25	18.80	36.98	PASS
Band13	10MHz	QPSK	23230	25RB#25	22.73	18.28	36.98	PASS
Band13	10MHz	QPSK	23230	50RB#0	22.92	18.47	36.98	PASS
Band13	10MHz	16QAM	23230	1RB#0	21.83	17.38	36.98	PASS
Band13	10MHz	16QAM	23230	1RB#24	23.43	19.08	36.98	PASS
Band13	10MHz	16QAM	23230	1RB#49	21.82	17.37	36.98	PASS
Band13	10MHz	16QAM	23230	27RB#0	22.07	17.62	36.98	PASS

Remark:

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

ERP [dBm] = SGP [dBm] - Cable Loss [dB] + Gain [dBd]

EIRP [dBm] = SGP [dBm] – Cable Loss [dB] + Gain [dBi]

b: SGP=Signal Generator Level

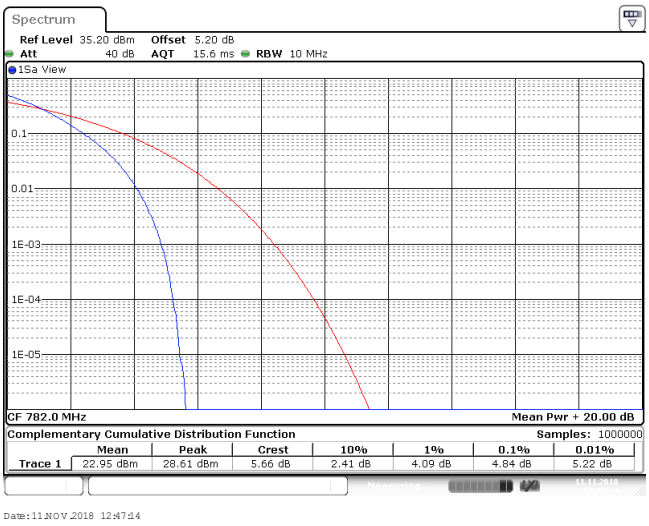
2. Peak-to-Average Ratio(CCDF)

2.1. Test Result

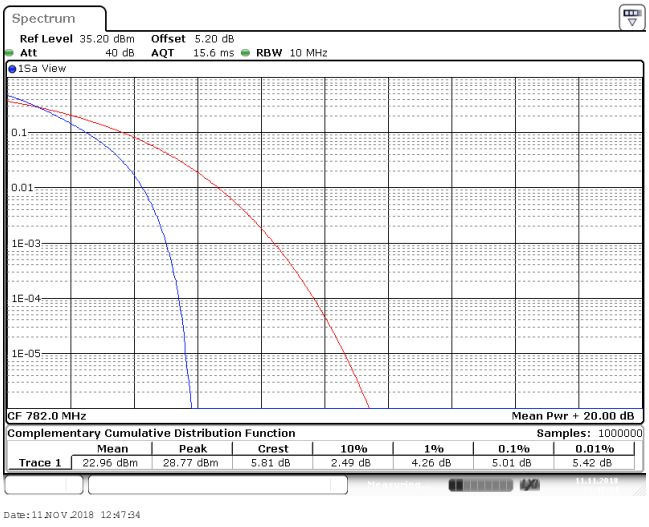
BAND	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band13	10MHz	QPSK	23230	50RB#0	4.84	13	PASS
Band13	10MHz	16QAM	23230	27RB#0	5.01	13	PASS

2.2. Test Plots

Band13_10MHz_QPSK_23230_50RB#0



Band13_10MHz_16QAM_23230_27RB#0

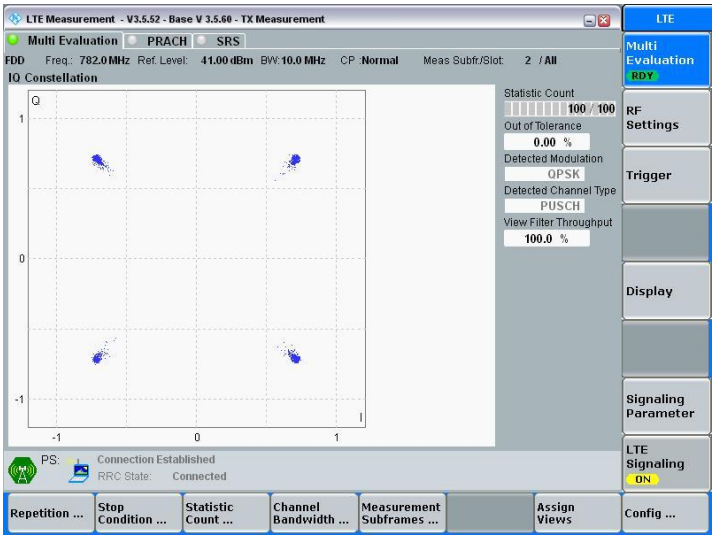


3. Modulation Characteristics

3.1. Test BAND = LTE BAND13

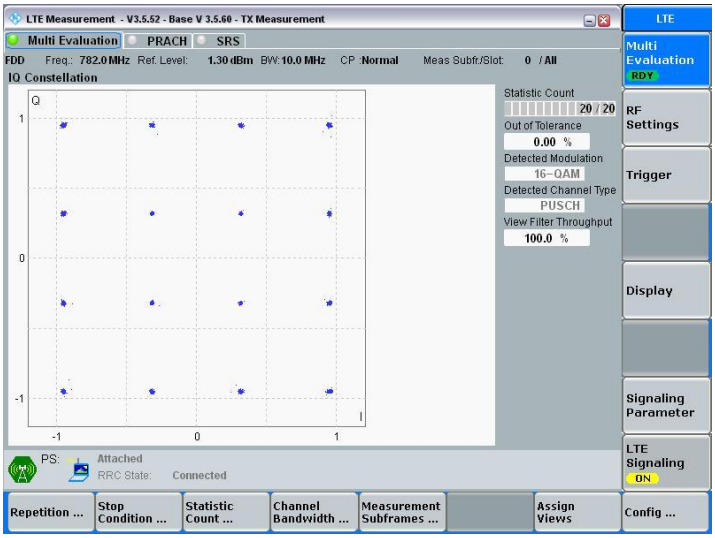
3.1.1. Test Mode = LTE /TM1 10MHz

3.1.1.1. Test Channel = MCH



3.1.2. Test Mode = LTE /TM2 10MHz

3.1.2.1. Test Channel = MCH



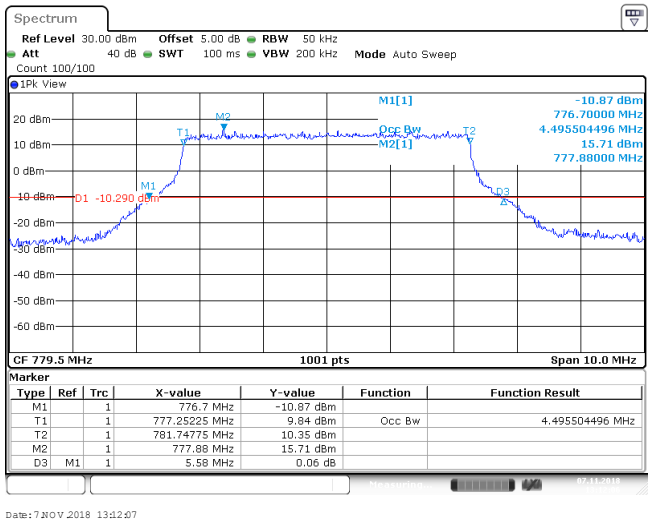
4. 26dB Bandwidth and Occupied Bandwidth

4.1. Test Result

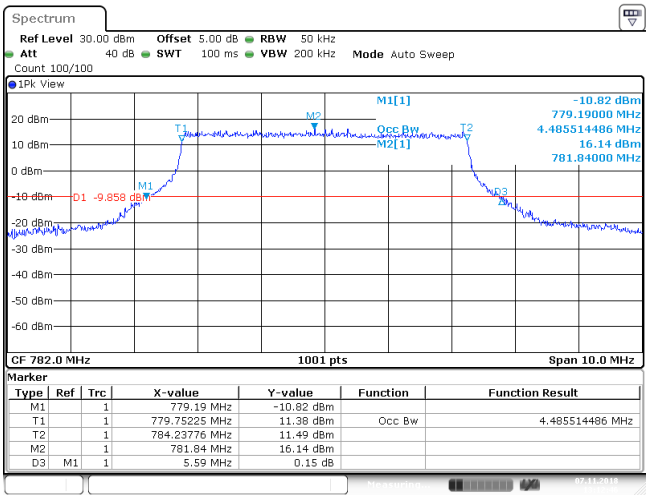
BAND	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band13	5MHz	QPSK	23205	25RB#0	4.496	5.580	PASS
Band13	5MHz	QPSK	23230	25RB#0	4.486	5.590	PASS
Band13	5MHz	QPSK	23255	25RB#0	4.496	5.520	PASS
Band13	5MHz	16QAM	23205	25RB#0	4.496	5.720	PASS
Band13	5MHz	16QAM	23230	25RB#0	4.505	5.700	PASS
Band13	5MHz	16QAM	23255	25RB#0	4.496	5.530	PASS
Band13	10MHz	QPSK	23230	50RB#0	8.911	10.620	PASS
Band13	10MHz	16QAM	23230	27RB#0	4.955	7.440	PASS

4.2. Test Plots

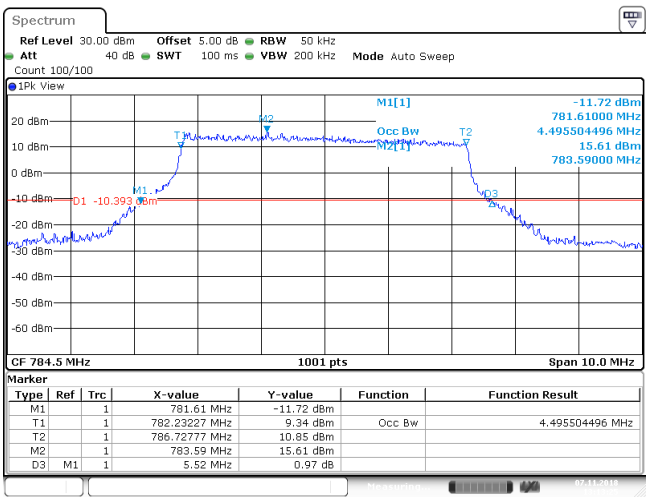
Band13_5MHz_QPSK_23205_25RB#0



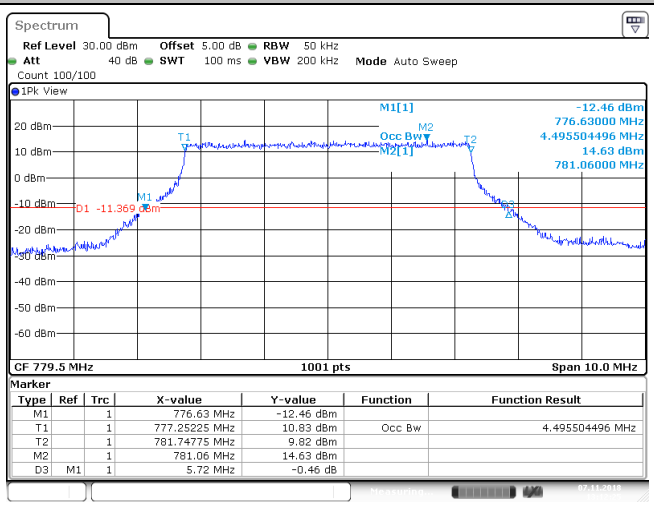
Band13_5MHz_QPSK_23230_25RB#0



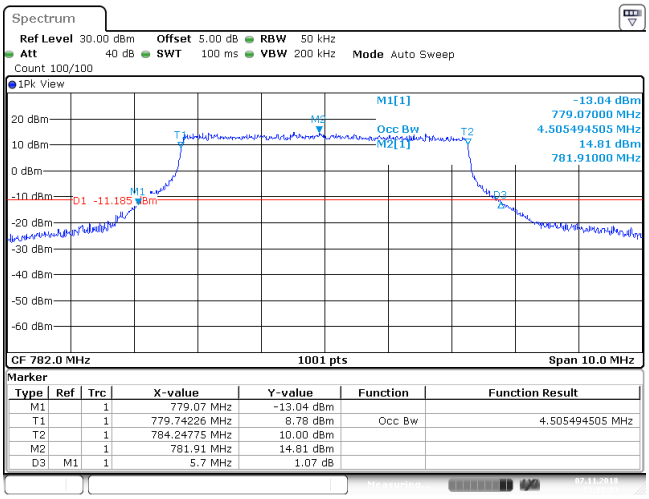
Band13_5MHz_QPSK_23255_25RB#0



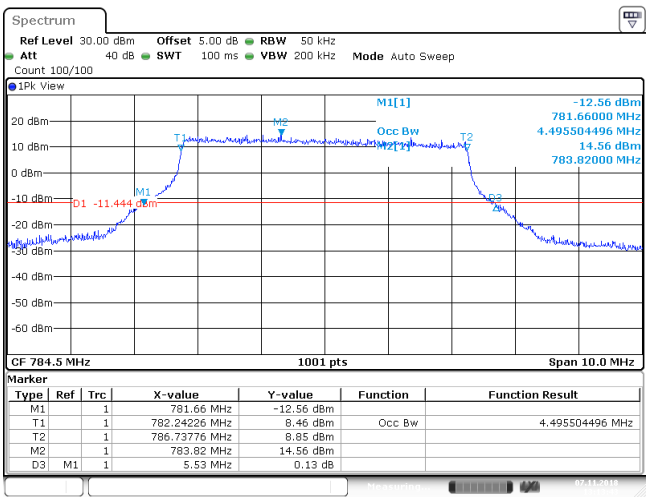
Band13_5MHz_16QAM_23205_25RB#0



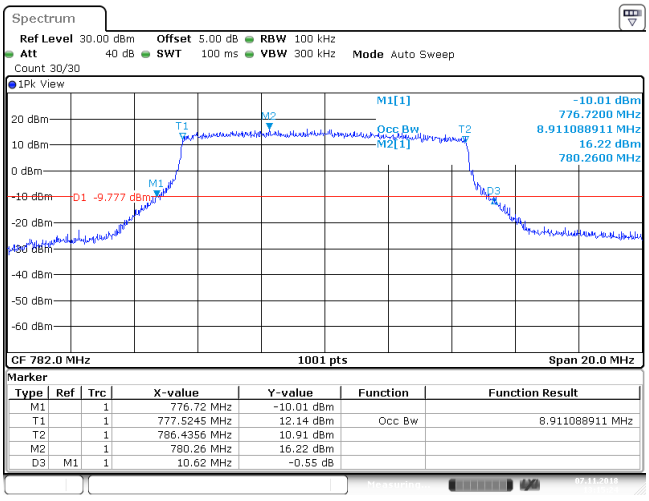
Band13_5MHz_16QAM_23230_25RB#0



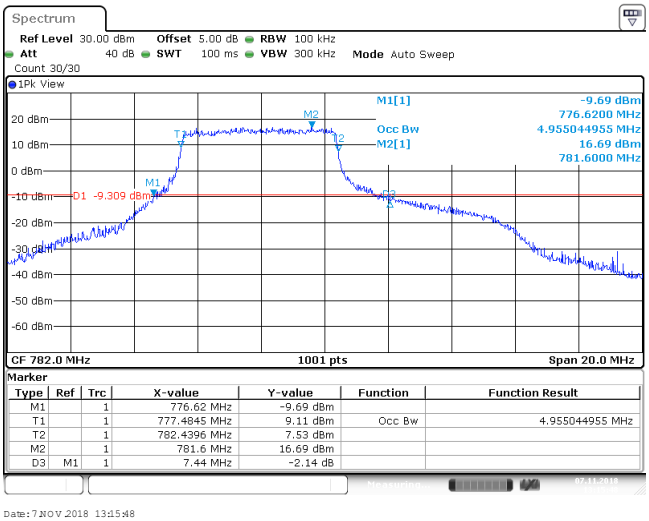
Band13_5MHz_16QAM_23255_25RB#0



Band13_10MHz_QPSK_23230_50RB#0



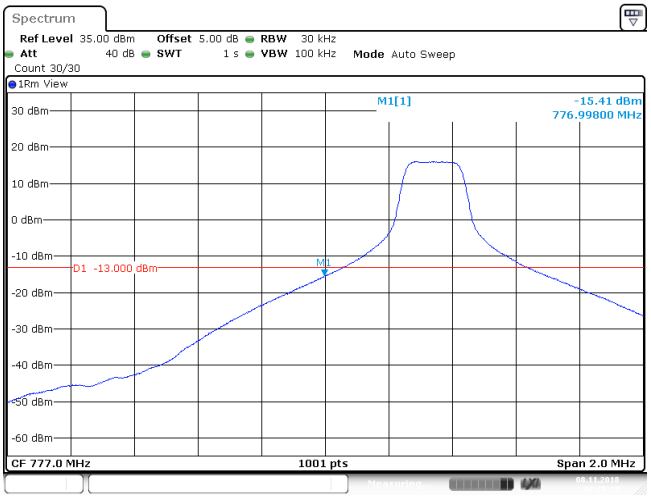
Band13_10MHz_16QAM_23230_27RB#0



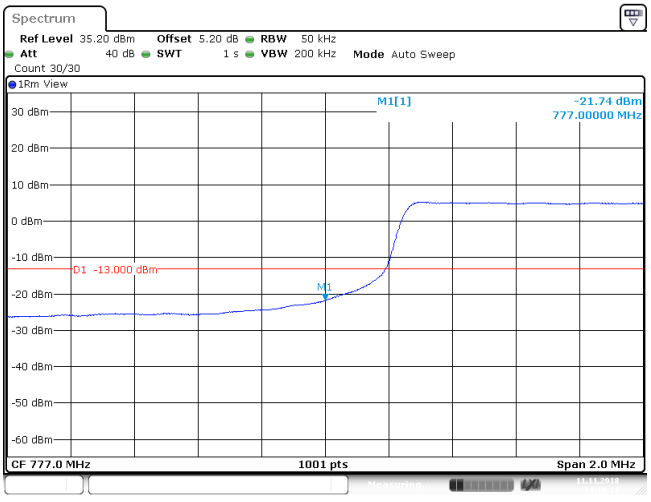
5. Band Edge Compliance

5.1. Test Plots

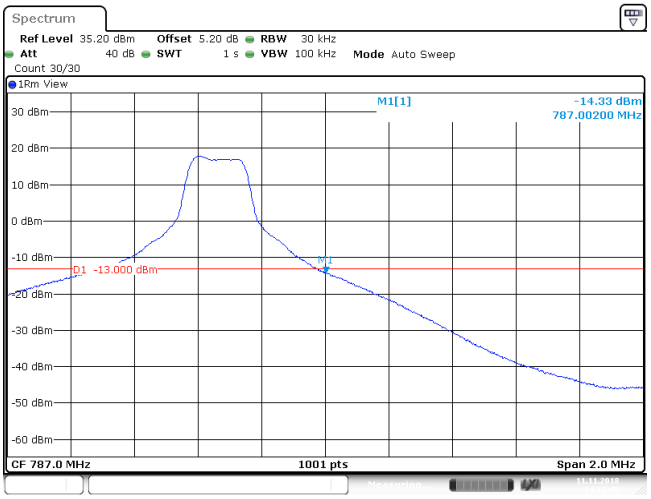
Band13_5MHz_QPSK_23205_1RB#0



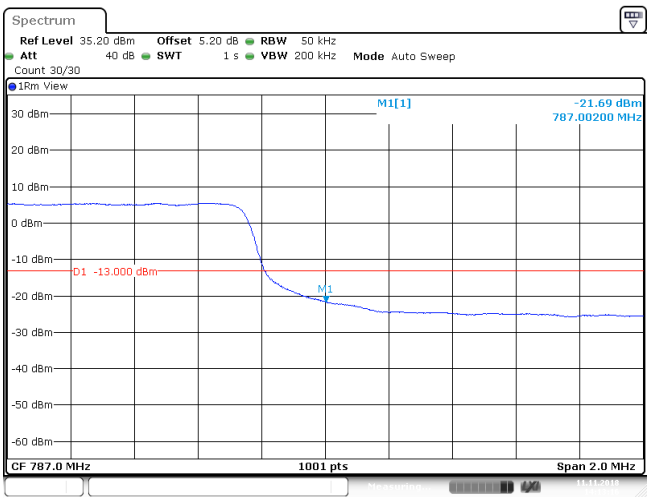
Band13_5MHz_QPSK_23205_25RB#0



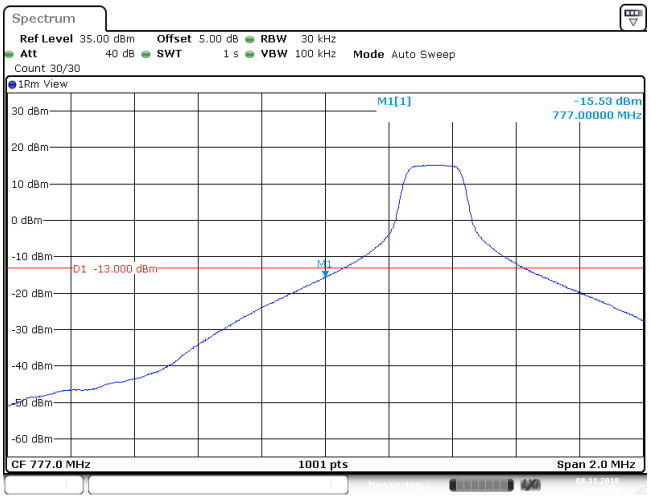
Band13_5MHz_QPSK_23255_1RB#24



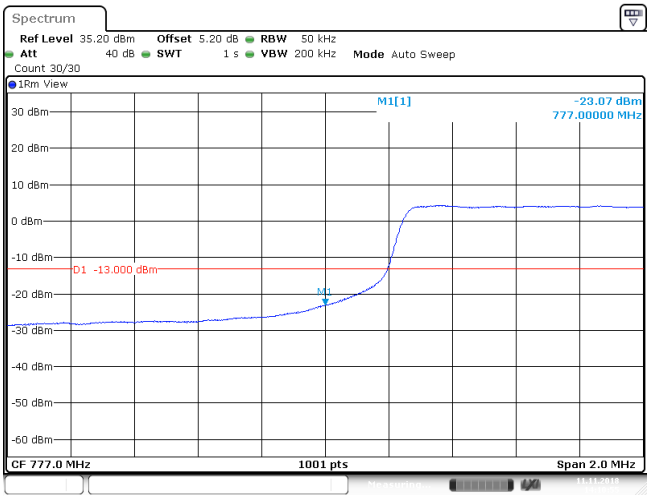
Band13_5MHz_QPSK_23255_25RB#0



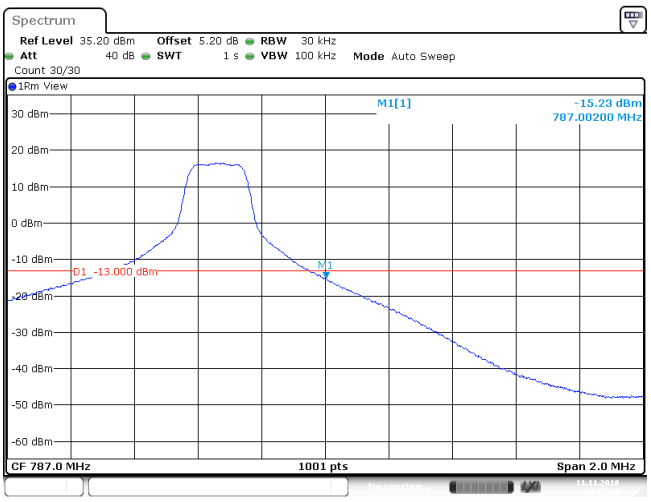
Band13_5MHz_16QAM_23205_1RB#0



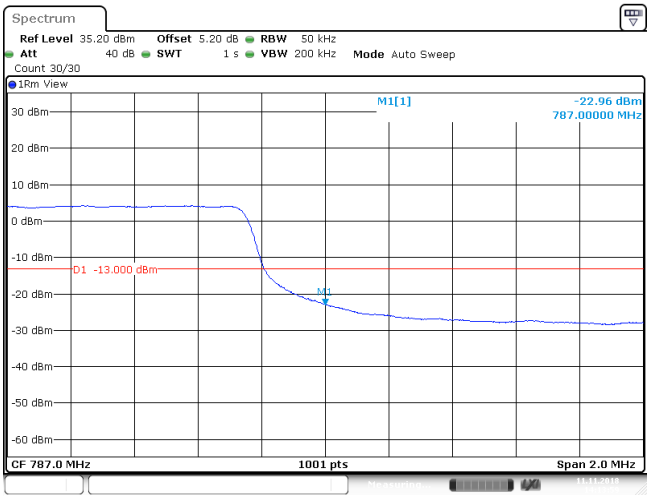
Band13_5MHz_16QAM_23205_25RB#0



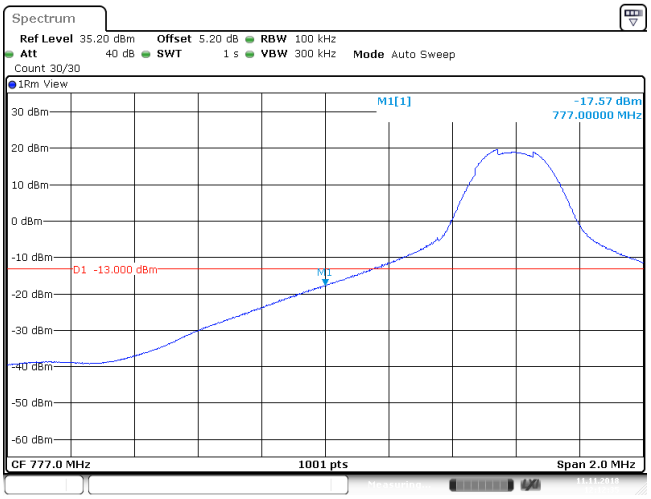
Band13_5MHz_16QAM_23255_1RB#24



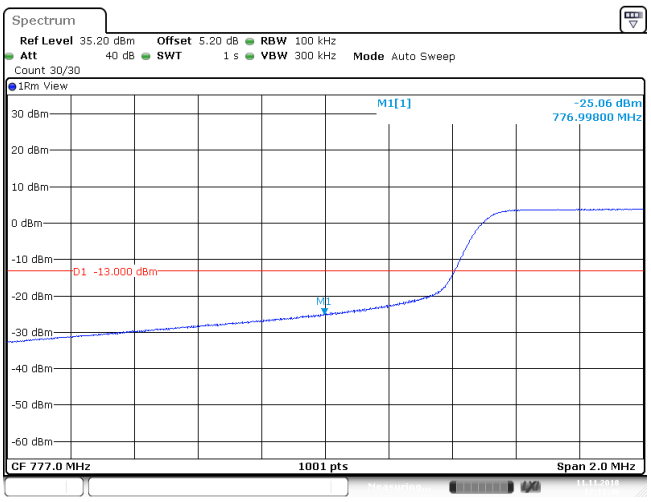
Band13_5MHz_16QAM_23255_25RB#0



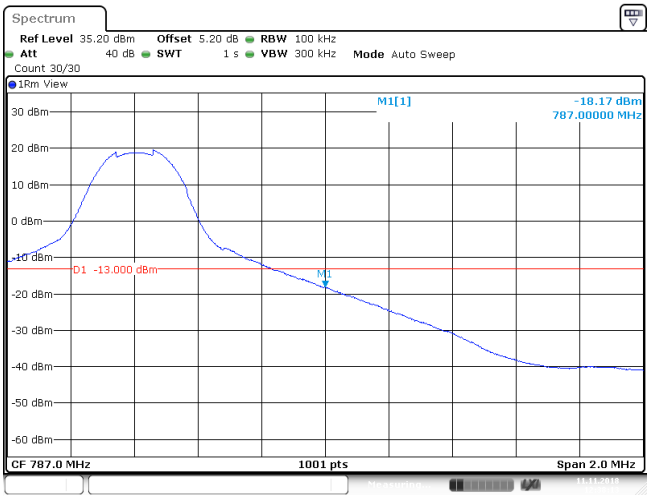
Band13_10MHz_QPSK_23230_Left_1RB#0



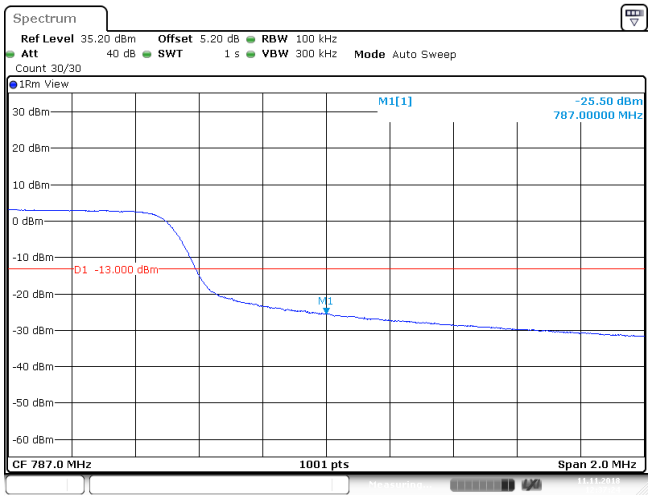
Band13_10MHz_QPSK_23230_Left_50RB#0



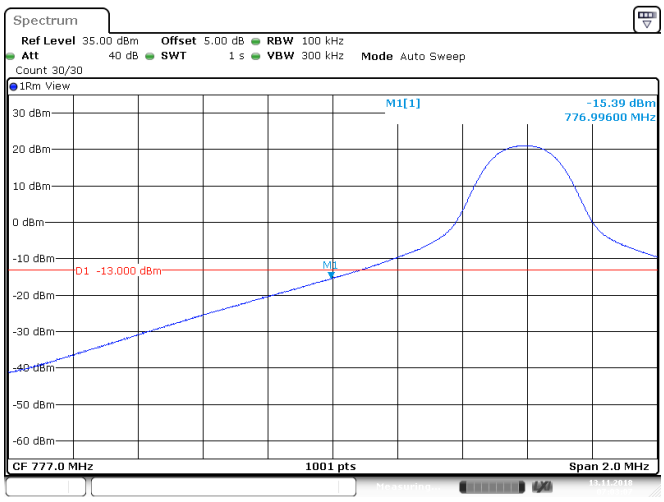
Band13_10MHz_QPSK_23230_Right_1RB#49



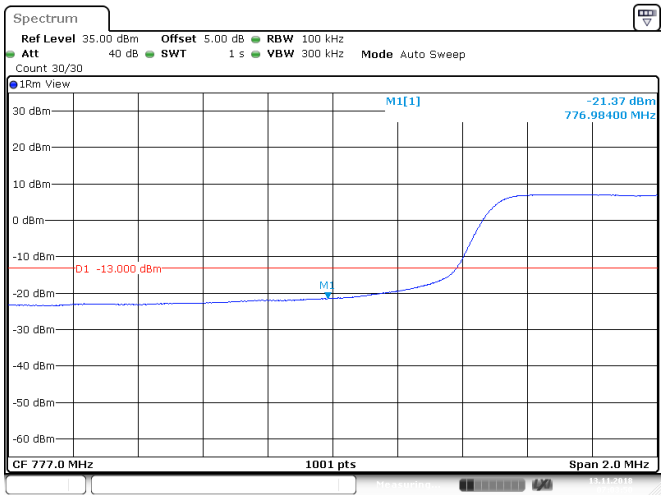
Band13_10MHz_QPSK_23230_Right_50RB#0



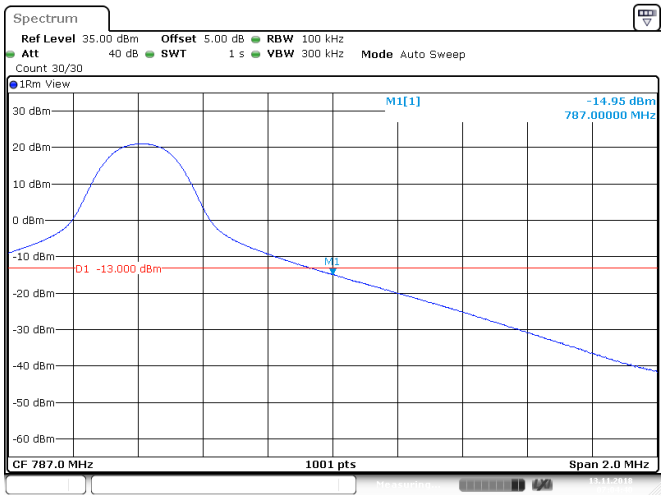
Band13_10MHz_16QAM_23230_Left_1RB#0



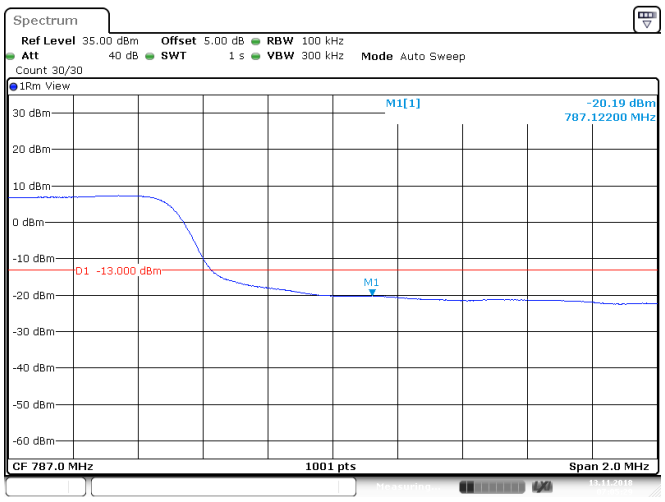
Band13_10MHz_16QAM_23230_Left_27RB#0



Band13_10MHz_16QAM_23230_Right_1RB#49



Band13_10MHz_16QAM_23230_Right_27RB#23



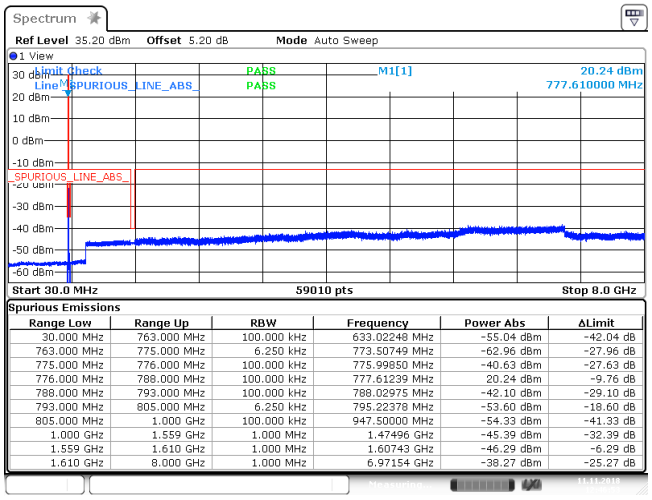
6. Spurious Emission at Antenna Terminal

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 * (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

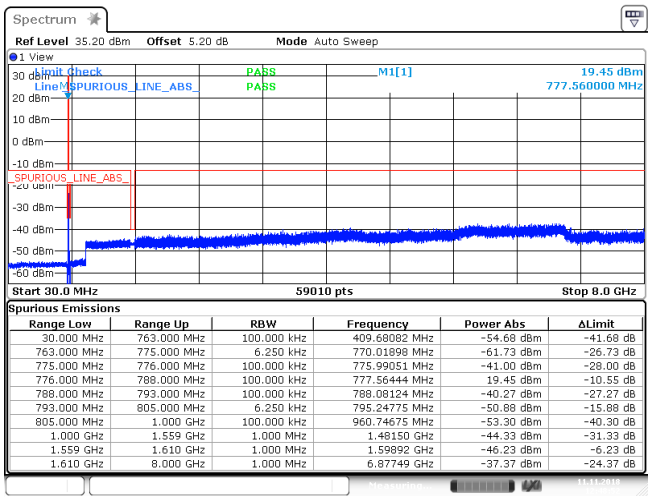


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	763.000 MHz	100.000 kHz	633.02248 MHz	-55.04 dBm	-42.04 dB
763.000 MHz	775.000 MHz	6.250 kHz	773.50749 MHz	-62.96 dBm	-27.96 dB
775.000 MHz	776.000 MHz	100.000 kHz	775.99850 MHz	-40.63 dBm	-27.63 dB
776.000 MHz	788.000 MHz	100.000 kHz	777.61239 MHz	20.24 dBm	-9.76 dB
788.000 MHz	793.000 MHz	100.000 kHz	788.02975 MHz	-42.10 dBm	-29.10 dB
793.000 MHz	805.000 MHz	6.250 kHz	795.22378 MHz	-53.60 dBm	-18.60 dB
805.000 MHz	1.000 GHz	100.000 kHz	947.50000 MHz	-54.33 dBm	-41.33 dB
1.000 GHz	1.559 GHz	1.000 MHz	1.47496 GHz	-45.39 dBm	-32.39 dB
1.559 GHz	1.610 GHz	1.000 MHz	1.60743 GHz	-46.29 dBm	-6.29 dB
1.610 GHz	8.000 GHz	1.000 MHz	6.97154 GHz	-38.27 dBm	-25.27 dB

Date: 11.NOV.2018 12:46:53

Band13_10MHz_16QAM_23230_1RB#0



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	763.000 MHz	100.000 kHz	409.68082 MHz	-54.68 dBm	-41.68 dB
763.000 MHz	775.000 MHz	6.250 kHz	770.01899 MHz	-61.73 dBm	-26.73 dB
775.000 MHz	776.000 MHz	100.000 kHz	775.99051 MHz	-41.00 dBm	-28.00 dB
776.000 MHz	788.000 MHz	100.000 kHz	777.56444 MHz	19.45 dBm	-10.55 dB
788.000 MHz	793.000 MHz	100.000 kHz	788.08124 MHz	-40.27 dBm	-27.27 dB
793.000 MHz	805.000 MHz	6.250 kHz	795.24775 MHz	-50.88 dBm	-15.88 dB
805.000 MHz	1.000 GHz	100.000 kHz	960.74675 MHz	-53.30 dBm	-40.30 dB
1.000 GHz	1.559 GHz	1.000 MHz	1.48150 GHz	-44.33 dBm	-31.33 dB
1.559 GHz	1.610 GHz	1.000 MHz	1.59892 GHz	-46.23 dBm	-6.23 dB
1.610 GHz	8.000 GHz	1.000 MHz	6.87749 GHz	-37.37 dBm	-24.37 dB

Date: 11.NOV.2018 12:48:53

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 = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
64.673333	-81.67	-13.00	68.67	Vertical
357.086667	-73.08	-13.00	60.08	Vertical
1555.000000	-63.12	-13.00	50.12	Vertical
1595.500000	-65.76	-40.00	25.76	Vertical
3730.762500	-67.32	-13.00	54.32	Vertical
6256.012500	-63.79	-13.00	50.79	Vertical
62.666667	-77.51	-13.00	64.51	Horizontal
178.400000	-73.27	-13.00	60.27	Horizontal
1555.000000	-63.13	-13.00	50.13	Horizontal
1595.500000	-65.82	-40.00	25.82	Horizontal
2578.000000	-57.82	-13.00	44.82	Horizontal
6256.012500	-63.72	-13.00	50.72	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 (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band13	10MHz	QPSK	23230	50RB#0	VN	NT	-15.44	-0.01974	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	VL	NT	-13.13	-0.01679	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	VH	NT	-15.75	-0.02014	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	VN	NT	-14.43	-0.01845	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	VL	NT	-15.29	-0.01955	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	VH	NT	-14.92	-0.01908	±2.5	PASS

8.2. Frequency Vs Temperature

Temperature										
BAND	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band13	10MHz	QPSK	23230	50RB#0	NV	-30	-16.87	-0.02157	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	-20	-14.00	-0.0179	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	0	-15.68	-0.02005	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	10	-15.15	-0.01937	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	20	-11.19	-0.01431	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	30	-11.57	-0.0148	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	40	-14.69	-0.01879	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	50	-15.03	-0.01922	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	NV	-30	-13.85	-0.01771	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	NV	-20	-11.73	-0.015	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	NV	0	-14.59	-0.01866	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	NV	10	-15.42	-0.01972	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	NV	20	-17.07	-0.02183	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	NV	30	-13.82	-0.01767	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	NV	40	-16.11	-0.0206	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	NV	50	-15.25	-0.0195	±2.5	PASS

The End