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	23.48	9.03	34.77	PASS
Band13	5MHz	QPSK	23205	1RB#12	24.06	9.61	34.77	PASS
Band13	5MHz	QPSK	23205	1RB#24	23.65	9.20	34.77	PASS
Band13	5MHz	QPSK	23205	12RB#0	22.56	8.11	34.77	PASS
Band13	5MHz	QPSK	23205	12RB#6	22.99	8.54	34.77	PASS
Band13	5MHz	QPSK	23205	12RB#13	22.89	8.44	34.77	PASS
Band13	5MHz	QPSK	23205	25RB#0	22.53	8.08	34.77	PASS
Band13	5MHz	QPSK	23230	1RB#0	23.60	9.15	34.77	PASS
Band13	5MHz	QPSK	23230	1RB#12	23.64	9.19	34.77	PASS
Band13	5MHz	QPSK	23230	1RB#24	23.29	8.84	34.77	PASS
Band13	5MHz	QPSK	23230	12RB#0	22.86	8.41	34.77	PASS
Band13	5MHz	QPSK	23230	12RB#6	22.53	8.08	34.77	PASS
Band13	5MHz	QPSK	23230	12RB#13	22.45	8.00	34.77	PASS
Band13	5MHz	QPSK	23230	25RB#0	22.52	8.07	34.77	PASS
Band13	5MHz	QPSK	23255	1RB#0	23.58	9.13	34.77	PASS
Band13	5MHz	QPSK	23255	1RB#12	23.51	9.06	34.77	PASS
Band13	5MHz	QPSK	23255	1RB#24	23.66	9.21	34.77	PASS
Band13	5MHz	QPSK	23255	12RB#0	22.54	8.09	34.77	PASS
Band13	5MHz	QPSK	23255	12RB#6	22.62	8.17	34.77	PASS
Band13	5MHz	QPSK	23255	12RB#13	22.58	8.13	34.77	PASS
Band13	5MHz	QPSK	23255	25RB#0	22.65	8.20	34.77	PASS
Band13	5MHz	16QAM	23205	1RB#0	22.62	8.17	34.77	PASS
Band13	5MHz	16QAM	23205	1RB#12	22.70	8.25	34.77	PASS
Band13	5MHz	16QAM	23205	1RB#24	22.02	7.57	34.77	PASS
Band13	5MHz	16QAM	23205	12RB#0	21.60	7.15	34.77	PASS
Band13	5MHz	16QAM	23205	12RB#6	21.42	6.97	34.77	PASS
Band13	5MHz	16QAM	23205	12RB#13	22.50	8.05	34.77	PASS
Band13	5MHz	16QAM	23205	25RB#0	21.45	7.00	34.77	PASS
Band13	5MHz	16QAM	23230	1RB#0	21.97	7.52	34.77	PASS
Band13	5MHz	16QAM	23230	1RB#12	22.51	8.06	34.77	PASS
Band13	5MHz	16QAM	23230	1RB#24	21.86	7.41	34.77	PASS
Band13	5MHz	16QAM	23230	12RB#0	21.50	7.05	34.77	PASS
Band13	5MHz	16QAM	23230	12RB#6	21.63	7.18	34.77	PASS
Band13	5MHz	16QAM	23230	12RB#13	21.56	7.11	34.77	PASS
Band13	5MHz	16QAM	23230	25RB#0	21.53	7.08	34.77	PASS

Band13	5MHz	16QAM	23255	1RB#0	22.46	8.01	34.77	PASS
Band13	5MHz	16QAM	23255	1RB#12	22.60	8.15	34.77	PASS
Band13	5MHz	16QAM	23255	1RB#24	21.98	7.53	34.77	PASS
Band13	5MHz	16QAM	23255	12RB#0	21.36	6.91	34.77	PASS
Band13	5MHz	16QAM	23255	12RB#6	21.44	6.99	34.77	PASS
Band13	5MHz	16QAM	23255	12RB#13	21.43	6.98	34.77	PASS
Band13	5MHz	16QAM	23255	25RB#0	21.58	7.13	34.77	PASS
Band13	10MHz	QPSK	23230	1RB#0	23.51	9.06	34.77	PASS
Band13	10MHz	QPSK	23230	1RB#24	24.27	9.82	34.77	PASS
Band13	10MHz	QPSK	23230	1RB#49	22.98	8.53	34.77	PASS
Band13	10MHz	QPSK	23230	25RB#0	22.80	8.35	34.77	PASS
Band13	10MHz	QPSK	23230	25RB#12	22.62	8.17	34.77	PASS
Band13	10MHz	QPSK	23230	25RB#25	22.46	8.01	34.77	PASS
Band13	10MHz	QPSK	23230	50RB#0	22.50	8.05	34.77	PASS
Band13	10MHz	16QAM	23230	1RB#0	22.47	8.02	34.77	PASS
Band13	10MHz	16QAM	23230	1RB#24	22.67	8.22	34.77	PASS
Band13	10MHz	16QAM	23230	1RB#49	21.72	7.27	34.77	PASS
Band13	10MHz	16QAM	23230	27RB#0	21.48	7.03	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,

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

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

b: SGP=Signal Generator Level

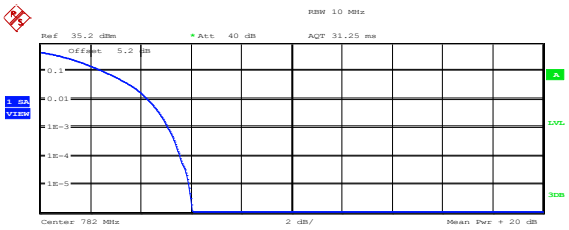
2. Peak-to-Average Ratio(CCDF)

2.1. Test Result

BAND	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band13	10MHz	QPSK	23230	50RB#0	5.06	13	PASS
Band13	10MHz	16QAM	23230	27RB#0	4.94	13	PASS

2.2. Test Plots

Band13_10MHz_QPSK_23230_50RB#0

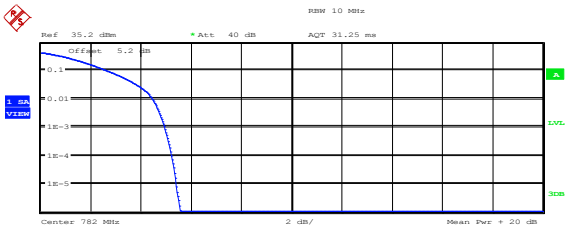


Complementary Cumulative Distribution Function (1000000 samples)

	Trace 1
Mean	23.39 dBm
Peak	29.48 dBm
Crest	6.08 dB
10 %	2.47 dB
1 %	4.26 dB
.1 %	5.06 dB
.01 %	5.54 dB

Date: 20.DEC.2018 13:55:15

Band13_10MHz_16QAM_23230_27RB#0



Complementary Cumulative Distribution Function (1000000 samples)

	Trace 1
Mean	23.00 dBm
Peak	28.63 dBm
Crest	5.63 dB
10 %	2.66 dB
1 %	4.46 dB
.1 %	4.94 dB
.01 %	5.22 dB

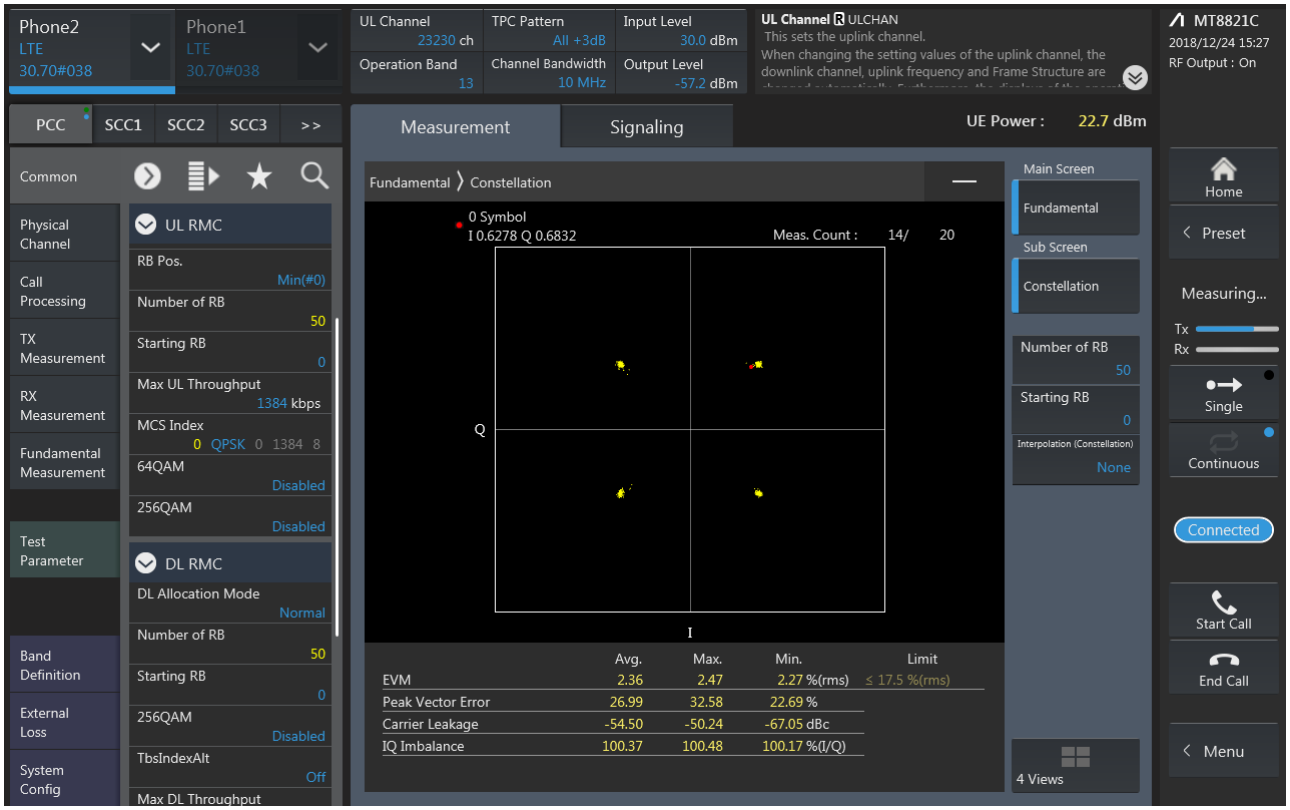
Date: 20.DEC.2018 19:02:40

3. Modulation Characteristics

3.1. Test BAND = LTE BAND13

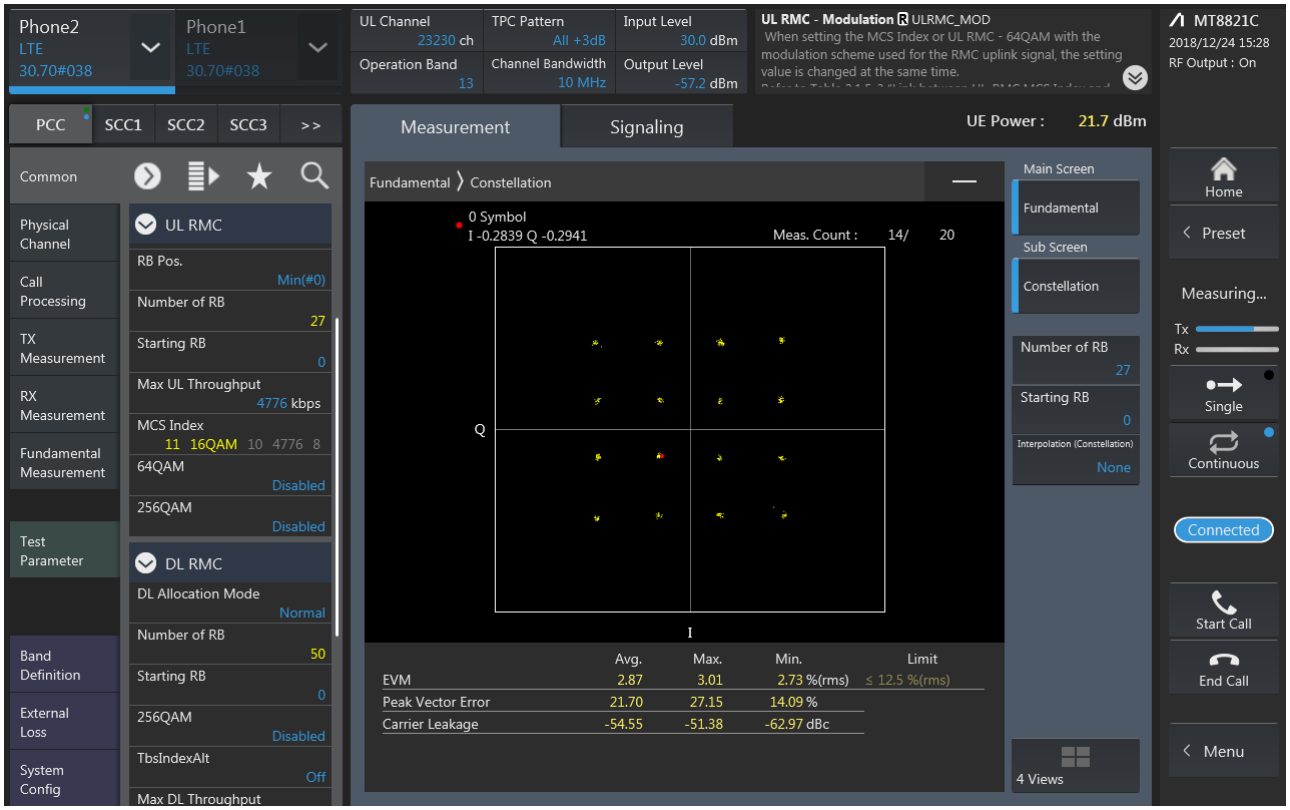
3.1.1. Test Mode = LTE /TM1 10MHz

3.1.1.1. Test Channel = MCH



3.1.2. Test Mode = LTE /TM2 10MHz

3.1.2.1. Test Channel = MCH



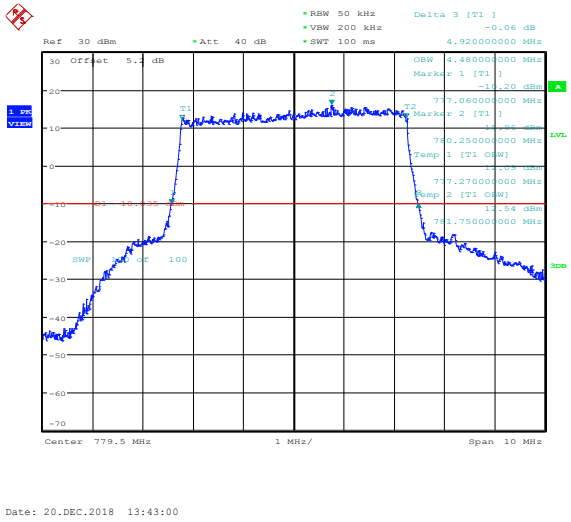
4. 26dB Bandwidth and Occupied Bandwidth

4.1. Test Result

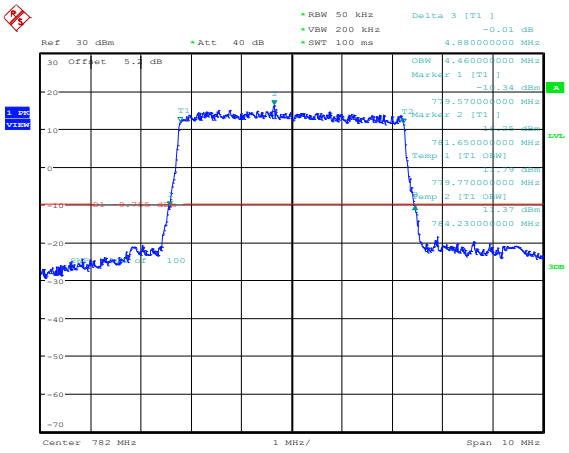
BAND	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band13	5MHz	QPSK	23205	25RB#0	4.480	4.920	PASS
Band13	5MHz	QPSK	23230	25RB#0	4.460	4.880	PASS
Band13	5MHz	QPSK	23255	25RB#0	4.490	4.910	PASS
Band13	5MHz	16QAM	23205	25RB#0	4.480	4.920	PASS
Band13	5MHz	16QAM	23230	25RB#0	4.470	4.920	PASS
Band13	5MHz	16QAM	23255	25RB#0	4.500	4.970	PASS
Band13	10MHz	QPSK	23230	50RB#0	8.900	9.740	PASS
Band13	10MHz	16QAM	23230	27RB#0	4.860	5.660	PASS

4.2. Test Plots

Band13_5MHz_QPSK_23205_25RB#0

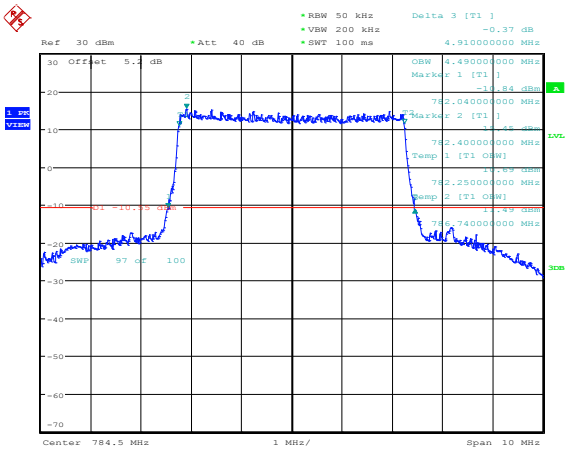


Band13_5MHz_QPSK_23230_25RB#0



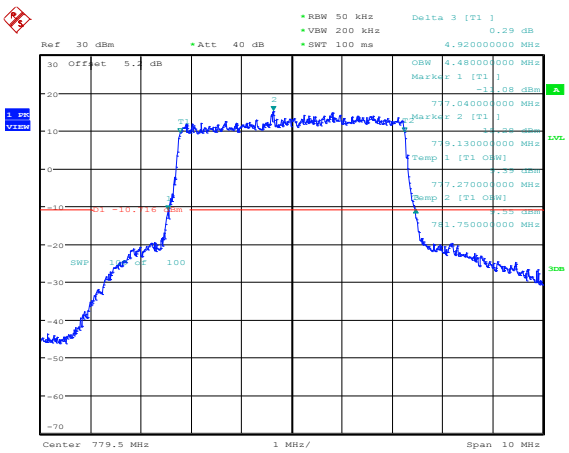
Date: 20.DEC.2018 13:43:37

Band13_5MHz_QPSK_23255_25RB#0



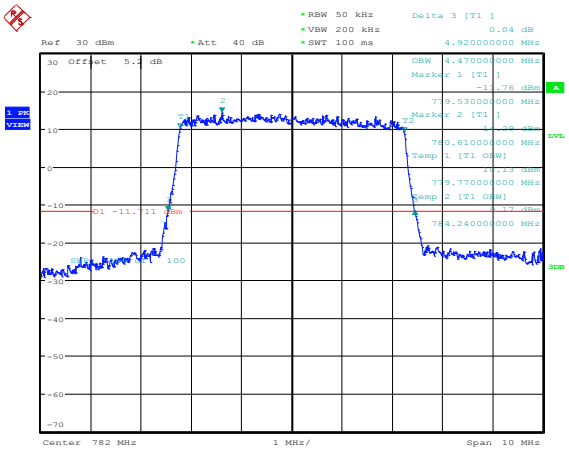
Date: 20.DEC.2018 13:44:14

Band13_5MHz_16QAM_23205_25RB#0

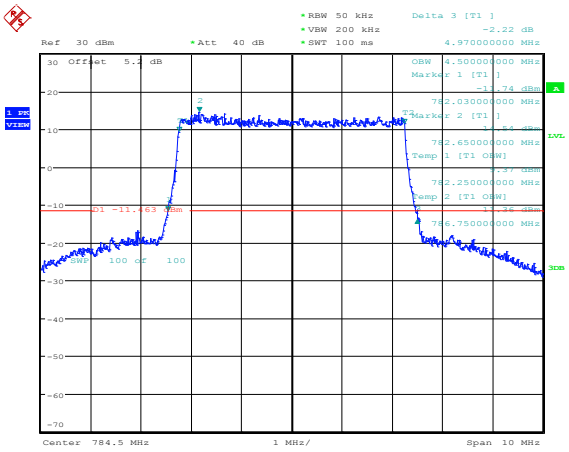


Date: 20.DEC.2018 13:43:17

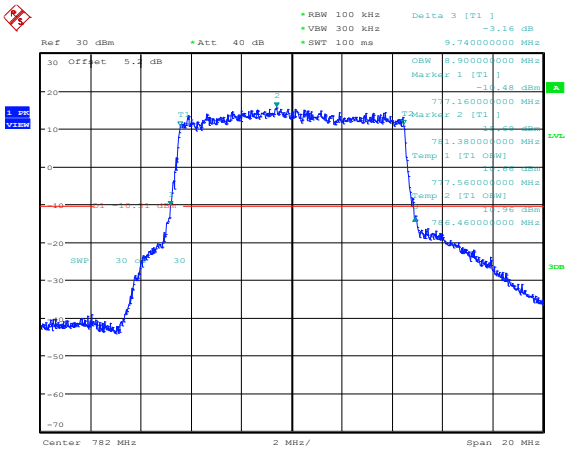
Band13_5MHz_16QAM_23230_25RB#0



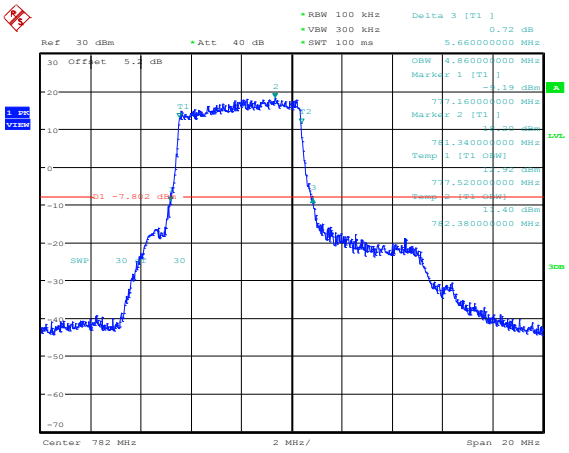
Band13_5MHz_16QAM_23255_25RB#0



Band13_10MHz_QPSK_23230_50RB#0



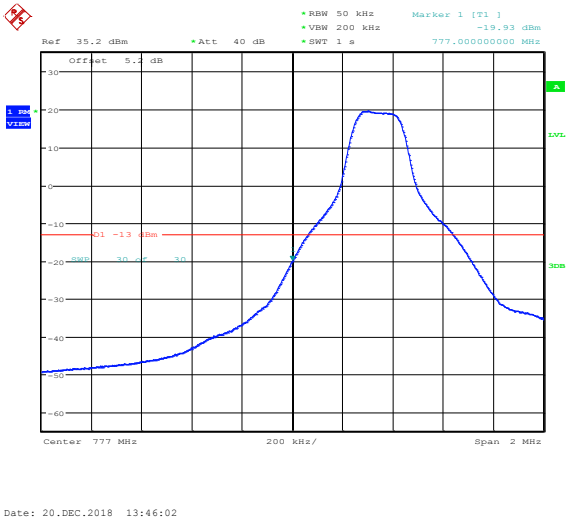
Band13_10MHz_16QAM_23230_27RB#0



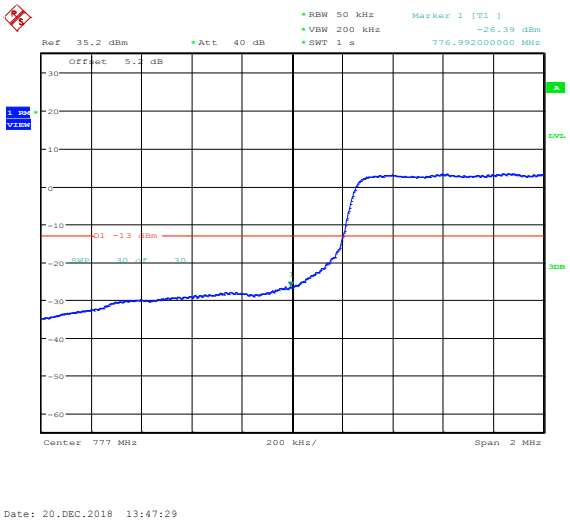
5. Band Edge Compliance

5.1. Test Plots

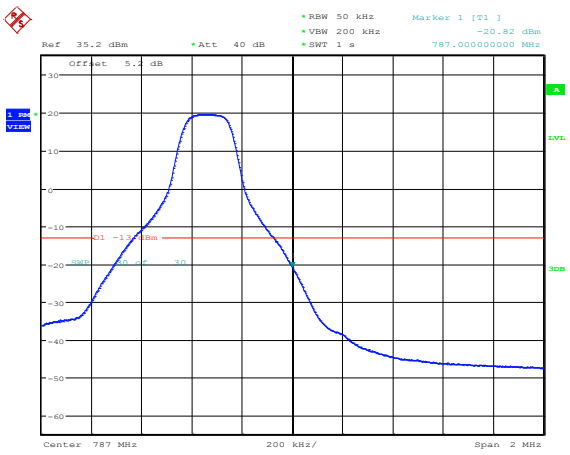
Band13_5MHz_QPSK_23205_1RB#0



Band13_5MHz_QPSK_23205_25RB#0

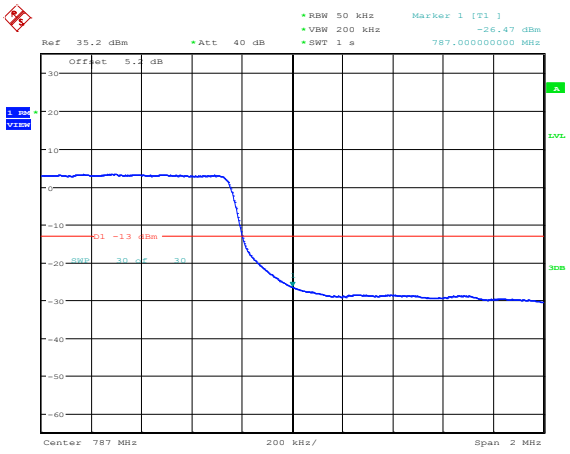


Band13_5MHz_QPSK_23255_1RB#24



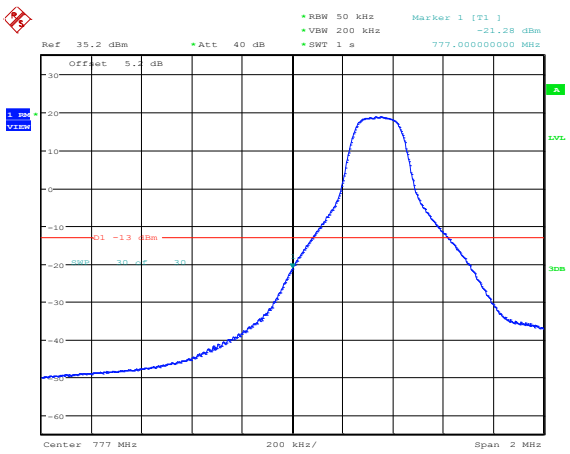
Date: 20.DEC.2018 13:49:03

Band13_5MHz_QPSK_23255_25RB#0



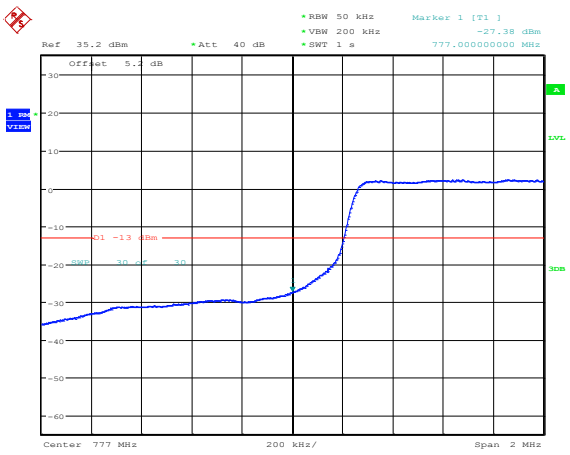
Date: 20.DEC.2018 13:51:39

Band13_5MHz_16QAM_23205_1RB#0



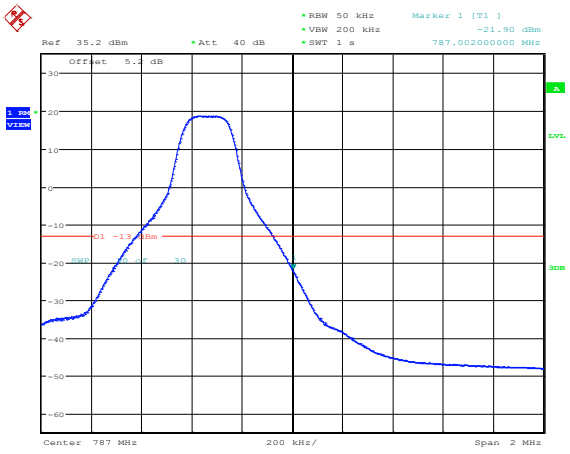
Date: 20.DEC.2018 13:46:45

Band13_5MHz_16QAM_23205_25RB#0



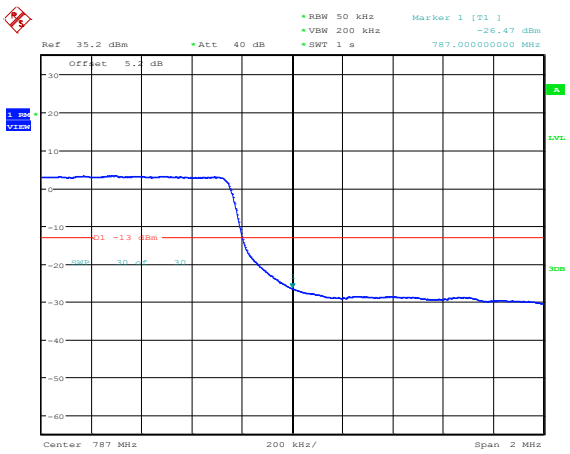
Date: 20.DEC.2018 13:48:13

Band13_5MHz_16QAM_23255_1RB#24



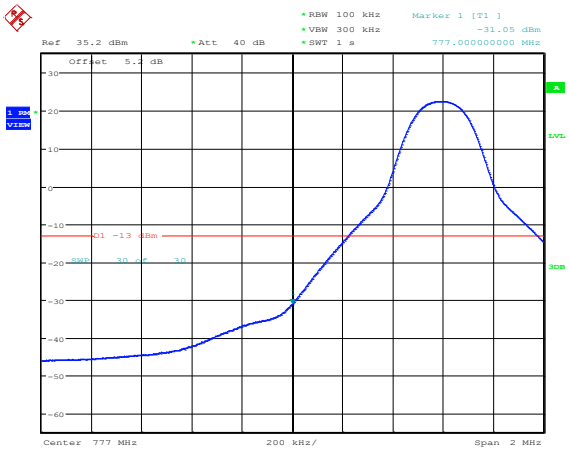
Date: 20.DEC.2018 13:49:47

Band13_5MHz_16QAM_23255_25RB#0



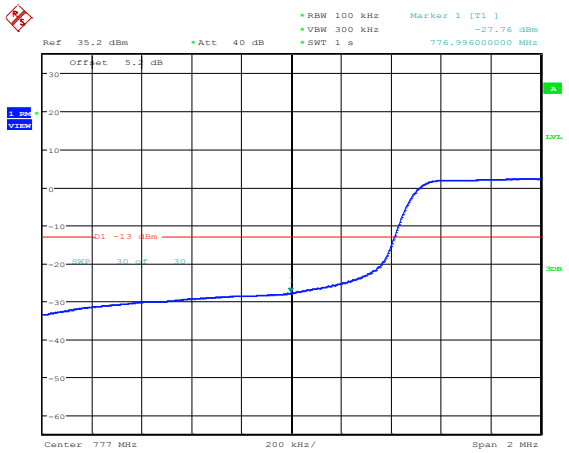
Date: 20.DEC.2018 13:51:39

Band13_10MHz_QPSK_23230_Left_1RB#0



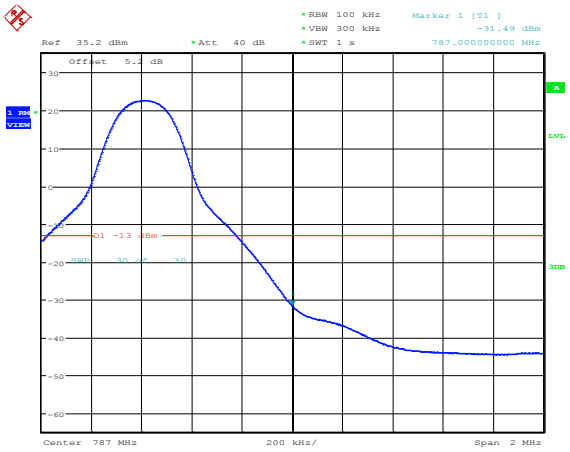
Date: 20.DEC.2018 13:52:51

Band13_10MHz_QPSK_23230_Left_50RB#0



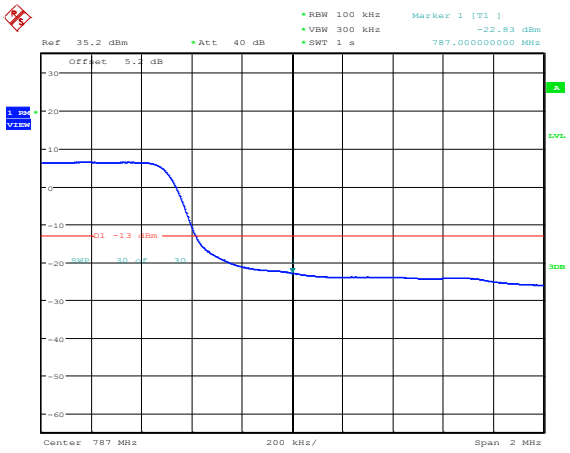
Date: 26.DEC.2018 09:12:57

Band13_10MHz_QPSK_23230_Right_1RB#49



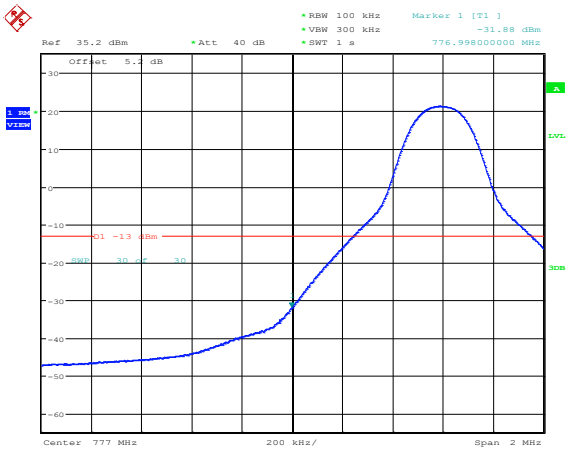
Date: 20.DEC.2018 13:53:40

Band13_10MHz_QPSK_23230_Right_50RB#0



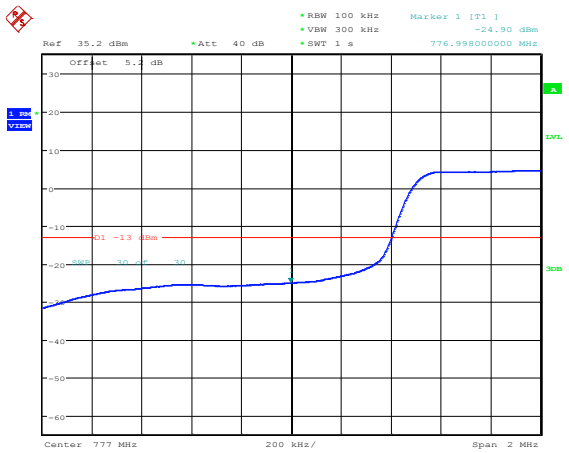
Date: 20.DEC.2018 19:01:40

Band13_10MHz_16QAM_23230_Left_1RB#0



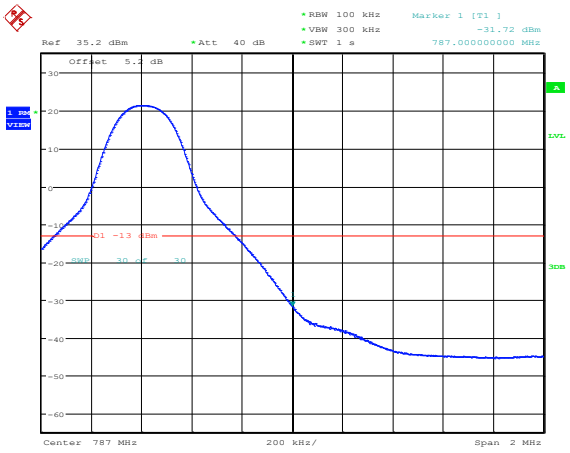
Date: 20.DEC.2018 19:00:03

Band13_10MHz_16QAM_23230_Left_27RB#0



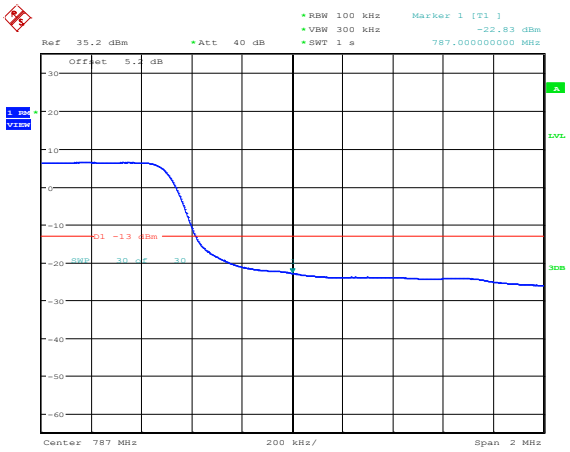
Date: 26.DEC.2018 09:12:12

Band13_10MHz_16QAM_23230_Right_1RB#49



Date: 20.DEC.2018 19:00:51

Band13_10MHz_16QAM_23230_Right_27RB#23



Date: 20.DEC.2018 19:01:40

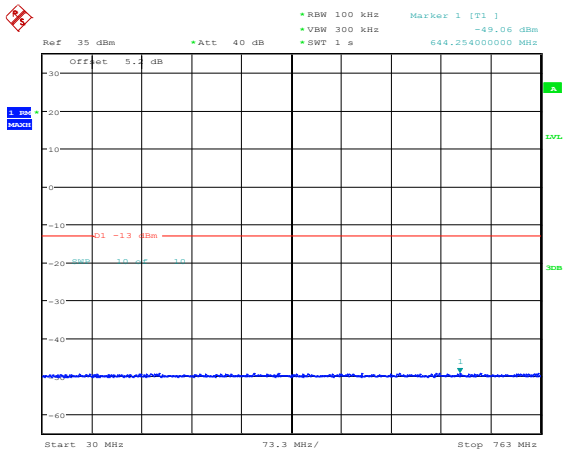
6. Spurious Emission at Antenna Terminal

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.

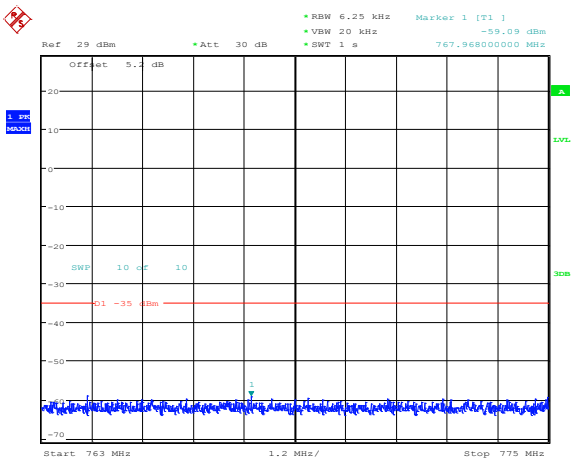
Remark2: only the worst case data displayed in this report.

6.1. Test Plots

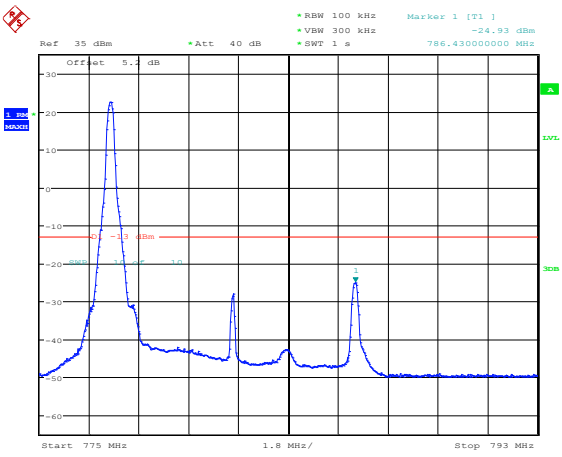
Band13_10MHz_QPSK_23230_1RB#0



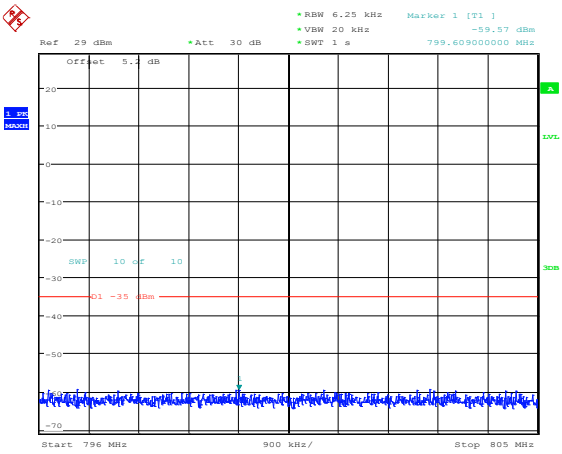
Date: 26.DEC.2018 09:46:49



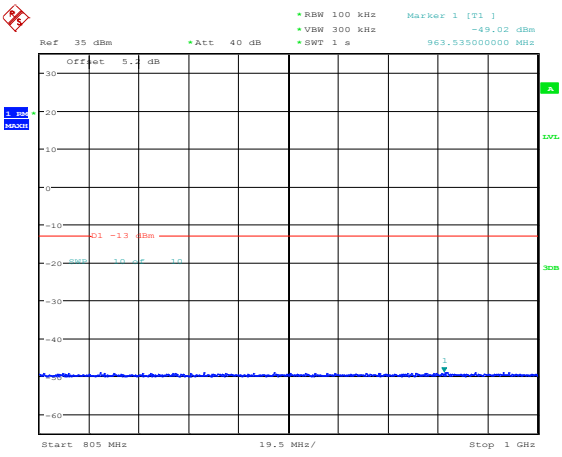
Date: 26.DEC.2018 10:55:08



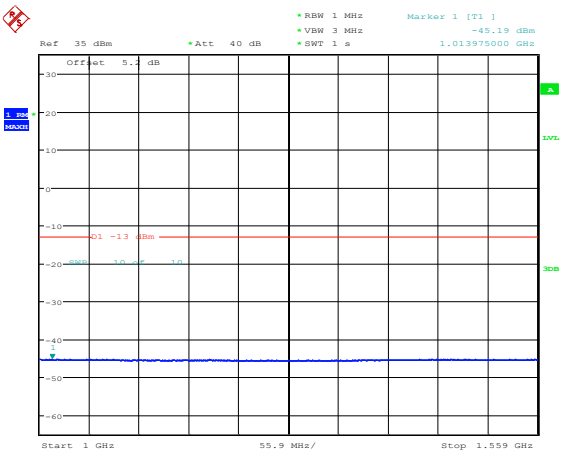
Date: 26.DEC.2018 09:42:09



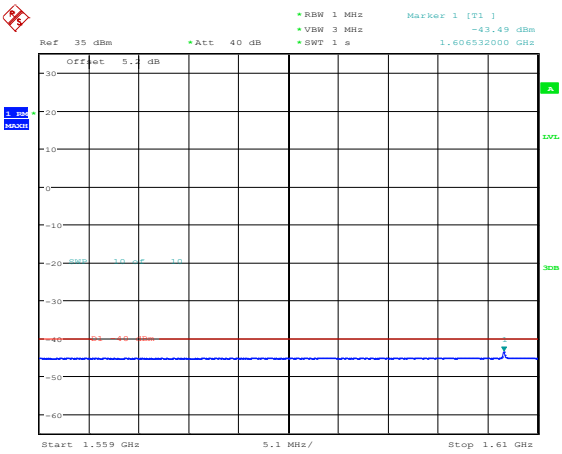
Date: 26.DEC.2018 10:56:03



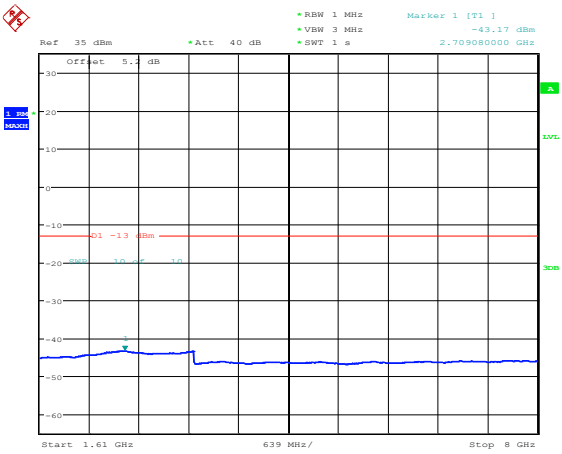
Date: 26.DEC.2018 09:48:01



Date: 26.DEC.2018 09:48:57

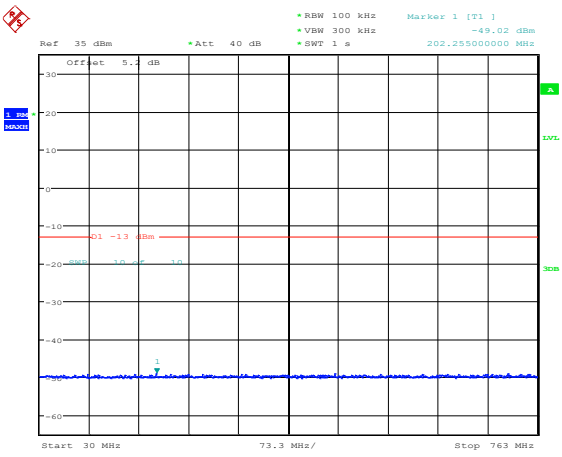


Date: 26.DEC.2018 09:50:24

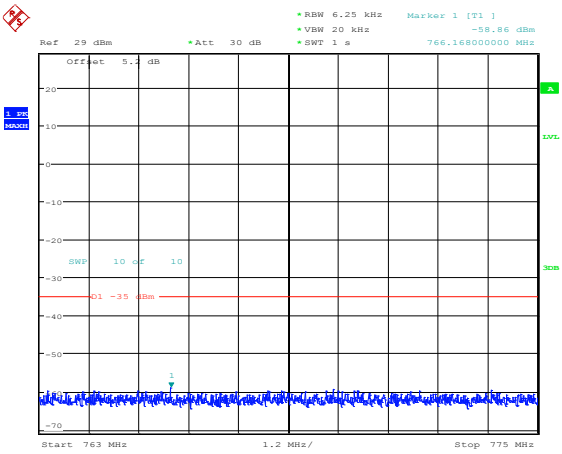


Date: 26.DEC.2018 10:28:23

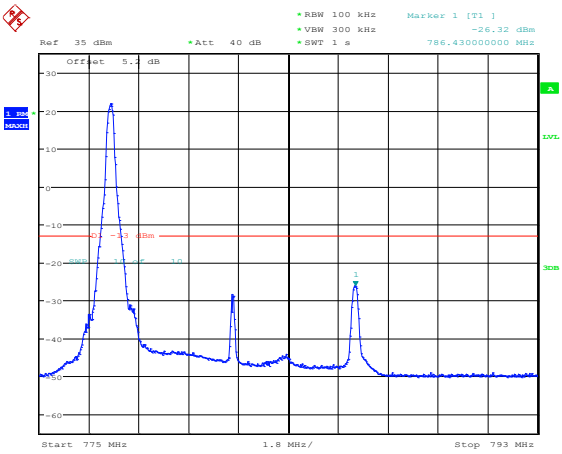
Band13_10MHz_16QAM_23230_1RB#0



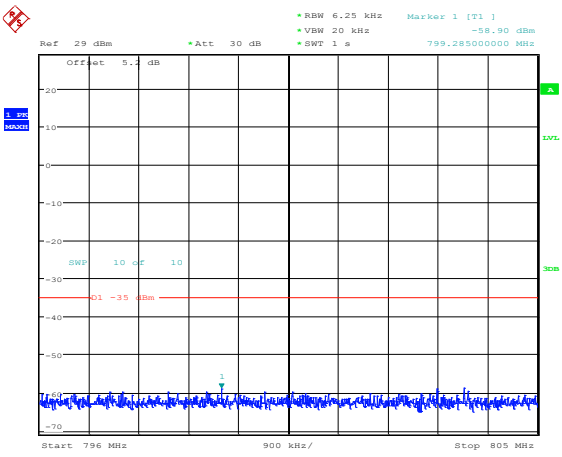
Date: 26.DEC.2018 09:47:16



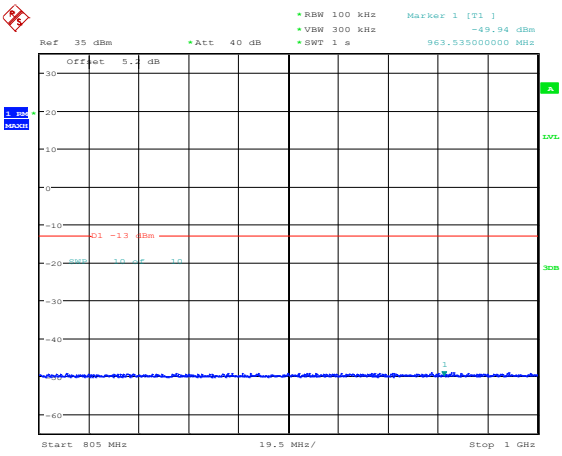
Date: 26.DEC.2018 10:55:33



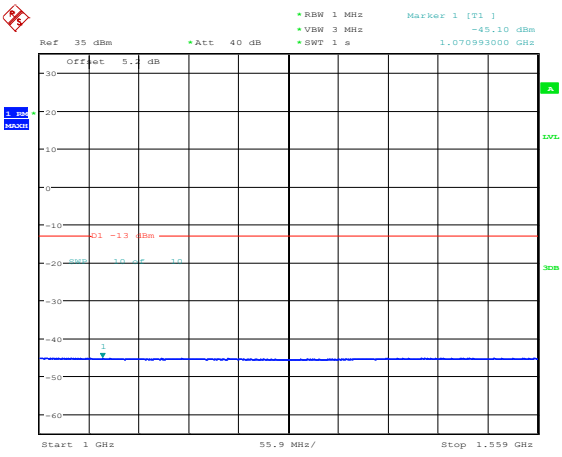
Date: 26.DEC.2018 09:42:36



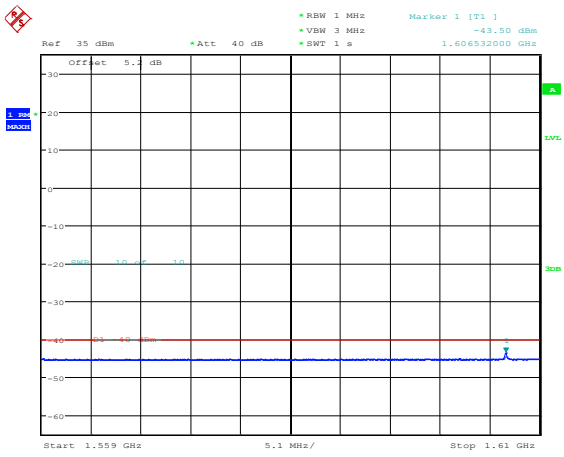
Date: 26.DEC.2018 10:56:22



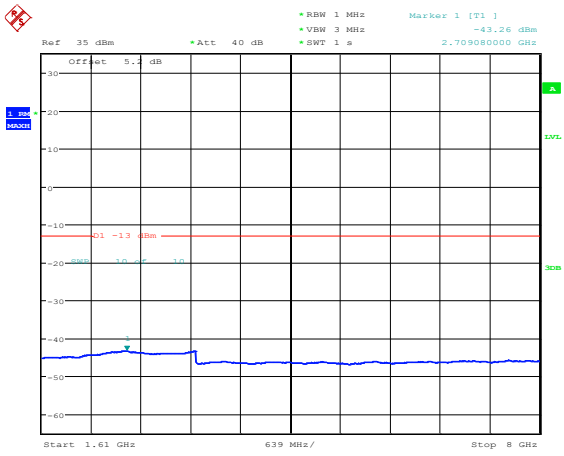
Date: 26.DEC.2018 09:48:21



Date: 26.DEC.2018 09:49:34



Date: 26.DEC.2018 10:27:47



Date: 26.DEC.2018 10:28:45

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 1RB#0

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
63.553333	-81.71	-13.00	68.71	Vertical
104.246667	-64.88	-13.00	51.88	Vertical
1555.000000	-66.05	-13.00	53.05	Vertical
1595.000000	-65.80	-40.00	25.80	Vertical
2332.500000	-57.62	-13.00	44.62	Vertical
6053.212500	-64.93	-13.00	51.93	Vertical
62.620000	-77.15	-13.00	64.15	Horizontal
104.246667	-75.98	-13.00	62.98	Horizontal
1555.000000	-65.78	-13.00	52.78	Horizontal
1597.000000	-65.75	-40.00	25.75	Horizontal
4283.100000	-66.79	-13.00	53.79	Horizontal
7939.350000	-63.69	-13.00	50.69	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	VL	NT	-1.20	-0.001535	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	VN	NT	0.00	0.000000	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	VH	NT	-0.10	-0.000128	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	VL	NT	-2.20	-0.002813	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	VN	NT	-2.20	-0.002813	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	VH	NT	-1.90	-0.002430	±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	-0.10	-0.000128	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	-20	-0.50	-0.000639	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	0	-0.60	-0.000767	±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	0.00	0.000000	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	30	-0.60	-0.000767	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	40	0.00	0.000000	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	50	-0.40	-0.000512	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	NV	-30	-0.90	-0.001151	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	NV	-20	0.00	0.000000	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	NV	0	-2.00	-0.002558	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	NV	10	-1.40	-0.001790	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	NV	20	-1.10	-0.001407	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	NV	30	-0.40	-0.000512	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	NV	40	-0.60	-0.000767	±2.5	PASS
Band13	10MHz	16QAM	23230	27RB#0	NV	50	-0.90	-0.001151	±2.5	PASS

The End