Appendix B

E-UTRA Band 13

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1. Main Test Instruments

RE in Chamber					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018/3/13	2021/3/12
Spectrum Analyzer (20Hz-43GHz)	Rohde & Schwarz	FSU43	SEM004-08	2019/3/2	2020/3/1
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-01	2017/6/27	2020/6/26
Horn Antenna (800MHz-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018/413	2021/412
Horn Antenna (15-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017/10/17	2020/10/16
Amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2019/7/14	2020/7/14
Low Noise Amplifier (100MHz-18GHz)	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2019/7/14	2020/7/14
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	EMC2063	2019/9/20	2020/9/19
Pre-amplifier (26-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2019/3/2	2020/3/1
Band filter	N/A	N/A	N/A	N/A	N/A
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2019/6/12	2020/6/11
Wideband Radio CommunicationTeste	Anristu	MT8821C	6201462742	2019/4/3	2020/4/3
Wideband Radio CommunicationTester	Rohde & Schwarz	CMW500	W005-02	2019/1/13	2020/1/12

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
Dual Output Mobile Communication DC Source	Agilent Technologies Inc	66311B	W009-09	2018/11/2	2019/11/1
Signal Analyzer	Rohde & Schwarz	FSV	W005-02	2019/3/2	2020/3/1
Coaxial Cable	SGS	N/A	SEM031-01	2019/6/12	2020/6/11
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2018/11/2	2019/11/1
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	HTC-1	W006-17	2018/11/2	2019/11/1
Temperature Chamber	GIANT FORCE	ICT-150-40-CP-AR	W027-03	2018/11/2	2019/11/1
Wideband Radio CommunicationTeste	Anristu	MT8821C	6201462742	2019/3/2	2020/3/1

2. Measurement Uncertainty

For a 95% confidence level (k = 2), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Test Item	Extended Uncertainty	Data
Transmit Output Power Data	Power [dBm]	U =±0.37 dB
Bandwidth	Magnitude [%]	U =± 0.2%
Band Edge Compliance	Disturbance Power [dBm]	U = ±2.0 dB
Spurious Emissions, Conducted	Disturbance Power [dBm]	U = ±2.0 dB
Frequency Stability	Frequency Accuracy [ppm]	U = ±0.24 ppm

3 Effective (Isotropic) Radiated Power

3.1. Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Conducted Power(dBm)	ERP (dBm)	Limit (dBm)	Verdict
Band13	5MHz	QPSK	23205	1RB#12	22.95	19.10	34.77	PASS
Band13	5MHz	QPSK	23205	1RB#24	22.68	18.83	34.77	PASS
Band13	5MHz	QPSK	23205	1RB#0	22.71	18.86	34.77	PASS
Band13	5MHz	QPSK	23205	12RB#0	21.85	18.00	34.77	PASS
Band13	5MHz	QPSK	23205	12RB#6	21.91	18.06	34.77	PASS
Band13	5MHz	QPSK	23205	12RB#13	21.89	18.04	34.77	PASS
Band13	5MHz	QPSK	23205	25RB#0	21.89	18.04	34.77	PASS
Band13	5MHz	QPSK	23230	1RB#0	22.72	18.87	34.77	PASS
Band13	5MHz	QPSK	23230	1RB#12	23.04	19.19	34.77	PASS
Band13	5MHz	QPSK	23230	1RB#24	22.66	18.81	34.77	PASS
Band13	5MHz	QPSK	23230	12RB#0	21.80	17.95	34.77	PASS
Band13	5MHz	QPSK	23230	12RB#6	21.90	18.05	34.77	PASS
Band13	5MHz	QPSK	23230	12RB#13	21.87	18.02	34.77	PASS
Band13	5MHz	QPSK	23230	25RB#0	21.82	17.97	34.77	PASS
Band13	5MHz	QPSK	23255	1RB#24	22.67	18.82	34.77	PASS
Band13	5MHz	QPSK	23255	1RB#0	22.69	18.84	34.77	PASS
Band13	5MHz	QPSK	23255	1RB#12	22.95	19.10	34.77	PASS
Band13	5MHz	QPSK	23255	12RB#6	21.88	18.03	34.77	PASS
Band13	5MHz	QPSK	23255	12RB#0	21.82	17.97	34.77	PASS
Band13	5MHz	QPSK	23255	12RB#13	21.81	17.96	34.77	PASS
Band13	5MHz	QPSK	23255	25RB#0	21.83	17.98	34.77	PASS
Band13	5MHz	16QAM	23205	1RB#12	22.12	18.27	34.77	PASS
Band13	5MHz	16QAM	23205	1RB#0	21.89	18.04	34.77	PASS
Band13	5MHz	16QAM	23205	1RB#24	21.95	18.10	34.77	PASS
Band13	5MHz	16QAM	23205	12RB#13	20.90	17.05	34.77	PASS
Band13	5MHz	16QAM	23205	12RB#6	20.93	17.08	34.77	PASS
Band13	5MHz	16QAM	23205	12RB#0	20.85	17.00	34.77	PASS
Band13	5MHz	16QAM	23205	25RB#0	20.84	16.99	34.77	PASS
Band13	5MHz	16QAM	23230	1RB#0	21.94	18.09	34.77	PASS
Band13	5MHz	16QAM	23230	1RB#12	22.24	18.39	34.77	PASS
Band13	5MHz	16QAM	23230	1RB#24	21.88	18.03	34.77	PASS
Band13	5MHz	16QAM	23230	12RB#0	20.77	16.92	34.77	PASS
Band13	5MHz	16QAM	23230	12RB#6	20.88	17.03	34.77	PASS
Band13	5MHz	16QAM	23230	12RB#13	20.86	17.01	34.77	PASS
Band13	5MHz	16QAM	23230	25RB#0	20.79	16.94	34.77	PASS
Band13	5MHz	16QAM	23255	1RB#0	21.97	18.12	34.77	PASS
Band13	5MHz	16QAM	23255	1RB#12	22.17	18.32	34.77	PASS
Band13	5MHz	16QAM	23255	1RB#24	21.91	18.06	34.77	PASS
Band13	5MHz	16QAM	23255	12RB#13	20.78	16.93	34.77	PASS
Band13	5MHz	16QAM	23255	12RB#0	20.84	16.99	34.77	PASS
Band13	5MHz	16QAM	23255	12RB#6	20.91	17.06	34.77	PASS
Band13	5MHz	16QAM	23255	25RB#0	20.82	16.97	34.77	PASS
Band13	10MHz	QPSK	23230	1RB#49	22.72	18.87	34.77	PASS
Band13	10MHz	QPSK	23230	1RB#24	22.94	19.09	34.77	PASS
Band13	10MHz	QPSK	23230	1RB#0	22.81	18.96	34.77	PASS
Band13	10MHz	QPSK	23230	25RB#0	21.91	18.06	34.77	PASS
Band13	10MHz	QPSK	23230	25RB#12	21.89	18.04	34.77	PASS

Band13	10MHz	QPSK	23230	25RB#25	21.92	18.07	34.77	PASS
Band13	10MHz	QPSK	23230	50RB#0	21.89	18.04	34.77	PASS
Band13	10MHz	16QAM	23230	1RB#49	21.97	18.12	34.77	PASS
Band13	10MHz	16QAM	23230	1RB#0	21.99	18.14	34.77	PASS
Band13	10MHz	16QAM	23230	1RB#24	22.16	18.31	34.77	PASS
Band13	10MHz	16QAM	23230	25RB#0	20.87	17.02	34.77	PASS
Band13	10MHz	16QAM	23230	25RB#12	20.88	17.03	34.77	PASS
Band13	10MHz	16QAM	23230	25RB#25	20.89	17.04	34.77	PASS
Band13	10MHz	16QAM	23230	50RB#0	20.87	17.02	34.77	PASS

Remark:

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

ERP [dBm] = Conducted Power [dBm] + Gain [dBd]

EIRP [dBm] = Conducted Power [dBm] + Gain [dBi]

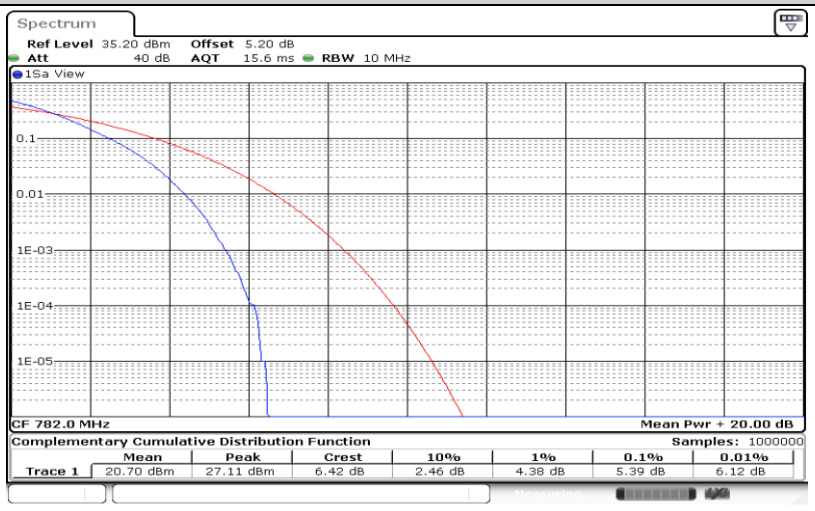
4. Peak-to-Average Ratio (CCDF)

4.1. Test Result

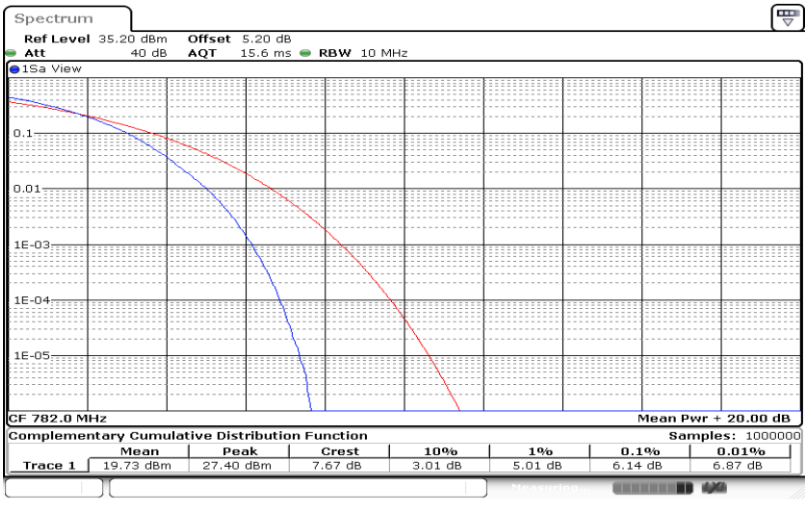
Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band13	10MHz	QPSK	23230	50RB#0	5.39	13	PASS
Band13	10MHz	16QAM	23230	50RB#0	6.14	13	PASS

4.2. Test Plots

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



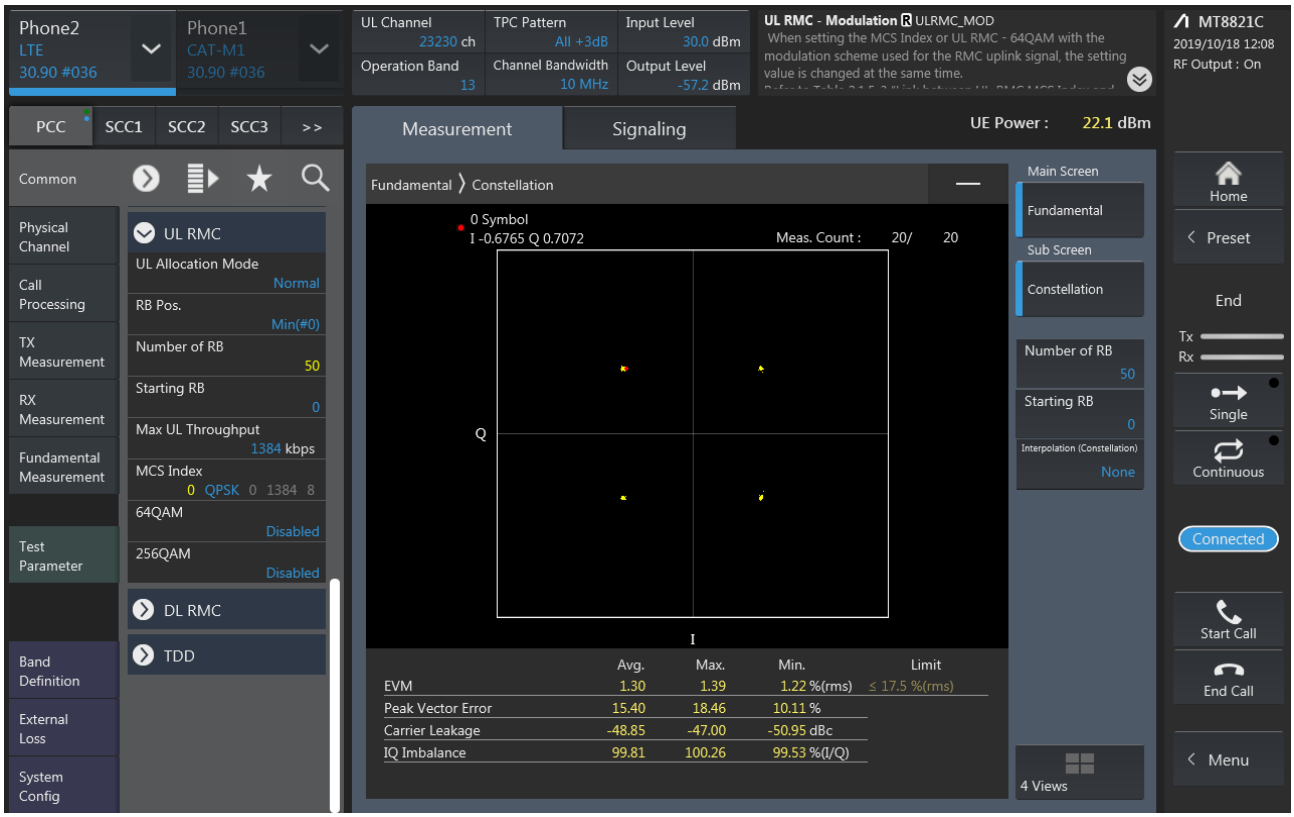
Band13-10MHz-16QAM-23230-50RB#0



5. Modulation Characteristics

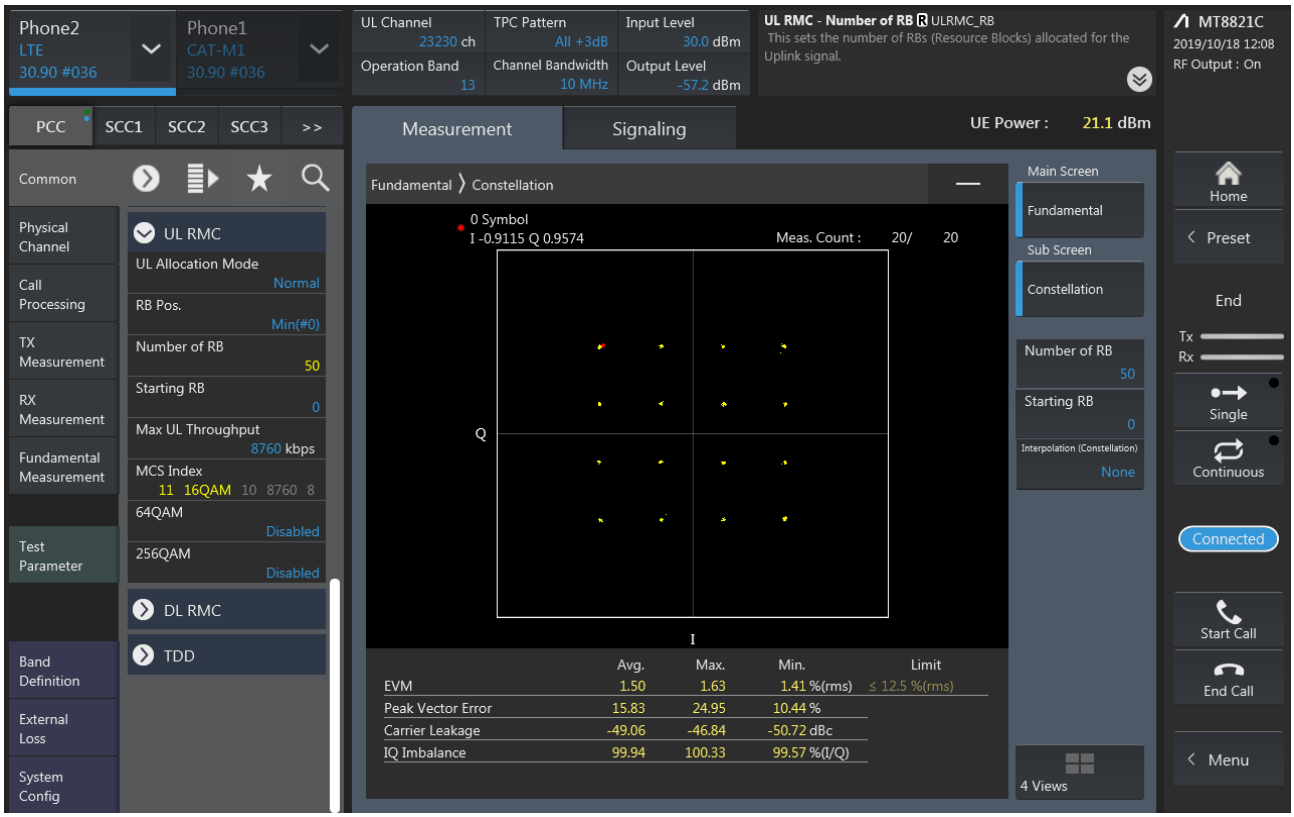
5.1. Test Mode = LTE /TM1 10MHz

5.1.1.Test Channel = MCH



5.2. Test Mode = LTE /TM2 10MHz

5.2.1.Test Channel = MCH



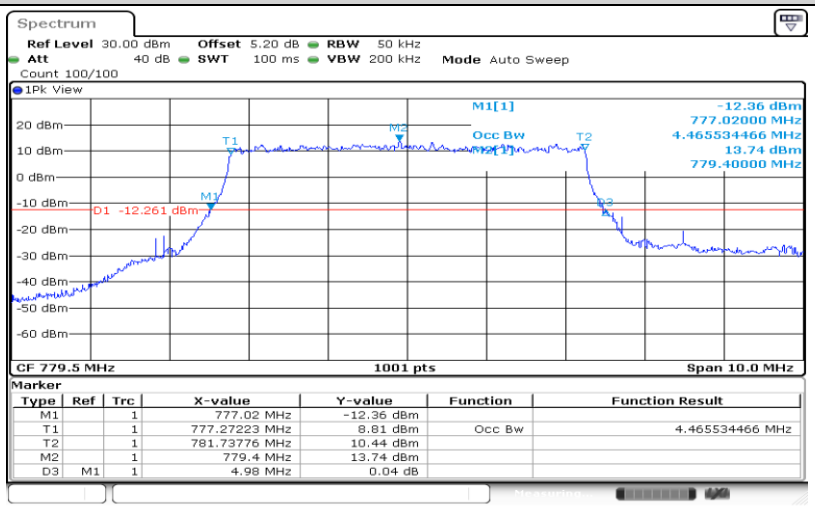
6. 26dB Bandwidth and Occupied Bandwidth

6.1. Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band13	5MHz	QPSK	23205	25RB#0	4.466	4.980	PASS
Band13	5MHz	QPSK	23230	25RB#0	4.476	5.080	PASS
Band13	5MHz	QPSK	23255	25RB#0	4.486	5.020	PASS
Band13	5MHz	16QAM	23205	25RB#0	4.486	5.020	PASS
Band13	5MHz	16QAM	23230	25RB#0	4.496	5.100	PASS
Band13	5MHz	16QAM	23255	25RB#0	4.486	5.090	PASS
Band13	10MHz	QPSK	23230	50RB#0	8.931	9.920	PASS
Band13	10MHz	16QAM	23230	50RB#0	8.931	9.900	PASS

6.2. Test Plots

Band13-5MHz-QPSK-23205-25RB#0-4.466



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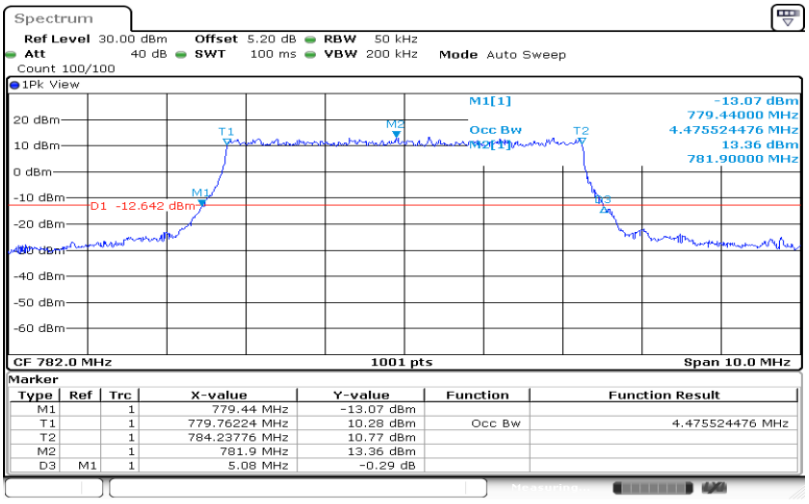
Band13-5MHz-QPSK-23230-25RB#0-4.476



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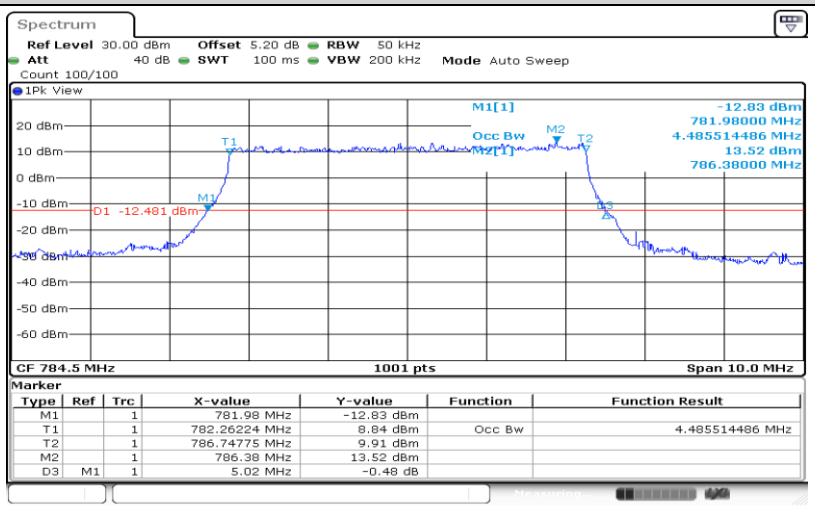
Band13-5MHz-QPSK-23255-25RB#0-4.486



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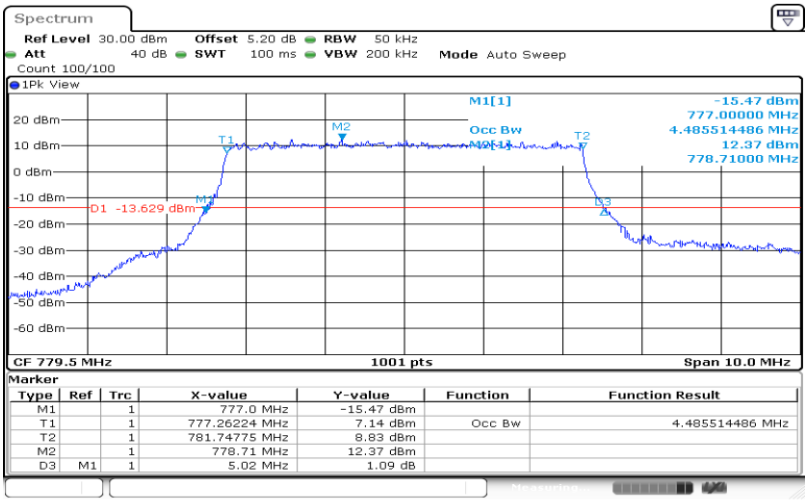
Band13-5MHz-16QAM-23205-25RB#0-4.486



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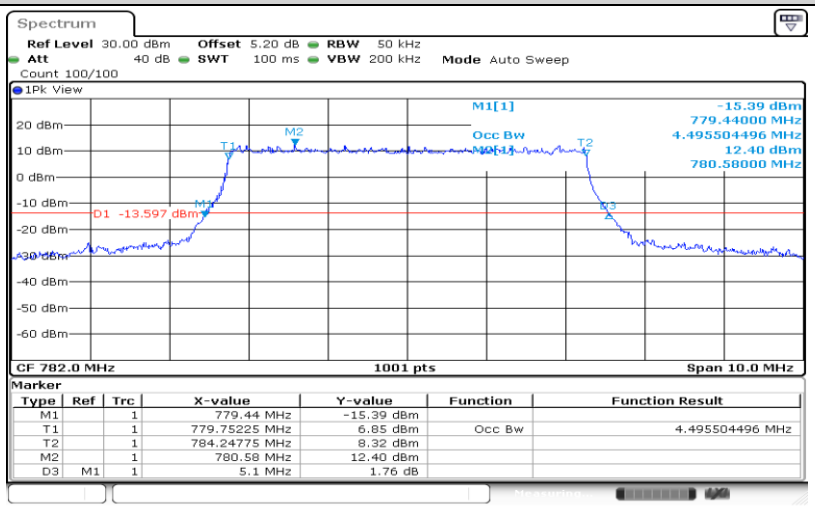

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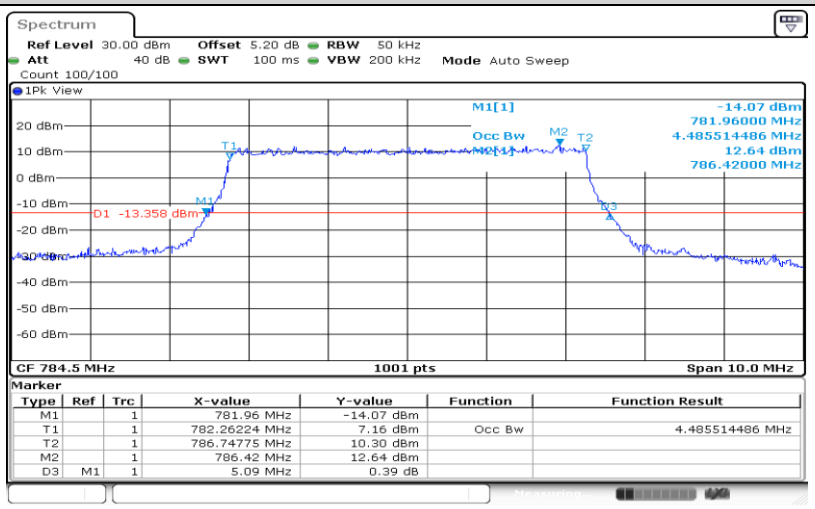
Band13-5MHz-16QAM-23255-25RB#0-4.486



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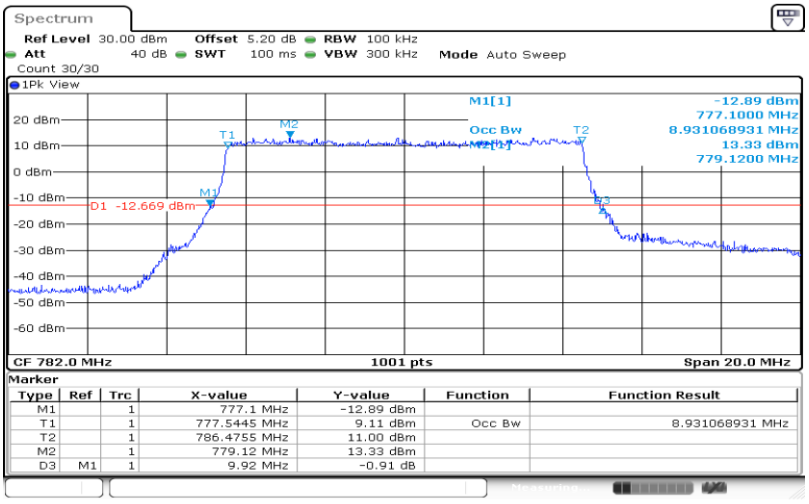
Band13-10MHz-QPSK-23230-50RB#0-8.931



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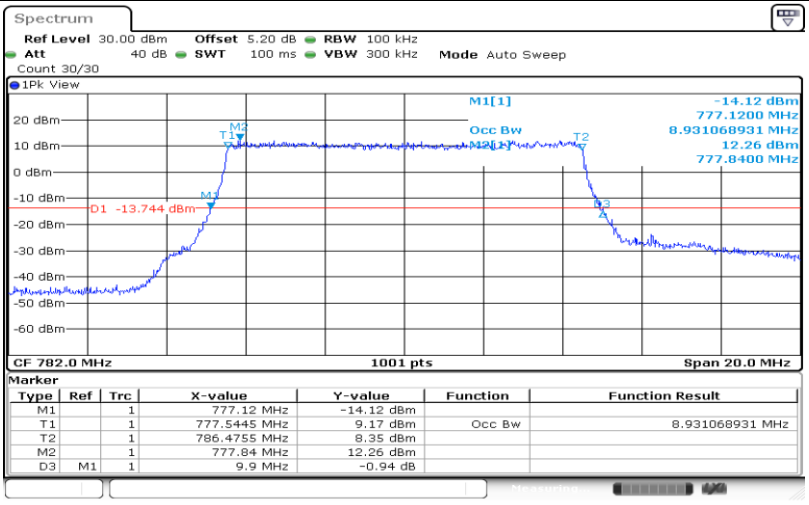
Band13-10MHz-16QAM-23230-50RB#0-8.931



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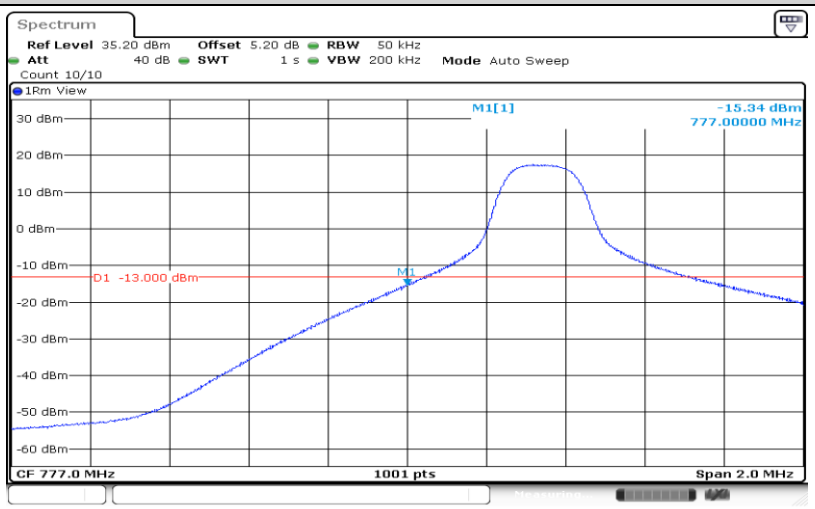
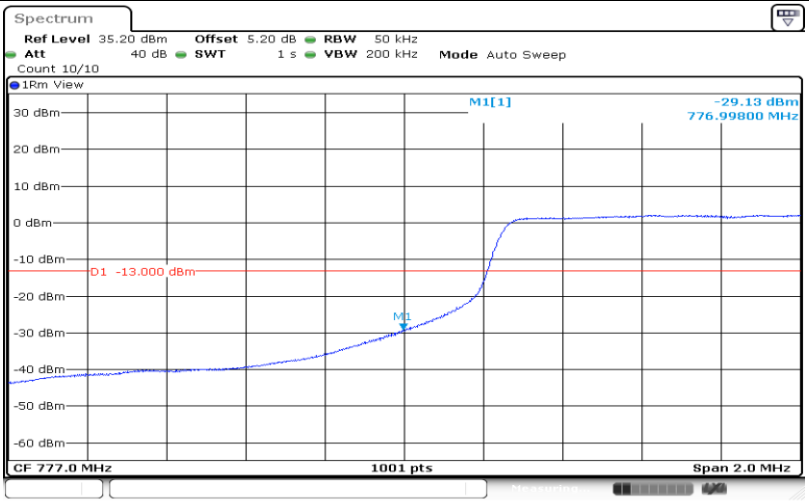
7. Band Edge Compliance

7.1. Test Plots

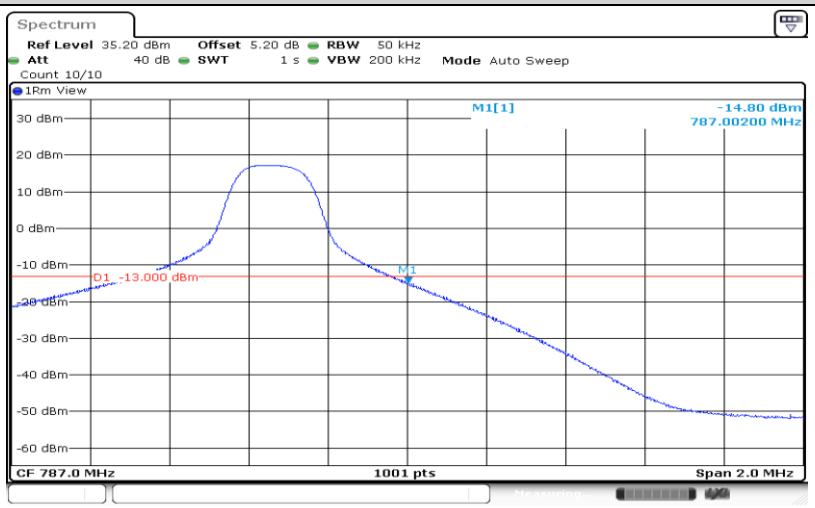
Band13-5MHz-QPSK-23205-1RB#0



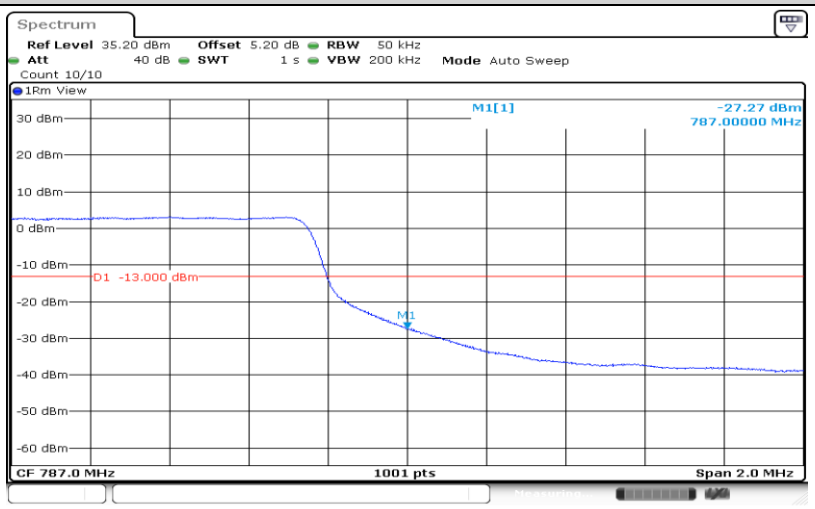
Band13-5MHz-QPSK-23205-25RB#0



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



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



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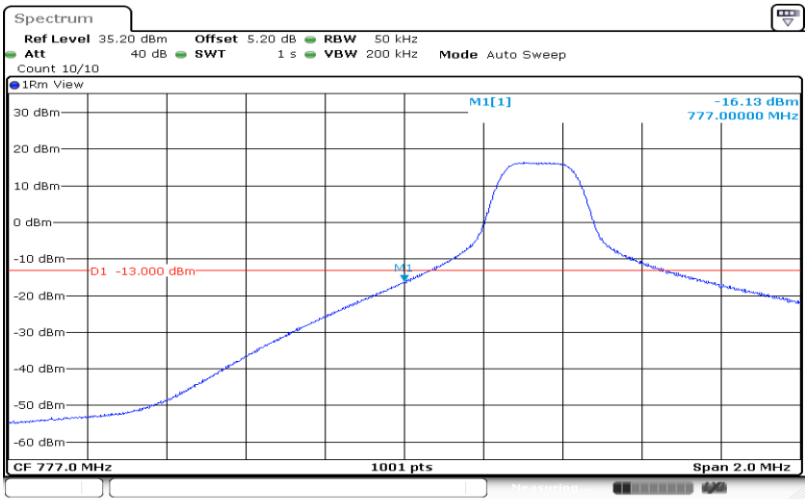
Band13-5MHz-16QAM-23205-1RB#0



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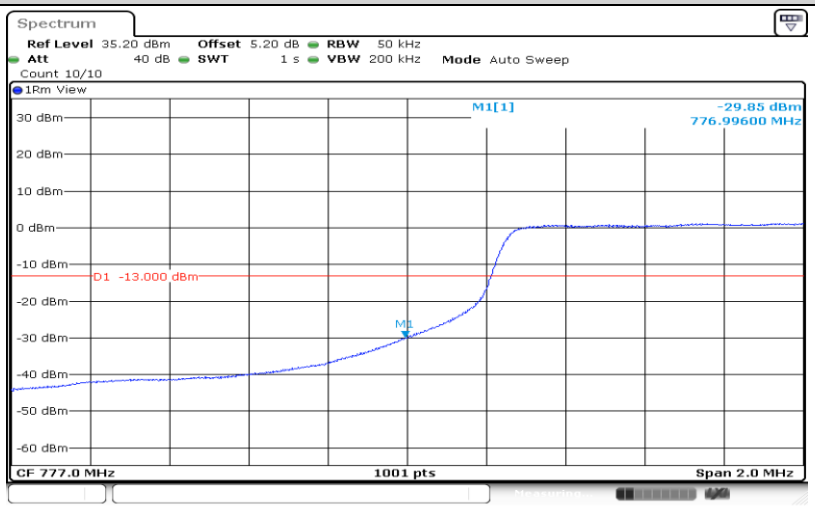
Band13-5MHz-16QAM-23205-25RB#0



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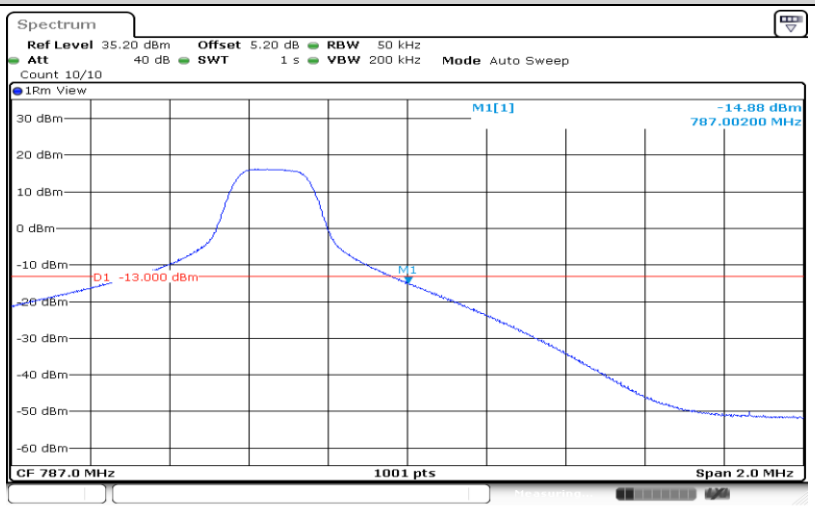

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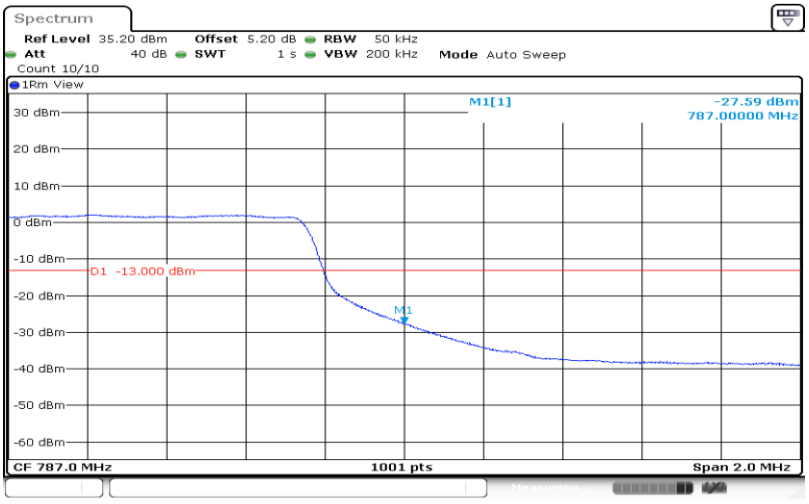
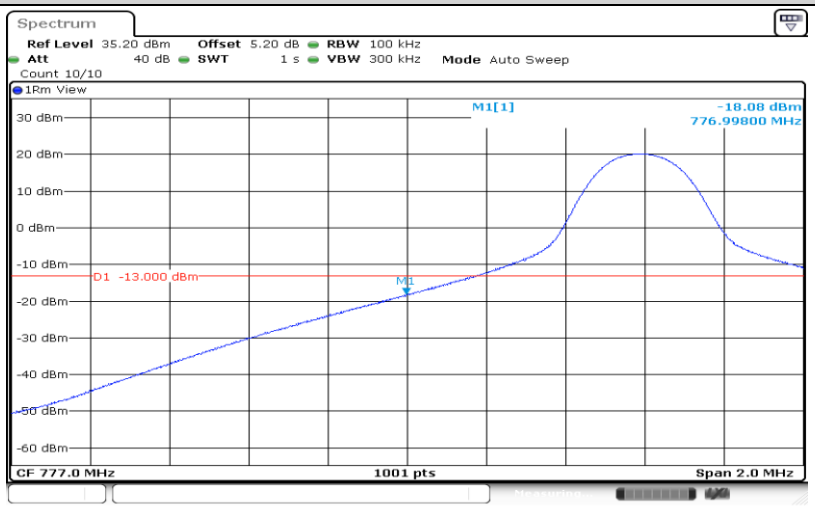
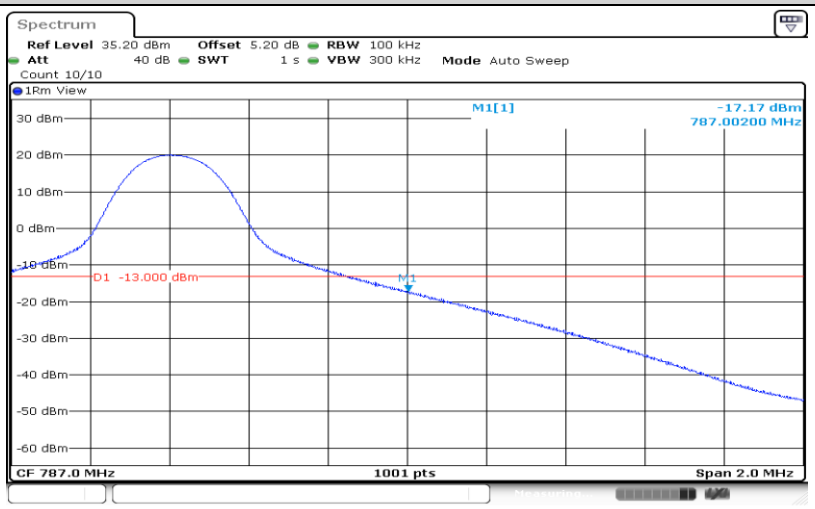


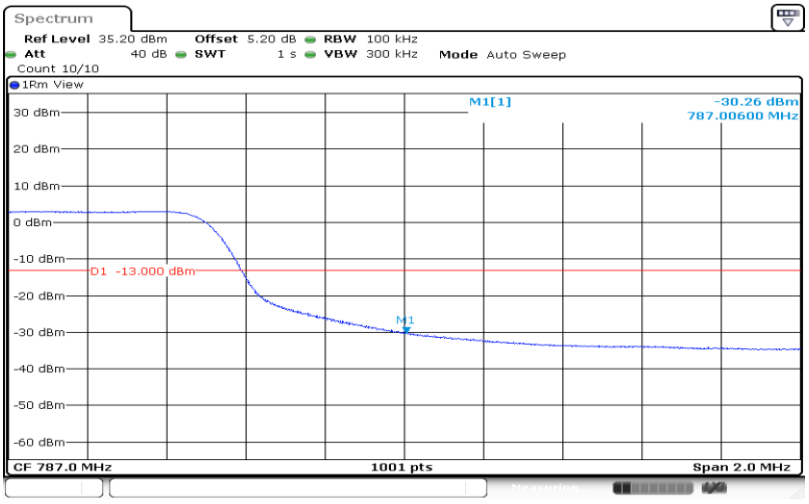
Band13-10MHz-QPSK-23230_Left-1RB#0



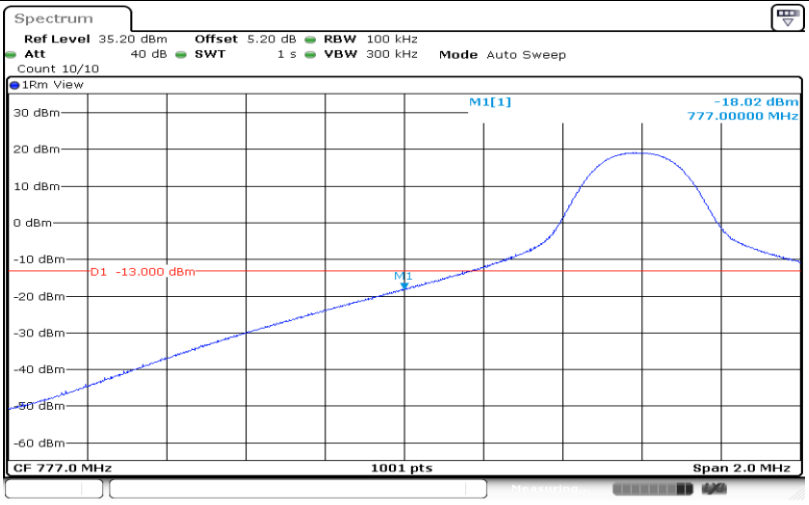
Band13-10MHz-QPSK-23230_Right-1RB#49



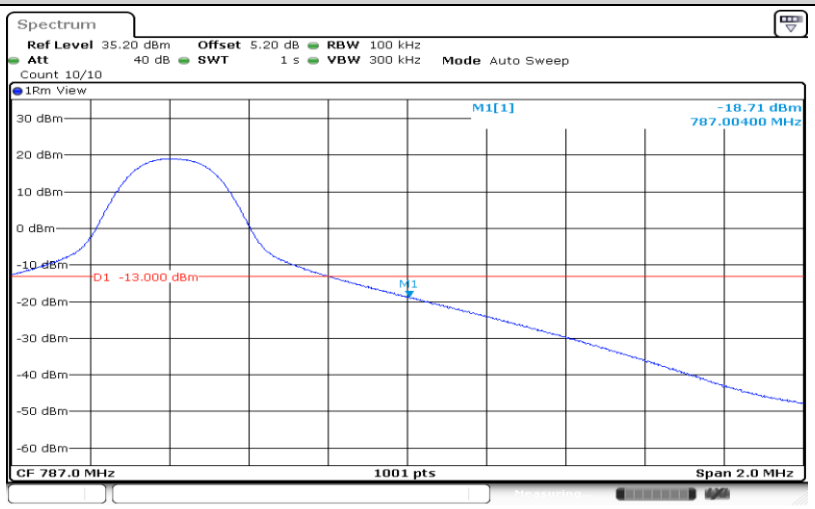
Band13-10MHz-QPSK-23230_Right-50RB#0



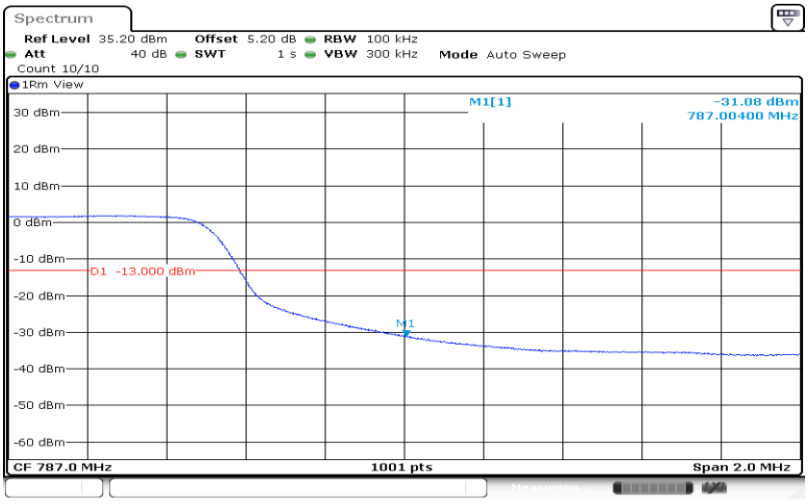
Band13-10MHz-16QAM-23230_Left-1RB#0



Band13-10MHz-16QAM-23230_Right-1RB#49



Band13-10MHz-16QAM-23230_Right-50RB#0



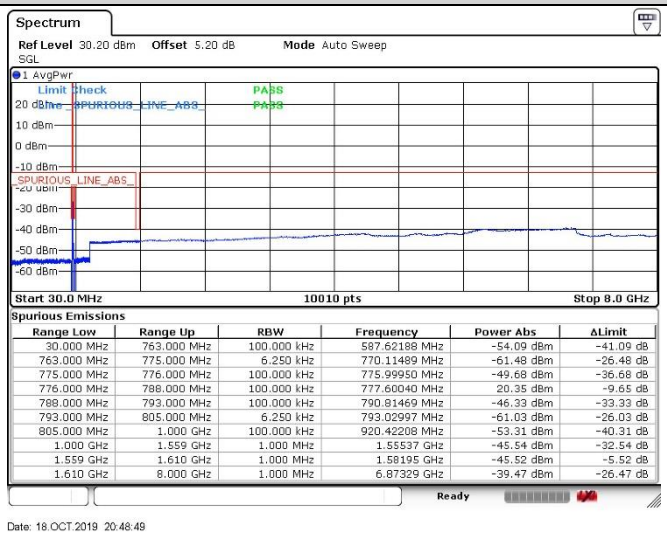
8. Spurious Emission at Antenna Terminal

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.

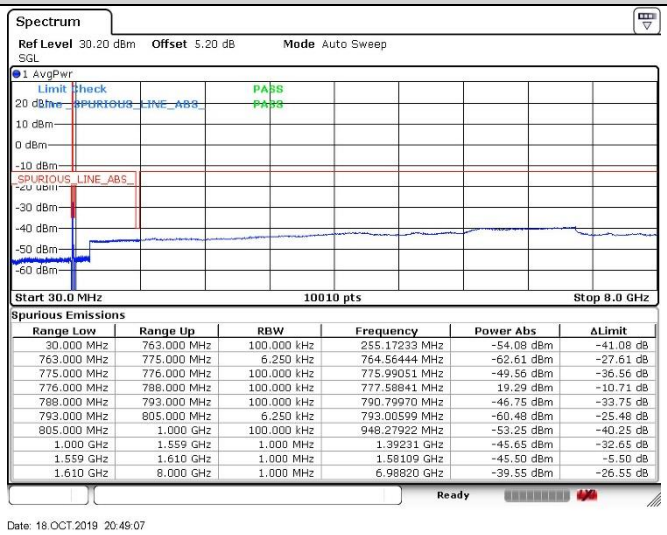
Remark2: only the worst case data displayed in this report.

8.1. Test Plots

Band13-10MHz-QPSK-23230-1RB#0-Range1:30~763MHz



Band13-10MHz-QPSK-23230-1RB#0-Range2:763~775MHz



9. Frequency Stability

9.1. Frequency Vs 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	-9.10	-0.011637	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	VN	NT	-6.20	-0.007928	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	VH	NT	-5.70	-0.007289	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	VL	NT	-1.20	-0.001535	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	VN	NT	-8.70	-0.011125	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	VH	NT	-4.90	-0.006266	±2.5	PASS

9.2. Frequency Vs 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	-3.10	-0.003964	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	-20	-5.40	-0.006905	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	0	-1.90	-0.002430	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	10	-1.10	-0.001407	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	20	-9.40	-0.012020	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	30	-1.30	-0.001662	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	40	-2.00	-0.002558	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	50	-2.10	-0.002685	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	-30	-6.00	-0.007673	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	-20	-6.60	-0.008440	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	0	1.00	0.001279	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	10	-10.40	-0.013299	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	20	-2.30	-0.002941	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	30	-3.20	-0.004092	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	40	-5.10	-0.006522	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	50	-2.20	-0.002813	±2.5	PASS

The End