

Appendix B.8

E-UTRA Band 14

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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	2018/4/13	2021/4/12
Horn Antenna (15-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017/10/17	2020/10/16
Amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2018/9/2	2019/9/2
Low Noise Amplifier (100MHz-18GHz)	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2018/9/2	2019/9/2
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	EMC2063	2018/10/20	2019/10/19
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	2018/7/12	2019/7/11
Wideband Radio Communication Tester	Anritsu	MT8821C	6201462742	2019/4/3	2020/4/3
Wideband Radio Communication Tester	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	2018/7/12	2019/7/11
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 Communication Tester	Anritsu	MT8821C	6201462742	2019/3/2	2020/3/1
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	W005-02	2018/11/2	2019/11/1

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]	$U = \pm 0.37 \text{ dB}$
Bandwidth	Magnitude [%]	$U = \pm 0.2\%$
Band Edge Compliance	Disturbance Power [dBm]	$U = \pm 2.0 \text{ dB}$
Spurious Emissions, Conducted	Disturbance Power [dBm]	$U = \pm 2.0 \text{ dB}$
Frequency Stability	Frequency Accuracy [ppm]	$U = \pm 0.24 \text{ ppm}$

3. Effective (Isotropic) Radiated Power

3.1. Test Result

BAND	Bandwidth	Modulation	Channel	RB Configuration	Conducted Power(dBm)	ERP (dBm)	Limit (dBm)	Verdict
Band14	5MHz	QPSK	23305	1RB#0	22.93	24.78	34.77	PASS
Band14	5MHz	QPSK	23305	1RB#12	23.47	25.32	34.77	PASS
Band14	5MHz	QPSK	23305	1RB#24	22.17	24.02	34.77	PASS
Band14	5MHz	QPSK	23305	12RB#0	22.01	23.86	34.77	PASS
Band14	5MHz	QPSK	23305	12RB#6	22.06	23.91	34.77	PASS
Band14	5MHz	QPSK	23305	12RB#13	21.88	23.73	34.77	PASS
Band14	5MHz	QPSK	23305	25RB#0	22.09	23.94	34.77	PASS
Band14	5MHz	QPSK	23330	1RB#0	22.95	24.80	34.77	PASS
Band14	5MHz	QPSK	23330	1RB#12	23.29	25.14	34.77	PASS
Band14	5MHz	QPSK	23330	1RB#24	22.43	24.28	34.77	PASS
Band14	5MHz	QPSK	23330	12RB#0	21.97	23.82	34.77	PASS
Band14	5MHz	QPSK	23330	12RB#6	21.95	23.80	34.77	PASS
Band14	5MHz	QPSK	23330	12RB#13	21.99	23.84	34.77	PASS
Band14	5MHz	QPSK	23330	25RB#0	22.05	23.90	34.77	PASS
Band14	5MHz	QPSK	23355	1RB#0	23.19	25.04	34.77	PASS
Band14	5MHz	QPSK	23355	1RB#12	23.42	25.27	34.77	PASS
Band14	5MHz	QPSK	23355	1RB#24	22.6	24.45	34.77	PASS
Band14	5MHz	QPSK	23355	12RB#0	22.18	24.03	34.77	PASS
Band14	5MHz	QPSK	23355	12RB#6	22.24	24.09	34.77	PASS
Band14	5MHz	QPSK	23355	12RB#13	22.19	24.04	34.77	PASS
Band14	5MHz	QPSK	23355	25RB#0	22.18	24.03	34.77	PASS
Band14	5MHz	16QAM	23305	1RB#0	22.24	24.09	34.77	PASS
Band14	5MHz	16QAM	23305	1RB#12	22.12	23.97	34.77	PASS
Band14	5MHz	16QAM	23305	1RB#24	22.15	24.00	34.77	PASS
Band14	5MHz	16QAM	23305	12RB#0	21.08	22.93	34.77	PASS
Band14	5MHz	16QAM	23305	12RB#6	21.07	22.92	34.77	PASS
Band14	5MHz	16QAM	23305	12RB#13	20.97	22.82	34.77	PASS
Band14	5MHz	16QAM	23305	25RB#0	20.92	22.77	34.77	PASS
Band14	5MHz	16QAM	23330	1RB#0	22.34	24.19	34.77	PASS
Band14	5MHz	16QAM	23330	1RB#12	22.15	24.00	34.77	PASS
Band14	5MHz	16QAM	23330	1RB#24	22.17	24.02	34.77	PASS
Band14	5MHz	16QAM	23330	12RB#0	21.03	22.88	34.77	PASS
Band14	5MHz	16QAM	23330	12RB#6	21.05	22.90	34.77	PASS
Band14	5MHz	16QAM	23330	12RB#13	21.08	22.93	34.77	PASS
Band14	5MHz	16QAM	23330	25RB#0	21.01	22.86	34.77	PASS
Band14	5MHz	16QAM	23355	1RB#0	22.47	24.32	34.77	PASS
Band14	5MHz	16QAM	23355	1RB#12	22.62	24.47	34.77	PASS

Band14	5MHz	16QAM	23355	1RB#24	22.56	24.41	34.77	PASS
Band14	5MHz	16QAM	23355	12RB#0	21.29	23.14	34.77	PASS
Band14	5MHz	16QAM	23355	12RB#6	21.32	23.17	34.77	PASS
Band14	5MHz	16QAM	23355	12RB#13	21.18	23.03	34.77	PASS
Band14	5MHz	16QAM	23355	25RB#0	21.19	23.04	34.77	PASS
Band14	10MHz	QPSK	23330	1RB#0	23.07	24.92	34.77	PASS
Band14	10MHz	QPSK	23330	1RB#24	23.77	25.62	34.77	PASS
Band14	10MHz	QPSK	23330	1RB#49	22.06	23.91	34.77	PASS
Band14	10MHz	QPSK	23330	25RB#0	22.25	24.10	34.77	PASS
Band14	10MHz	QPSK	23330	25RB#12	22.08	23.93	34.77	PASS
Band14	10MHz	QPSK	23330	25RB#25	21.92	23.77	34.77	PASS
Band14	10MHz	QPSK	23330	50RB#0	21.99	23.84	34.77	PASS
Band14	10MHz	16QAM	23330	1RB#0	22.27	24.12	34.77	PASS
Band14	10MHz	16QAM	23330	1RB#24	22.33	24.18	34.77	PASS
Band14	10MHz	16QAM	23330	1RB#49	22.51	24.36	34.77	PASS
Band14	10MHz	16QAM	23330	25RB#0	20.98	22.83	34.77	PASS
Band14	10MHz	16QAM	23330	25RB#12	21.01	22.86	34.77	PASS
Band14	10MHz	16QAM	23330	25RB#25	20.97	22.82	34.77	PASS
Band14	10MHz	16QAM	23330	50RB#0	20.94	22.79	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]

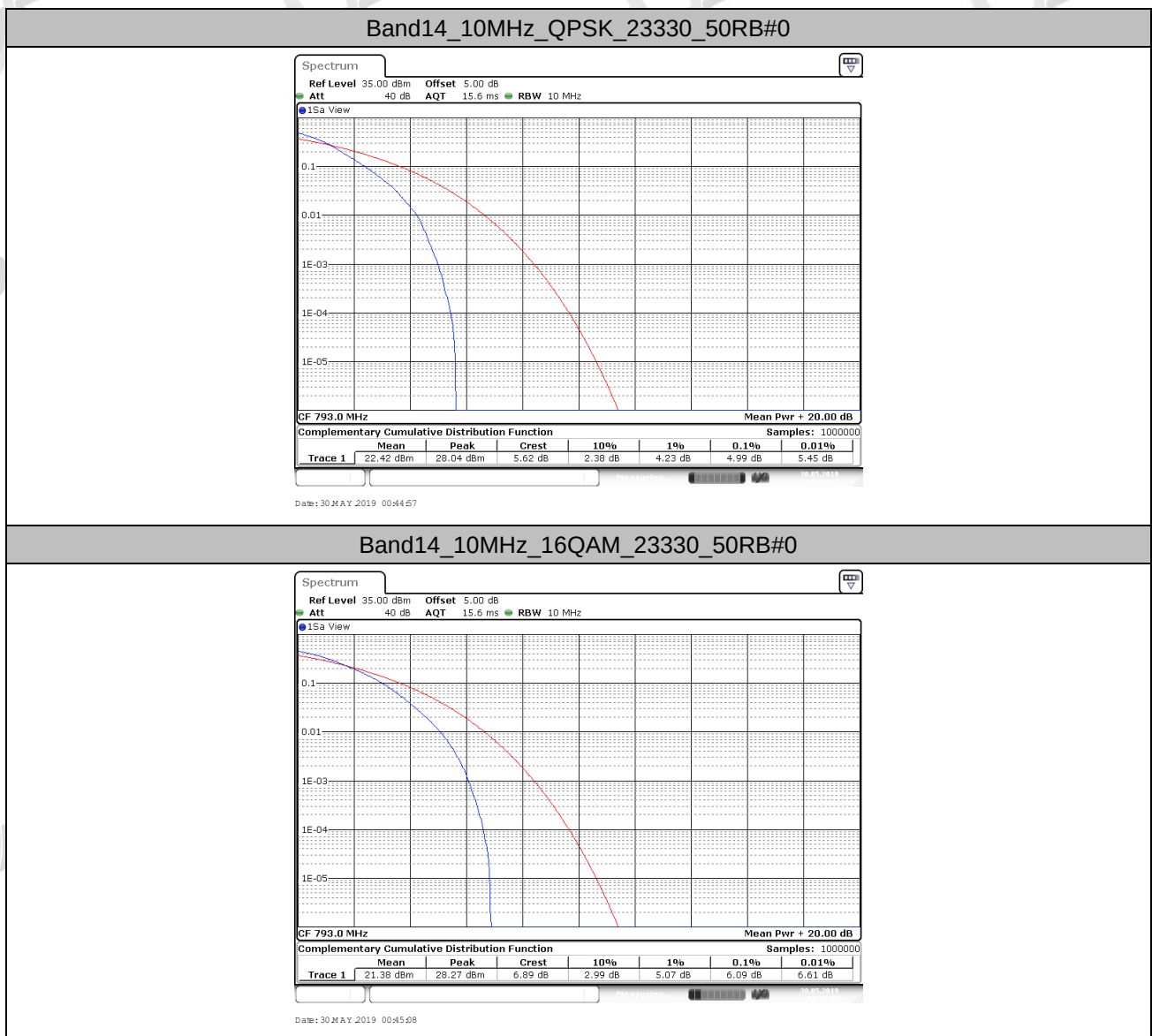
EIRP [dBm] = Conducted Power [dBm] + Gain [dBi]

4. Peak-to-Average Ratio(CCDF)

4.1. Test Result

BAND	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band14	10MHz	QPSK	23330	50RB#0	4.99	13	PASS
Band14	10MHz	16QAM	23330	50RB#0	6.09	13	PASS

4.2. Test Plots

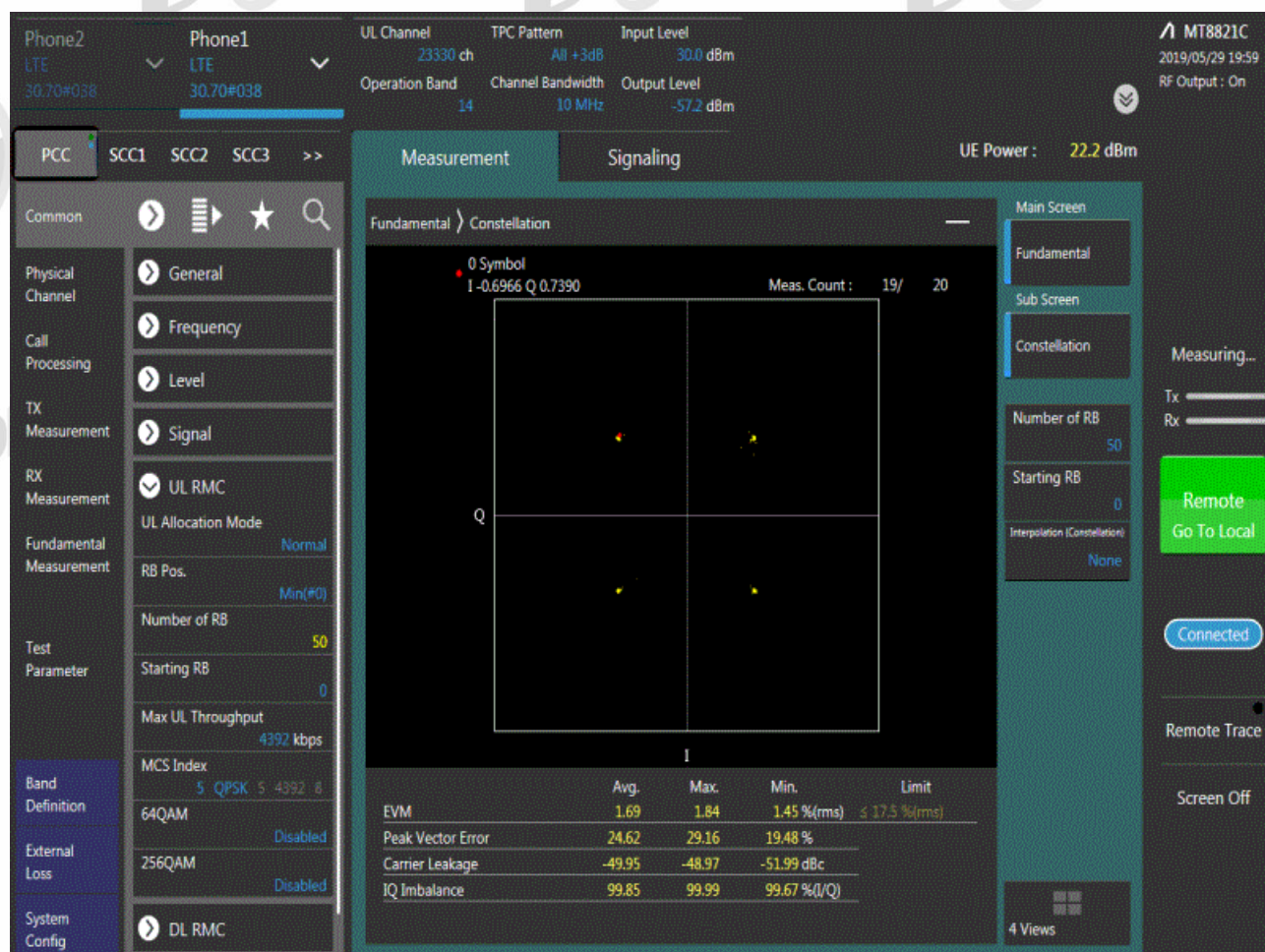


5. Modulation Characteristics

5.1. Test BAND = LTE Band 14

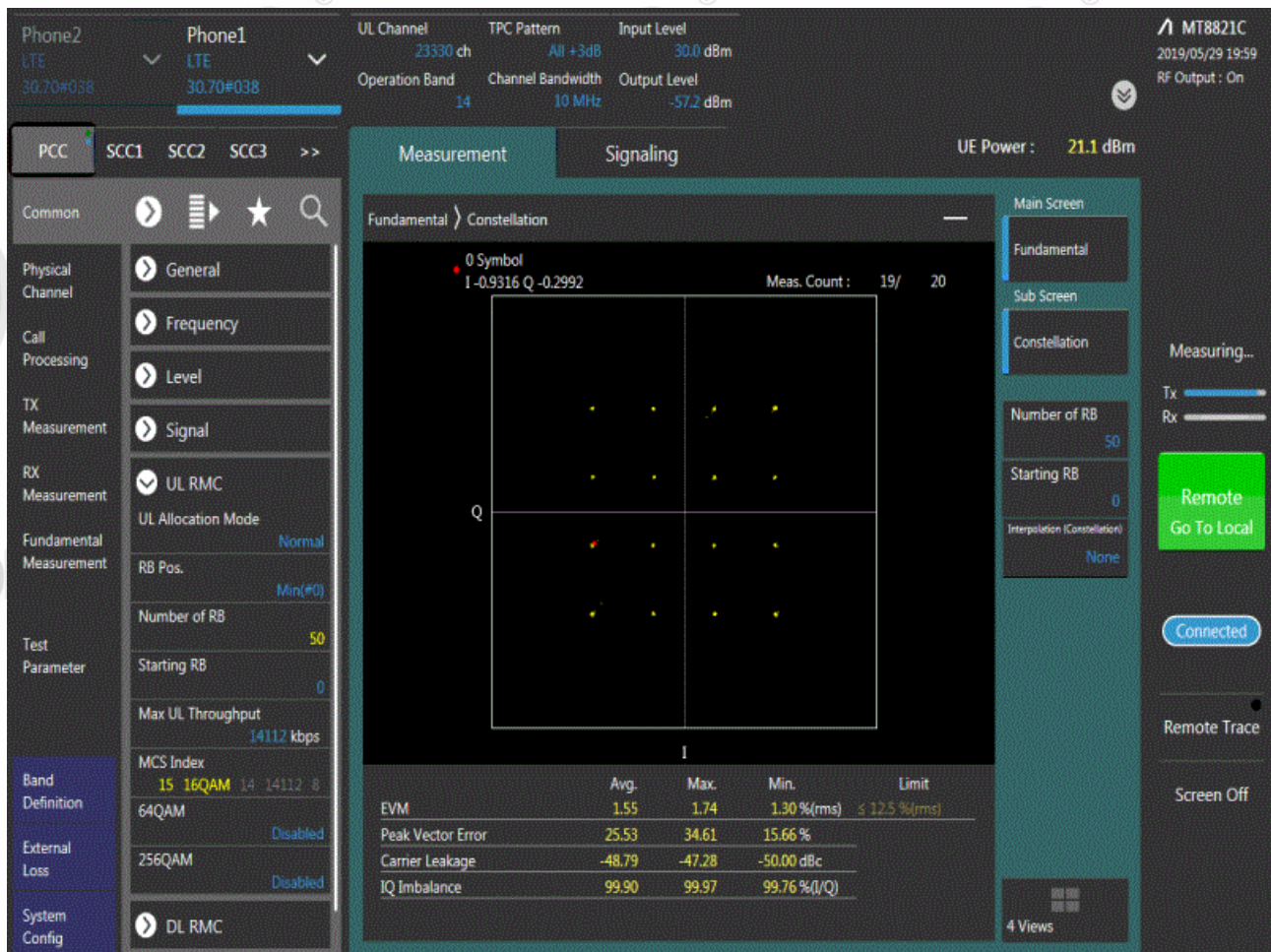
5.2. Test Mode = LTE /TM1 10MHz

5.2.1. Test Channel = MCH



5.3. Test Mode = LTE /TM2 10MHz

5.3.1. Test Channel = MCH

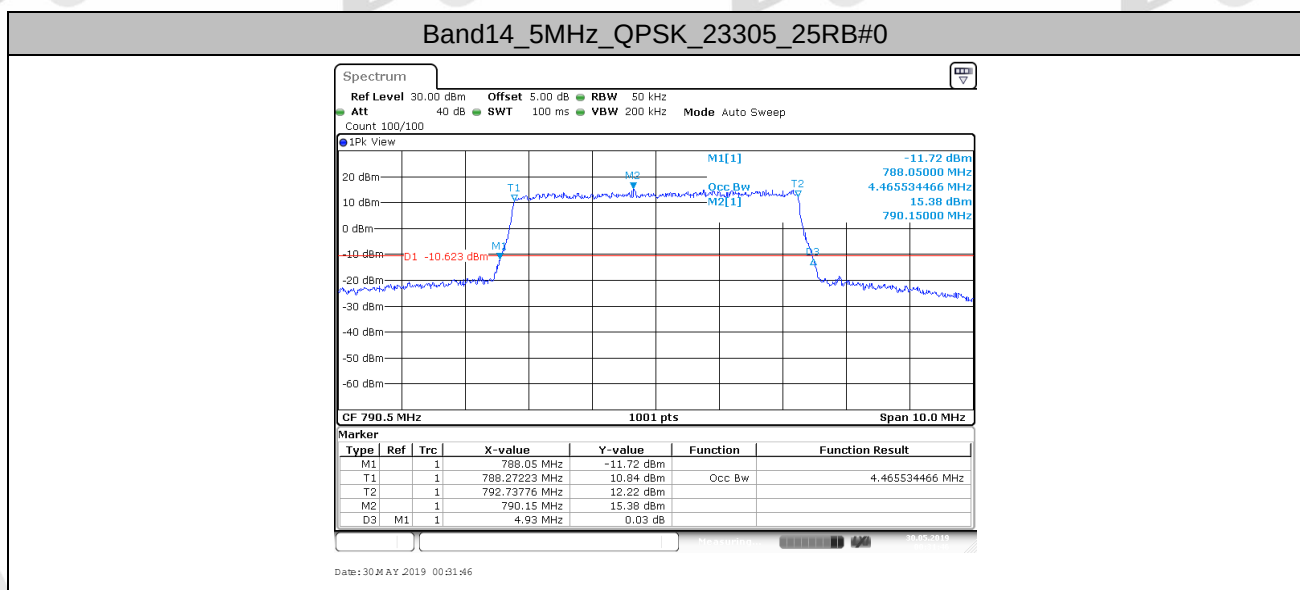


6. 26dB Bandwidth and Occupied Bandwidth

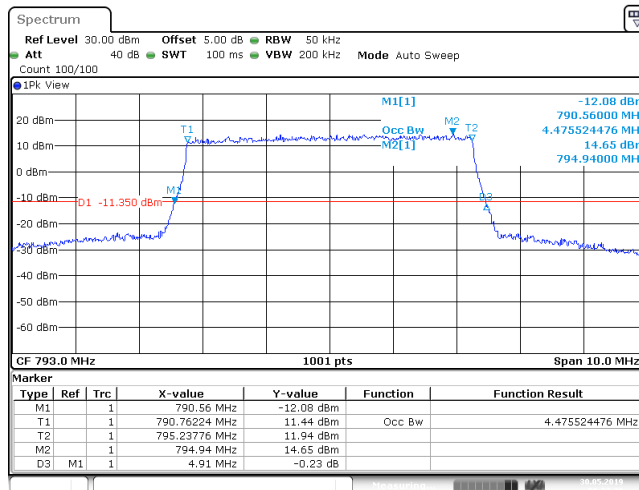
6.1. Test Result

BAND	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band14	5MHz	QPSK	23305	25RB#0	4.466	4.930	PASS
Band14	5MHz	QPSK	23330	25RB#0	4.476	4.910	PASS
Band14	5MHz	QPSK	23355	25RB#0	4.476	4.930	PASS
Band14	5MHz	16QAM	23305	25RB#0	4.476	4.950	PASS
Band14	5MHz	16QAM	23330	25RB#0	4.466	4.930	PASS
Band14	5MHz	16QAM	23355	25RB#0	4.456	4.850	PASS
Band14	10MHz	QPSK	23330	50RB#0	8.911	9.700	PASS
Band14	10MHz	16QAM	23330	50RB#0	8.891	9.700	PASS

6.2. Test Plots

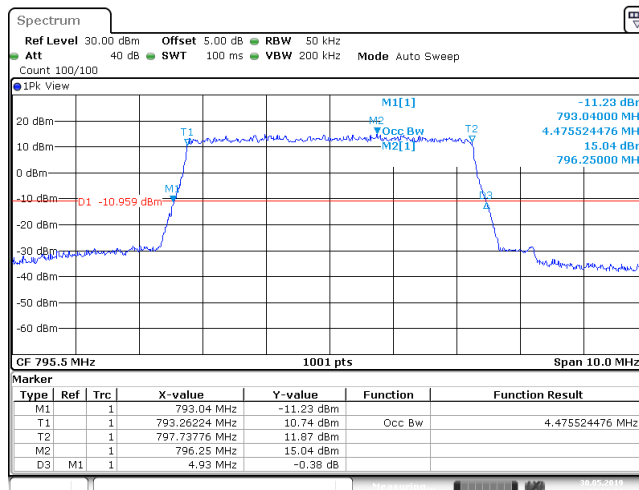


Band14_5MHz_QPSK_23330_25RB#0



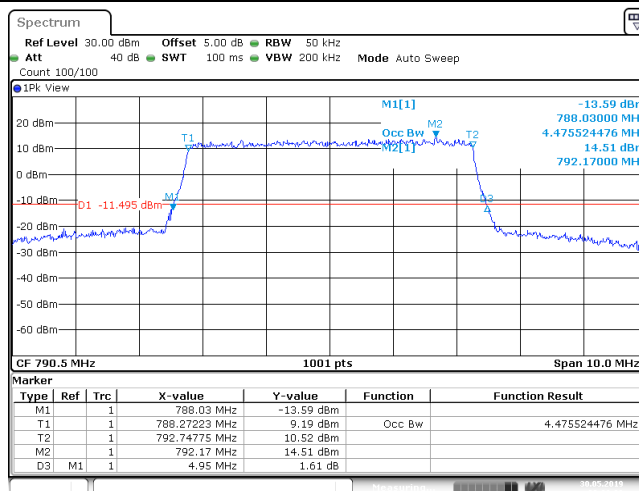
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Band14_5MHz_QPSK_23355_25RB#0



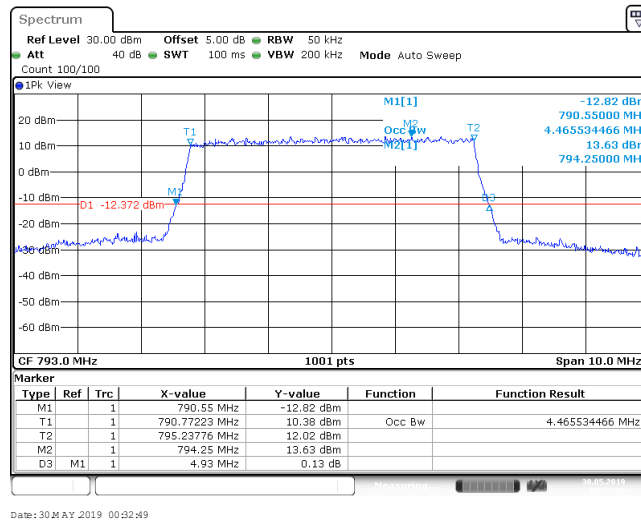
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Band14_5MHz_16QAM_23305_25RB#0

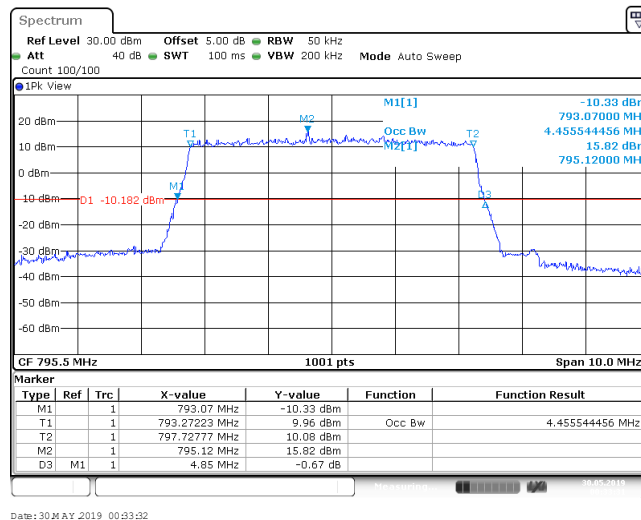


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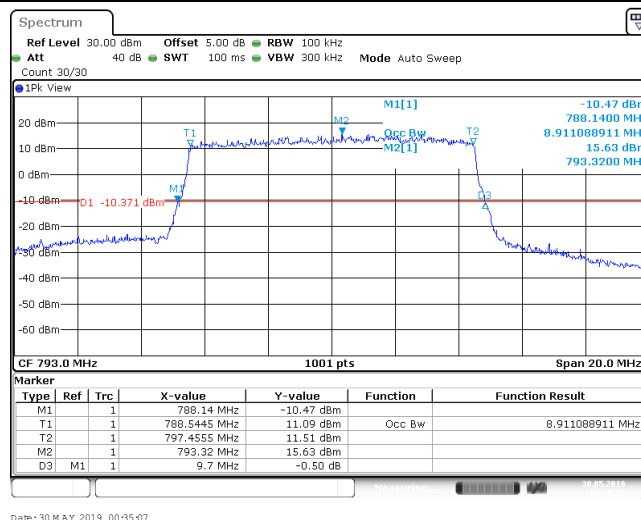
Band14_5MHz_16QAM_23330_25RB#0



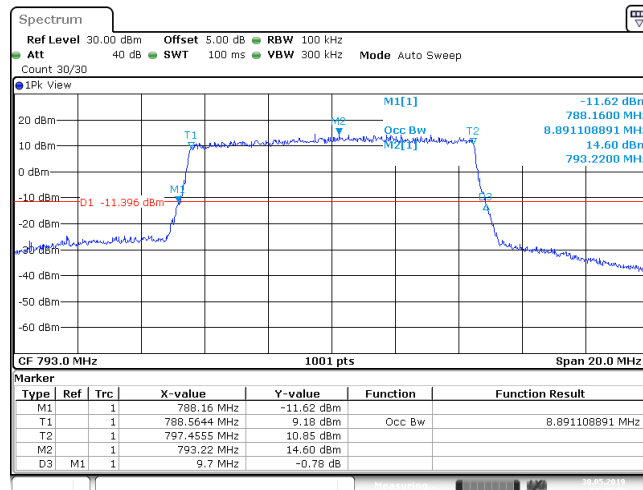
Band14_5MHz_16QAM_23355_25RB#0



Band14_10MHz_QPSK_23330_50RB#0



Band14_10MHz_16QAM_23330_50RB#0

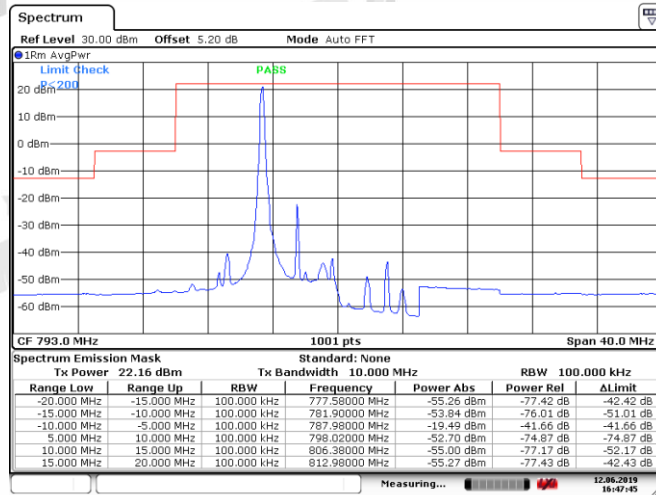


Date: 30 MAY 2019 00:35:20

7. Emission Mask

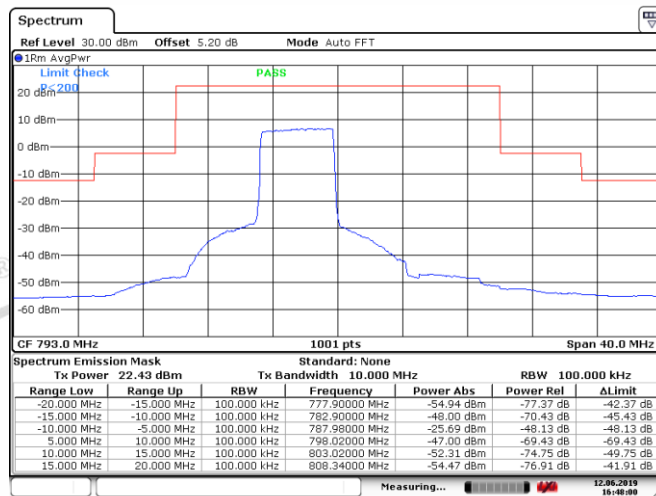
7.1. Test Plots

BAND 14_5MHz_QPSK_23305_1RB#0



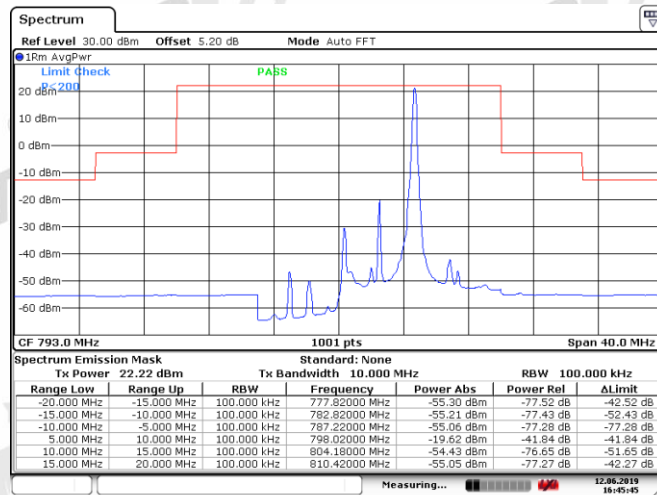
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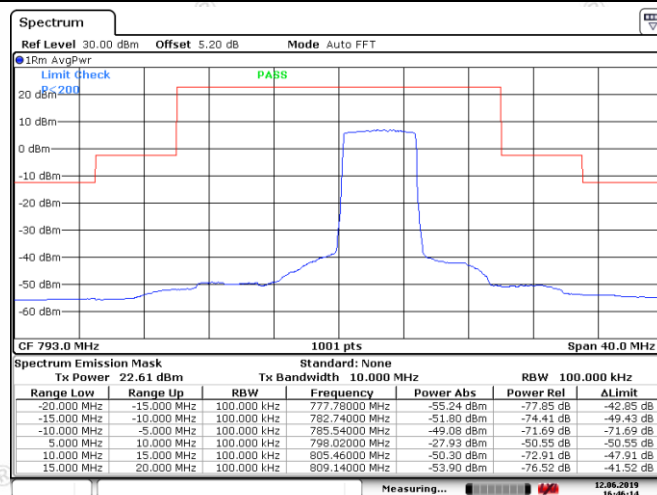
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BAND 14_5MHz_QPSK_23355_1RB#24



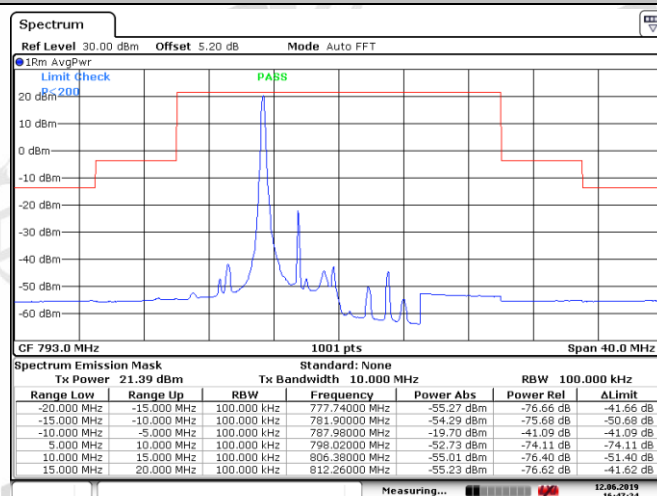
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BAND 14_5MHz_QPSK_23355_25RB#0



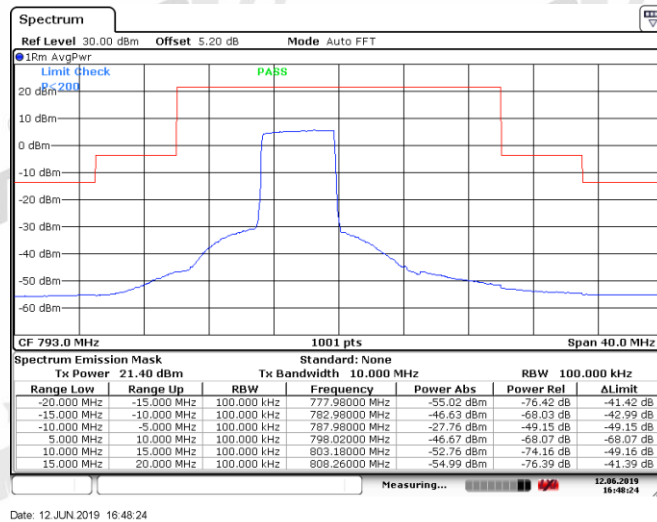
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BAND 14_5MHz_16QAM_23305_1RB#0



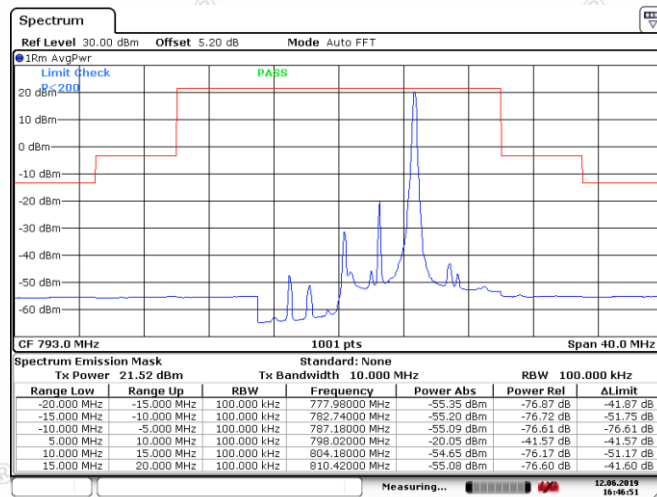
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BAND 14_5MHz_16QAM_23305_25RB#0



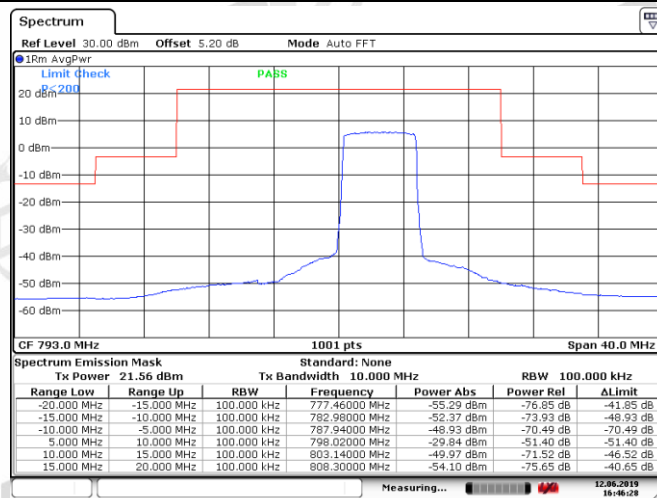
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BAND 14_5MHz_16QAM_23355_1RB#24



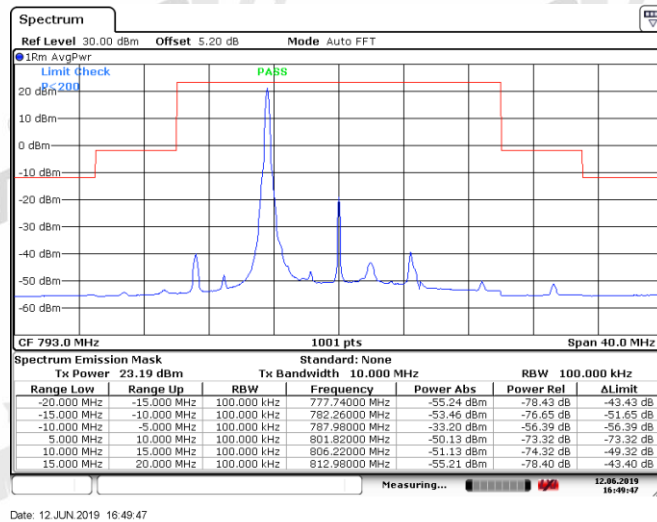
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BAND 14_5MHz_16QAM_23355_25RB#0



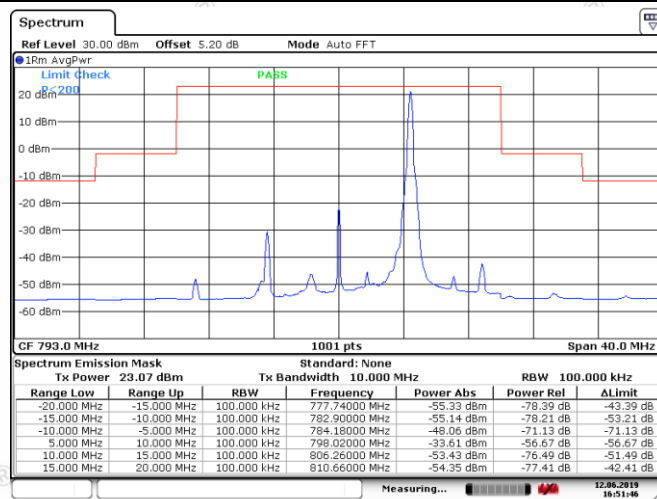
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BAND 14_10MHz_QPSK_23330_1RB#0



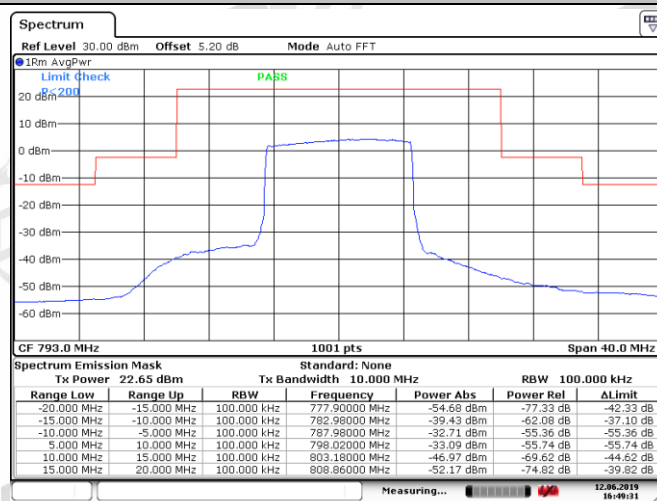
Date: 12 JUN 2019 16:49:47

BAND 14_10MHz_QPSK_23330_1RB#49



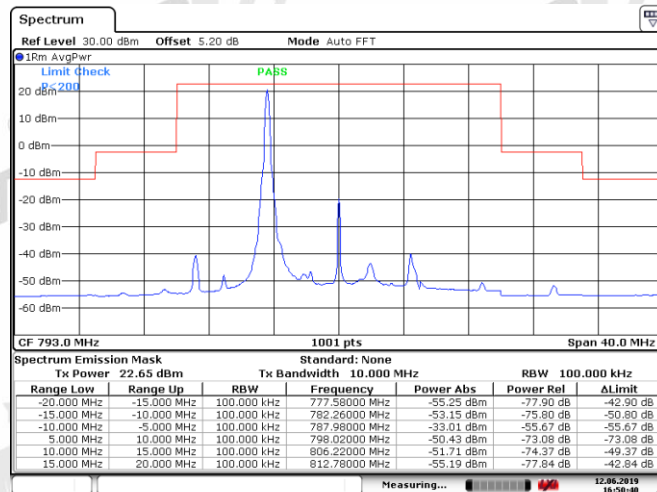
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BAND 14_10MHz_QPSK_23330_50RB#0



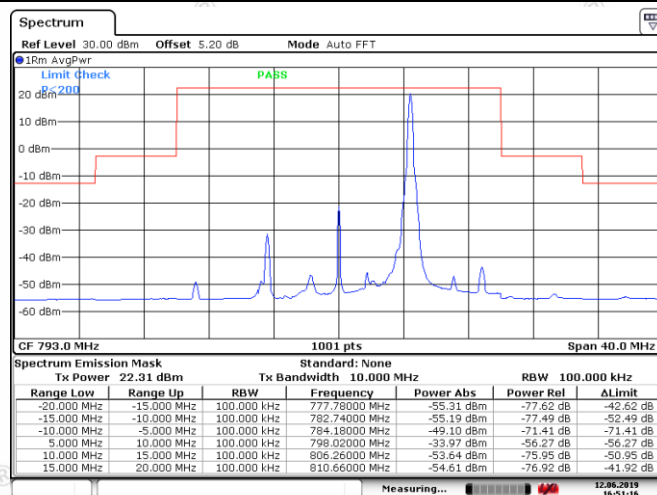
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BAND 14_10MHz_16QAM_23330_1RB#0



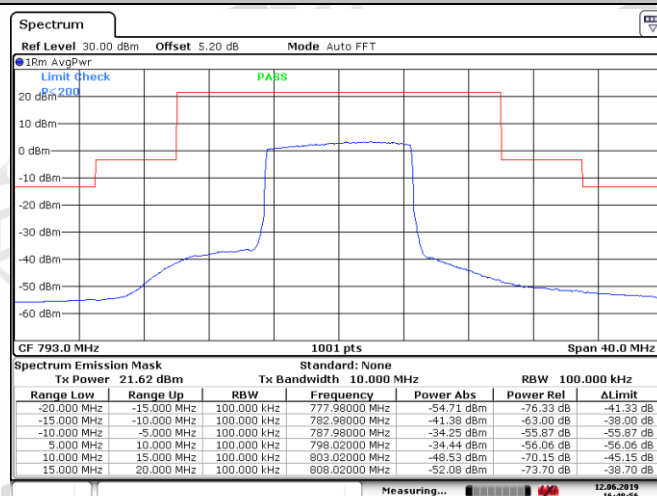
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BAND 14_10MHz_16QAM_23330_1RB#49



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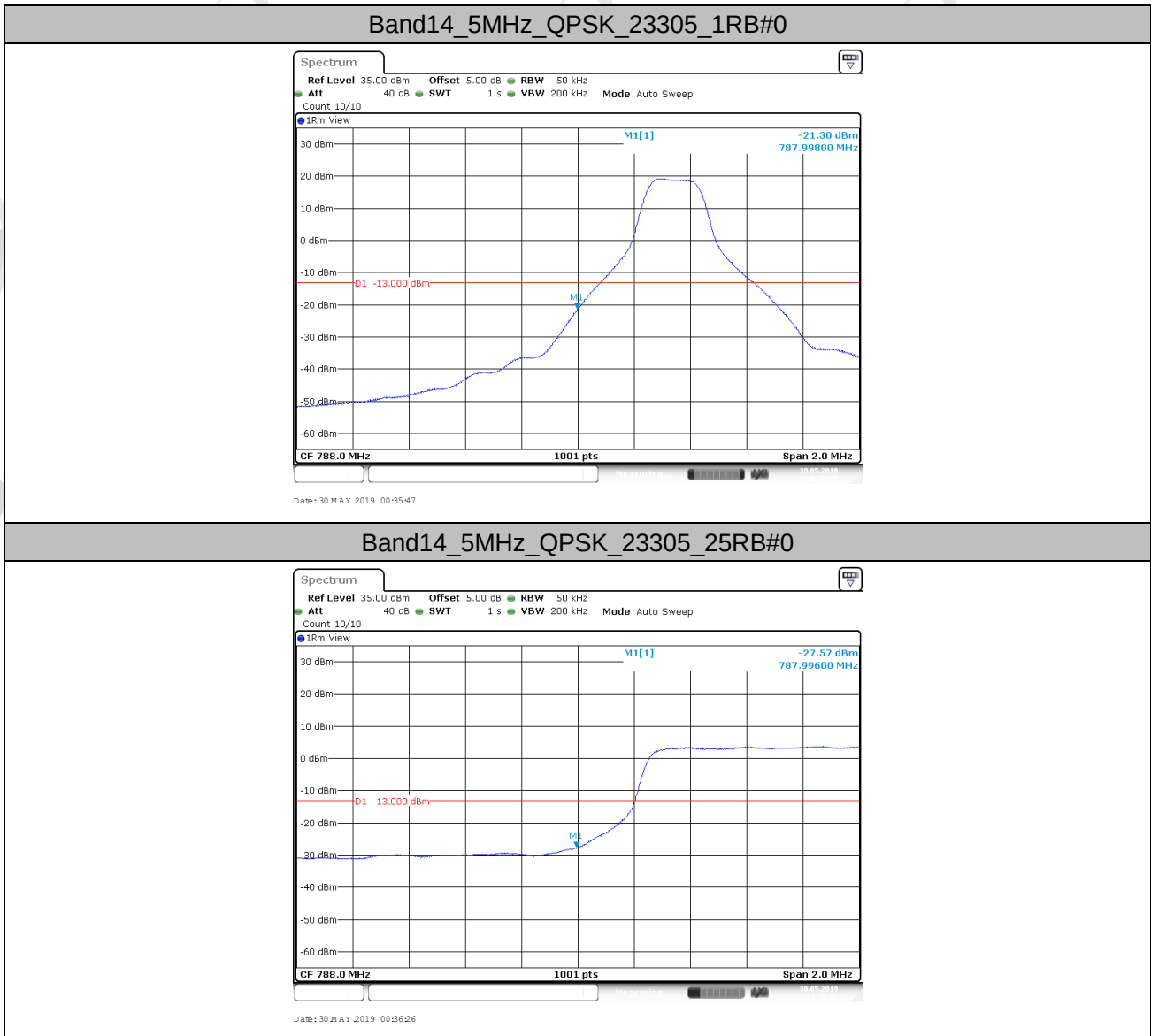
BAND 14_10MHz_16QAM_23330_50RB#0



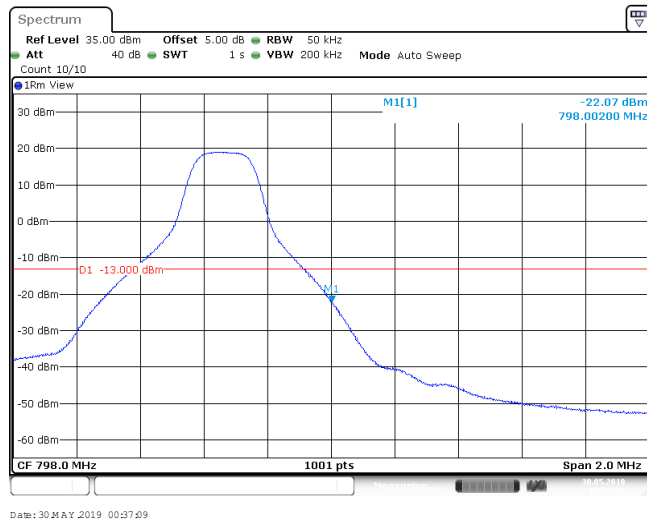
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8. Band Edge Compliance

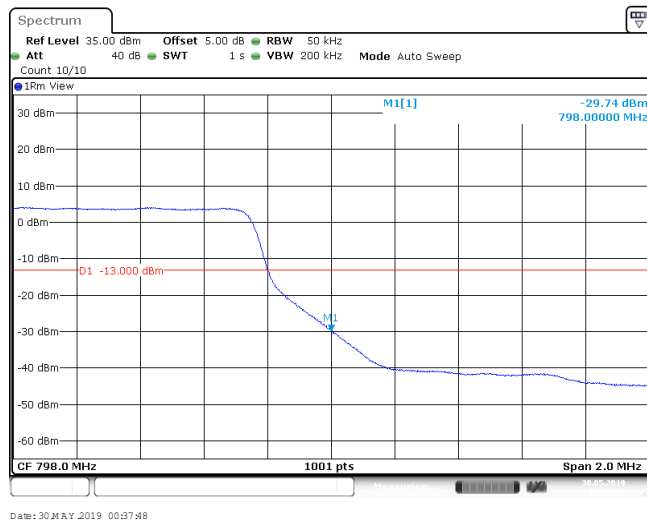
8.1. Test Plots



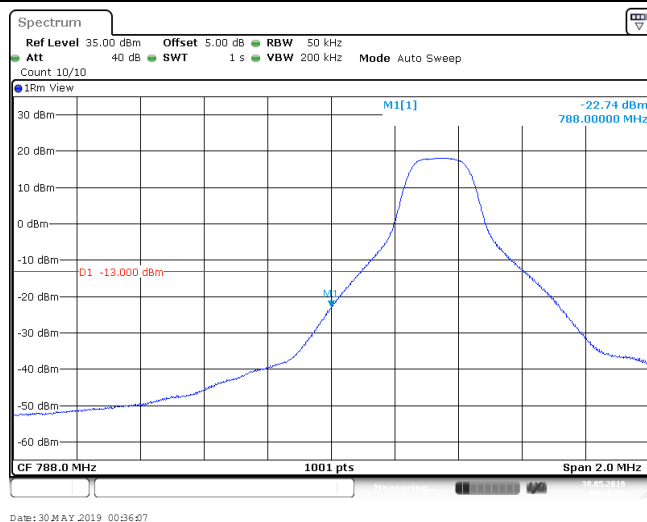
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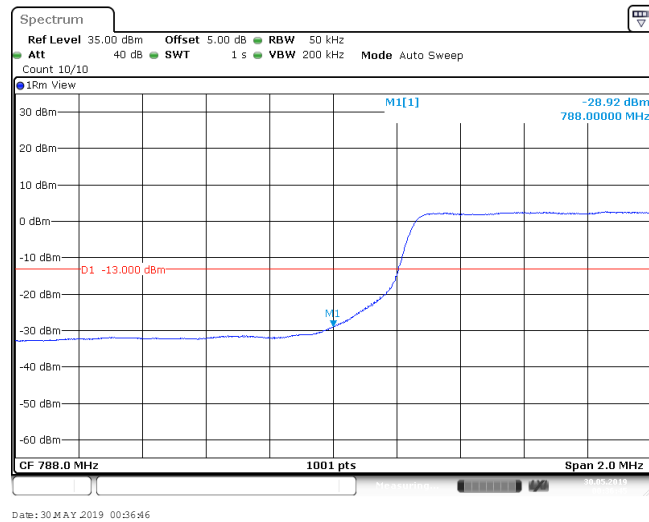
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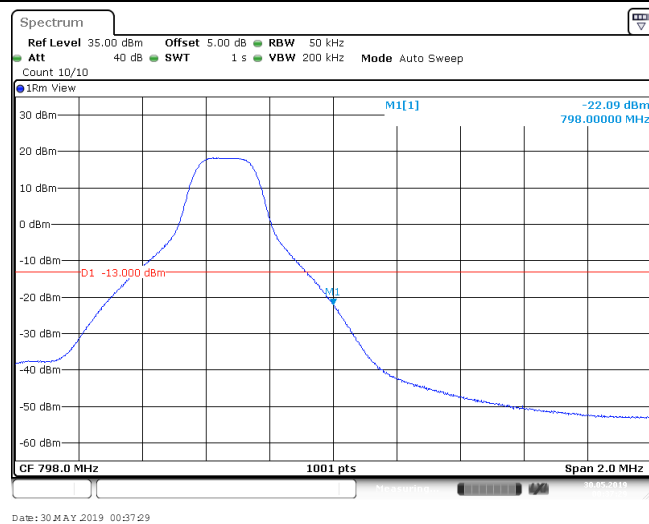
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Band14_5MHz_16QAM_23305_25RB#0



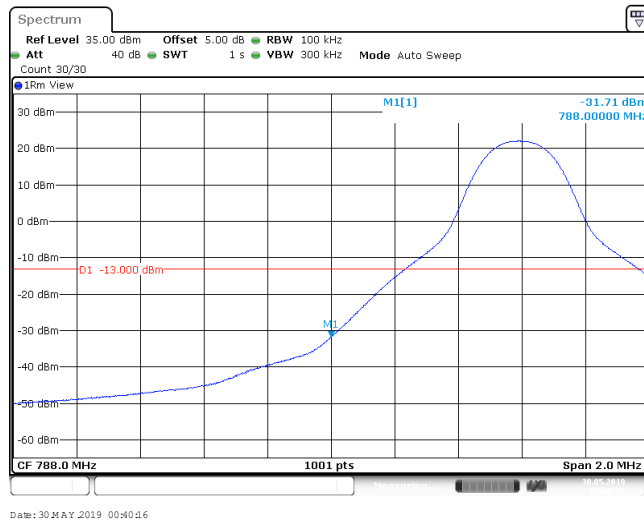
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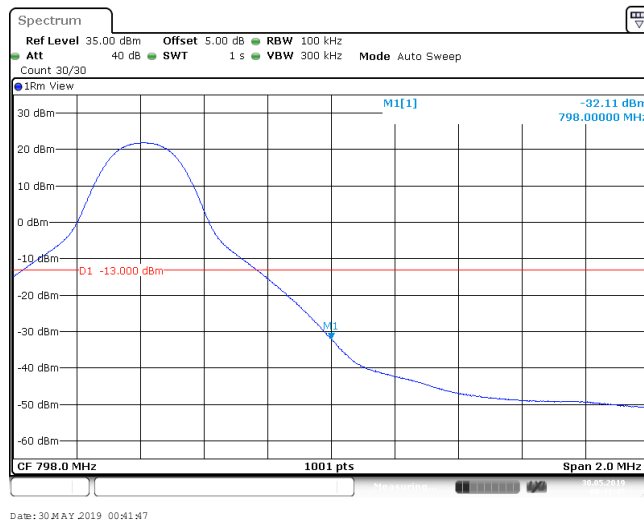
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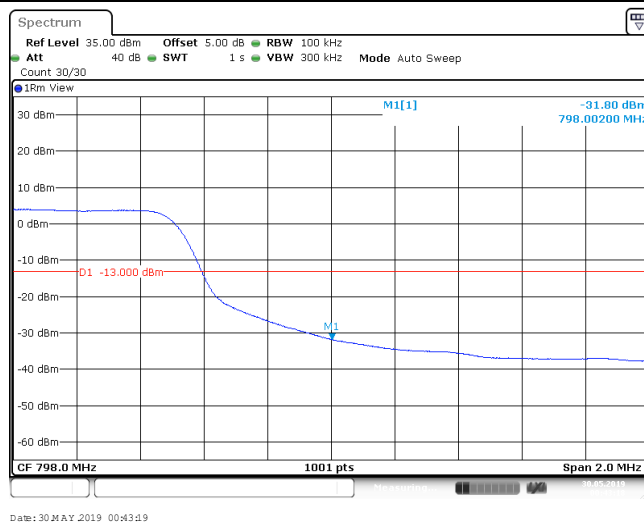
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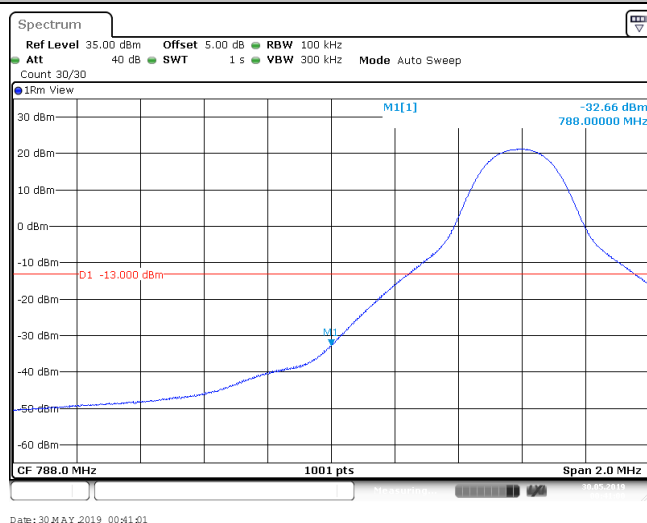
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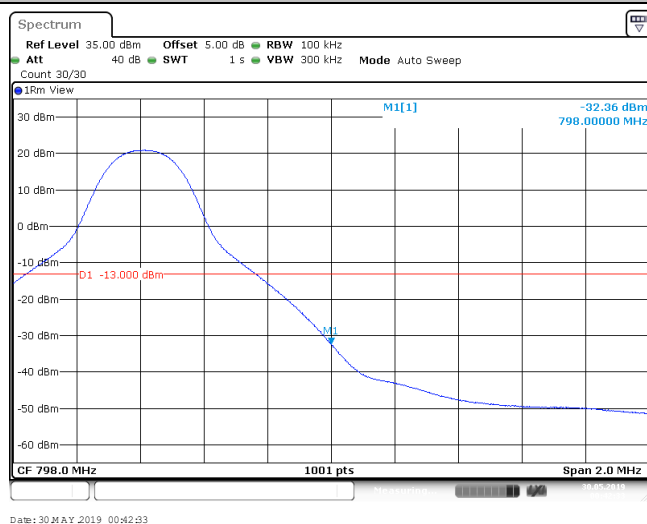
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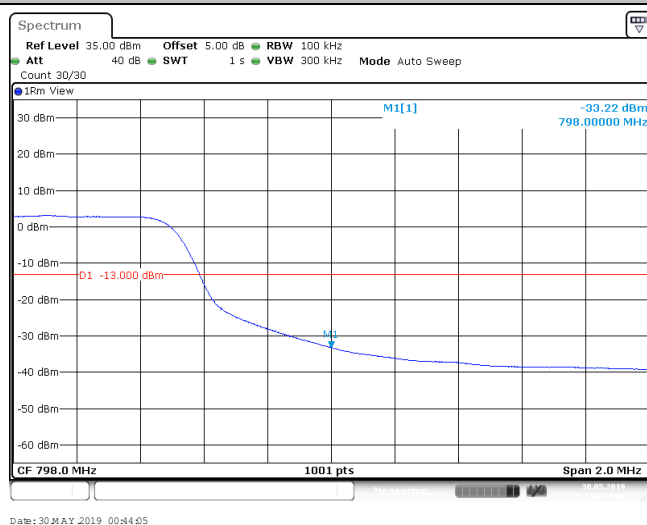
Band14_10MHz_16QAM_23330_Left_1RB#0



Band14_10MHz_16QAM_23330_Right_1RB#49



Band14_10MHz_16QAM_23330_Right_50RB#0



9. 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.

9.1. Test Plots



10. Frequency Stability

10.1. Frequency Vs Voltage

Voltage										
BAND	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band14	10MHz	QPSK	23330	50RB#0	VL	NT	-0.40	-0.000504	±2.5	PASS
Band14	10MHz	QPSK	23330	50RB#0	VN	NT	0.10	0.000126	±2.5	PASS
Band14	10MHz	QPSK	23330	50RB#0	VH	NT	-0.70	-0.000883	±2.5	PASS
Band14	10MHz	16QAM	23330	50RB#0	VL	NT	1.20	0.001513	±2.5	PASS
Band14	10MHz	16QAM	23330	50RB#0	VN	NT	-1.10	-0.001387	±2.5	PASS
Band14	10MHz	16QAM	23330	50RB#0	VH	NT	0.20	0.000252	±2.5	PASS

10.2. Frequency Vs Temperature

Temperature										
BAND	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band14	10MHz	QPSK	23330	50RB#0	NV	-30	-2.10	-0.002648	±2.5	PASS
Band14	10MHz	QPSK	23330	50RB#0	NV	-20	-1.50	-0.001892	±2.5	PASS
Band14	10MHz	QPSK	23330	50RB#0	NV	0	-0.40	-0.000504	±2.5	PASS
Band14	10MHz	QPSK	23330	50RB#0	NV	10	1.40	0.001765	±2.5	PASS
Band14	10MHz	QPSK	23330	50RB#0	NV	20	-1.90	-0.002396	±2.5	PASS
Band14	10MHz	QPSK	23330	50RB#0	NV	30	-0.20	-0.000252	±2.5	PASS
Band14	10MHz	QPSK	23330	50RB#0	NV	40	0.10	0.000126	±2.5	PASS
Band14	10MHz	QPSK	23330	50RB#0	NV	50	-2.10	-0.002648	±2.5	PASS
Band14	10MHz	16QAM	23330	50RB#0	NV	-30	-1.30	-0.001639	±2.5	PASS
Band14	10MHz	16QAM	23330	50RB#0	NV	-20	1.30	0.001639	±2.5	PASS
Band14	10MHz	16QAM	23330	50RB#0	NV	0	-1.60	-0.002018	±2.5	PASS
Band14	10MHz	16QAM	23330	50RB#0	NV	10	0.50	0.000631	±2.5	PASS
Band14	10MHz	16QAM	23330	50RB#0	NV	20	-1.00	-0.001261	±2.5	PASS
Band14	10MHz	16QAM	23330	50RB#0	NV	30	-1.50	-0.001892	±2.5	PASS
Band14	10MHz	16QAM	23330	50RB#0	NV	40	-1.40	-0.001765	±2.5	PASS
Band14	10MHz	16QAM	23330	50RB#0	NV	50	-2.10	-0.002648	±2.5	PASS

The End