BAND EDGE COMPLIANCE - BAND n14

XMit 2022.02.07.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3239	ANE	2022-03-02	2023-03-02
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2022-01-17	2023-01-17

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in the available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet. For Multiband operation, measurements were taken at the lower band edge of the lower band and the upper band edge of the upper band.

The spectrum was scanned below the lower band edge and above the higher band edge.

Per section 90.543(e)(3) and RSS 140 4.4 the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm [-13 dBm -10 log (4)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter for Band n14.

FCC 90.543(e)(5) and RSS 140 4.4b requires a >100 kHz measurement bandwidth for emissions 100 kHz outside of the RRH operating frequency range. FCC 90.543(e)(5) and RSS 140 4.4b requires a >30 kHz measurement bandwidth for emissions between 100 kHz outside of the RRH operating frequency range and band edge of the operating frequency range.

FCC 90.543(e) (1) and RSS 140 4.4a requires an emission limit of -46dBm for any 6.25 kHz bandwidth between frequency bands 769-775 MHz and 799-806 MHz (Note that the upper frequency for Part 90 is 805MHz and RSS 140 is 806MHz). The limit is adjusted to -52 dBm per 6.25 kHz bandwidth [-46 dBm -10 log (4)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

Spectrum analyzer reference level offset corrections were applied for the Band n14 band edge measurements from 769MHz-775MHz and 799MHz to 808MHz.

AHLBBA antenna ports 1&4 are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

BAND EDGE COMPLIANCE - BAND n14

element

TbtTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	AHLBBA (C2PC/C3PC FCC/ISED)			Work Order:	NOKI0047
Serial Number:	K9193514835			Date:	3-Aug-22
Customer:	Nokia Solutions and Networks			Temperature:	22.2 °C
Attendees:	Mitchell Hill			Humidity:	53.8% RH
Project:	None			Barometric Pres.:	1021 mbar
Tested by:	Marty Martin	Power:	54VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 90R:2022	ANSI C63.26:2015
RSS 140 Issue 1: 2018	ANSI C63.26:2015

COMMENTS

All measurement path losses were accounted for in the reference level offset including attenuators, cables, DC block and filter when in use. The carriers were enabled at maximum power.

DEVIATIONS FROM TEST STANDARD

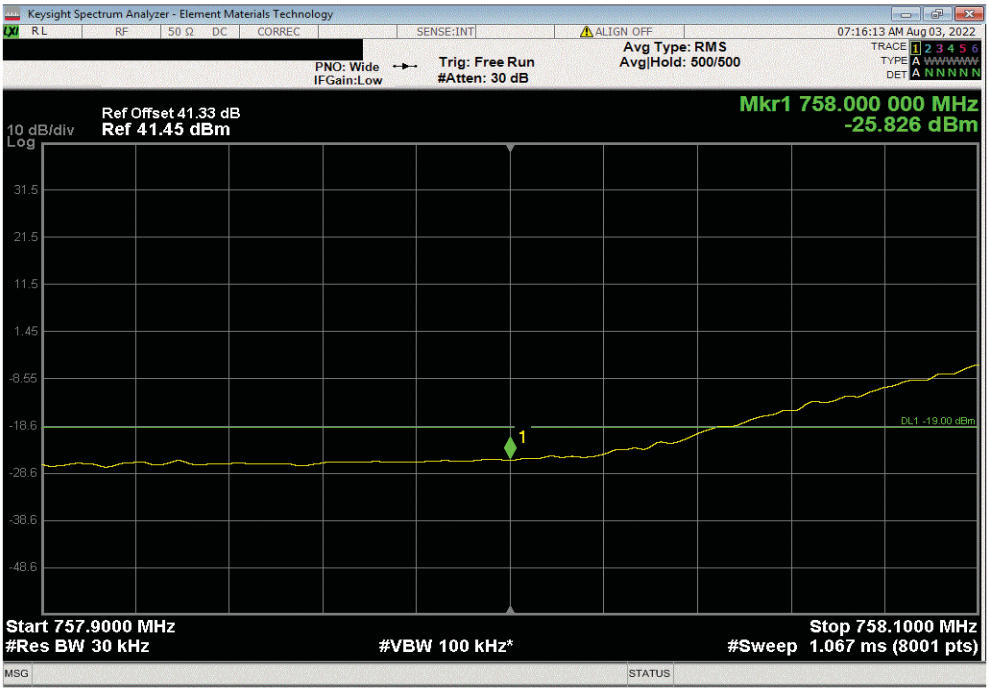
None

Configuration #	2, 4	Signature

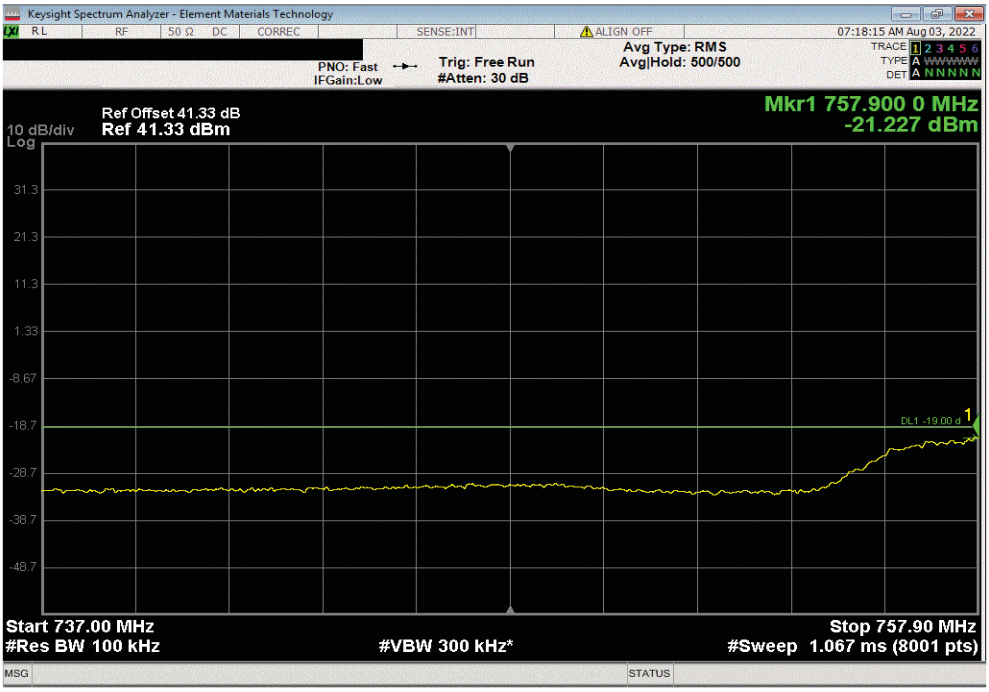
		Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
Port 1						
5G NR Band n14, 758 - 768 Mhz						
5 MHz Bandwidth						
QPSK Modulation						
	Low Channel, 760.5 MHz	1	758	-25.8	-19	Pass
	Low Channel, 760.5 MHz	2	757.9	-21.2	-19	Pass
	High Channel, 765.5 MHz	1	768	-25.8	-19	Pass
	High Channel, 765.5 MHz	2	768.1	-22.9	-19	Pass
	High Channel, 765.5 MHz	3	769.04	-55.8	-52	Pass
	High Channel, 765.5 MHz	4	806.76	-72.7	-52	Pass
16QAM Modulation						
	Low Channel, 760.5 MHz	1	758	-26.0	-19	Pass
	Low Channel, 760.5 MHz	2	757.9	-21.0	-19	Pass
	High Channel, 765.5 MHz	1	768	-26.1	-19	Pass
	High Channel, 765.5 MHz	2	768.15	-23.2	-19	Pass
	High Channel, 765.5 MHz	3	769	-56.9	-52	Pass
	High Channel, 765.5 MHz	4	804.66	-72.9	-52	Pass
64QAM Modulation						
	Low Channel, 760.5 MHz	1	758	-25.9	-19	Pass
	Low Channel, 760.5 MHz	2	757.9	-20.5	-19	Pass
	High Channel, 765.5 MHz	1	768	-25.8	-19	Pass
	High Channel, 765.5 MHz	2	768.1	-22.5	-19	Pass
	High Channel, 765.5 MHz	3	769.01	-55.7	-52	Pass
	High Channel, 765.5 MHz	4	805.89	-72.9	-52	Pass
256QAM Modulation						
	Low Channel, 760.5 MHz	1	758	-25.7	-19	Pass
	Low Channel, 760.5 MHz	2	757.9	-20.7	-19	Pass
	High Channel, 765.5 MHz	1	768	-25.7	-19	Pass
	High Channel, 765.5 MHz	2	768.16	-23.1	-19	Pass
	High Channel, 765.5 MHz	3	769.01	-56.0	-52	Pass
	High Channel, 765.5 MHz	4	803.61	-72.9	-52	Pass
10 MHz Bandwidth, 256 QAM Modulation						
	Low Channel, 763.0 MHz	1	758	-28.1	-19	Pass
	Low Channel, 763.0 MHz	2	757.65	-22.9	-19	Pass
	High Channel, 763.0 MHz	1	768	-31.3	-19	Pass
	High Channel, 763.0 MHz	2	768.1	-28.3	-19	Pass
	High Channel, 763.0 MHz	3	769	-59.5	-52	Pass
	High Channel, 763.0 MHz	4	805.67	-72.7	-52	Pass
Port 2						
5G NR Band n14, 758 - 768 Mhz						
5 MHz Bandwidth						
QPSK Modulation						
	Low Channel, 760.5 MHz	1	758	-26.0	-19	Pass
	Low Channel, 760.5 MHz	2	757.9	-21.9	-19	Pass
	High Channel, 765.5 MHz	1	768	-27.0	-19	Pass
	High Channel, 765.5 MHz	2	768.15	-25.1	-19	Pass
	High Channel, 765.5 MHz	3	769.07	-60.0	-52	Pass
	High Channel, 765.5 MHz	4	805.08	-72.8	-52	Pass
16QAM Modulation						
	Low Channel, 760.5 MHz	1	758	-26.4	-19	Pass
	Low Channel, 760.5 MHz	2	757.9	-21.9	-19	Pass
	High Channel, 765.5 MHz	1	768	-27.2	-19	Pass
	High Channel, 765.5 MHz	2	768.1	-25.3	-19	Pass
	High Channel, 765.5 MHz	3	769.19	-59.8	-52	Pass
	High Channel, 765.5 MHz	4	807.49	-72.8	-52	Pass
64QAM Modulation						
	Low Channel, 760.5 MHz	1	758	-26.0	-19	Pass
	Low Channel, 760.5 MHz	2	757.87	-21.9	-19	Pass
	High Channel, 765.5 MHz	1	768	-26.9	-19	Pass
	High Channel, 765.5 MHz	2	768.1	-24.4	-19	Pass
	High Channel, 765.5 MHz	3	769.11	-59.8	-52	Pass
	High Channel, 765.5 MHz	4	803.97	-72.9	-52	Pass
256QAM Modulation						
	Low Channel, 760.5 MHz	1	758	-26.2	-19	Pass
	Low Channel, 760.5 MHz	2	757.9	-21.4	-19	Pass
	High Channel, 765.5 MHz	1	768	-26.6	-19	Pass
	High Channel, 765.5 MHz	2	768.13	-24.2	-19	Pass
	High Channel, 765.5 MHz	3	769.1	-59.5	-52	Pass
	High Channel, 765.5 MHz	4	804.03	-72.8	-52	Pass
10 MHz Bandwidth						
256QAM Modulation						
	Low Channel, 763.0 MHz	1	758	-27.1	-19	Pass
	Low Channel, 763.0 MHz	2	757.71	-21.5	-19	Pass
	High Channel, 763.0 MHz	1	768	-30.0	-19	Pass
	High Channel, 763.0 MHz	2	768.16	-26.3	-19	Pass
	High Channel, 763.0 MHz	3	769.29	-59.5	-52	Pass
	High Channel, 763.0 MHz	4	802.9	-72.8	-52	Pass

BAND EDGE COMPLIANCE - BAND n14

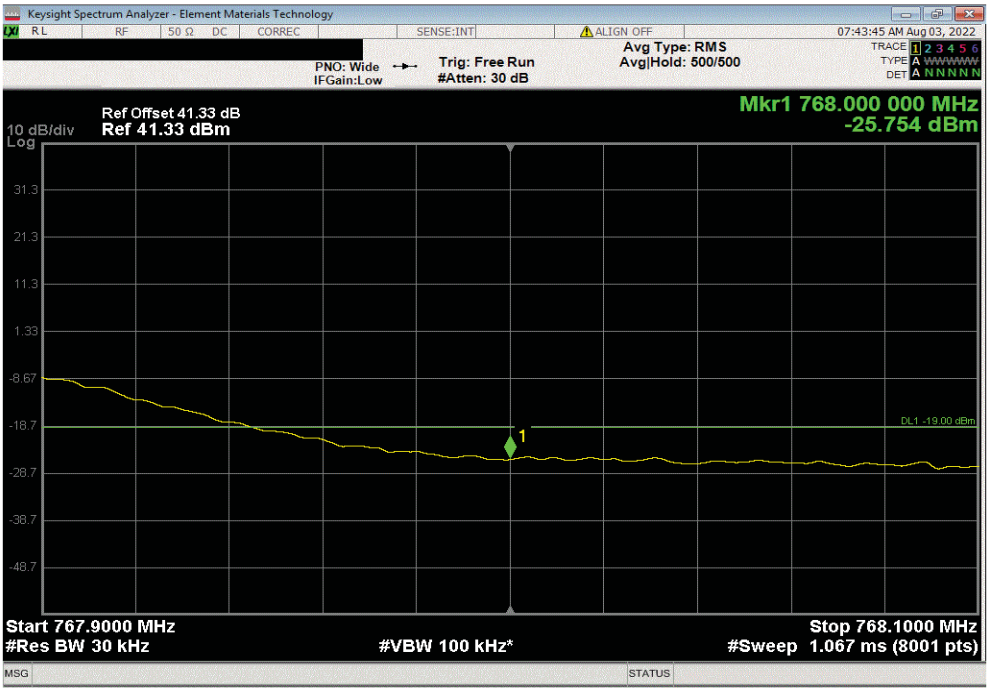
Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		758	-25.83	-19	Pass



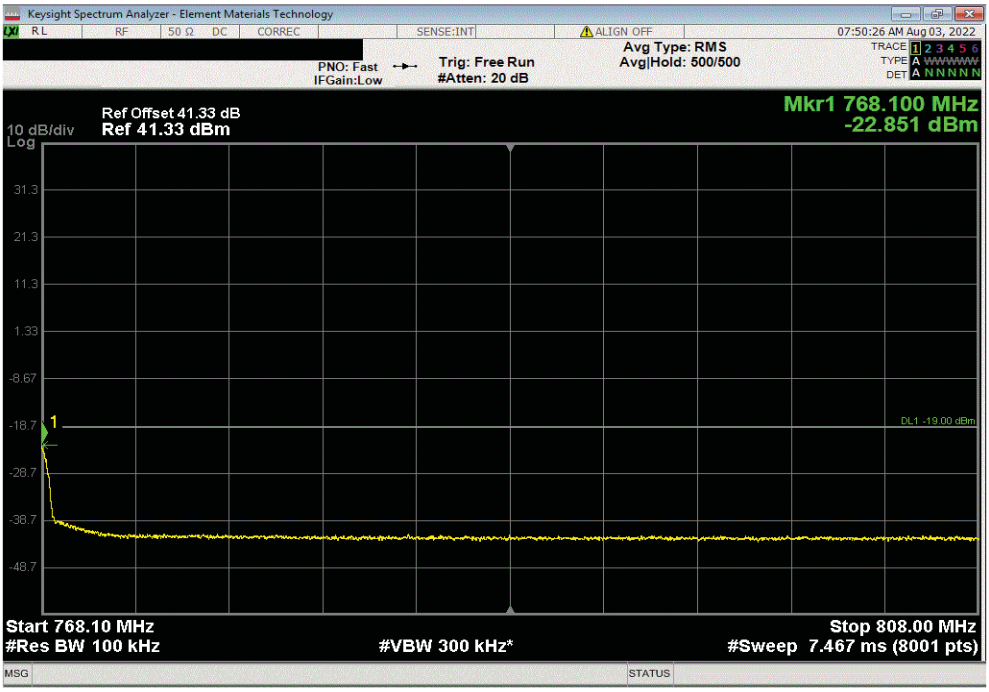
Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		757.9	-21.23	-19	Pass



Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		768	-25.75	-19	Pass

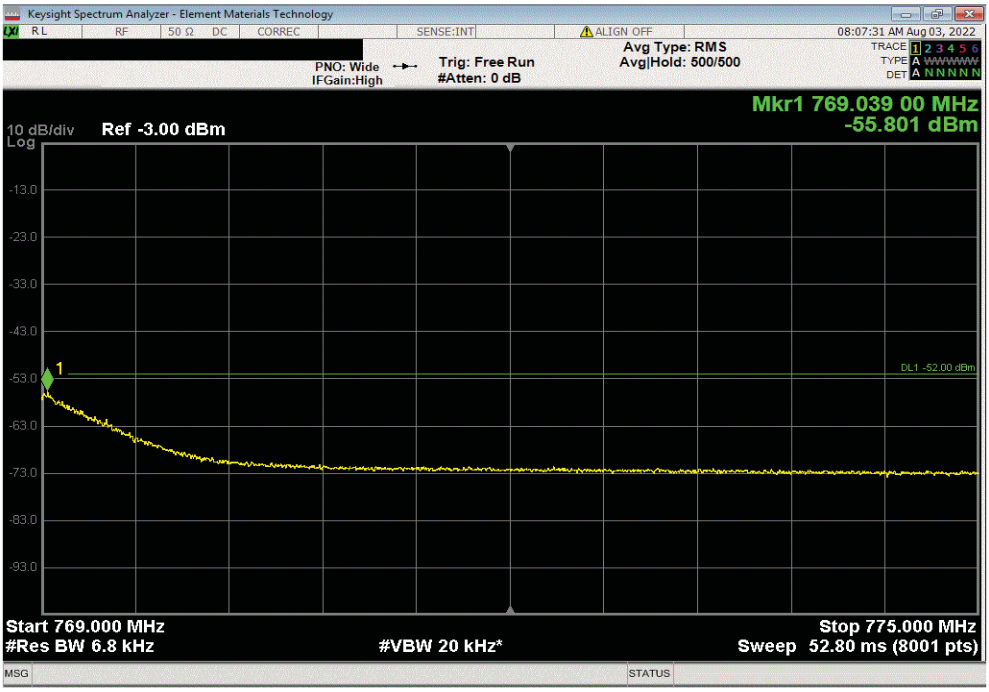


Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		768.1	-22.85	-19	Pass

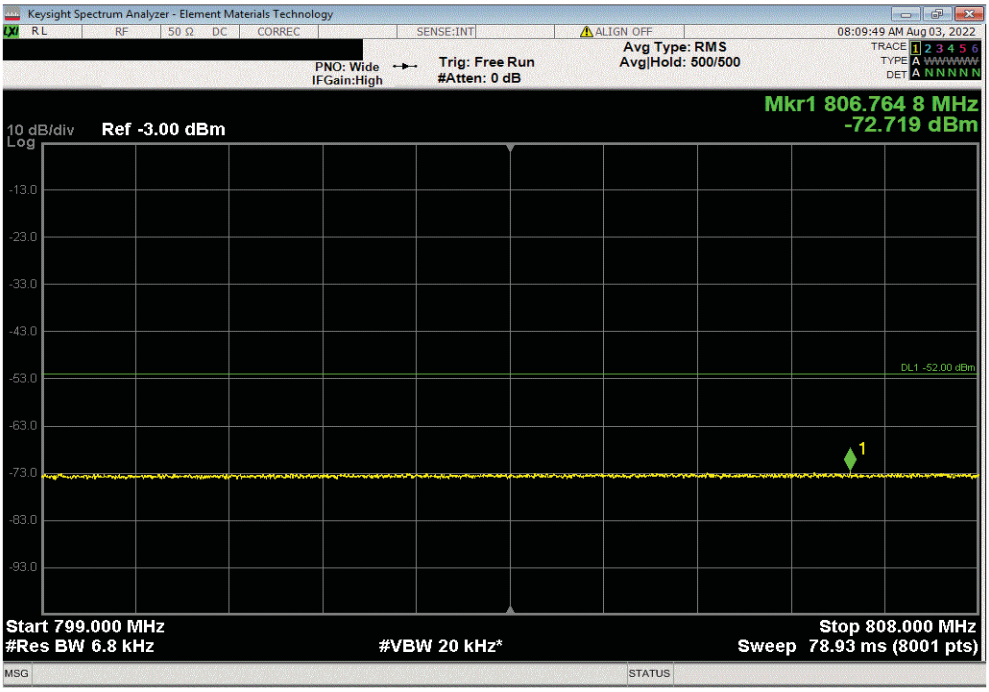


BAND EDGE COMPLIANCE - BAND n14

Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	3		769.04	-55.8	-52	Pass

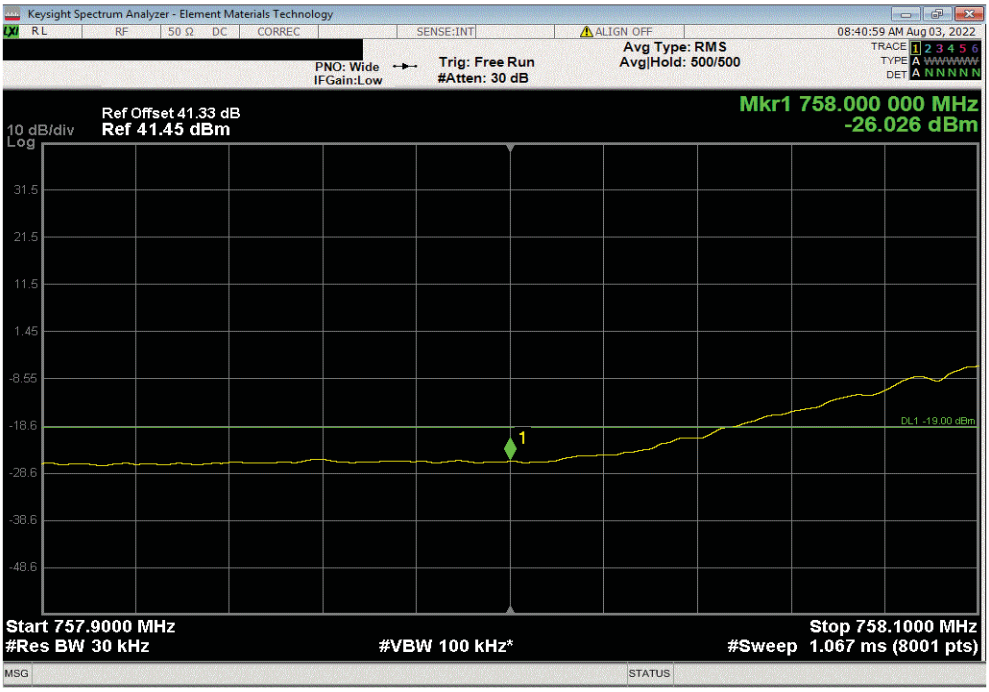


Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	4		806.76	-72.72	-52	Pass

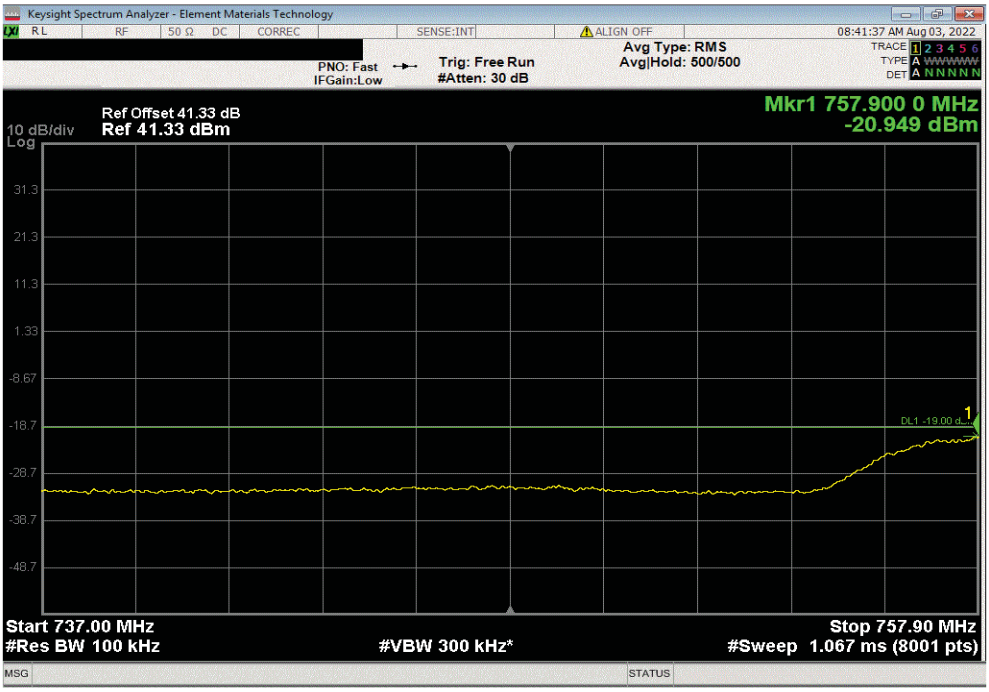


BAND EDGE COMPLIANCE - BAND n14

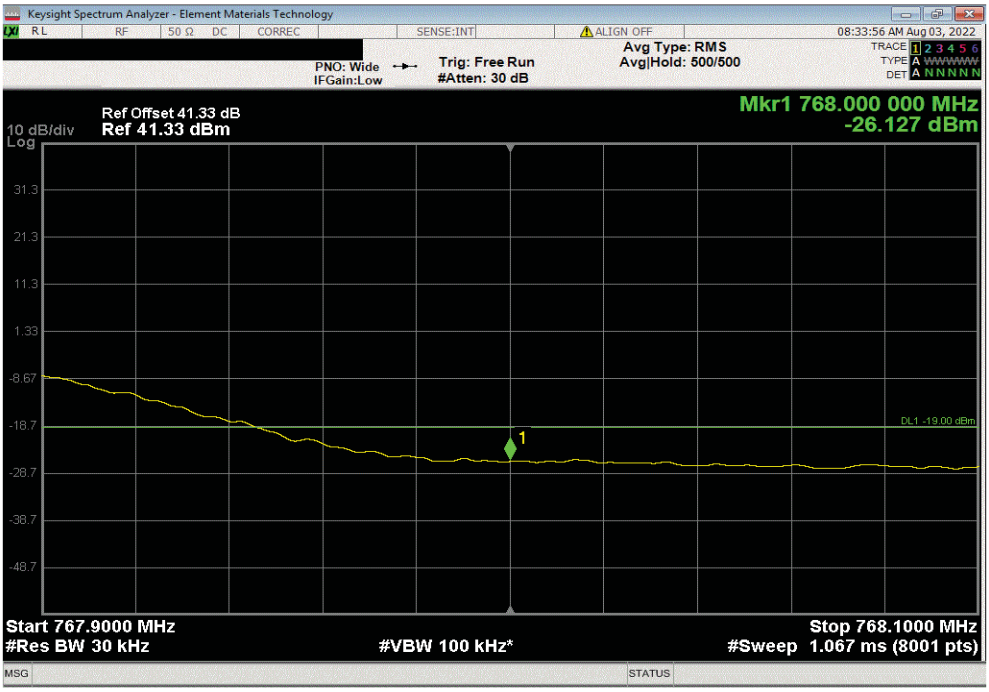
Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		758	-26.03	-19	Pass



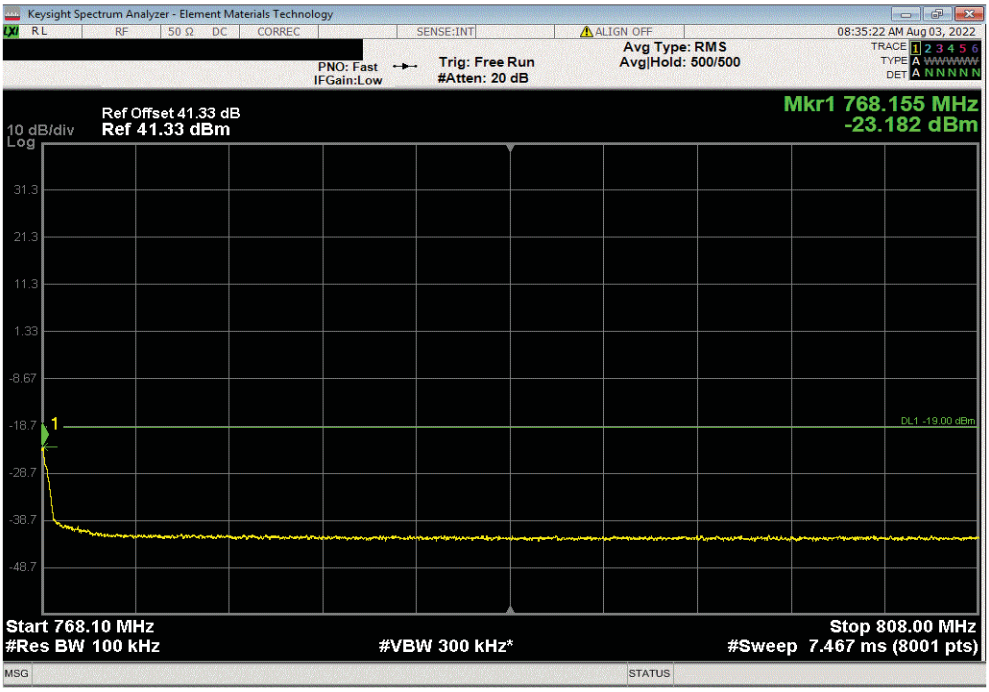
Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		757.9	-20.95	-19	Pass



Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		768	-26.13	-19	Pass

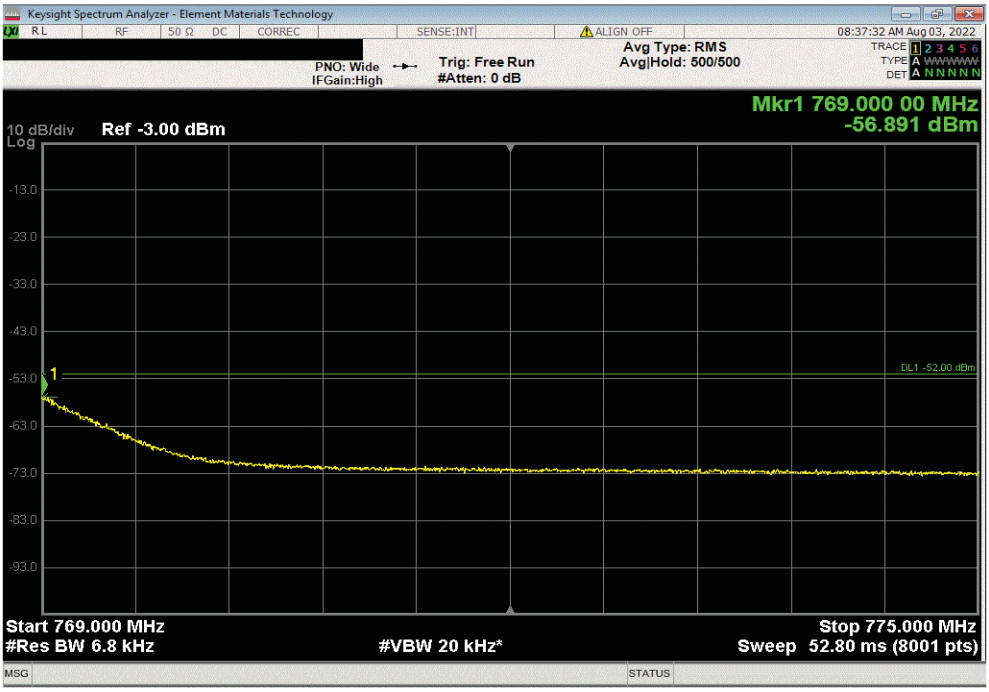


Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		768.15	-23.18	-19	Pass

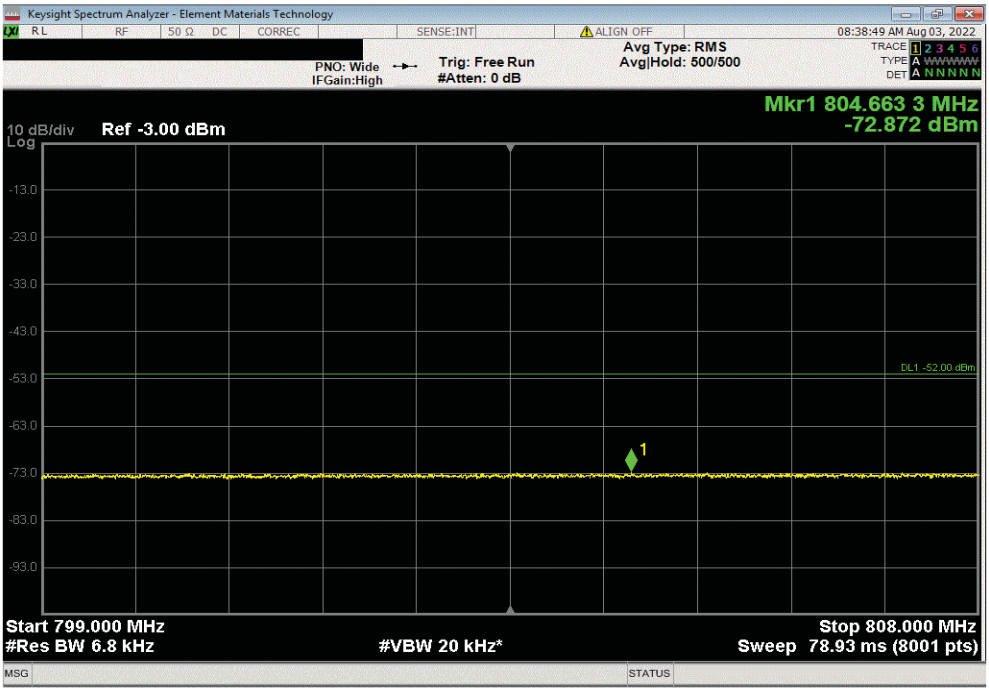


BAND EDGE COMPLIANCE - BAND n14

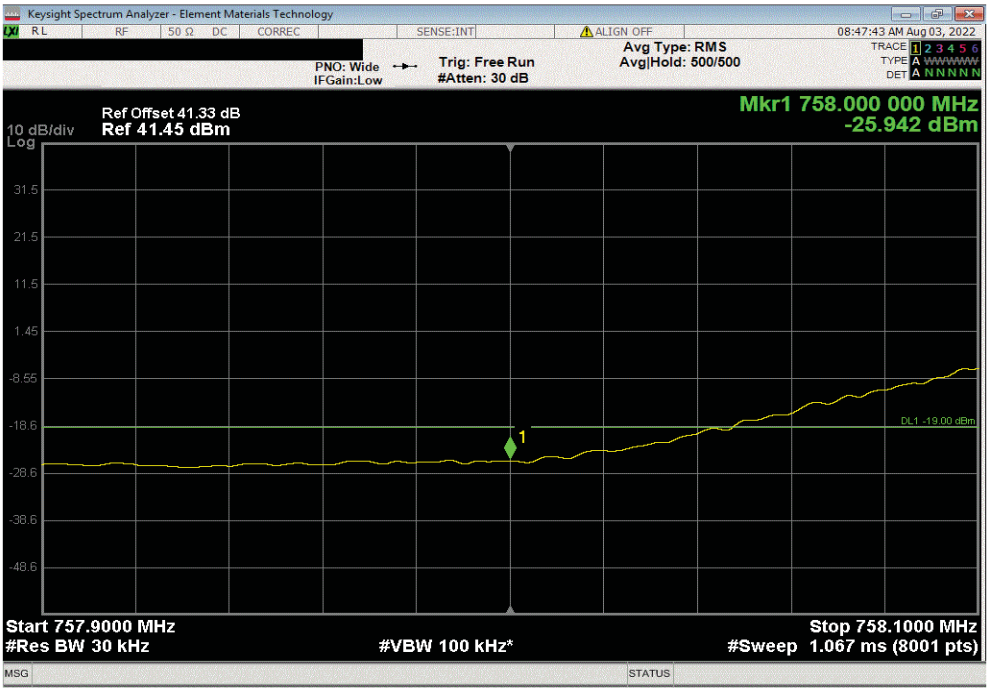
Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	3		769	-56.89	-52	Pass



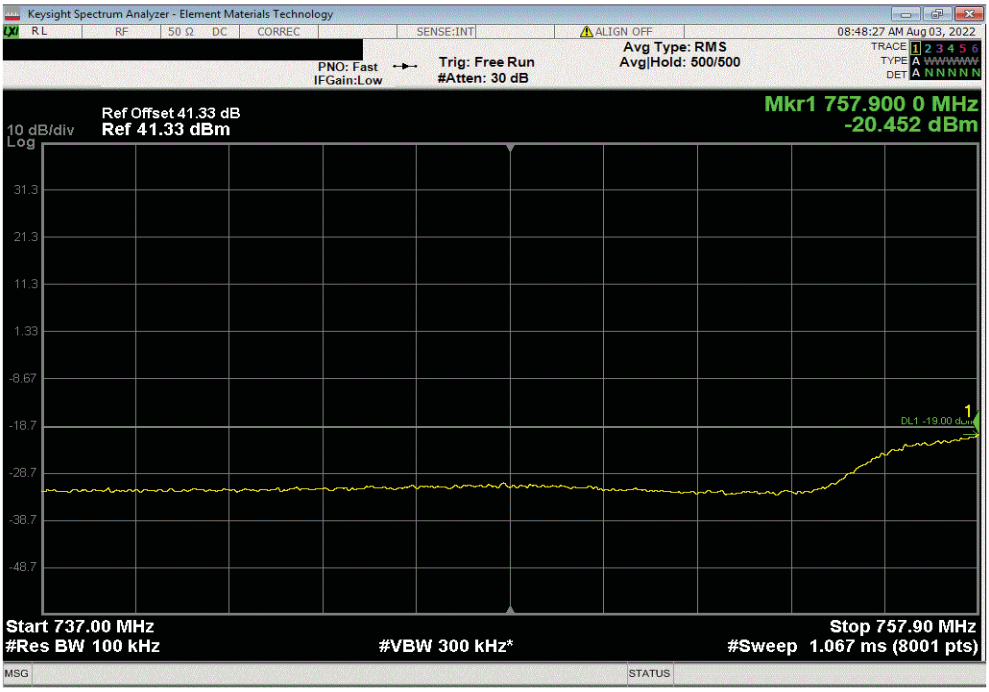
Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	4		804.66	-72.87	-52	Pass



Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		758	-25.94	-19	Pass

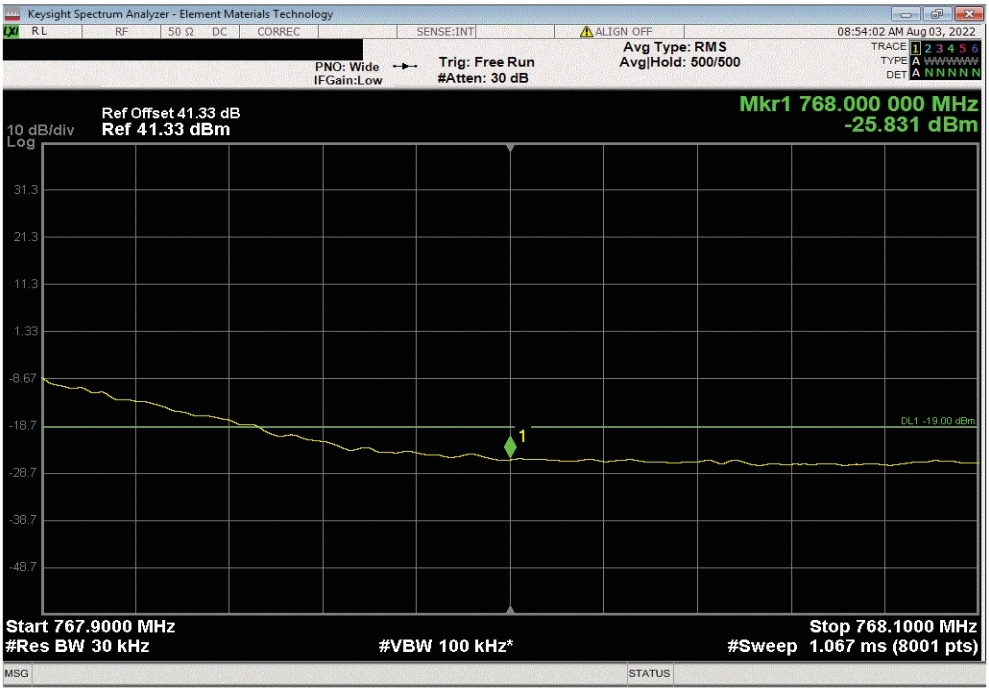


Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		757.9	-20.45	-19	Pass

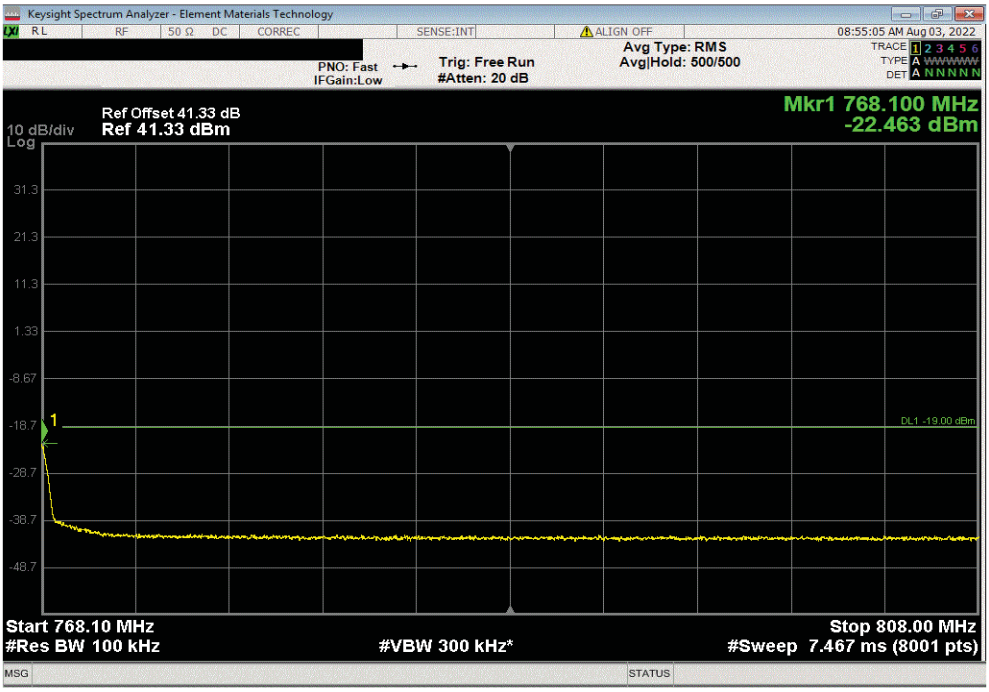


BAND EDGE COMPLIANCE - BAND n14

Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		768	-25.83	-19	Pass

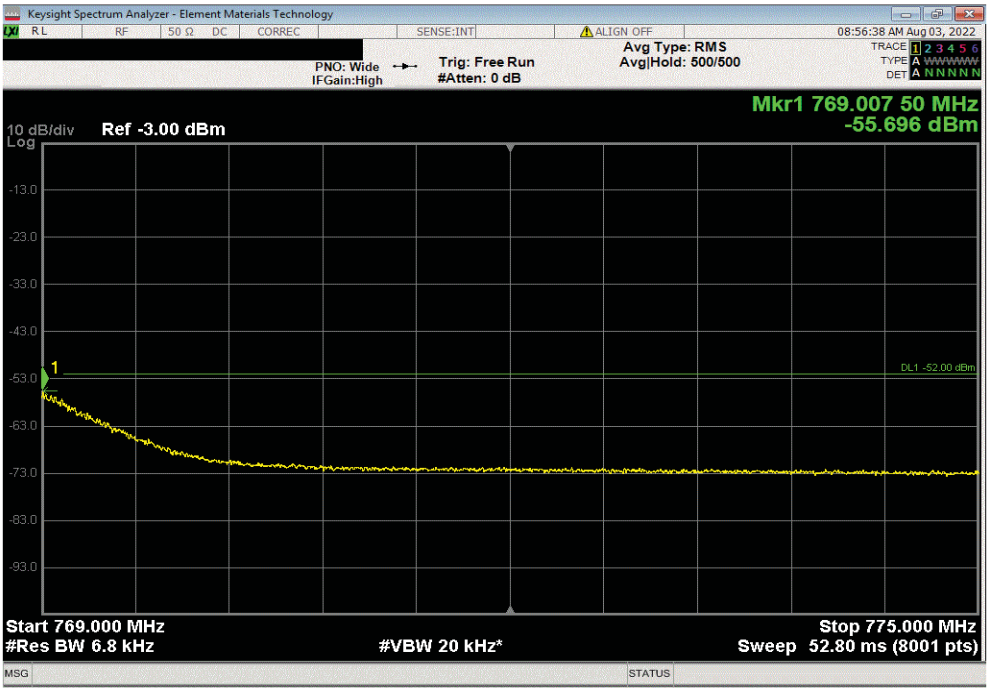


Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		768.1	-22.46	-19	Pass

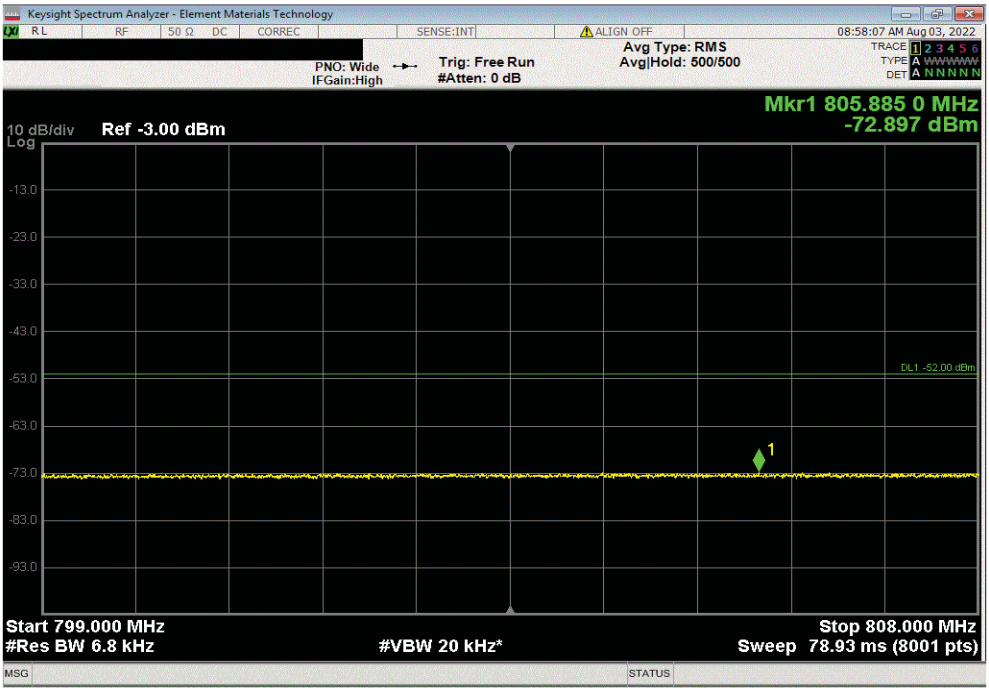


BAND EDGE COMPLIANCE - BAND n14

Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	3		769.01	-55.7	-52	Pass

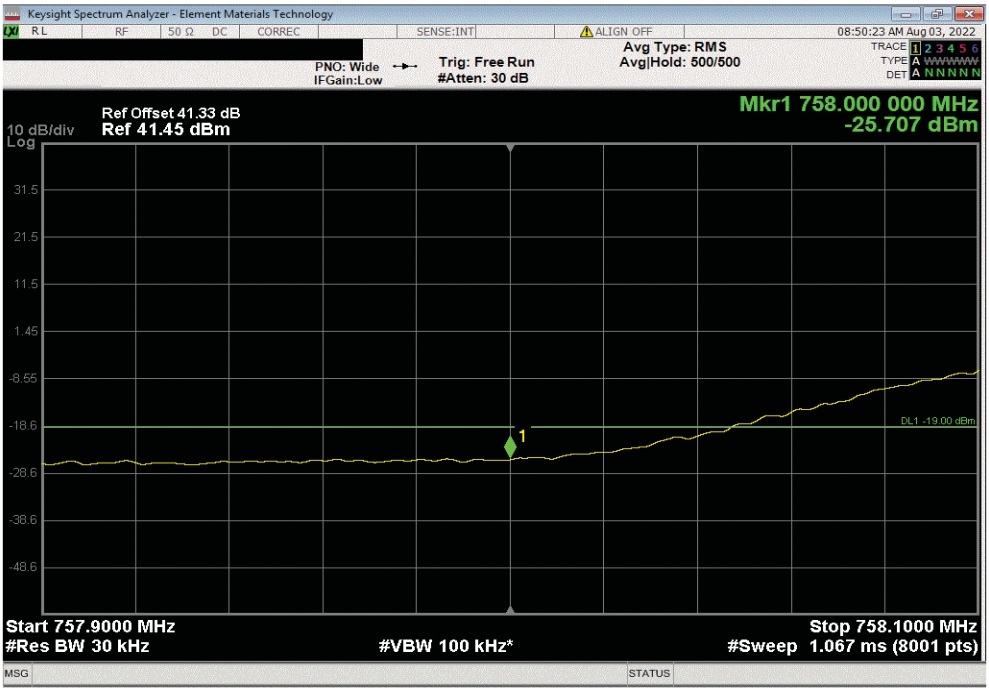


Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	4		805.89	-72.9	-52	Pass

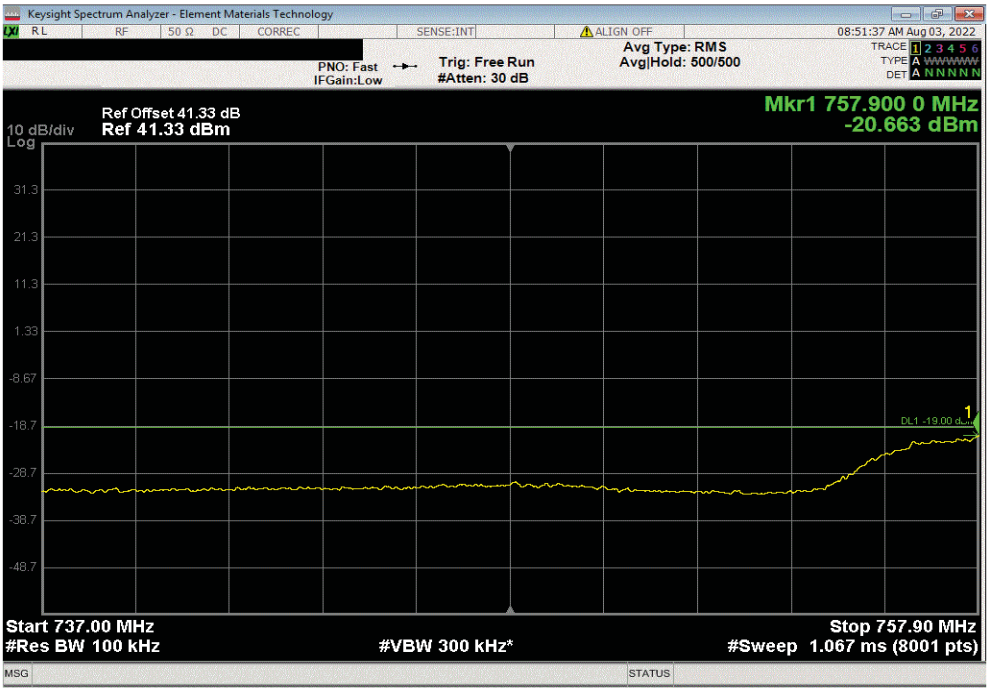


BAND EDGE COMPLIANCE - BAND n14

Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		758	-25.71	-19	Pass

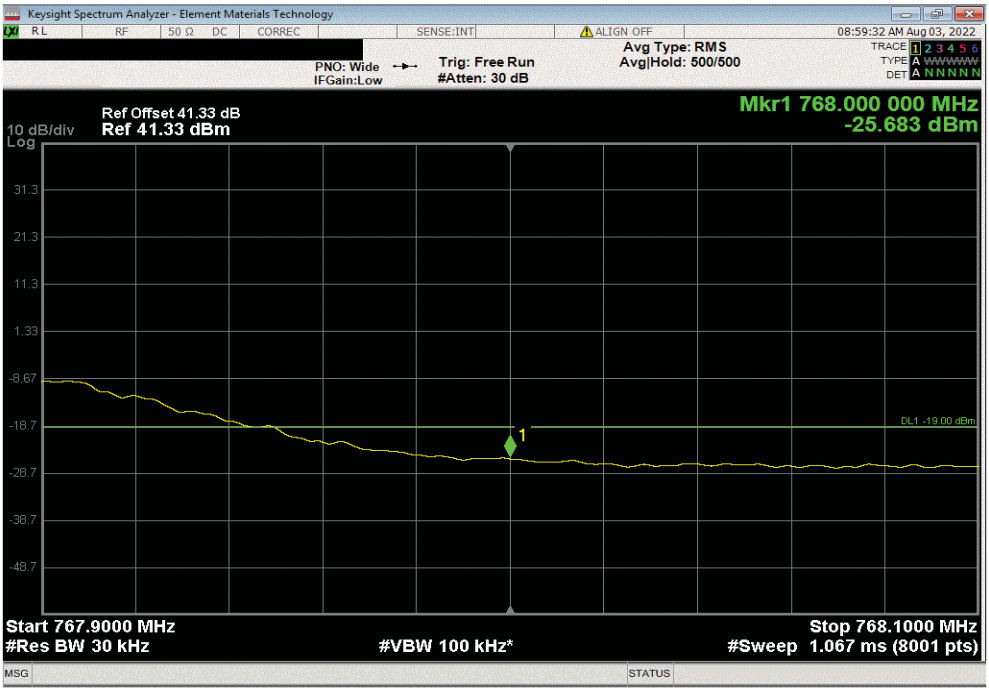


Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		757.9	-20.66	-19	Pass



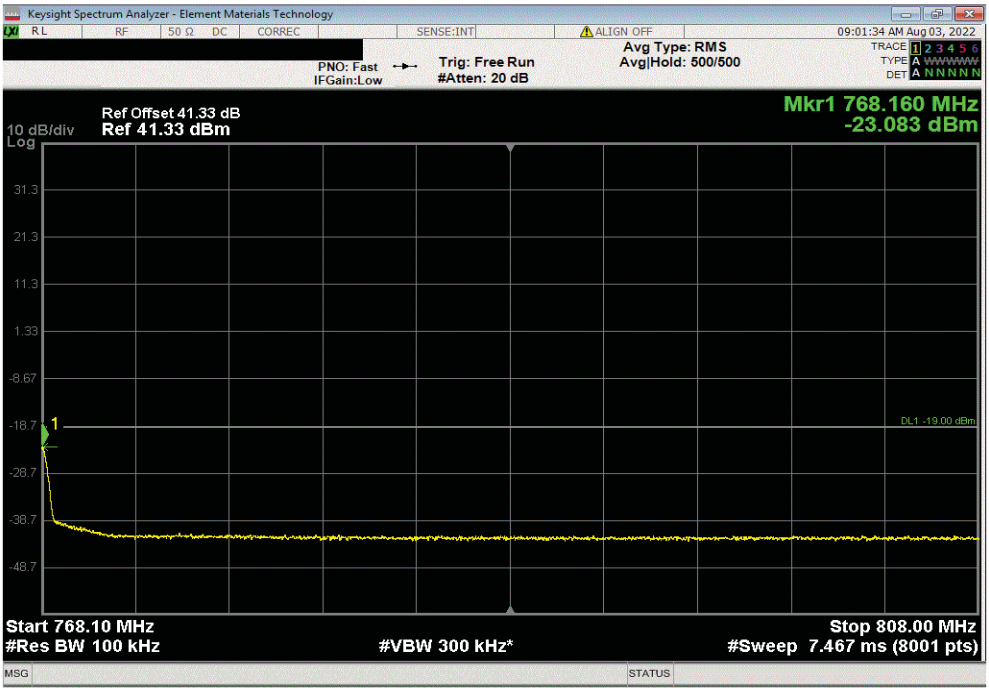
Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz

Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1		768	-25.68	-19	Pass



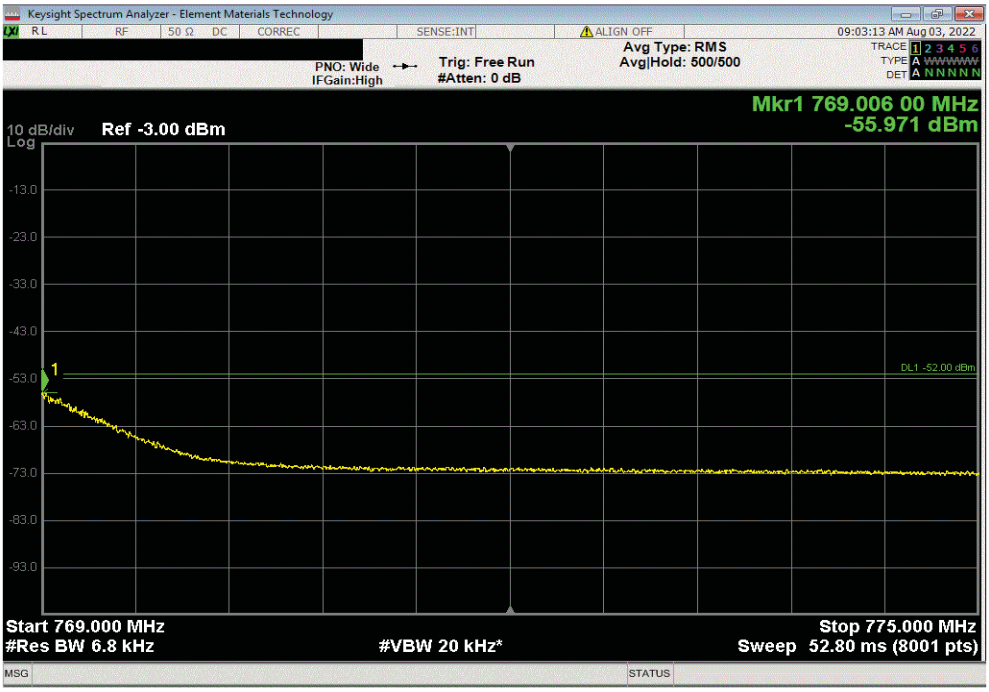
Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz

Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
2		768.16	-23.08	-19	Pass

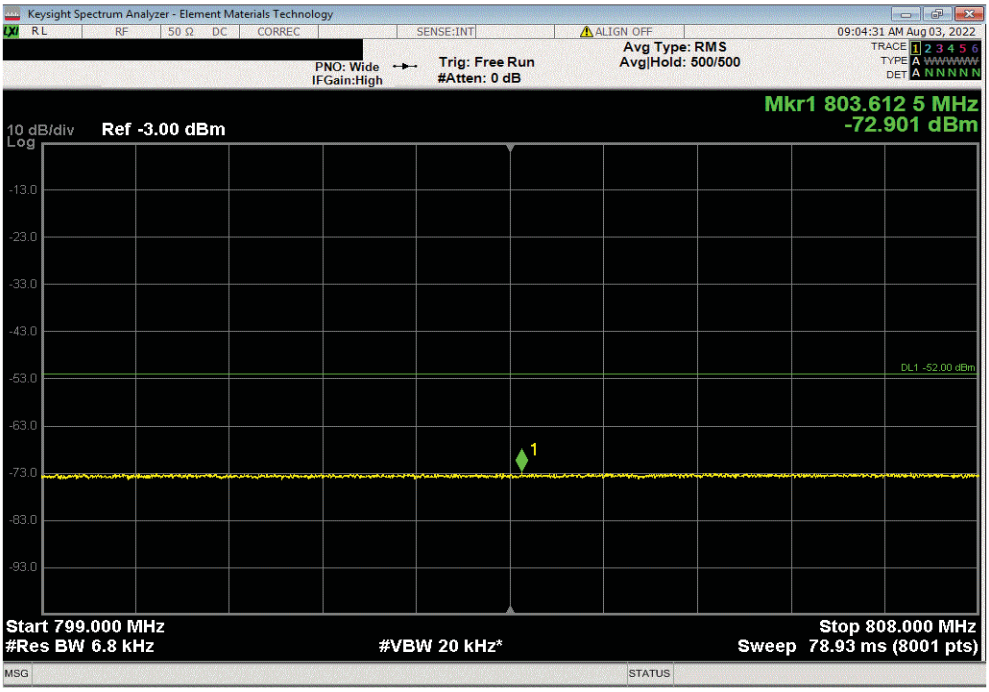


BAND EDGE COMPLIANCE - BAND n14

Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	3		769.01	-55.97	-52	Pass

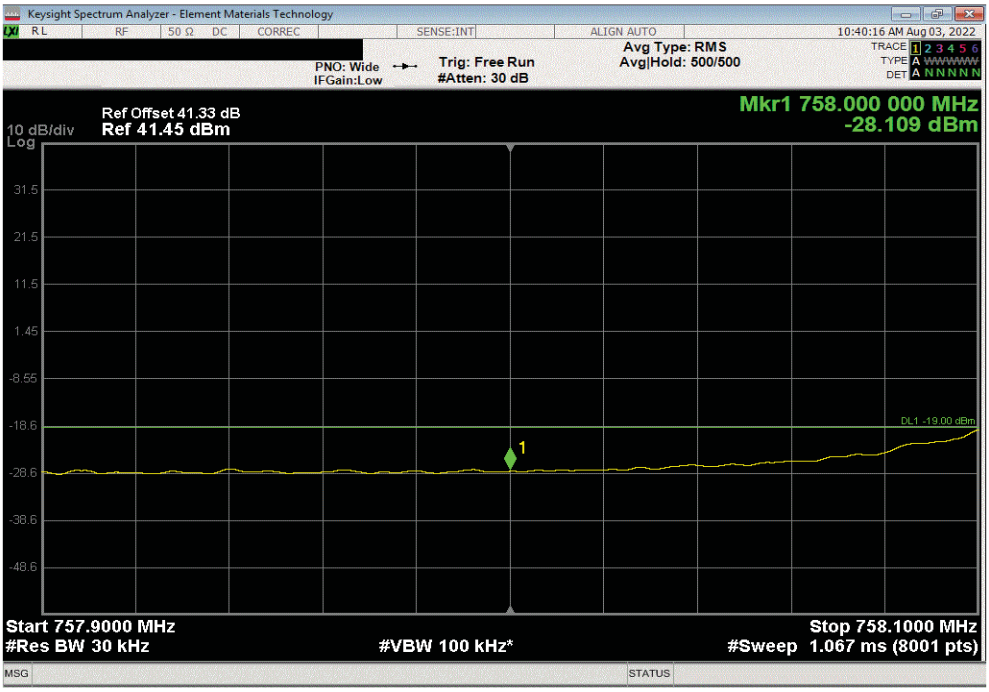


Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	4		803.61	-72.9	-52	Pass



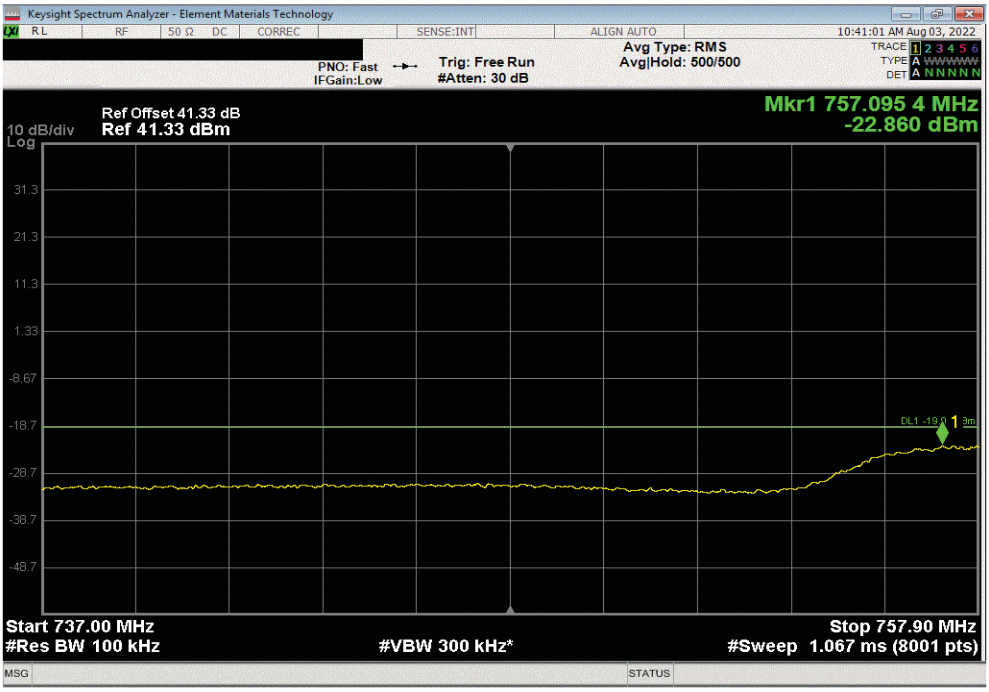
Port 1, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Low Channel, 760.5 MHz

Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1		758	-28.11	-19	Pass

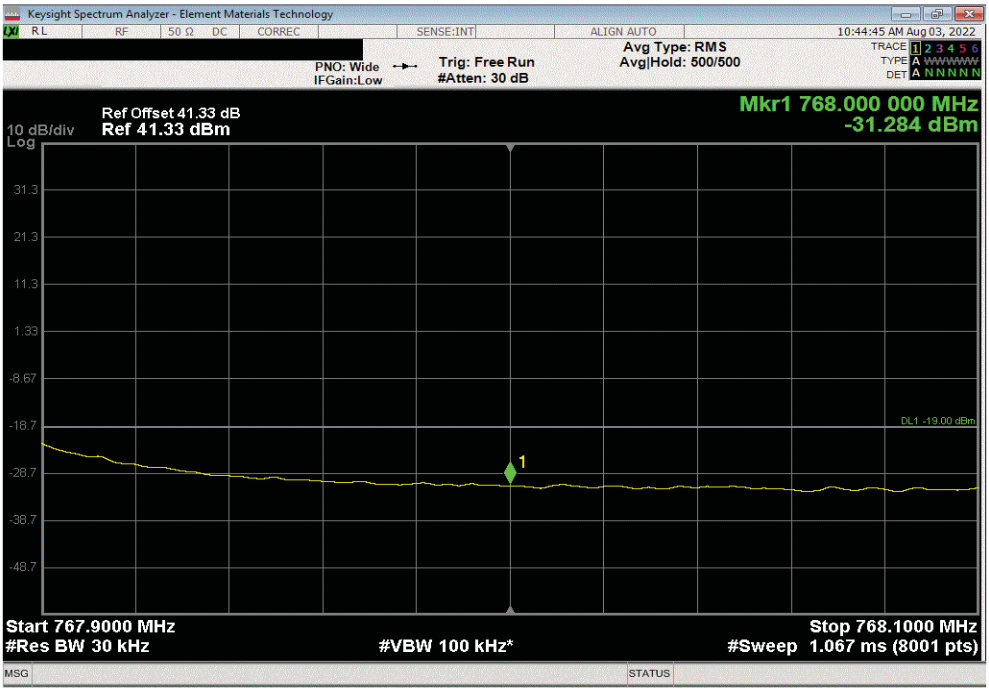


Port 1, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Low Channel, 760.5 MHz

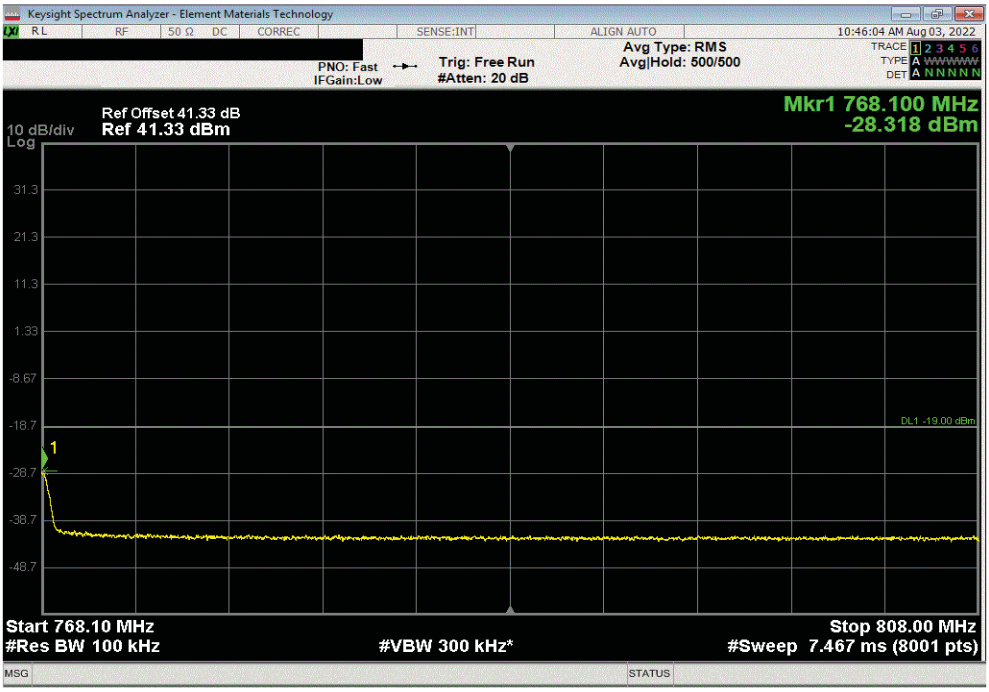
Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
2		757.1	-22.86	-19	Pass



Port 1, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		768	-31.28	-19	Pass

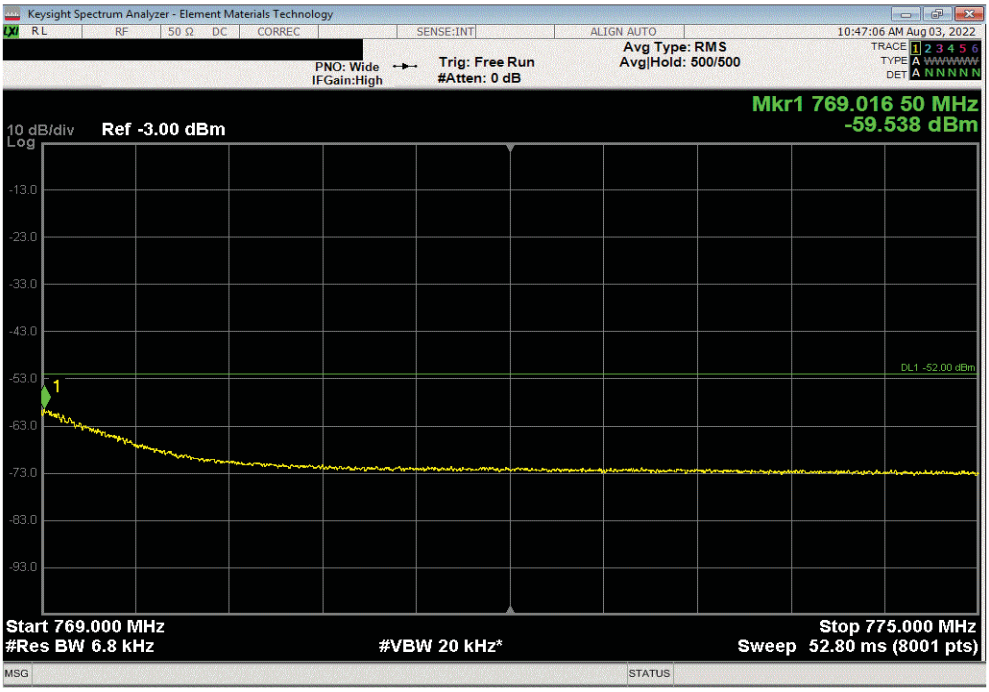


Port 1, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		768.1	-28.32	-19	Pass

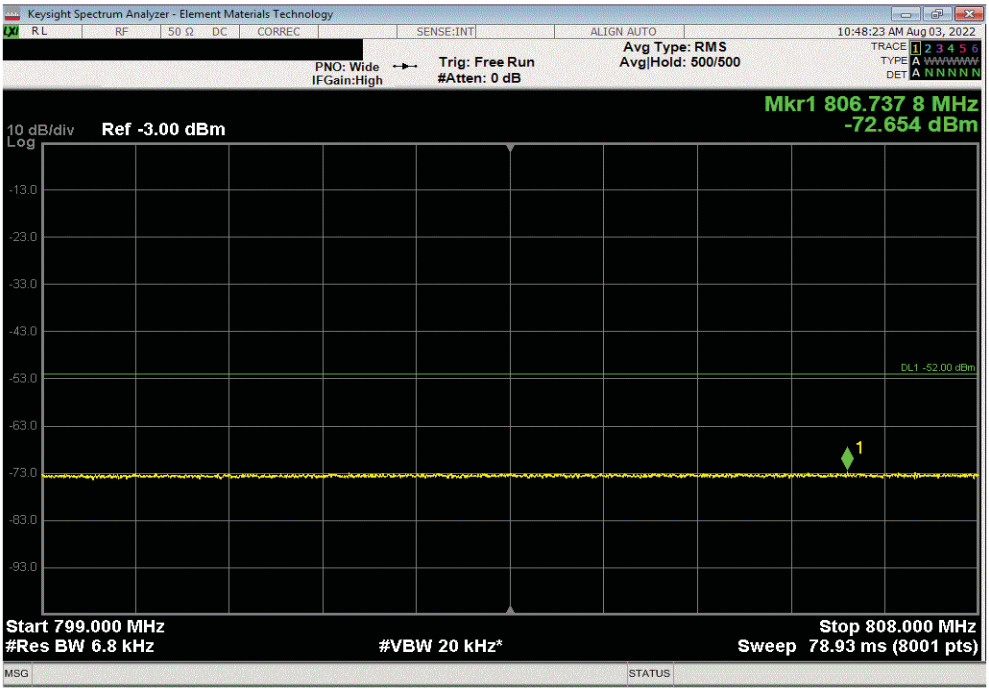


BAND EDGE COMPLIANCE - BAND n14

Port 1, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	3		769.02	-59.54	-52	Pass

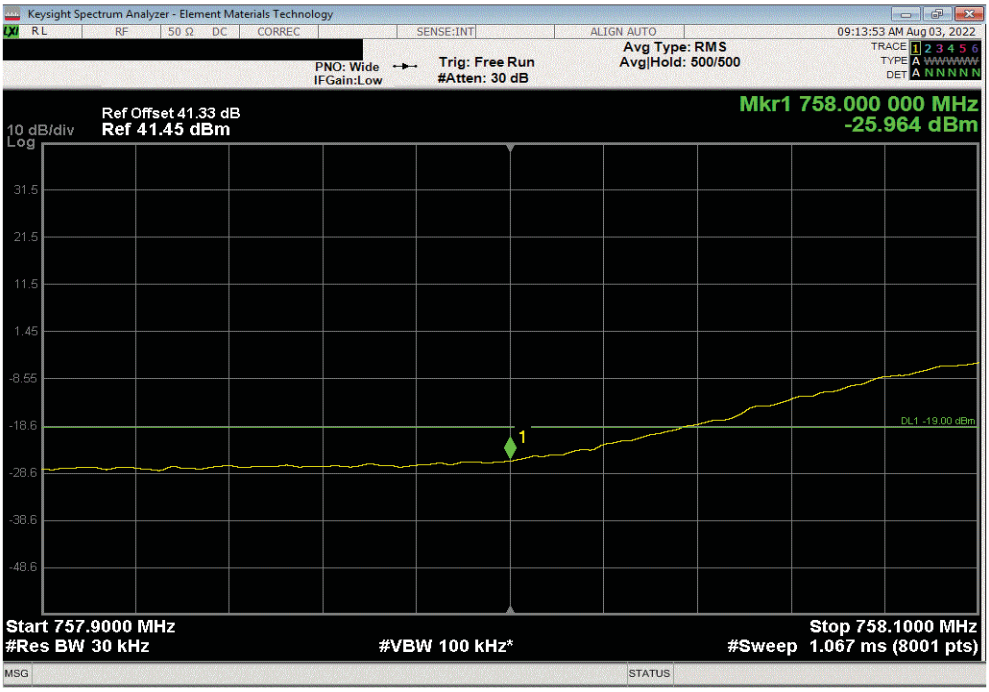


Port 1, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	4		806.74	-72.65	-52	Pass

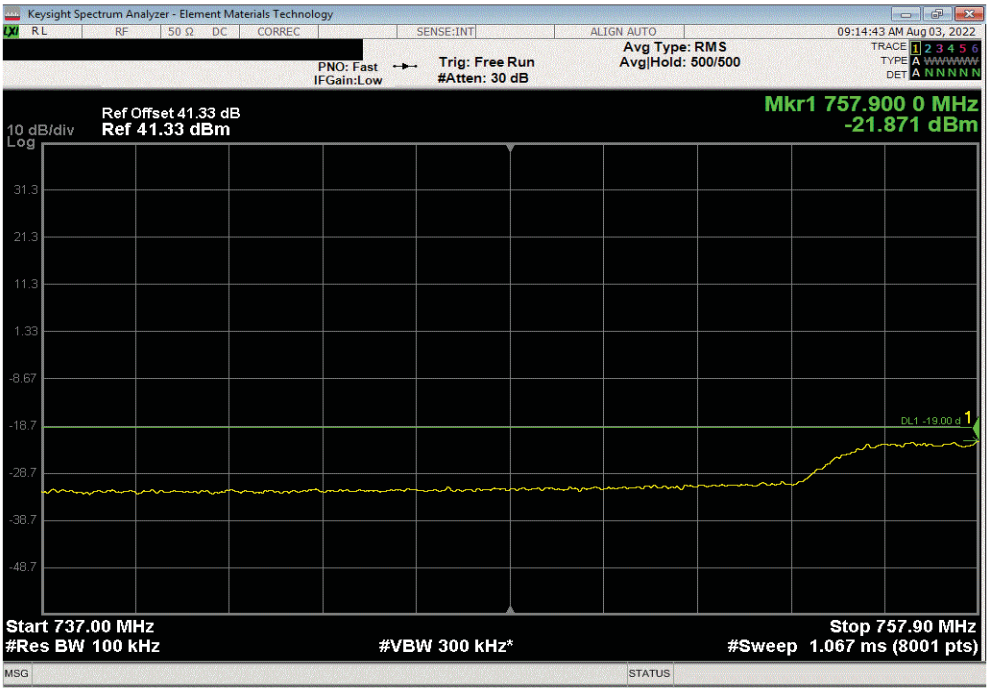


BAND EDGE COMPLIANCE - BAND n14

Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		758	-25.96	-19	Pass

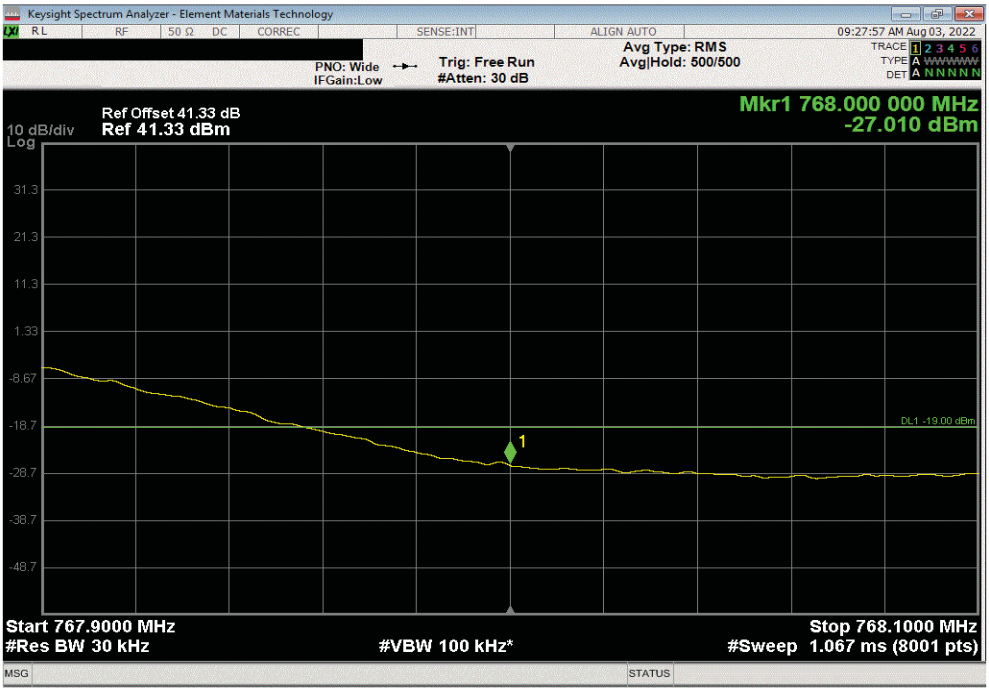


Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		757.9	-21.87	-19	Pass

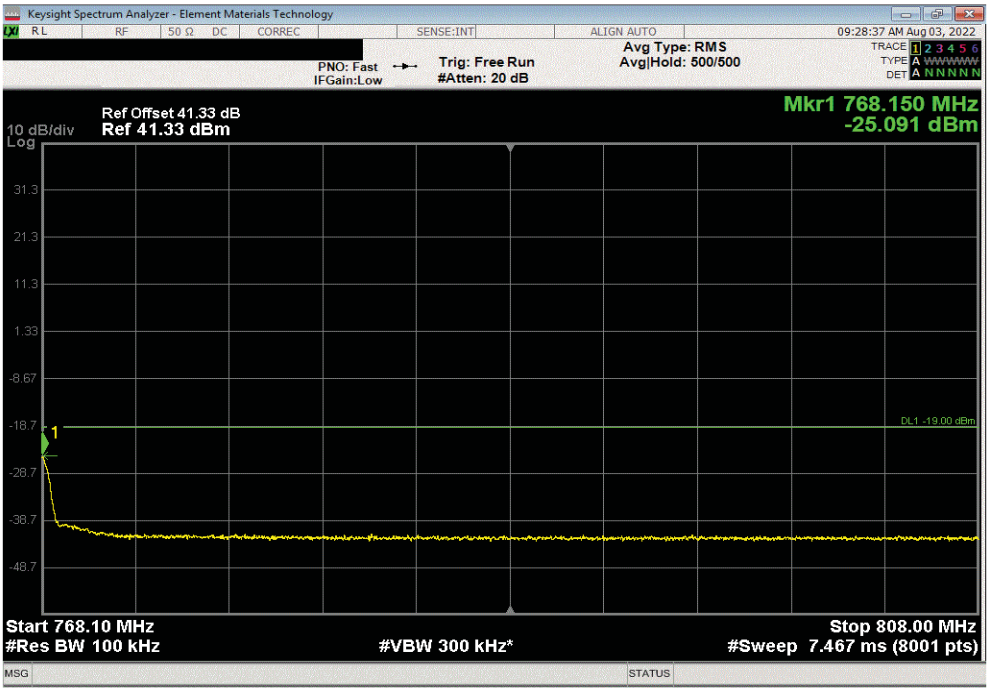


BAND EDGE COMPLIANCE - BAND n14

Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		768	-27.01	-19	Pass

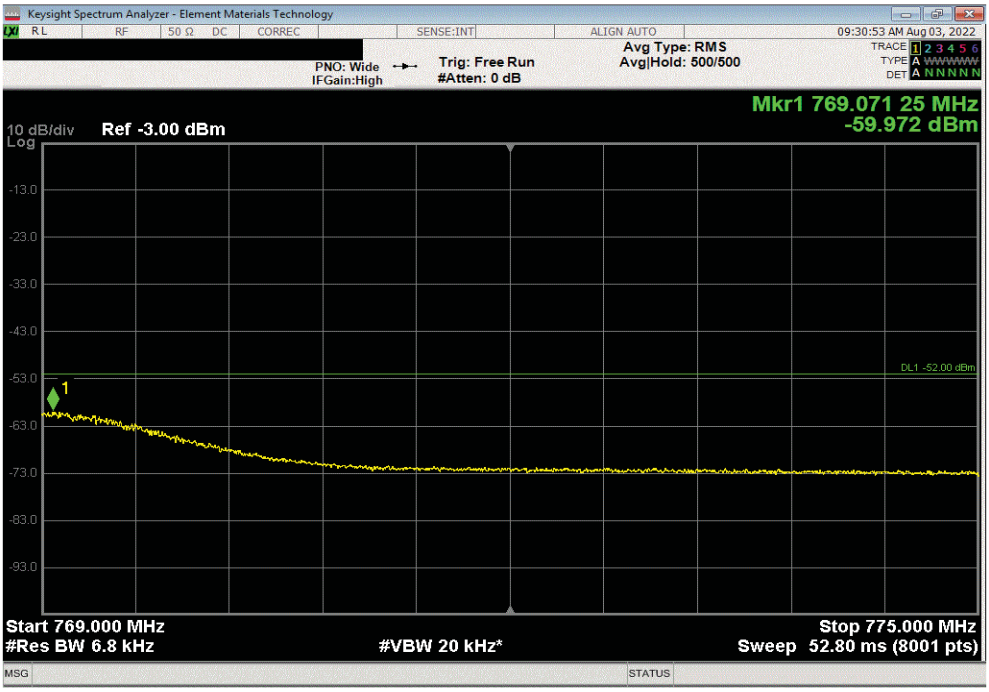


Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		768.15	-25.09	-19	Pass

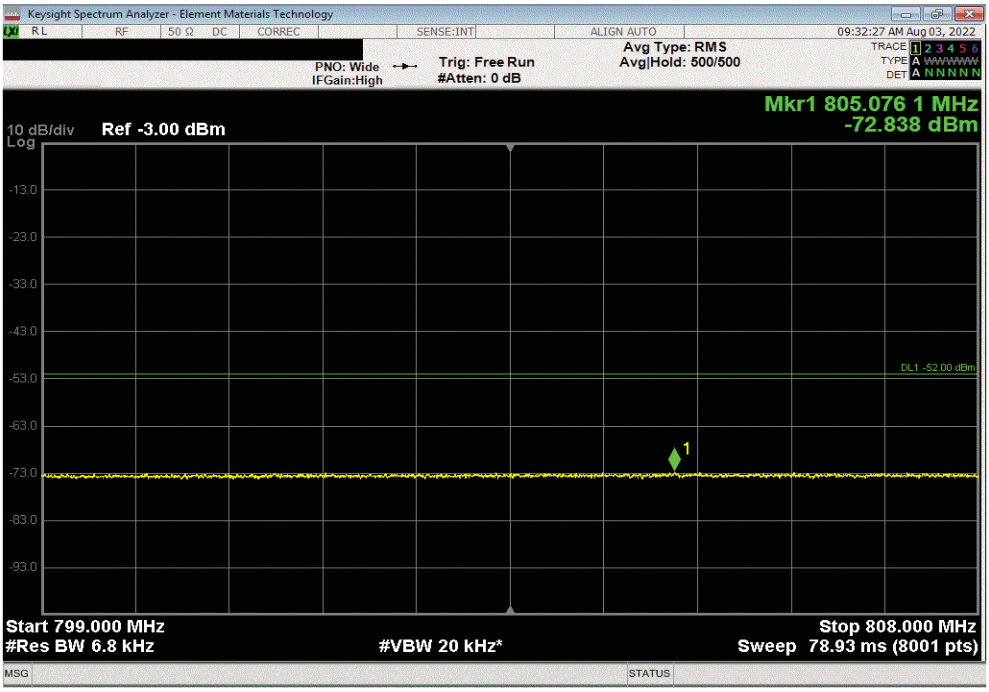


BAND EDGE COMPLIANCE - BAND n14

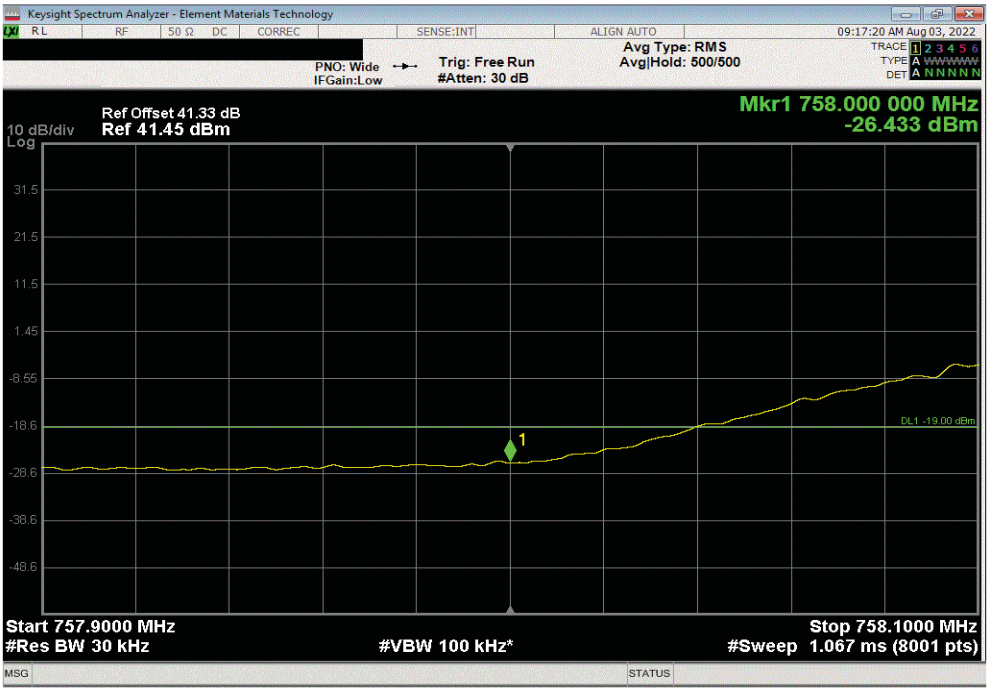
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	3		769.07	-59.97	-52	Pass



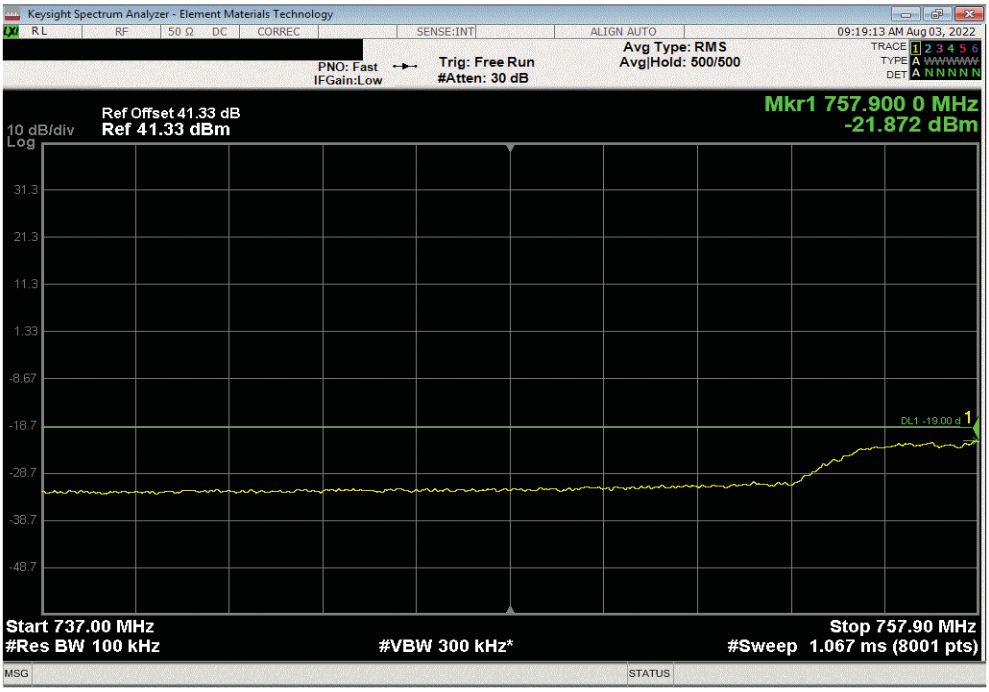
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	4		805.08	-72.84	-52	Pass



Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		758	-26.43	-19	Pass

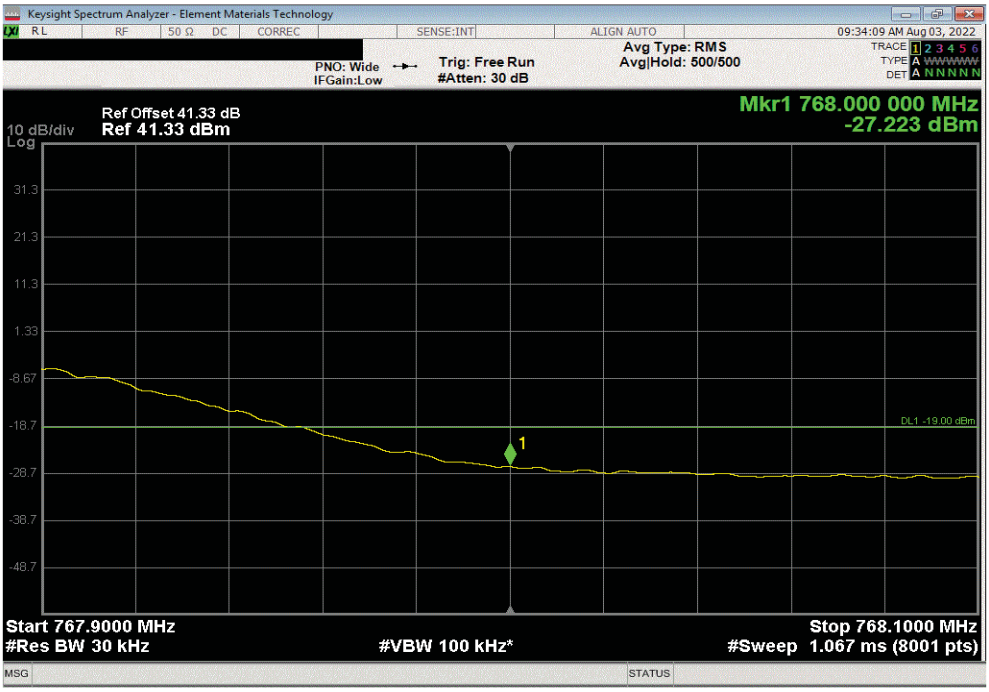


Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		757.9	-21.87	-19	Pass



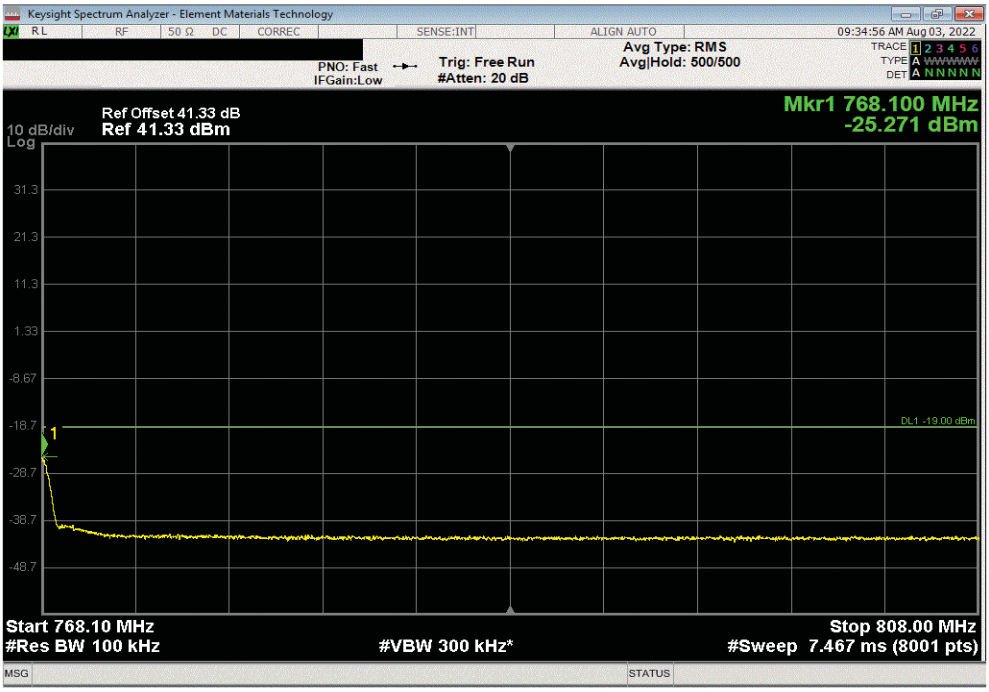
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, High Channel, 765.5 MHz

	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		768	-27.22	-19	Pass



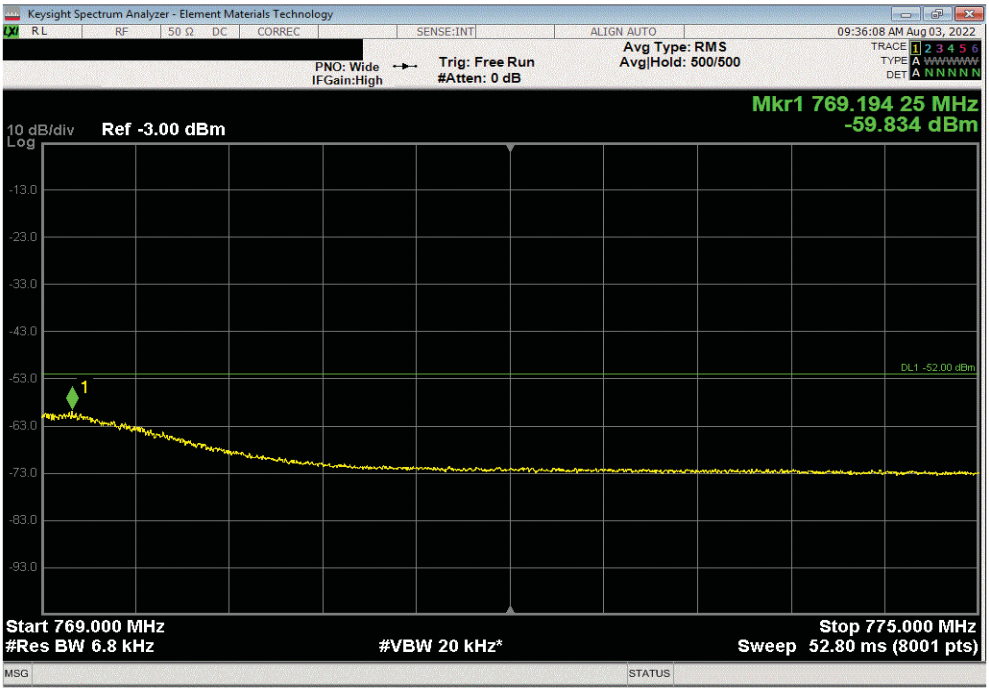
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, High Channel, 765.5 MHz

	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		768.1	-25.27	-19	Pass

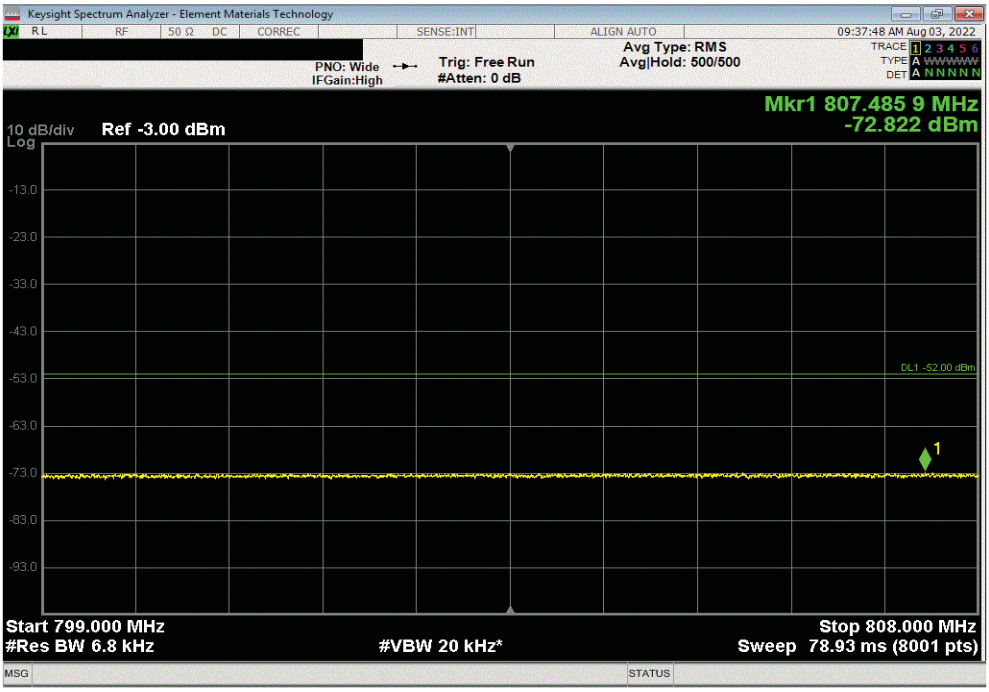


BAND EDGE COMPLIANCE - BAND n14

Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	3		769.19	-59.83	-52	Pass

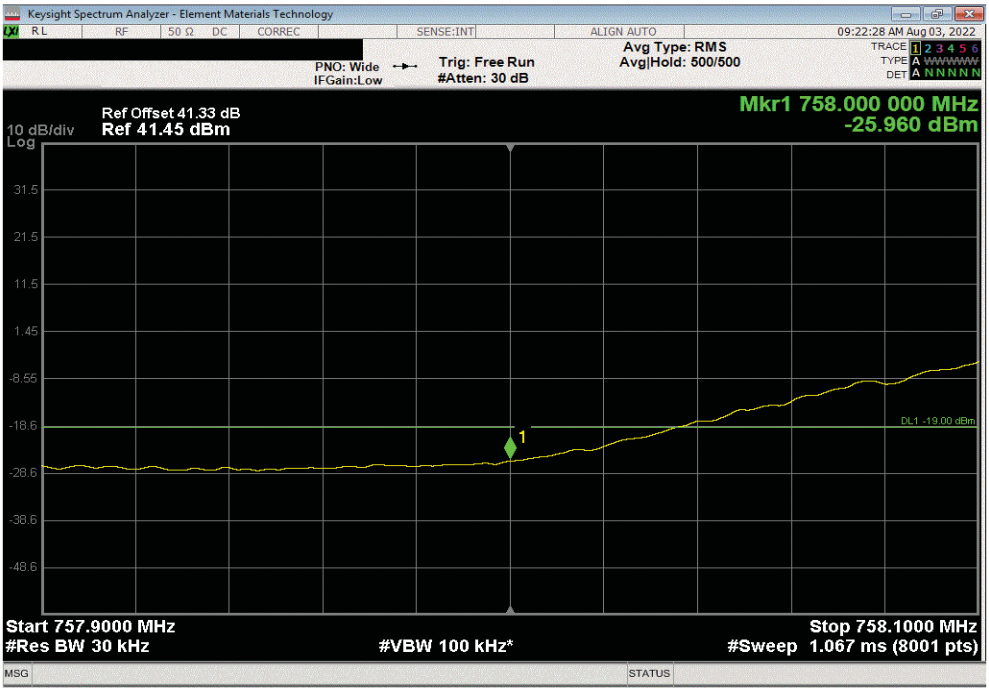


Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	4		807.49	-72.82	-52	Pass

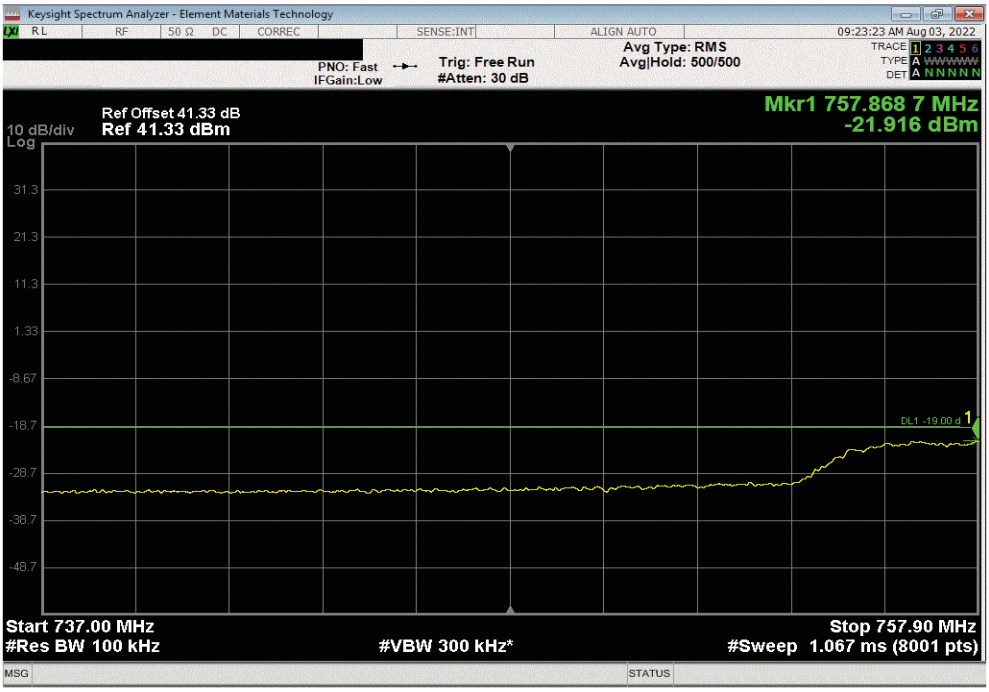


BAND EDGE COMPLIANCE - BAND n14

Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		758	-25.96	-19	Pass

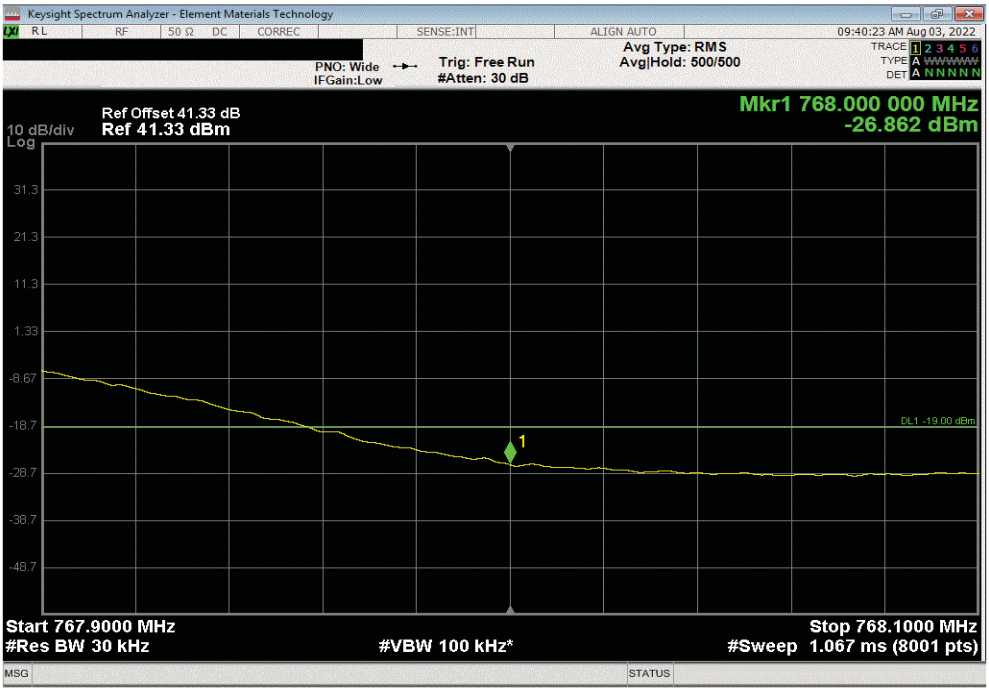


Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		757.87	-21.92	-19	Pass

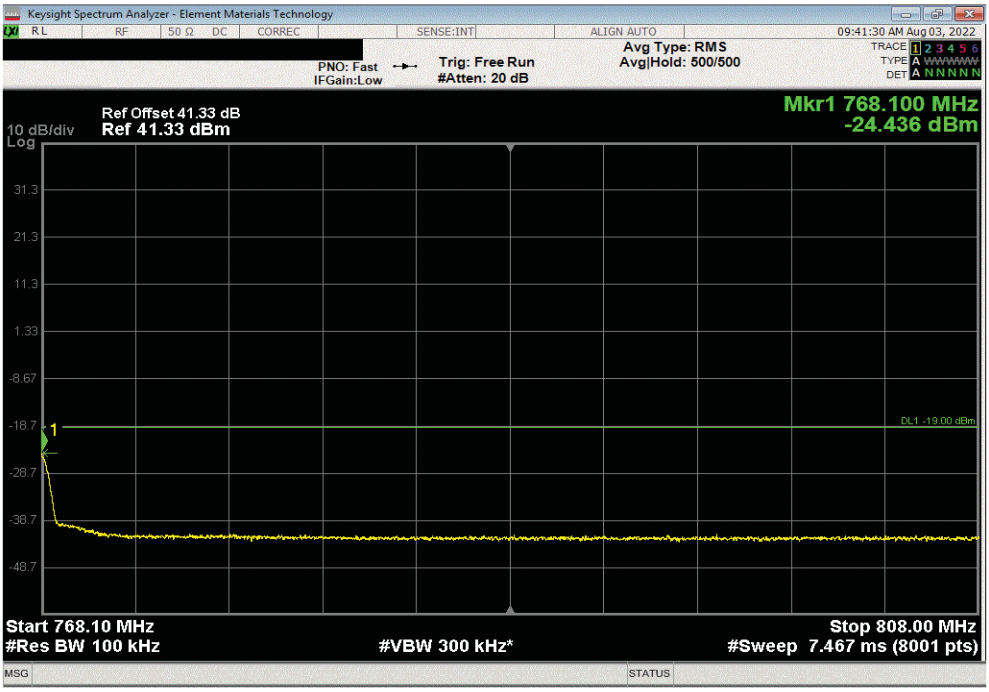


BAND EDGE COMPLIANCE - BAND n14

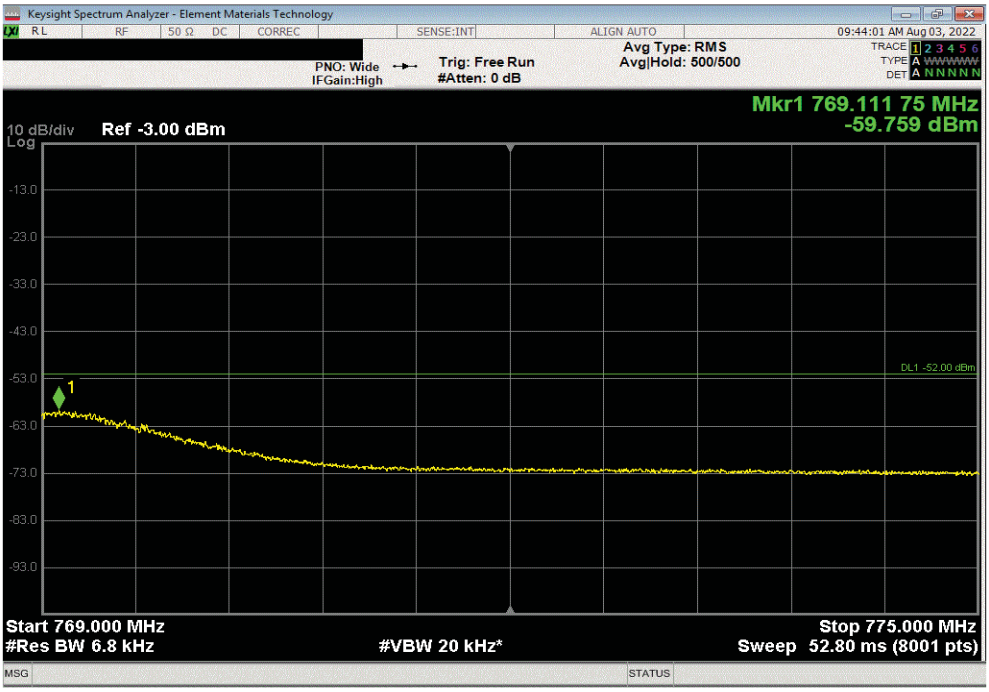
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		768	-26.86	-19	Pass



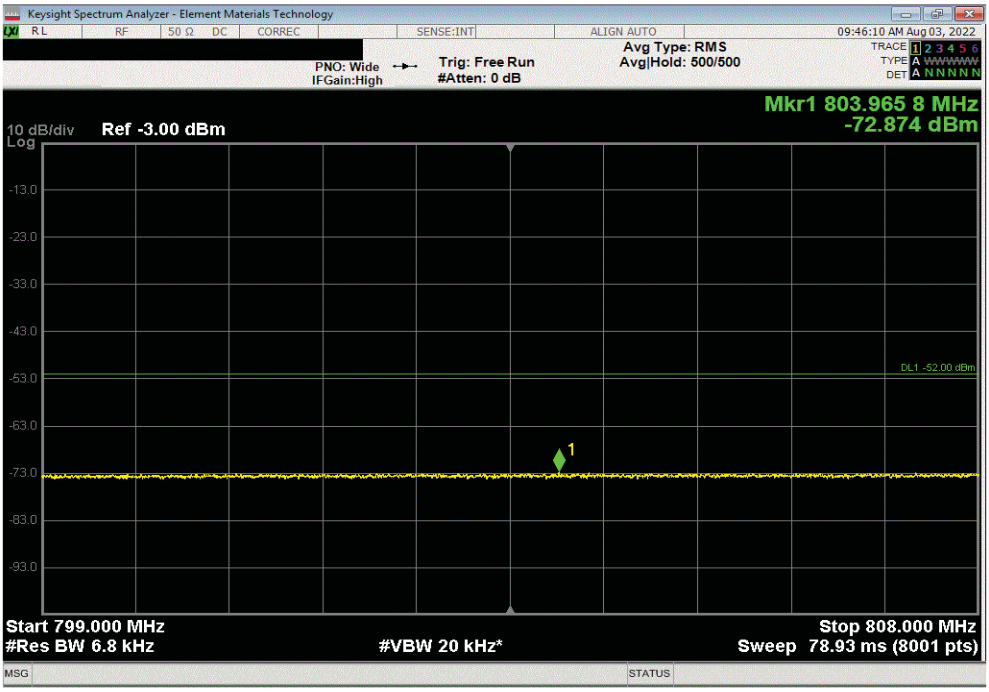
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		768.1	-24.44	-19	Pass



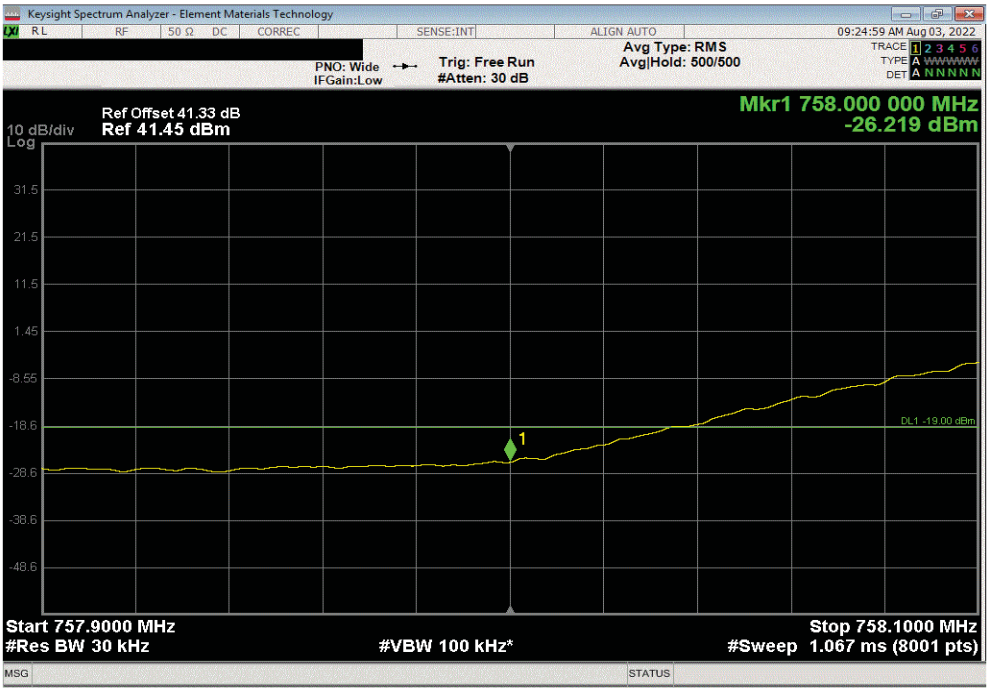
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	3		769.11	-59.76	-52	Pass



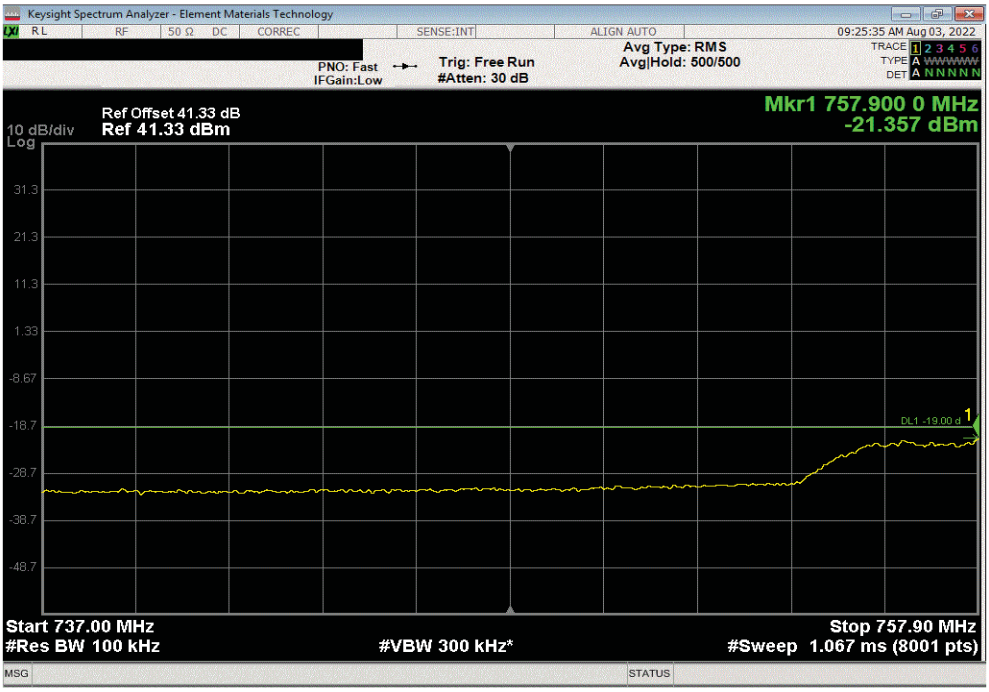
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	4		803.97	-72.87	-52	Pass



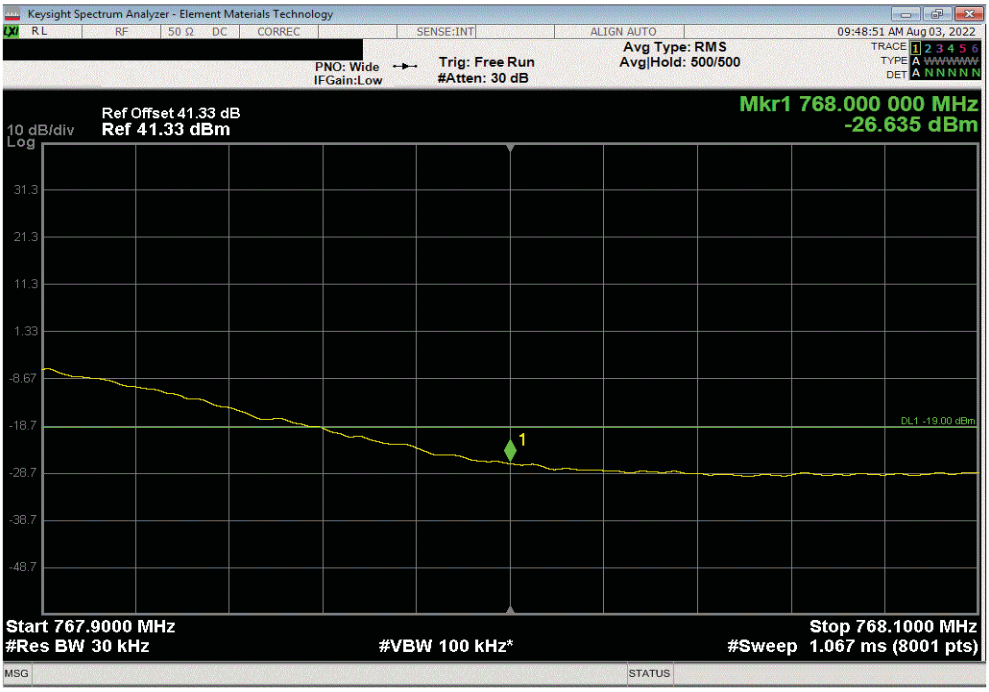
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		758	-26.22	-19	Pass



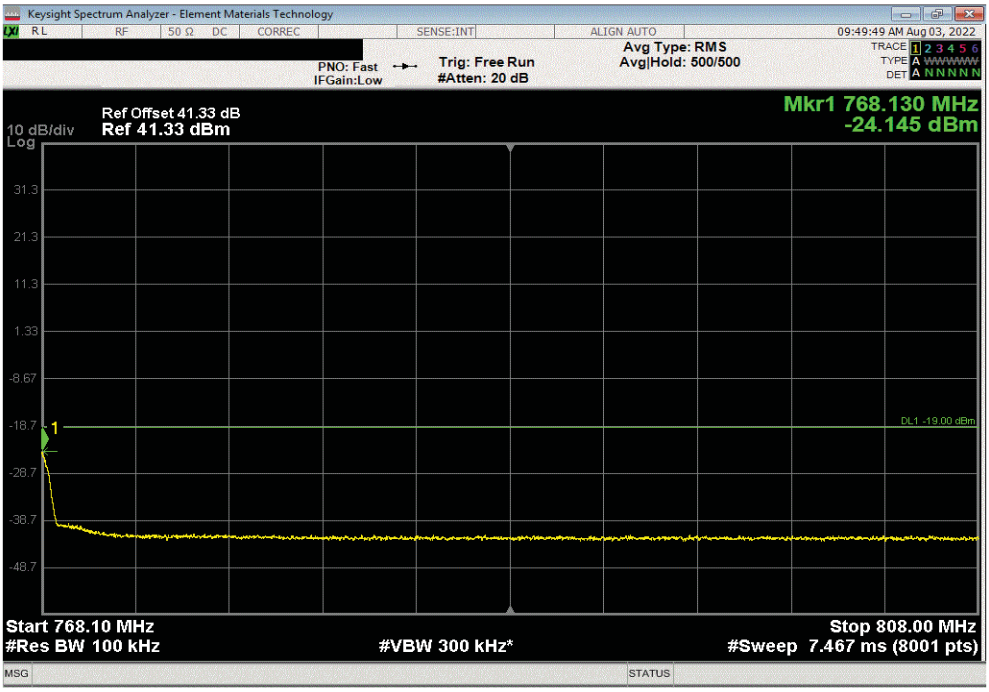
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		757.9	-21.36	-19	Pass



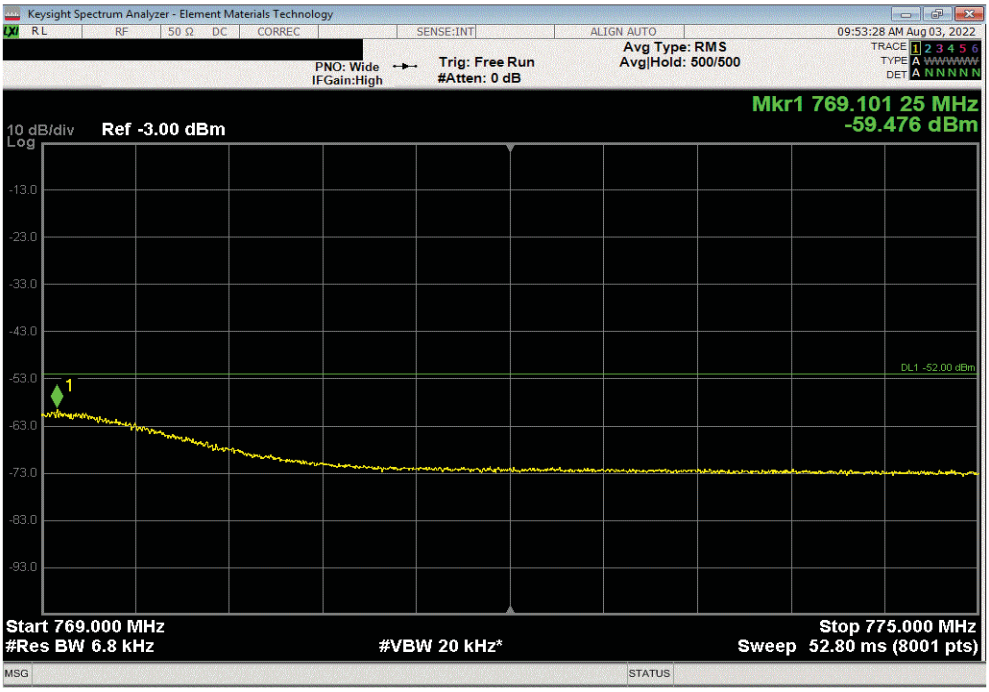
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		768	-26.64	-19	Pass



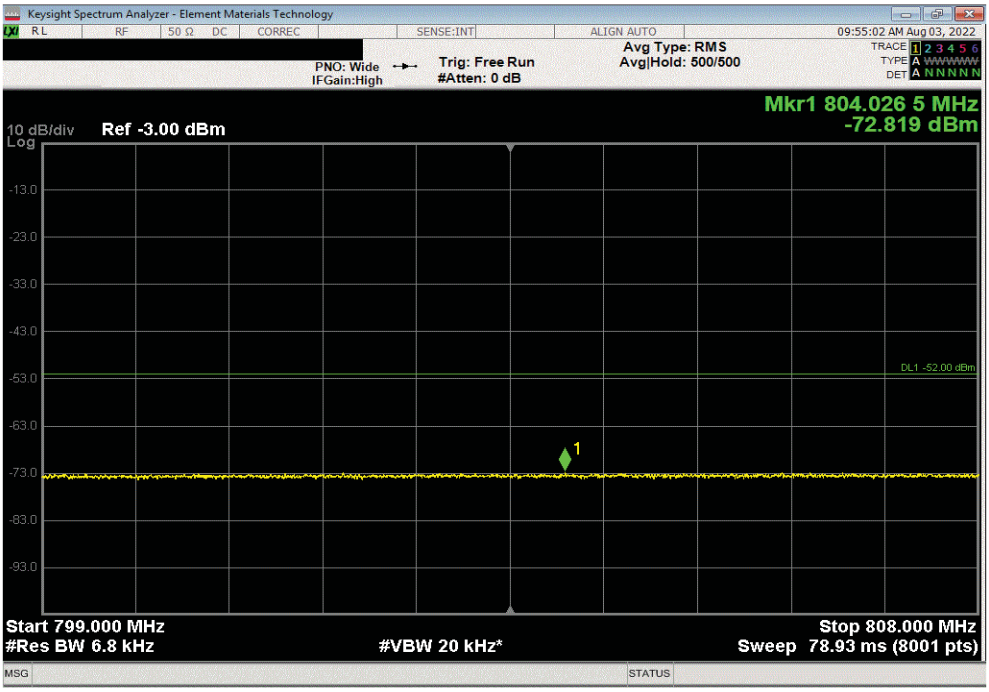
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		768.13	-24.15	-19	Pass



Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	3		769.1	-59.48	-52	Pass

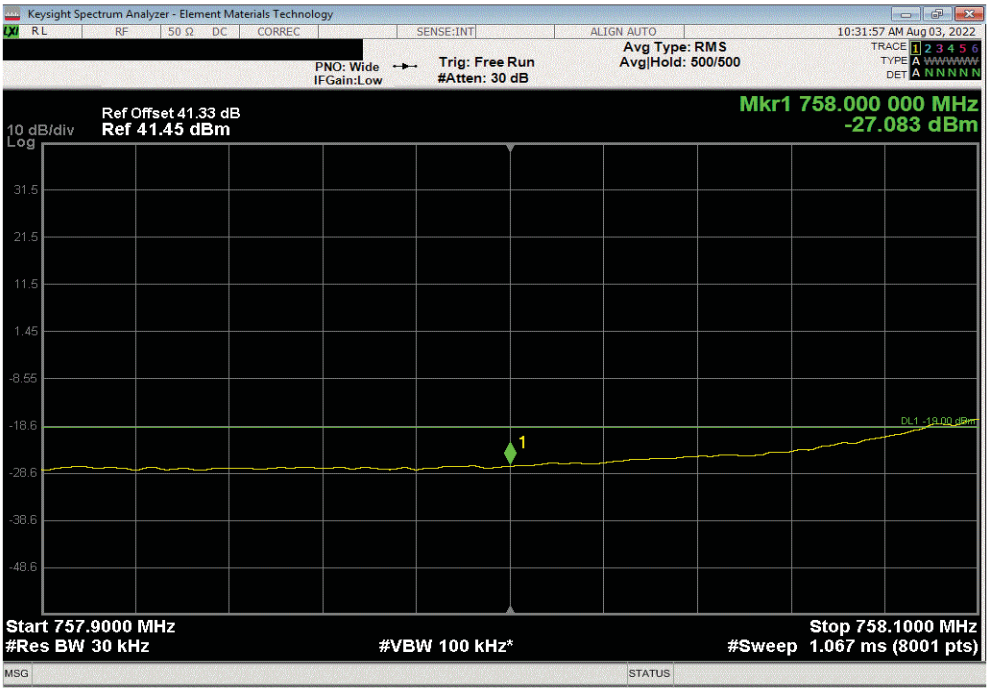


Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	4		804.03	-72.82	-52	Pass

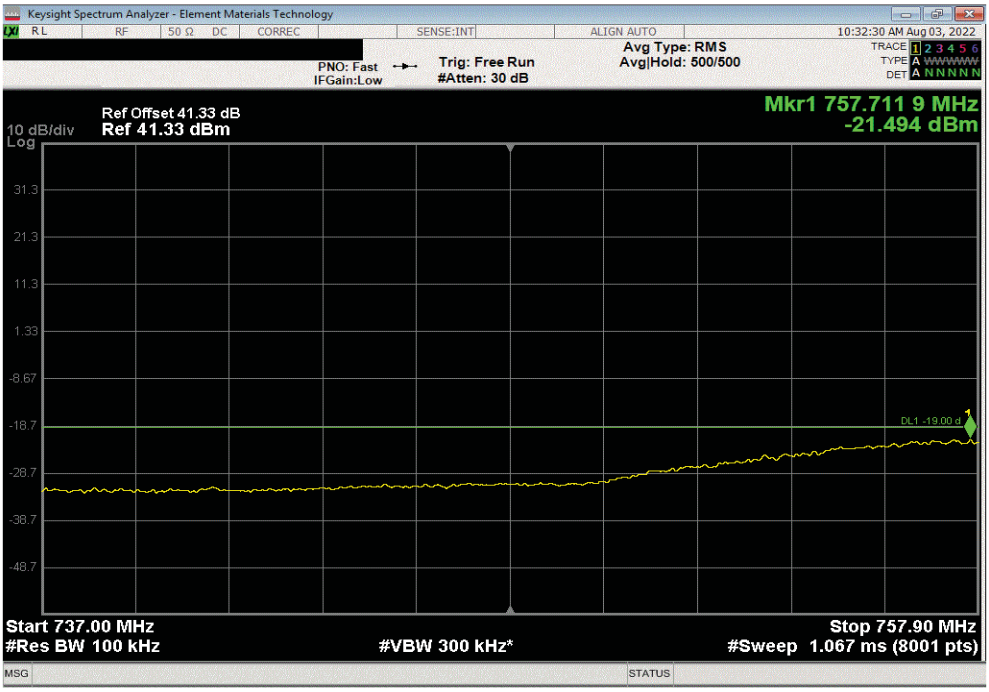


BAND EDGE COMPLIANCE - BAND n14

Port 2, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		758	-27.08	-19	Pass

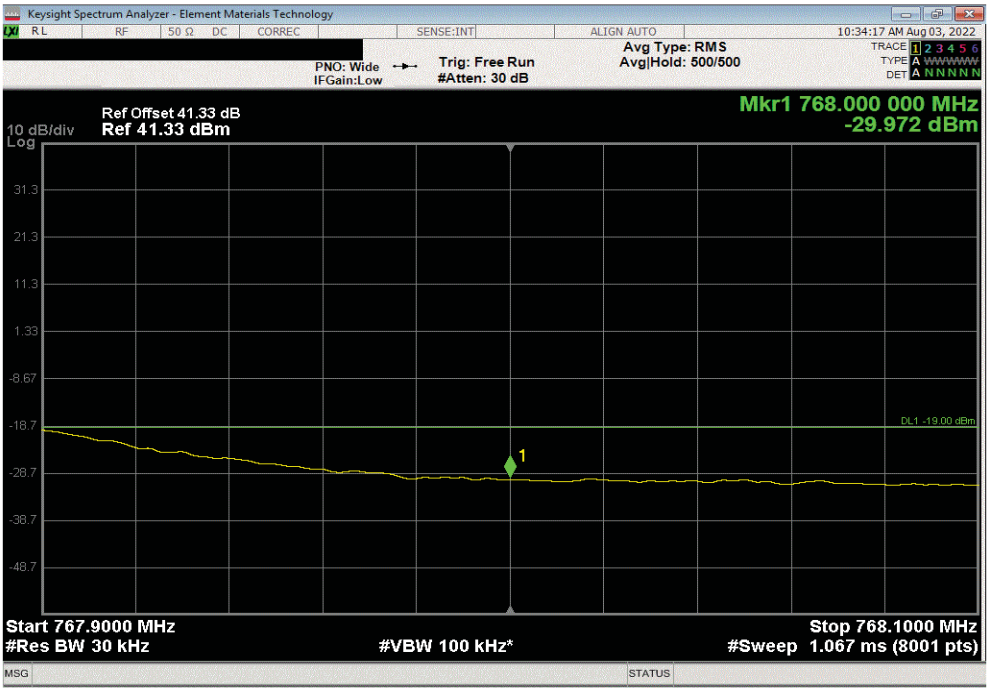


Port 2, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Low Channel, 760.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		757.71	-21.49	-19	Pass



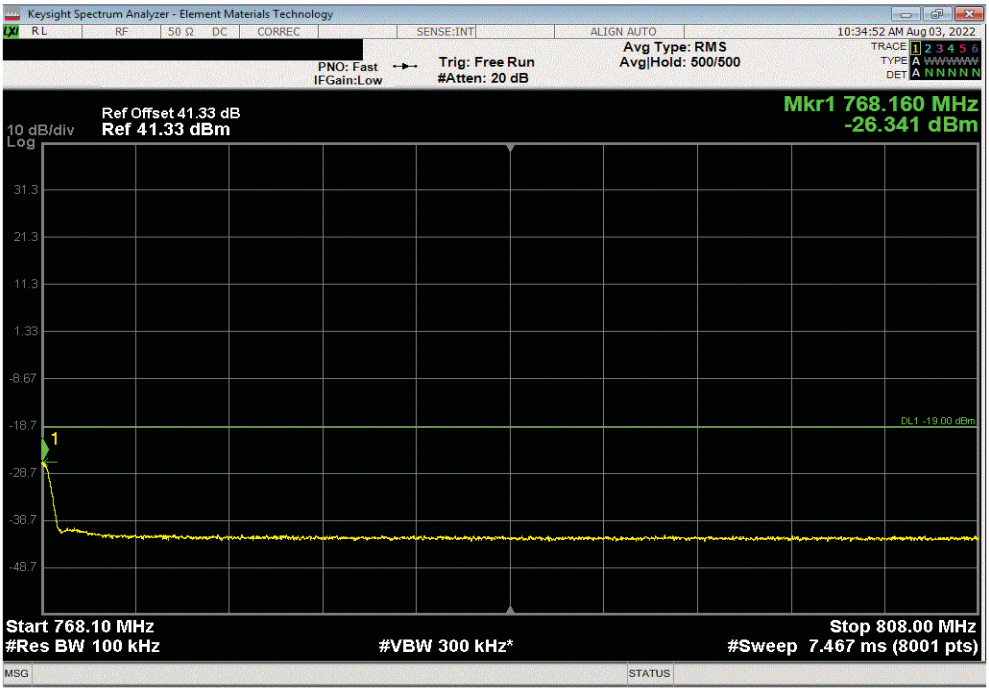
Port 2, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz

Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1		768	-29.97	-19	Pass

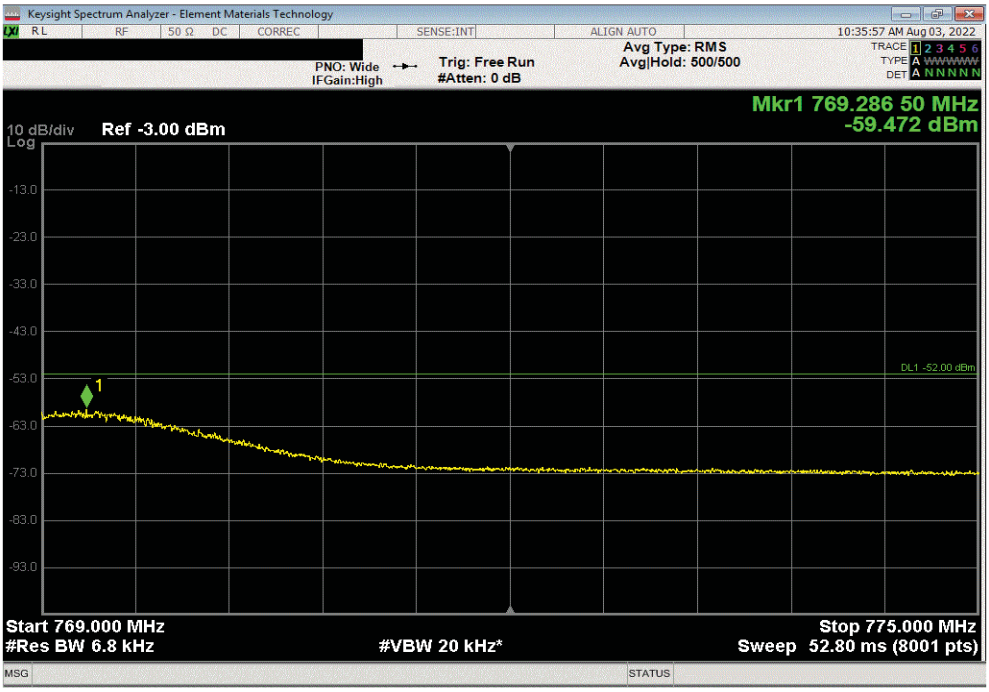


Port 2, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz

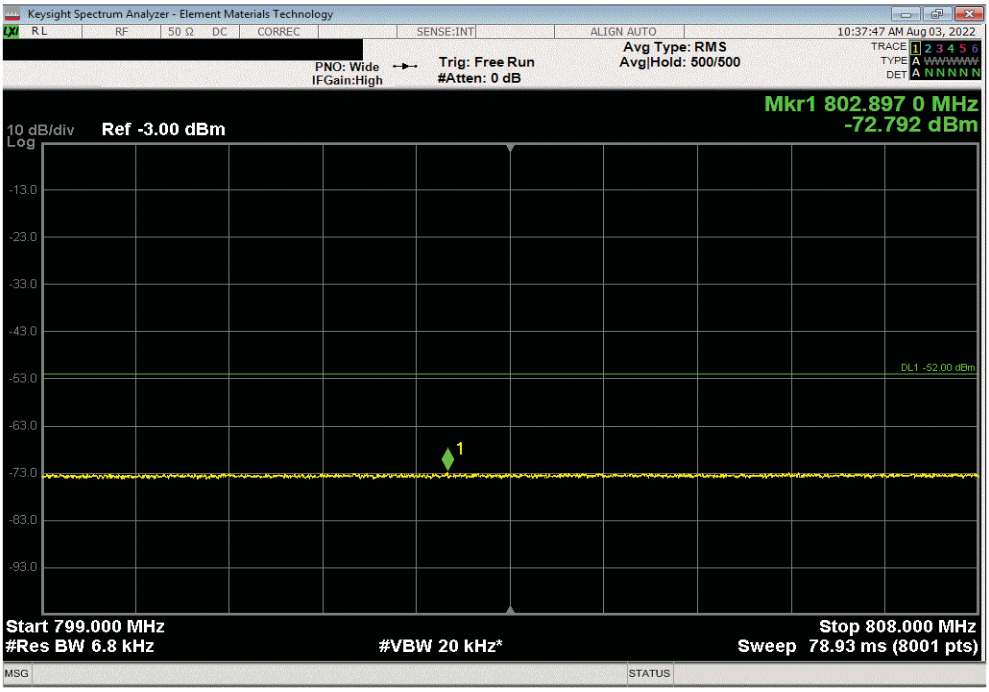
Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
2		768.16	-26.34	-19	Pass



Port 2, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	3		769.29	-59.47	-52	Pass



Port 2, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	4		802.9	-72.79	-52	Pass



BAND EDGE COMPLIANCE - MULTIBAND MULTICARRIER

XMit 2022.02.07.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3239	ANE	2022-03-02	2023-03-02
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2022-01-17	2023-01-17

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in the available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet. For Multiband operation, measurements were taken at the lower band edge of the lower band and the upper band edge of the upper band.

The spectrum was scanned below the lower band edge and above the higher band edge.

Per FCC section 27.53(g) and RSS 130 4.7.1, FCC section 90.543(e)(3) and RSS 140 4.4 the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm [-13 dBm -10 log (4)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter for 5G NR Band n12.

FCC section 27.53(g) and RSS 130 4.7.1, FCC section 90.543(e)(3) and RSS 140 4.4 requires a >100 kHz measurement bandwidth for emissions 100 kHz outside of the RRH operating frequency range. FCC section 27.53(g) and RSS 130 4.7.1, FCC section 90.543(e)(3) and RSS 140 4.4 requires a >30 kHz measurement bandwidth for emissions between 100 kHz outside of the RRH operating frequency range and band edge of the operating frequency range.

FCC 90.543(e)(1) and RSS 140 4.4a requires an emission limit of -46dBm for any 6.25 kHz bandwidth between frequency bands 769-775 MHz and 799-806 MHz (Note that the upper frequency for Part 90 is 805MHz and RSS 140 is 806MHz). The limit is adjusted to -52 dBm per 6.25kHz bandwidth [-46 dBm -10 log (4)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

Spectrum analyzer reference level offset corrections were applied for the Band n14 band edge measurements from 769MHz-775MHz and 799MHz to 808MHz.

AHLBBA antenna port s 1&4 are essentially electrically identical (the RF power variation between antenna ports is small as shown in the certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i, and 6.4.

AHLBBA antenna ports 2&3 are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 2 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

Multicarrier/Multiband test cases:
Multi-Carrier Test Case 1 (3GPP Band n12 Multicarrier): Three NR5 carriers using two carriers (with minimum spacing between carrier frequencies) at the lower band (731.5MHz & 736.5MHz) and a third carrier with maximum spacing between the other two carrier frequencies (742.5MHz) at the upper band edge. The NR 5Mhz channel bandwidth was selected to maximize carrier power spectral density. The carriers are operated at maximum power for a total port power of 80 watts (~26.6W/Band n12 carriers).
Multi-Carrier Test Case 2 (3GPP Band n12 and Band n14 Multicarrier/Multiband): In the Band n12 _ Two NR 5MHz carriers at the lower band edge (731.5 & 736.5MHz). In Band n14 one NR 5MHz carrier at the upper band edge 765.5MHz. The carriers are operated at maximum power for a total port power of 80 watts (~26.6W/Band n12/n14 carriers).

BAND EDGE COMPLIANCE - MULTIBAND MULTICARRIER

element

TbtTx 2022.05.02.0 XMit 2022.02.07.0

EUT:	AHLBBA (C2PC/C3PC FCC/ISED)			Work Order:	NOKI0047
Serial Number:	K9193514835			Date:	5-Aug-22
Customer:	Nokia Solutions and Networks			Temperature:	20.4 °C
Attendees:	Mitchell Hill			Humidity:	58.3% RH
Project:	None			Barometric Pres.:	1021 mbar
Tested by:	Marty Martin	Power:	54VDC	Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 27:2022	ANSI C63.26:2015
FCC 90R:2022	ANSI C63.26:2015
RSS-130 Issue 2: 2019 and RSS 140 Issue 1: 2018	ANSI C63.26:2015

COMMENTS

All measurement path losses were accounted for in the reference level offset including attenuators, cables, DC block and filter when in use. Band n12 and Band n14 carriers were operating at maximum power in each applicable test case to achieve a total port power of 80 watts.

DEVIATIONS FROM TEST STANDARD

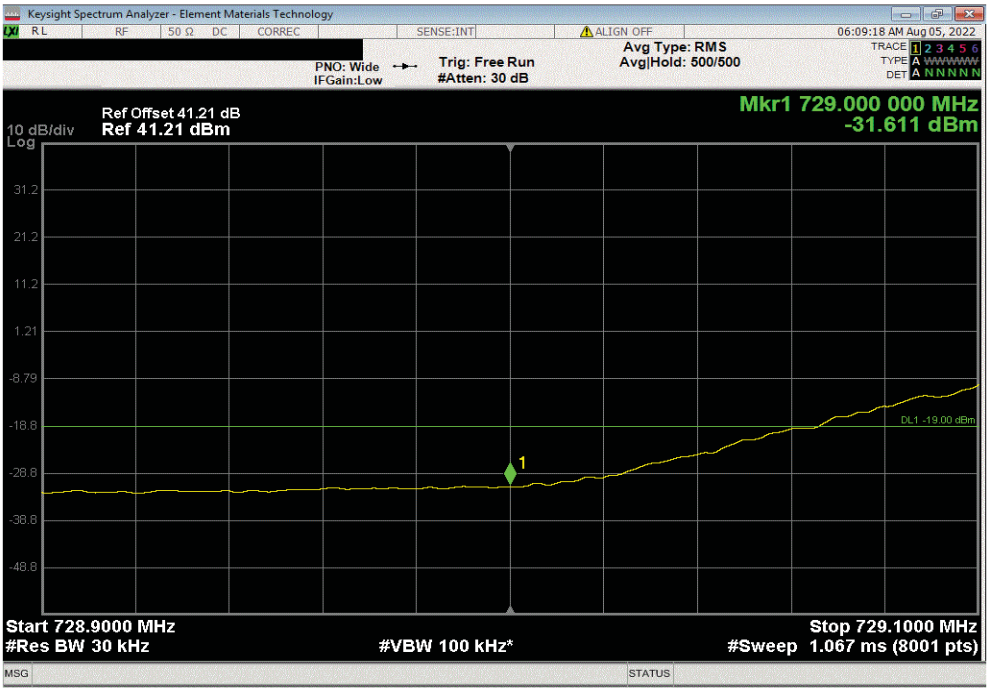
None

Configuration #	2, 4	Signature

	Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
Port 1, 5G NR, Multi-Carrier Test Case 1					
Band n12, 729 - 745 Mhz					
5 MHz Bandwidth					
QPSK Modulation					
Low Channel, 731.5 MHz	1	729	-31.6	-19	Pass
Low Channel, 731.5 MHz	2	728.78	-27.2	-19	Pass
High Channel, 742.5 MHz	1	745	-31.8	-19	Pass
High Channel, 742.5 MHz	2	745.39	-26.9	-19	Pass
Port 1, 5G NR, Multi-Carrier Test Case 2					
Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz					
5 MHz Bandwidth					
QPSK Modulation					
Low Channel, 731.5 MHz	1	729	-28.8	-19	Pass
Low Channel, 731.5 MHz	2	728.87	-24.4	-19	Pass
High Channel, 765.5 MHz	1	768	-29.1	-19	Pass
High Channel, 765.5 MHz	2	768.1	-25.3	-19	Pass
High Channel, 765.5 MHz	3	769.03	-54.5	-52	Pass
High Channel, 765.5 MHz	4	805.99	-73.0	-52	Pass
Port 2, 5G NR, Multi-Carrier Test Case 1					
Band n12, 729 - 745 Mhz					
5 MHz Bandwidth					
QPSK Modulation					
Low Channel, 731.5 MHz	1	729	-28.9	-19	Pass
Low Channel, 731.5 MHz	2	728.9	-24.0	-19	Pass
High Channel, 742.5 MHz	1	745	-27.3	-19	Pass
High Channel, 742.5 MHz	2	745.11	-22.8	-19	Pass
Port 2, 5G NR, Multi-Carrier Test Case 2					
Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz					
5 MHz Bandwidth					
QPSK Modulation					
Low Channel, 731.5 MHz	1	729	-26.5	-19	Pass
Low Channel, 731.5 MHz	2	728.72	-21.4	-19	Pass
High Channel, 765.5 MHz	1	768	-25.3	-19	Pass
High Channel, 765.5 MHz	2	768.11	-21.3	-19	Pass
High Channel, 765.5 MHz	3	769.37	-54.9	-52	Pass
High Channel, 765.5 MHz	4	806.33	-72.9	-52	Pass

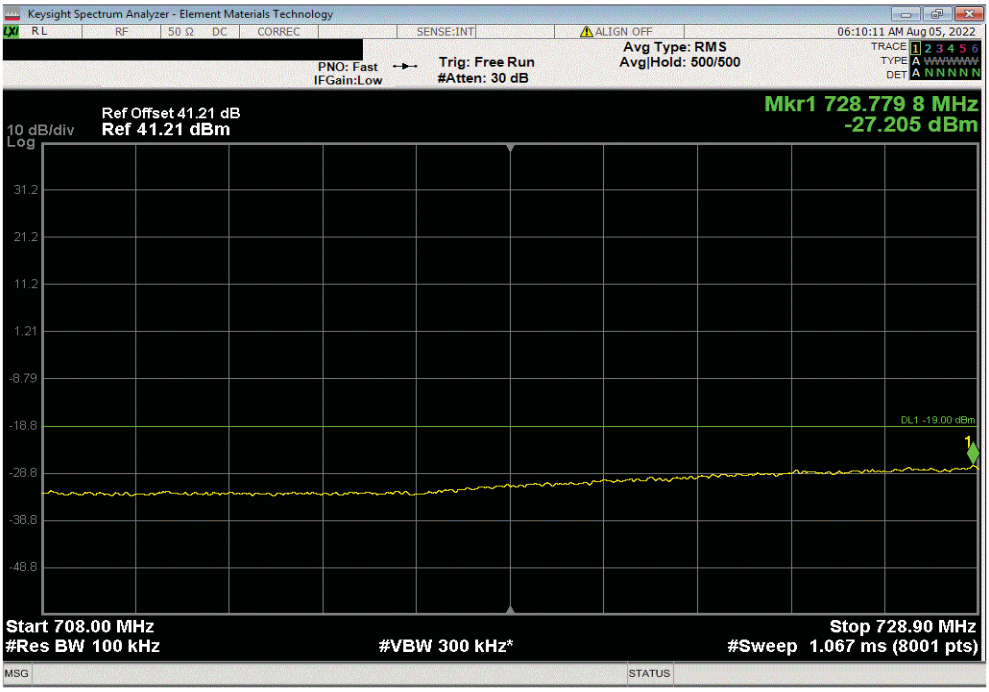
Port 1, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 731.5 MHz

Frequency Range			Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		729	-31.61	-19	Pass



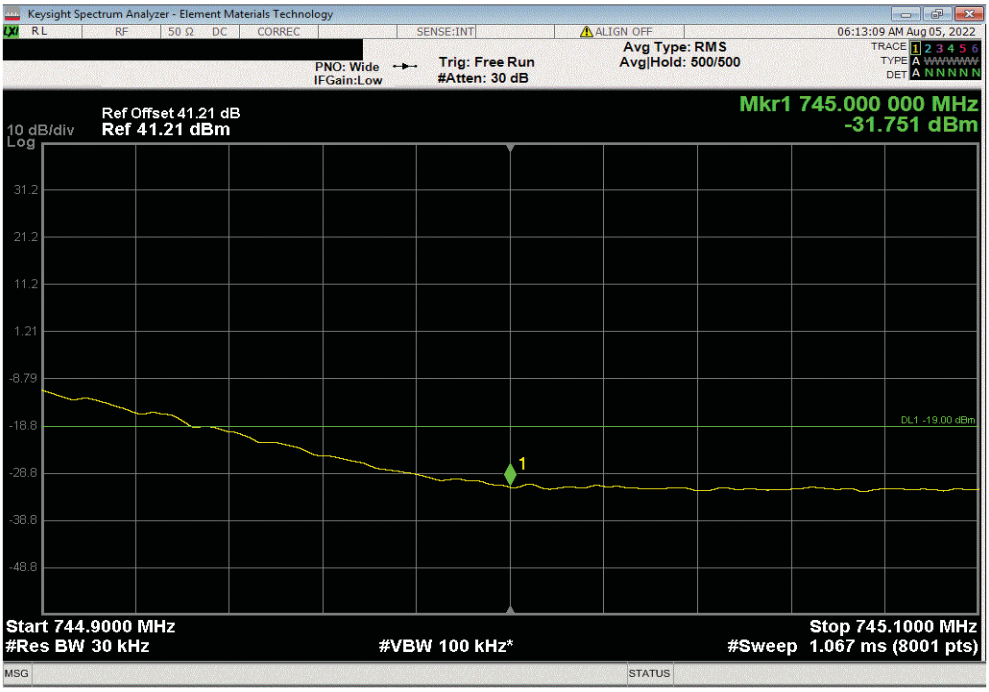
Port 1, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 731.5 MHz

Frequency Range			Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		728.78	-27.21	-19	Pass

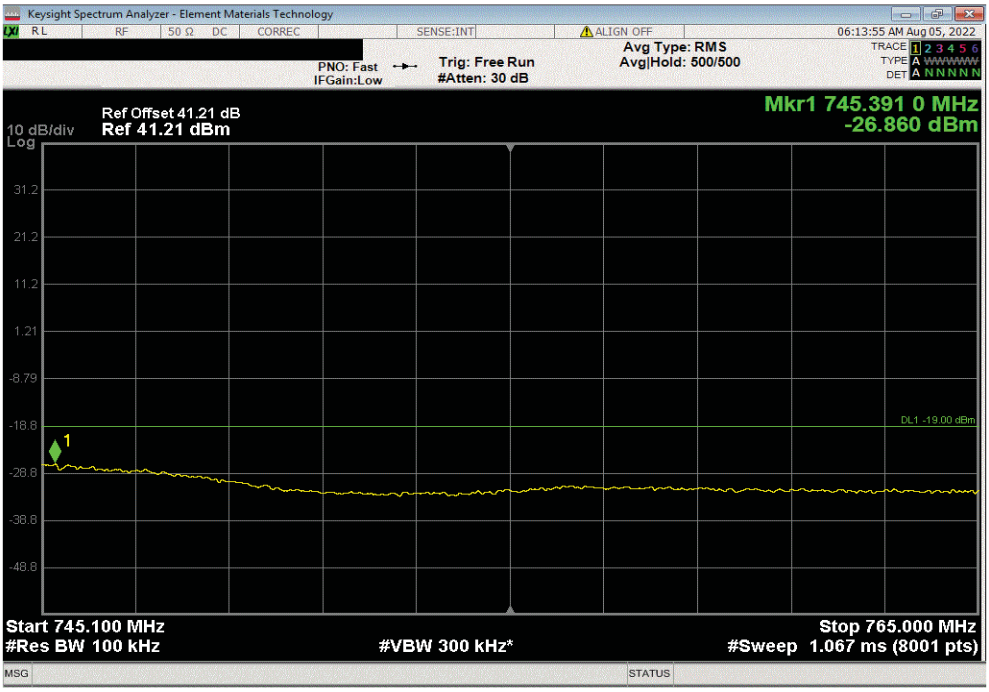


BAND EDGE COMPLIANCE - MULTIBAND MULTICARRIER

Port 1, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 742.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		745	-31.75	-19	Pass

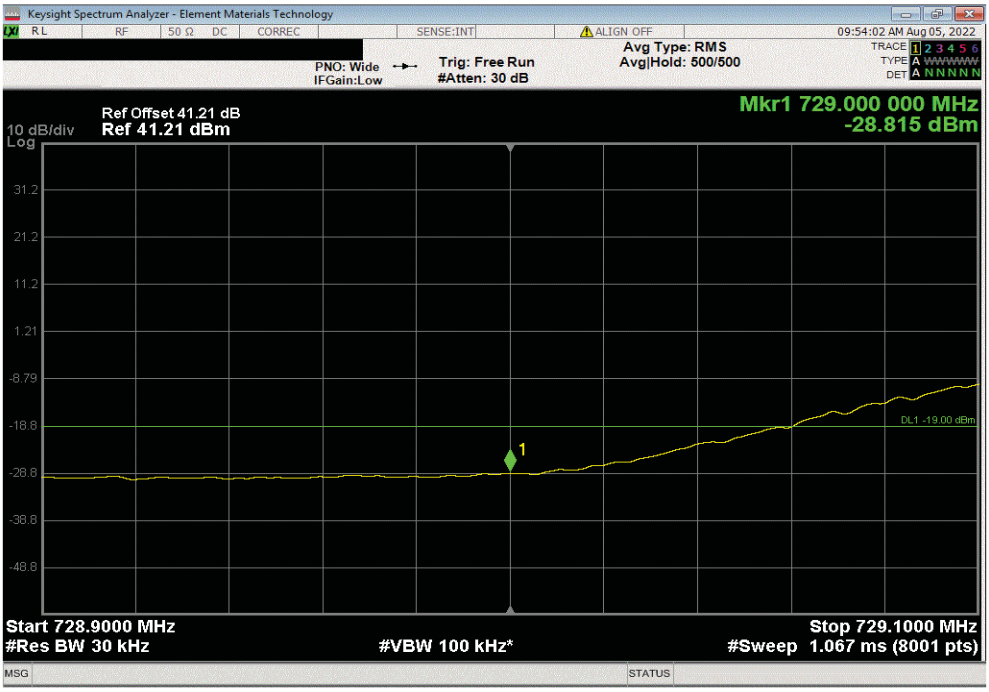


Port 1, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 742.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		745.39	-26.86	-19	Pass

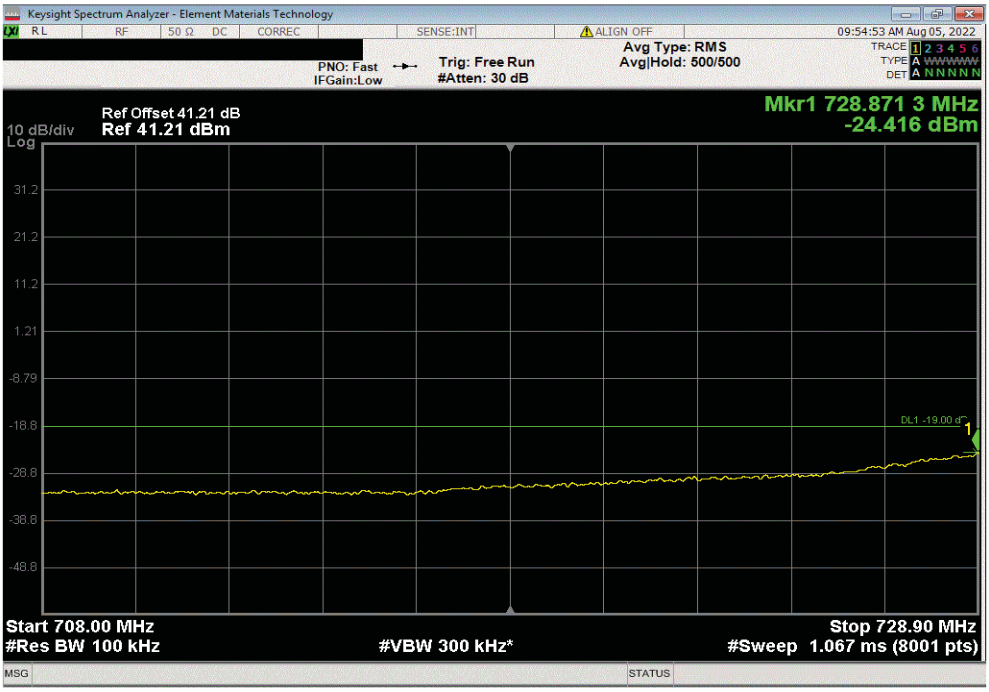


BAND EDGE COMPLIANCE - MULTIBAND MULTICARRIER

Port 1, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 731.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		729	-28.82	-19	Pass

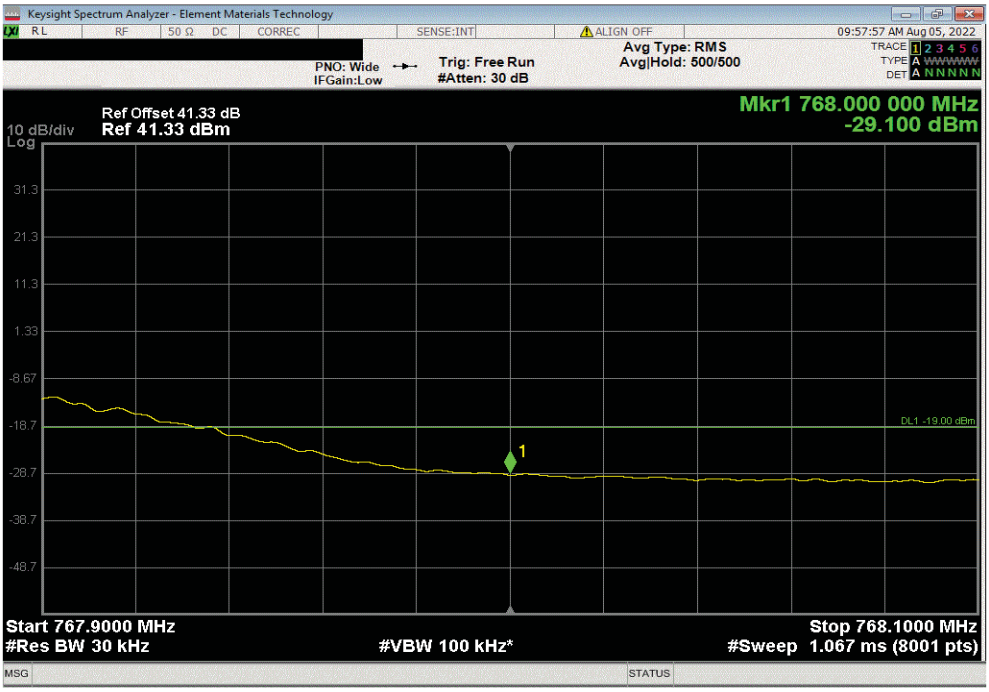


Port 1, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 731.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		728.87	-24.42	-19	Pass

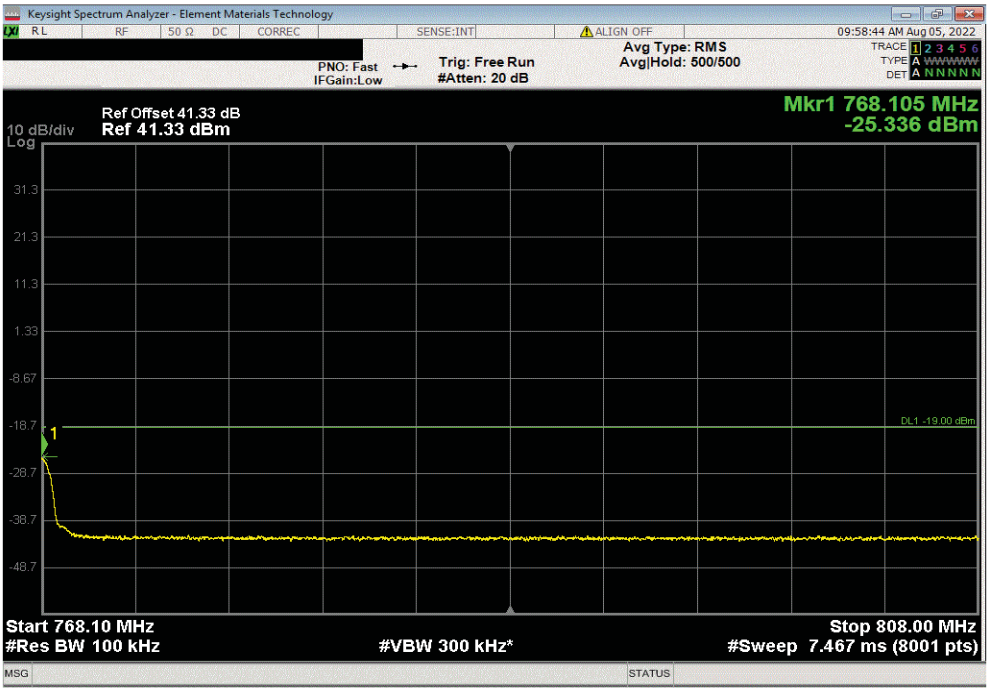


BAND EDGE COMPLIANCE - MULTIBAND MULTICARRIER

Port 1, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		768	-29.1	-19	Pass

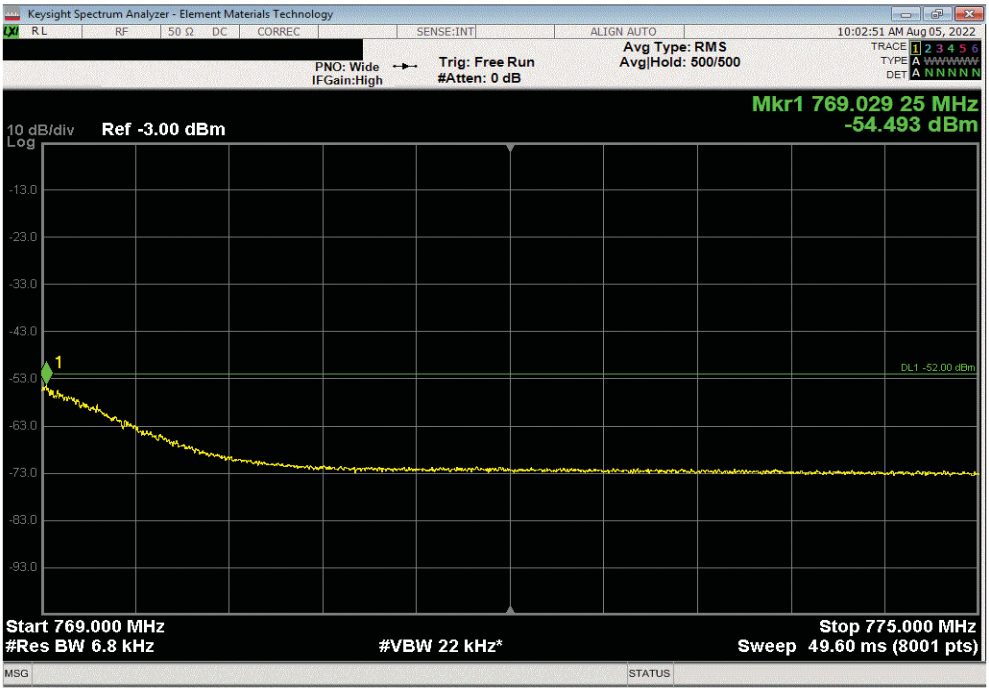


Port 1, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		768.1	-25.34	-19	Pass

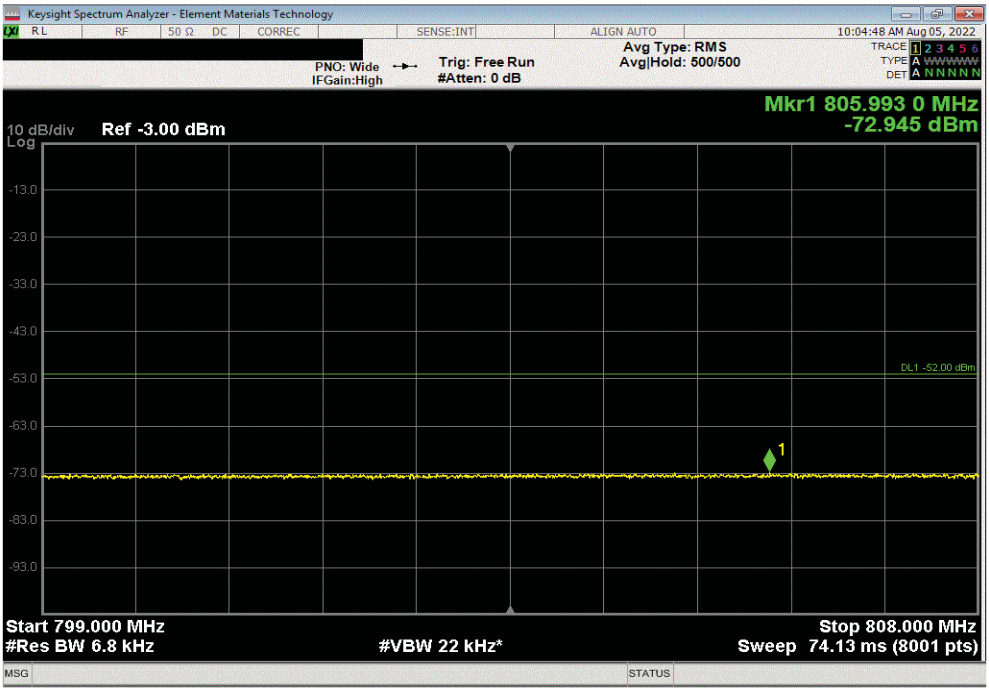


BAND EDGE COMPLIANCE - MULTIBAND MULTICARRIER

Port 1, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	3		769.03	-54.49	-52	Pass

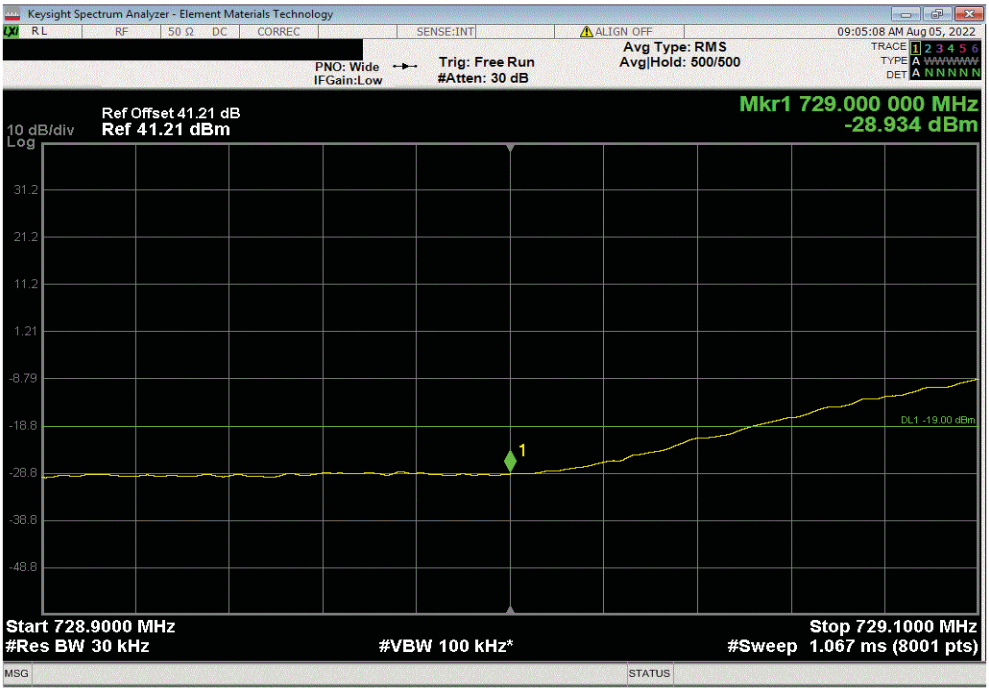


Port 1, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	4		805.99	-72.95	-52	Pass

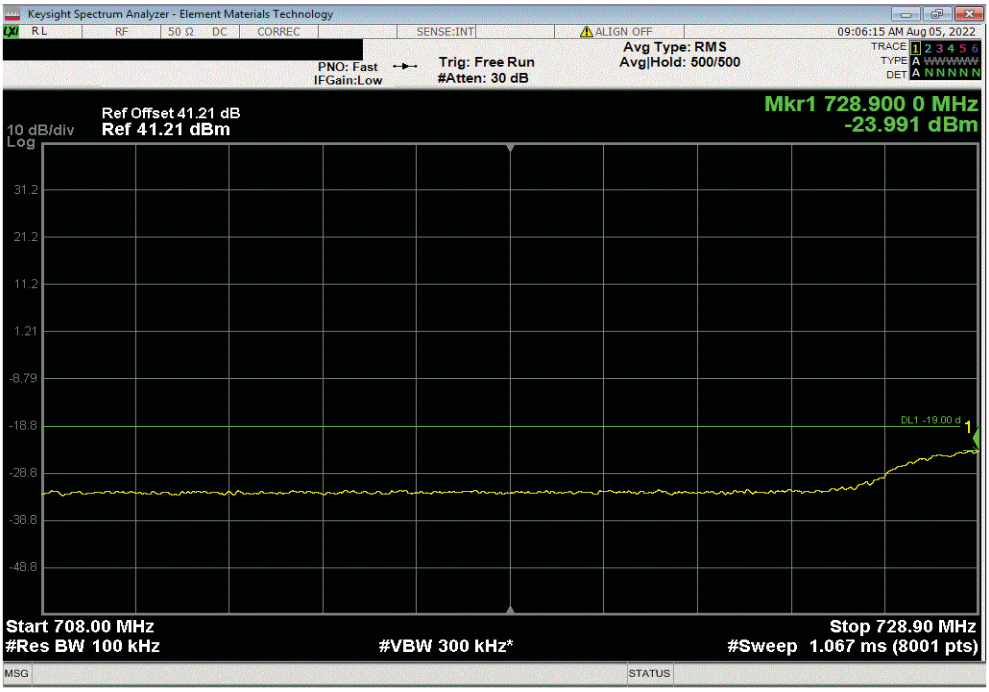


BAND EDGE COMPLIANCE - MULTIBAND MULTICARRIER

Port 2, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 731.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		729	-28.93	-19	Pass

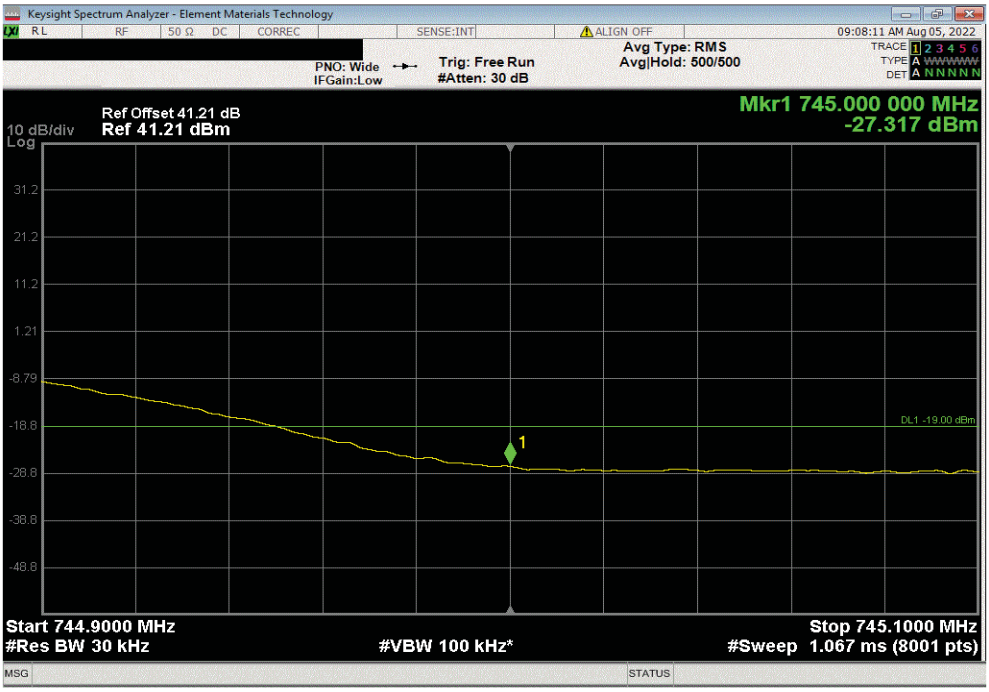


Port 2, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 731.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		728.9	-23.99	-19	Pass

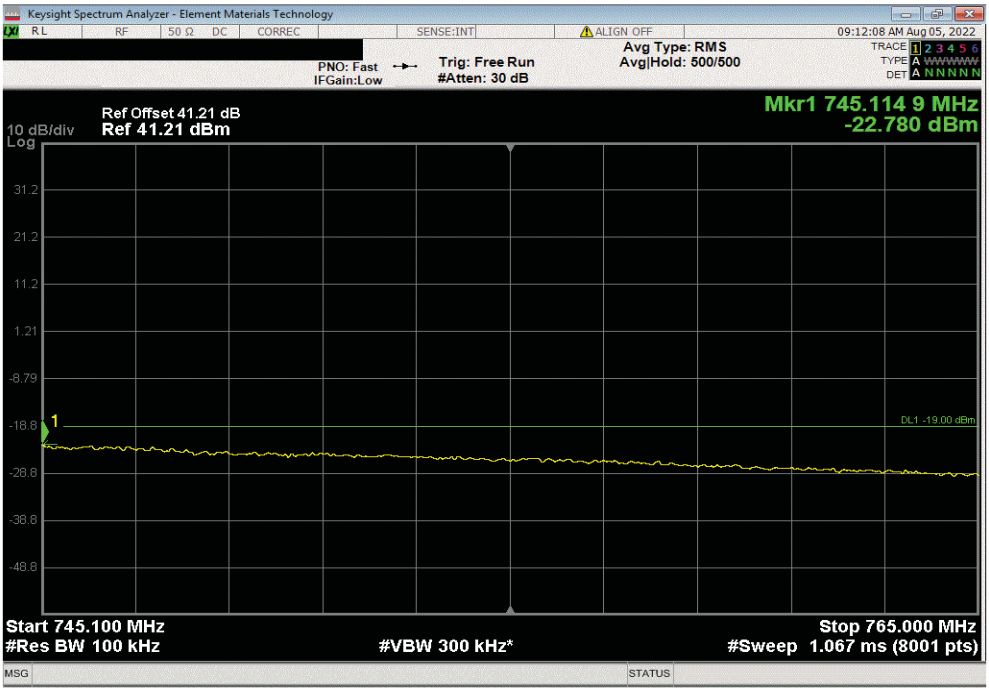


BAND EDGE COMPLIANCE - MULTIBAND MULTICARRIER

Port 2, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 742.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	3		745	-27.32	-19	Pass



Port 2, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 742.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	4		745.11	-22.78	-19	Pass

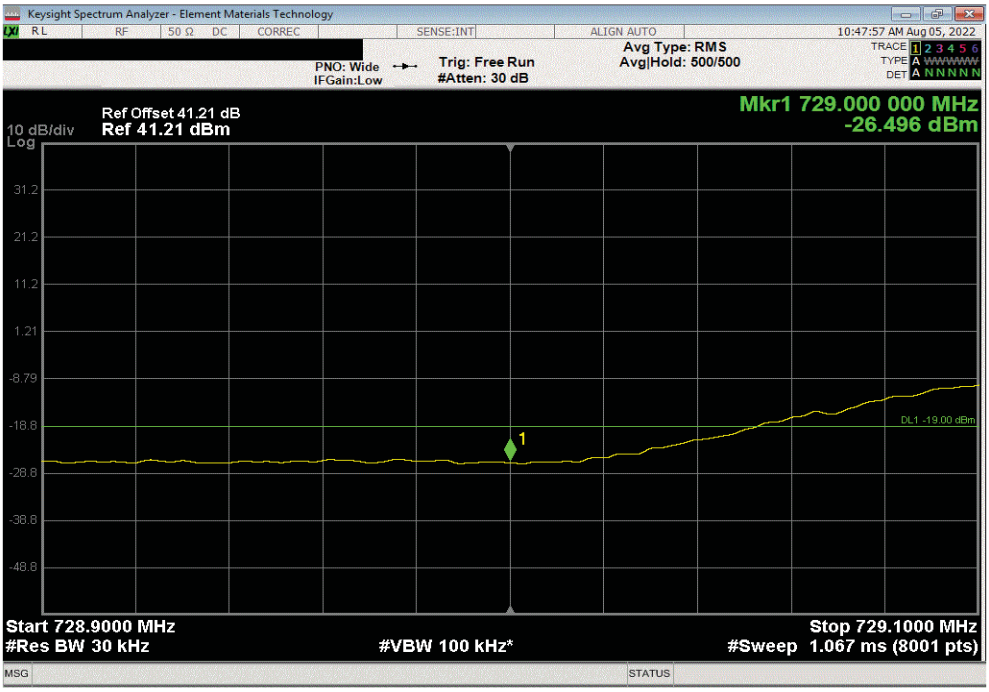


BAND EDGE COMPLIANCE - MULTIBAND MULTICARRIER

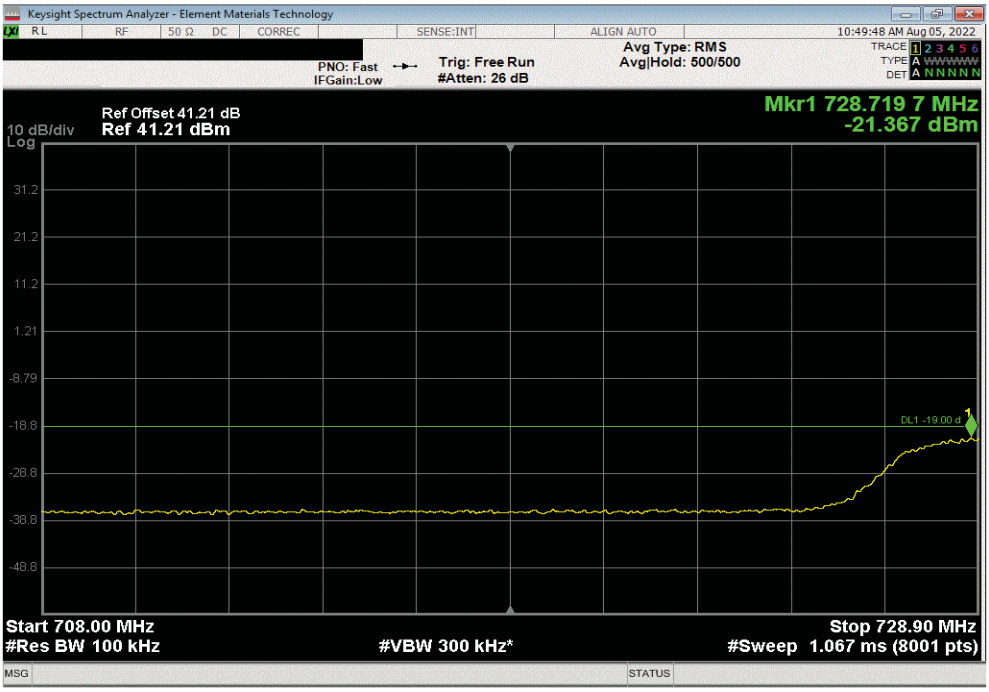
element

TbtTx 2022.05.02.0 XMit 2022.02.07.0

Port 2, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 731.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		729	-26.5	-19	Pass



Port 2, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 731.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		728.72	-21.37	-19	Pass

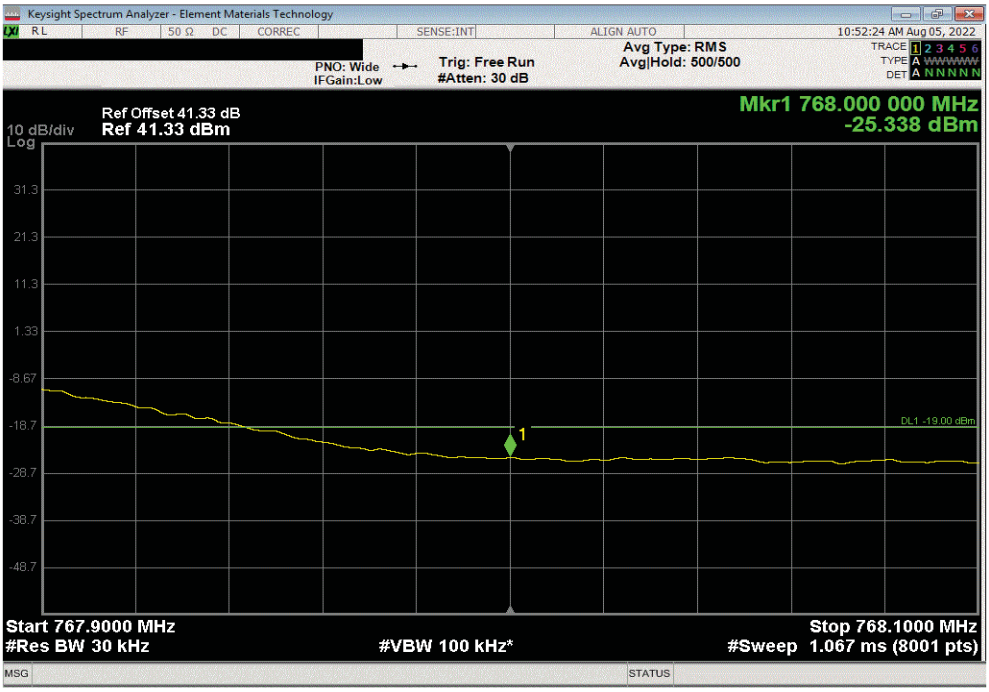


BAND EDGE COMPLIANCE - MULTIBAND MULTICARRIER

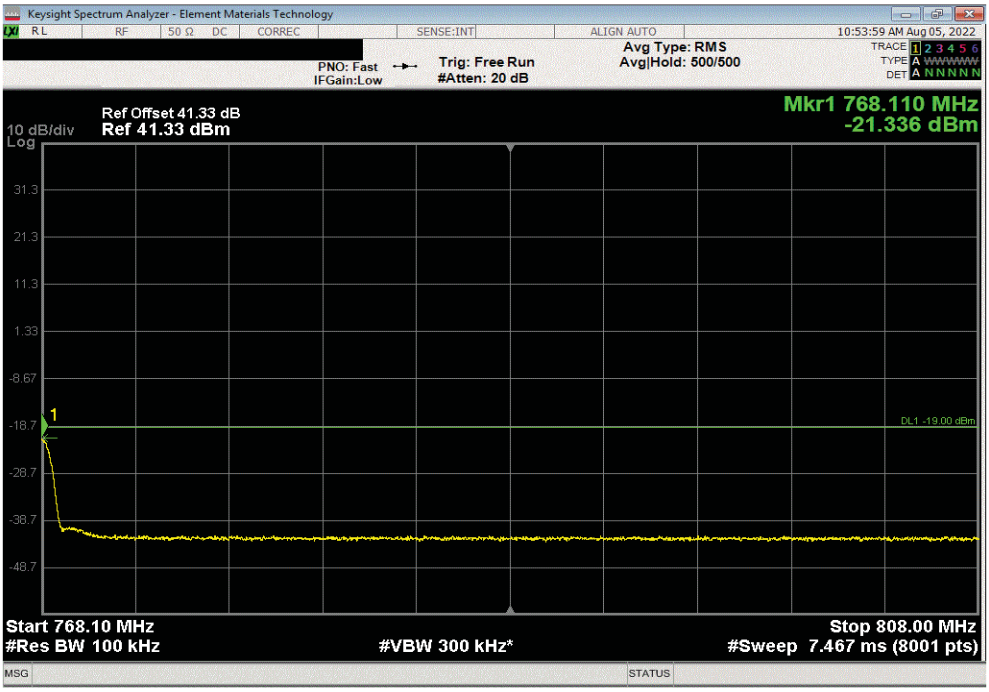
element

TbtTx 2022.05.02.0 XMit 2022.02.07.0

Port 2, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	1		768	-25.34	-19	Pass

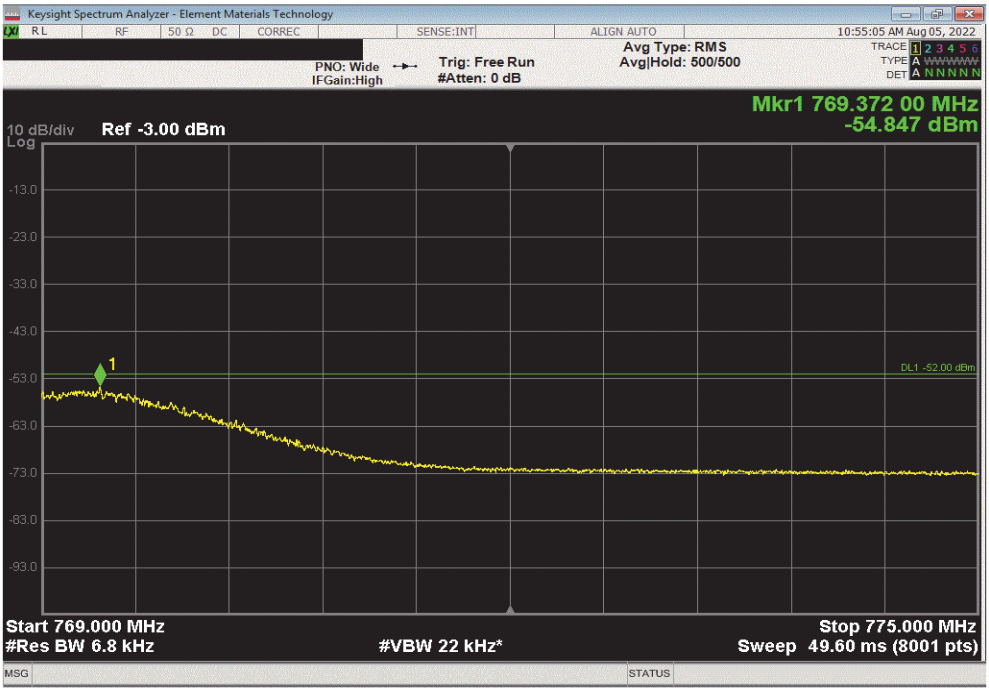


Port 2, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	2		768.11	-21.34	-19	Pass



BAND EDGE COMPLIANCE - MULTIBAND MULTICARRIER

Port 2, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	3		769.37	-54.85	-52	Pass



Port 2, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	4		806.33	-72.93	-52	Pass