SPURIOUS CONDUCTED EMISSIONS

XMit 2020.03.25.0

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
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	27-Feb-20	27-Feb-21
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Generator - Signal	Agilent	N5173B	TIW	5-Jul-17	5-Jul-20

TEST DESCRIPTION

The antenna port spurious emissions were measured at the RF output terminal of the EUT through 3 different attenuation configurations which continues through to the RF input of the spectrum analyzer. Analyzer plots utilizing a resolution bandwidth called out by the client's test plan were made for each modulation type from 9 KHz to 8 GHz. The peak conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, were investigated to ensure they were less than the limits also called out by the client's test plan shown below.

The measurement methods are detailed in KDB 971168 D01v03 section 6 and ANSI C63.26-2015.

Per FCC 2.1057(a)(1) and RSS Gen 6.13, the upper level of measurement is the 10th harmonic of the highest fundamental frequency.

These measurements are for the frequency band after the first 1.0 MHz bands immediately outside and adjacent to the frequency block.

Per section 27.53(g) and RSS 130 4.7, the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm for a 100kHz measurement bandwidth. 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.

The limit for the 9kHz to 150kHz frequency range was adjusted to –39dBm to correct for a spectrum analyzer RBW of 1kHz versus required RBW of 100kHz [i.e.: -39dBm = -19dBm -10log(100kHz/1kHz)]. The limit for the 150kHz to 20MHz frequency range was adjusted to –29dBm to correct for a spectrum analyzer RBW of 10kHz versus required RBW of 100kHz [i.e.: -29dBm = -19dBm -10log(100kHz/10kHz)]. The required limit of -19dBm with a RBW of > 100kHz was used for all other frequency ranges.

RF conducted emissions testing was performed only on one port. The testing was performed on the same version of hardware (AHBOA) as the original certification test. The AHBOA antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraph 5.7.2i.

SPURIOUS CONDUCTED EMISSIONS

element

TbtTx 2020.06.08.0 BETA XMit 2020.03.25.0

EUT:	Airscale Base Transceiver Station Remote Radio Head Model AHBOA	Work Order:	NOKI0017
Serial Number:	BL1943X1001	Date:	9-Jun-20
Customer:	Nokia Solutions and Networks	Temperature:	22.5 °C
Attendees:	Mitchell Hill, John Rattanavong	Humidity:	42.5% RH
Project:	None	Barometric Pres.:	1009 mbar
Tested by:	Brandon Hobbs	Power: 54 VDC	Job Site: TX05

TEST SPECIFICATIONS	Test Method
FCC 27:2020	ANSI C63.26:2015
RSS-130:2019	RSS-Gen:2019

COMMENTS

All measurement path losses were accounted for in the reference level offset including any attenuators, filters and DC blocks. The carrier power was set to maximum for all testing.

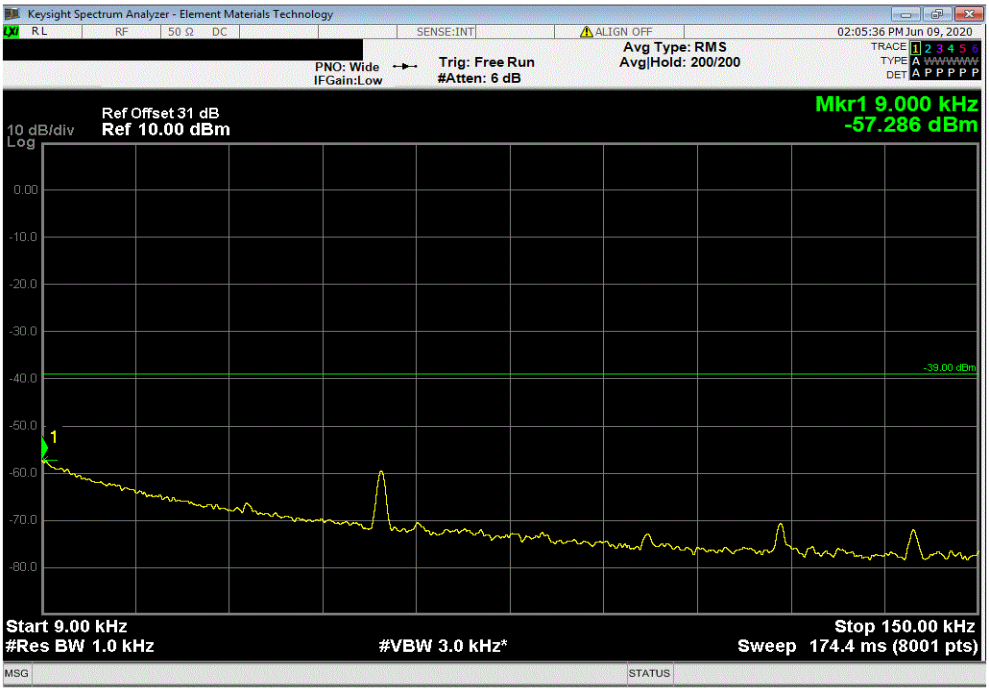
DEVIATIONS FROM TEST STANDARD

None

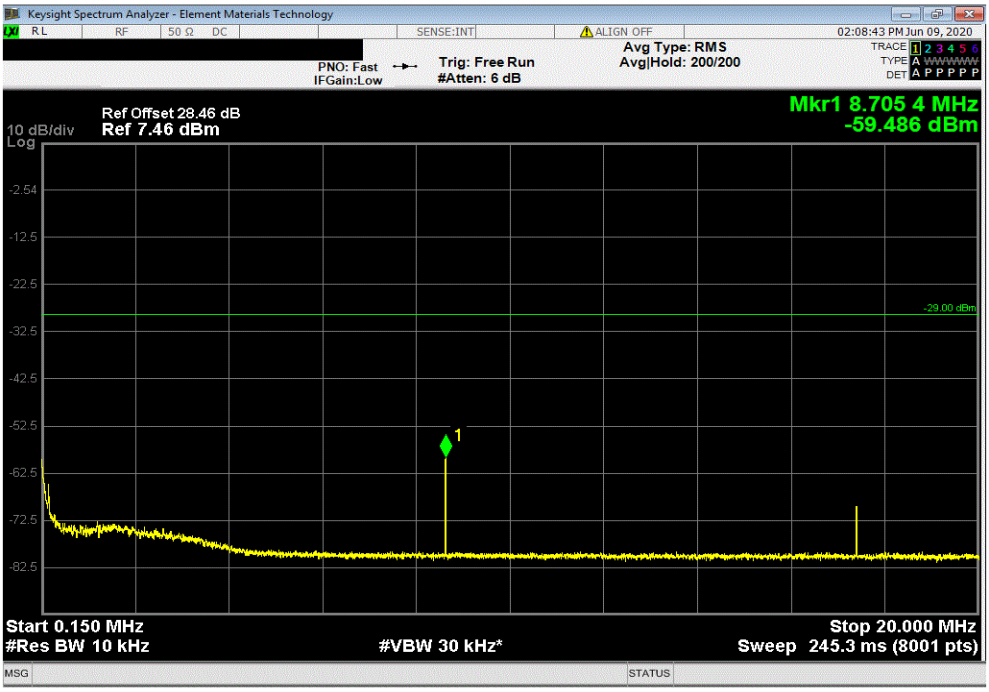
Configuration #	1,2,3	Signature

		Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
Port 1, Band 71, 617 MHz - 652 MHz						
5 MHz Bandwidth						
	QPSK Modulation					
	Mid Channel, 634.5 MHz	9 kHz - 150 kHz	0.01	-57.29	-39	Pass
	Mid Channel, 634.5 MHz	150 kHz - 20 MHz	8.71	-59.49	-29	Pass
	Mid Channel, 634.5 MHz	20 MHz - 600 MHz	435.99	-33.15	-19	Pass
	Mid Channel, 634.5 MHz	600 MHz - 800 MHz	743.83	-42.01	-19	Pass
	Mid Channel, 634.5 MHz	800 MHz - 1.2 GHz	822.45	-38.45	-19	Pass
	Mid Channel, 634.5 MHz	1.2 GHz - 8 GHz	3855.40	-36.90	-19	Pass
	16-QAM Modulation					
	Mid Channel, 634.5 MHz	9 kHz - 150 kHz	0.01	-57.70	-39	Pass
	Mid Channel, 634.5 MHz	150 kHz - 20 MHz	8.71	-59.39	-29	Pass
	Mid Channel, 634.5 MHz	20 MHz - 600 MHz	429.56	-35.12	-19	Pass
	Mid Channel, 634.5 MHz	600 MHz - 800 MHz	754.43	-41.64	-19	Pass
	Mid Channel, 634.5 MHz	800 MHz - 1.2 GHz	820.85	-38.93	-19	Pass
	Mid Channel, 634.5 MHz	1.2 GHz - 8 GHz	3839.25	-35.51	-19	Pass
	64-QAM Modulation					
	Mid Channel, 634.5 MHz	9 kHz - 150 kHz	0.01	-56.93	-39	Pass
	Mid Channel, 634.5 MHz	150 kHz - 20 MHz	8.71	-59.46	-29	Pass
	Mid Channel, 634.5 MHz	20 MHz - 600 MHz	429.71	-34.67	-19	Pass
	Mid Channel, 634.5 MHz	600 MHz - 800 MHz	747.68	-41.21	-19	Pass
	Mid Channel, 634.5 MHz	800 MHz - 1.2 GHz	813.55	-38.61	-19	Pass
	Mid Channel, 634.5 MHz	1.2 GHz - 8 GHz	3772.10	-36.38	-19	Pass
	256-QAM Modulation					
	Mid Channel, 634.5 MHz	9 kHz - 150 kHz	0.01	-57.05	-39	Pass
	Mid Channel, 634.5 MHz	150 kHz - 20 MHz	8.70	-59.49	-29	Pass
	Mid Channel, 634.5 MHz	20 MHz - 600 MHz	408.25	-35.16	-19	Pass
	Mid Channel, 634.5 MHz	600 MHz - 800 MHz	745.23	-41.02	-19	Pass
	Mid Channel, 634.5 MHz	800 MHz - 1.2 GHz	835.90	-38.03	-19	Pass
	Mid Channel, 634.5 MHz	1.2 GHz - 8 GHz	3853.70	-36.73	-19	Pass
10 MHz Bandwidth						
	256-QAM Modulation					
	Mid Channel, 634.5 MHz	9 kHz - 150 kHz	0.01	-57.07	-39	Pass
	Mid Channel, 634.5 MHz	150 kHz - 20 MHz	8.71	-59.51	-29	Pass
	Mid Channel, 634.5 MHz	20 MHz - 600 MHz	418.06	-34.47	-19	Pass
	Mid Channel, 634.5 MHz	600 MHz - 800 MHz	747.38	-40.75	-19	Pass
	Mid Channel, 634.5 MHz	800 MHz - 1.2 GHz	809.95	-38.17	-19	Pass
	Mid Channel, 634.5 MHz	1.2 GHz - 8 GHz	3904.70	-36.49	-19	Pass
15 MHz Bandwidth						
	256-QAM Modulation					
	Mid Channel, 634.5 MHz	9 kHz - 150 kHz	0.01	-57.16	-39	Pass
	Mid Channel, 634.5 MHz	150 kHz - 20 MHz	8.71	-59.48	-29	Pass
	Mid Channel, 634.5 MHz	20 MHz - 600 MHz	402.11	-34.48	-19	Pass
	Mid Channel, 634.5 MHz	600 MHz - 800 MHz	755.03	-41.69	-19	Pass
	Mid Channel, 634.5 MHz	800 MHz - 1.2 GHz	807.65	-38.76	-19	Pass
	Mid Channel, 634.5 MHz	1.2 GHz - 8 GHz	3726.20	-36.60	-19	Pass
20 MHz Bandwidth						
	256-QAM Modulation					
	Mid Channel, 634.5 MHz	9 kHz - 150 kHz	0.01	-57.54	-39	Pass
	Mid Channel, 634.5 MHz	150 kHz - 20 MHz	8.71	-59.52	-29	Pass
	Mid Channel, 634.5 MHz	20 MHz - 600 MHz	413.03	-35.18	-19	Pass
	Mid Channel, 634.5 MHz	600 MHz - 800 MHz	754.30	-40.97	-19	Pass
	Mid Channel, 634.5 MHz	800 MHz - 1.2 GHz	827.70	-38.37	-19	Pass
	Mid Channel, 634.5 MHz	1.2 GHz - 8 GHz	3796.75	-36.99	-19	Pass

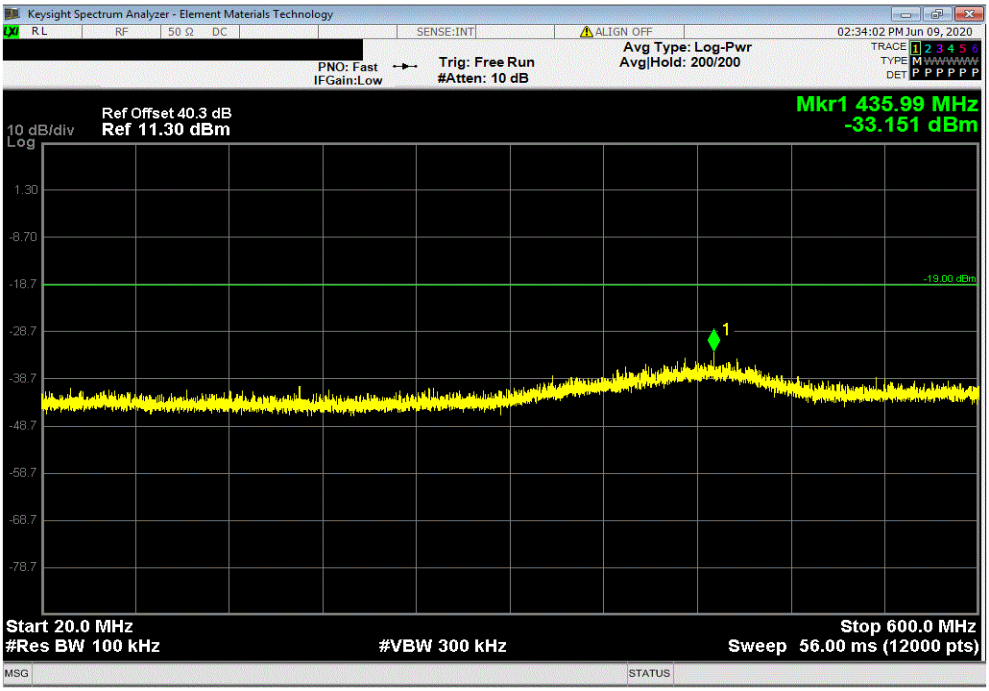
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 634.5 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBm)**	**Limit < (dBm)**	**Result**
9 kHz - 150 kHz	0.01	-57.29	-39	Pass



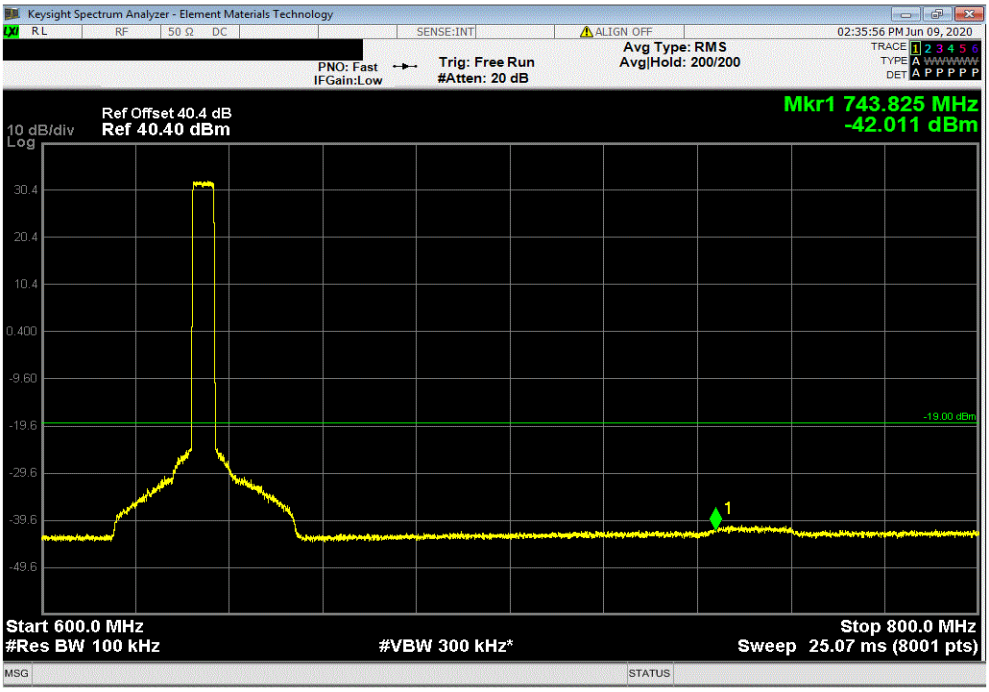
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 634.5 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBm)**	**Limit < (dBm)**	**Result**
150 kHz - 20 MHz	8.71	-59.49	-29	Pass



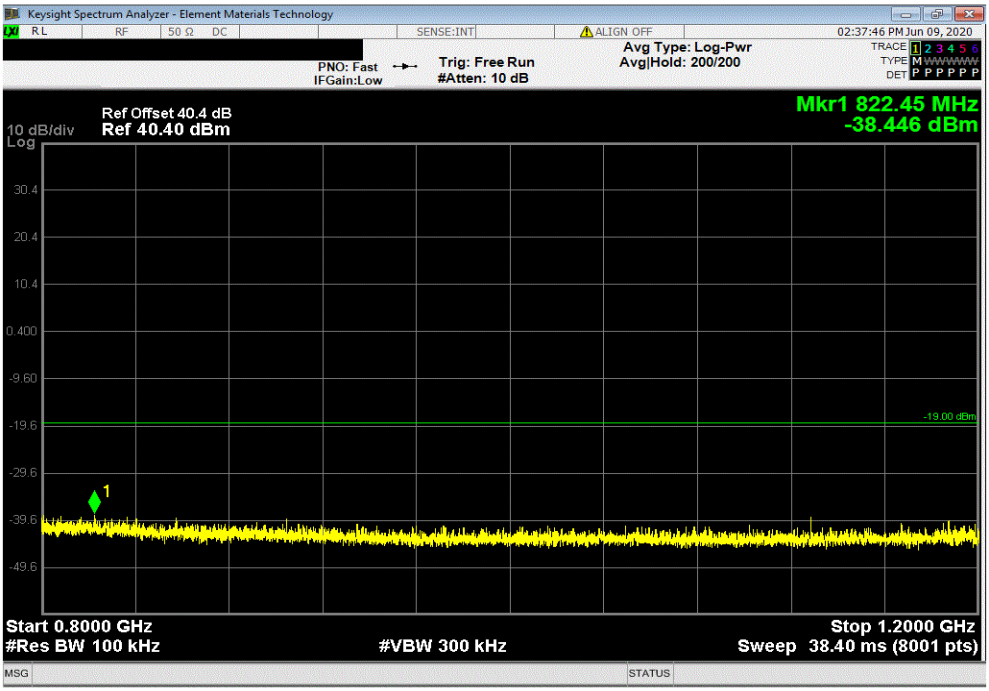
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 634.5 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBm)**	**Limit < (dBm)**	**Result**
20 MHz - 600 MHz	435.99	-33.15	-19	Pass



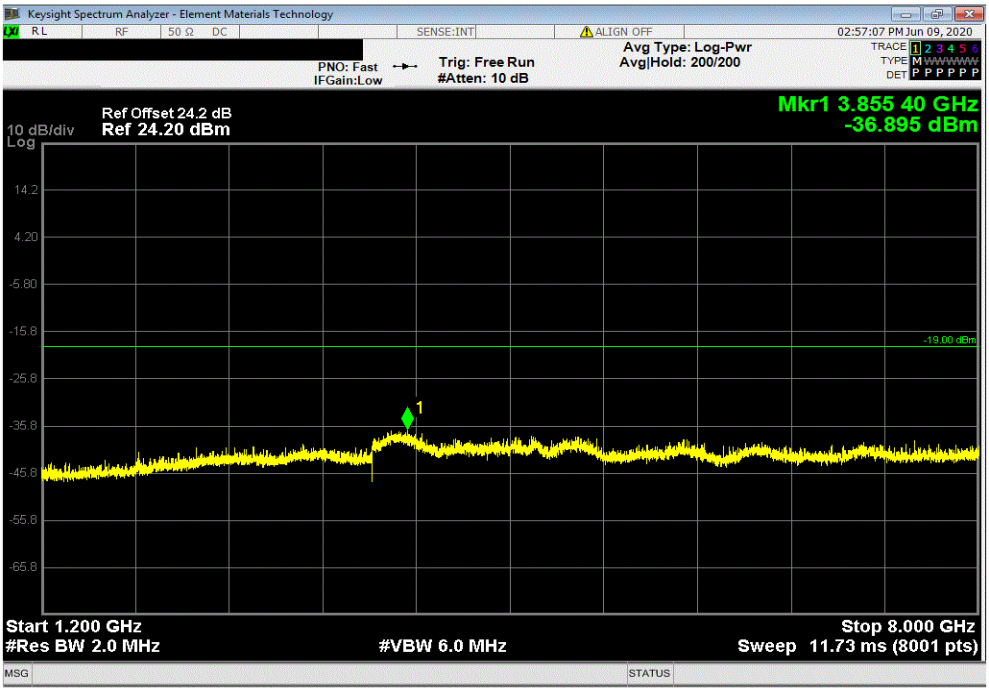
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 634.5 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBm)**	**Limit < (dBm)**	**Result**
600 MHz - 800 MHz	743.83	-42.01	-19	Pass



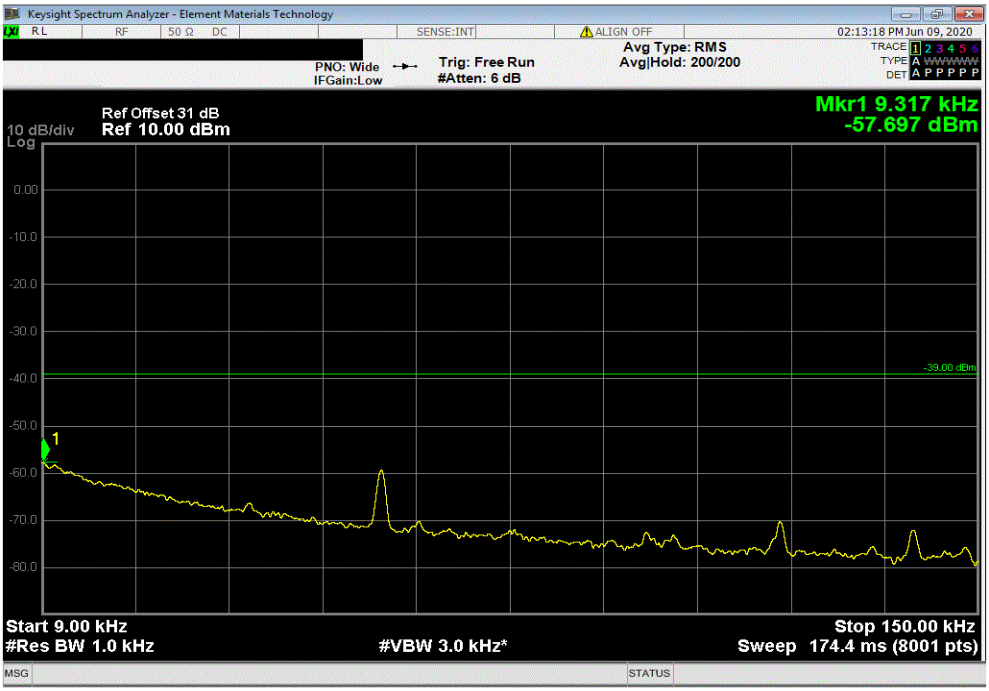
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 634.5 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBm)**	**Limit < (dBm)**	**Result**
800 MHz - 1.2 GHz	822.45	-38.45	-19	Pass



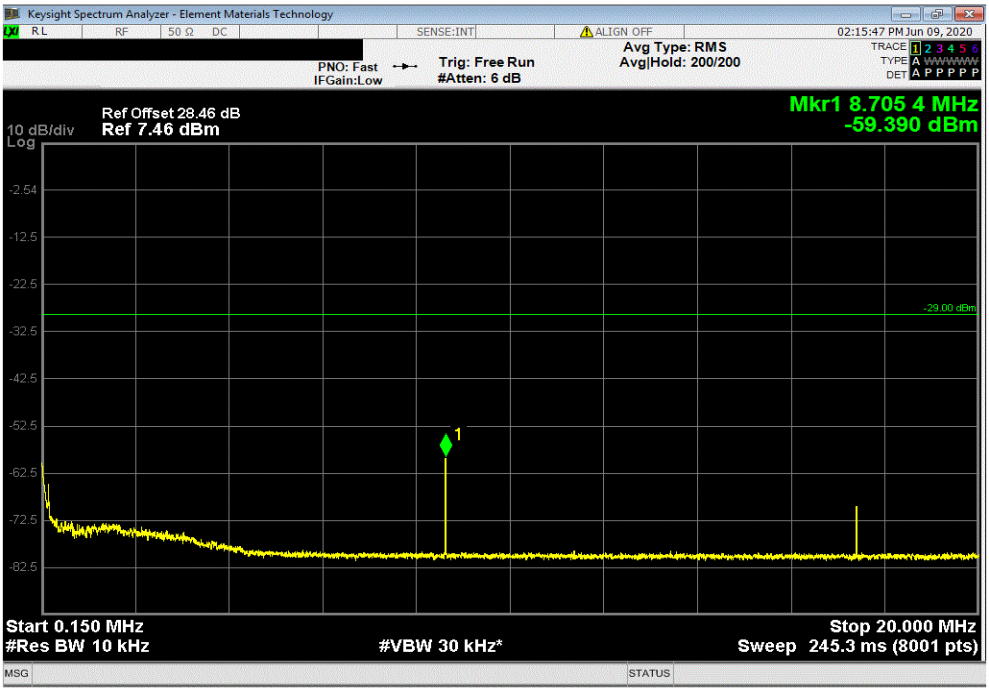
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 634.5 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBm)**	**Limit < (dBm)**	**Result**
1.2 GHz - 8 GHz	3855.4	-36.9	-19	Pass



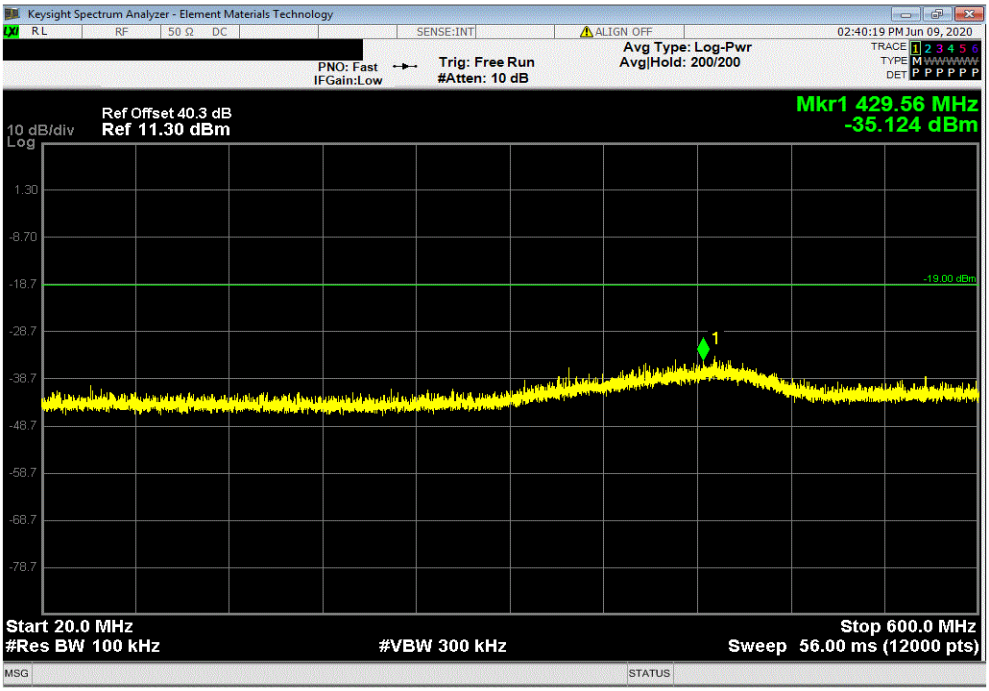
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 634.5 MHz					
	Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	9 kHz - 150 kHz	0.01	-57.7	-39	Pass



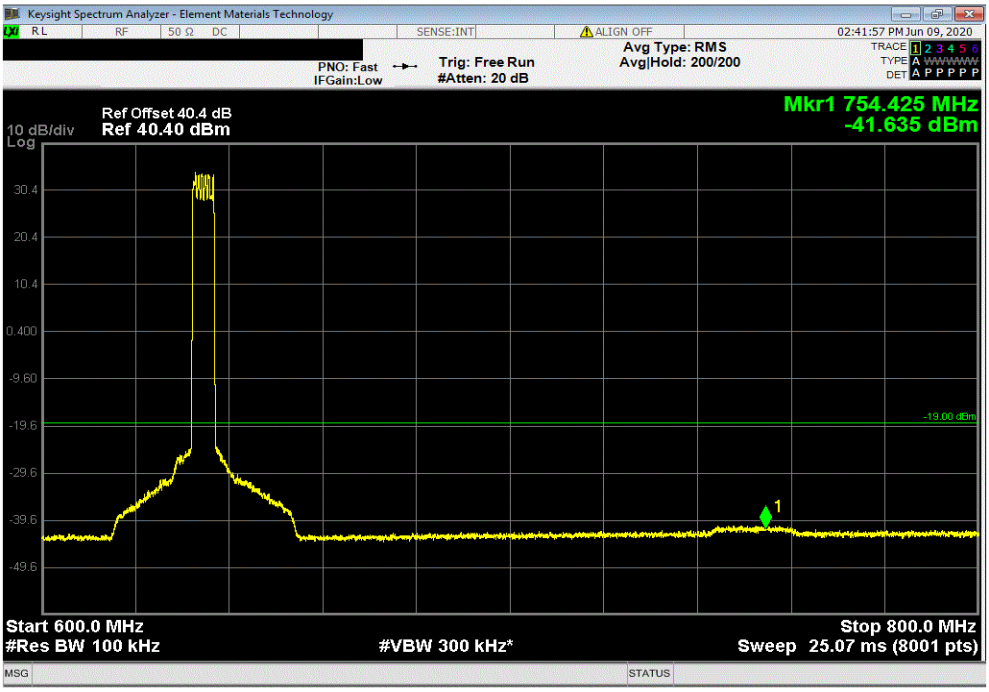
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 634.5 MHz					
	Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
	150 kHz - 20 MHz	8.71	-59.39	-29	Pass



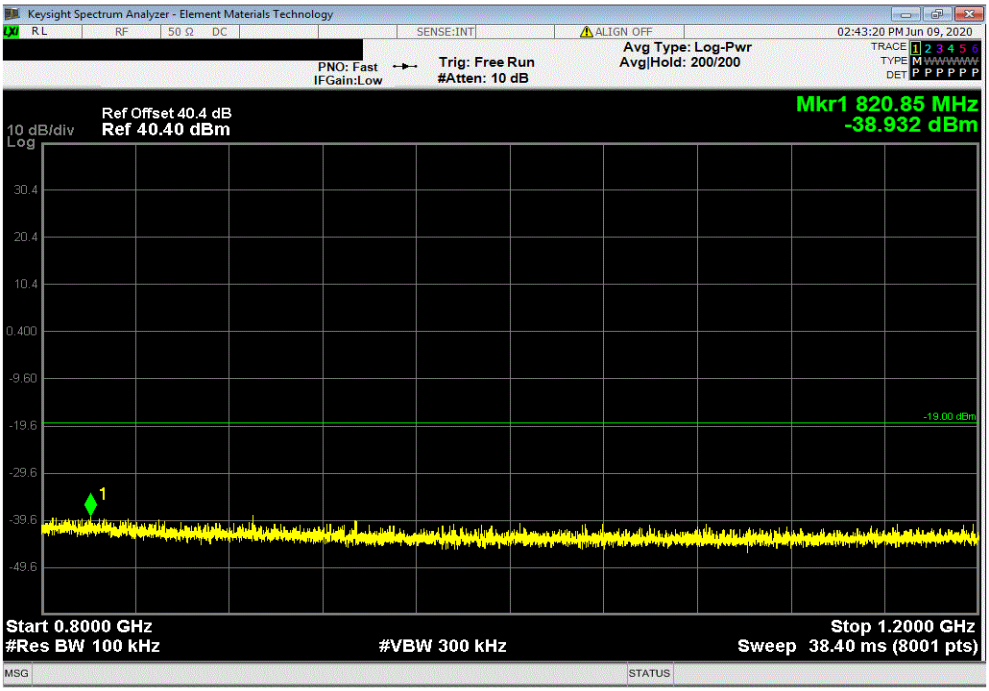
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 600 MHz	429.56	-35.12	-19	Pass



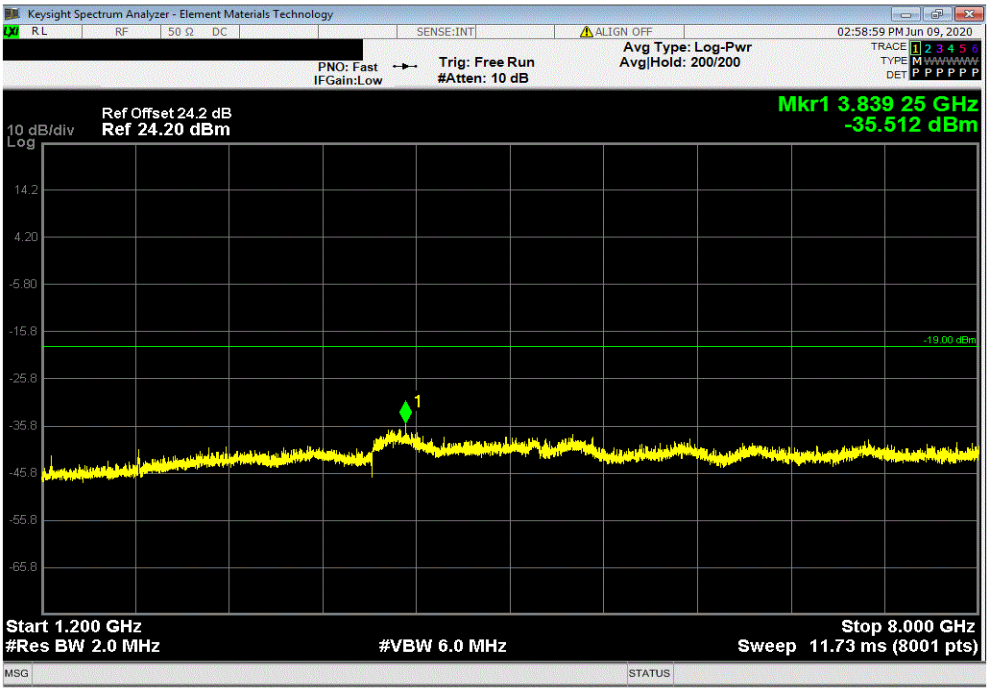
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
600 MHz - 800 MHz	754.43	-41.64	-19	Pass



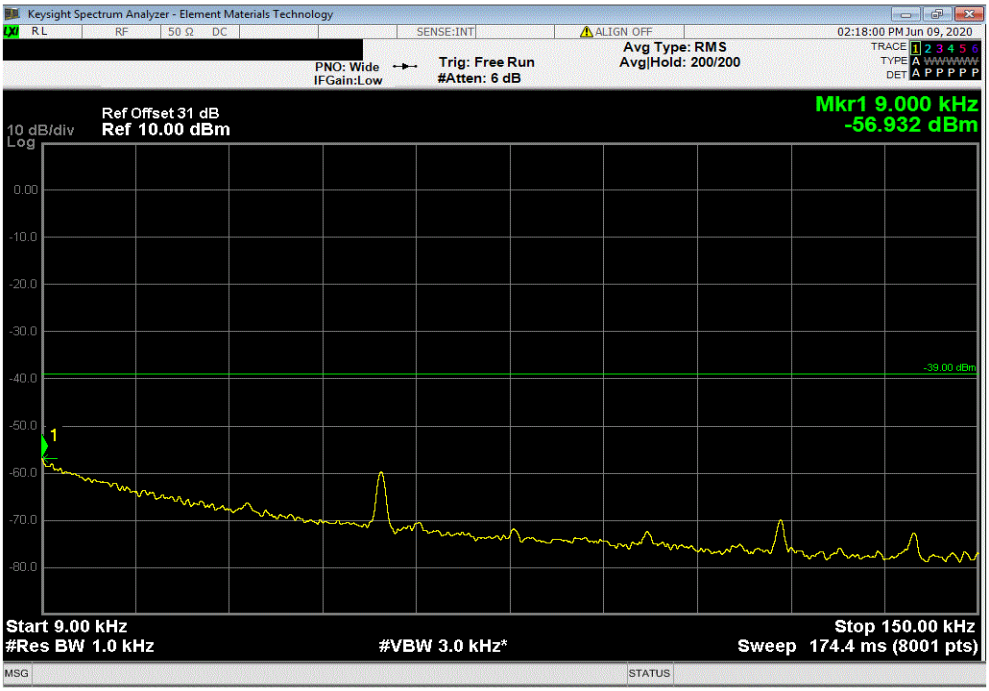
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
800 MHz - 1.2 GHz	820.85	-38.93	-19	Pass



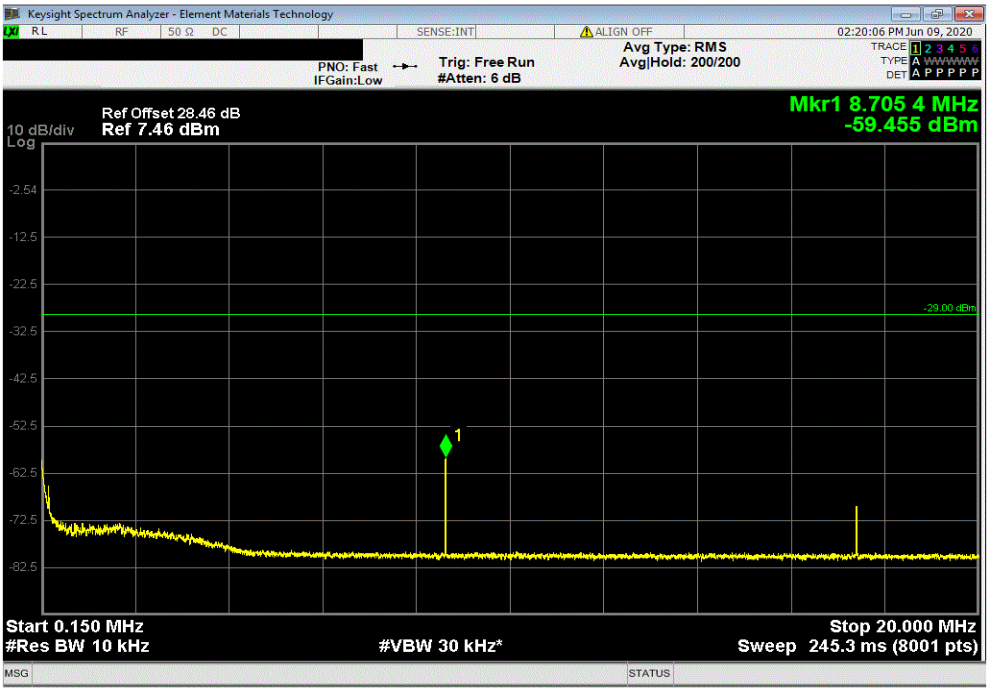
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	3839.25	-35.51	-19	Pass



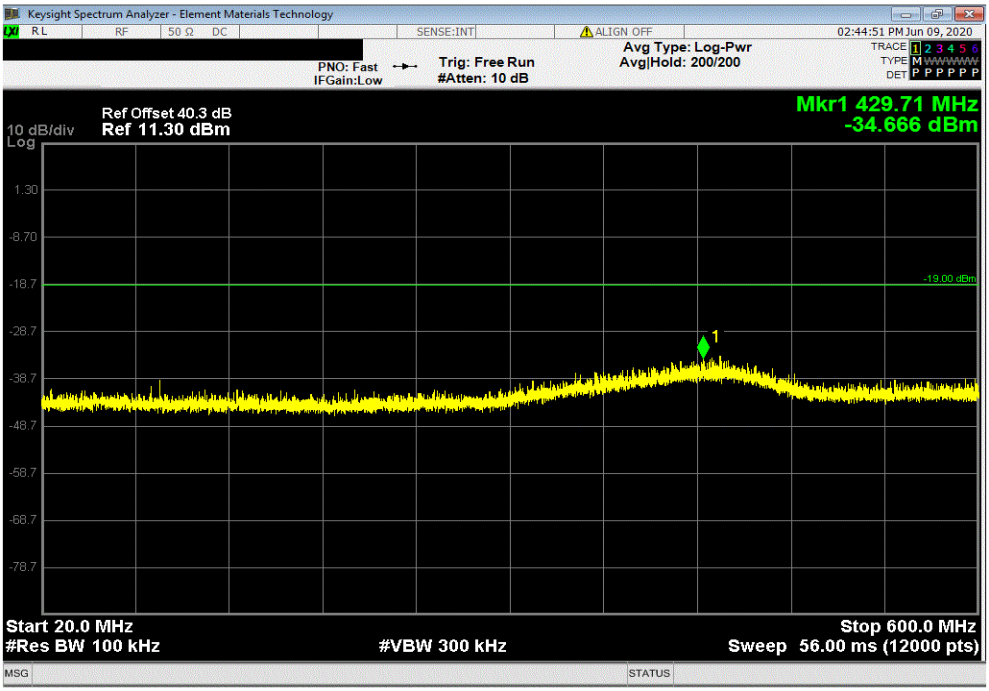
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 634.5 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
9 kHz - 150 kHz		0.01	-56.93	-39	Pass



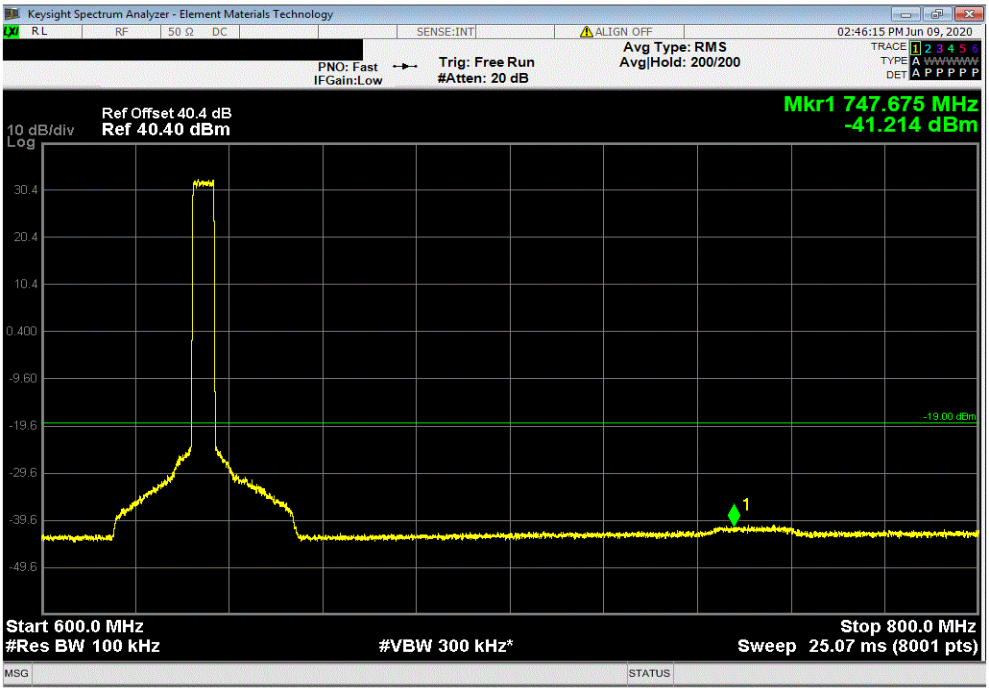
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
150 kHz - 20 MHz	8.71	-59.46	-29	Pass



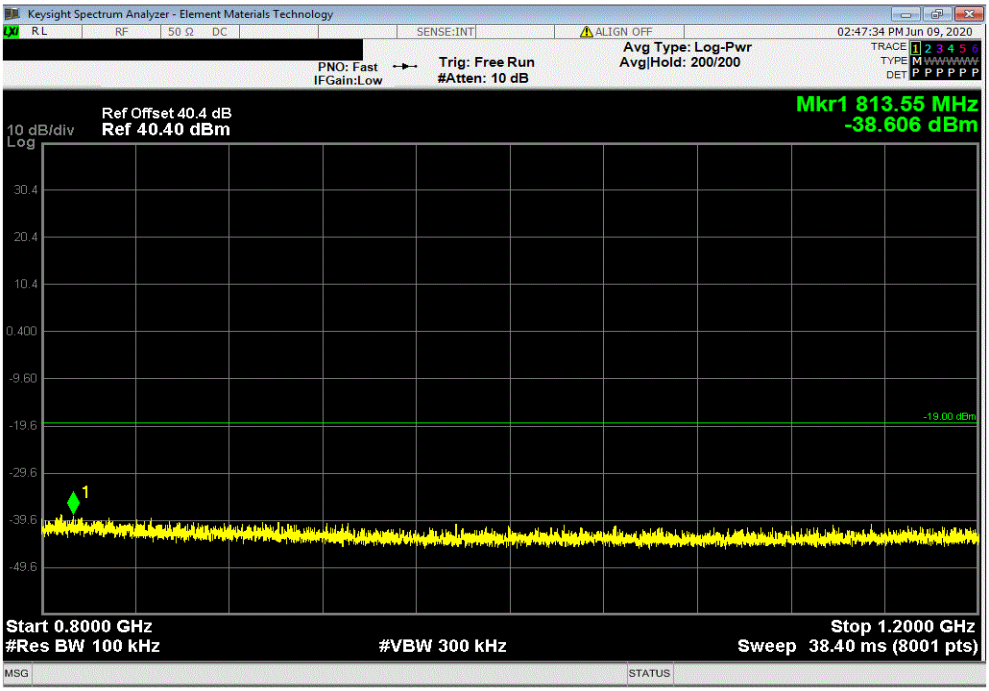
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 600 MHz	429.71	-34.67	-19	Pass



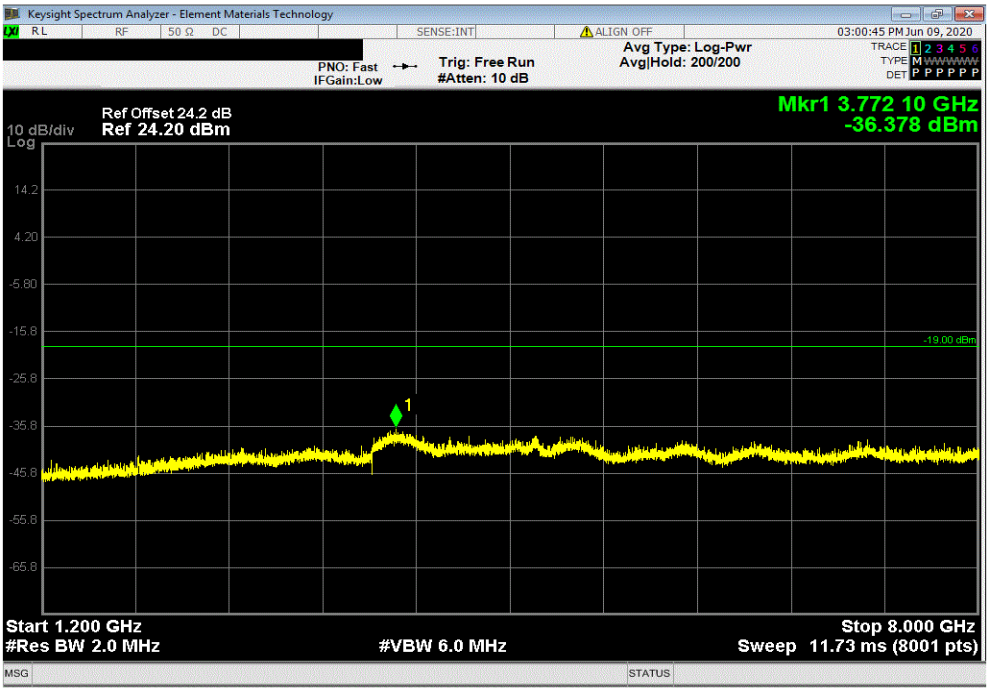
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
600 MHz - 800 MHz	747.68	-41.21	-19	Pass



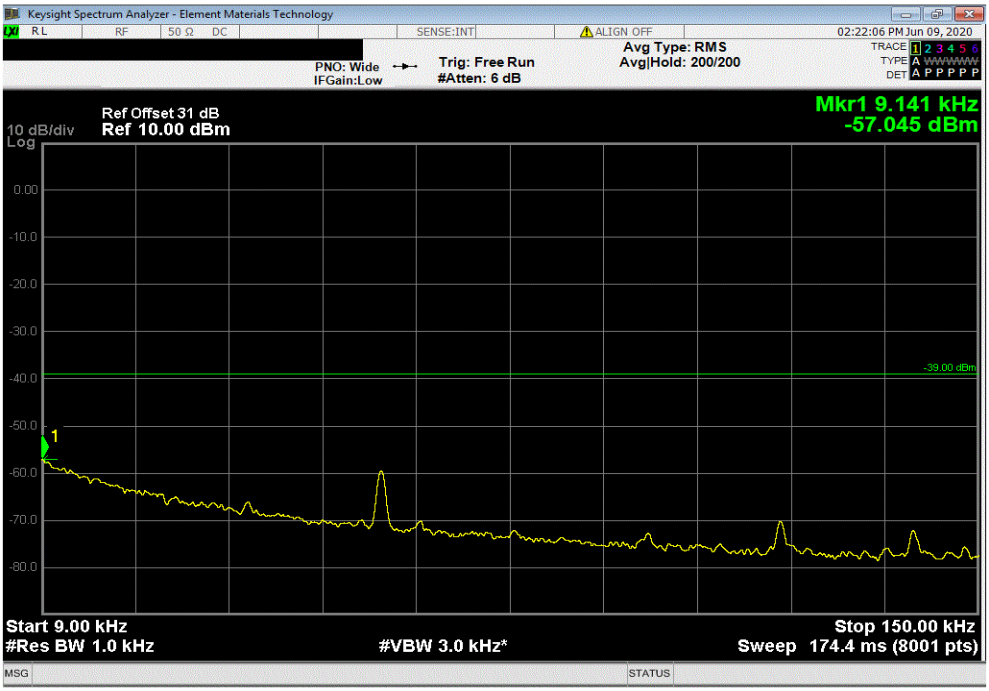
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
800 MHz - 1.2 GHz	813.55	-38.61	-19	Pass



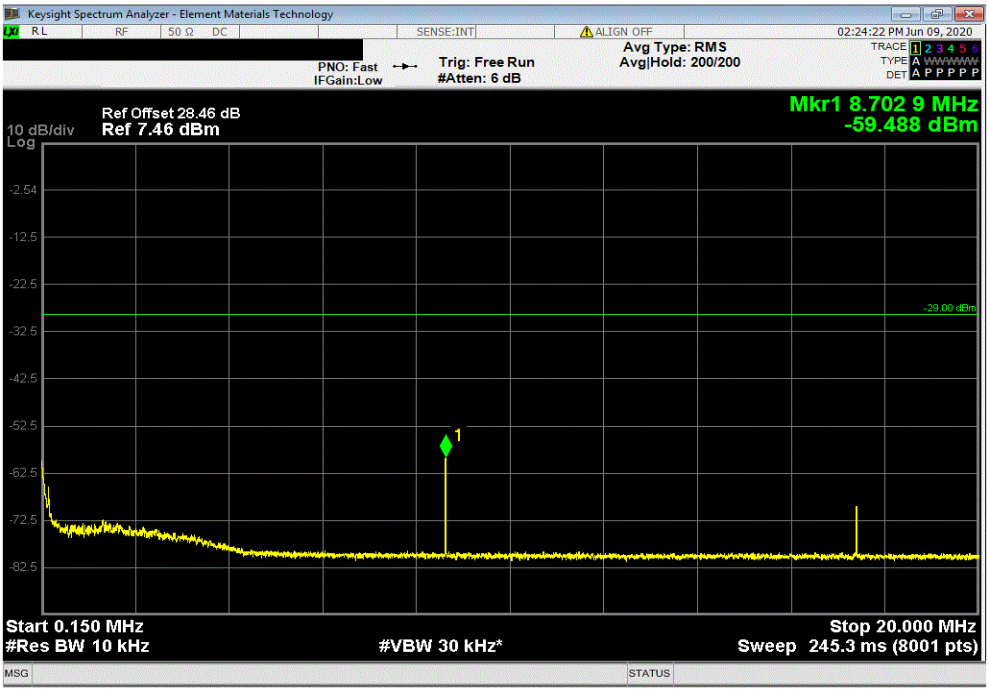
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	3772.1	-36.38	-19	Pass



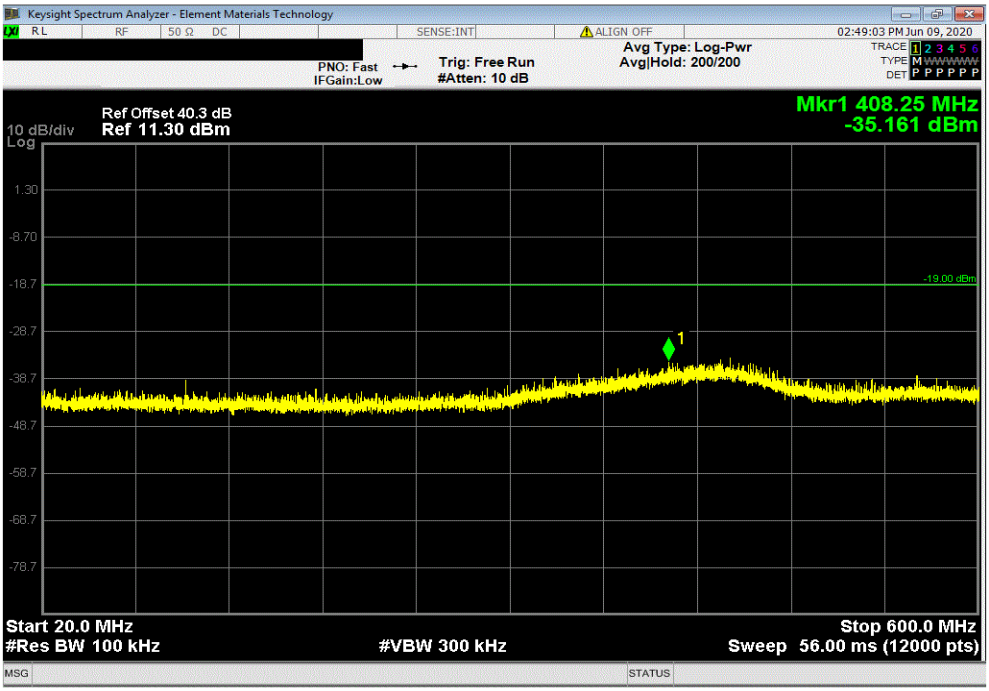
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
9 kHz - 150 kHz		0.01	-57.05	-39	Pass



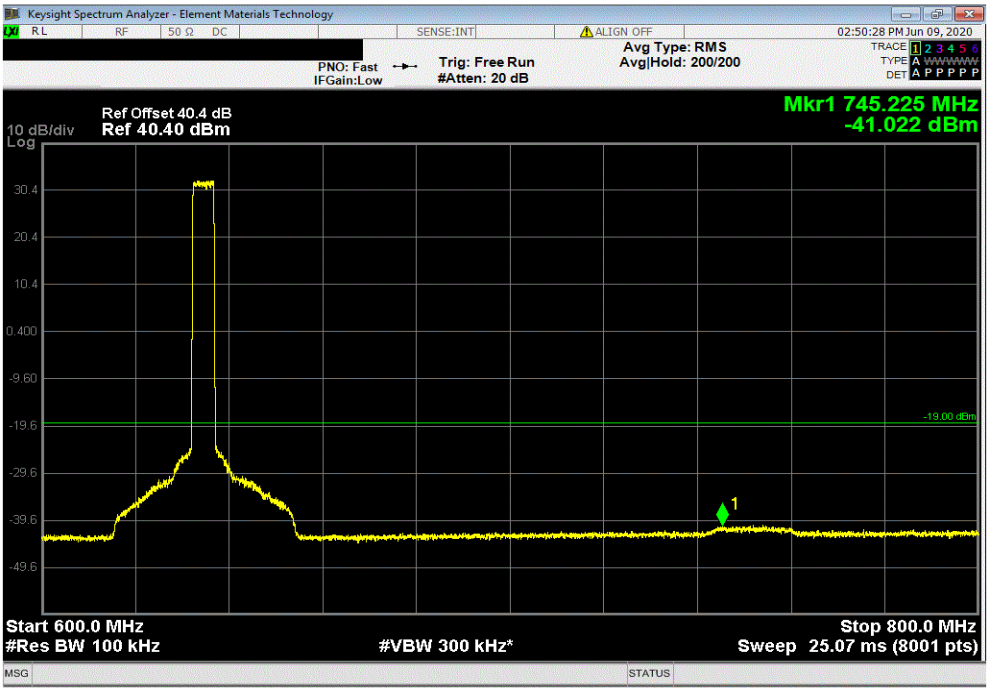
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
150 kHz - 20 MHz	8.7	-59.49	-29	Pass



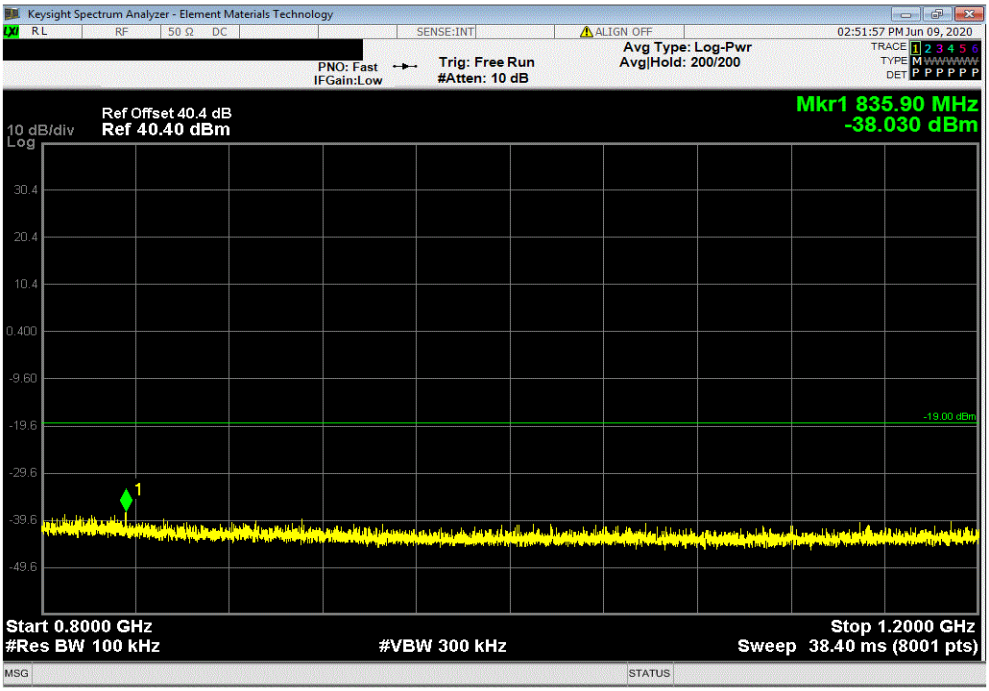
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 600 MHz	408.25	-35.16	-19	Pass



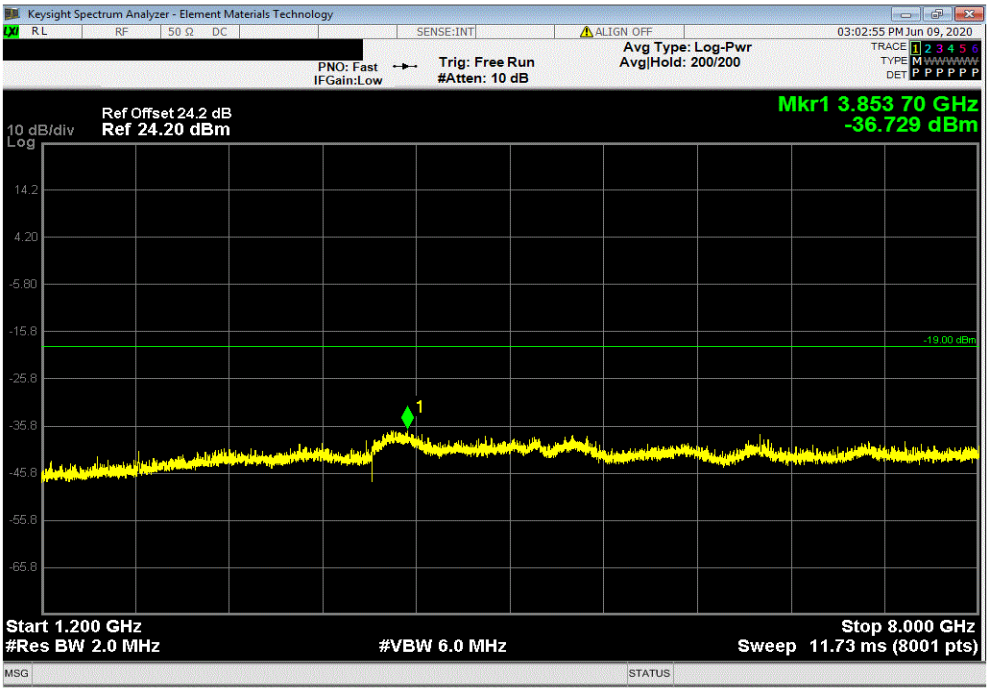
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
600 MHz - 800 MHz	745.23	-41.02	-19	Pass



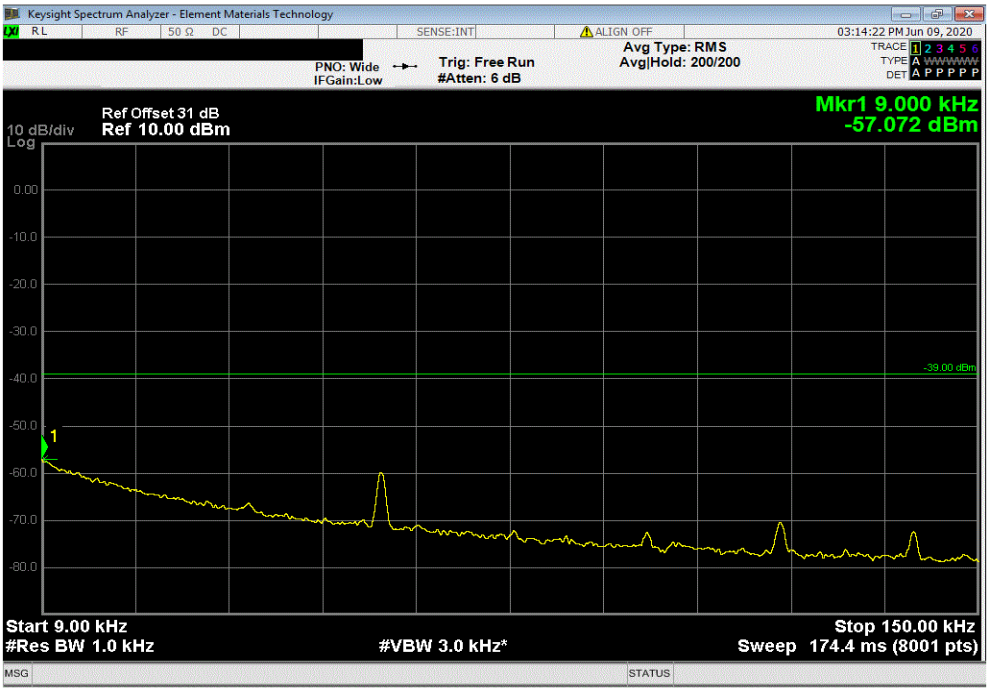
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
800 MHz - 1.2 GHz	835.9	-38.03	-19	Pass



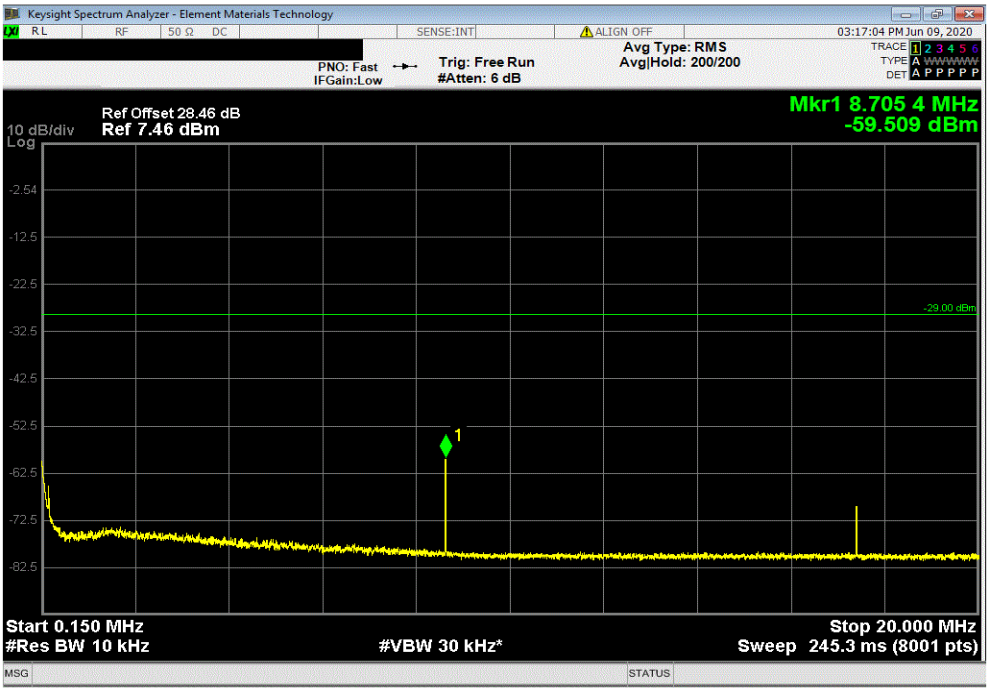
Port 1, Band 71, 617 MHz - 652 MHz, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	3853.7	-36.73	-19	Pass



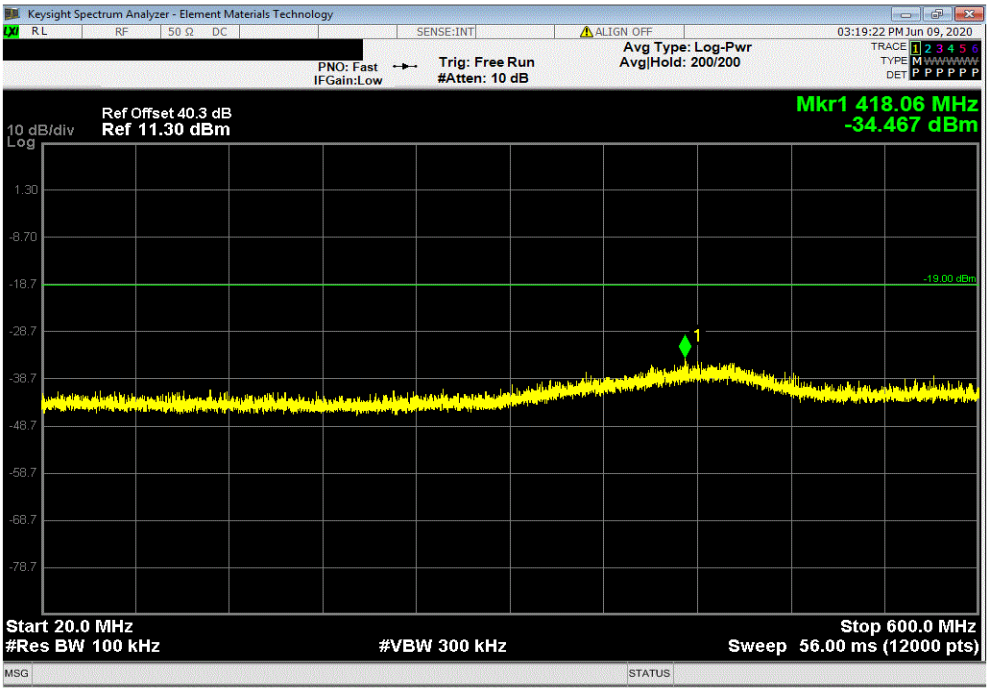
Port 1, Band 71, 617 MHz - 652 MHz, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
9 kHz - 150 kHz		0.01	-57.07	-39	Pass



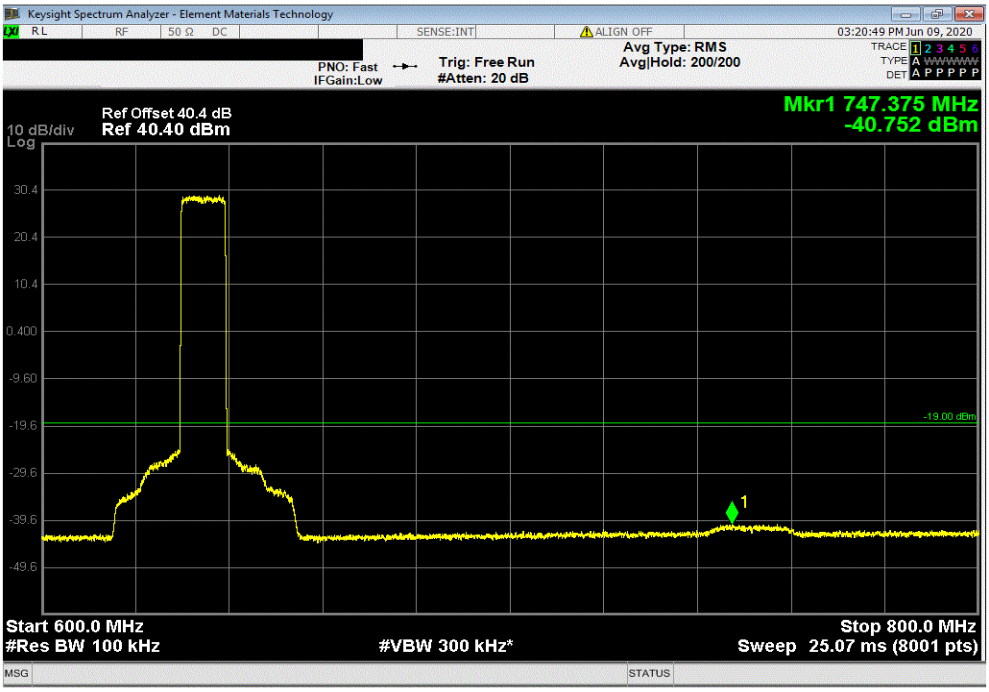
Port 1, Band 71, 617 MHz - 652 MHz, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
150 kHz - 20 MHz	8.71	-59.51	-29	Pass



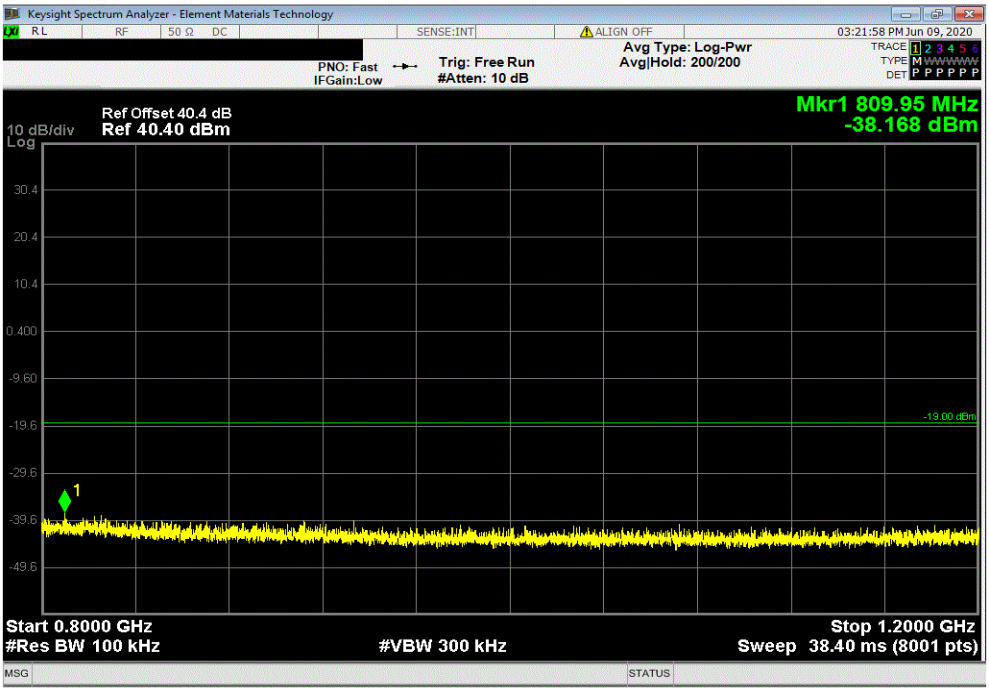
Port 1, Band 71, 617 MHz - 652 MHz, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 600 MHz	418.06	-34.47	-19	Pass



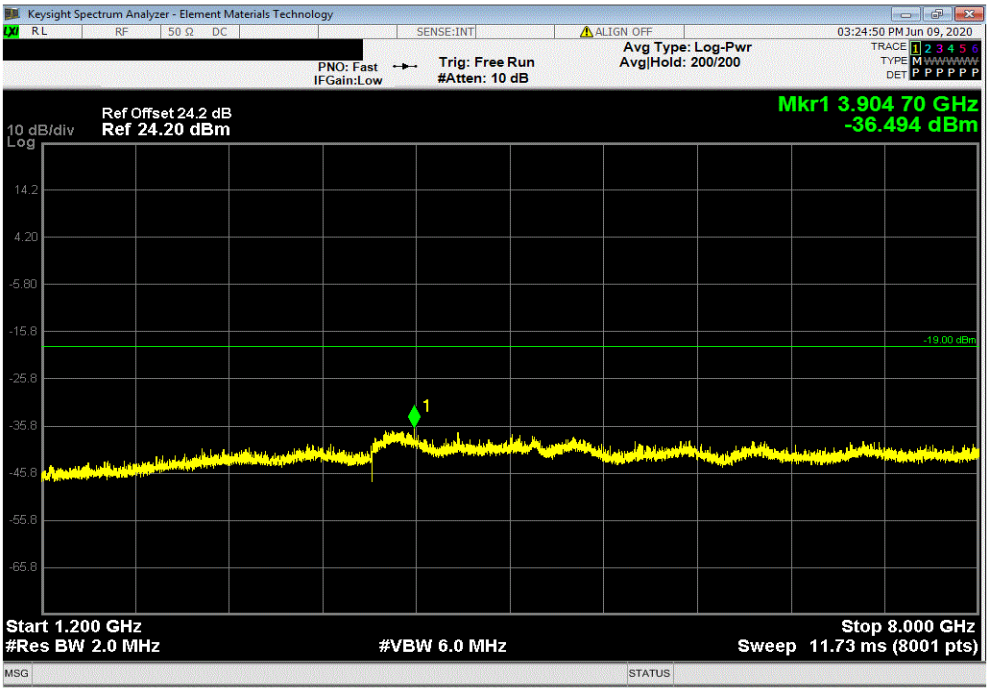
Port 1, Band 71, 617 MHz - 652 MHz, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
600 MHz - 800 MHz	747.38	-40.75	-19	Pass



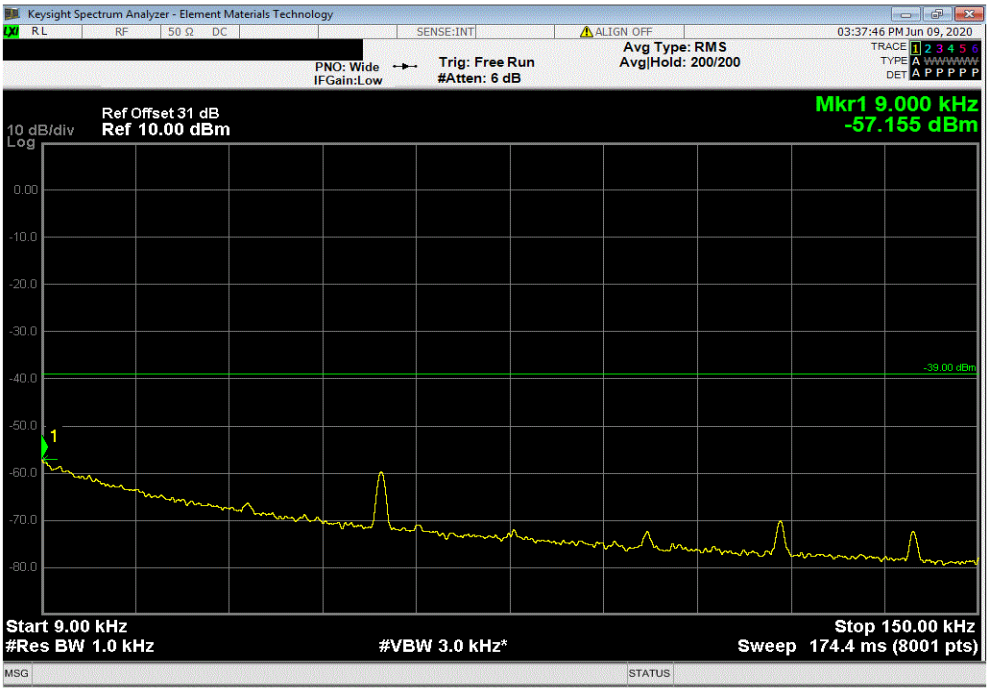
Port 1, Band 71, 617 MHz - 652 MHz, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
800 MHz - 1.2 GHz	809.95	-38.17	-19	Pass



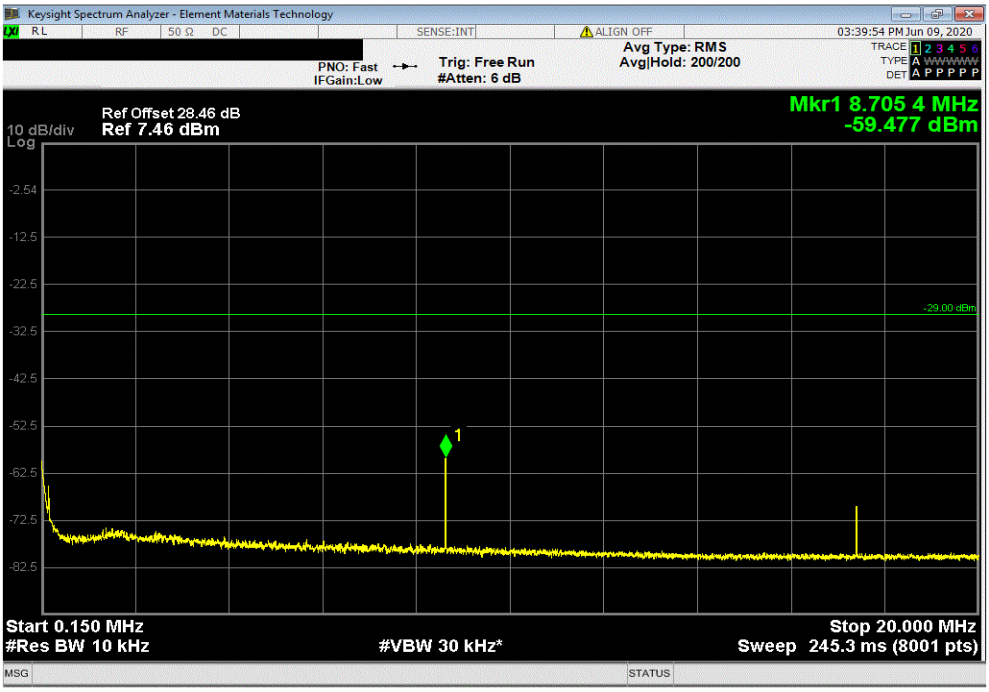
Port 1, Band 71, 617 MHz - 652 MHz, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	3904.7	-36.49	-19	Pass



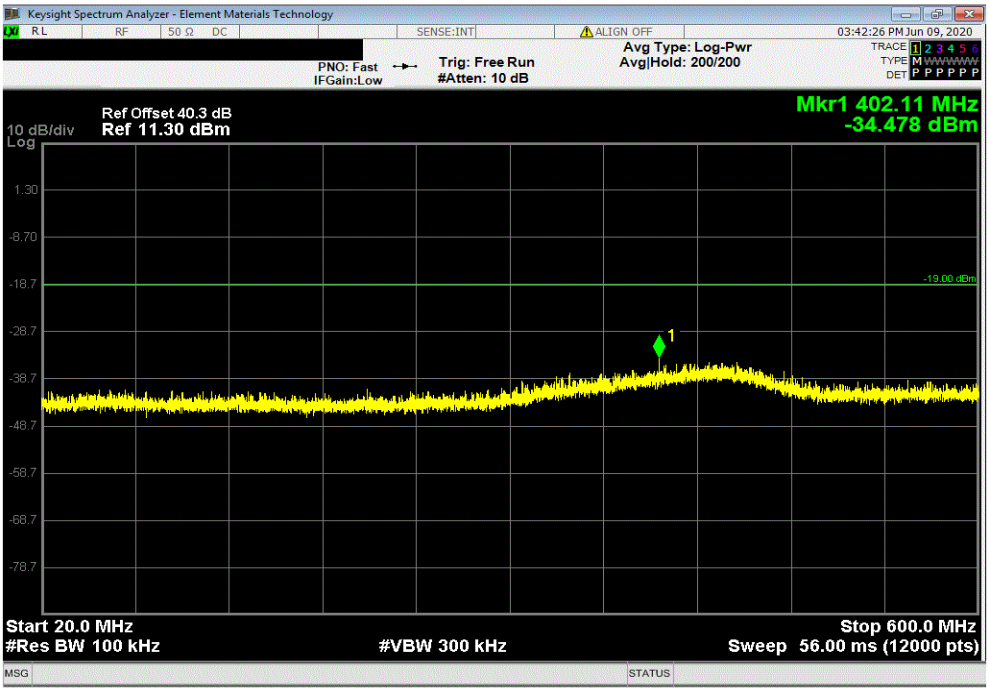
Port 1, Band 71, 617 MHz - 652 MHz, 15 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
9 kHz - 150 kHz	0.01	-57.16	-39	Pass



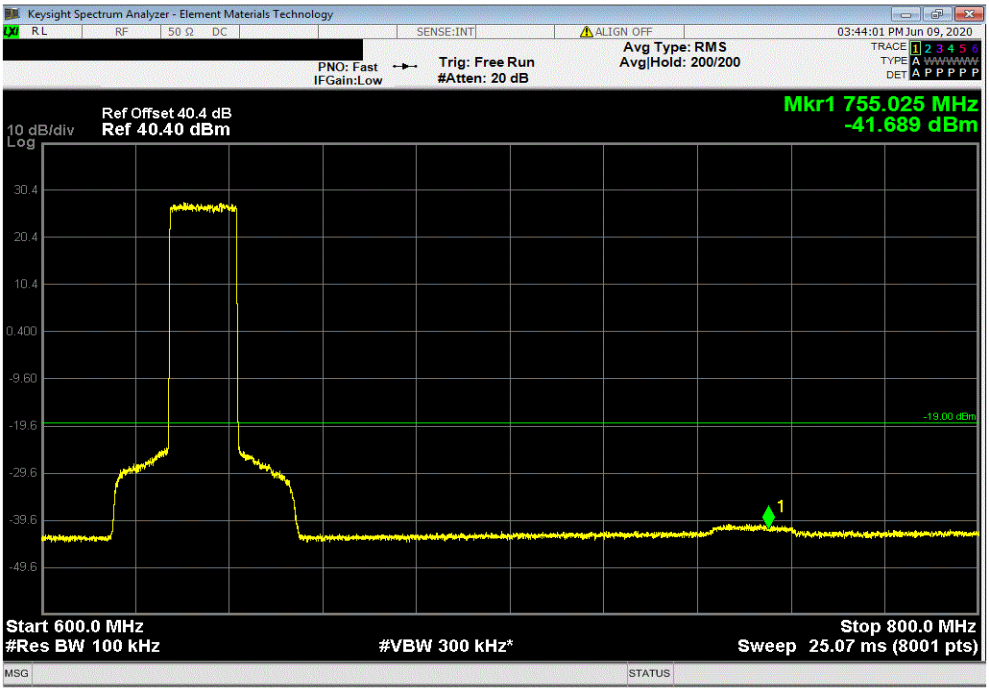
Port 1, Band 71, 617 MHz - 652 MHz, 15 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
150 kHz - 20 MHz	8.71	-59.48	-29	Pass



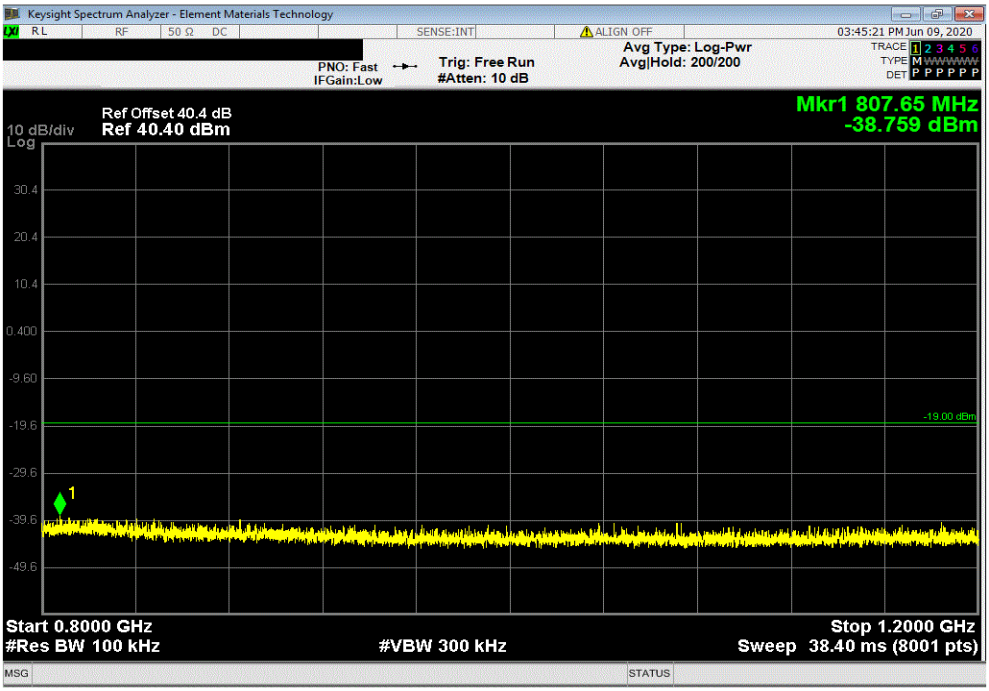
Port 1, Band 71, 617 MHz - 652 MHz, 15 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 600 MHz	402.11	-34.48	-19	Pass



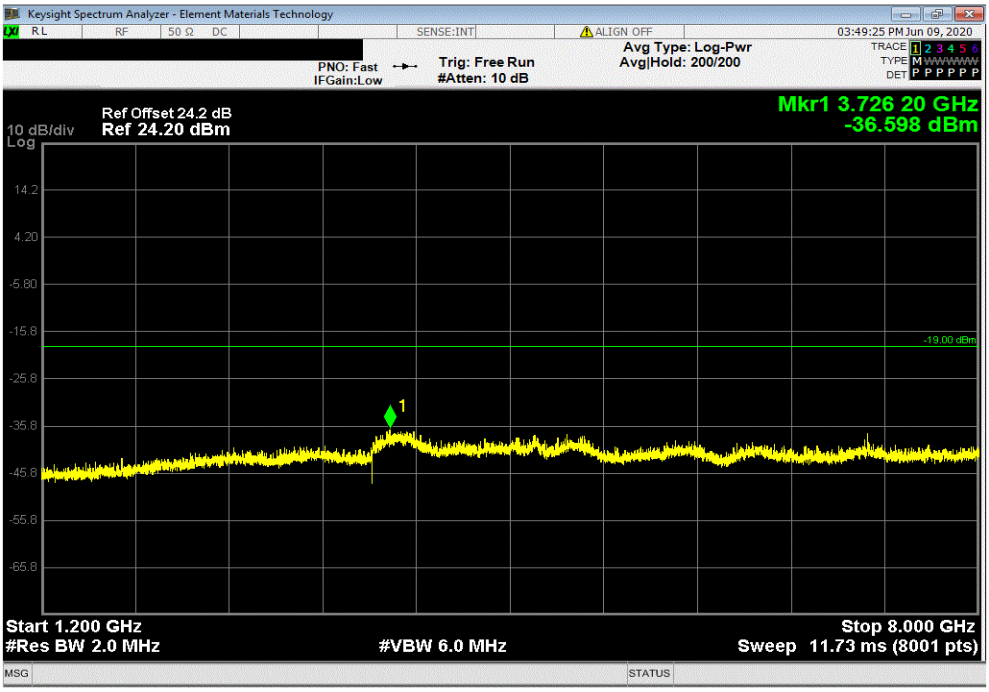
Port 1, Band 71, 617 MHz - 652 MHz, 15 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
600 MHz - 800 MHz	755.03	-41.69	-19	Pass



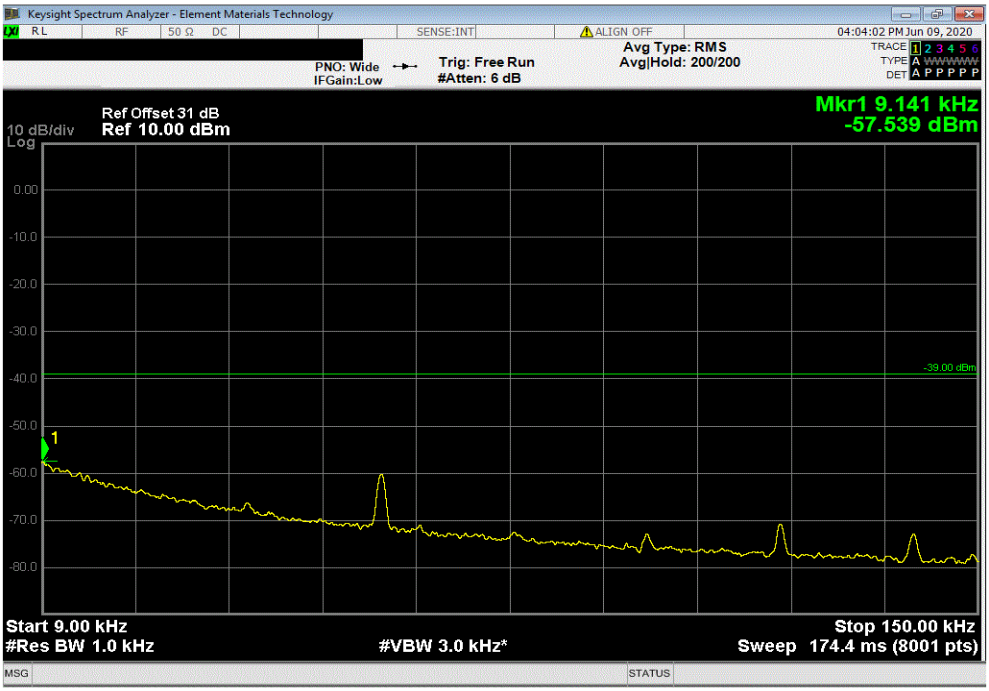
Port 1, Band 71, 617 MHz - 652 MHz, 15 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
800 MHz - 1.2 GHz	807.65	-38.76	-19	Pass



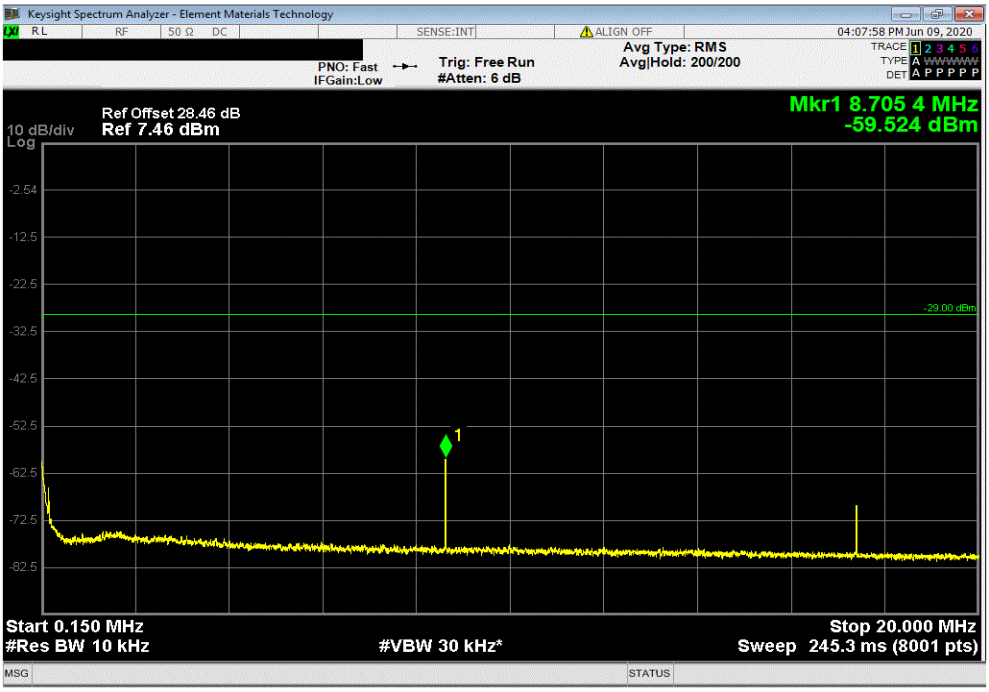
Port 1, Band 71, 617 MHz - 652 MHz, 15 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	3726.2	-36.6	-19	Pass



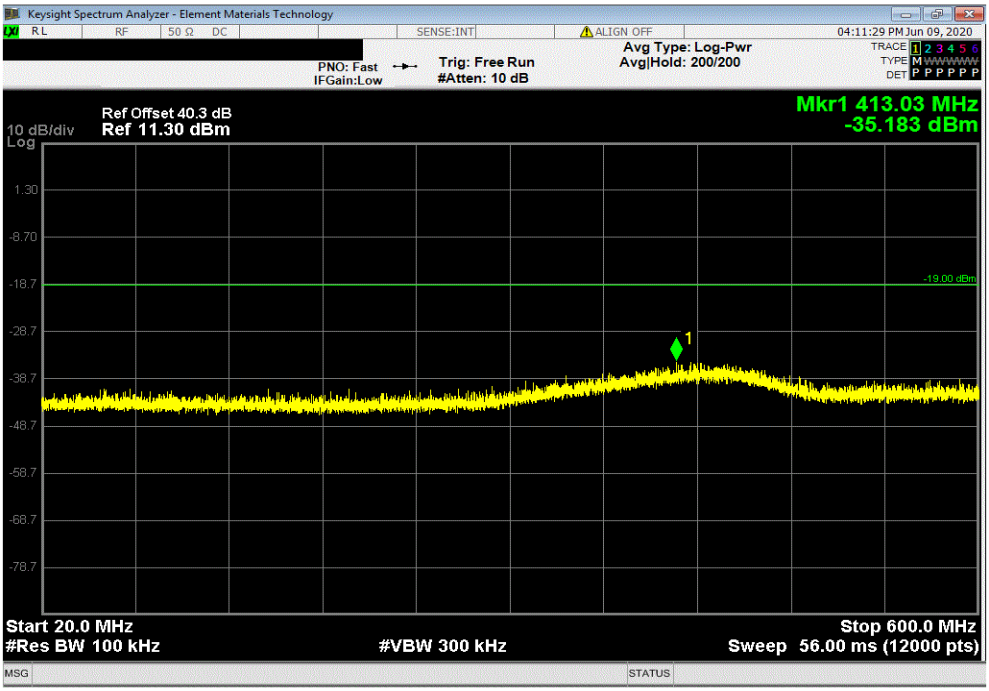
Port 1, Band 71, 617 MHz - 652 MHz, 20 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
9 kHz - 150 kHz		0.01	-57.54	-39	Pass



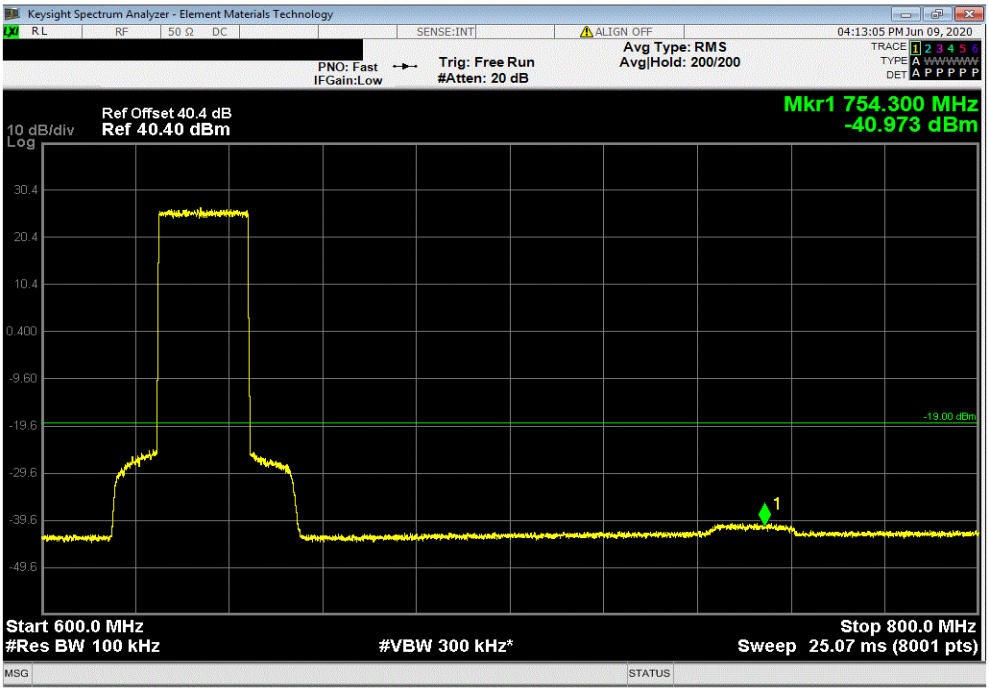
Port 1, Band 71, 617 MHz - 652 MHz, 20 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
150 kHz - 20 MHz	8.71	-59.52	-29	Pass



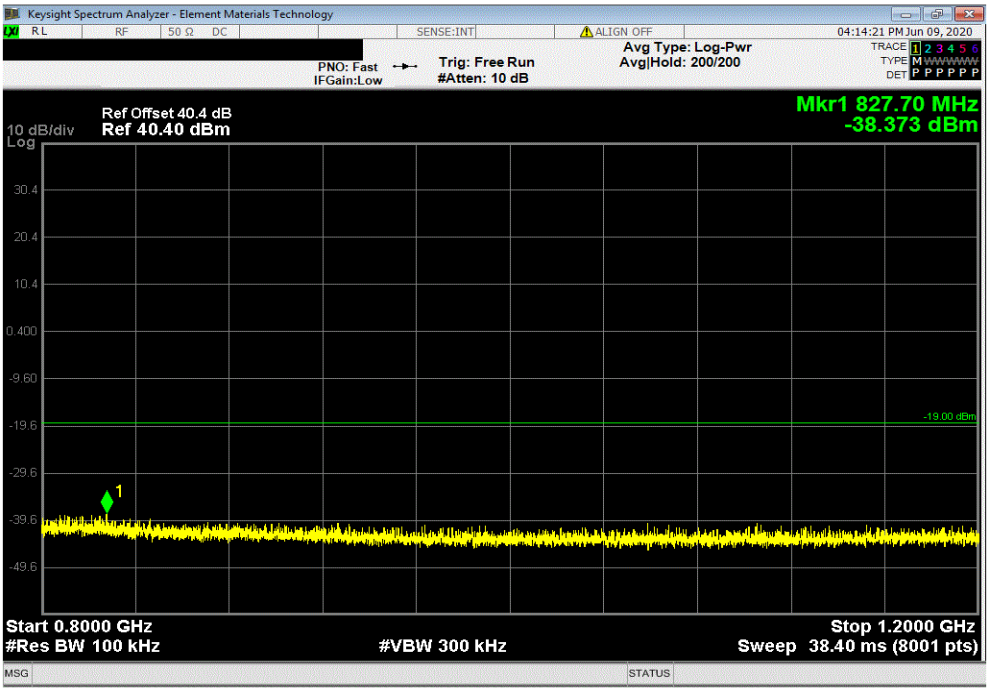
Port 1, Band 71, 617 MHz - 652 MHz, 20 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
20 MHz - 600 MHz	413.03	-35.18	-19	Pass



Port 1, Band 71, 617 MHz - 652 MHz, 20 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
600 MHz - 800 MHz	754.3	-40.97	-19	Pass



Port 1, Band 71, 617 MHz - 652 MHz, 20 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
800 MHz - 1.2 GHz	827.7	-38.37	-19	Pass



Port 1, Band 71, 617 MHz - 652 MHz, 20 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 634.5 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
1.2 GHz - 8 GHz	3796.75	-36.99	-19	Pass