

SPURIOUS CONDUCTED EMISSIONS



XMIT 2019.09.05

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
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-19	19-Mar-20
Generator - Signal	Agilent	E8257D	TGU	15-Feb-18	15-Feb-21

TEST DESCRIPTION

The spurious RF conducted emissions were measured with the EUT set to the middle channel. The EUT was transmitting at the data rate(s) and bandwidths listed in the datasheet. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

Two separate tests were carried out:

1. Band 13 carriers enabled at maximum power (60 Watts/carrier) with Band 71 carriers not enabled.
2. Band 71 carriers enabled at maximum power (60 Watts/carrier) with Band 71 carriers not enabled.

All limits were adjusted by a factor of $[-10 \cdot \log(4)]$ dB to account for the device operation as a 4 port MIMO transmitter, as per FCC KDB 622911.

Band 71: Per FCC section 27.53(g), the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm $[-13 \text{ dBm} - 10 \log(4)]$ per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter. FCC 27.53(g) requires a >100 kHz measurement bandwidth for emissions 100 kHz outside of the RRH operating frequency range.

Band 13:

Per FCC section 27.53(c), the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm $[-13 \text{ dBm} - 10 \log(4)]$ per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter. FCC section 27.53(c) requires a >100 kHz measurement bandwidth for emissions 100 kHz outside of the RRH operating frequency range.

Per section 27.53(f), for the frequency range 1559-1610 MHz the EIRP limit is -70dBW/MHz for wideband signals and -80dBW for discrete emissions of bandwidths less than 700Hz. This equates to an EIRP of -40dBm/MHz for wideband emissions and -50dBm/MHz for discrete emissions. The limit is adjusted to -46 dBm $[-40 \text{ dBm} - 10 \log(4)]$ for wideband signals and -56dBm $[-50 \text{ dBm} - 10 \log(4)]$ for discrete emissions per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

SPURIOUS CONDUCTED EMISSIONS



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EUT: AHBOA Remote Radio Head (RRH)

Serial Number: BL1934X1001

Customer: Nokia Solutions and Networks

Attendees: John Rattanavong, Mitchell Hill

Project: None

Tested by: Jonathan Kiefer

Power: 48VDC

Work Order: NOKI0003

Date: 23-Oct-19

Temperature: 22.5 °C

Humidity: 38.4% RH

Barometric Pres.: 1018 mbar

Job Site: TX09

TEST SPECIFICATIONS

FCC 27:2019

Test Method

ANSI C63.26:2015

COMMENTS

Tested on highest power antenna port (Port 1). EUT is operated at 100% duty cycle. All modulation types were tested for the LTE5 channel bandwidths. Insignificant changes were observed between the conducted emission levels of the different LTE5 modulation types. Only 256QAM was tested on the other LTE channel bandwidths (LTE10, LTE 15, LTE20).

DEVIATIONS FROM TEST STANDARD

None

Configuration #

1, 2, 3

Signature

Jonathan Kiefer

Value (dBm)

Limit (dBm)

Result

Band 13

QPSK Modulation

LTE5 Bandwidth

9kHz-150kHz

150kHz-20MHz

20MHz-600MHz

600MHz-800MHz

800MHz-1.2GHz

1.2GHz-8GHz

1559MHz-1610MHz

16QAM Modulation

LTE5 Bandwidth

9kHz-150kHz

150kHz-20MHz

20MHz-600MHz

600MHz-800MHz

800MHz-1.2GHz

1.2GHz-8GHz

1559MHz-1610MHz

64QAM Modulation

LTE5 Bandwidth

9kHz-150kHz

150kHz-20MHz

20MHz-600MHz

600MHz-800MHz

800MHz-1.2GHz

1.2GHz-8GHz

1559MHz-1610MHz

256QAM Modulation

LTE5 Bandwidth

9kHz-150kHz

150kHz-20MHz

20MHz-600MHz

600MHz-800MHz

800MHz-1.2GHz

1.2GHz-8GHz

1559MHz-1610MHz

LTE10 Bandwidth

9kHz-150kHz

150kHz-20MHz

20MHz-600MHz

600MHz-800MHz

800MHz-1.2GHz

1.2GHz-8GHz

1559MHz-1610MHz

Band 71

QPSK Modulation

LTE5 Bandwidth

9kHz-150kHz

150kHz-20MHz

20MHz-600MHz

600MHz-800MHz

800MHz-1.2GHz

1.2GHz-8GHz

16QAM Modulation

LTE5 Bandwidth

9kHz-150kHz

150kHz-20MHz

20MHz-600MHz

600MHz-800MHz

800MHz-1.2GHz

1.2GHz-8GHz

64QAM Modulation

LTE5 Bandwidth

9kHz-150kHz

150kHz-20MHz

20MHz-600MHz

600MHz-800MHz

800MHz-1.2GHz

1.2GHz-8GHz

256QAM Modulation

LTE5 Bandwidth

9kHz-150kHz

150kHz-20MHz

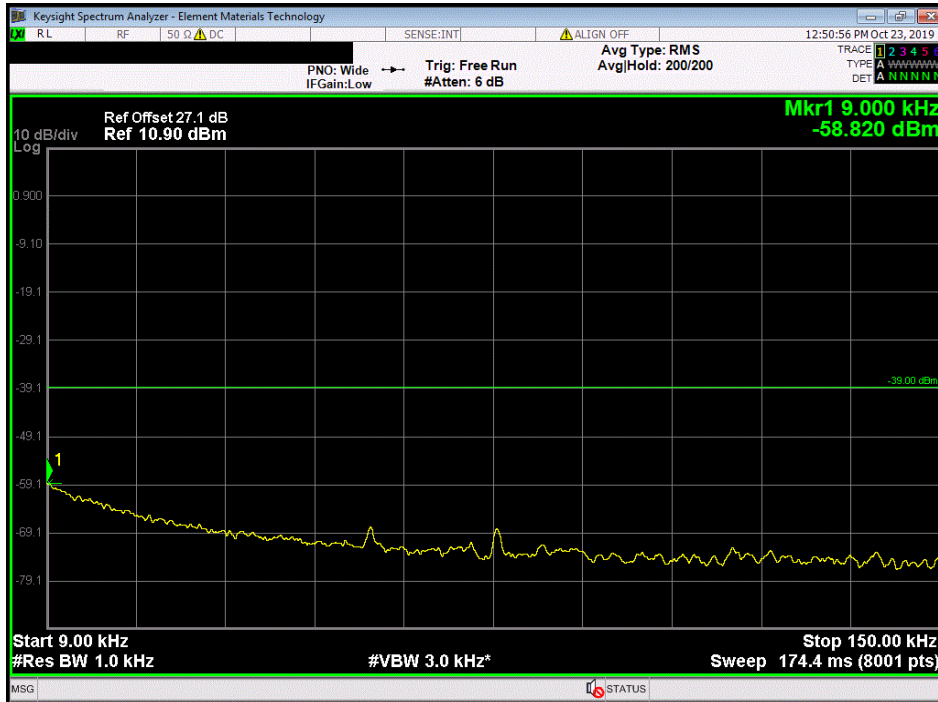
20MHz-600MHz

600MHz-800MHz

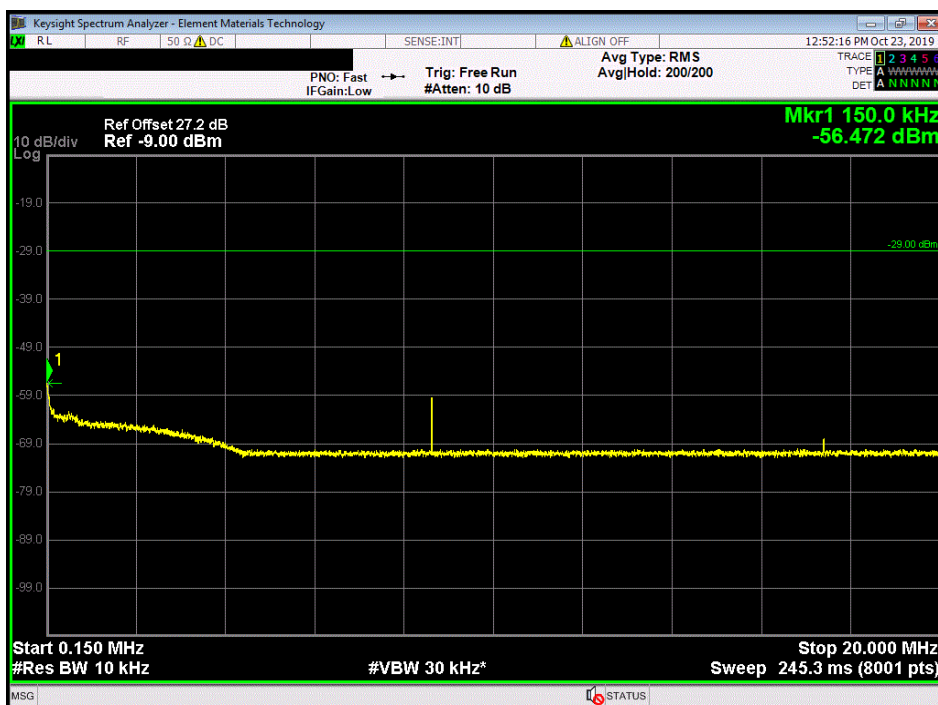
800MHz-1.2GHz	-34.592	-19	Pass
1.2GHz-8GHz	-29.649	-19	Pass
LTE10 Bandwidth			
9kHz-150kHz	-58.85	-39	Pass
150kHz-20MHz	-56.871	-29	Pass
20MHz-600MHz	-33.401	-29	Pass
600MHz-800MHz	-36.947	-19	Pass
800MHz-1.2GHz	-34.085	-19	Pass
1.2GHz-8GHz	-32.345	-19	Pass
LTE15 Bandwidth			
9kHz-150kHz	-58.256	-39	Pass
150kHz-20MHz	-56.257	-29	Pass
20MHz-600MHz	-32.348	-19	Pass
600MHz-800MHz	-36.733	-19	Pass
800MHz-1.2GHz	-34.704	-19	Pass
1.2GHz-8GHz	-33.457	-19	Pass
LTE20 Bandwidth			
9kHz-150kHz	-59.056	-39	Pass
150kHz-20MHz	-56.663	-29	Pass
20MHz-600MHz	-32.753	-19	Pass
600MHz-800MHz	-37.071	-19	Pass
800MHz-1.2GHz	-34.37	-19	Pass
1.2GHz-8GHz	-35.108	-19	Pass

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Band 13, QPSK Modulation, LTE5 Bandwidth, 9kHz-150kHz						
				Value (dBm)	Limit (dBm)	Result
				-58.52	-39	Pass

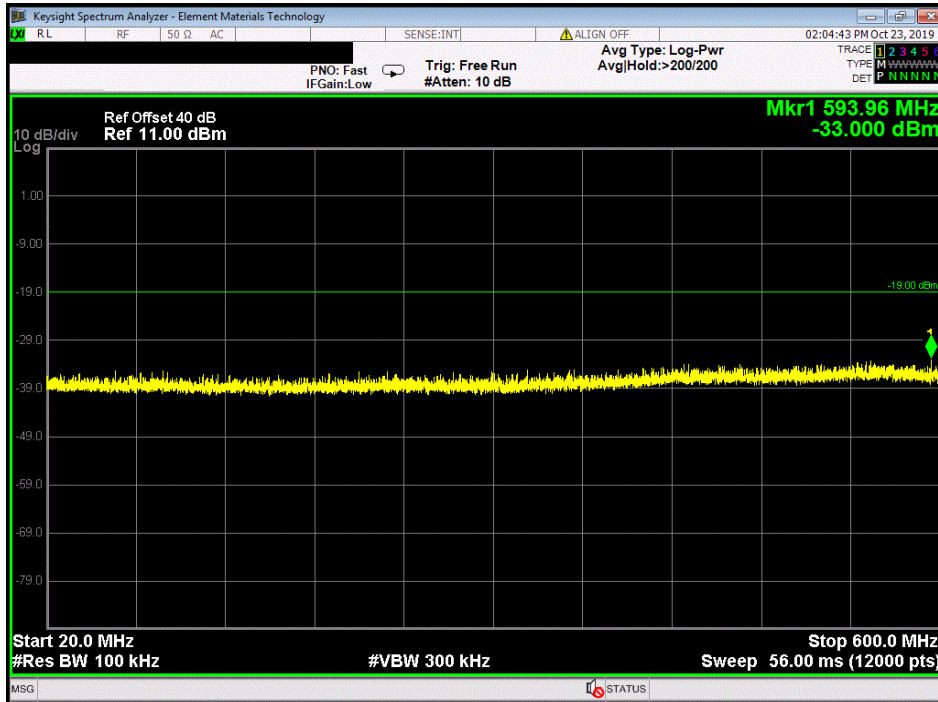


Band 13, QPSK Modulation, LTE5 Bandwidth, 150kHz-20MHz						
				Value (dBm)	Limit (dBm)	Result
				-56.472	-29	Pass

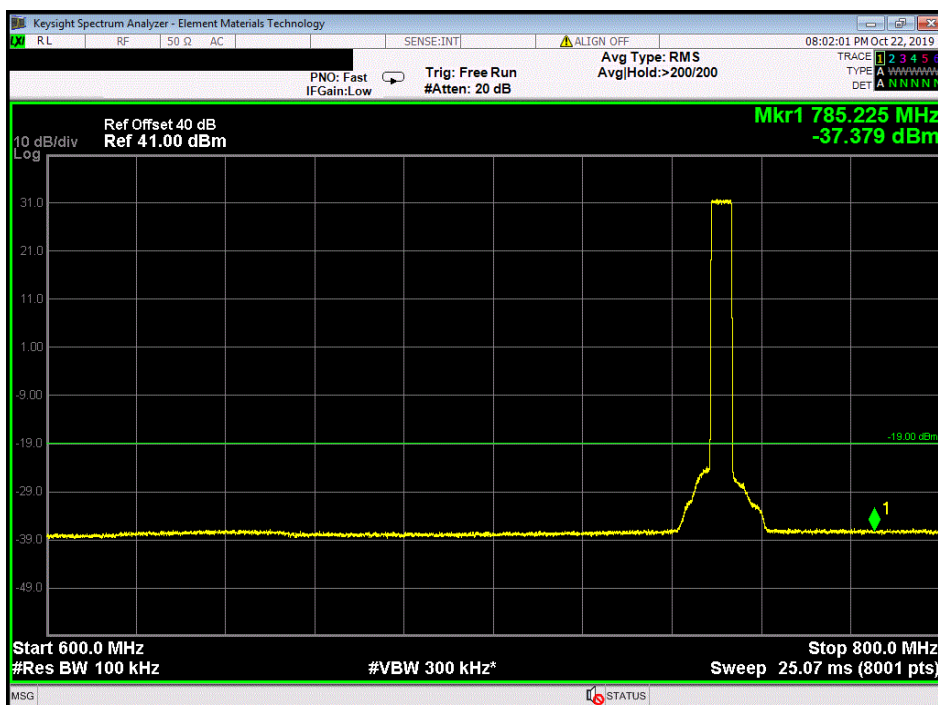


SPURIOUS CONDUCTED EMISSIONS

Band 13, QPSK Modulation, LTE5 Bandwidth, 20MHz-600MHz						
				Value (dBm)	Limit (dBm)	Result
				-33	-19	Pass



Band 13, QPSK Modulation, LTE5 Bandwidth, 600MHz-800MHz						
				Value (dBm)	Limit (dBm)	Result
				-37.379	-19	Pass

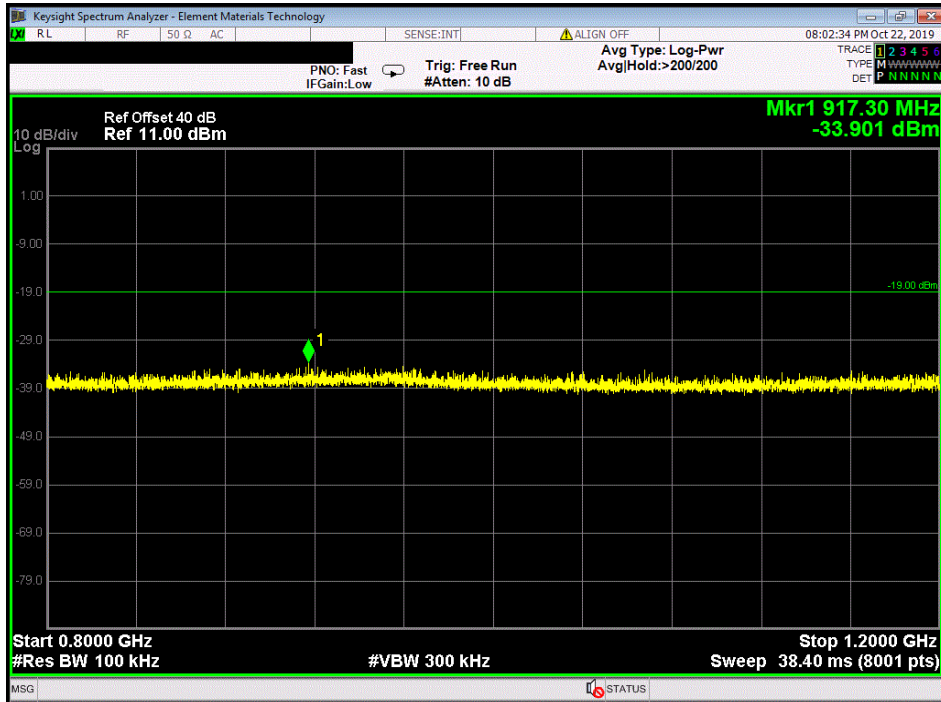


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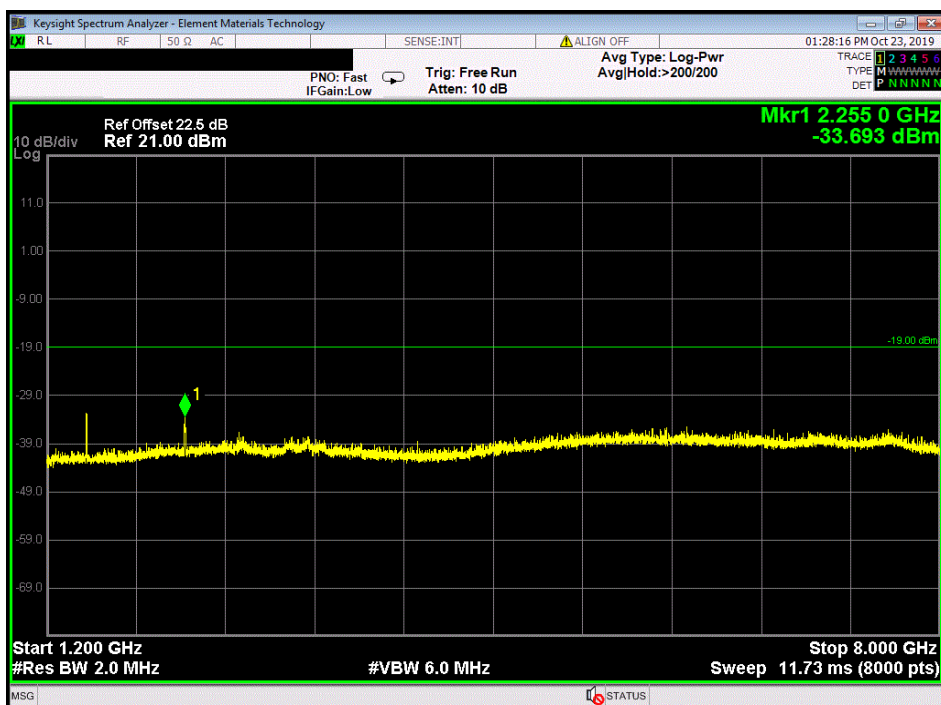


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Band 13, QPSK Modulation, LTE5 Bandwidth, 800MHz-1.2GHz						
				Value (dBm)	Limit (dBm)	Result
				-33.901	-19	Pass

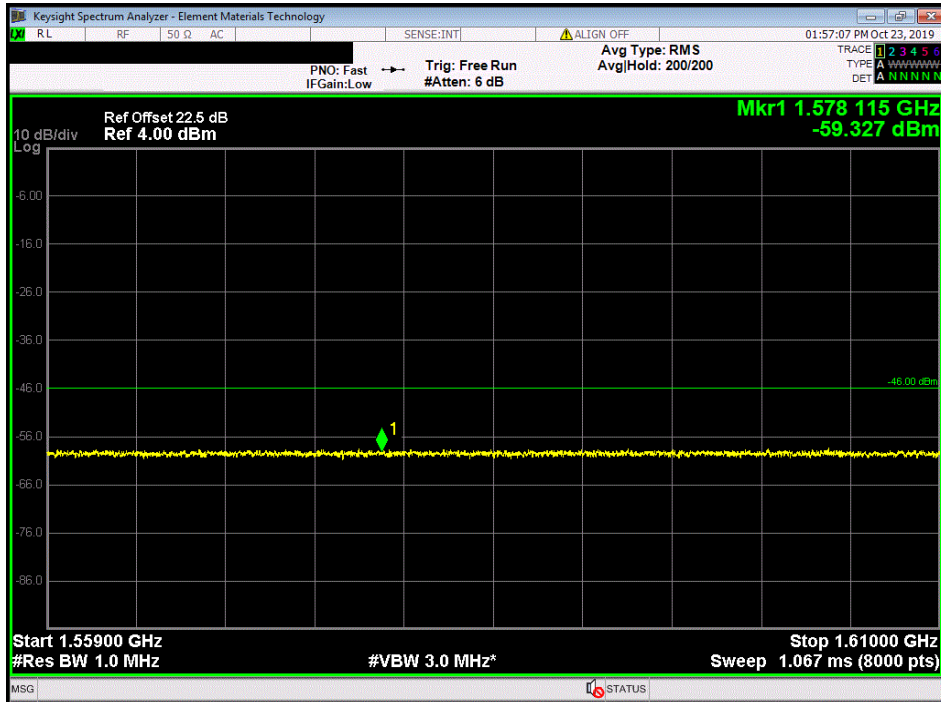


Band 13, QPSK Modulation, LTE5 Bandwidth, 1.2GHz-8GHz						
				Value (dBm)	Limit (dBm)	Result
				-33.693	-19	Pass

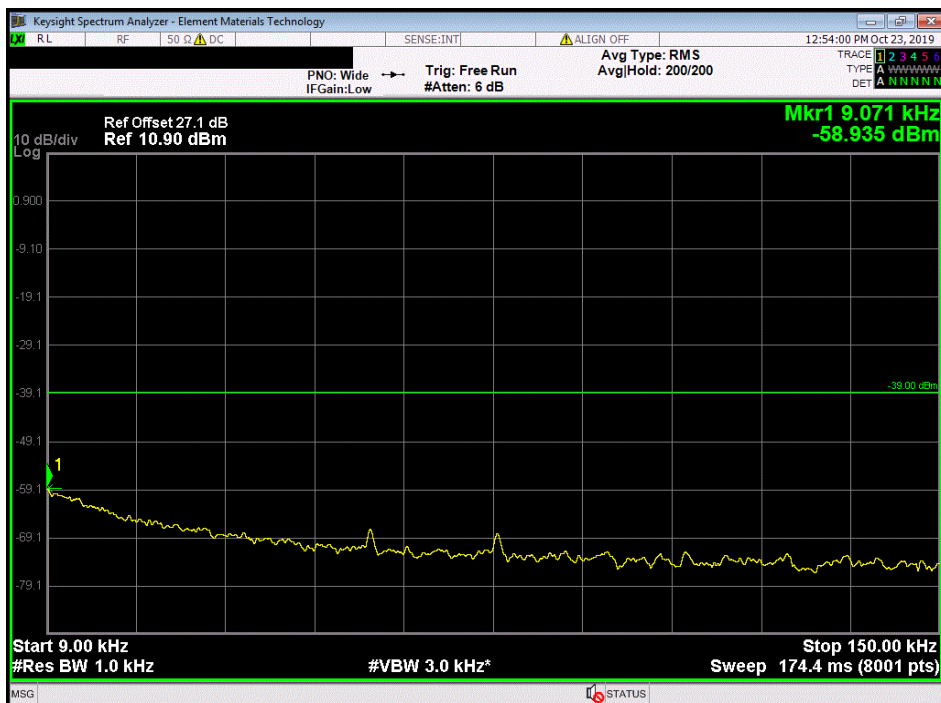


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Band 13, QPSK Modulation, LTE5 Bandwidth, 1559MHz-1610MHz						
				Value (dBm)	Limit (dBm)	Result
				-59.327	-46	Pass



Band 13, 16QAM Modulation, LTE5 Bandwidth, 9kHz-150kHz						
				Value (dBm)	Limit (dBm)	Result
				-58.935	-39	Pass

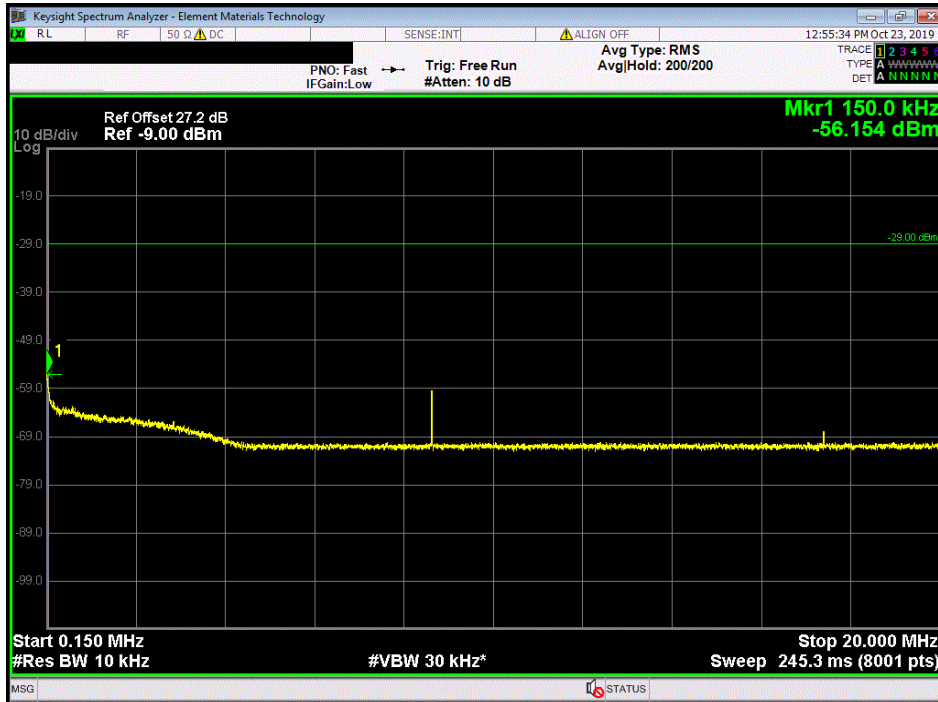


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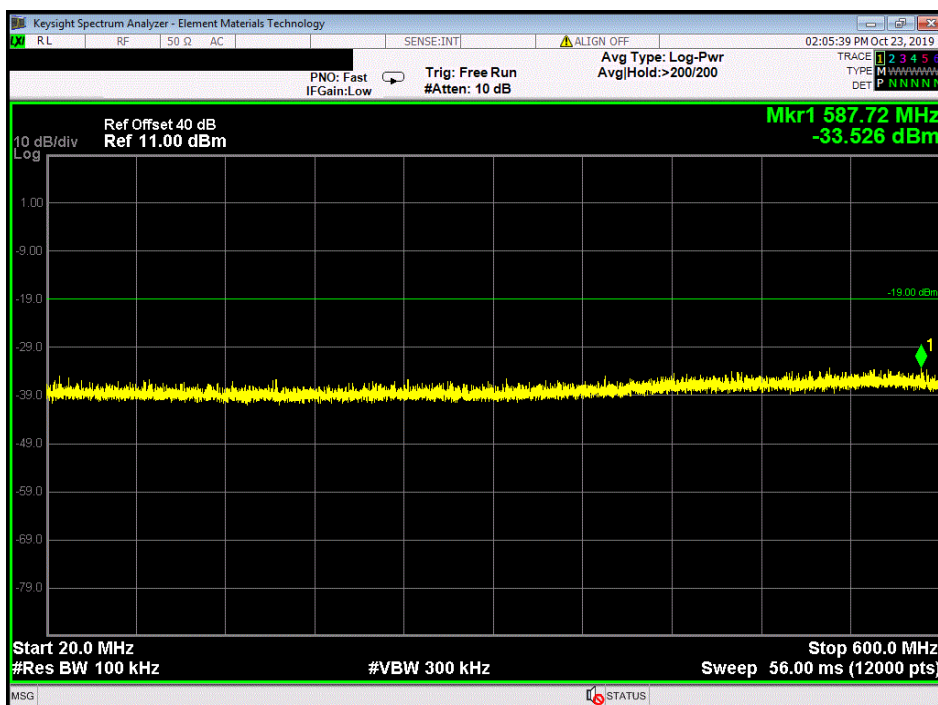


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Band 13, 16QAM Modulation, LTE5 Bandwidth, 150kHz-20MHz						
				Value (dBm)	Limit (dBm)	Result
				-56.154	-29	Pass



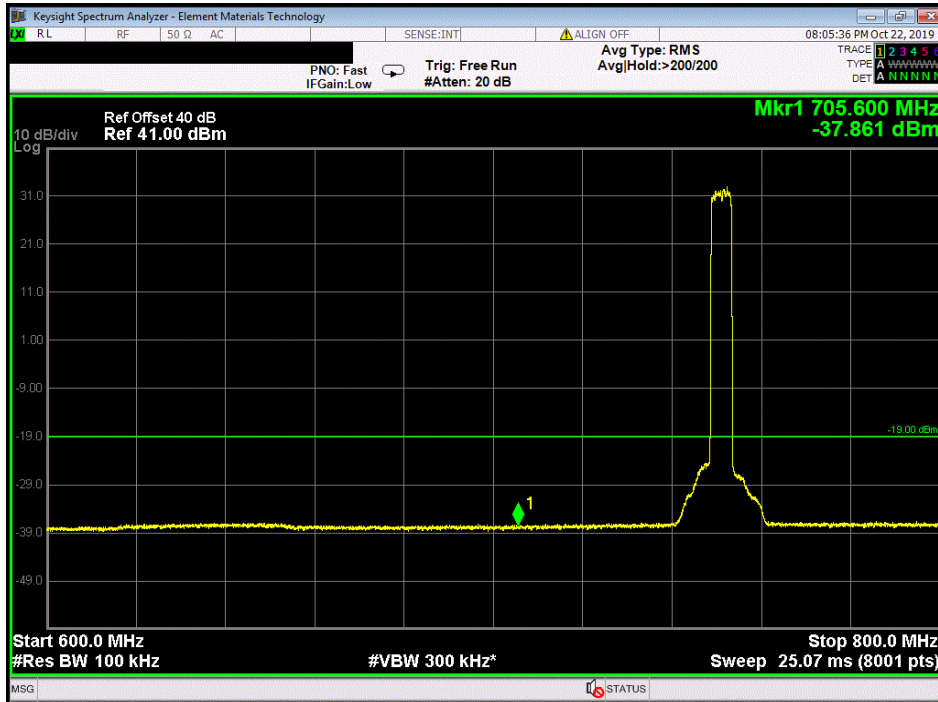
Band 13, 16QAM Modulation, LTE5 Bandwidth, 20MHz-600MHz						
				Value (dBm)	Limit (dBm)	Result
				-33.526	-19	Pass



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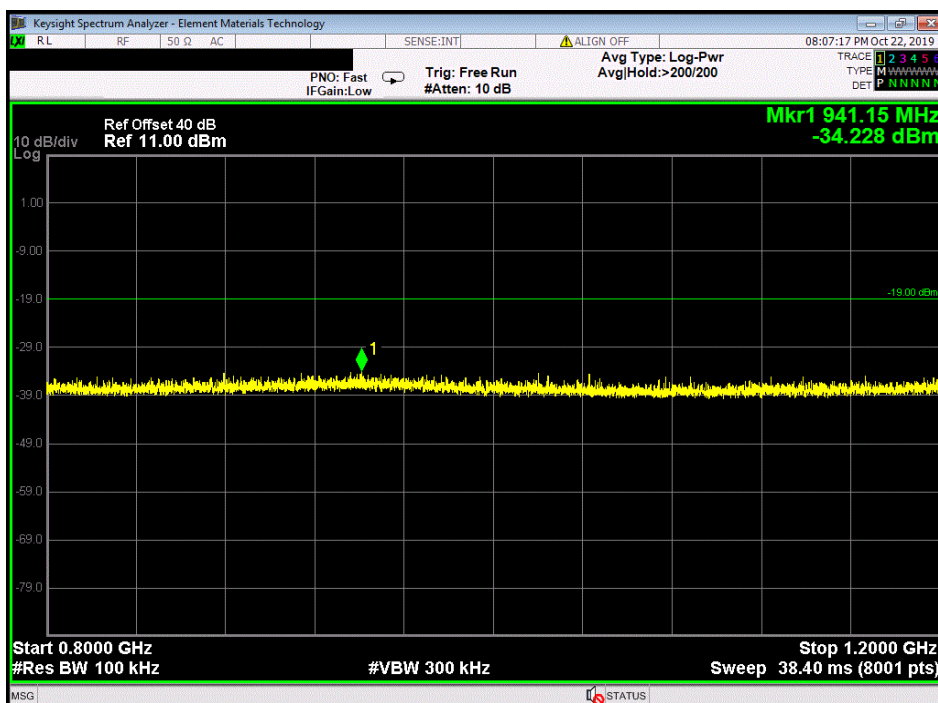
Band 13, 16QAM Modulation, LTE5 Bandwidth, 600MHz-800MHz

	Value (dBm)	Limit (dBm)	Result
	-37.861	-19	Pass



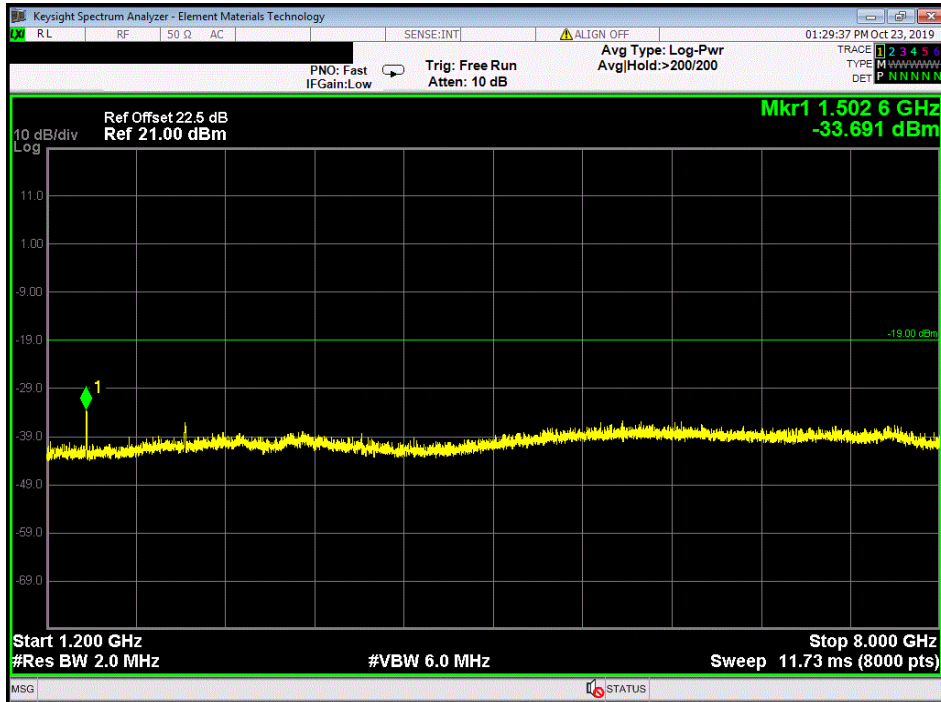
Band 13, 16QAM Modulation, LTE5 Bandwidth, 800MHz-1.2GHz

	Value (dBm)	Limit (dBm)	Result
	-34.228	-19	Pass

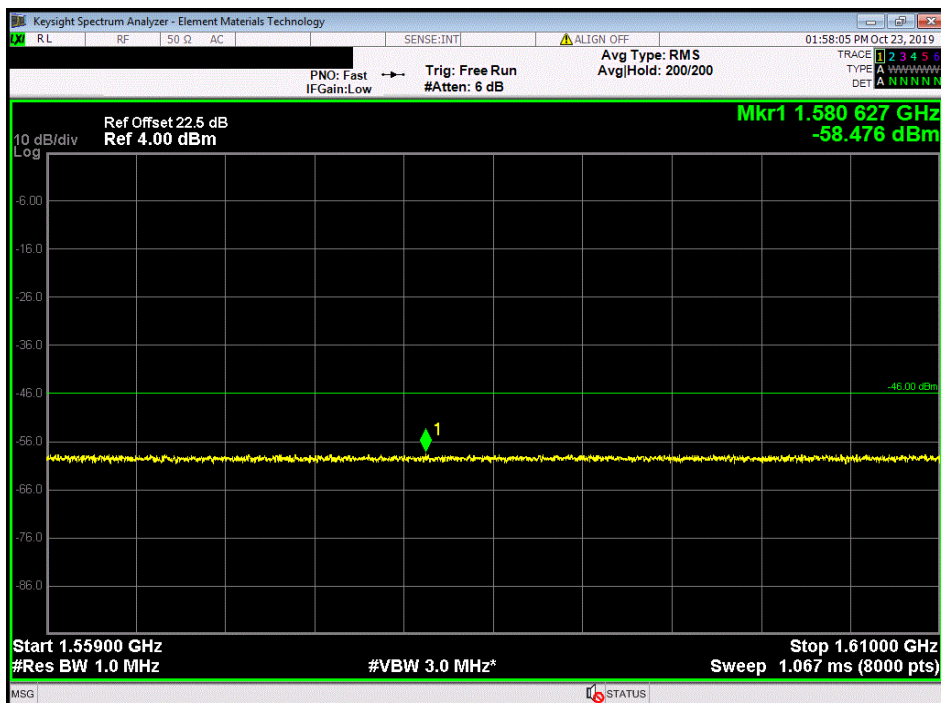


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Band 13, 16QAM Modulation, LTE5 Bandwidth, 1.2GHz-8GHz						
	Value	Limit	Result			
	(dBm)	(dBm)				
	-33.691	-19	Pass			

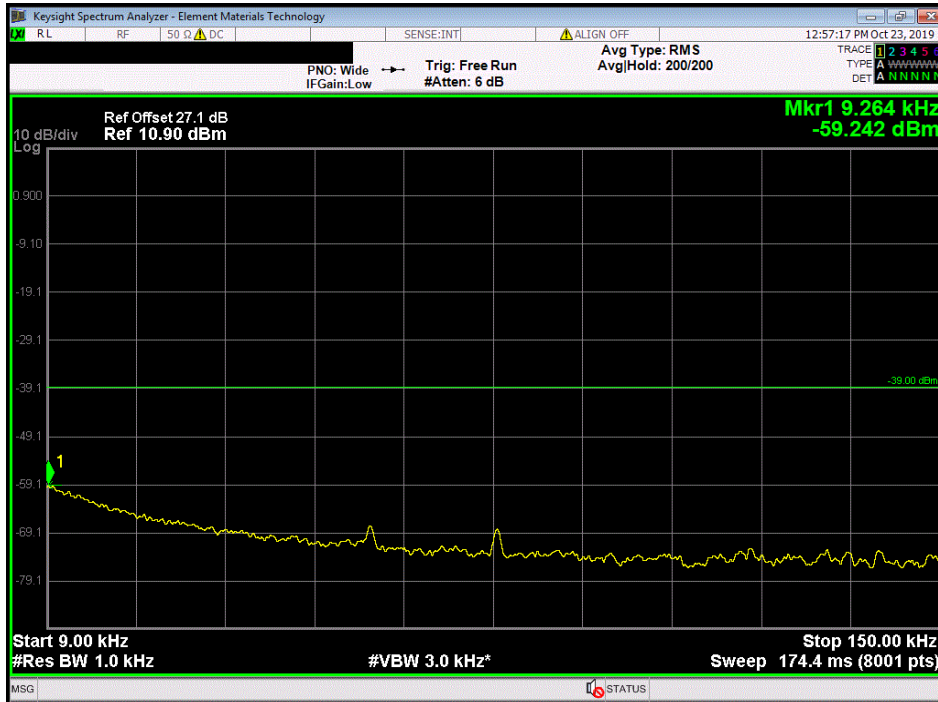


Band 13, 16QAM Modulation, LTE5 Bandwidth, 1559MHz-1610MHz						
	Value	Limit	Result			
	(dBm)	(dBm)				
	-58.476	-46	Pass			

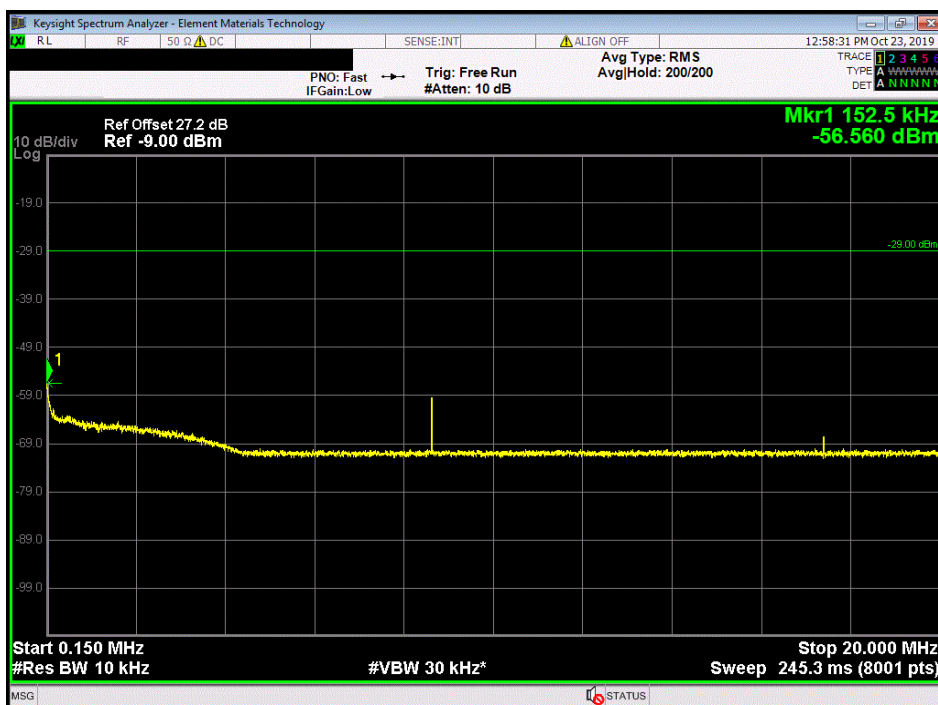


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Band 13, 64QAM Modulation, LTE5 Bandwidth, 9kHz-150kHz						
				Value (dBm)	Limit (dBm)	Result
				-59.242	-39	Pass



Band 13, 64QAM Modulation, LTE5 Bandwidth, 150kHz-20MHz						
				Value (dBm)	Limit (dBm)	Result
				-56.56	-29	Pass

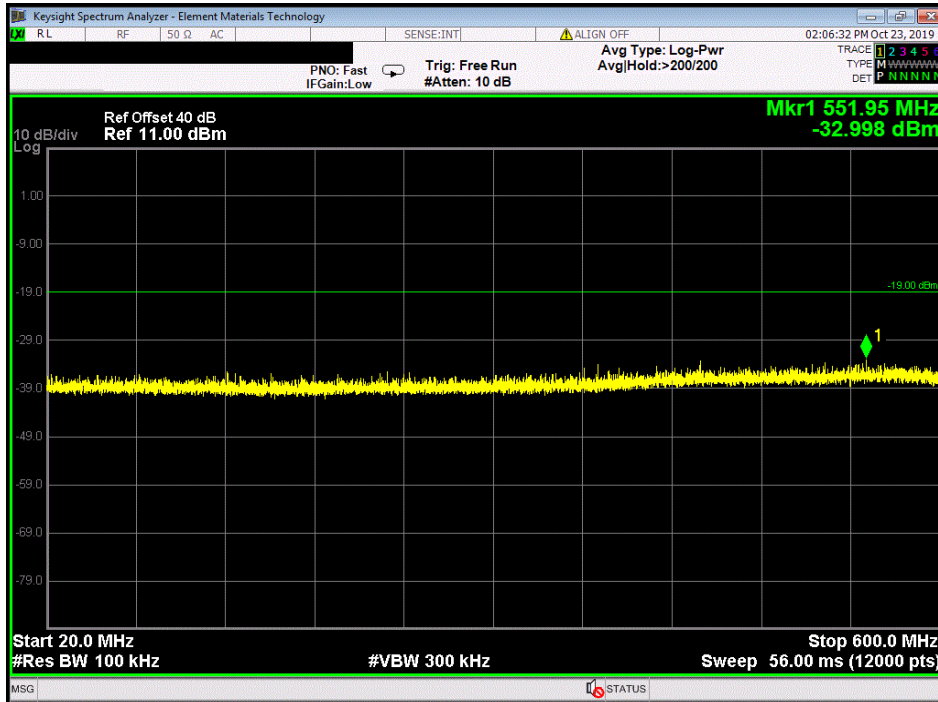


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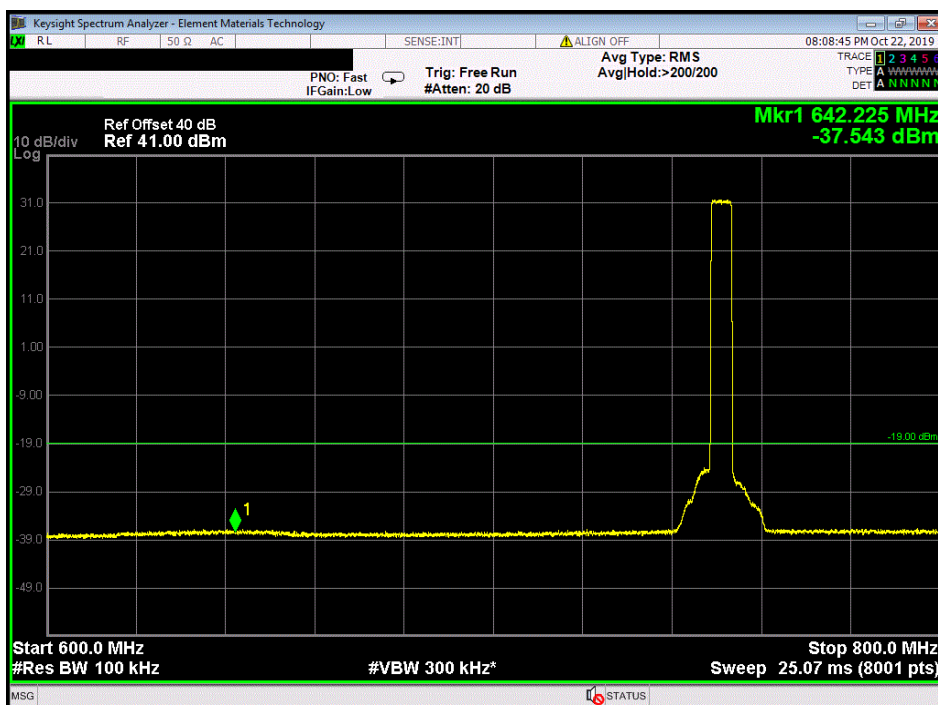


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Band 13, 64QAM Modulation, LTE5 Bandwidth, 20MHz-600MHz						
	Value	Limit	Result			
	(dBm)	(dBm)				
	-32.998	-19	Pass			



Band 13, 64QAM Modulation, LTE5 Bandwidth, 600MHz-800MHz						
	Value	Limit	Result			
	(dBm)	(dBm)				
	-37.543	-19	Pass			

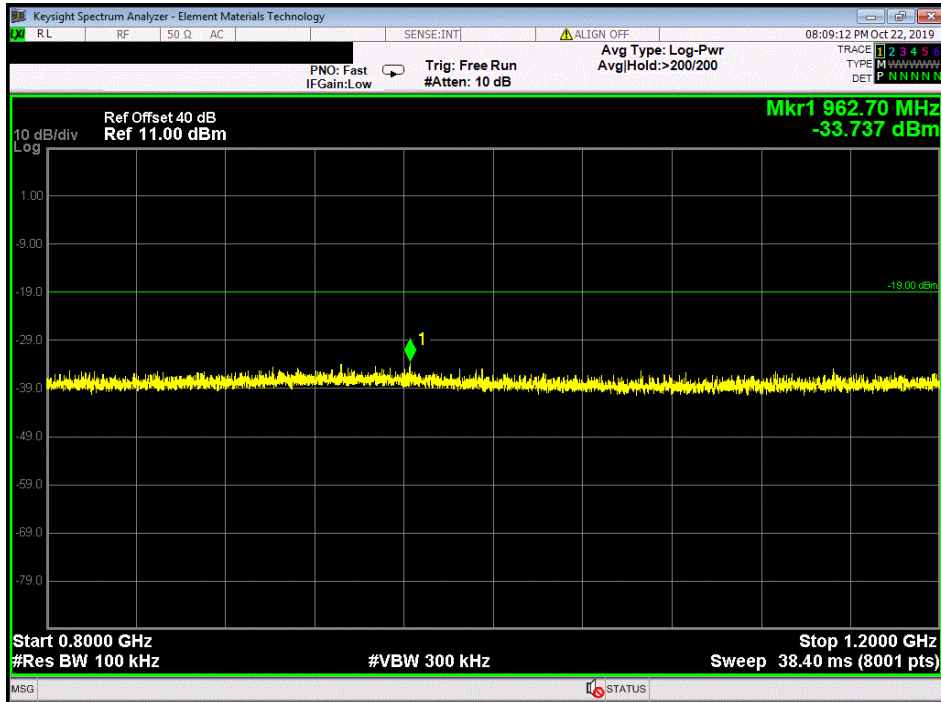


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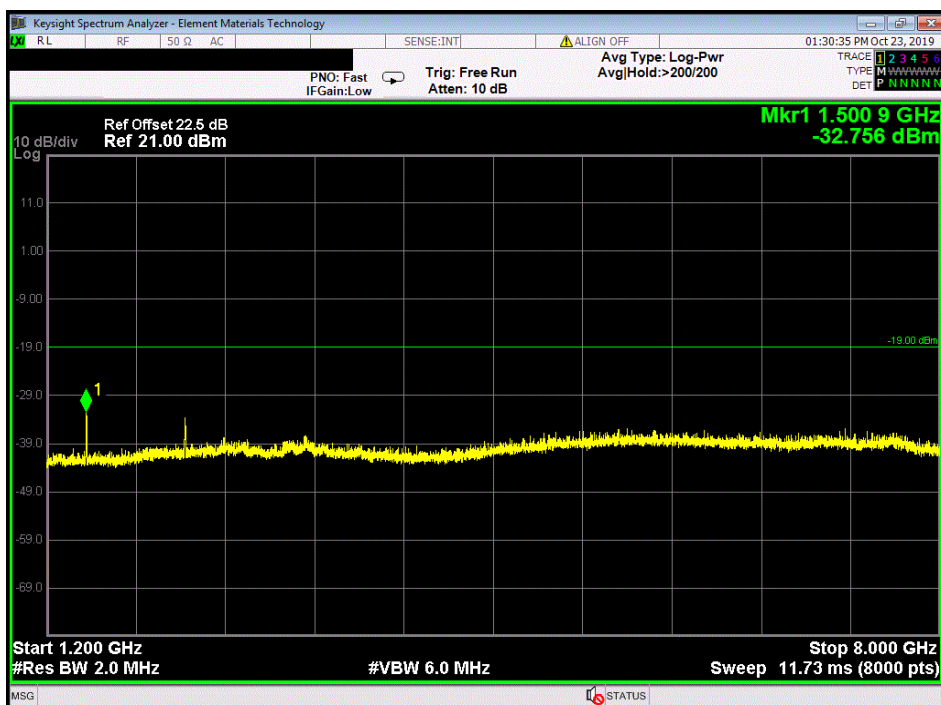


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Band 13, 64QAM Modulation, LTE5 Bandwidth, 800MHz-1.2GHz						
				Value (dBm)	Limit (dBm)	Result
				-33.737	-19	Pass

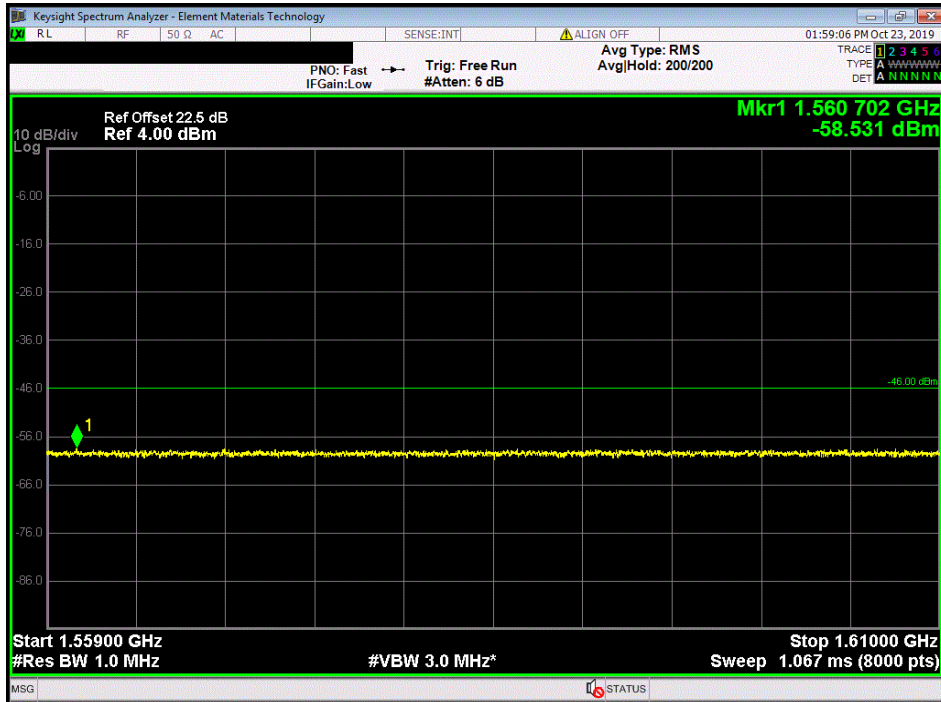


Band 13, 64QAM Modulation, LTE5 Bandwidth, 1.2GHz-8GHz						
				Value (dBm)	Limit (dBm)	Result
				-32.756	-19	Pass



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Band 13, 64QAM Modulation, LTE5 Bandwidth, 1559MHz-1610MHz						
				Value (dBm)	Limit (dBm)	Result
				-58.531	-46	Pass



Band 13, 256QAM Modulation, LTE5 Bandwidth, 9kHz-150kHz						
				Value (dBm)	Limit (dBm)	Result
				-58.817	-39	Pass

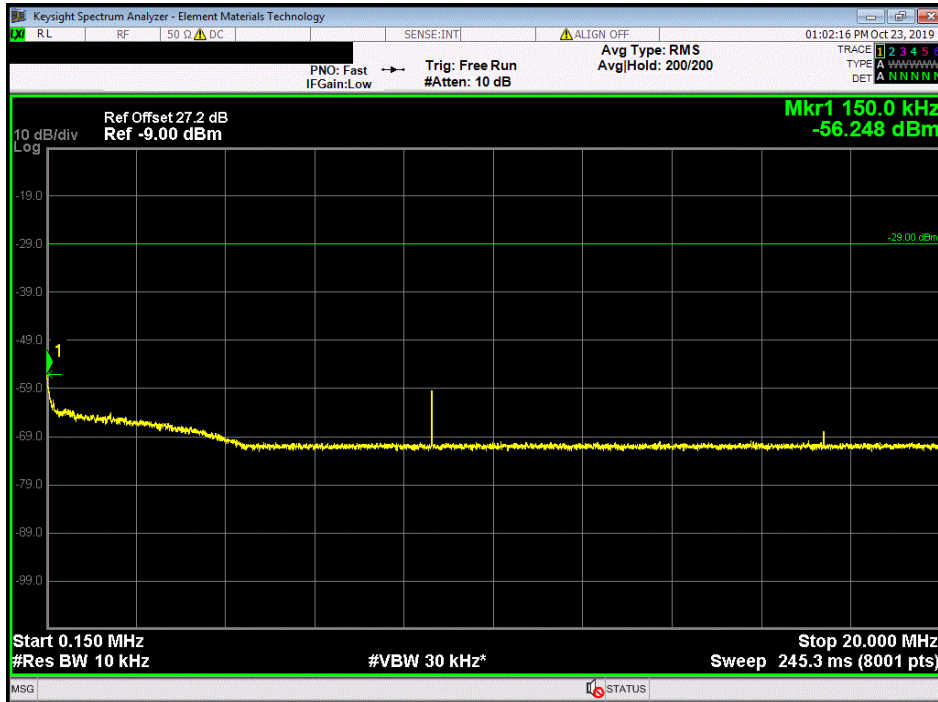


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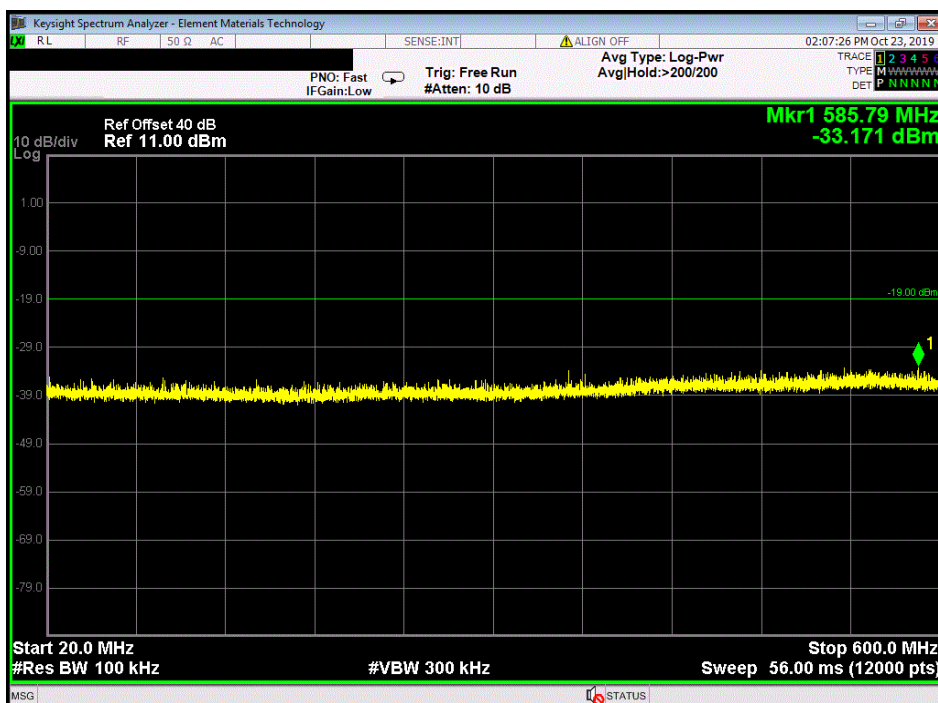


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Band 13, 256QAM Modulation, LTE5 Bandwidth, 150kHz-20MHz						
	Value	Limit	Result			
	(dBm)	(dBm)				
	-56.248	-29	Pass			

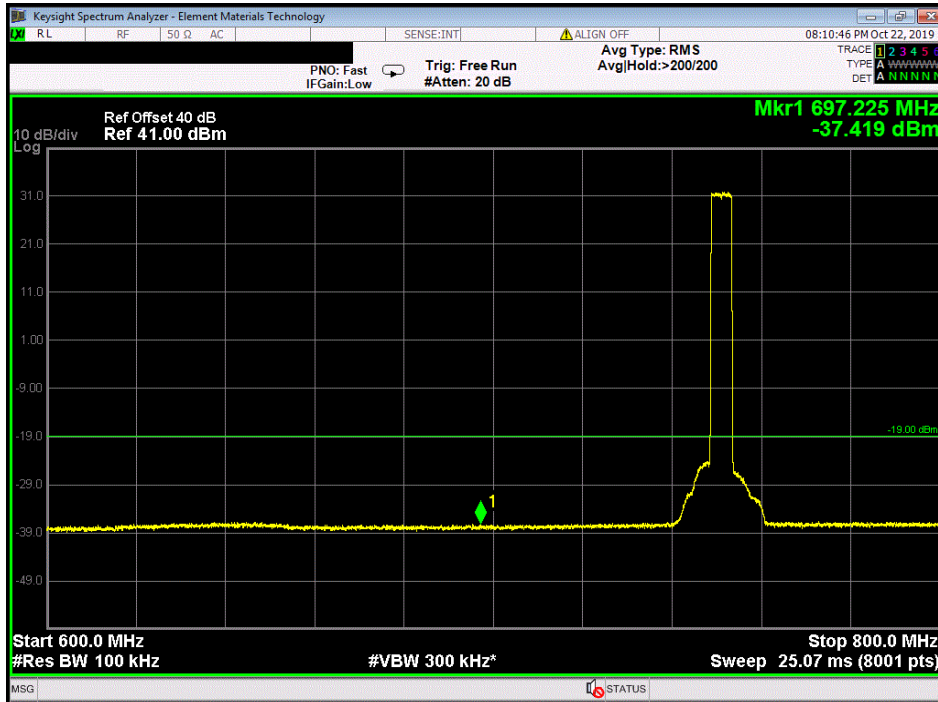


Band 13, 256QAM Modulation, LTE5 Bandwidth, 20MHz-600MHz						
	Value	Limit	Result			
	(dBm)	(dBm)				
	-33.171	-19	Pass			

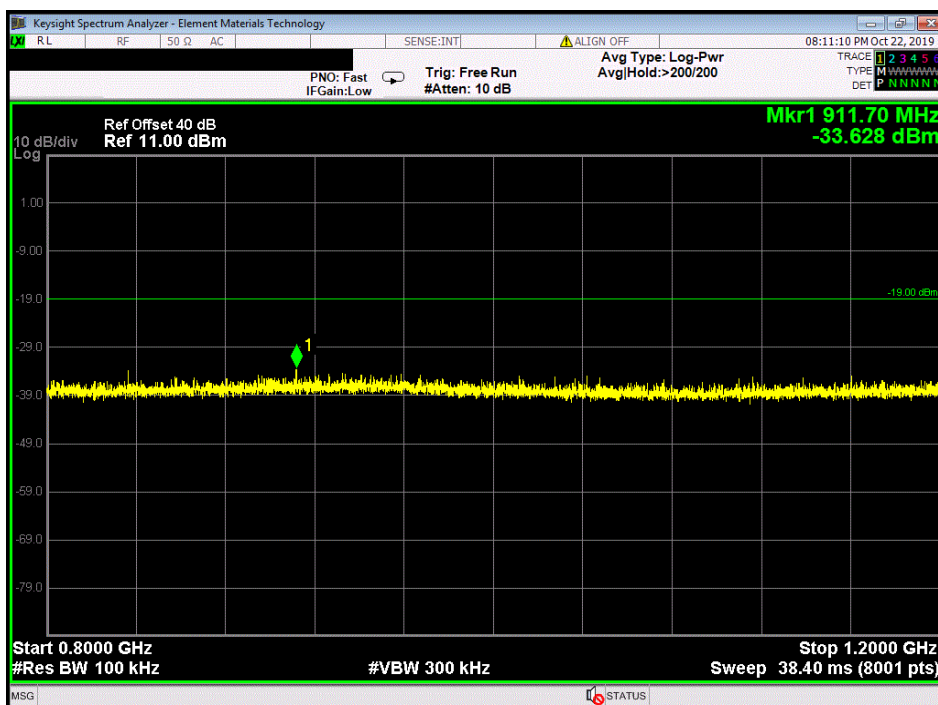


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Band 13, 256QAM Modulation, LTE5 Bandwidth, 600MHz-800MHz						
				Value (dBm)	Limit (dBm)	Result
				-37.419	-19	Pass

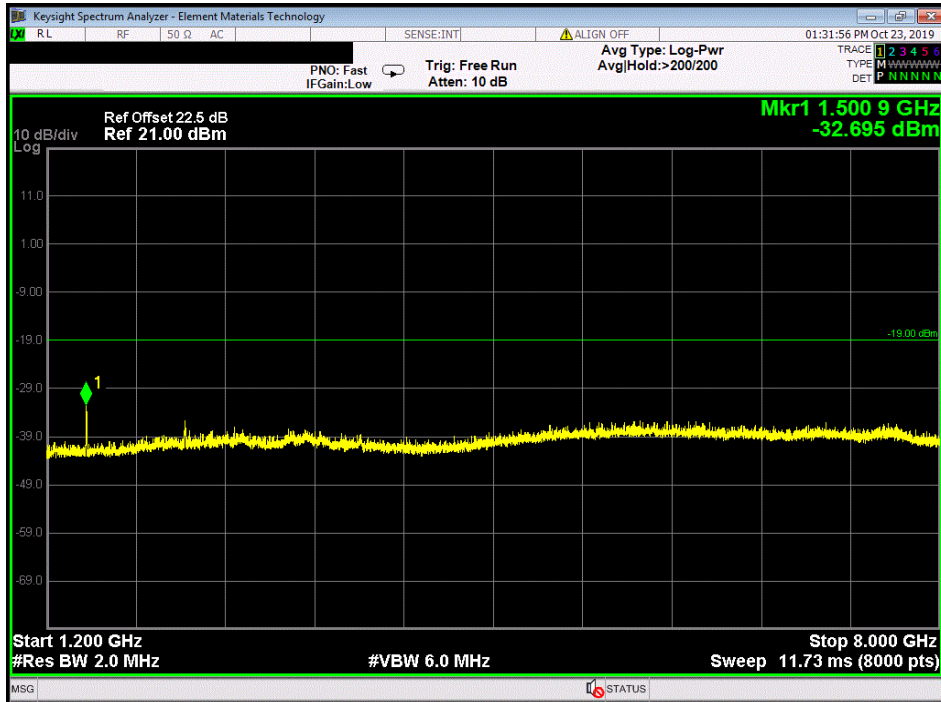


Band 13, 256QAM Modulation, LTE5 Bandwidth, 800MHz-1.2GHz						
				Value (dBm)	Limit (dBm)	Result
				-33.628	-19	Pass

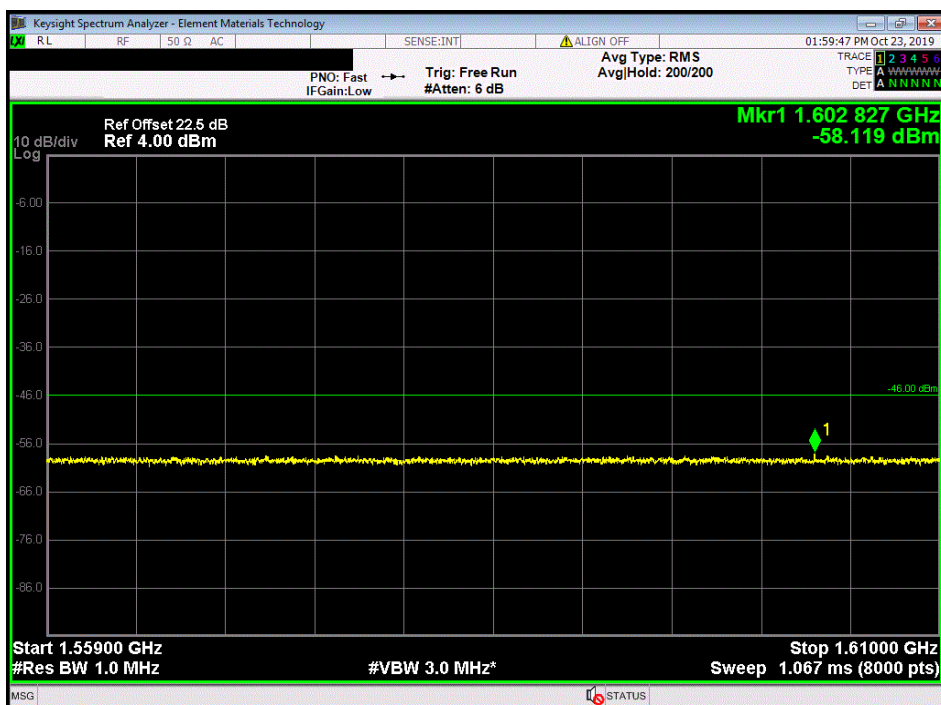


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Band 13, 256QAM Modulation, LTE5 Bandwidth, 1.2GHz-8GHz						
				Value (dBm)	Limit (dBm)	Result
				-32.695	-19	Pass

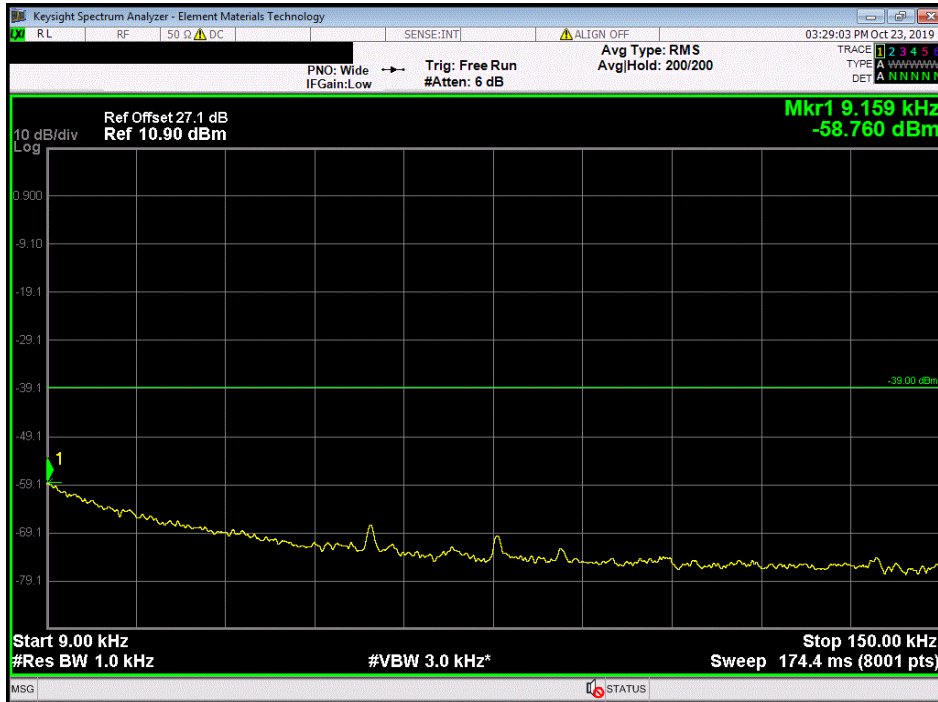


Band 13, 256QAM Modulation, LTE5 Bandwidth, 1559MHz-1610MHz						
				Value (dBm)	Limit (dBm)	Result
				-58.119	-46	Pass

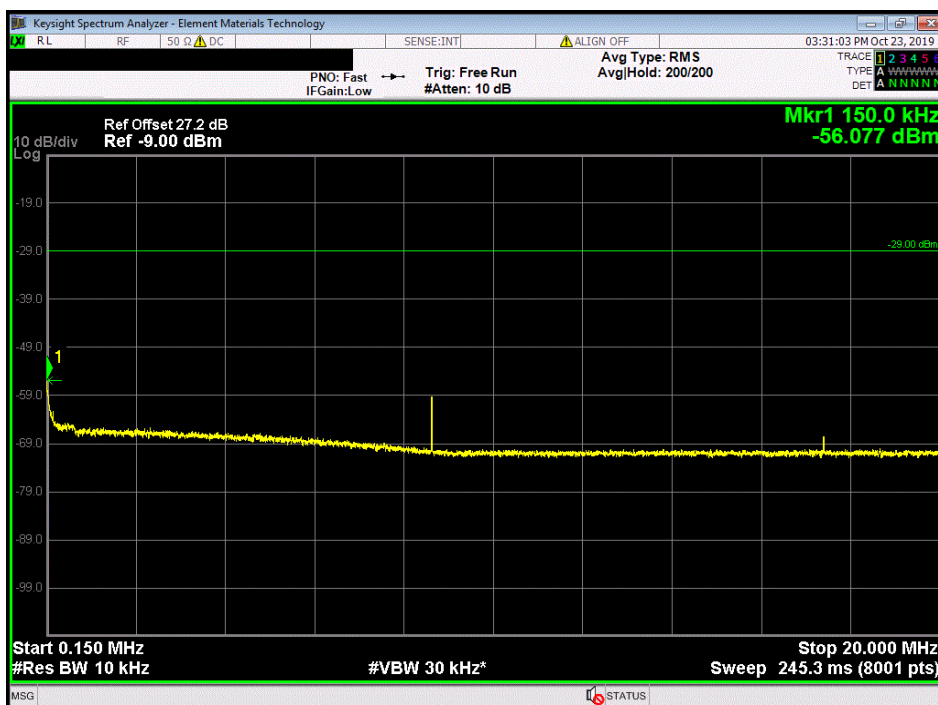


SPURIOUS CONDUCTED EMISSIONS

Band 13, 256QAM Modulation, LTE10 Bandwidth, 9kHz-150kHz						
				Value (dBm)	Limit (dBm)	Result
				-58.76	-39	Pass



Band 13, 256QAM Modulation, LTE10 Bandwidth, 150kHz-20MHz						
				Value (dBm)	Limit (dBm)	Result
				-56.077	-29	Pass

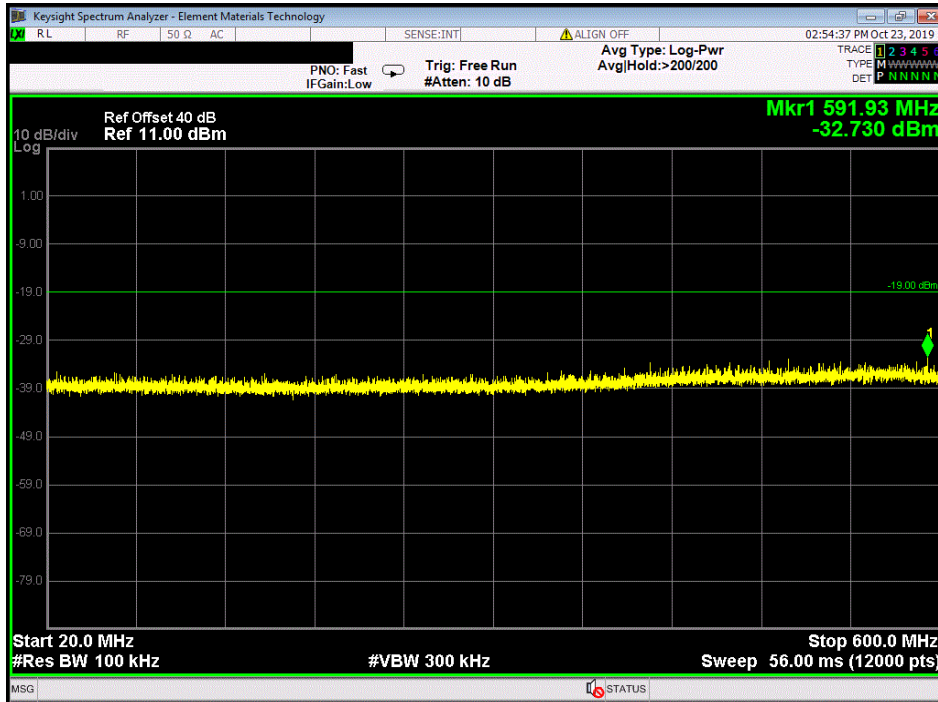


SPURIOUS CONDUCTED EMISSIONS

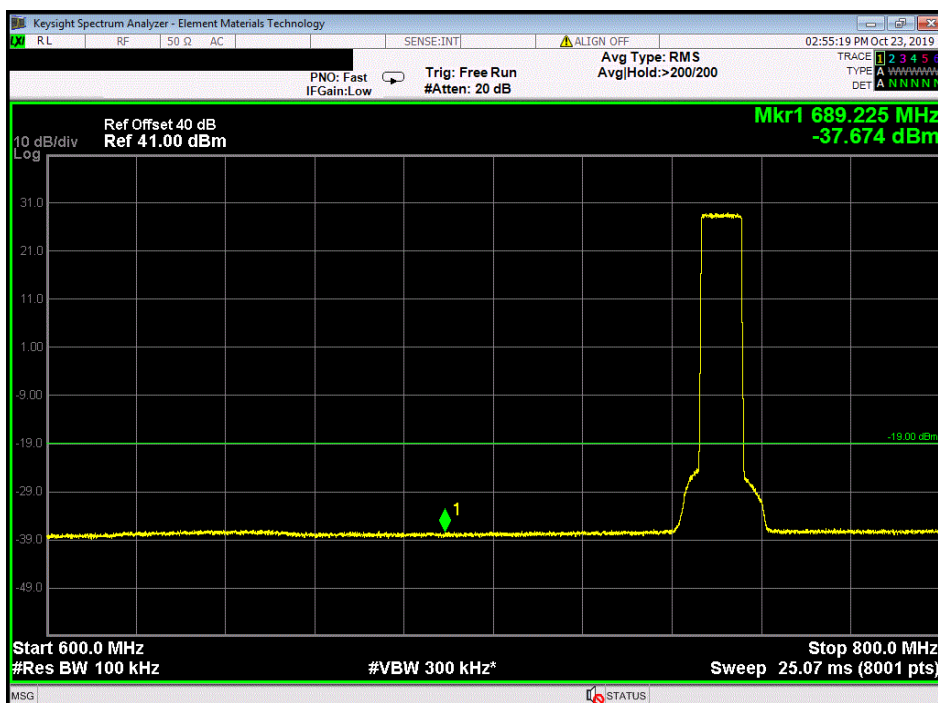


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Band 13, 256QAM Modulation, LTE10 Bandwidth, 20MHz-600MHz						
				Value (dBm)	Limit (dBm)	Result
				-32.73	-19	Pass



Band 13, 256QAM Modulation, LTE10 Bandwidth, 600MHz-800MHz						
				Value (dBm)	Limit (dBm)	Result
				-37.674	-19	Pass

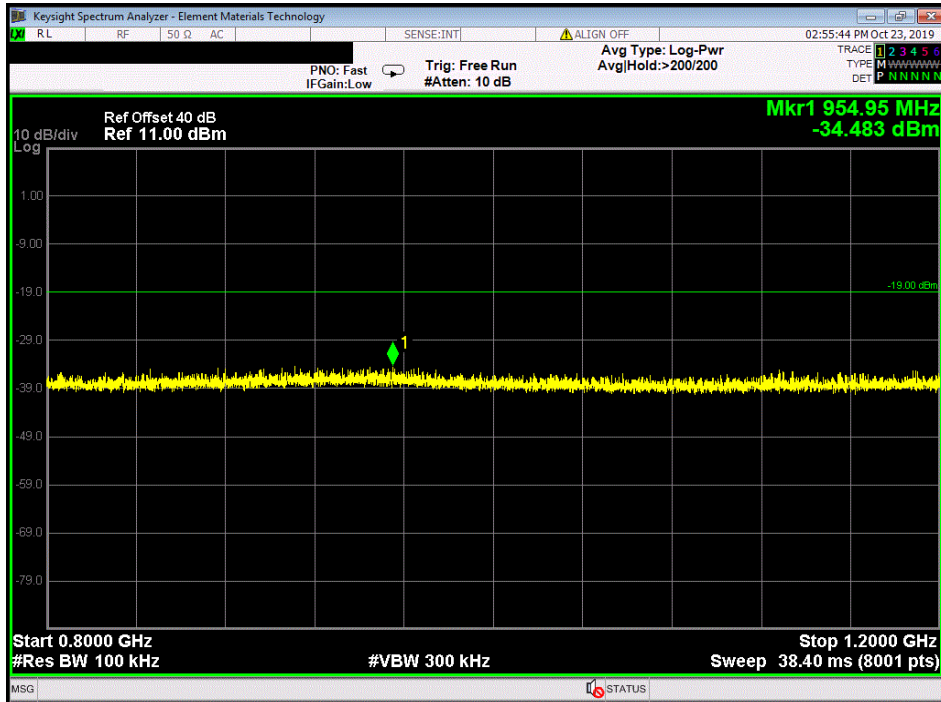


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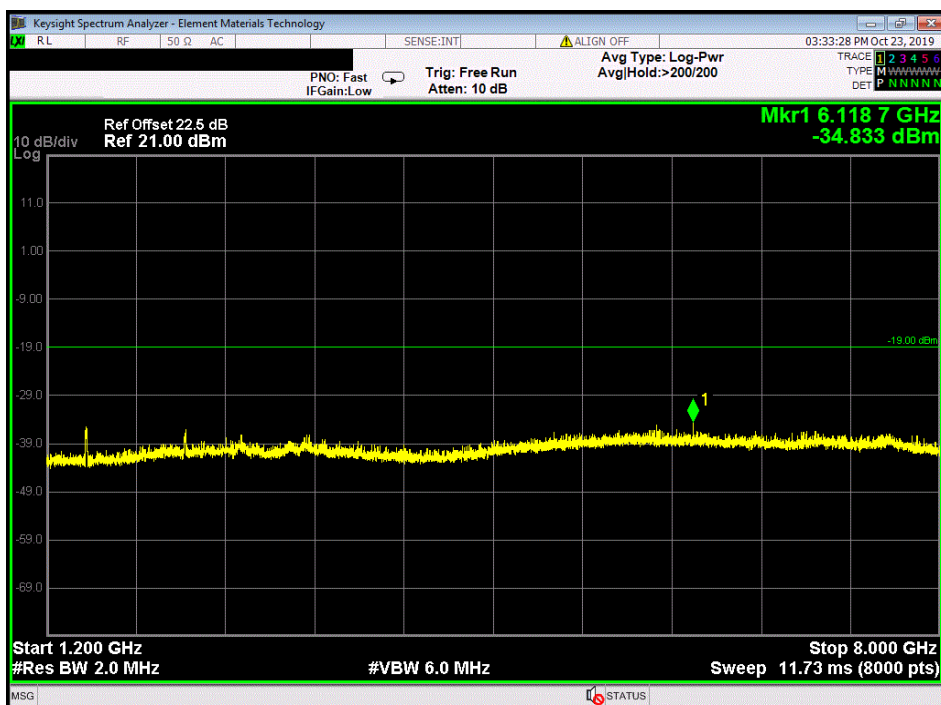


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Band 13, 256QAM Modulation, LTE10 Bandwidth, 800MHz-1.2GHz						
				Value (dBm)	Limit (dBm)	Result
				-34.483	-19	Pass



Band 13, 256QAM Modulation, LTE10 Bandwidth, 1.2GHz-8GHz						
				Value (dBm)	Limit (dBm)	Result
				-34.833	-19	Pass

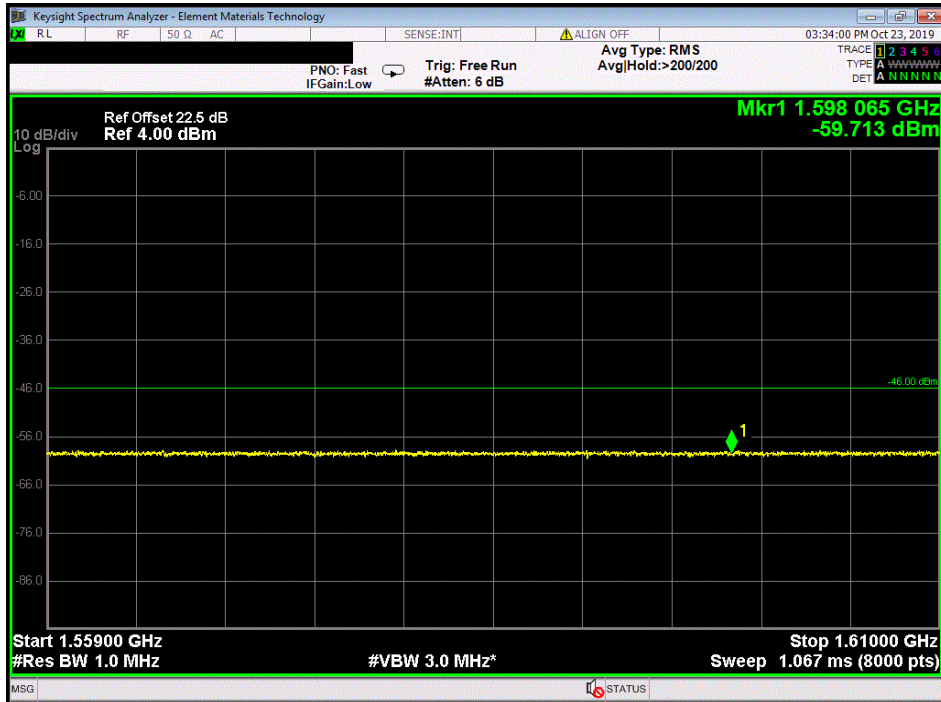


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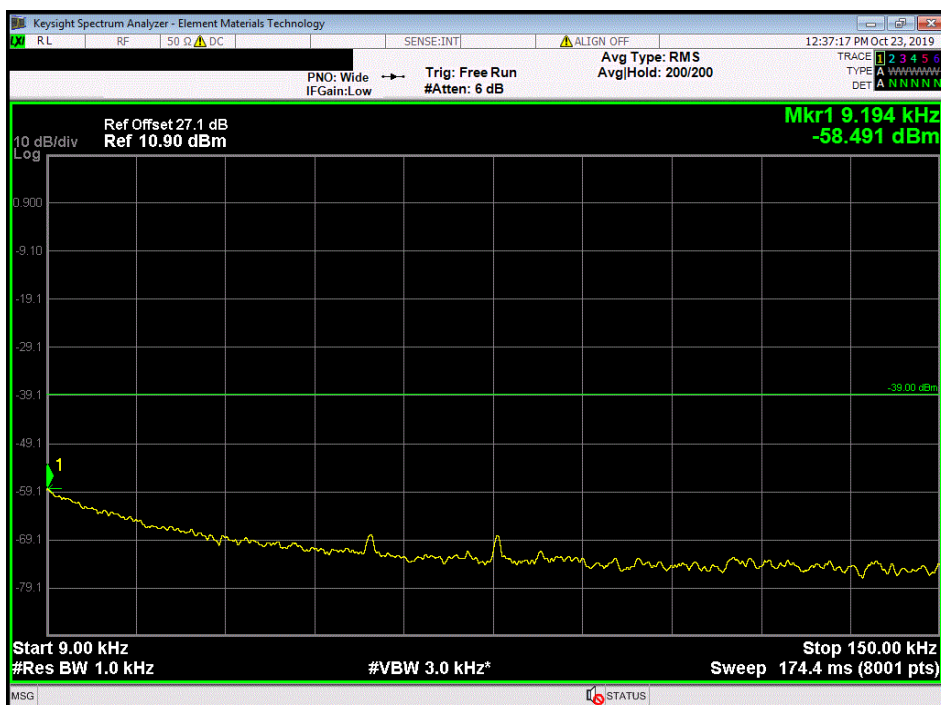


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Band 13, 256QAM Modulation, LTE10 Bandwidth, 1559MHz-1610MHz						
				Value (dBm)	Limit (dBm)	Result
				-59.713	-46	Pass

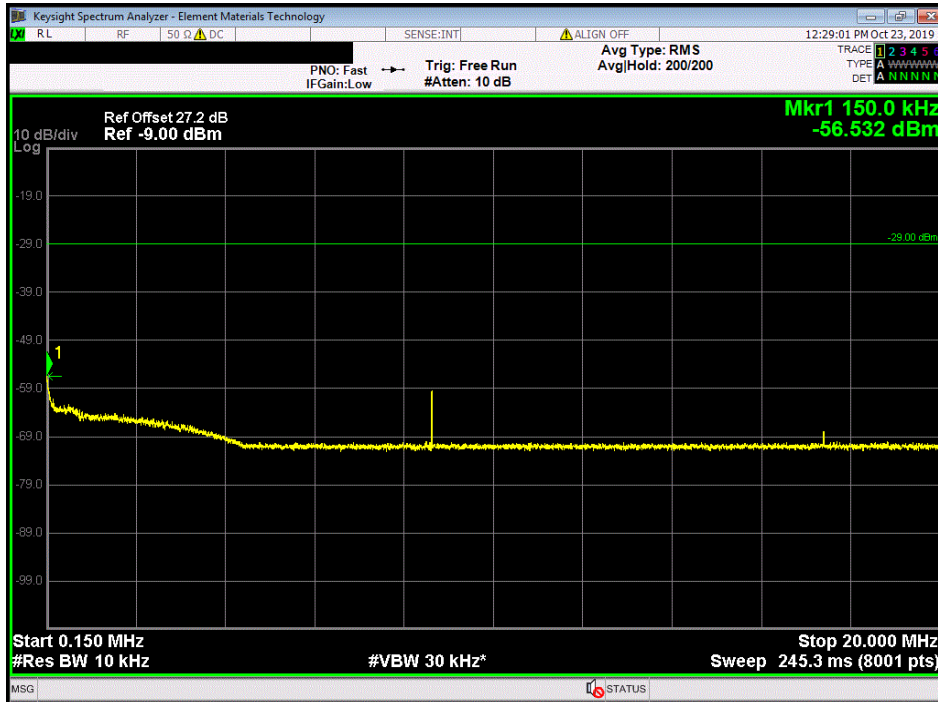


Band 71, QPSK Modulation, LTE5 Bandwidth, 9kHz-150kHz						
				Value (dBm)	Limit (dBm)	Result
				-58.491	-39	Pass

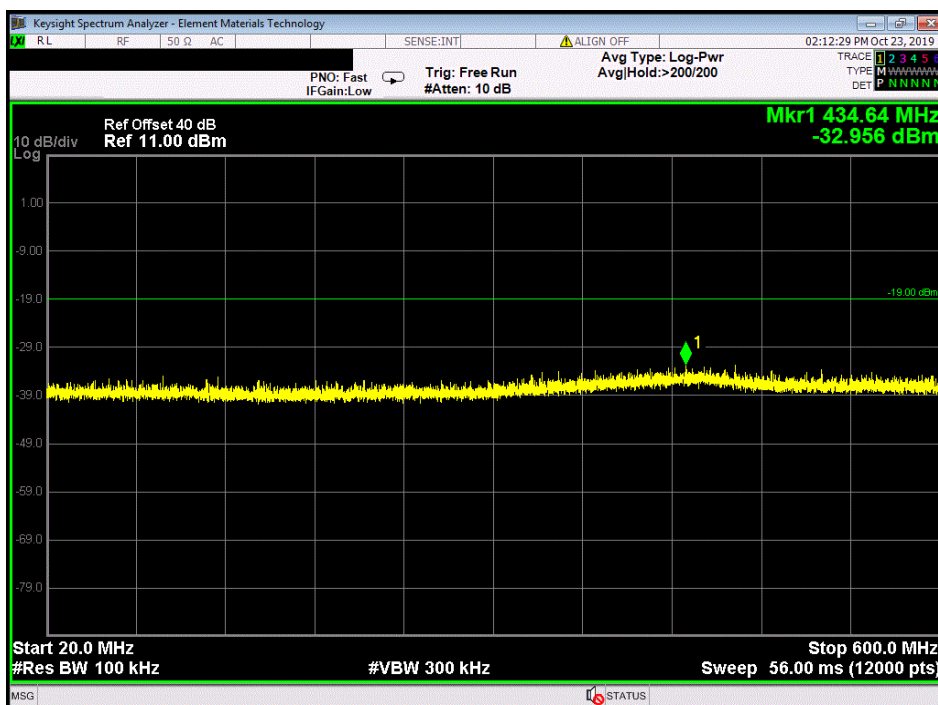


SPURIOUS CONDUCTED EMISSIONS

Band 71, QPSK Modulation, LTE5 Bandwidth, 150kHz-20MHz						
				Value (dBm)	Limit (dBm)	Result
				-56.532	-29	Pass

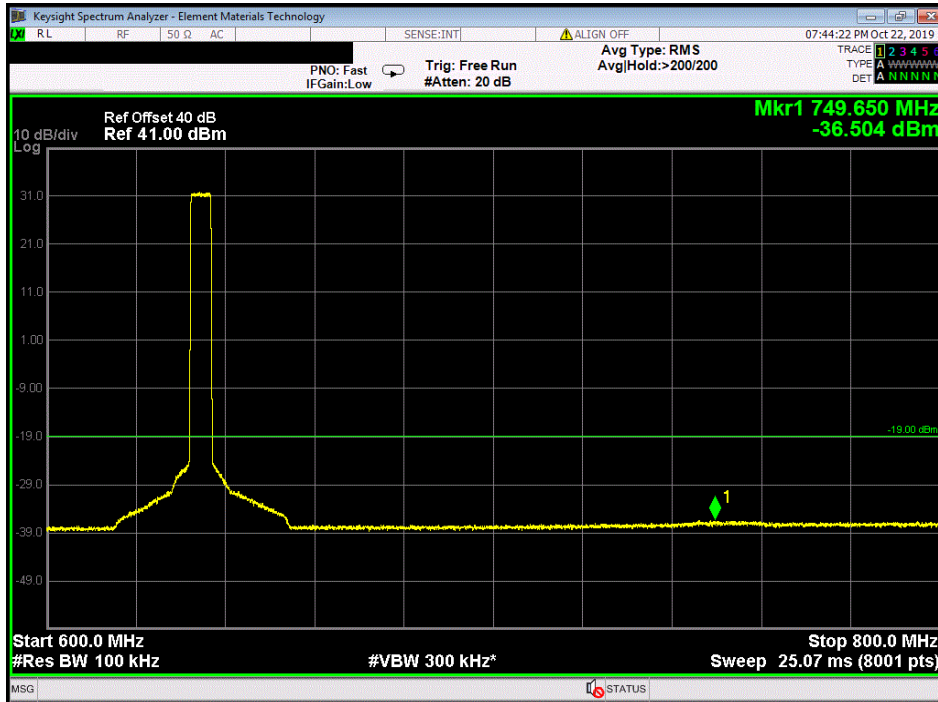


Band 71, QPSK Modulation, LTE5 Bandwidth, 20MHz-600MHz						
				Value (dBm)	Limit (dBm)	Result
				-32.956	-19	Pass

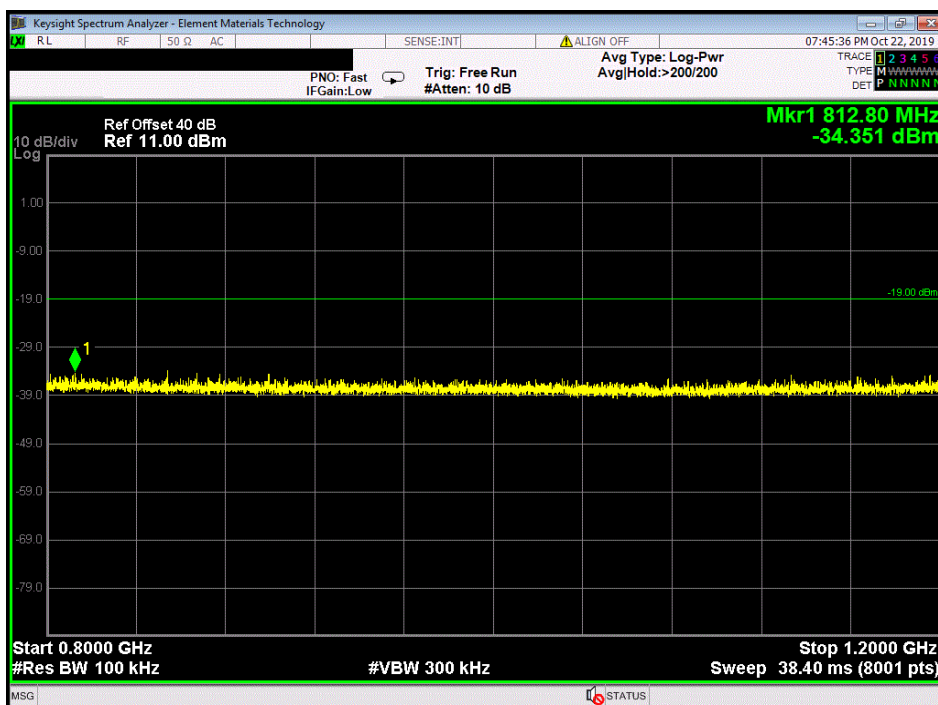


SPURIOUS CONDUCTED EMISSIONS

Band 71, QPSK Modulation, LTE5 Bandwidth, 600MHz-800MHz						
				Value (dBm)	Limit (dBm)	Result
				-36.504	-19	Pass

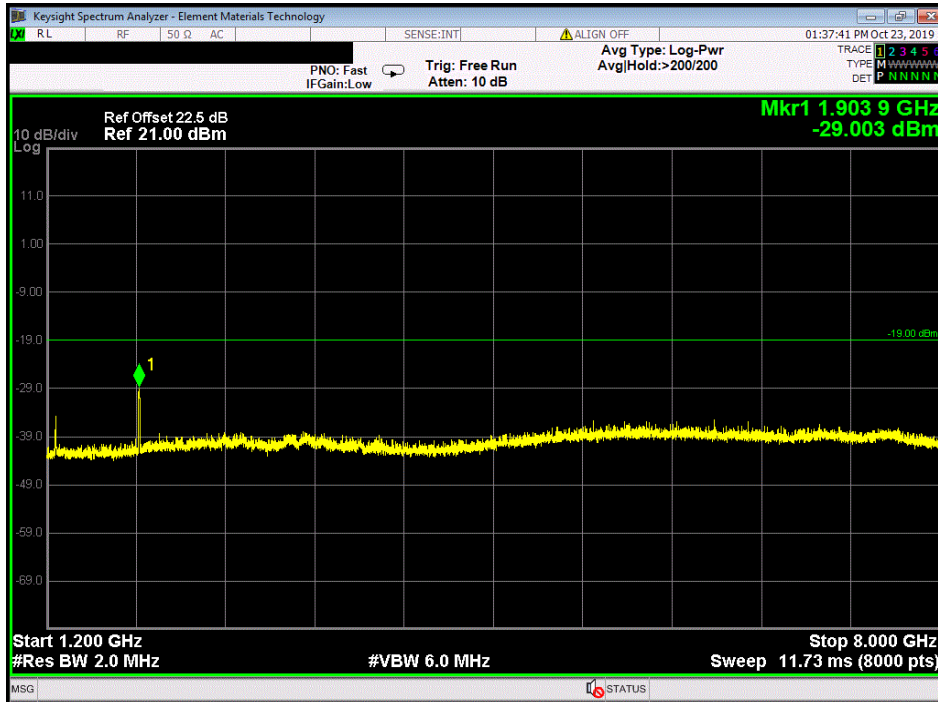


Band 71, QPSK Modulation, LTE5 Bandwidth, 800MHz-1.2GHz						
				Value (dBm)	Limit (dBm)	Result
				-34.351	-19	Pass

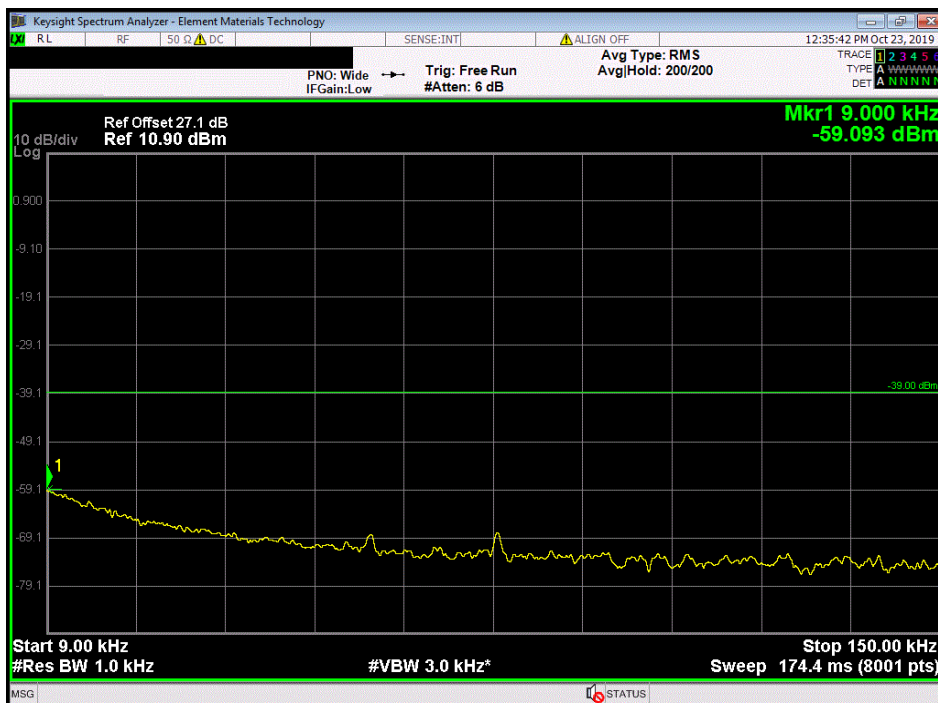


SPURIOUS CONDUCTED EMISSIONS

Band 71, QPSK Modulation, LTE5 Bandwidth, 1.2GHz-8GHz						
				Value (dBm)	Limit (dBm)	Result
				-29.003	-19	Pass

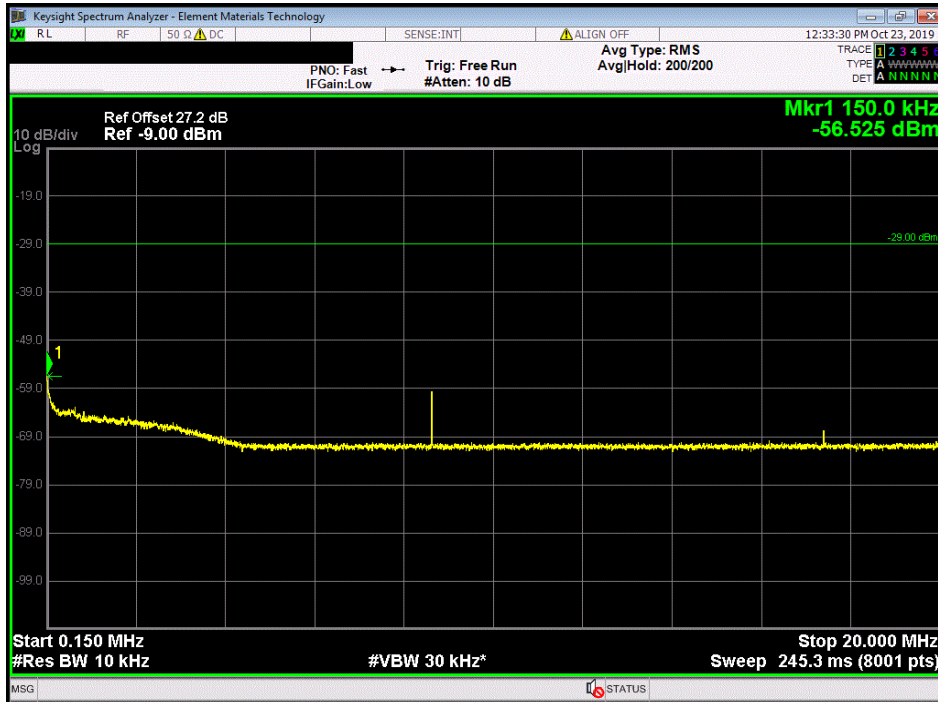


Band 71, 16QAM Modulation, LTE5 Bandwidth, 9kHz-150kHz						
				Value (dBm)	Limit (dBm)	Result
				-59.093	-39	Pass

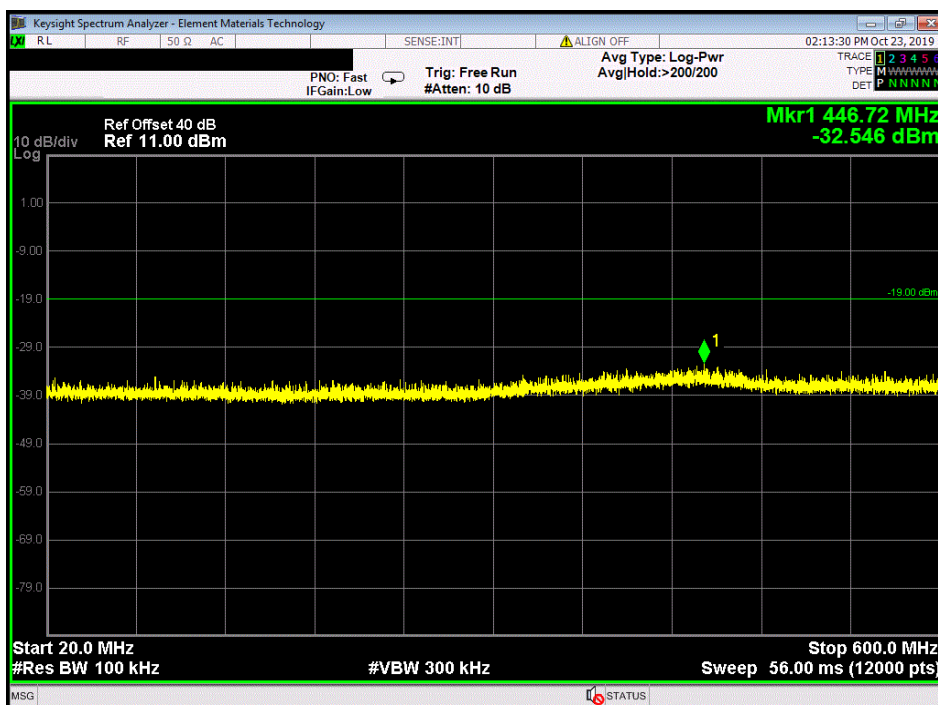


SPURIOUS CONDUCTED EMISSIONS

Band 71, 16QAM Modulation, LTE5 Bandwidth, 150kHz-20MHz						
				Value (dBm)	Limit (dBm)	Result
				-56.525	-29	Pass



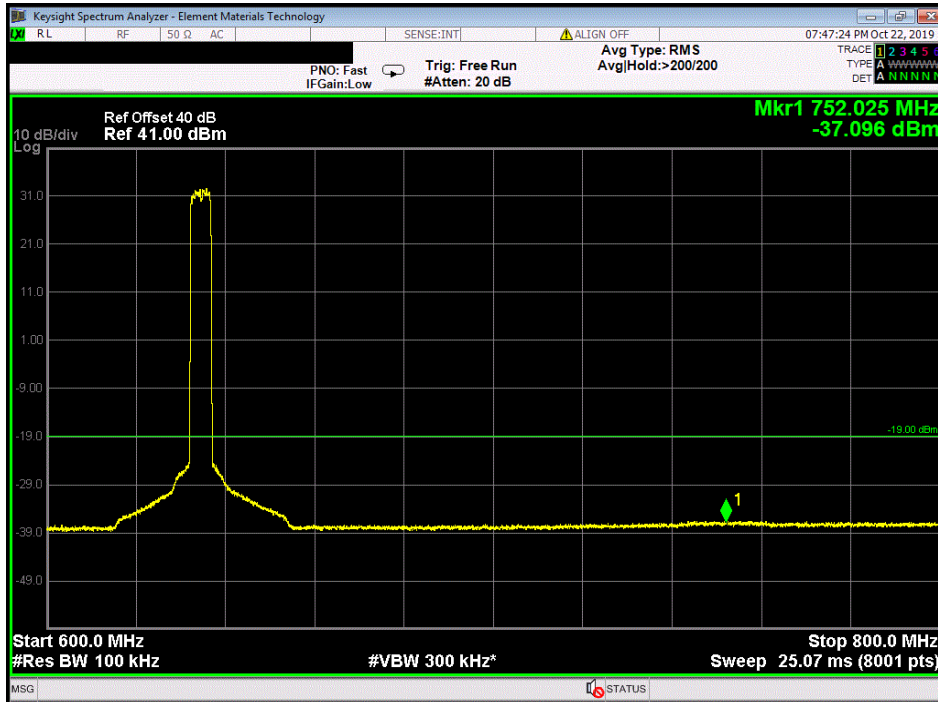
Band 71, 16QAM Modulation, LTE5 Bandwidth, 20MHz-600MHz						
				Value (dBm)	Limit (dBm)	Result
				-32.546	-19	Pass



SPURIOUS CONDUCTED EMISSIONS

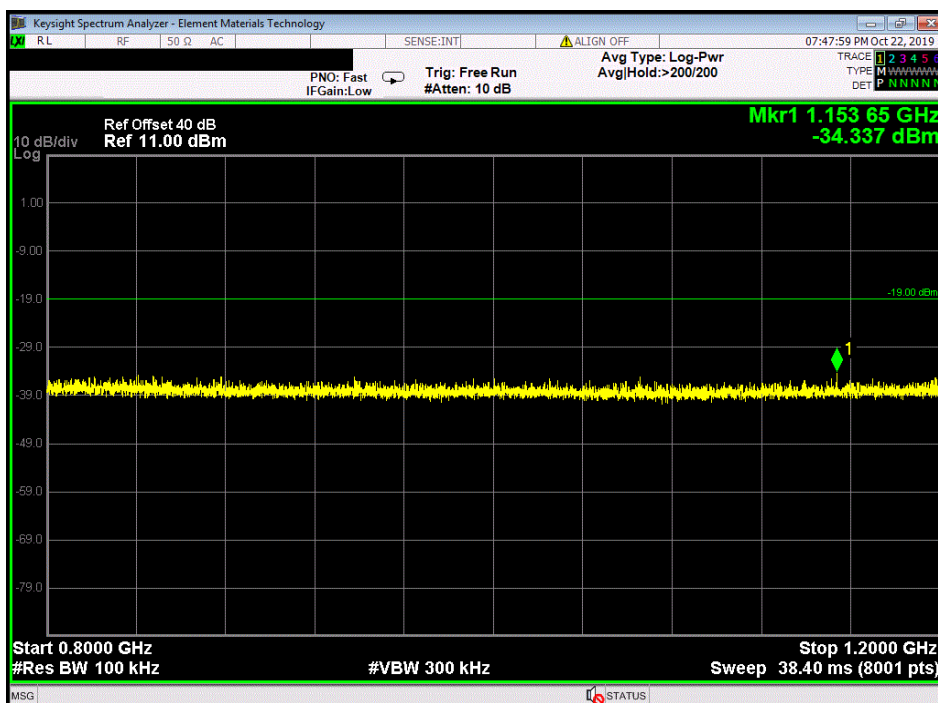
Band 71, 16QAM Modulation, LTE5 Bandwidth, 600MHz-800MHz

				Value (dBm)	Limit (dBm)	Result
				-37.096	-19	Pass



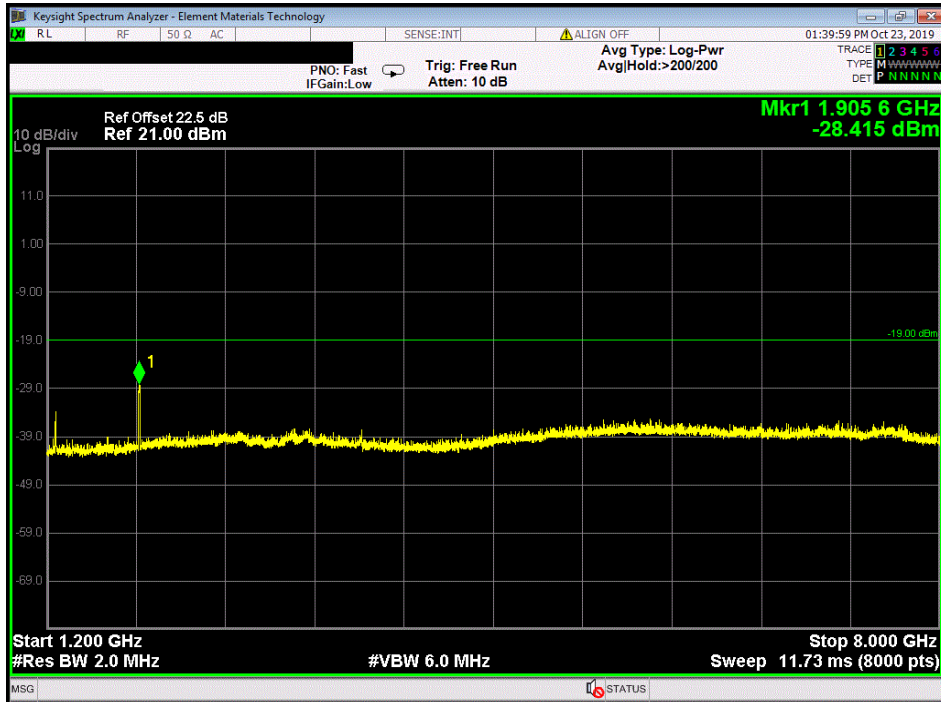
Band 71, 16QAM Modulation, LTE5 Bandwidth, 800MHz-1.2GHz

				Value (dBm)	Limit (dBm)	Result
				-34.337	-19	Pass

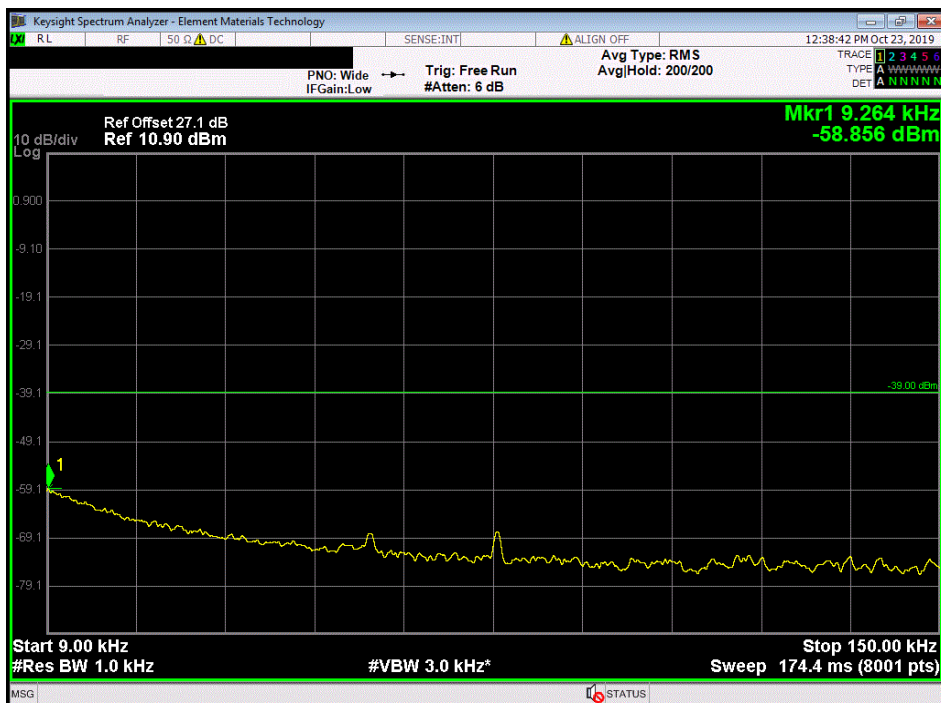


SPURIOUS CONDUCTED EMISSIONS

Band 71, 16QAM Modulation, LTE5 Bandwidth, 1.2GHz-8GHz						
	Value	Limit	Result			
	(dBm)	(dBm)				
	-28.415	-19	Pass			

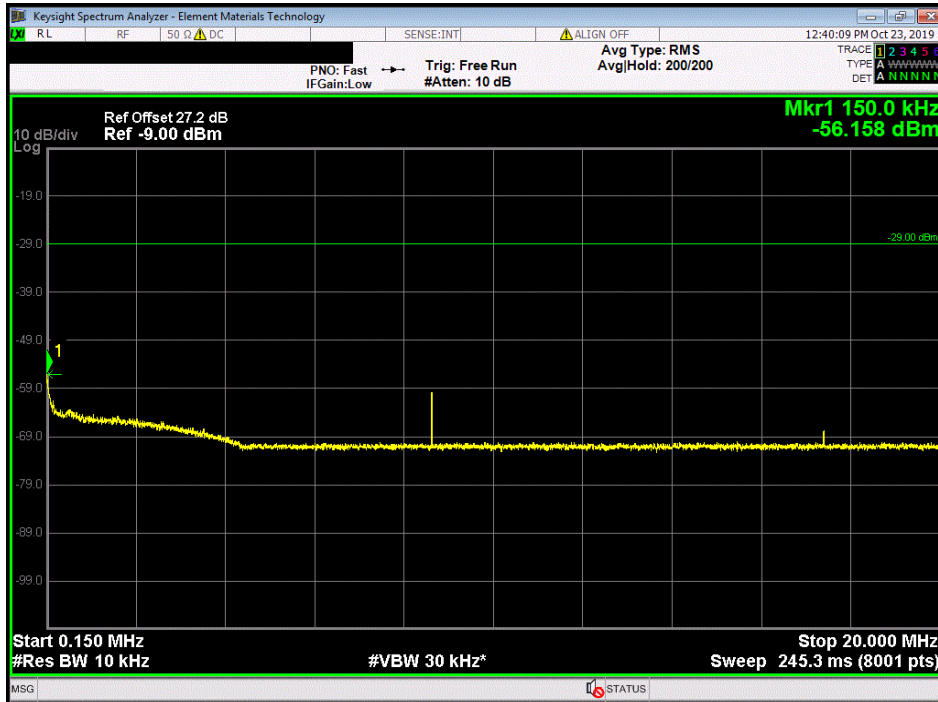


Band 71, 64QAM Modulation, LTE5 Bandwidth, 9kHz-150kHz						
	Value	Limit	Result			
	(dBm)	(dBm)				
	-58.856	-39	Pass			

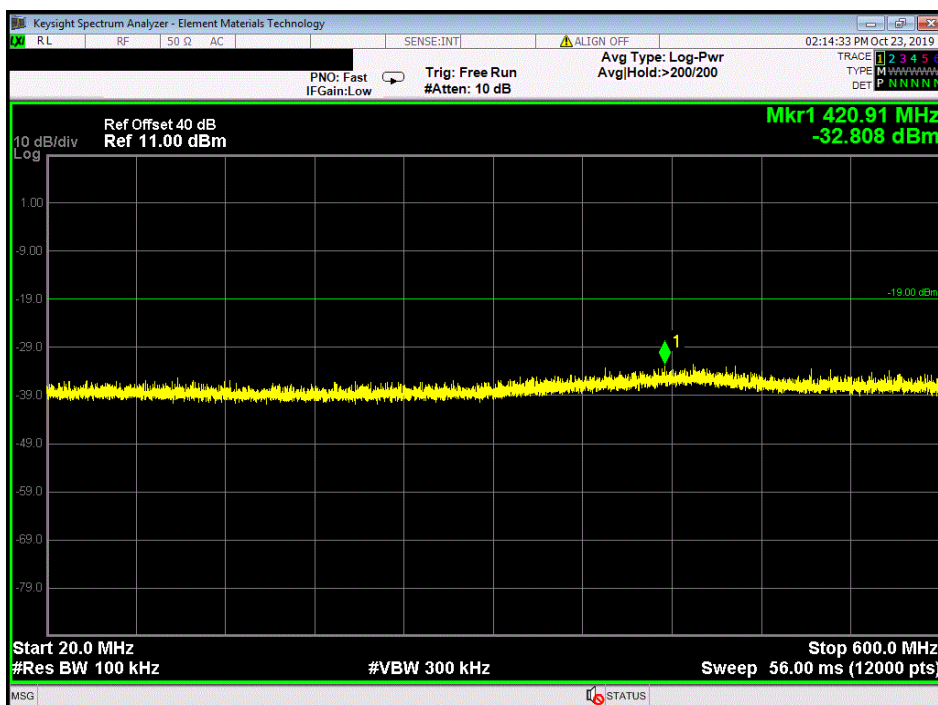


SPURIOUS CONDUCTED EMISSIONS

Band 71, 64QAM Modulation, LTE5 Bandwidth, 150kHz-20MHz						
				Value (dBm)	Limit (dBm)	Result
				-56.158	-29	Pass



Band 71, 64QAM Modulation, LTE5 Bandwidth, 20MHz-600MHz						
				Value (dBm)	Limit (dBm)	Result
				-32.808	-19	Pass

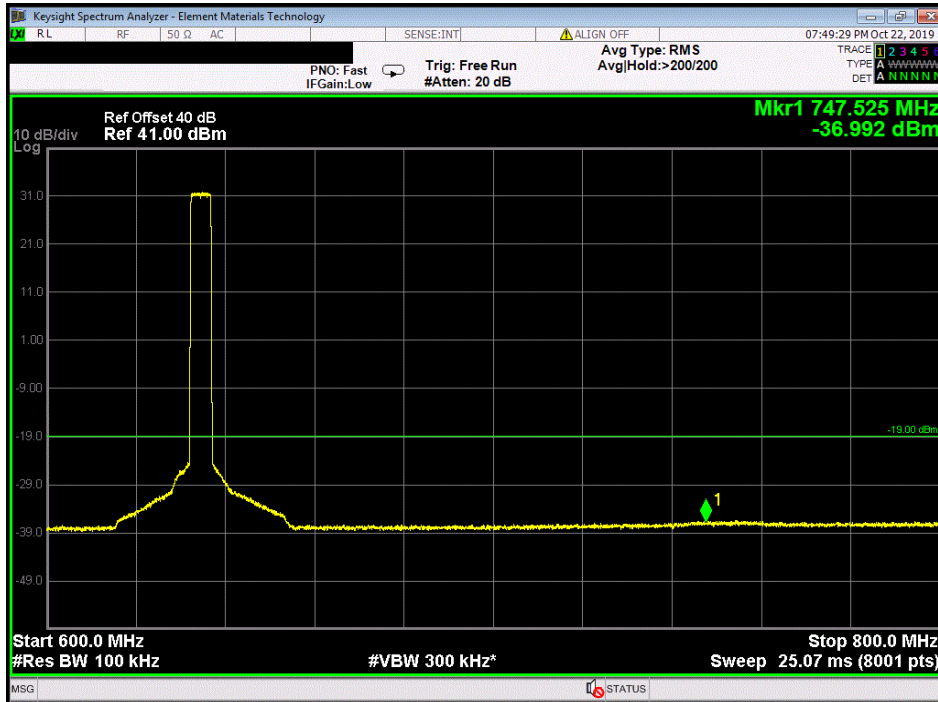


SPURIOUS CONDUCTED EMISSIONS

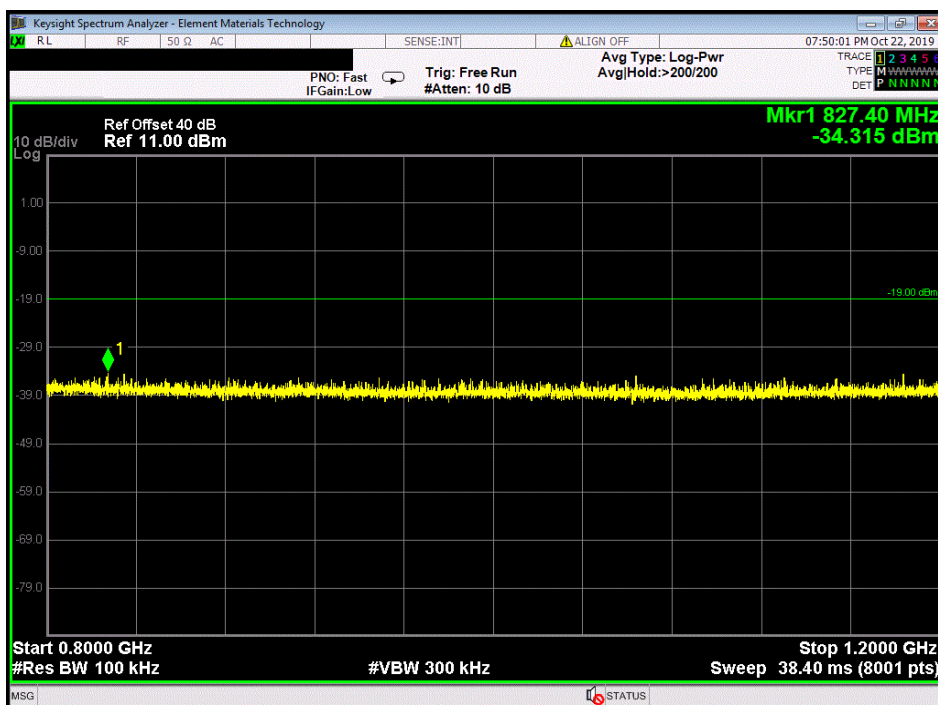


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Band 71, 64QAM Modulation, LTE5 Bandwidth, 600MHz-800MHz						
				Value (dBm)	Limit (dBm)	Result
				-36.992	-19	Pass

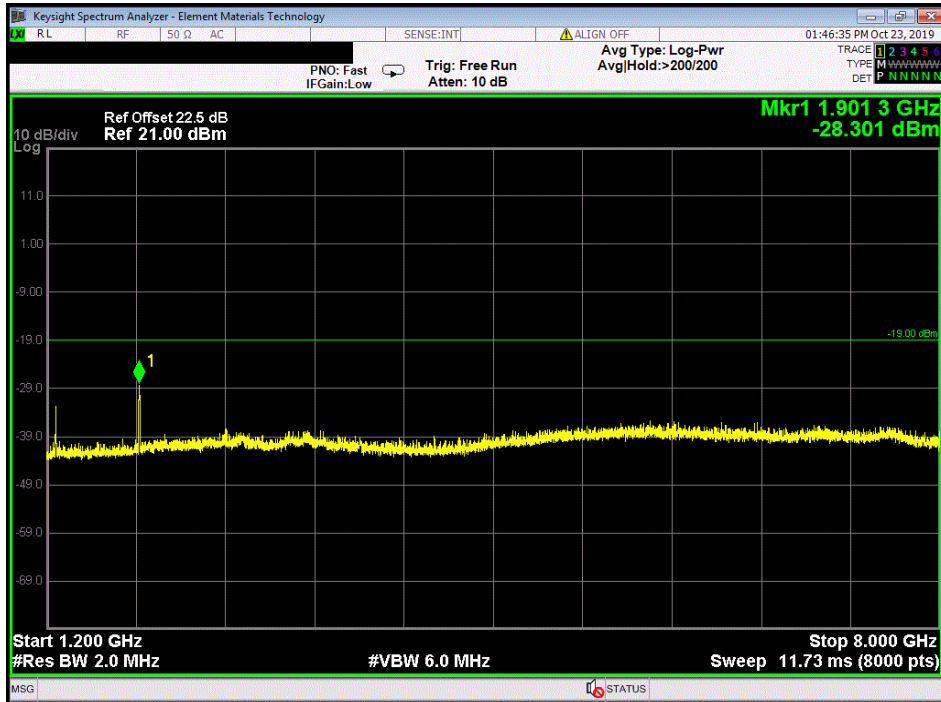


Band 71, 64QAM Modulation, LTE5 Bandwidth, 800MHz-1.2GHz						
				Value (dBm)	Limit (dBm)	Result
				-34.315	-19	Pass

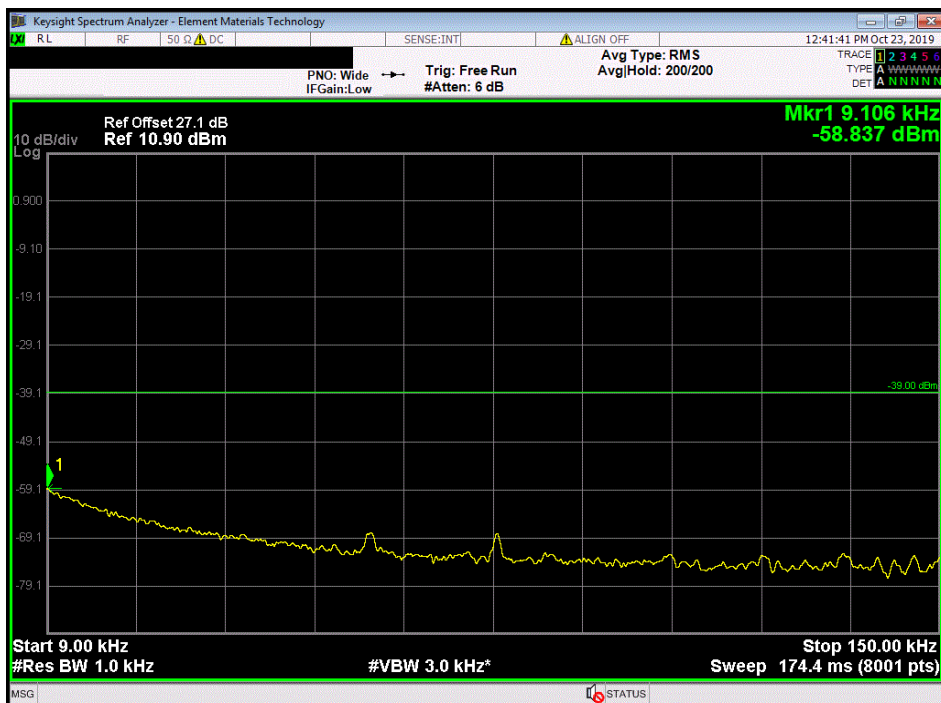


SPURIOUS CONDUCTED EMISSIONS

Band 71, 64QAM Modulation, LTE5 Bandwidth, 1.2GHz-8GHz						
	Value	Limit	Result			
	(dBm)	(dBm)				
	-28.301	-19	Pass			



Band 71, 256QAM Modulation, LTE5 Bandwidth, 9kHz-150kHz						
	Value	Limit	Result			
	(dBm)	(dBm)				
	-58.837	-39	Pass			

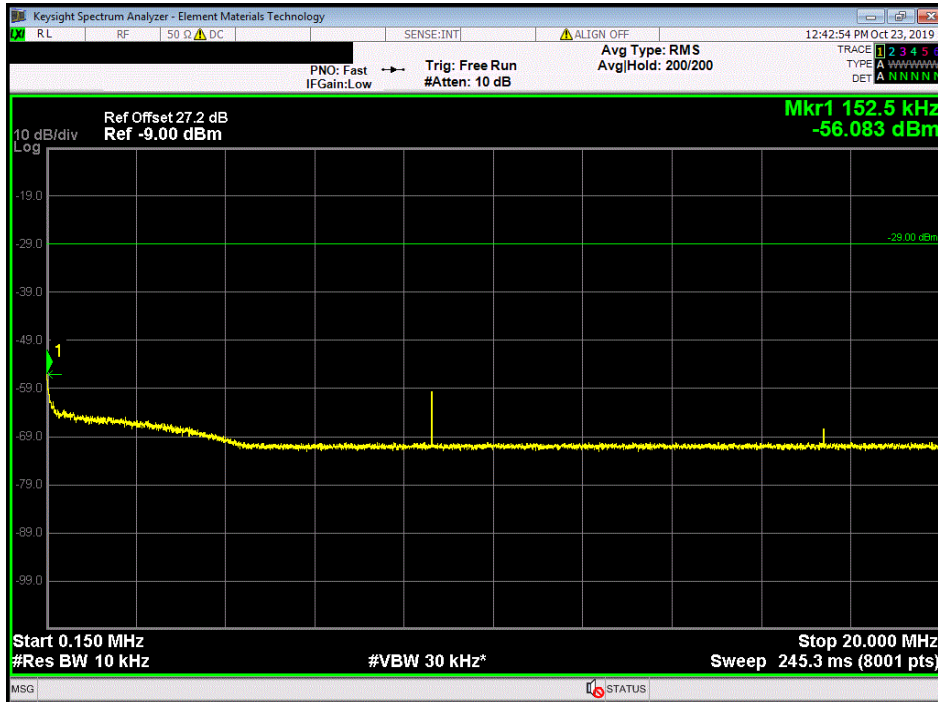


SPURIOUS CONDUCTED EMISSIONS

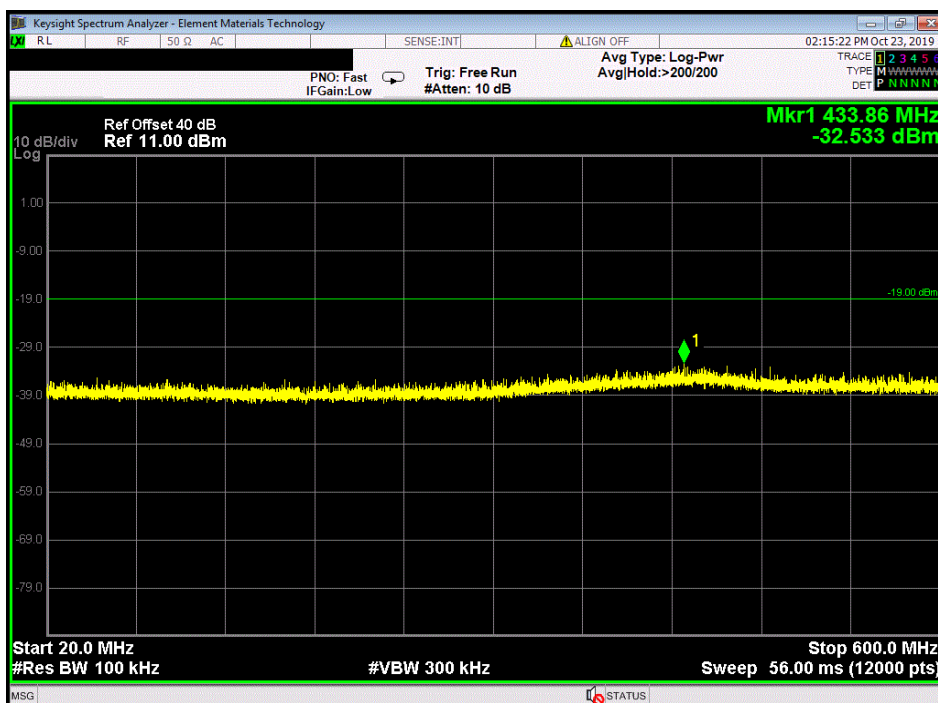


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Band 71, 256QAM Modulation, LTE5 Bandwidth, 150kHz-20MHz						
	Value	Limit	Result			
	(dBm)	(dBm)				
	-56.083	-29	Pass			

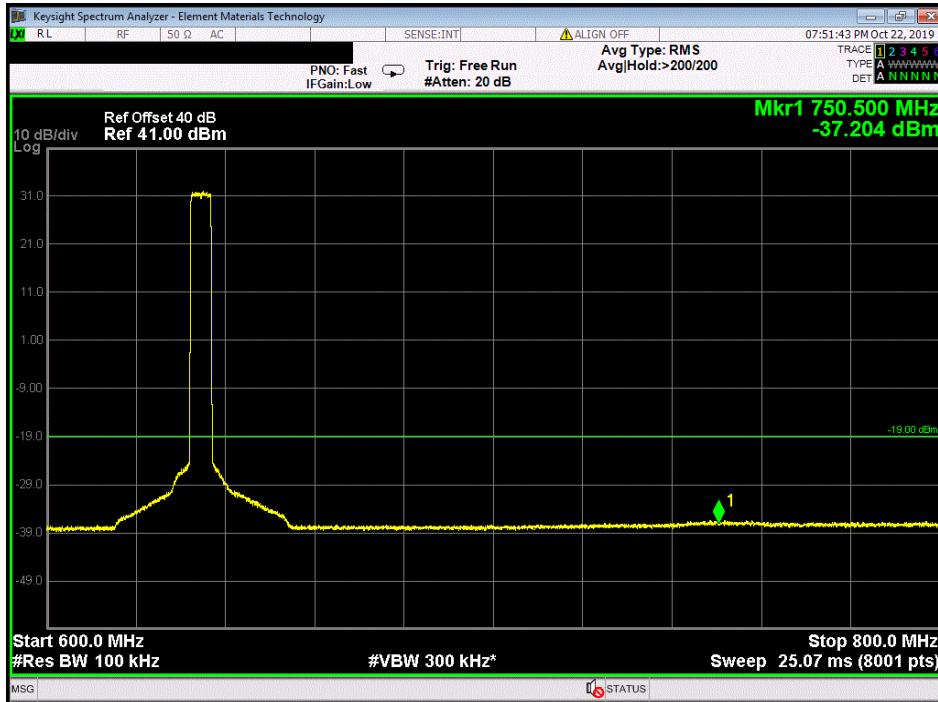


Band 71, 256QAM Modulation, LTE5 Bandwidth, 20MHz-600MHz						
	Value	Limit	Result			
	(dBm)	(dBm)				
	-32.533	-19	Pass			

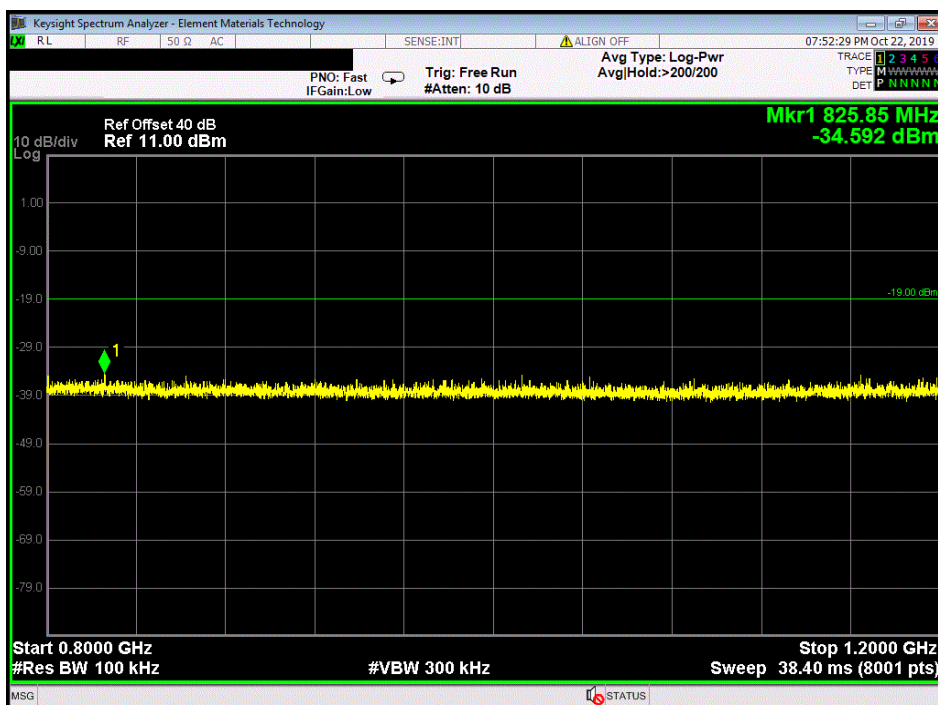


SPURIOUS CONDUCTED EMISSIONS

Band 71, 256QAM Modulation, LTE5 Bandwidth, 600MHz-800MHz						
				Value (dBm)	Limit (dBm)	Result
				-37.204	-19	Pass

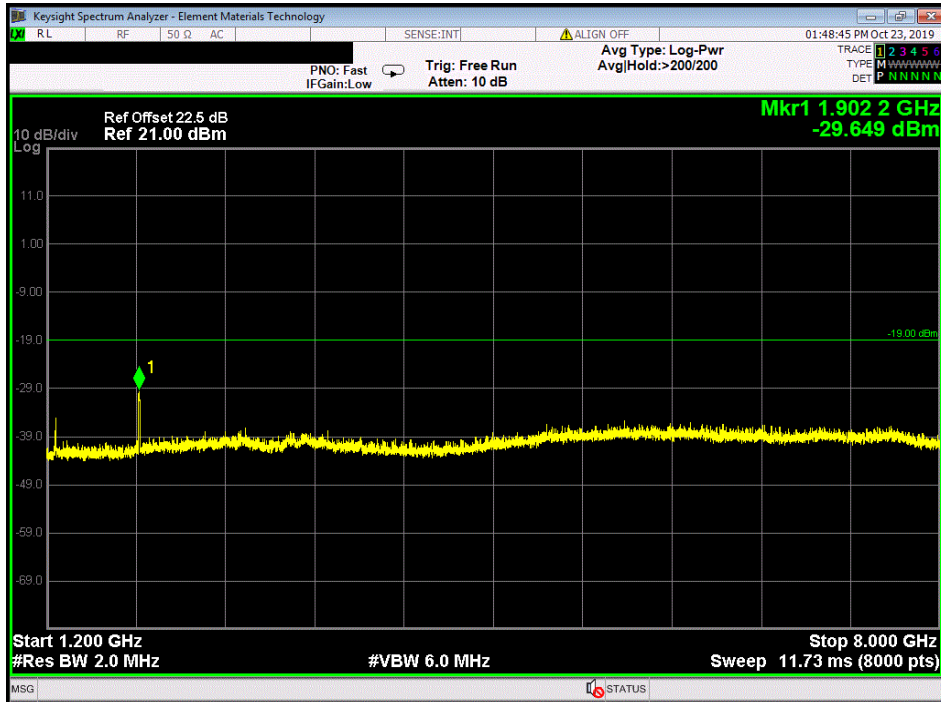


Band 71, 256QAM Modulation, LTE5 Bandwidth, 800MHz-1.2GHz						
				Value (dBm)	Limit (dBm)	Result
				-34.592	-19	Pass

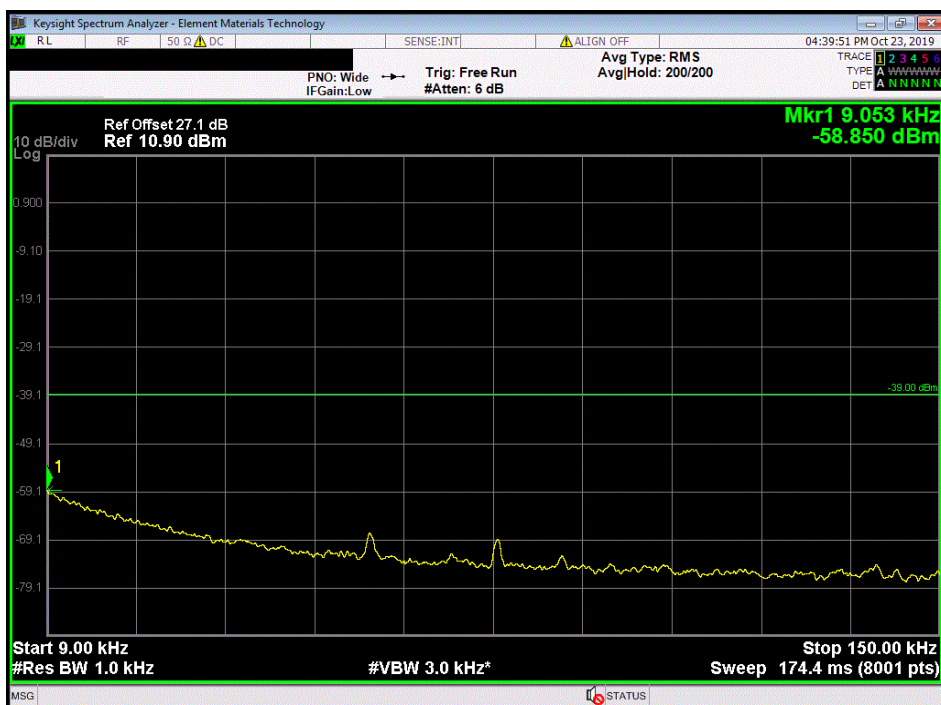


SPURIOUS CONDUCTED EMISSIONS

Band 71, 256QAM Modulation, LTE5 Bandwidth, 1.2GHz-8GHz						
				Value (dBm)	Limit (dBm)	Result
				-29.649	-19	Pass

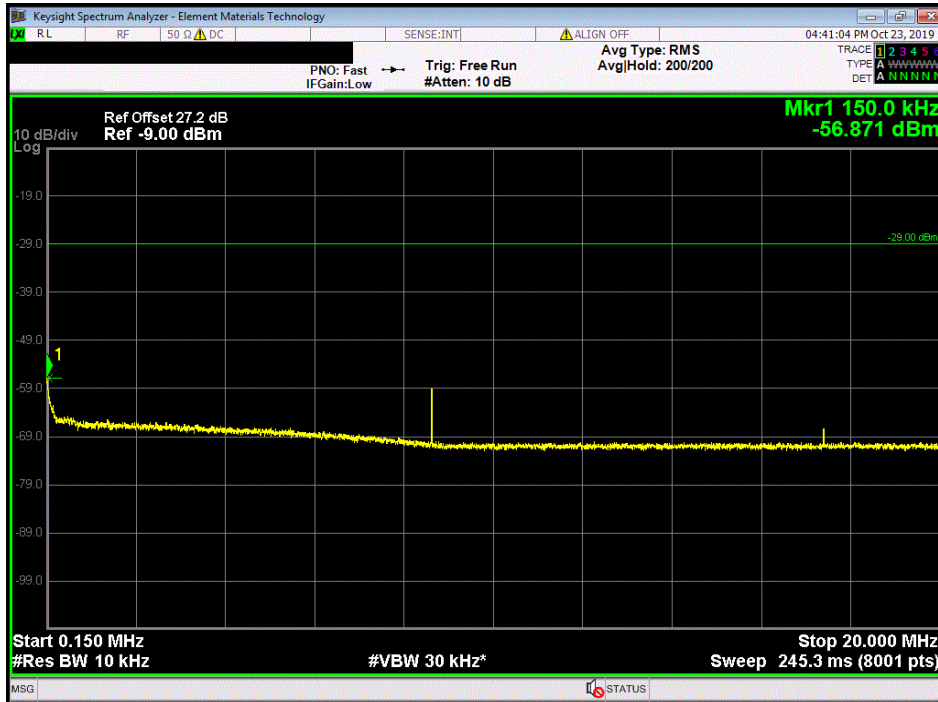


Band 71, 256QAM Modulation, LTE10 Bandwidth, 9kHz-150kHz						
				Value (dBm)	Limit (dBm)	Result
				-58.85	-39	Pass

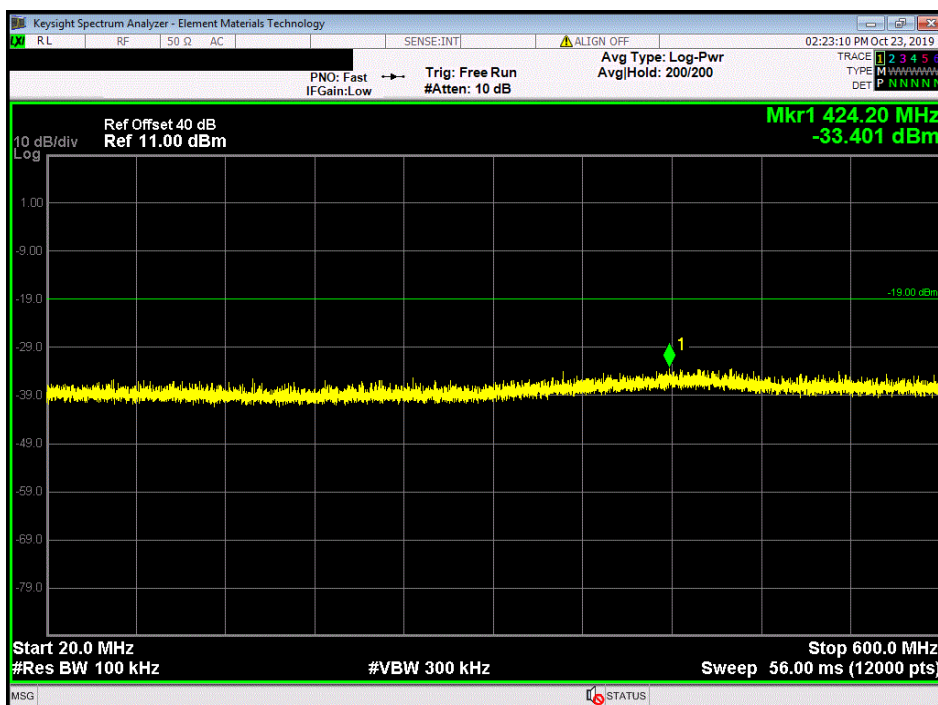


SPURIOUS CONDUCTED EMISSIONS

Band 71, 256QAM Modulation, LTE10 Bandwidth, 150kHz-20MHz						
				Value (dBm)	Limit (dBm)	Result
				-56.871	-29	Pass

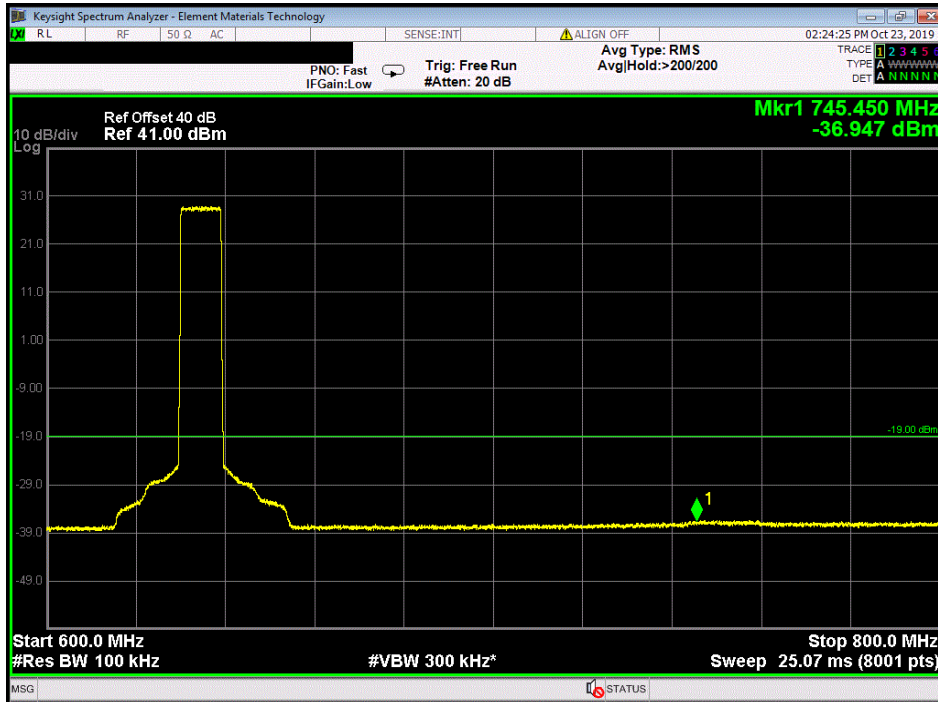


Band 71, 256QAM Modulation, LTE10 Bandwidth, 20MHz-600MHz						
				Value (dBm)	Limit (dBm)	Result
				-33.401	-29	Pass

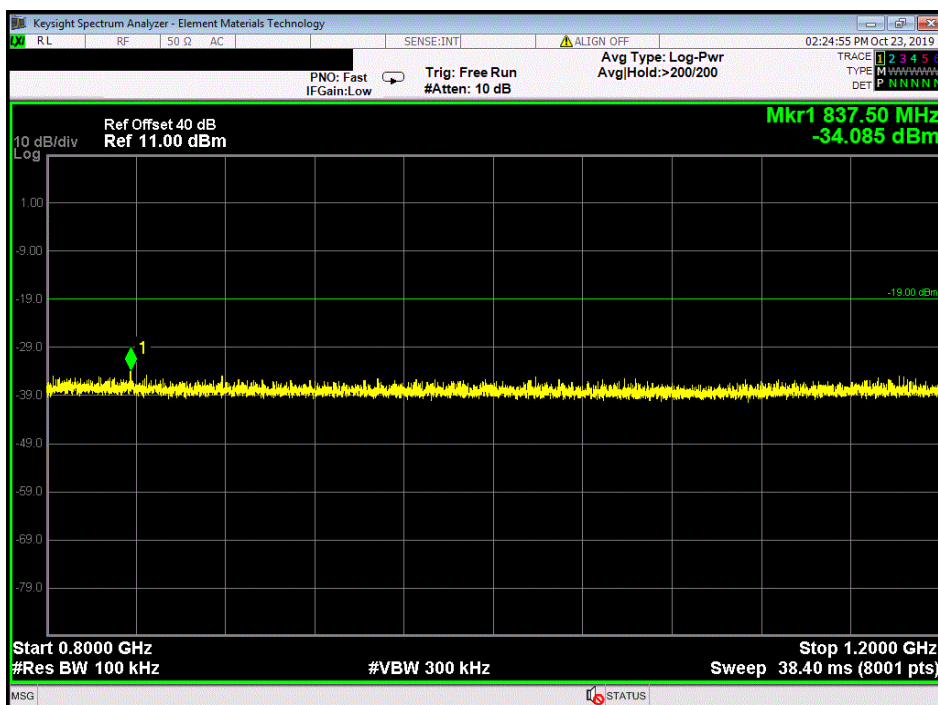


SPURIOUS CONDUCTED EMISSIONS

Band 71, 256QAM Modulation, LTE10 Bandwidth, 600MHz-800MHz						
				Value (dBm)	Limit (dBm)	Result
				-36.947	-19	Pass

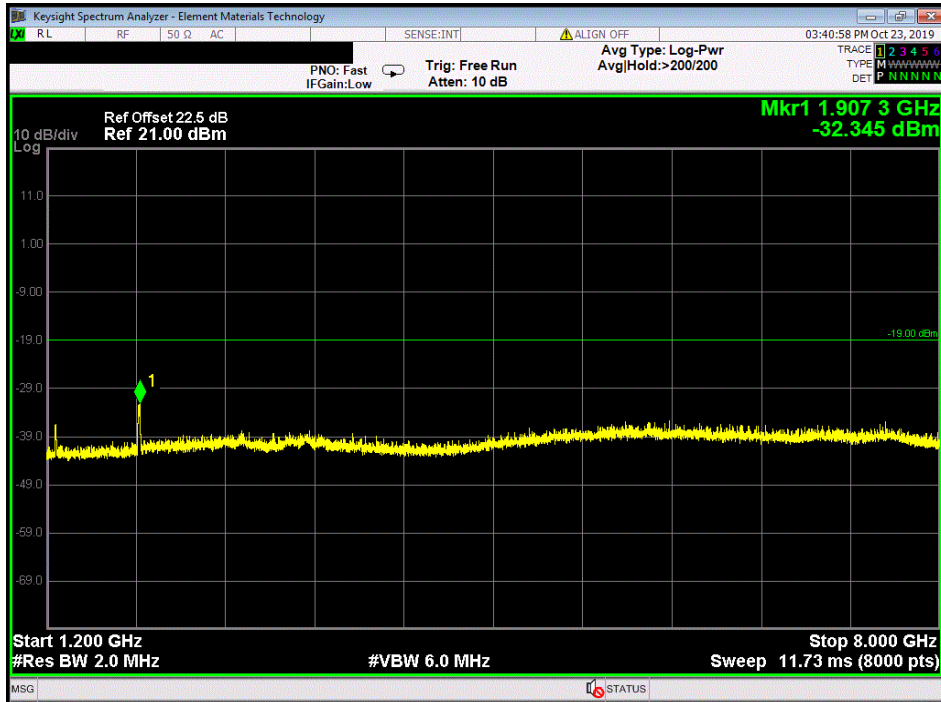


Band 71, 256QAM Modulation, LTE10 Bandwidth, 800MHz-1.2GHz						
				Value (dBm)	Limit (dBm)	Result
				-34.085	-19	Pass

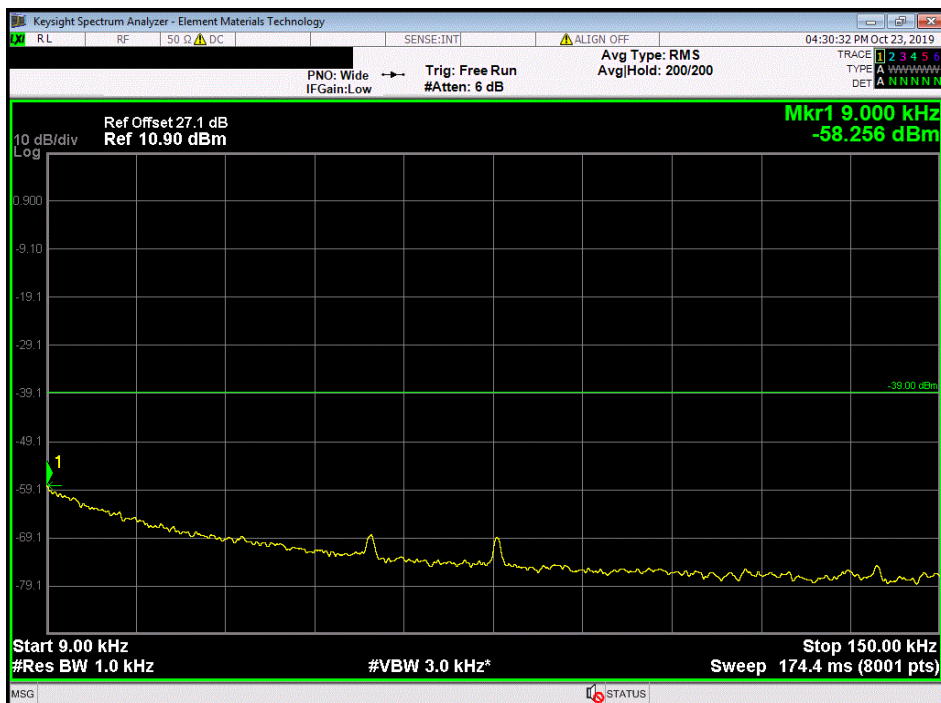


SPURIOUS CONDUCTED EMISSIONS

Band 71, 256QAM Modulation, LTE10 Bandwidth, 1.2GHz-8GHz						
				Value (dBm)	Limit (dBm)	Result
				-32.345	-19	Pass



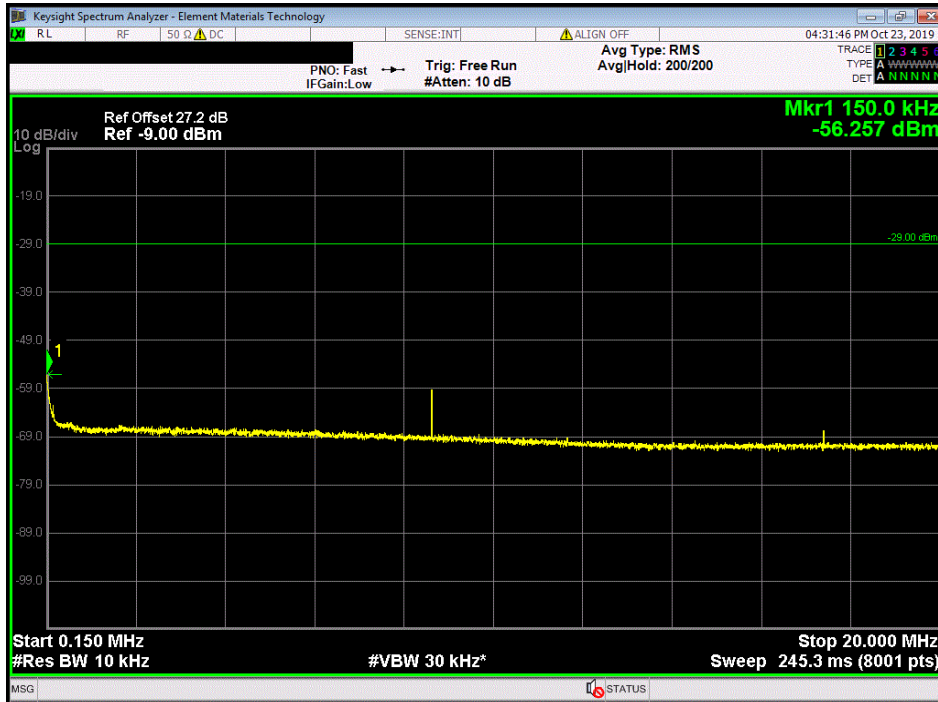
Band 71, 256QAM Modulation, LTE15 Bandwidth, 9kHz-150kHz						
				Value (dBm)	Limit (dBm)	Result
				-58.256	-39	Pass



SPURIOUS CONDUCTED EMISSIONS

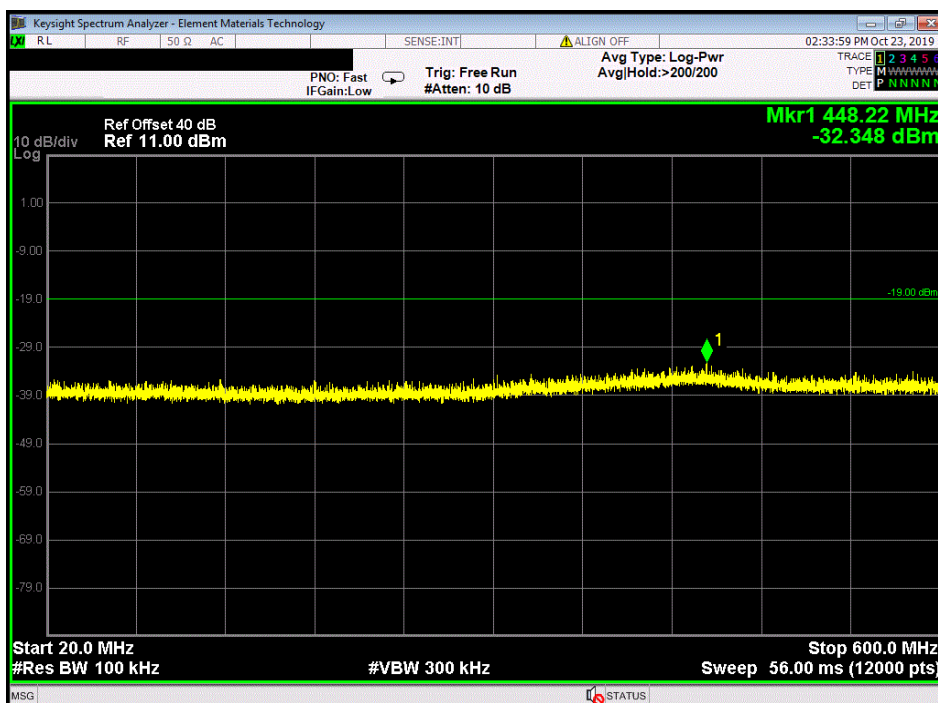
Band 71, 256QAM Modulation, LTE15 Bandwidth, 150kHz-20MHz

	Value (dBm)	Limit (dBm)	Result
	-56.257	-29	Pass



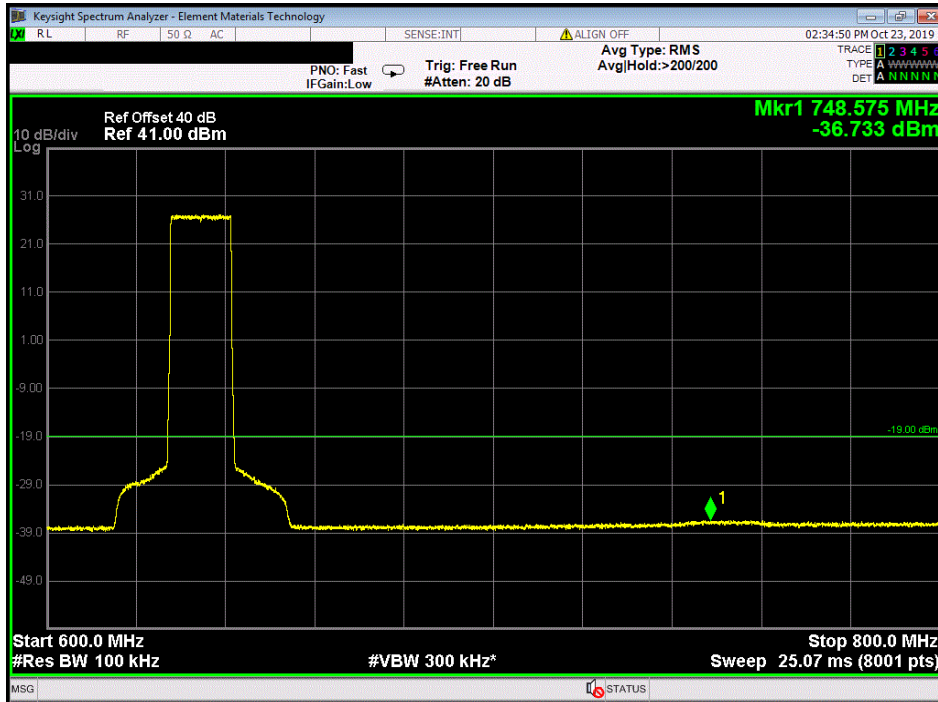
Band 71, 256QAM Modulation, LTE15 Bandwidth, 20MHz-600MHz

	Value (dBm)	Limit (dBm)	Result
	-32.348	-19	Pass

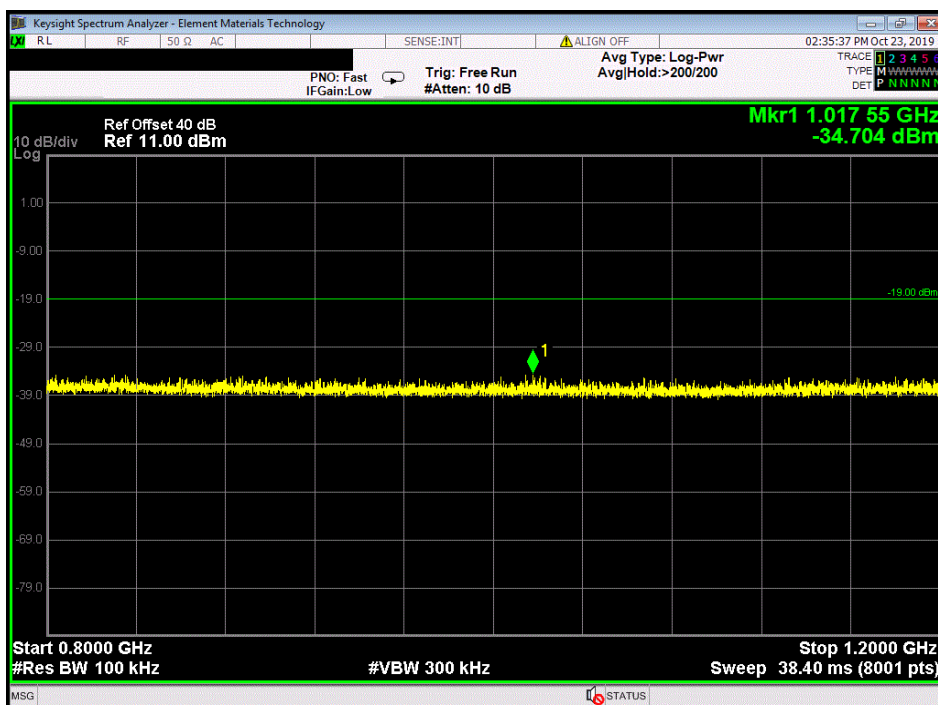


SPURIOUS CONDUCTED EMISSIONS

Band 71, 256QAM Modulation, LTE15 Bandwidth, 600MHz-800MHz						
				Value (dBm)	Limit (dBm)	Result
				-36.733	-19	Pass

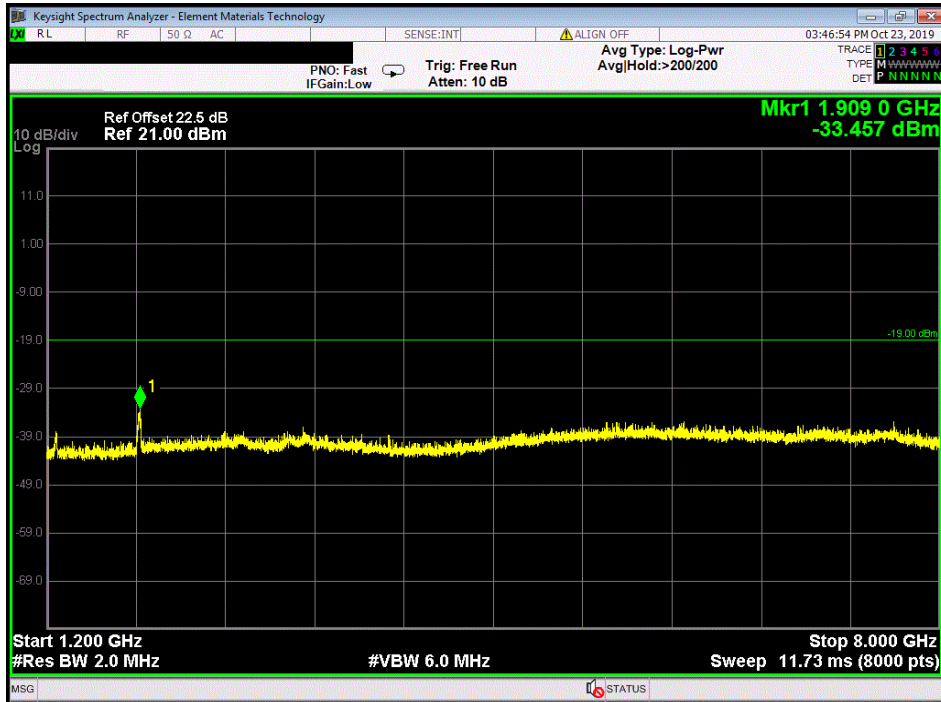


Band 71, 256QAM Modulation, LTE15 Bandwidth, 800MHz-1.2GHz						
				Value (dBm)	Limit (dBm)	Result
				-34.704	-19	Pass

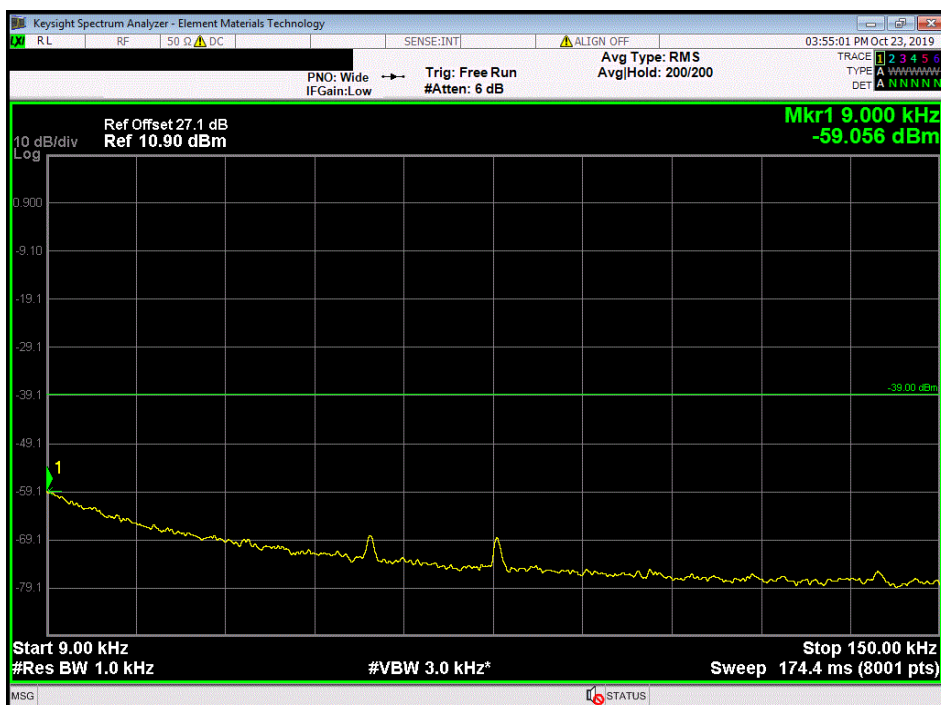


SPURIOUS CONDUCTED EMISSIONS

Band 71, 256QAM Modulation, LTE15 Bandwidth, 1.2GHz-8GHz						
				Value (dBm)	Limit (dBm)	Result
				-33.457	-19	Pass



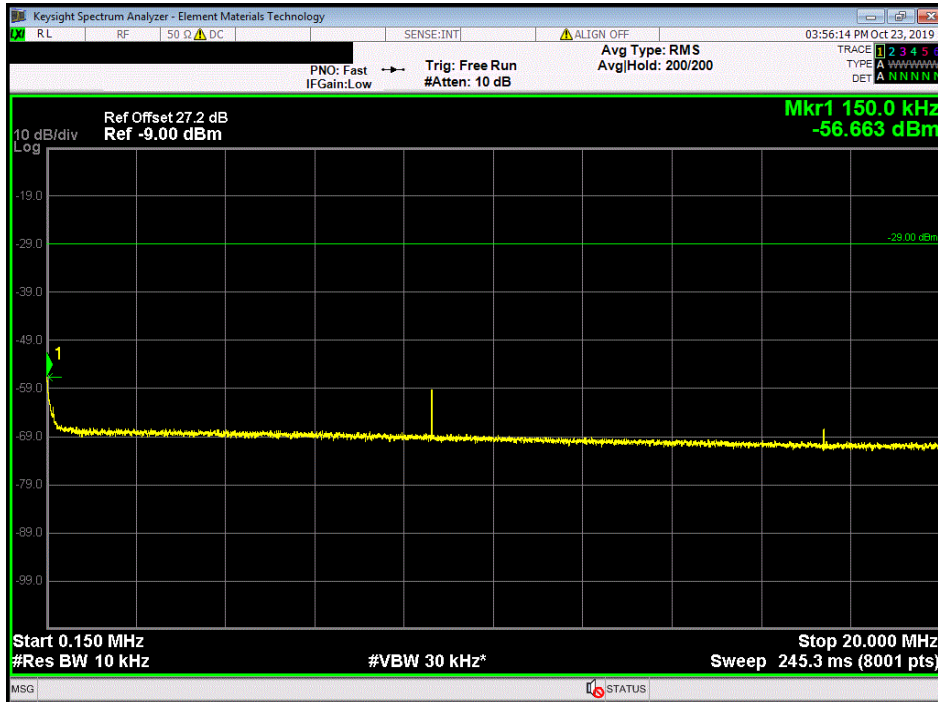
Band 71, 256QAM Modulation, LTE20 Bandwidth, 9kHz-150kHz						
				Value (dBm)	Limit (dBm)	Result
				-59.056	-39	Pass



SPURIOUS CONDUCTED EMISSIONS

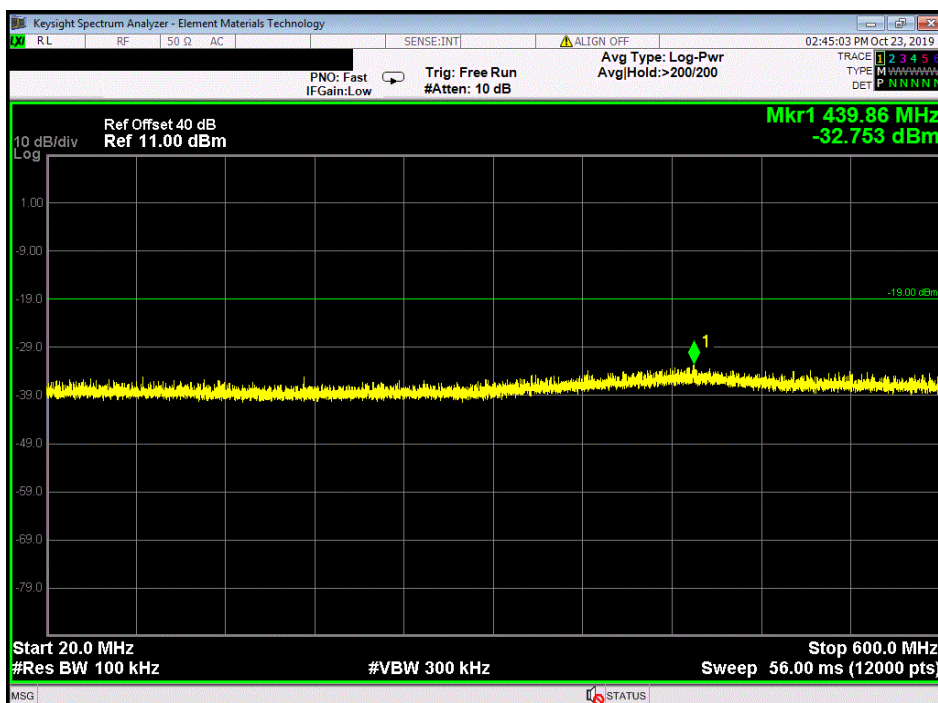
Band 71, 256QAM Modulation, LTE20 Bandwidth, 150kHz-20MHz

	Value (dBm)	Limit (dBm)	Result
	-56.663	-29	Pass



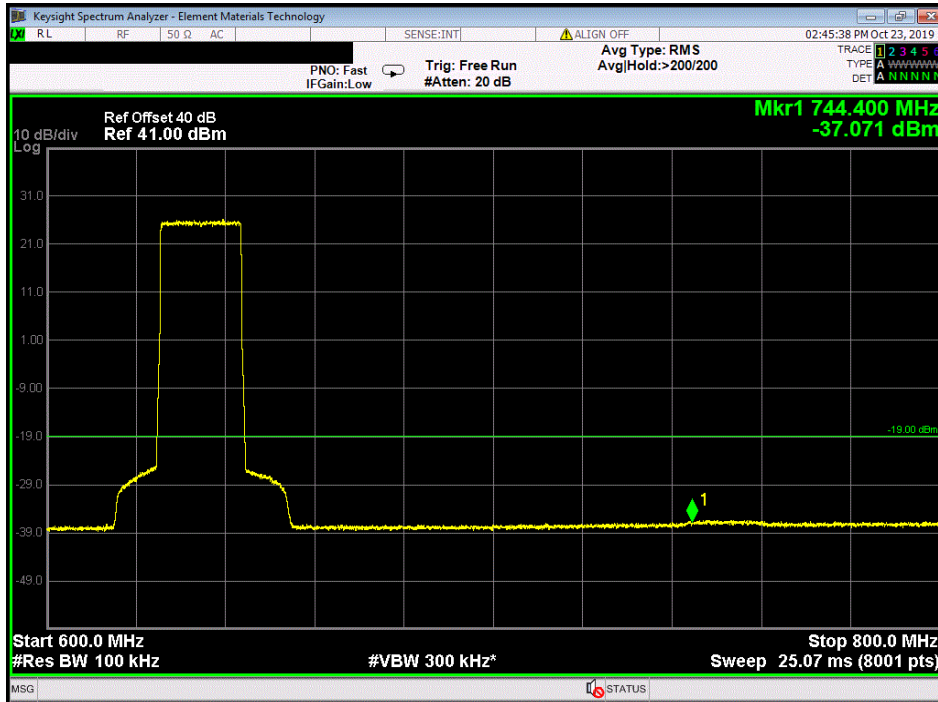
Band 71, 256QAM Modulation, LTE20 Bandwidth, 20MHz-600MHz

	Value (dBm)	Limit (dBm)	Result
	-32.753	-19	Pass

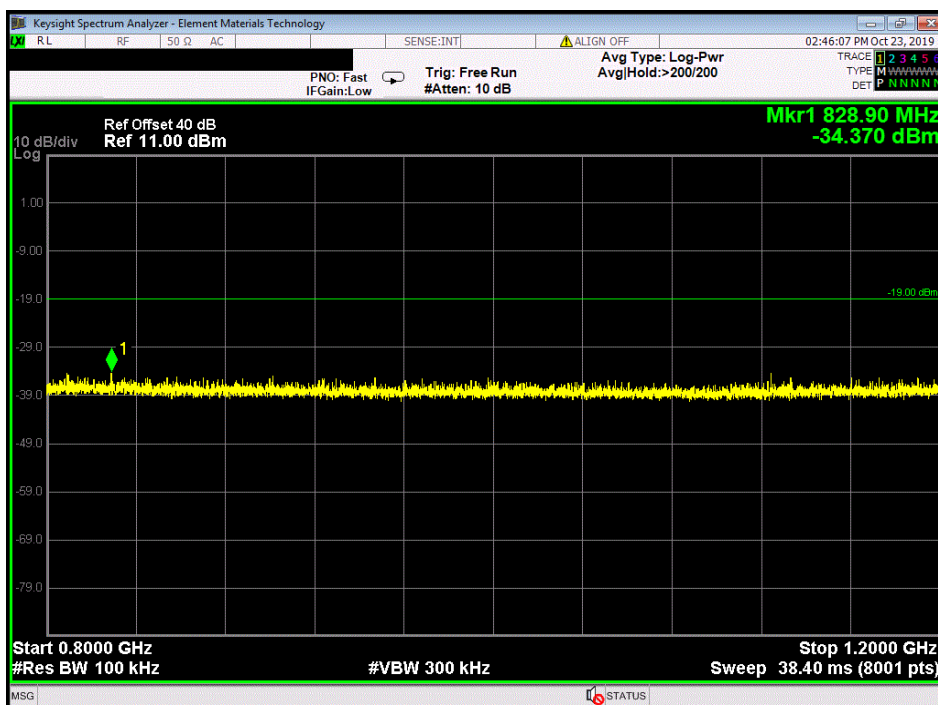


SPURIOUS CONDUCTED EMISSIONS

Band 71, 256QAM Modulation, LTE20 Bandwidth, 600MHz-800MHz						
				Value (dBm)	Limit (dBm)	Result
				-37.071	-19	Pass



Band 71, 256QAM Modulation, LTE20 Bandwidth, 800MHz-1.2GHz						
				Value (dBm)	Limit (dBm)	Result
				-34.37	-19	Pass

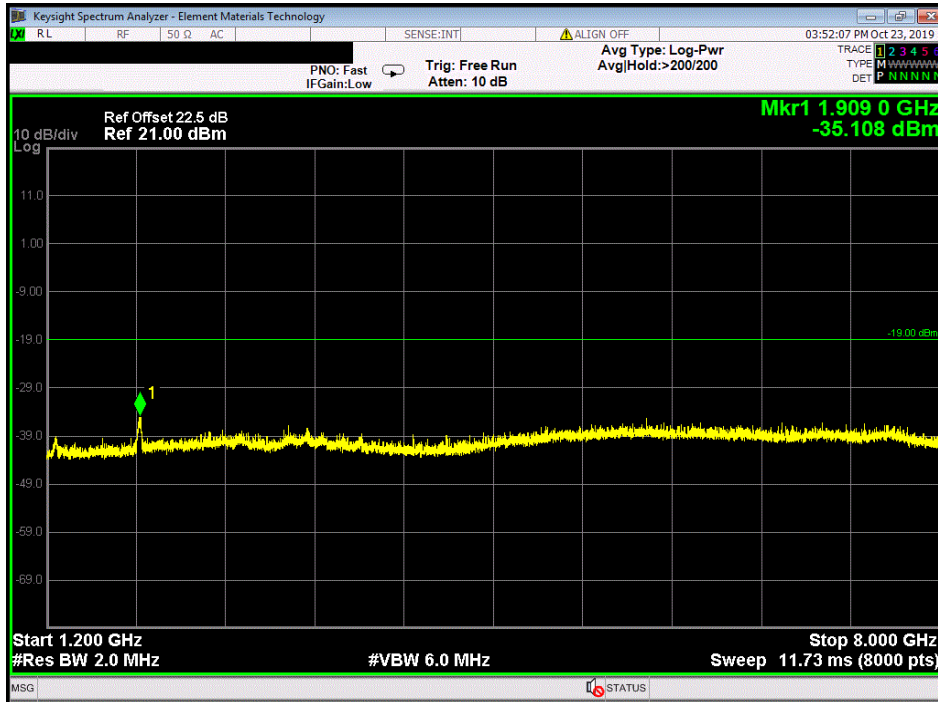


SPURIOUS CONDUCTED EMISSIONS



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Band 71, 256QAM Modulation, LTE20 Bandwidth, 1.2GHz-8GHz						
				Value (dBm)	Limit (dBm)	Result
				-35.108	-19	Pass



SPURIOUS CONDUCTED EMISSIONS



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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
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-19	19-Mar-20
Generator - Signal	Agilent	E8257D	TGU	15-Feb-18	15-Feb-21

TEST DESCRIPTION

The spurious RF conducted emissions were measured with the EUT set for multiband multicarrier transmission (Low, Mid and High for Band 71; Mid for Band 13). The EUT was transmitting at the data rate(s) and bandwidths listed in the datasheet. For each transmit frequency, the spectrum was scanned throughout the specified frequency range. The device was configured to enable both Band 13 & Band 71 carriers simultaneously (30Watts/carrier).

All limits were adjusted by a factor of $[-10 \cdot \log(4)]$ dB to account for the device operation as a 4 port MIMO transmitter, as per FCC KDB 622911.

Band 71: Per FCC section 27.53(g), the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm $[-13 \text{ dBm} - 10 \log(4)]$ per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter. FCC 27.53(g) requires a >100 kHz measurement bandwidth for emissions 100 kHz outside of the RRH operating frequency range.

Band 13: Per FCC section 27.53(c), the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm $[-13 \text{ dBm} - 10 \log(4)]$ per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter. FCC section 27.53(c) requires a >100 kHz measurement bandwidth for emissions 100 kHz outside of the RRH operating frequency range.

Per section 27.53(f), for the frequency range 1559-1610 MHz the EIRP limit is -70dBW/MHz for wideband signals and -80dBW for discrete emissions of bandwidths less than 700Hz. This equates to an EIRP of -40dBm/MHz for wideband emissions and -50dBm/MHz for discrete emissions. The limit is adjusted to -46 dBm $[-40 \text{ dBm} - 10 \log(4)]$ for wideband signals and -56dBm $[-50 \text{ dBm} - 10 \log(4)]$ for discrete emissions per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

SPURIOUS CONDUCTED EMISSIONS



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EUT: AHBOA Remote Radio Head (RRH)		Work Order: NOKI0003	
Serial Number: BL1934X1001		Date: 28-Oct-19	
Customer: Nokia Solutions and Networks		Temperature: 22.5 °C	
Attendees: John Rattavong, Mitchell Hill		Humidity: 50.3% RH	
Project: None		Barometric Pres.: 1019 mbar	
Tested by: Jonathan Kiefer		Power: 48VDC	
		Job Site: TX03	
TEST SPECIFICATIONS		Test Method	
FCC 27:2019		ANSI C63.26:2015	
COMMENTS			
Tested on highest power antenna port (Port 1). EUT is operated at 100% duty cycle. Spurious conducted emissions measurements were made for a Band 71/Band 13 multiband multicarrier test case for the 256QAM modulation type. Three Band 71/Band 13 LTE5 carriers (based upon KDB 971168 D03v01) were enabled using two carriers (with minimum spacing between carrier frequencies) at the Band 71 lower band edge [619.5MHz and 624.5MHz] and a third carrier with maximum spacing between the other two carrier frequencies [753.5MHz] at the Band 13 upper band edge.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1, 2, 3	Signature <i>Jonathan Kiefer</i>	
		Value (dBm)	Limit (dBm)
			Result
Band 71/13			
256QAM Modulation			
LTE5 Bandwidth			
	9kHz-150kHz	-59.375	-39
	150kHz-20MHz	-56.493	-29
	20MHz-600MHz	-28.586	-19
	600MHz-800MHz	-37.116	-19
	800MHz-1.2GHz	-31.896	-19
	1.2GHz-8GHz	-35.433	-19
	1559MHz-1610MHz	-59.293	-46
			Pass
			Pass
			Pass
			Pass
			Pass
			Pass

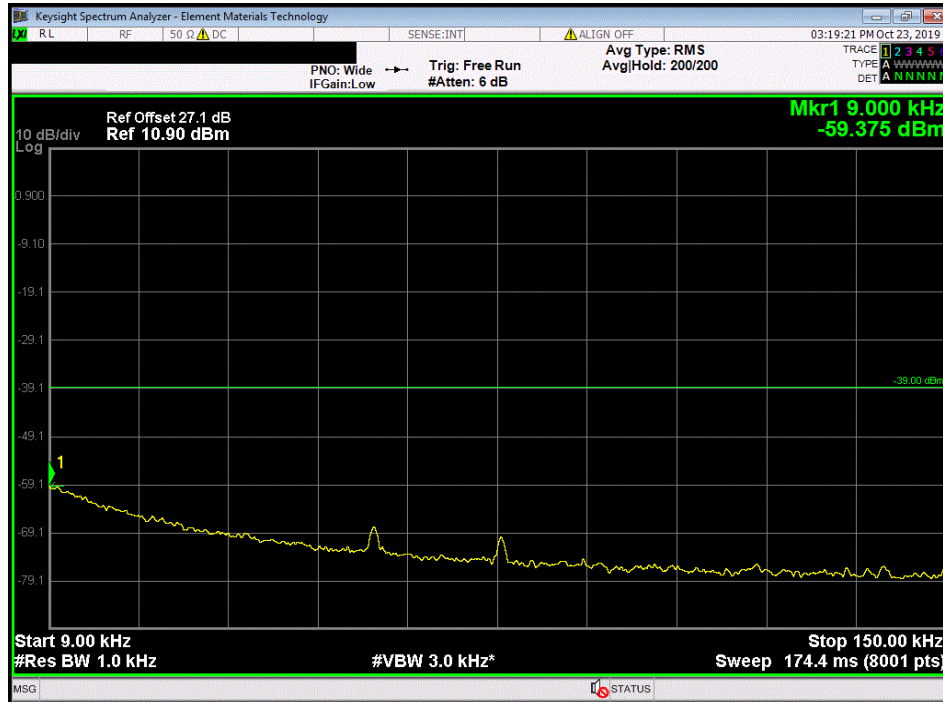
SPURIOUS CONDUCTED EMISSIONS



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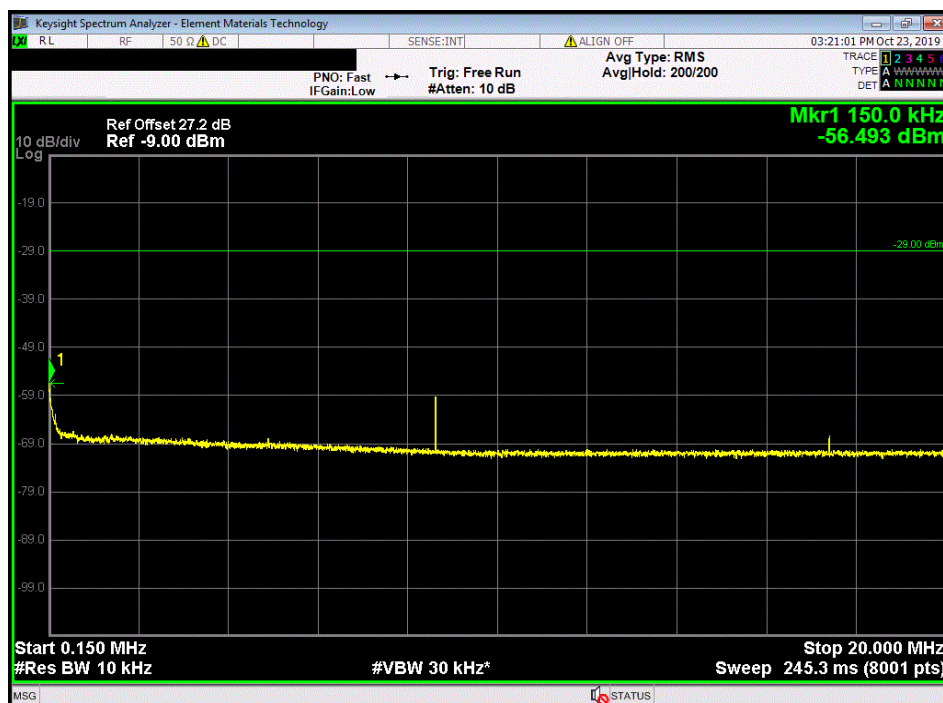
Band 71/13, 256QAM Modulation, LTE5 Bandwidth, 9kHz-150kHz

	Value (dBm)	Limit (dBm)	Result
	-59.375	-39	Pass



Band 71/13, 256QAM Modulation, LTE5 Bandwidth, 150kHz-20MHz

	Value (dBm)	Limit (dBm)	Result
	-56.493	-29	Pass

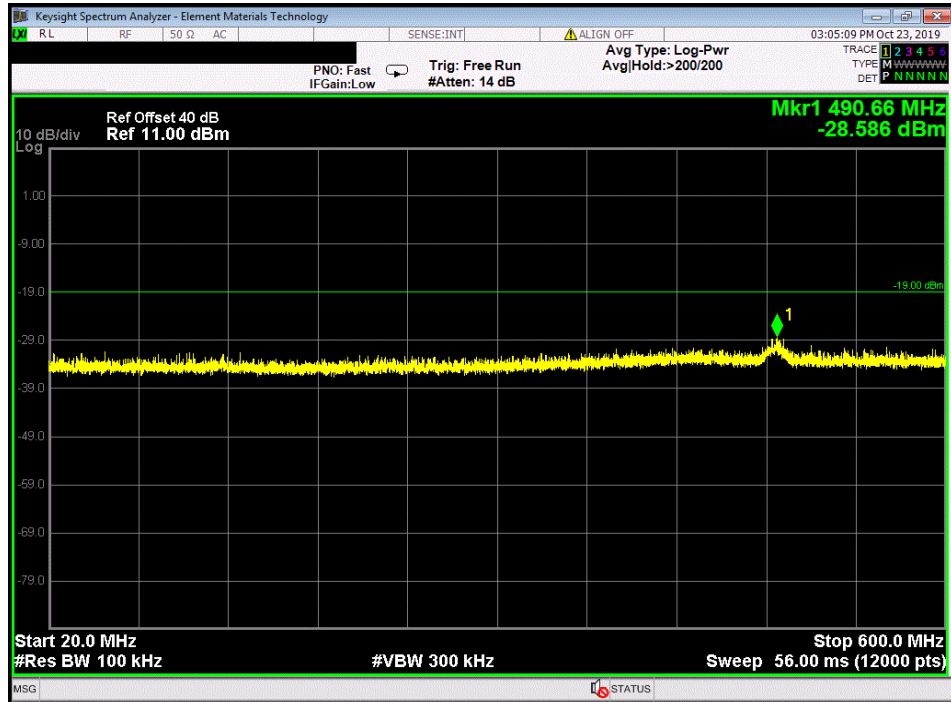


SPURIOUS CONDUCTED EMISSIONS

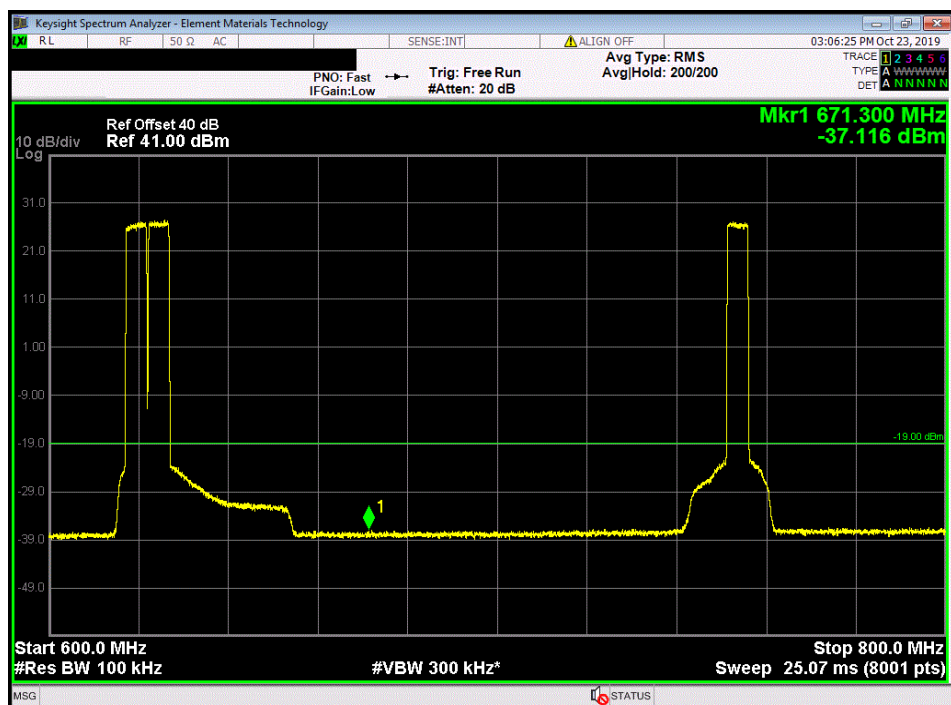


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Band 71/13, 256QAM Modulation, LTE5 Bandwidth, 20MHz-600MHz						
	Value	Limit	Result			
	(dBm)	(dBm)				
	-28.586	-19	Pass			



Band 71/13, 256QAM Modulation, LTE5 Bandwidth, 600MHz-800MHz						
	Value	Limit	Result			
	(dBm)	(dBm)				
	-37.116	-19	Pass			

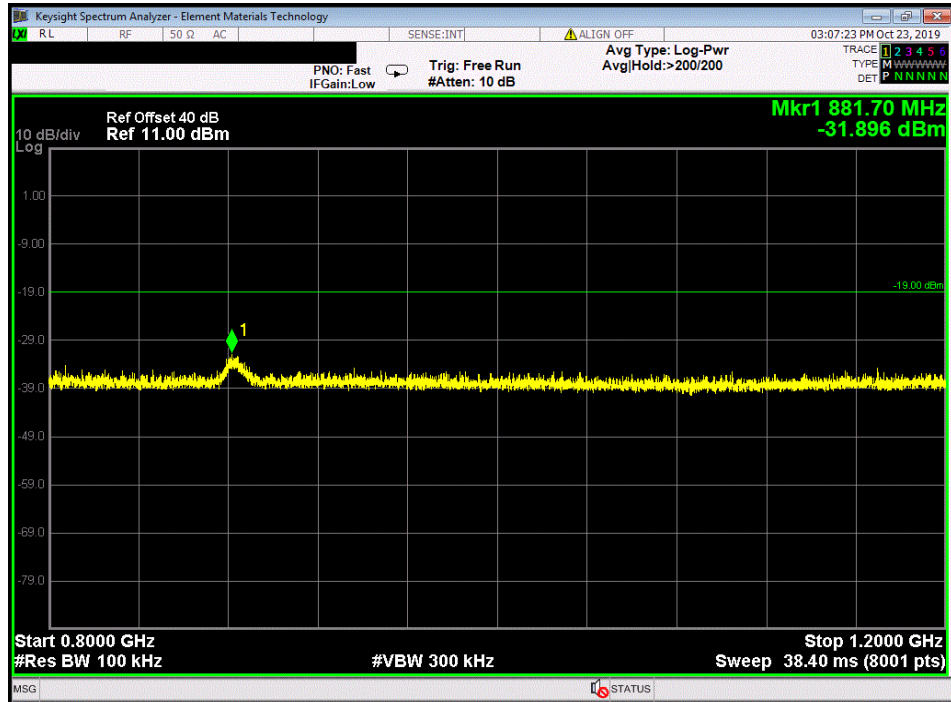


SPURIOUS CONDUCTED EMISSIONS

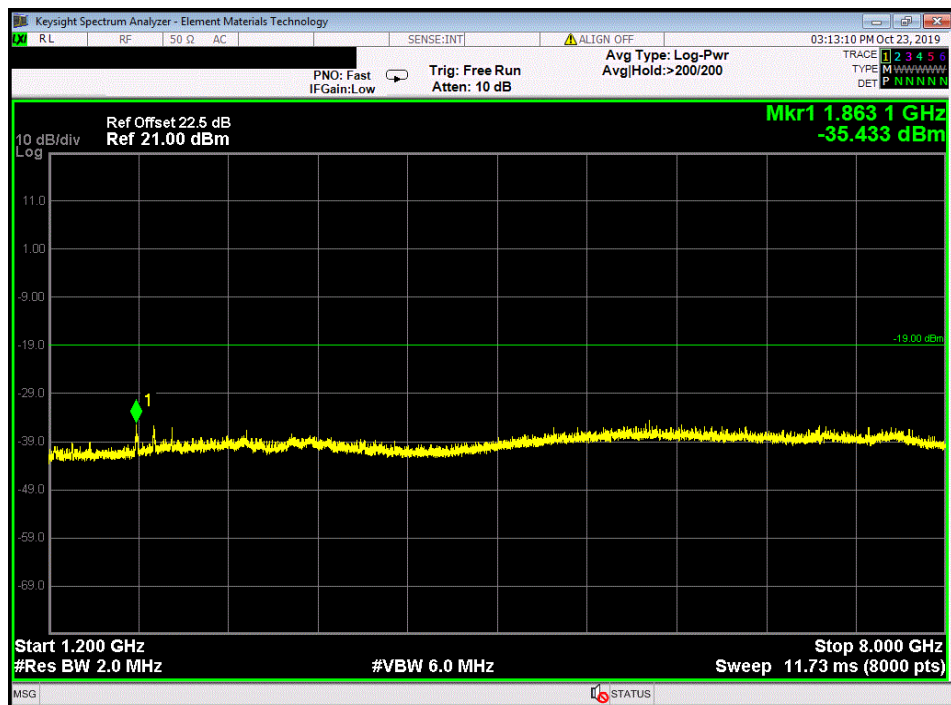


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Band 71/13, 256QAM Modulation, LTE5 Bandwidth, 800MHz-1.2GHz						
	Value	Limit	Result			
	(dBm)	(dBm)				
	-31.896	-19	Pass			



Band 71/13, 256QAM Modulation, LTE5 Bandwidth, 1.2GHz-8GHz						
	Value	Limit	Result			
	(dBm)	(dBm)				
	-35.433	-19	Pass			



SPURIOUS CONDUCTED EMISSIONS



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Band 71/13, 256QAM Modulation, LTE5 Bandwidth, 1559MHz-1610MHz						
				Value (dBm)	Limit (dBm)	Result
				-59.293	-46	Pass

