BAND EDGE COMPLIANCE -HOPPING MODE

XMit 2019.05.15

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
Attenuator	Fairview Microwave	SA18H-20	TKR	20-Dec-18	20-Dec-19
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Generator - Signal	Agilent	E8257D	TGU	15-Feb-18	15-Feb-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	13-Jun-18	13-Jun-19
Block - DC	Fairview Microwave	SD3379	AMV	3-Jan-19	3-Jan-20

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 band were measured with the EUT set to its normal pseudo-random hopping sequence. The EUT was transmitting at the data rate(s) listed in the datasheet.

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

BAND EDGE COMPLIANCE -HOPPING MODE

TbtTx 2018.09.13 XMit 2019.05.15

EUT:	**Jonah**			**Work Order:**	**DROP0009**
Serial Number:	**PL1919P10034**			**Date:**	**6-Jun-19**
Customer:	**SonicSensory, Inc.**			**Temperature:**	**24.5 °C**
Attendees:	**Daniel Quiros**			**Humidity:**	**47.2% RH**
Project:	**None**			**Barometric Pres.:**	**1016 mbar**
Tested by:	**Salvador Solorzano**	**Power:**	**110VAC/60Hz**	**Job Site:**	**OC13**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

DC Block + 20dB attenuator + Coax Cable + patch cable = 24.07 dB Total Offset

DEVIATIONS FROM TEST STANDARD

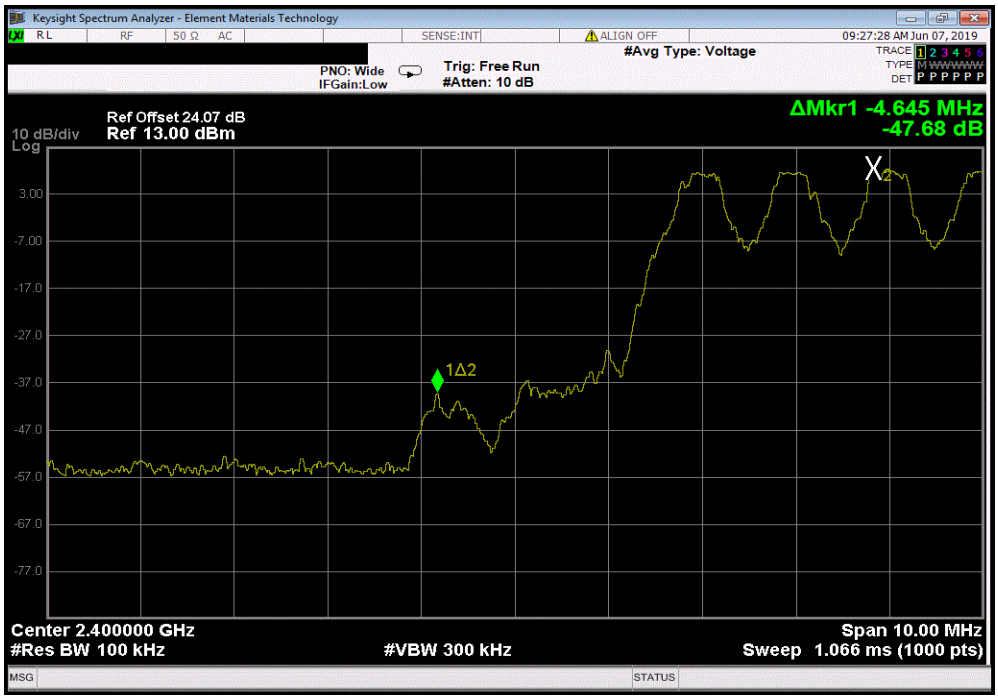
None

Configuration #	**3**	*Signature*

	Value (dBc)	Limit ≤ (dBc)	Result
Hopping Mode (All Channels)			
DH5, GFSK			
Low Channel, 2402 MHz	-47.68	-20	Pass
High Channel, 2480 MHz	-60.42	-20	Pass
2DH5, pi/4-DQPSK			
Low Channel, 2402 MHz	-37.83	-20	Pass
High Channel, 2480 MHz	-61.37	-20	Pass
3DH5, 8-DPSK			
Low Channel, 2402 MHz	-43.78	-20	Pass
High Channel, 2480 MHz	-59.46	-20	Pass

BAND EDGE COMPLIANCE -HOPPING MODE

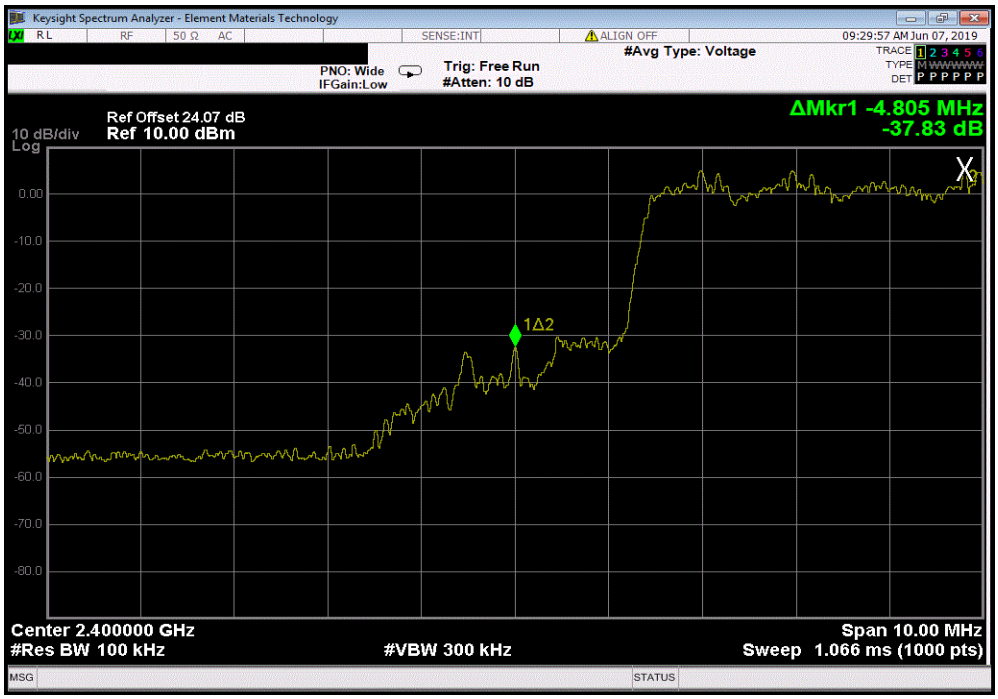
Hopping Mode (All Channels), DH5, GFSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-47.68	-20	Pass



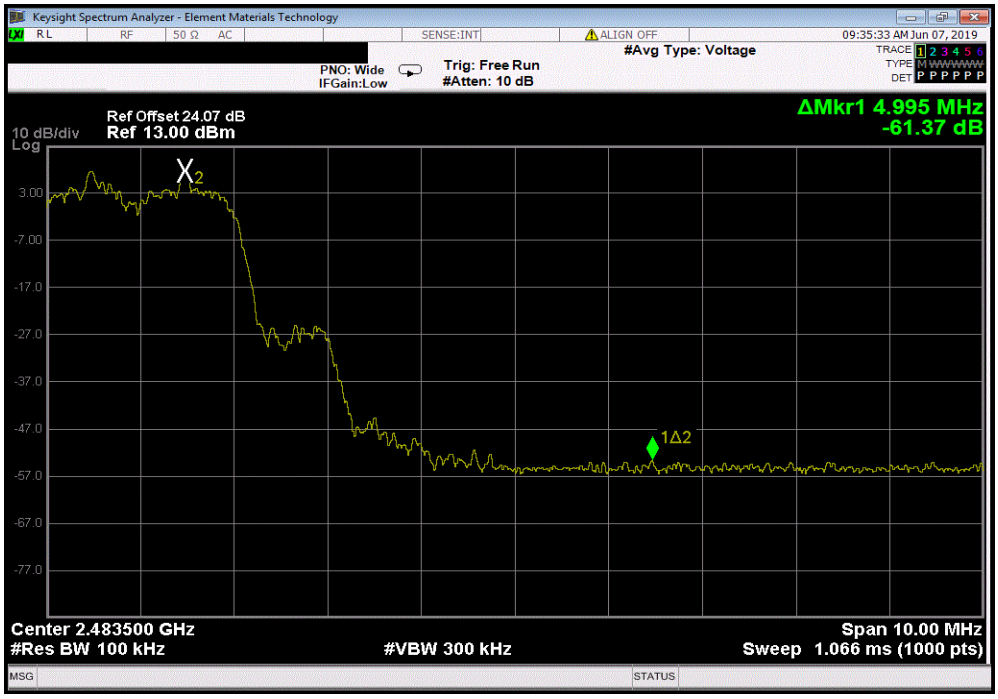
Hopping Mode (All Channels), DH5, GFSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-60.42	-20	Pass

BAND EDGE COMPLIANCE -HOPPING MODE

Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-37.83	-20	Pass

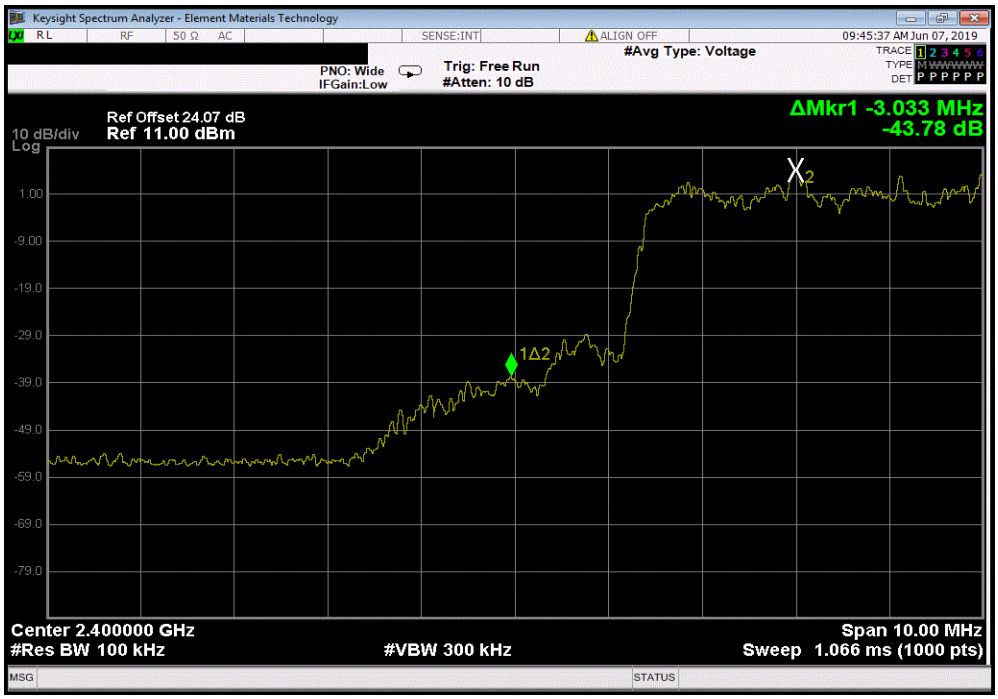


Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-61.37	-20	Pass

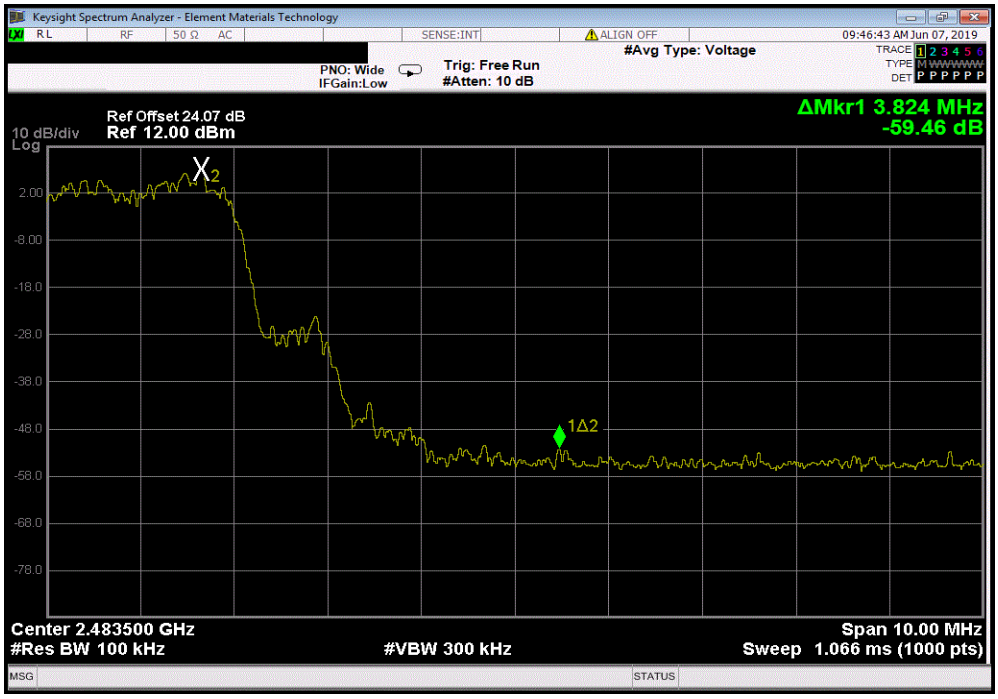


BAND EDGE COMPLIANCE -HOPPING MODE

Hopping Mode (All Channels), 3DH5, 8-DPSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-43.78	-20	Pass



Hopping Mode (All Channels), 3DH5, 8-DPSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-59.46	-20	Pass



OCCUPIED BANDWIDTH

XMit 2019.05.15

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
Attenuator	Fairview Microwave	SA18H-20	TKR	20-Dec-18	20-Dec-19
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Block - DC	Fairview Microwave	SD3379	AMV	3-Jan-19	3-Jan-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	13-Jun-18	13-Jun-19
Generator - Signal	Agilent	E8257D	TGU	15-Feb-18	15-Feb-21

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The 20 dB occupied bandwidth was measured with the EUT set to low, medium and high transmit frequencies in the band. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode.

OCCUPIED BANDWIDTH

element

TbtTx 2018.09.13 XMit 2019.05.15

EUT:	**Jonah**			**Work Order:**	**DROP0009**
Serial Number:	**PL1919P10034**			**Date:**	**6-Jun-19**
Customer:	**SonicSensory, Inc.**			**Temperature:**	**24.5 °C**
Attendees:	**Daniel Quiros**			**Humidity:**	**47.2% RH**
Project:	**None**			**Barometric Pres.:**	**1016 mbar**
Tested by:	**Salvador Solorzano**	**Power:**	**110VAC/60Hz**	**Job Site:**	**OC13**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

DC Block + 20dB attenuator + Coax Cable + patch cable = 24.07 dB Total Offset

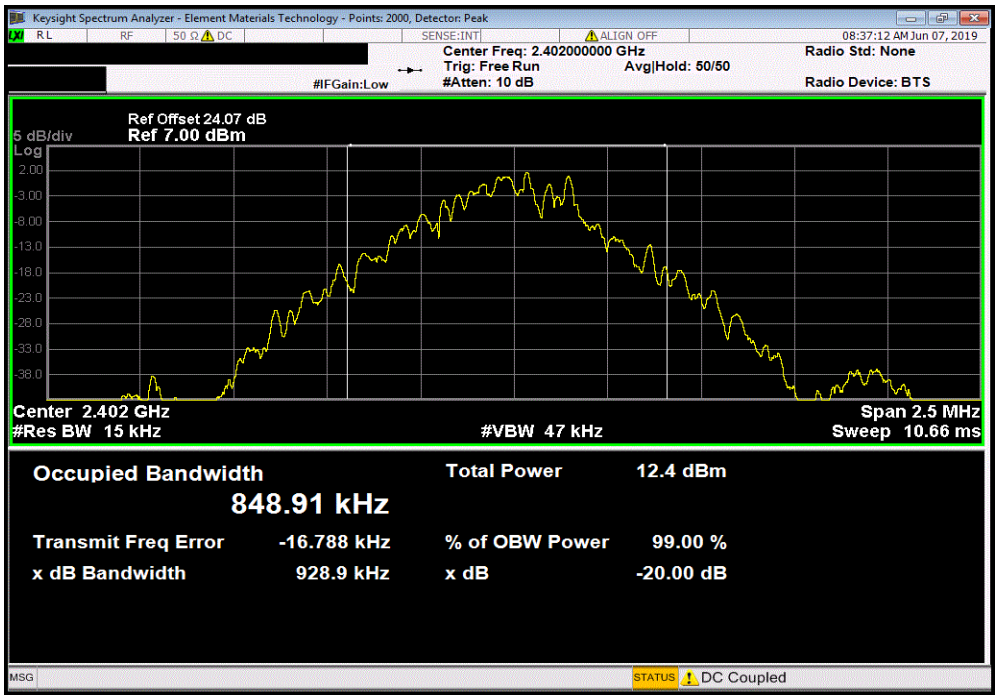
DEVIATIONS FROM TEST STANDARD

None

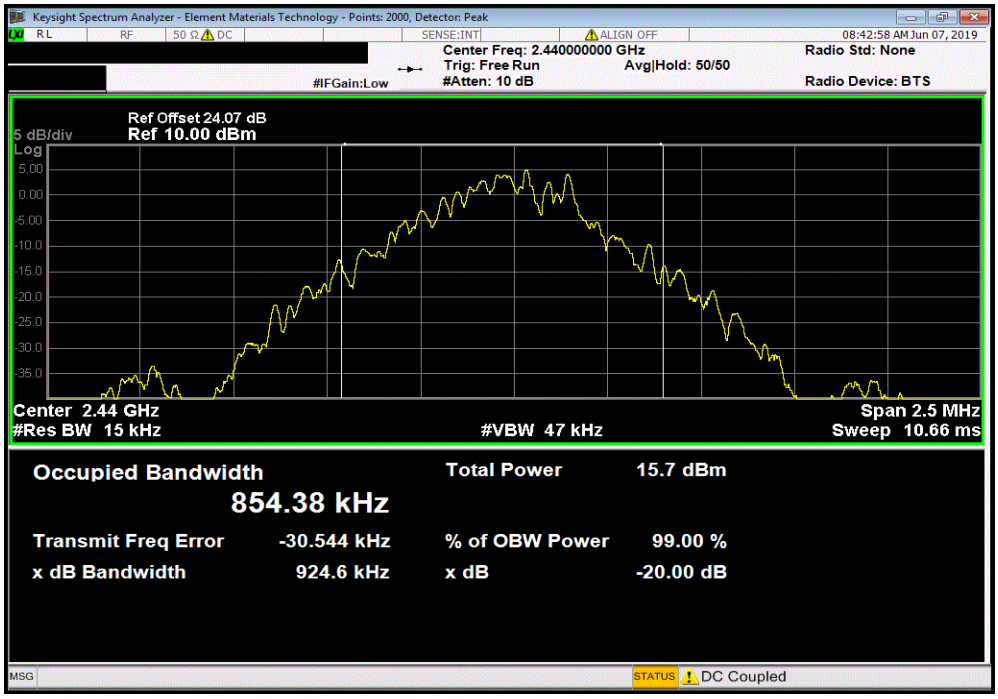
Configuration #	**3**	*Signature*

		Value	**Limit (<)**	**Result**
DH5, GFSK				
	Low Channel	928.904 kHz	1.5 MHz	Pass
	Mid Channel	924.595 kHz	1.5 MHz	Pass
	High Channel	925.359 kHz	1.5 MHz	Pass
2DH5, pi/4-DQPSK				
	Low Channel	1.237 MHz	1.5 MHz	Pass
	Mid Channel	1.236 MHz	1.5 MHz	Pass
	High Channel	1.238 MHz	1.5 MHz	Pass
3DH5, 8-DPSK				
	Low Channel	1.254 MHz	1.5 MHz	Pass
	Mid Channel	1.255 MHz	1.5 MHz	Pass
	High Channel	1.257 MHz	1.5 MHz	Pass

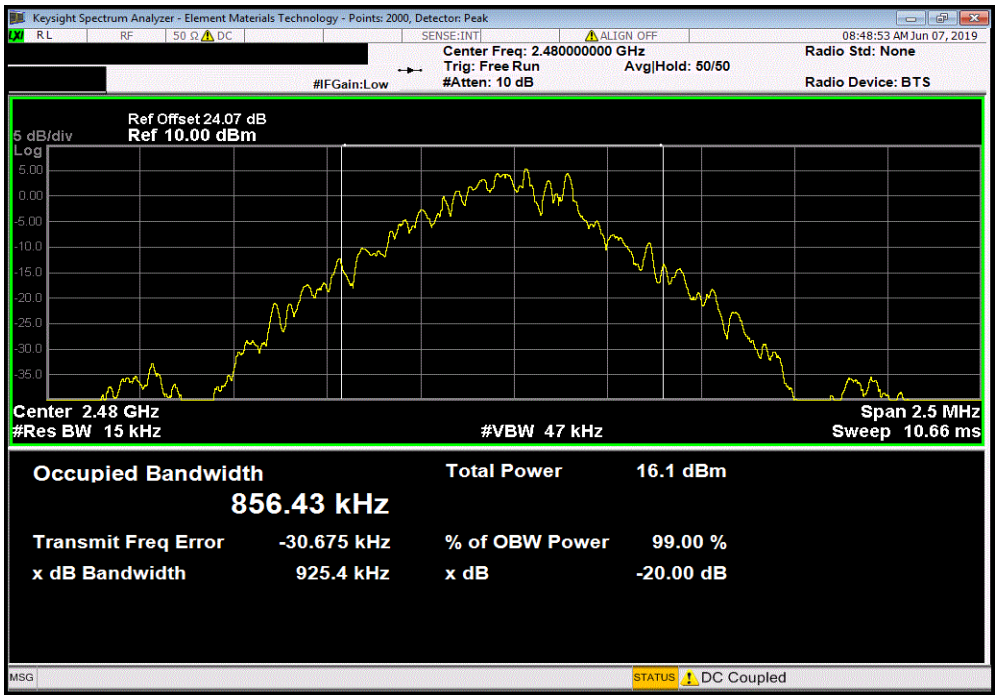
DH5, GFSK, Low Channel						
				Value	Limit (<)	Result
				928.904 kHz	1.5 MHz	Pass



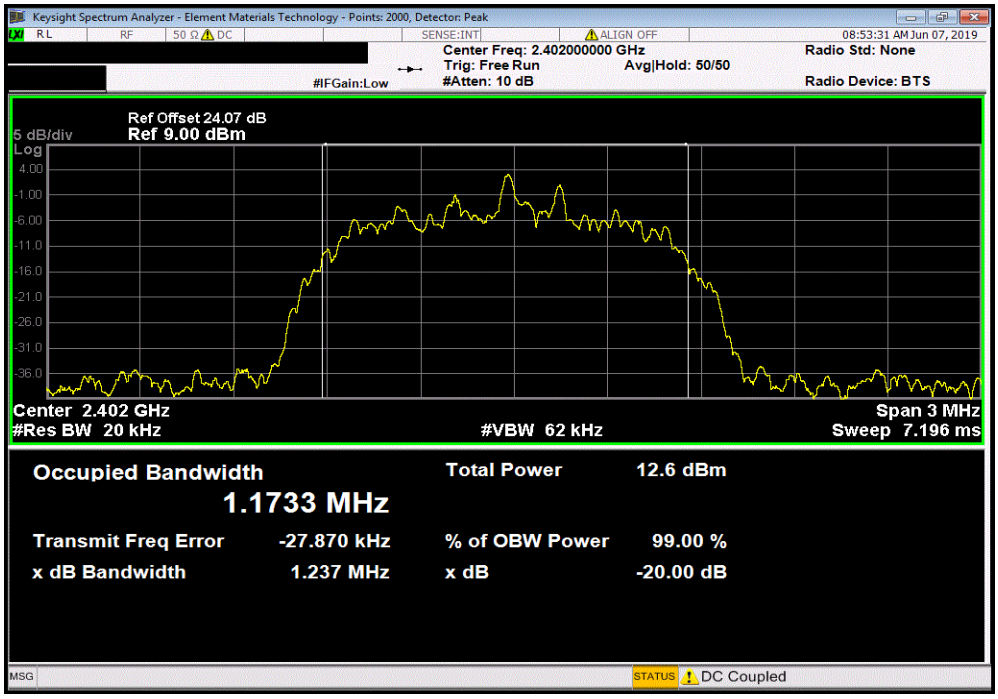
DH5, GFSK, Mid Channel						
				Value	Limit (<)	Result
				924.595 kHz	1.5 MHz	Pass



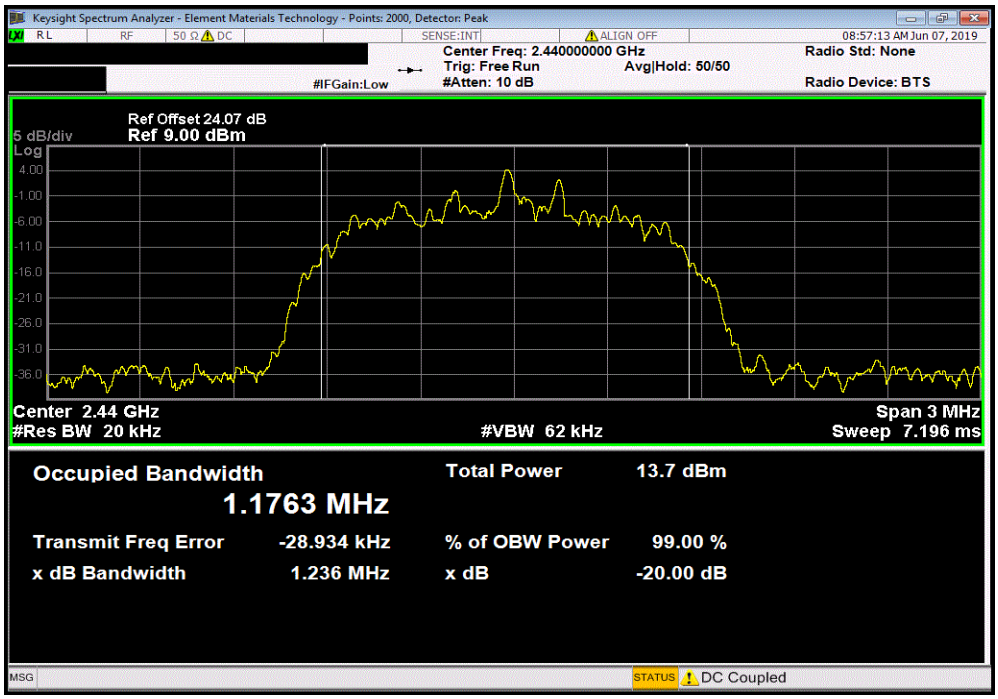
DH5, GFSK, High Channel						
				Value	Limit (<)	Result
				925.359 kHz	1.5 MHz	Pass



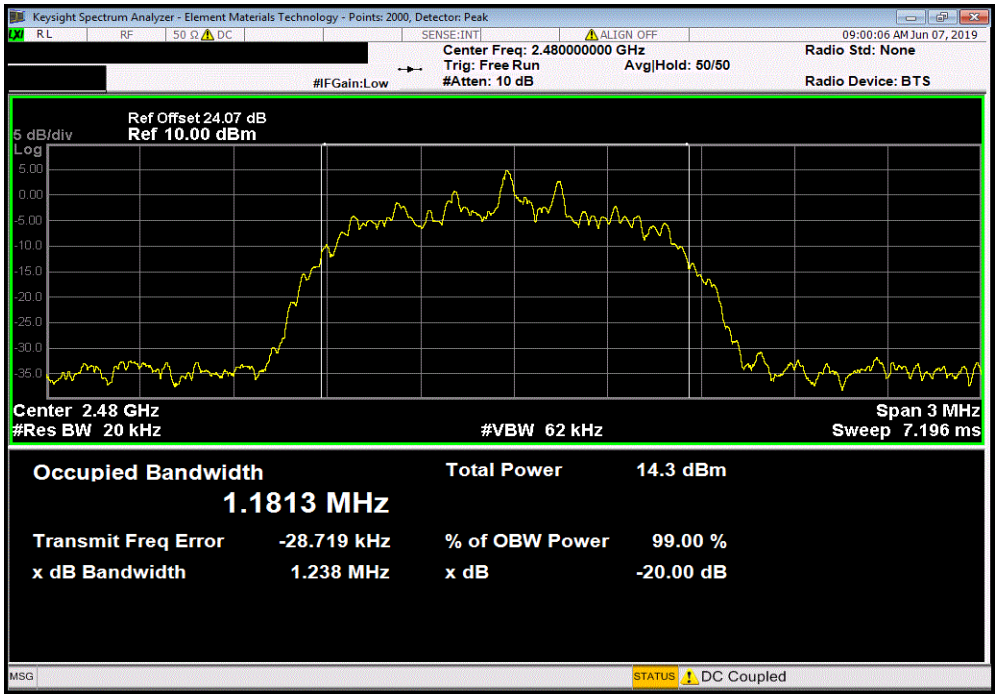
2DH5, pi/4-DQPSK, Low Channel						
				Value	Limit (<)	Result
				1.237 MHz	1.5 MHz	Pass



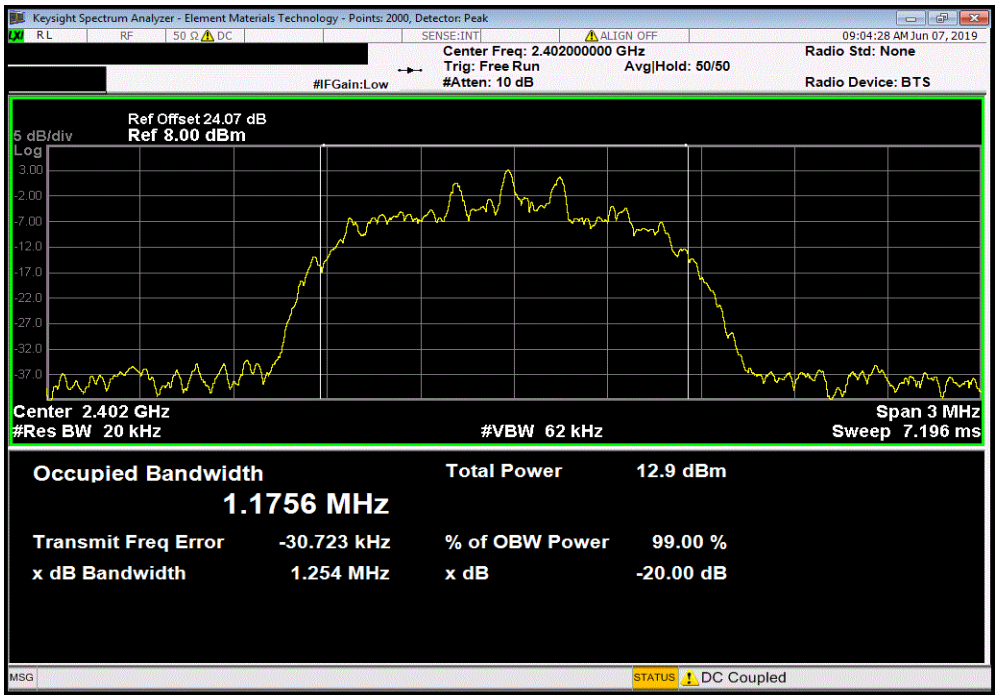
2DH5, pi/4-DQPSK, Mid Channel						
				Value	Limit (<)	Result
				1.236 MHz	1.5 MHz	Pass



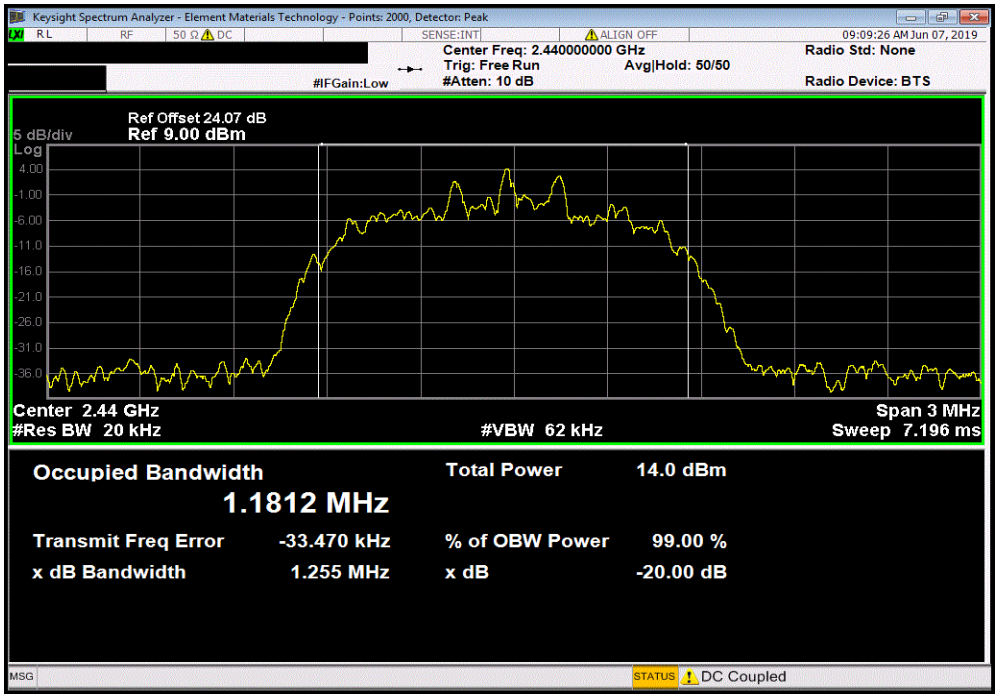
2DH5, pi/4-DQPSK, High Channel						
				Value	Limit (<)	Result
				1.238 MHz	1.5 MHz	Pass



3DH5, 8-DPSK, Low Channel						
				Value	Limit (<)	Result
				1.254 MHz	1.5 MHz	Pass

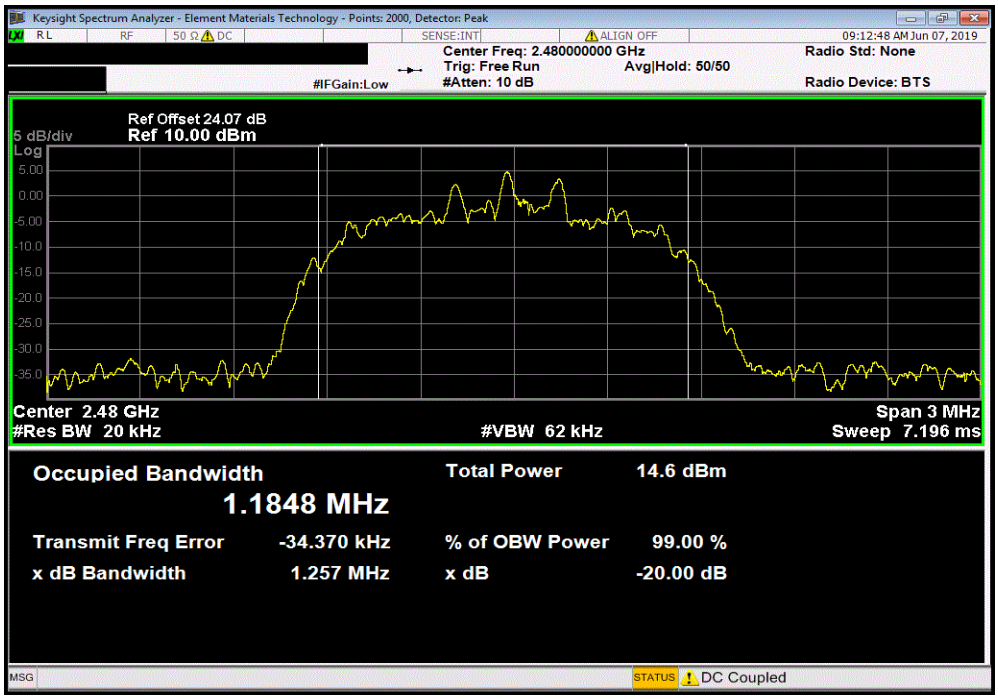


3DH5, 8-DPSK, Mid Channel						
				Value	Limit (<)	Result
				1.255 MHz	1.5 MHz	Pass



OCCUPIED BANDWIDTH

3DH5, 8-DPSK, High Channel						
				Value	Limit (<)	Result
				1.257 MHz	1.5 MHz	Pass



SPURIOUS CONDUCTED EMISSIONS

XMit 2019.06.11

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
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	NCR
Attenuator	Fairview Microwave	SA18H-20	TKR	20-Dec-18	20-Dec-19
Block - DC	Fairview Microwave	SD3379	AMV	3-Jan-19	3-Jan-20
Generator - Signal	Agilent	E8257D	TGU	15-Feb-18	15-Feb-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	2-Jul-19	2-Jul-20

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 were measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

SPURIOUS CONDUCTED EMISSIONS

element

TbtTx 2018.09.13 XMit 2019.06.11

EUT:	**Jonah**			**Work Order:**	**DROP0009**
Serial Number:	**PL1919P10034**			**Date:**	**21-Aug-19**
Customer:	**SonicSensory, Inc.**			**Temperature:**	**23 °C**
Attendees:	**Daniel Quiros**			**Humidity:**	**45.3% RH**
Project:	**None**			**Barometric Pres.:**	**1015 mbar**
Tested by:	**Johnny Candelas**	**Power:**	**110VAC/60Hz**	**Job Site:**	**OC13**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

DC Block + 20 dB attenuator + Coax Cable + patch cable = 24.07 dB Total Offset

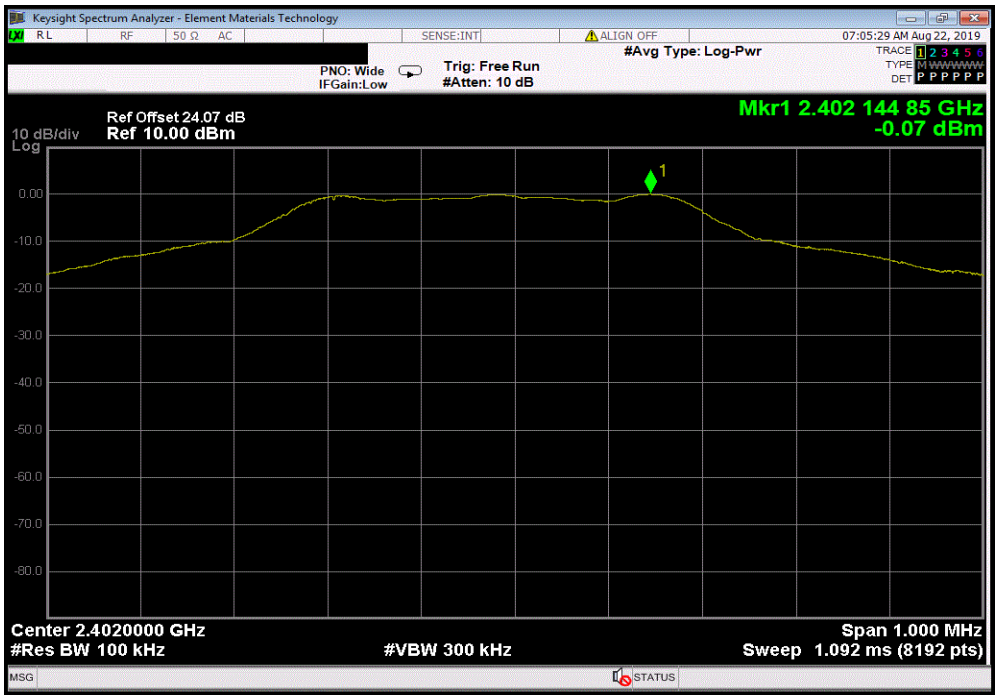
DEVIATIONS FROM TEST STANDARD

None

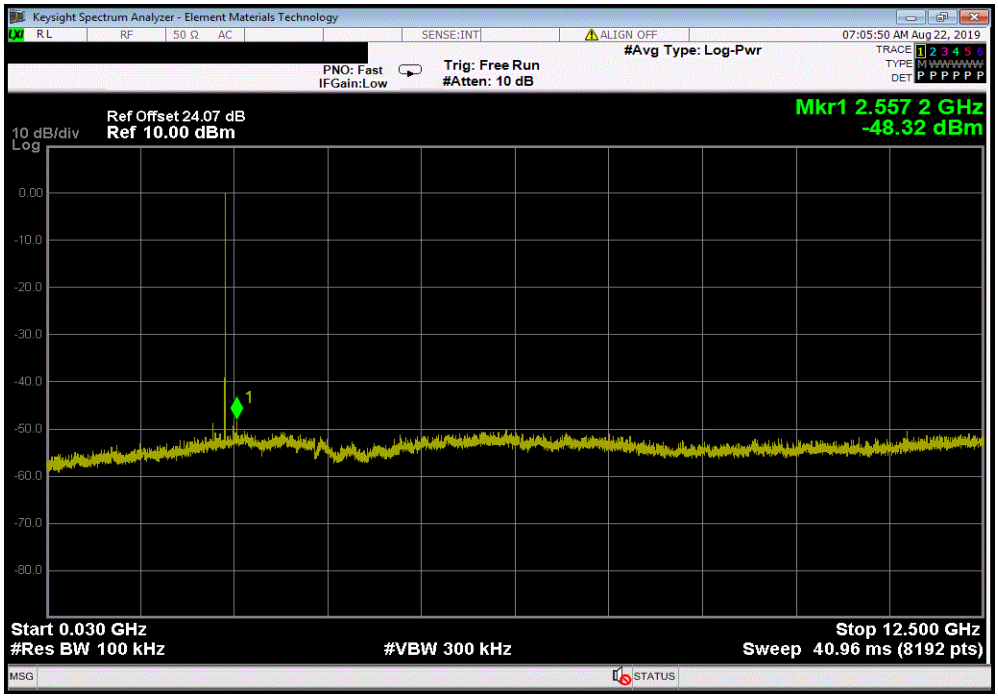
Configuration #	**3**	*Signature*

		Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
DH5, GFSK						
	Low Channel	Fundamental	2402.14	N/A	N/A	N/A
	Low Channel	30 MHz - 12.5 GHz	2557.19	-48.25	-20	Pass
	Low Channel	12.5 GHz - 25 GHz	24949.64	-35.69	-20	Pass
	Mid Channel	Fundamental	2439.98	N/A	N/A	N/A
	Mid Channel	30 MHz - 12.5 GHz	2543.49	-50.09	-20	Pass
	Mid Channel	12.5 GHz - 25 GHz	24987.79	-37.33	-20	Pass
	High Channel	Fundamental	2479.98	N/A	N/A	N/A
	High Channel	30 MHz - 12.5 GHz	2584.59	-51.08	-20	Pass
	High Channel	12.5 GHz - 25 GHz	24980.16	-37.82	-20	Pass
2DH5, pi/4-DQPSK						
	Low Channel	Fundamental	2401.98	N/A	N/A	N/A
	Low Channel	30 MHz - 12.5 GHz	6969.11	-47.3	-20	Pass
	Low Channel	12.5 GHz - 25 GHz	24954.22	-33.64	-20	Pass
	Mid Channel	Fundamental	2439.98	N/A	N/A	N/A
	Mid Channel	30 MHz - 12.5 GHz	2543.49	-47.92	-20	Pass
	Mid Channel	12.5 GHz - 25 GHz	24975.58	-34.9	-20	Pass
	High Channel	Fundamental	2479.97	N/A	N/A	N/A
	High Channel	30 MHz - 12.5 GHz	2584.59	-48.5	-20	Pass
	High Channel	12.5 GHz - 25 GHz	24995.42	-36.47	-20	Pass
3DH5, 8-DPSK						
	Low Channel	Fundamental	2401.81	N/A	N/A	N/A
	Low Channel	30 MHz - 12.5 GHz	5818.17	-47.43	-20	Pass
	Low Channel	12.5 GHz - 25 GHz	24972.53	-34.01	-20	Pass
	Mid Channel	Fundamental	2439.82	N/A	N/A	N/A
	Mid Channel	30 MHz - 12.5 GHz	3188.99	-46.85	-20	Pass
	Mid Channel	12.5 GHz - 25 GHz	24978.64	-33.69	-20	Pass
	High Channel	Fundamental	2479.8	N/A	N/A	N/A
	High Channel	30 MHz - 12.5 GHz	2700.29	-48.8	-20	Pass
	High Channel	12.5 GHz - 25 GHz	24983.21	-34.6	-20	Pass

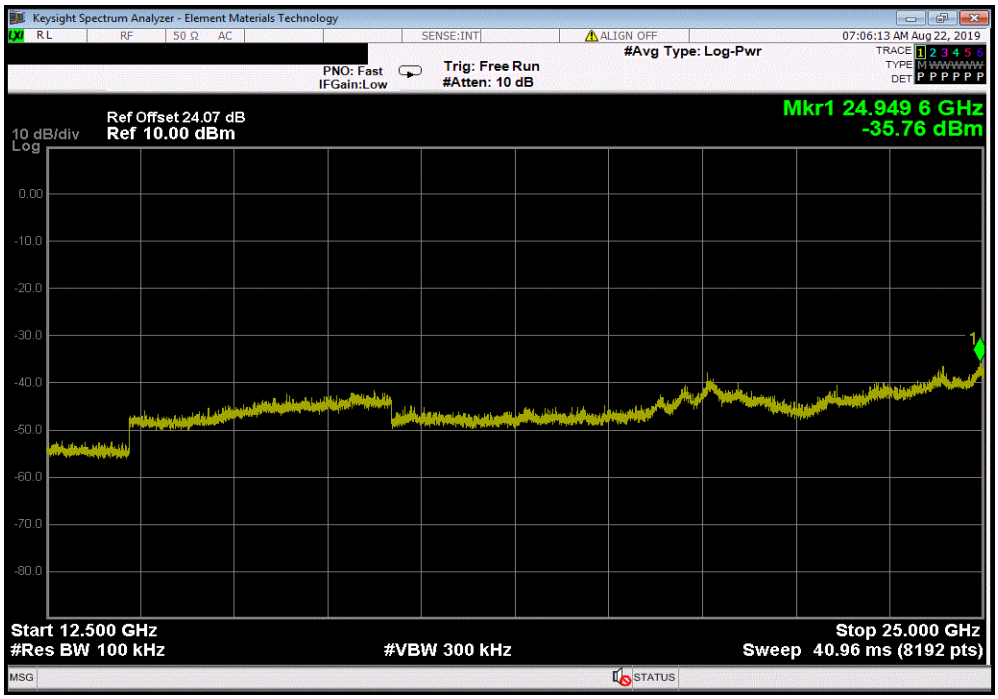
DH5, GFSK, Low Channel					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2402.14	N/A	N/A	N/A



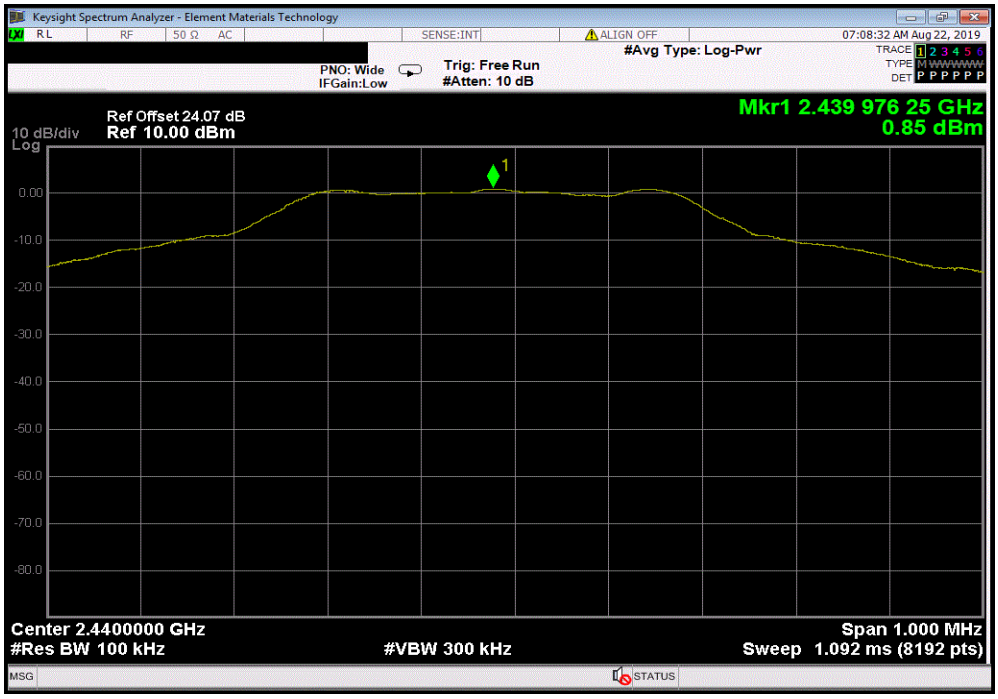
DH5, GFSK, Low Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	2557.19	-48.25	-20	Pass



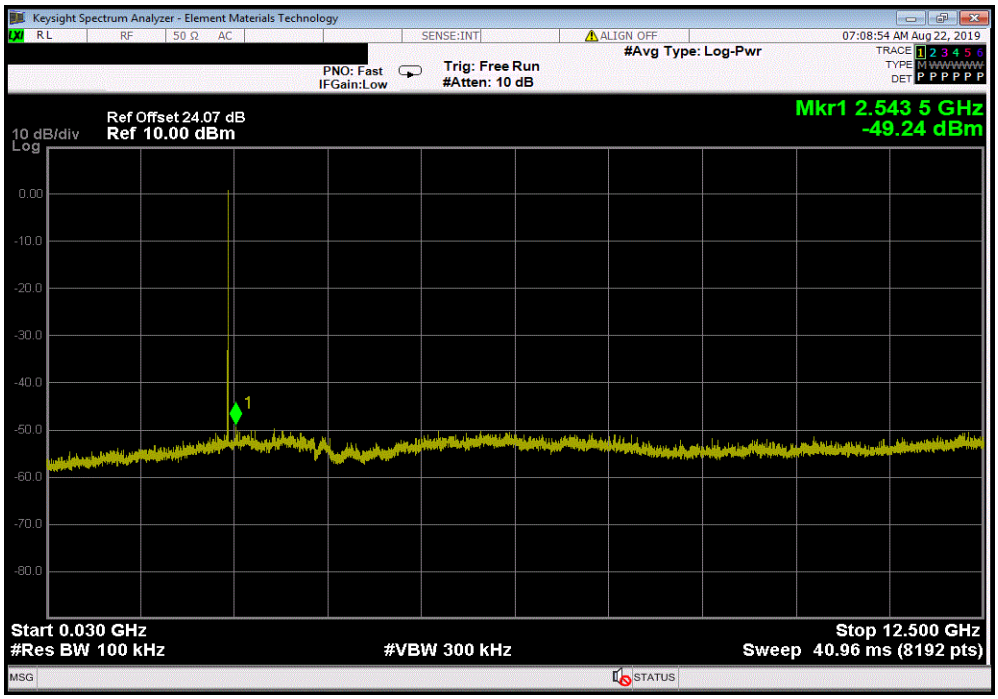
DH5, GFSK, Low Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24949.64	-35.69	-20	Pass



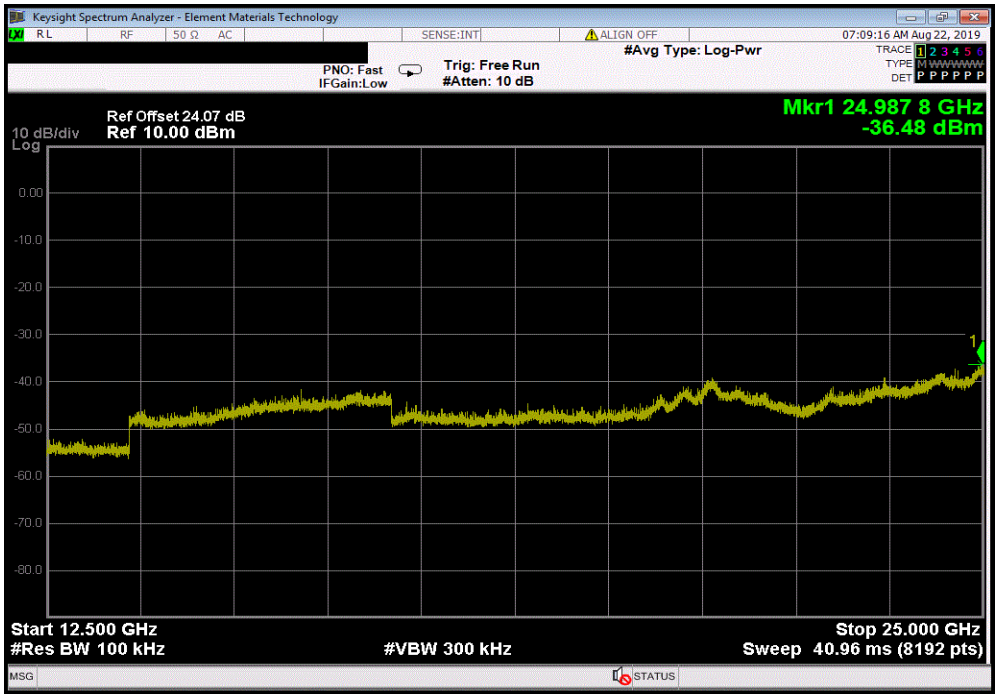
DH5, GFSK, Mid Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental	2439.98	N/A	N/A	N/A



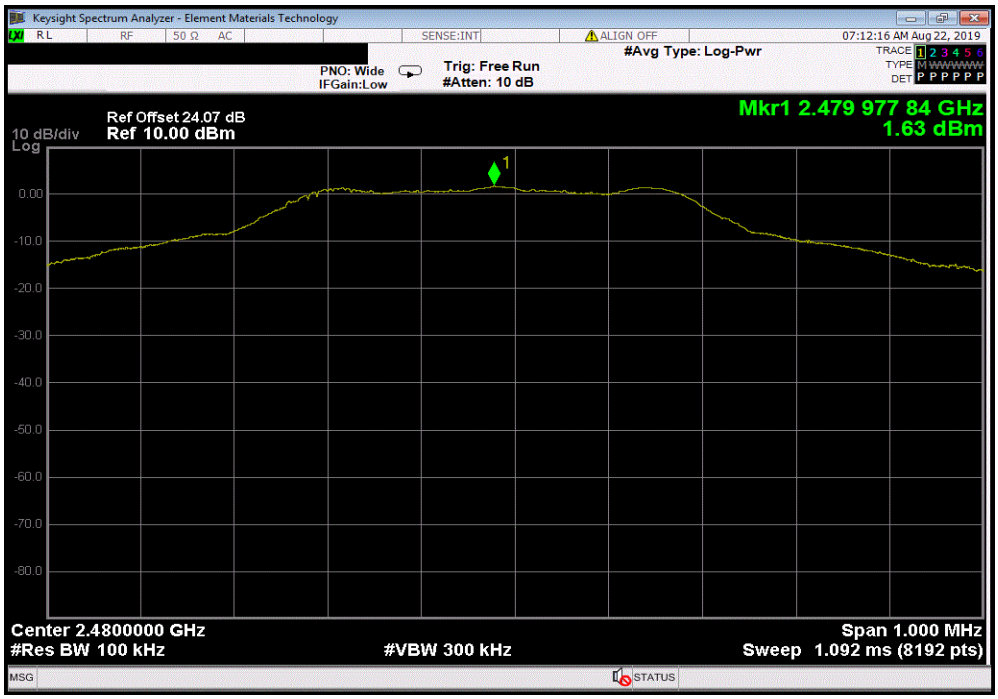
DH5, GFSK, Mid Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	2543.49	-50.09	-20	Pass



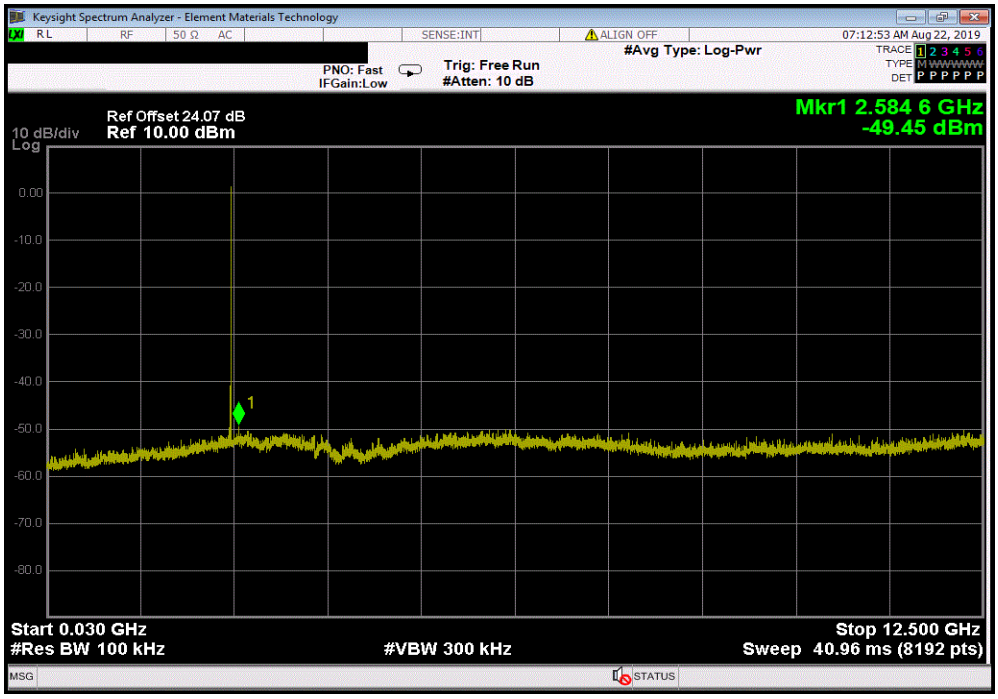
DH5, GFSK, Mid Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24987.79	-37.33	-20	Pass



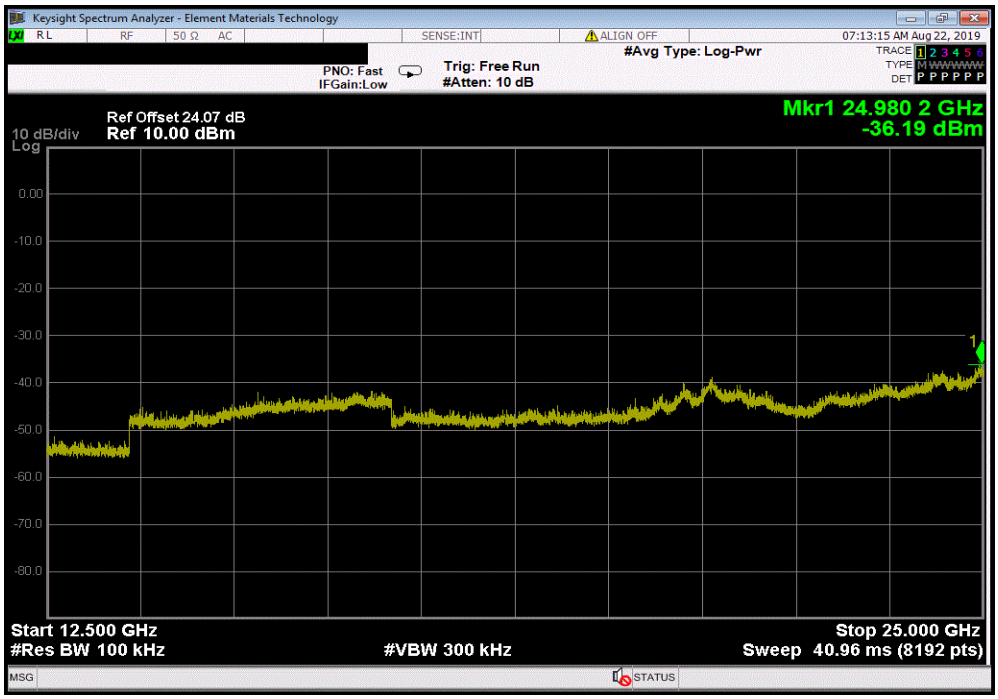
DH5, GFSK, High Channel					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2479.98	N/A	N/A	N/A



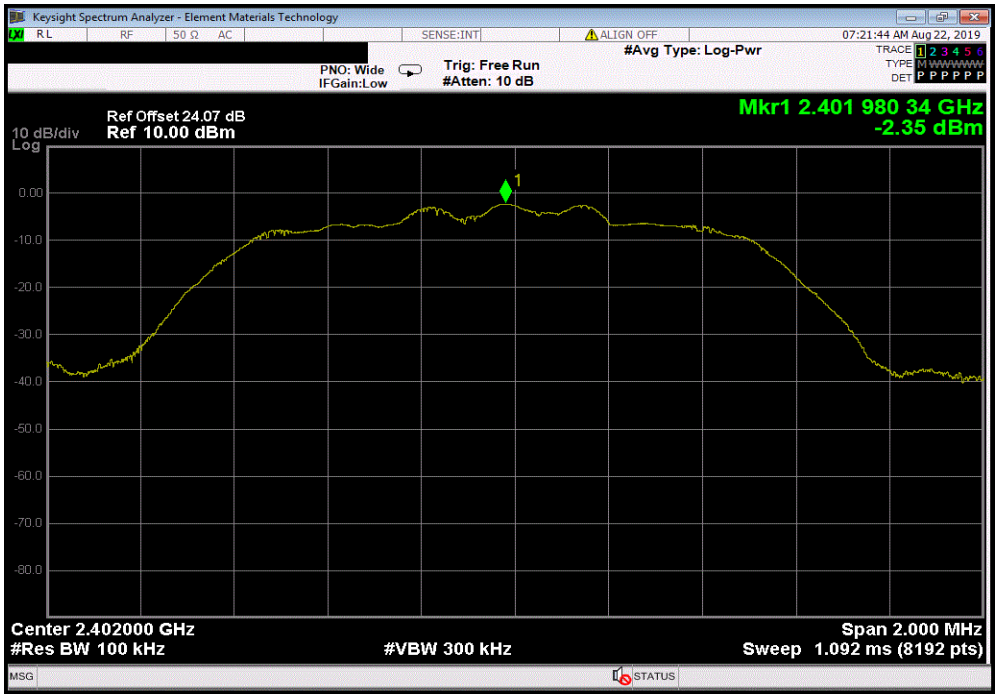
DH5, GFSK, High Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	2584.59	-51.08	-20	Pass



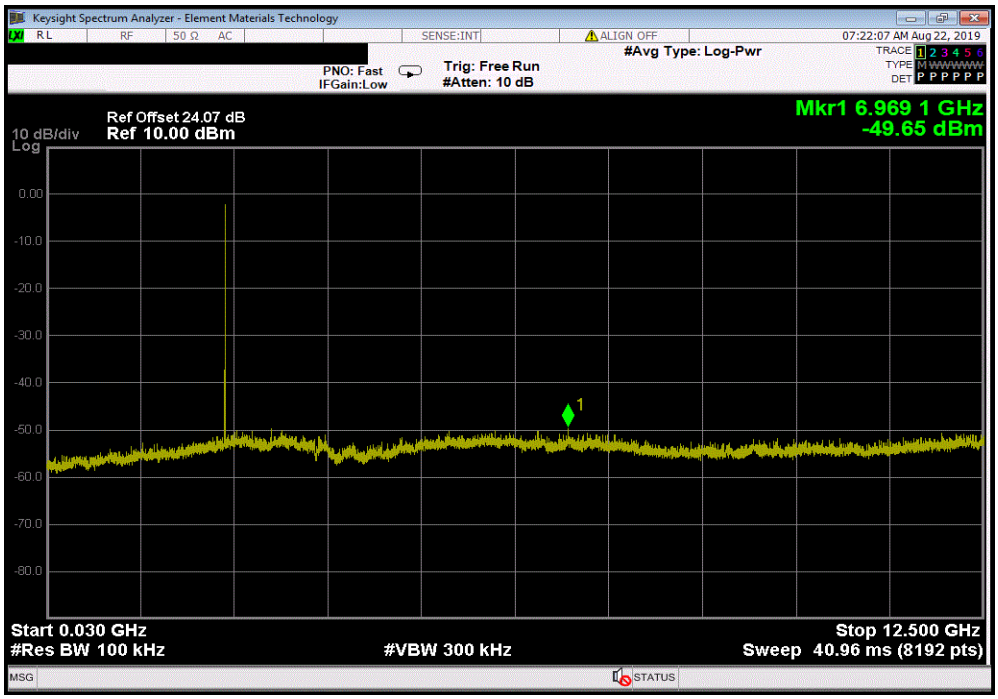
DH5, GFSK, High Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24980.16	-37.82	-20	Pass



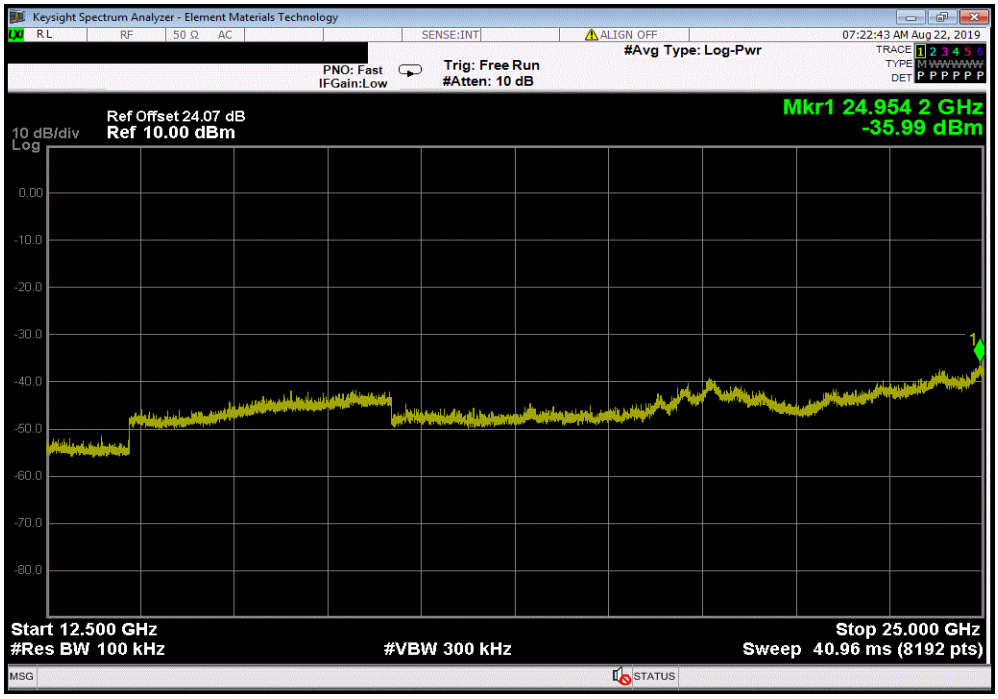
2DH5, pi/4-DQPSK, Low Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental	2401.98	N/A	N/A	N/A



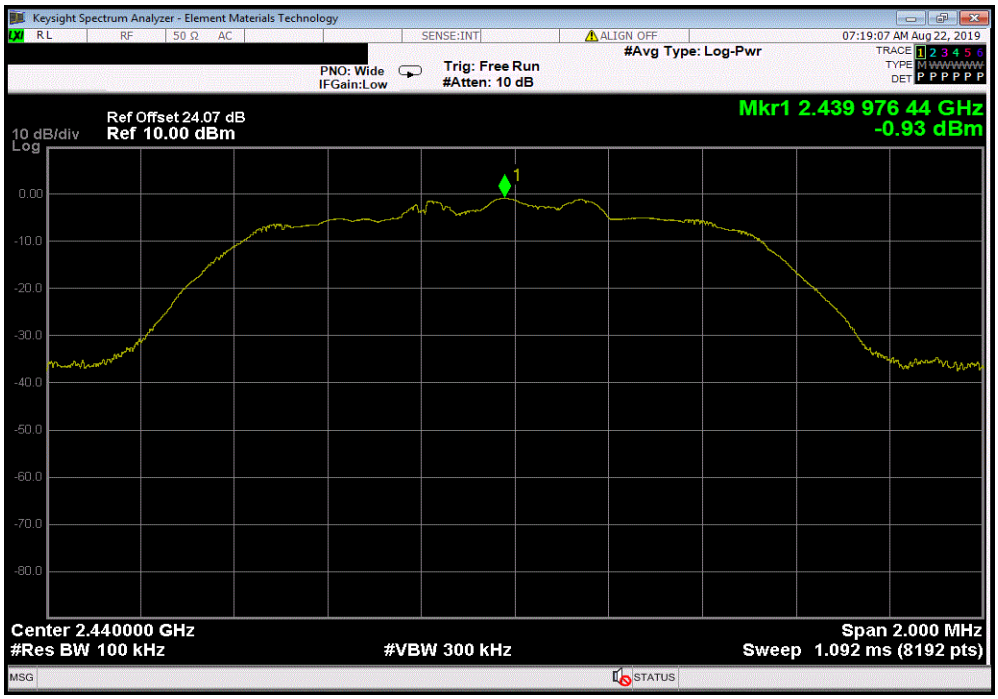
2DH5, pi/4-DQPSK, Low Channel				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz	6969.11	-47.3	-20	Pass



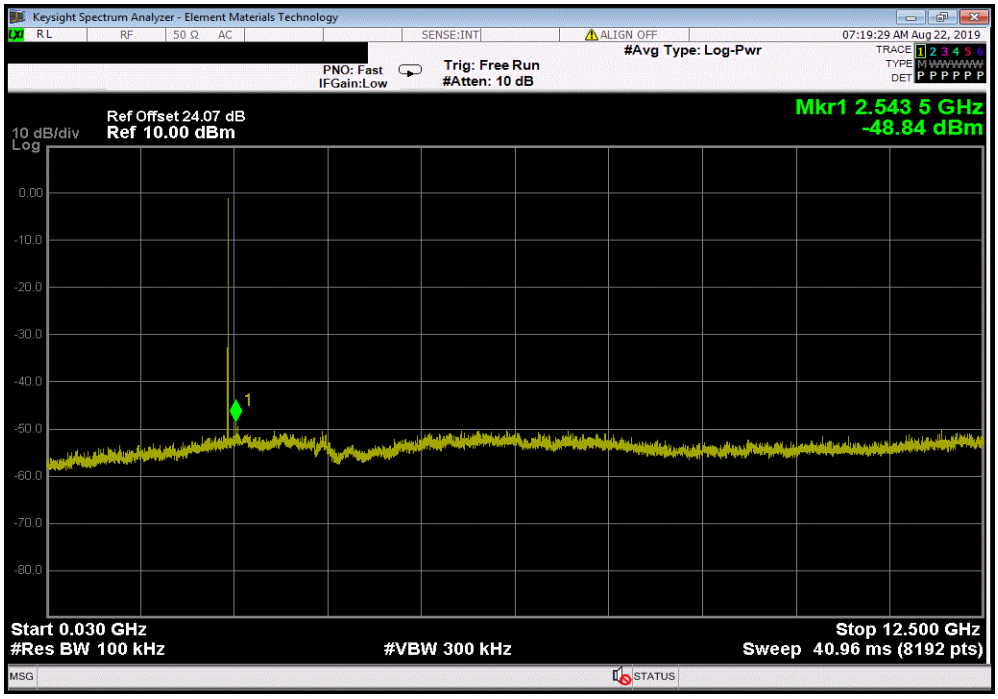
2DH5, pi/4-DQPSK, Low Channel				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	24954.22	-33.64	-20	Pass



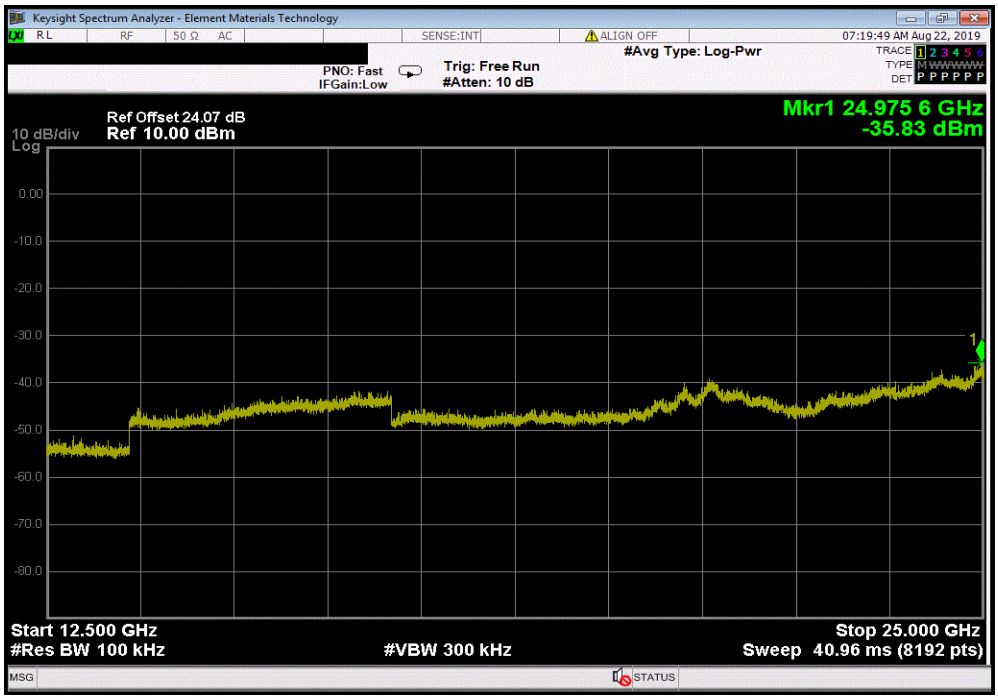
2DH5, pi/4-DQPSK, Mid Channel					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2439.98	N/A	N/A	N/A



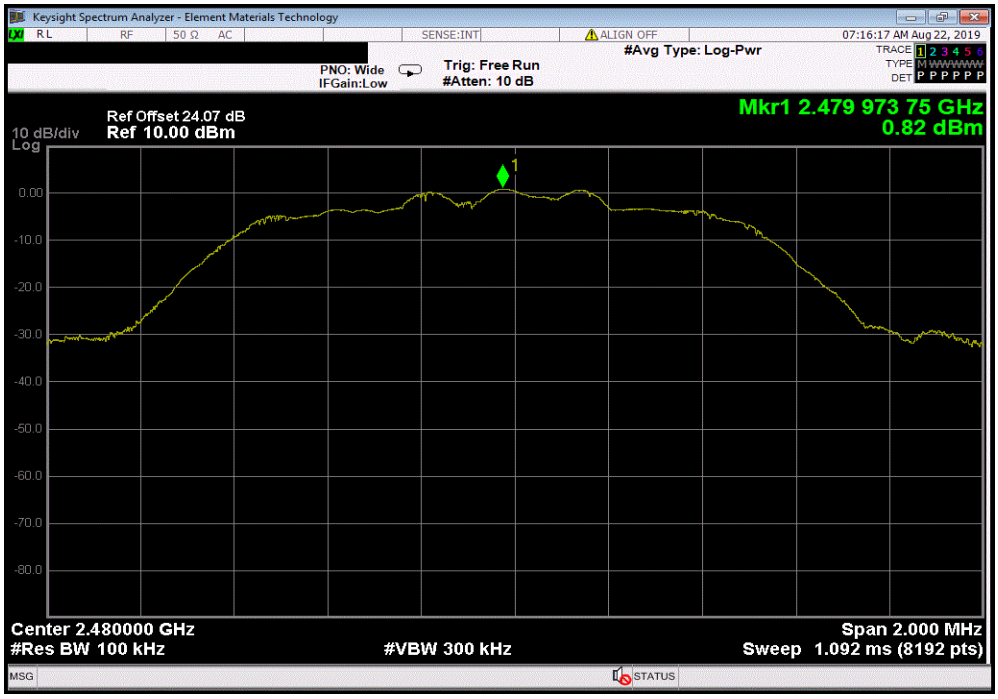
2DH5, pi/4-DQPSK, Mid Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	2543.49	-47.92	-20	Pass



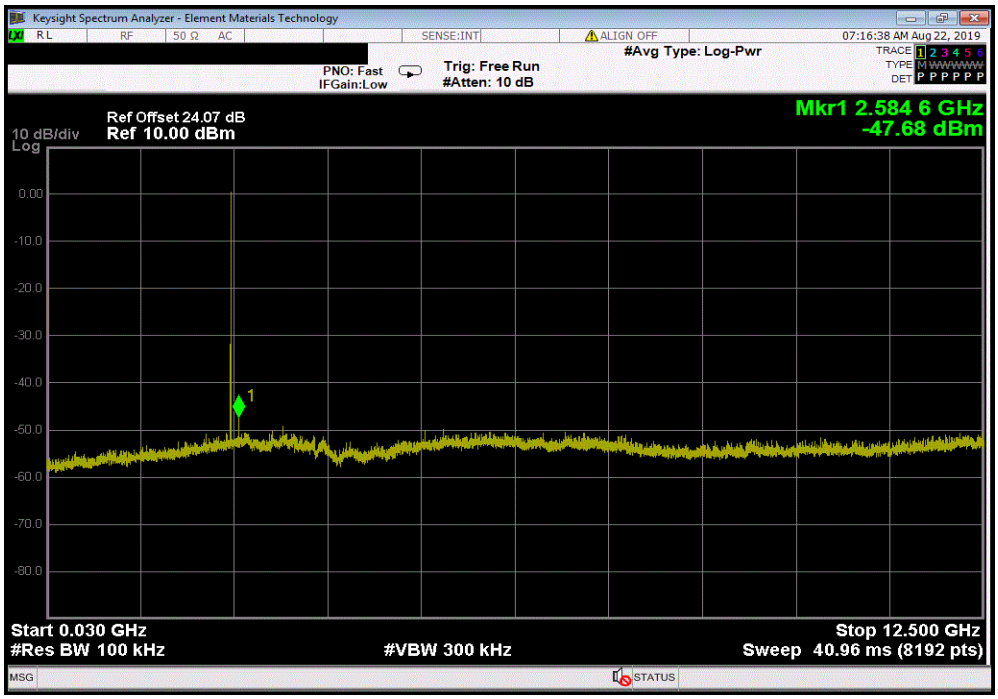
2DH5, pi/4-DQPSK, Mid Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24975.58	-34.9	-20	Pass



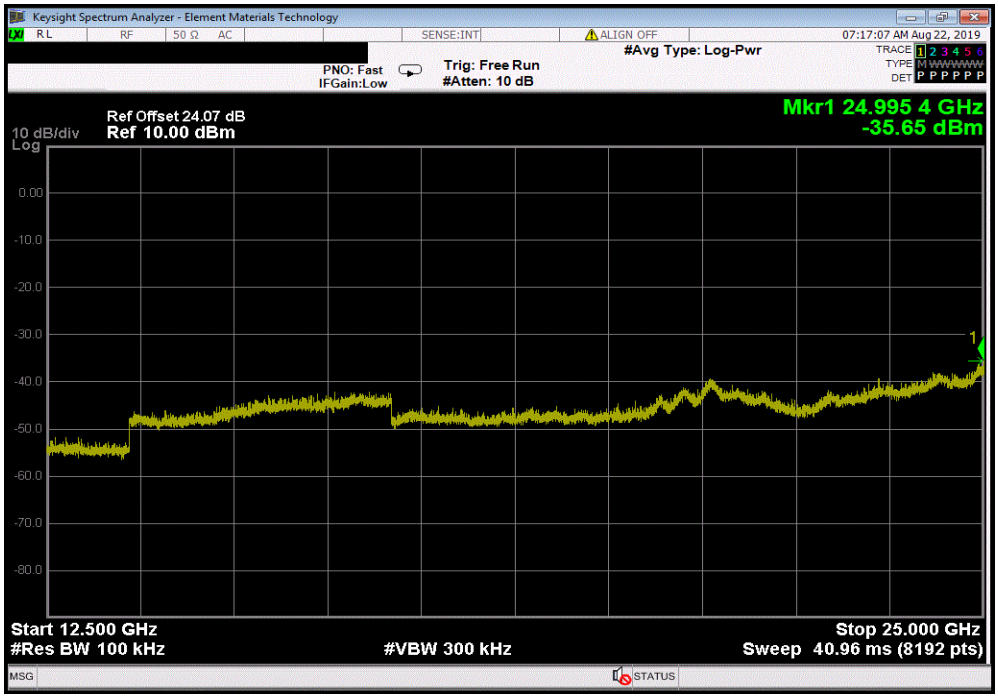
2DH5, pi/4-DQPSK, High Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental	2479.97	N/A	N/A	N/A



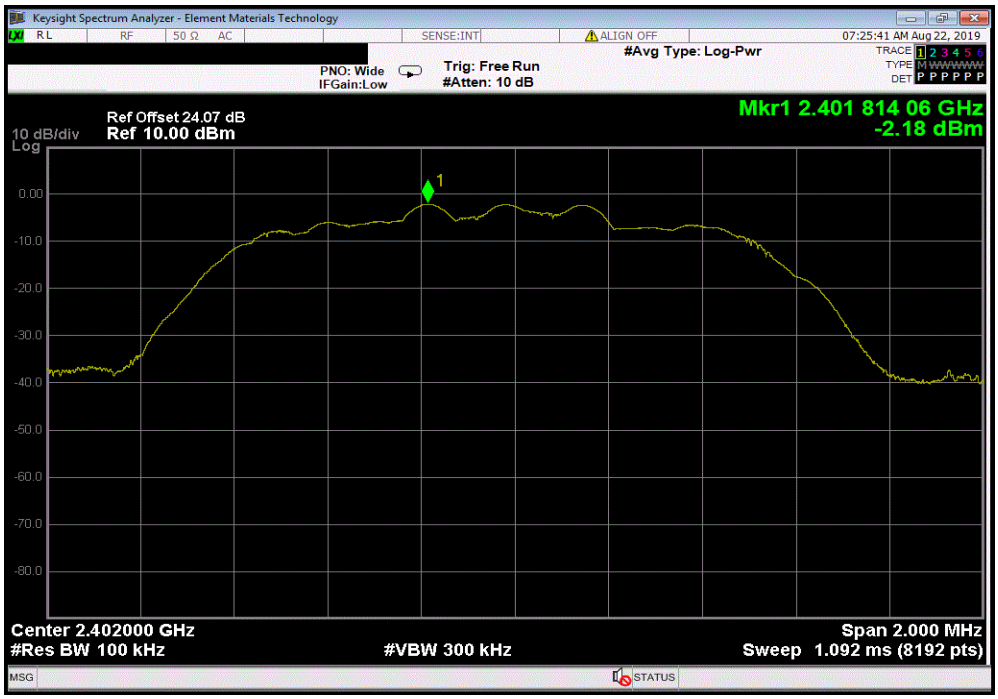
2DH5, pi/4-DQPSK, High Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	2584.59	-48.5	-20	Pass



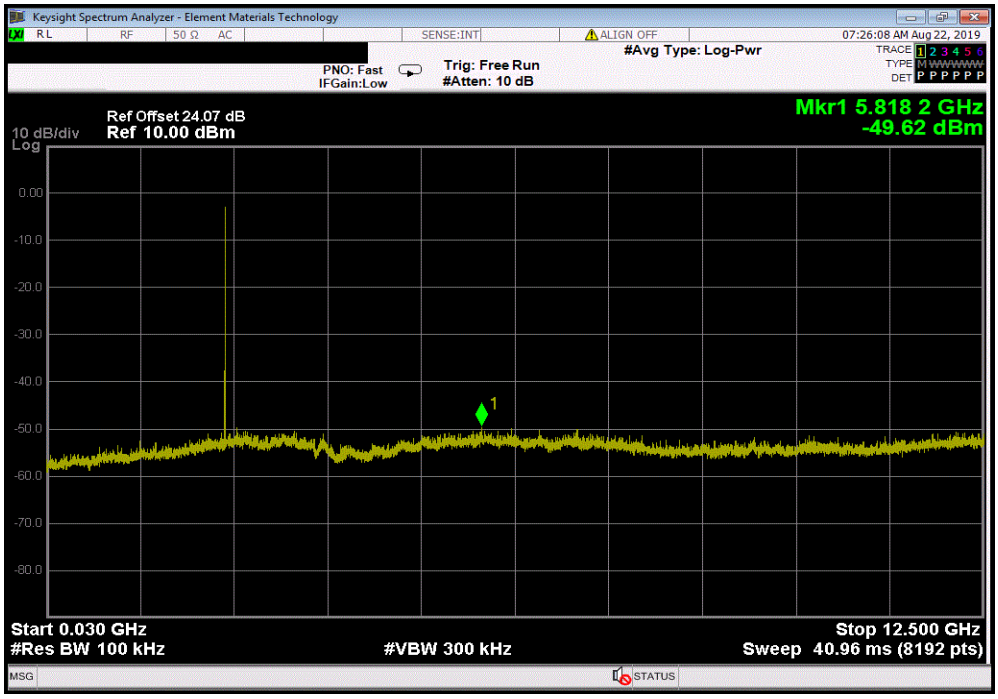
2DH5, pi/4-DQPSK, High Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24995.42	-36.47	-20	Pass



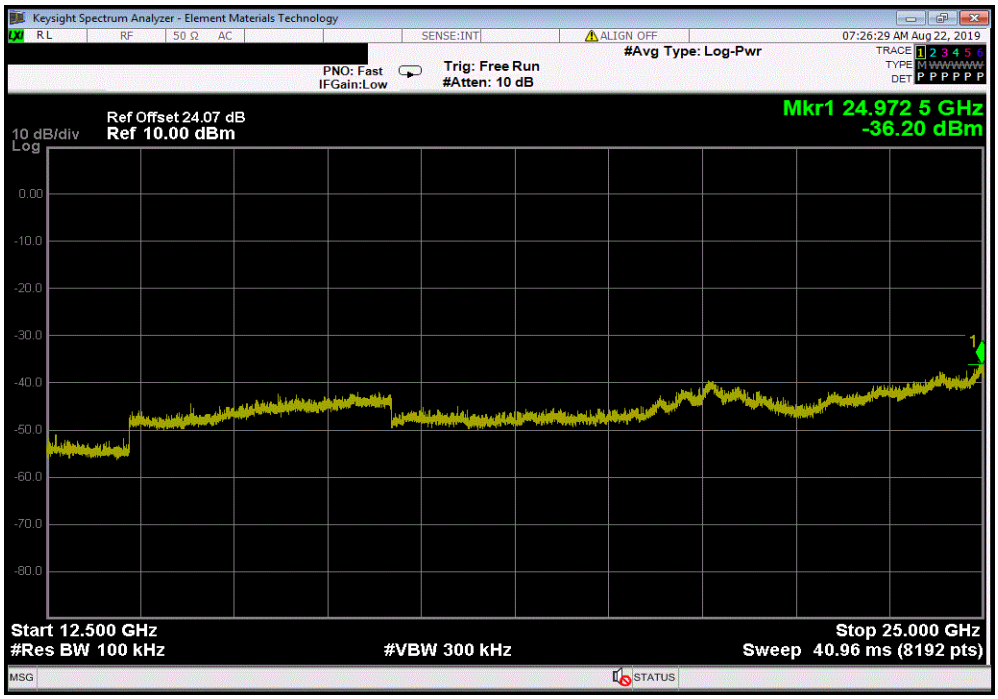
3DH5, 8-DPSK, Low Channel					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2401.81	N/A	N/A	N/A



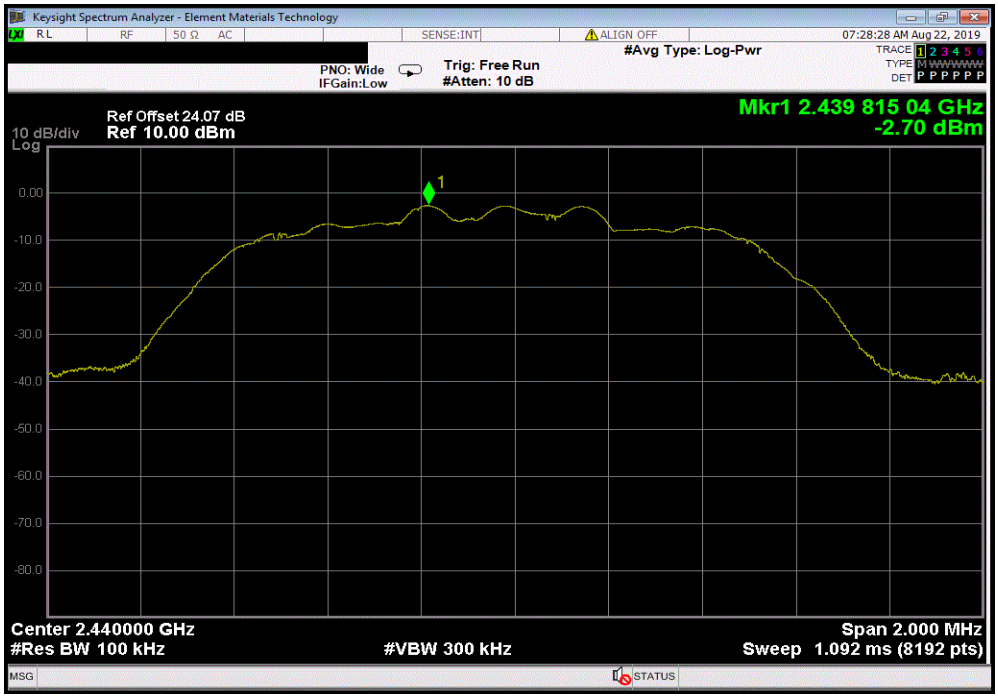
3DH5, 8-DPSK, Low Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	5818.17	-47.43	-20	Pass



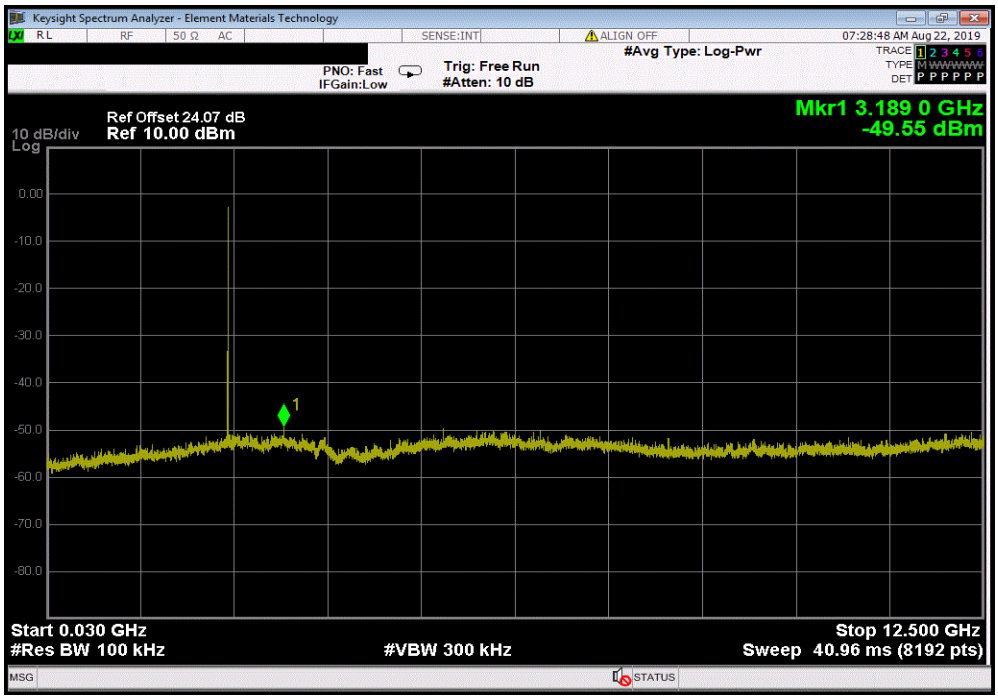
3DH5, 8-DPSK, Low Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24972.53	-34.01	-20	Pass



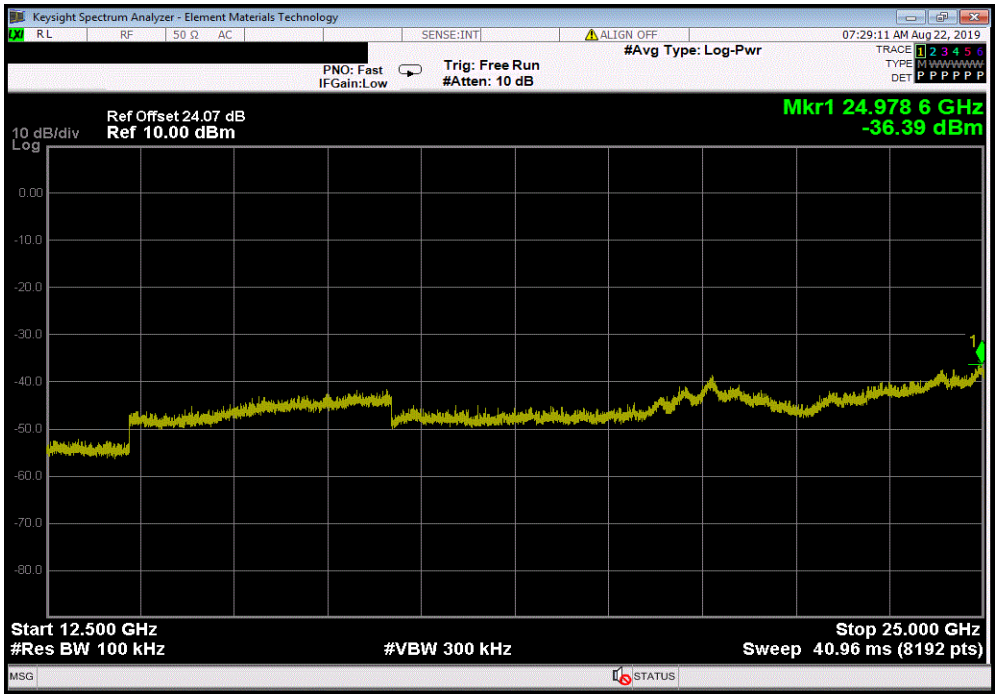
3DH5, 8-DPSK, Mid Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental	2439.82	N/A	N/A	N/A



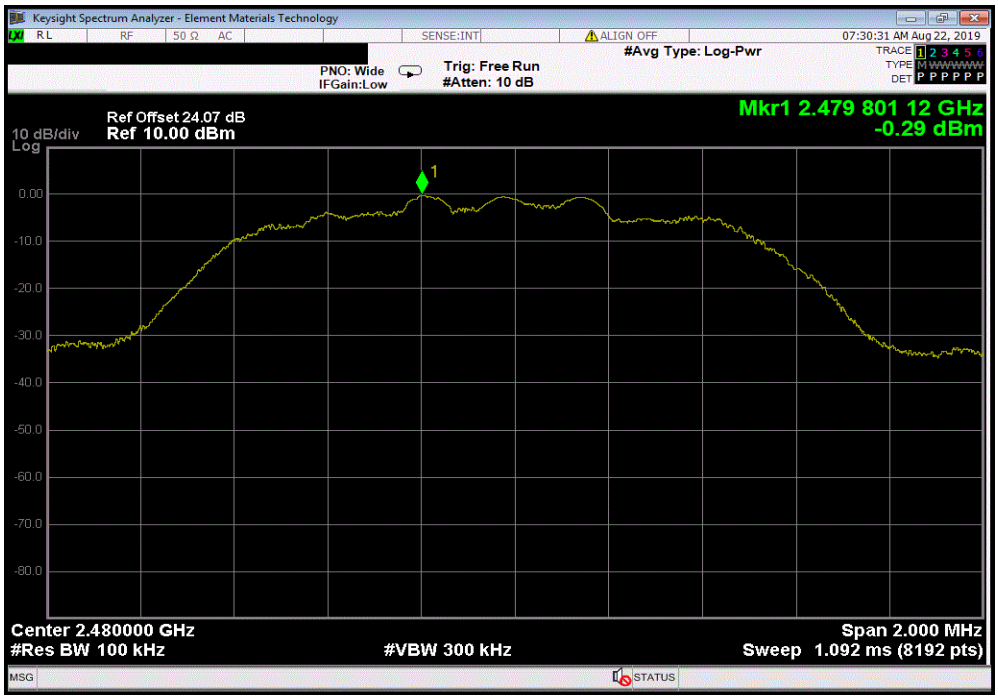
3DH5, 8-DPSK, Mid Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	3188.99	-46.85	-20	Pass



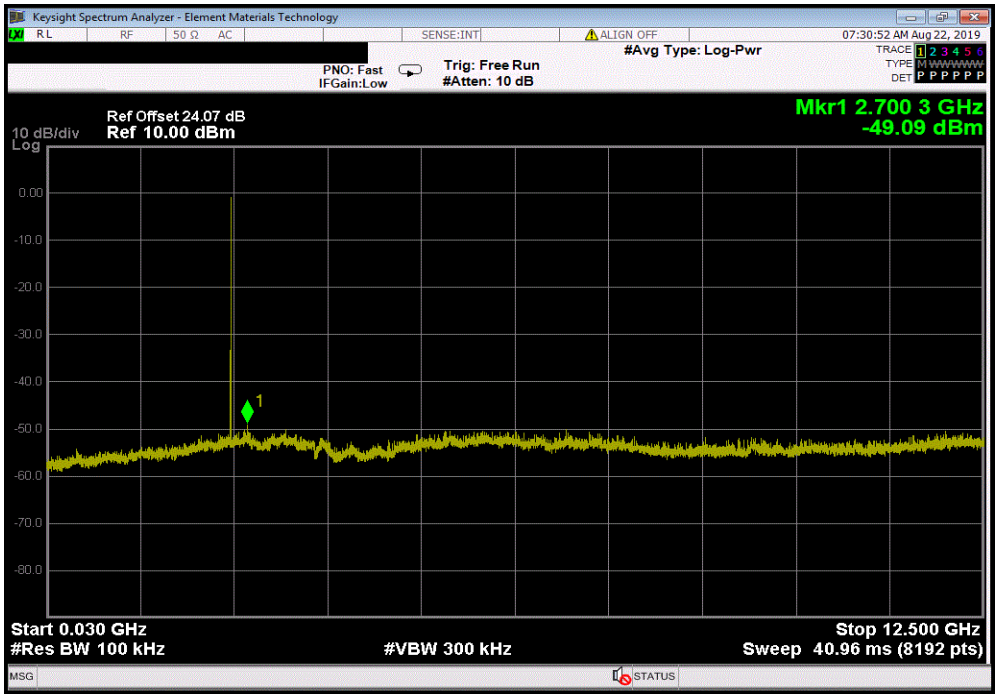
3DH5, 8-DPSK, Mid Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24978.64	-33.69	-20	Pass



3DH5, 8-DPSK, High Channel					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	2479.8	N/A	N/A	N/A



3DH5, 8-DPSK, High Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	2700.29	-48.8	-20	Pass



3DH5, 8-DPSK, High Channel				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz	24983.21	-34.6	-20	Pass