

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

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



TbTfx 2018.09.13 XMt 2019.05.15

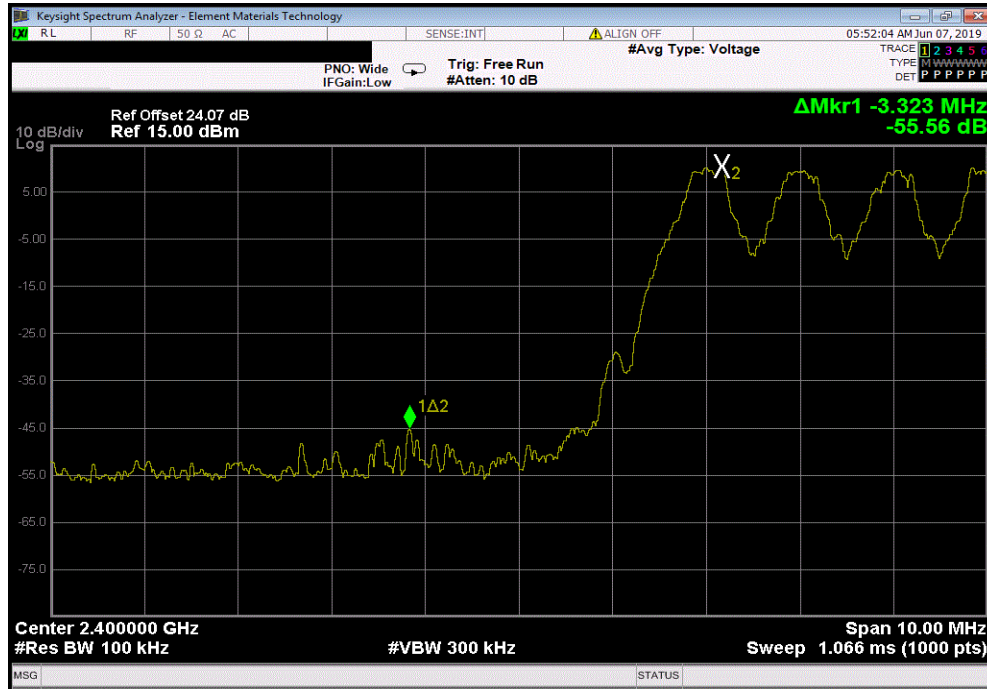
EUT: Jonah		Work Order: DROP0009	
Serial Number: PL1919P10034		Date: 10-Jun-19	
Customer: SonicSensory, Inc.		Temperature:	
Attendees: Daniel Quiros		Humidity:	
Project: None		Barometric Pres.:	
Tested by: Salvador Solorzano		Power: 110VAC/60Hz	
		Job Site: OC13	
TEST SPECIFICATIONS		Test Method	
FCC 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)
Hopping Mode (All Channels)			
DH5, GFSK			
Low Channel, 2402 MHz		-55.56	-20
High Channel, 2480 MHz		-59.09	-20
2DH5, pi/4-DQPSK			
Low Channel, 2402 MHz		-49.23	-20
High Channel, 2480 MHz		-57.24	-20
3DH5, 8-DPSK			
Low Channel, 2402 MHz		-49.71	-20
High Channel, 2480 MHz		-54.81	-20

BAND EDGE COMPLIANCE -HOPPING MODE

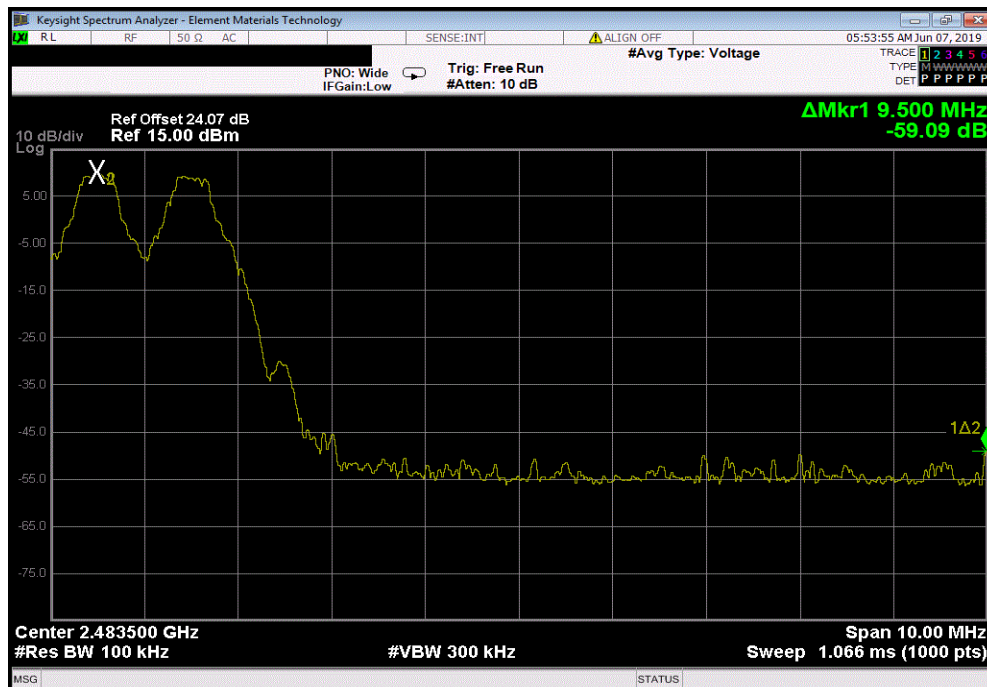


TMTx 2018.09.13 XMI 2019.05.15

Hopping Mode (All Channels), DH5, GFSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-55.56	-20	Pass



Hopping Mode (All Channels), DH5, GFSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-59.09	-20	Pass

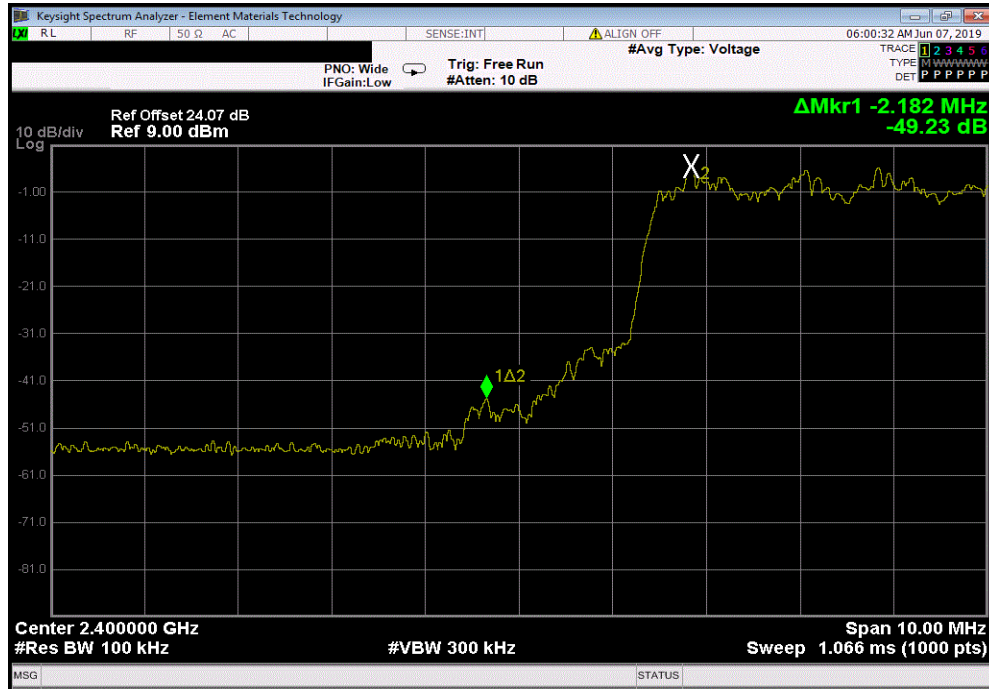


BAND EDGE COMPLIANCE -HOPPING MODE

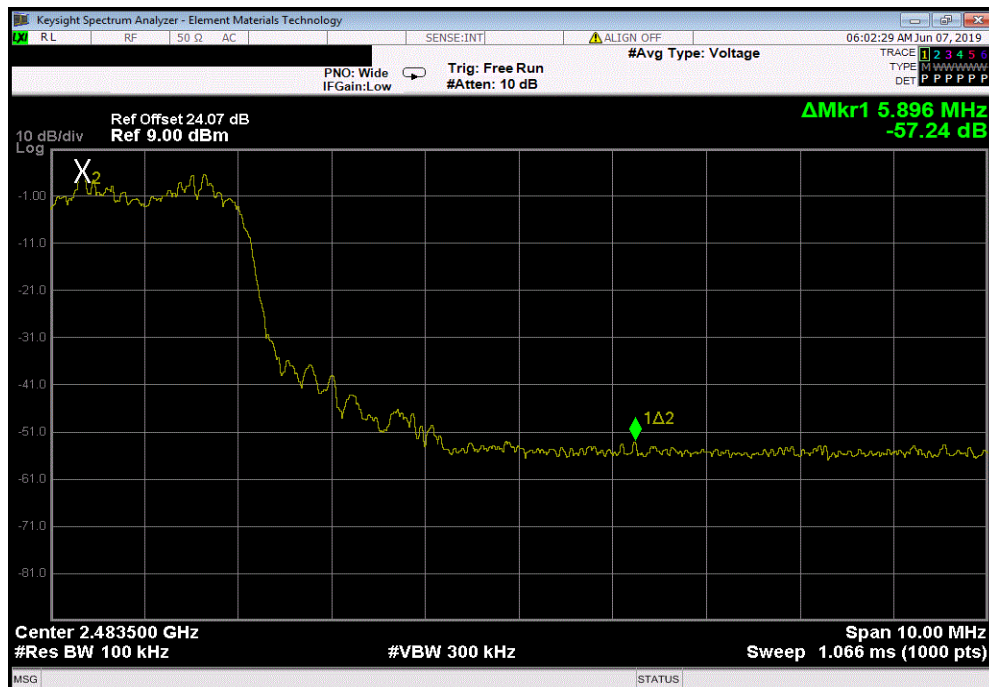


TMTx 2018.09.13 XMI 2019.05.15

Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-49.23	-20	Pass



Hopping Mode (All Channels), 2DH5, pi/4-DQPSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-57.24	-20	Pass

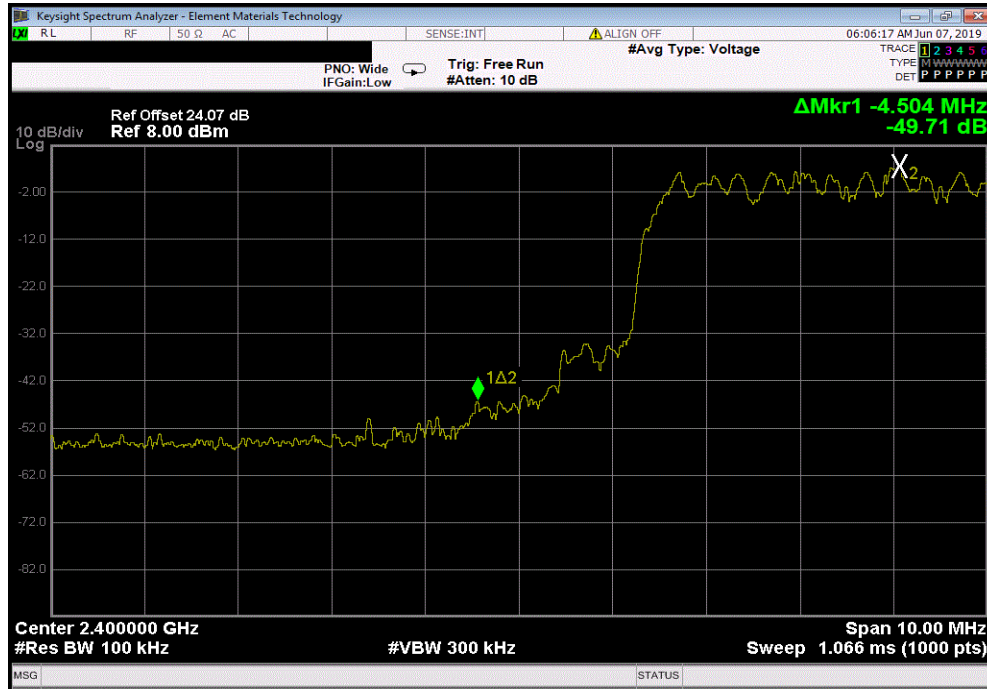


BAND EDGE COMPLIANCE -HOPPING MODE

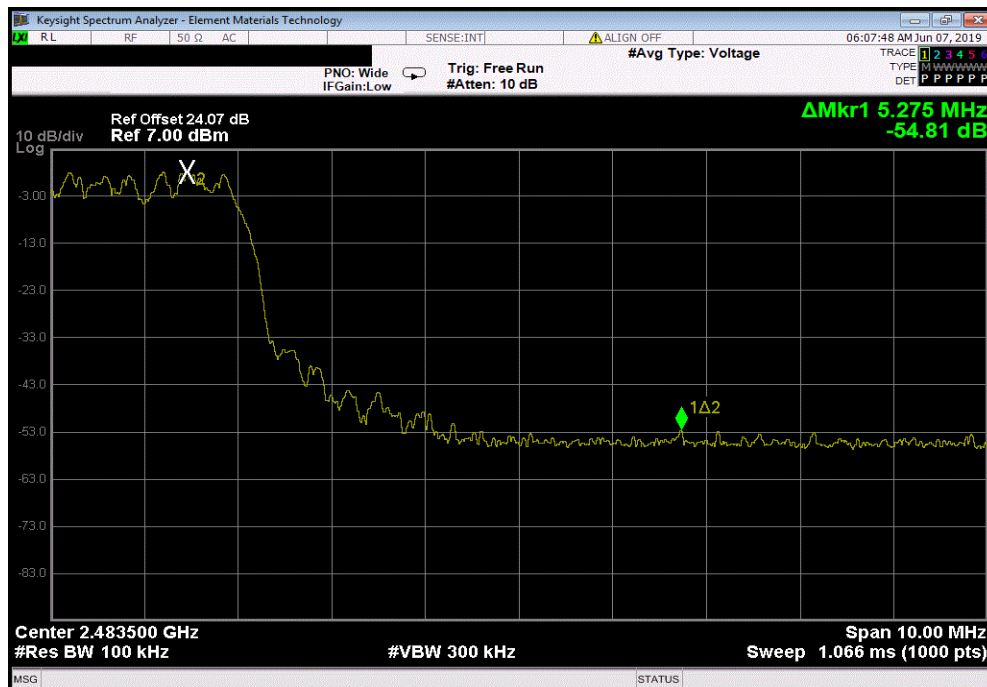


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Hopping Mode (All Channels), 3DH5, 8-DPSK, Low Channel, 2402 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-49.71	-20	Pass



Hopping Mode (All Channels), 3DH5, 8-DPSK, High Channel, 2480 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-54.81	-20	Pass



OCCUPIED BANDWIDTH



XMIT 2019.05.15

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TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Attenuator	Fairview Microwave	SA18H-20	TKR	20-Dec-18	20-Dec-19
Block - DC	Fairview Microwave	SD3379	AMV	3-Jan-19	3-Jan-20
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

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



ThxTx 2018.09.13 XMt 2019.05.15

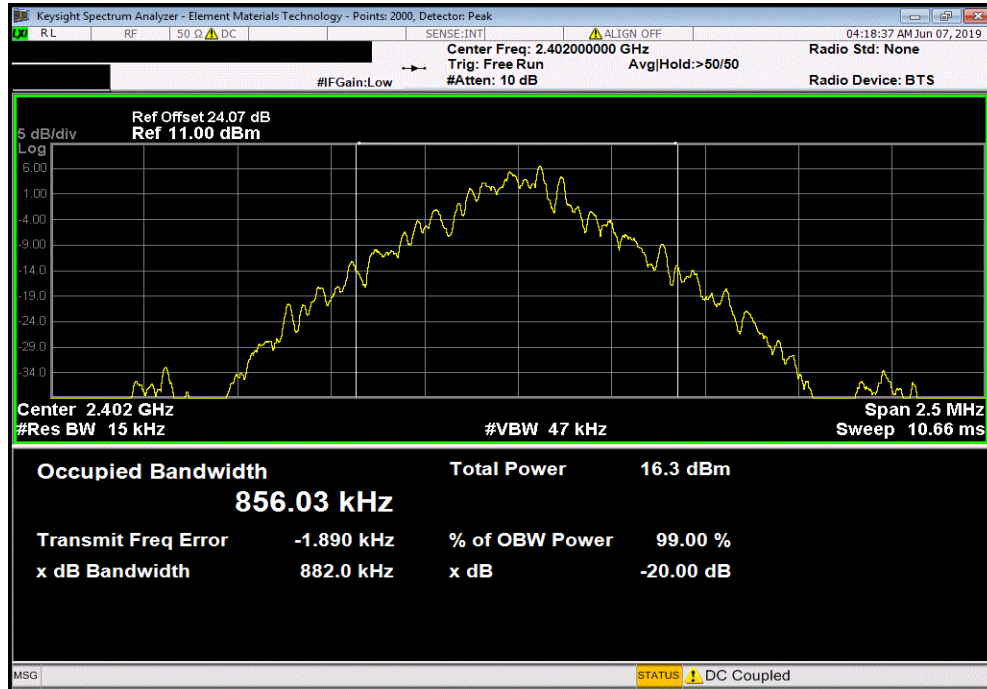
EUT: Jonah		Work Order: DROP0009	
Serial Number: PL1919P10034		Date: 6-Jun-19	
Customer: SonicSensory, Inc.		Temperature: 24.5 °C	
Attendees: Daniel Quiros		Humidity: 47.2% RH	
Project: None		Barometric Pres.: 1016 mbar	
Tested by: Salvador Solorzano		Power: 110VAC/60Hz	
		Job Site: OC13	
TEST SPECIFICATIONS		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	881.992 kHz	N/A Pass
	Mid Channel	882.41 kHz	N/A Pass
	High Channel	884.138 kHz	N/A Pass
2DH5, pi/4-DQPSK			
	Low Channel	1.364 MHz	N/A Pass
	Mid Channel	1.37 MHz	N/A Pass
	High Channel	1.367 MHz	N/A Pass
3DH5, 8-DPSK			
	Low Channel	1.353 MHz	N/A Pass
	Mid Channel	1.354 MHz	N/A Pass
	High Channel	1.357 MHz	N/A Pass

OCCUPIED BANDWIDTH

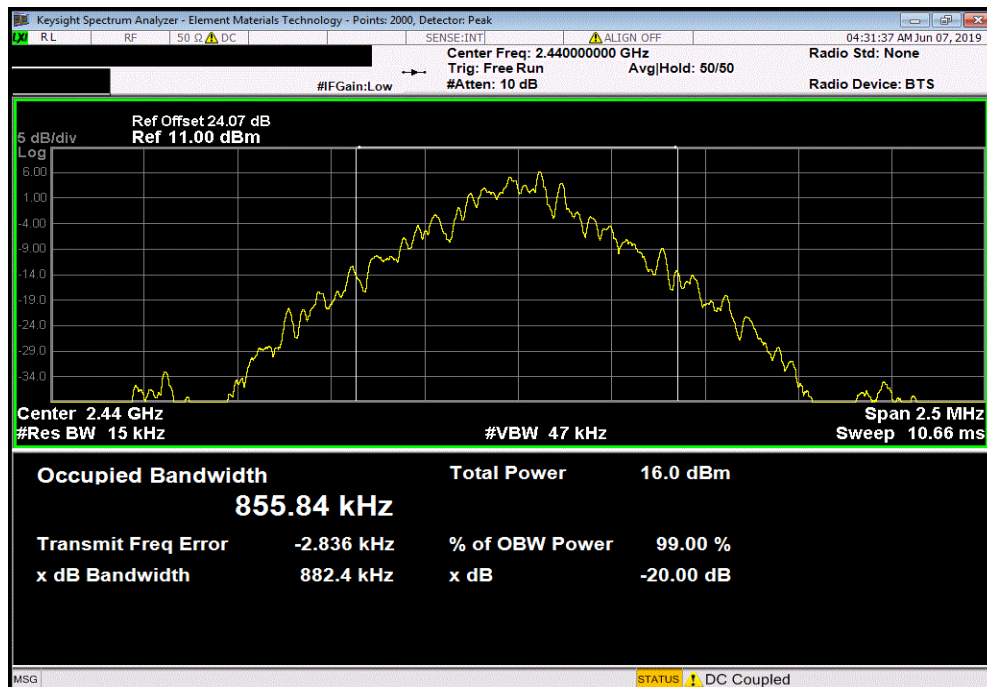


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DH5, GFSK, Low Channel						
				Value	Limit (<)	Result
				881.992 kHz	N/A	Pass



DH5, GFSK, Mid Channel						
				Value	Limit (<)	Result
				882.41 kHz	N/A	Pass

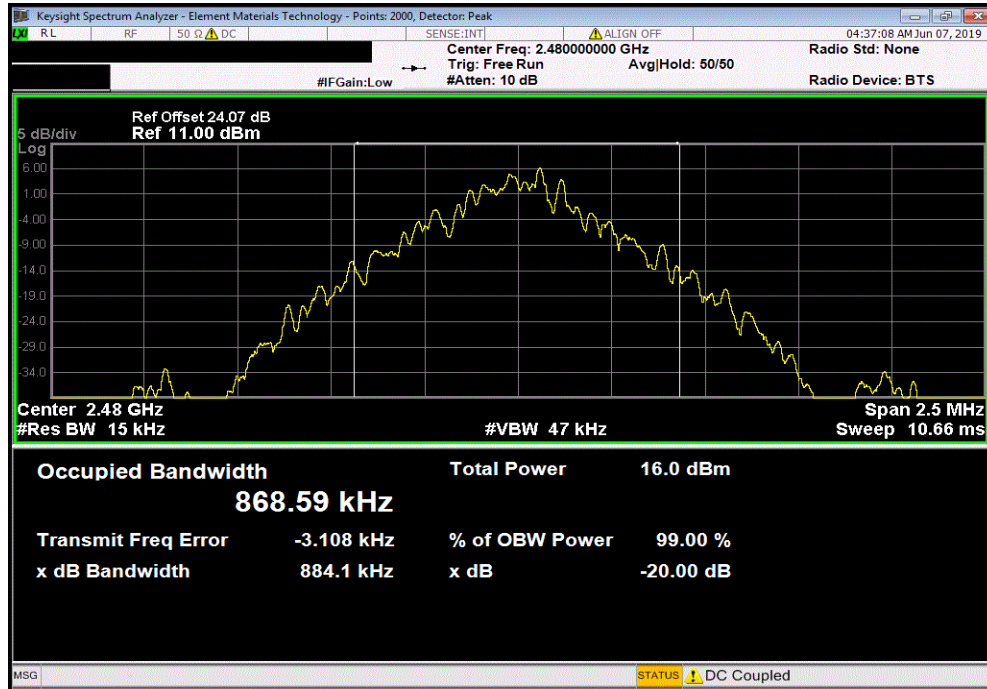


OCCUPIED BANDWIDTH

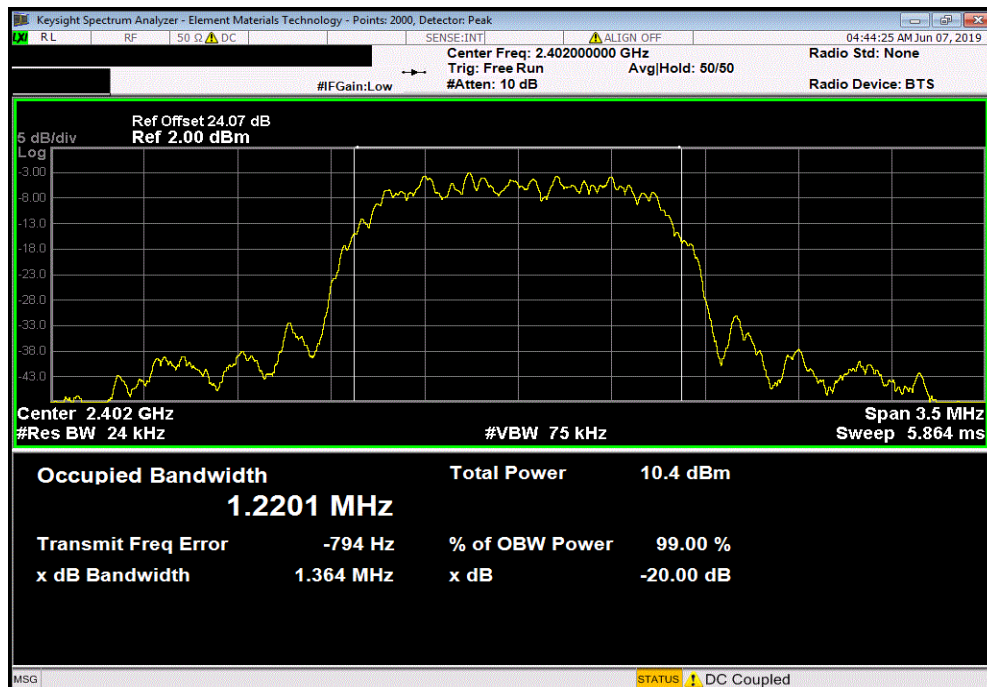


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DH5, GFSK, High Channel						
				Value	Limit (<)	Result
				884.138 kHz	N/A	Pass



2DH5, pi/4-DQPSK, Low Channel						
				Value	Limit (<)	Result
				1.364 MHz	N/A	Pass

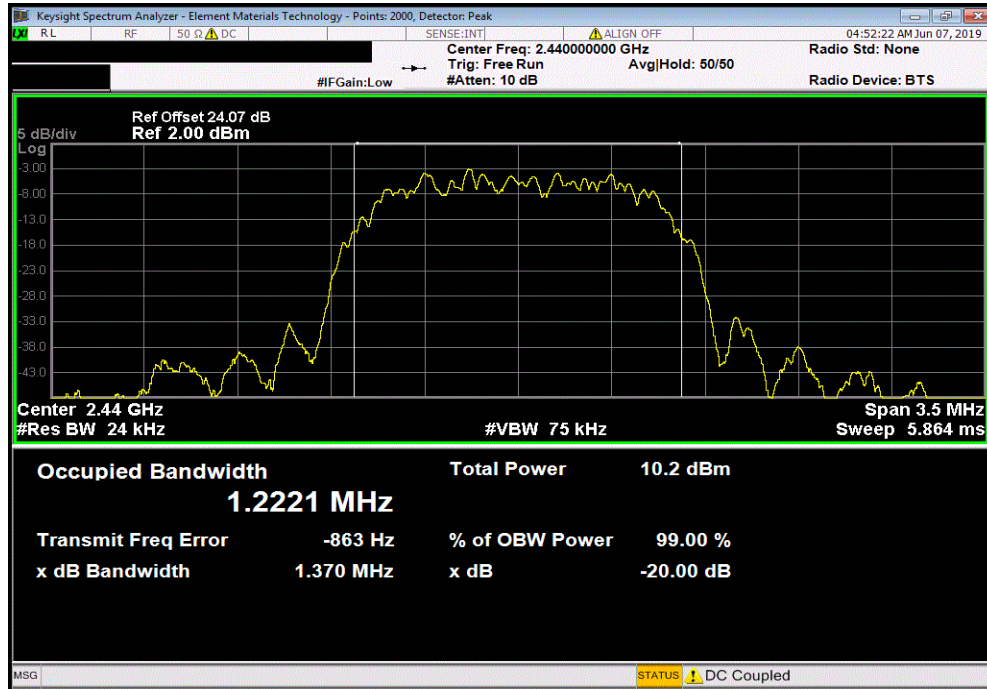


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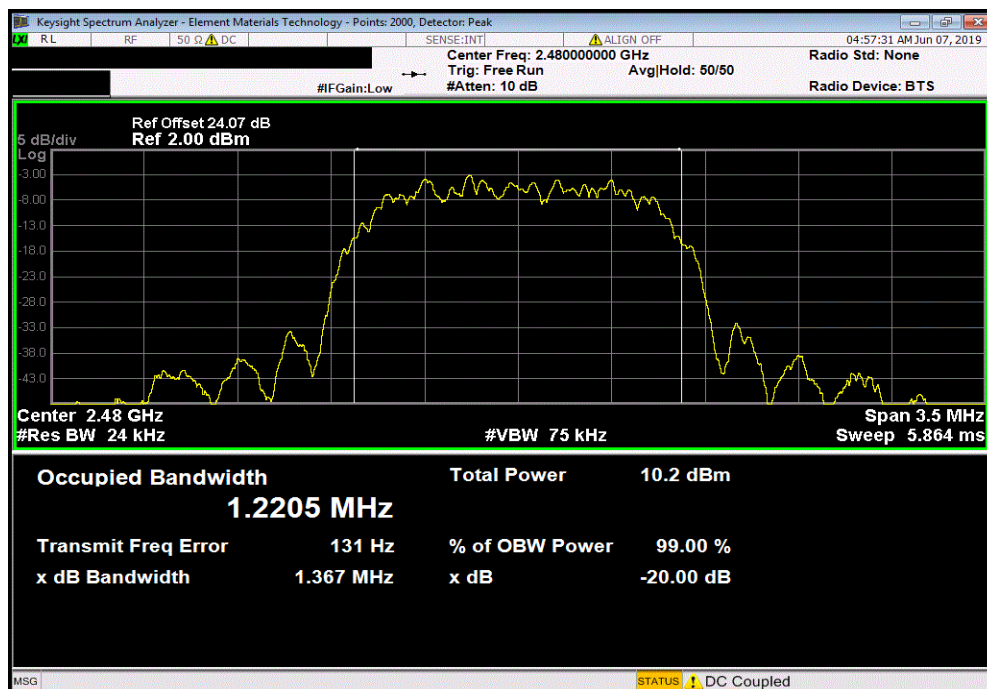


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2DH5, pi/4-DQPSK, Mid Channel						
				Value	Limit (<)	Result
				1.37 MHz	N/A	Pass



2DH5, pi/4-DQPSK, High Channel						
				Value	Limit (<)	Result
				1.367 MHz	N/A	Pass

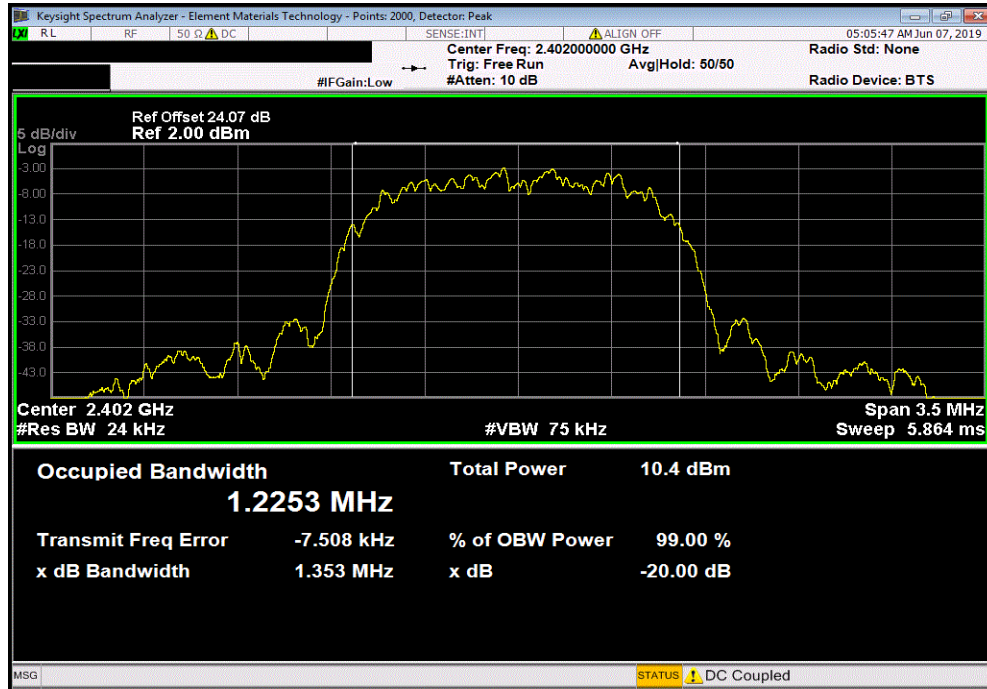


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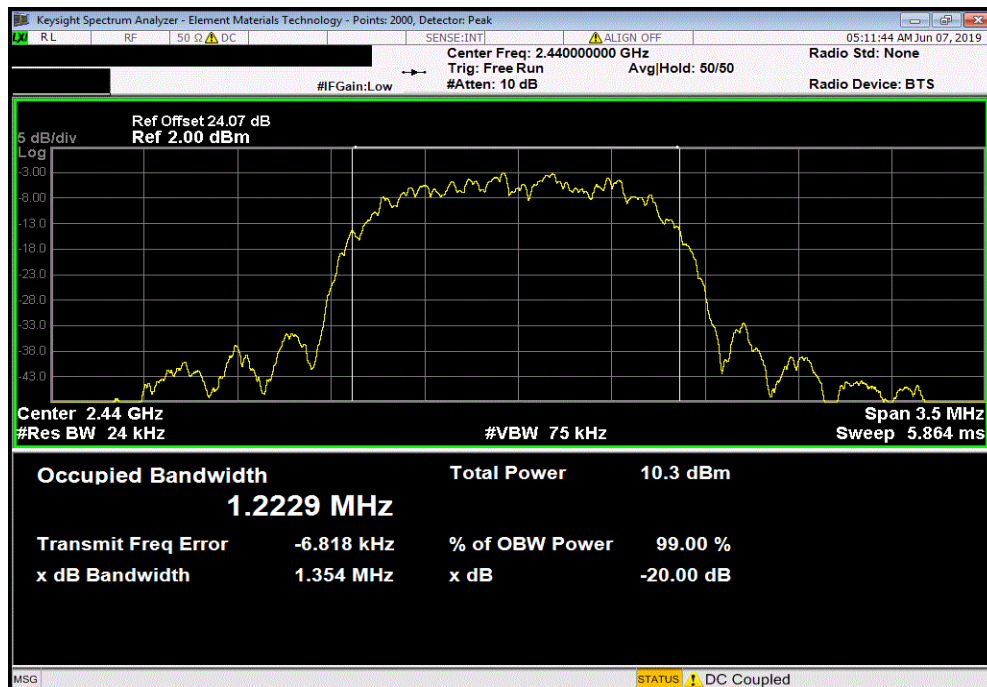


TMTx 2018.09.13 XMI 2019.05.15

3DH5, 8-DPSK, Low Channel						
				Value	Limit (<)	Result
				1.353 MHz	N/A	Pass



3DH5, 8-DPSK, Mid Channel						
				Value	Limit (<)	Result
				1.354 MHz	N/A	Pass

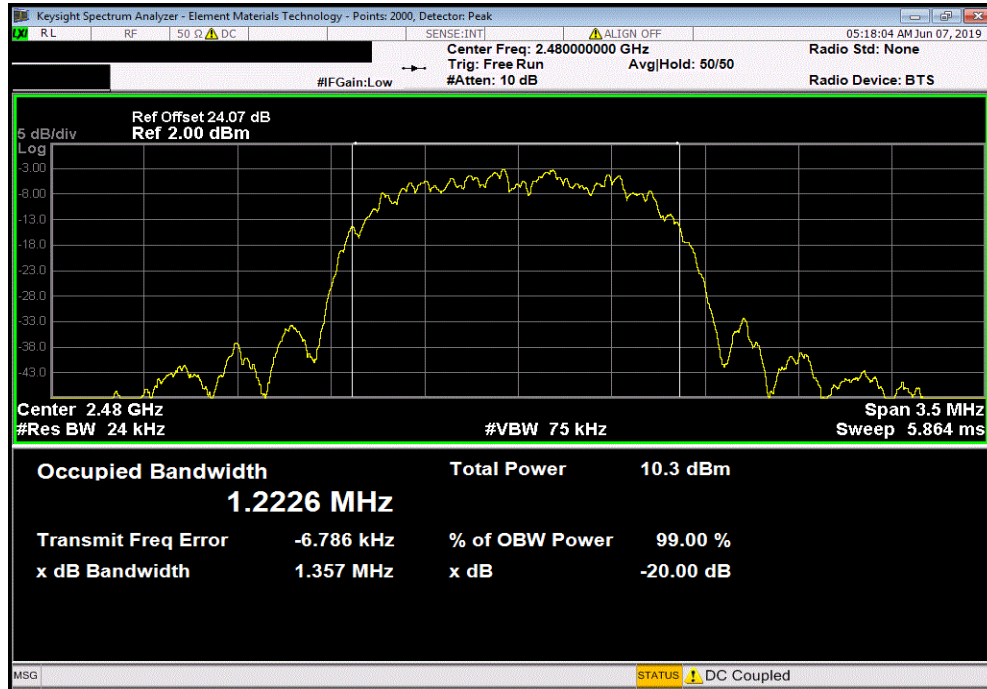


OCCUPIED BANDWIDTH



TMTx 2018.09.13 XMt 2019.05.15

3DH5, 8-DPSK, High Channel						
				Value	Limit (<)	Result
				1.357 MHz	N/A	Pass



SPURIOUS CONDUCTED EMISSIONS



XMIT 2019.06.11

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TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3379	AMV	3-Jan-19	3-Jan-20
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	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



TMTx 2018.09.13 XMM 2019.06.11

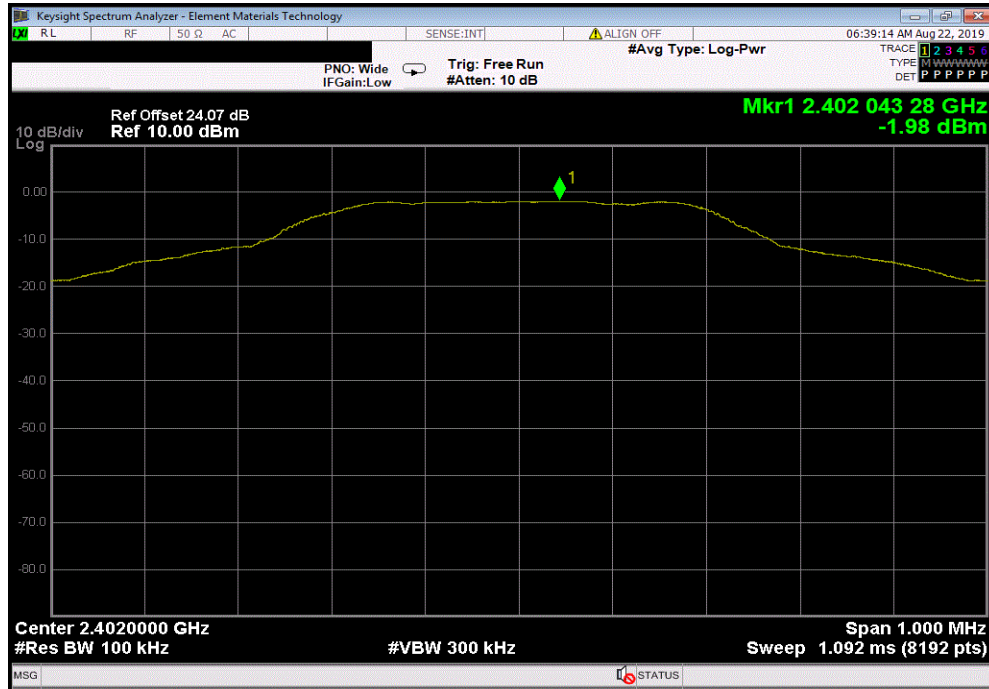
EUT: Jonah		Work Order: DROP0009			
Serial Number: PL1919P10034		Date: 21-Aug-19			
Customer: SonicSensory, Inc.		Temperature: 23.4 °C			
Attendees: Daniel Quiros		Humidity: 45.3% RH			
Project: None		Barometric Pres.: 1015 mbar			
Tested by: Johnny Candelas		Power: 110VAC/60Hz			
Job Site: OC13					
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	2402.04	N/A	N/A	N/A
Low Channel	30 MHz - 12.5 GHz	7206.61	-47.22	-20	Pass
Low Channel	12.5 GHz - 25 GHz	24946.59	-34.1	-20	Pass
Mid Channel	Fundamental	2440.04	N/A	N/A	N/A
Mid Channel	30 MHz - 12.5 GHz	7319.26	-45.6	-20	Pass
Mid Channel	12.5 GHz - 25 GHz	24952.69	-34.02	-20	Pass
High Channel	Fundamental	2480.04	N/A	N/A	N/A
High Channel	30 MHz - 12.5 GHz	3161.58	-47.1	-20	Pass
High Channel	12.5 GHz - 25 GHz	24923.7	-34.23	-20	Pass
2DH5, pi/4-DQPSK					
Low Channel	Fundamental	2402.03	N/A	N/A	N/A
Low Channel	30 MHz - 12.5 GHz	7206.61	-48.82	-20	Pass
Low Channel	12.5 GHz - 25 GHz	24966.43	-37.32	-20	Pass
Mid Channel	Fundamental	2440.03	N/A	N/A	N/A
Mid Channel	30 MHz - 12.5 GHz	7319.26	-49.56	-20	Pass
Mid Channel	12.5 GHz - 25 GHz	24934.38	-36.74	-20	Pass
High Channel	Fundamental	2480.04	N/A	N/A	N/A
High Channel	30 MHz - 12.5 GHz	7439.53	-50.61	-20	Pass
High Channel	12.5 GHz - 25 GHz	24967.95	-37.59	-20	Pass
3DH5, 8-DPSK					
Low Channel	Fundamental	2402.09	N/A	N/A	N/A
Low Channel	30 MHz - 12.5 GHz	7206.61	-49.55	-20	Pass
Low Channel	12.5 GHz - 25 GHz	24909.96	-38.08	-20	Pass
Mid Channel	Fundamental	2440.09	N/A	N/A	N/A
Mid Channel	30 MHz - 12.5 GHz	7320.79	-48.19	-20	Pass
Mid Channel	12.5 GHz - 25 GHz	24957.27	-37.72	-20	Pass
High Channel	Fundamental	2480.09	N/A	N/A	N/A
High Channel	30 MHz - 12.5 GHz	6168.33	-51.53	-20	Pass
High Channel	12.5 GHz - 25 GHz	24943.54	-37.18	-20	Pass

SPURIOUS CONDUCTED EMISSIONS

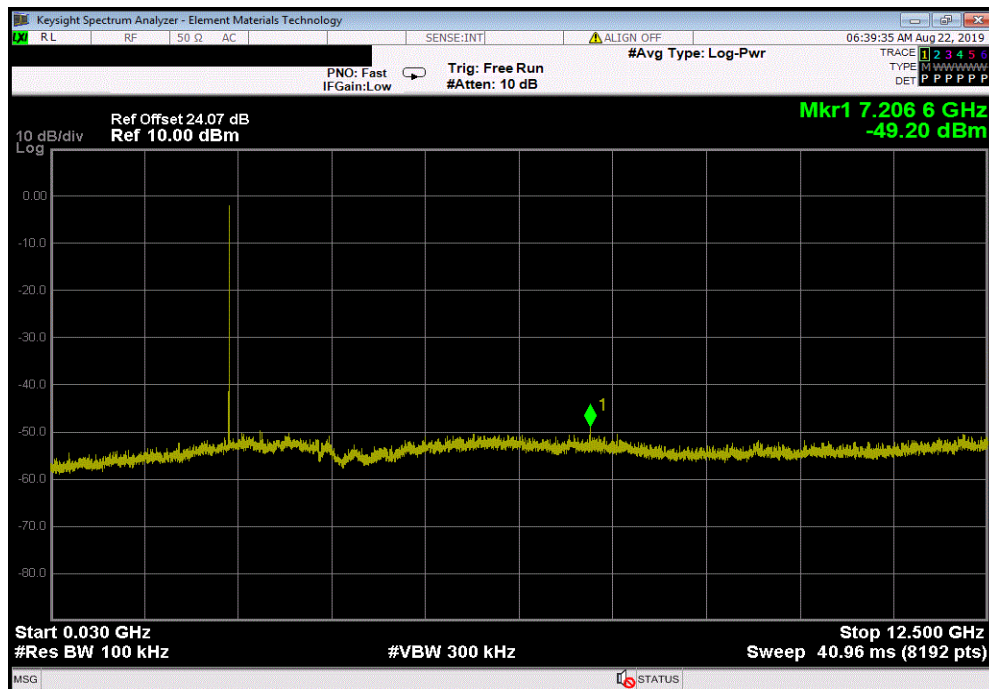


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DH5, GFSK, Low Channel						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2402.04	N/A	N/A	N/A		



DH5, GFSK, Low Channel						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	7206.61	-47.22	-20	Pass		

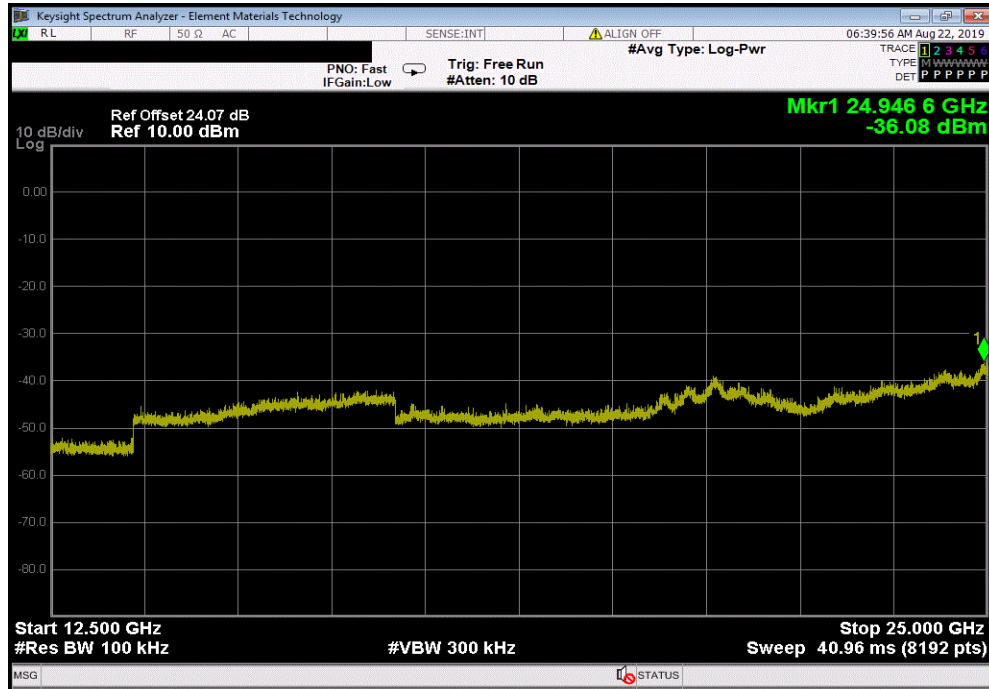


SPURIOUS CONDUCTED EMISSIONS

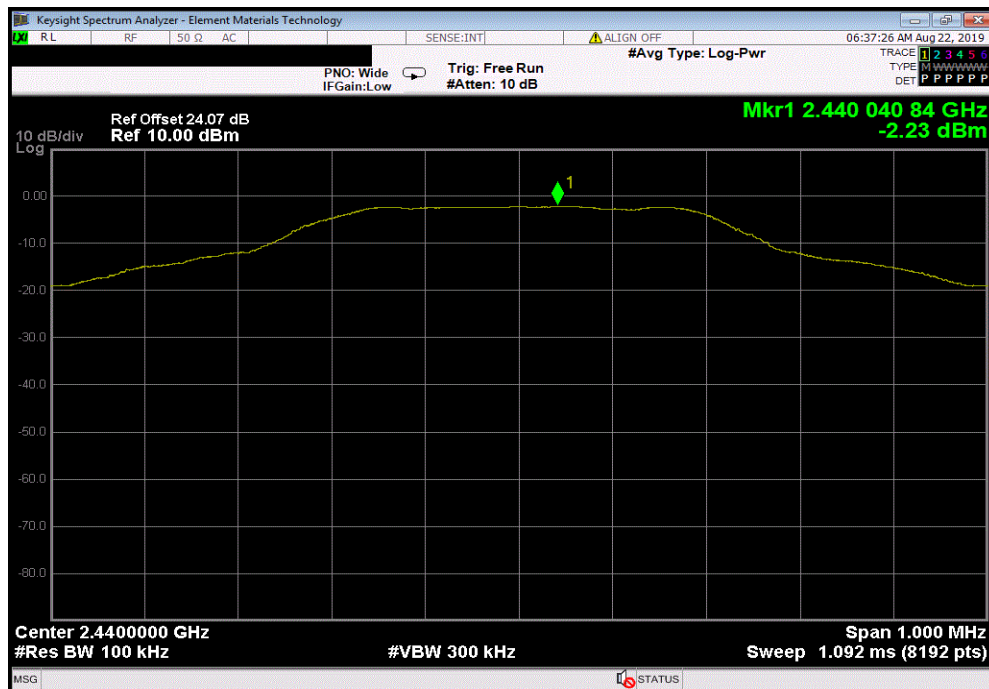


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DH5, GFSK, Low Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24946.59	-34.1	-20	Pass	



DH5, GFSK, Mid Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2440.04	N/A	N/A	N/A	

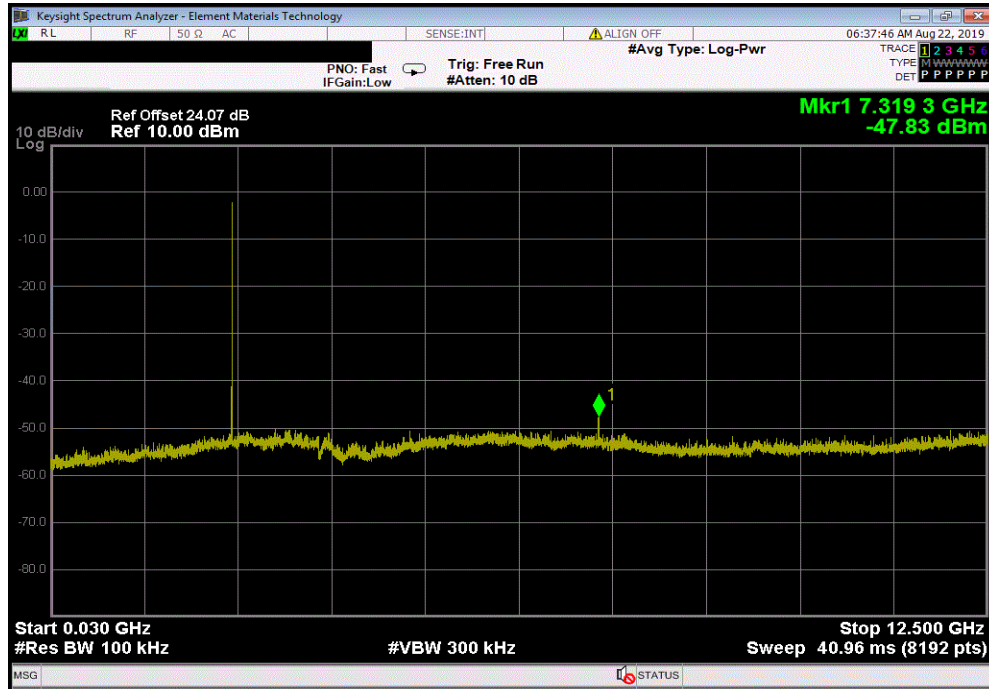


SPURIOUS CONDUCTED EMISSIONS

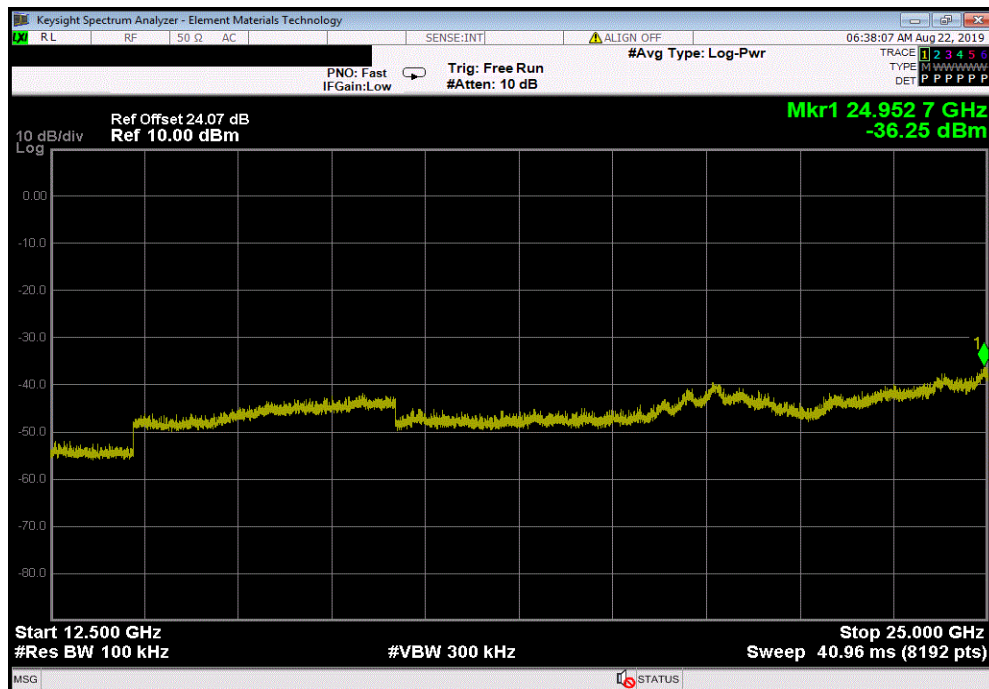


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DH5, GFSK, Mid Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	7319.26	-45.6	-20	Pass	



DH5, GFSK, Mid Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24952.69	-34.02	-20	Pass	

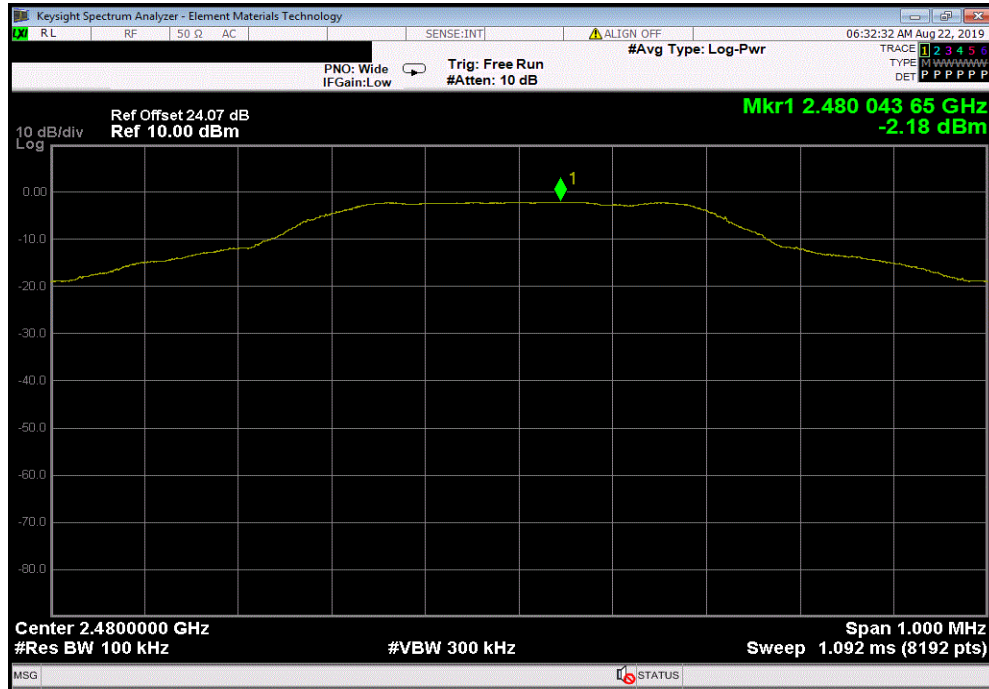


SPURIOUS CONDUCTED EMISSIONS

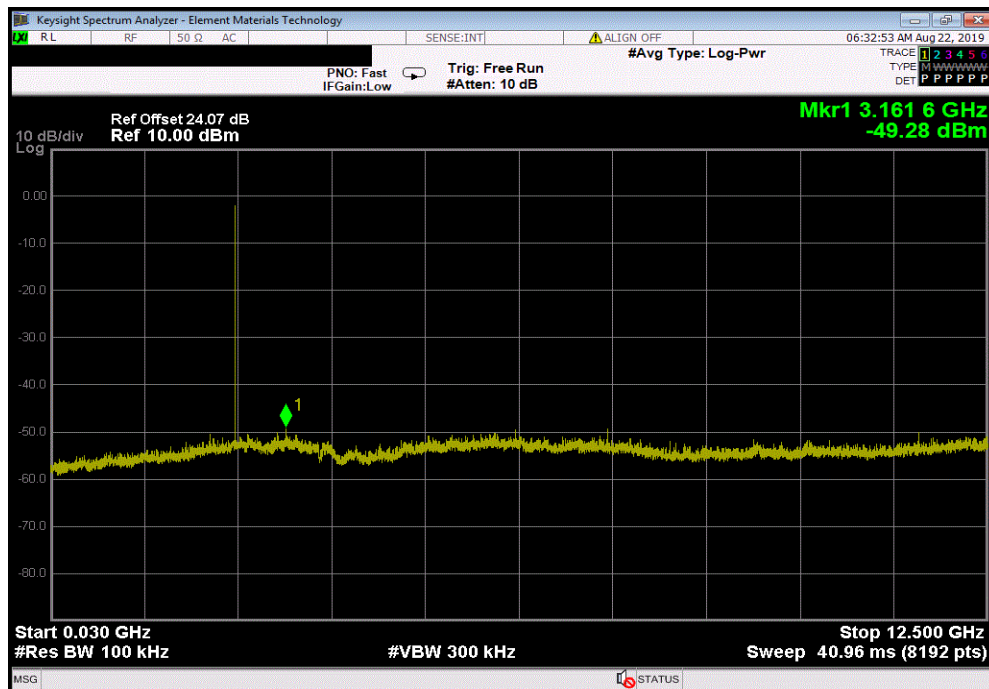


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DH5, GFSK, High Channel						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2480.04	N/A	N/A	N/A		



DH5, GFSK, High Channel						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	3161.58	-47.1	-20	Pass		

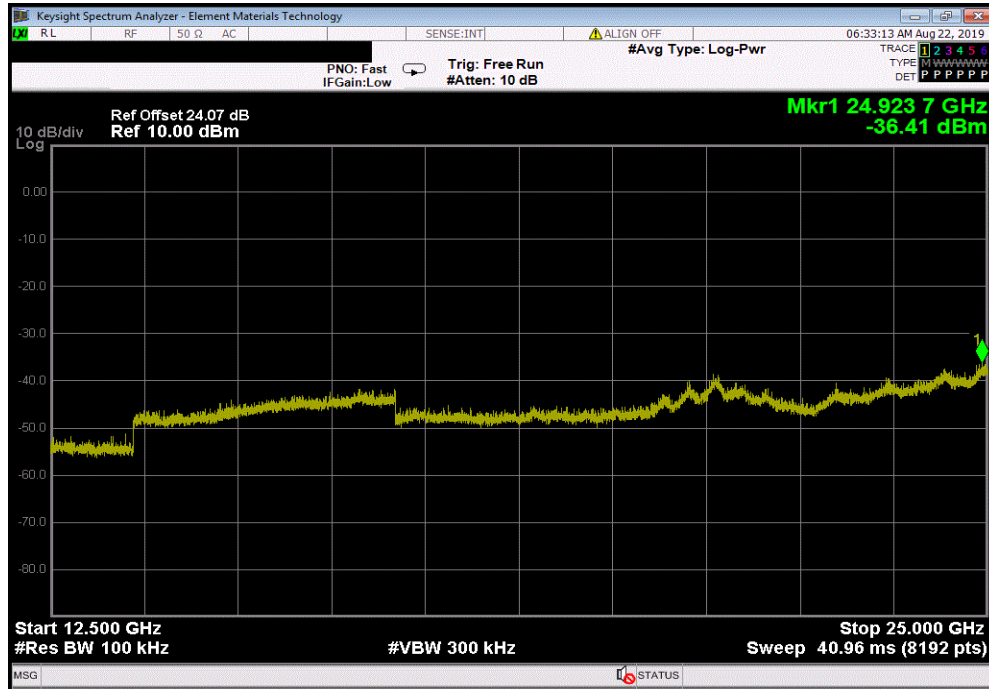


SPURIOUS CONDUCTED EMISSIONS

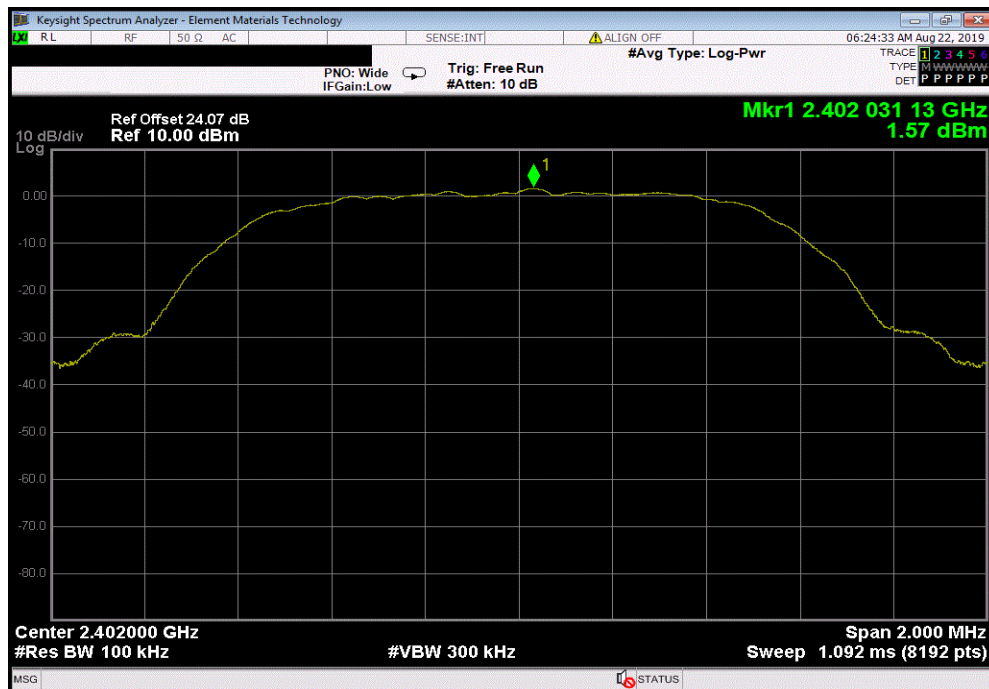


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DH5, GFSK, High Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24923.7	-34.23	-20	Pass	



2DH5, pi/4-DQPSK, Low Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2402.03	N/A	N/A	N/A	

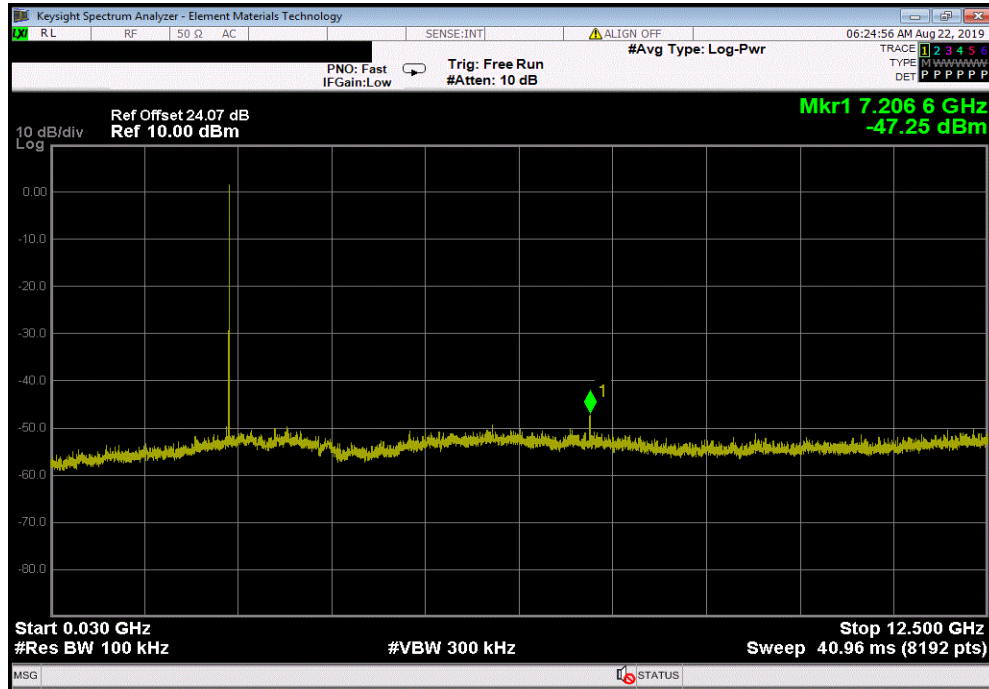


SPURIOUS CONDUCTED EMISSIONS

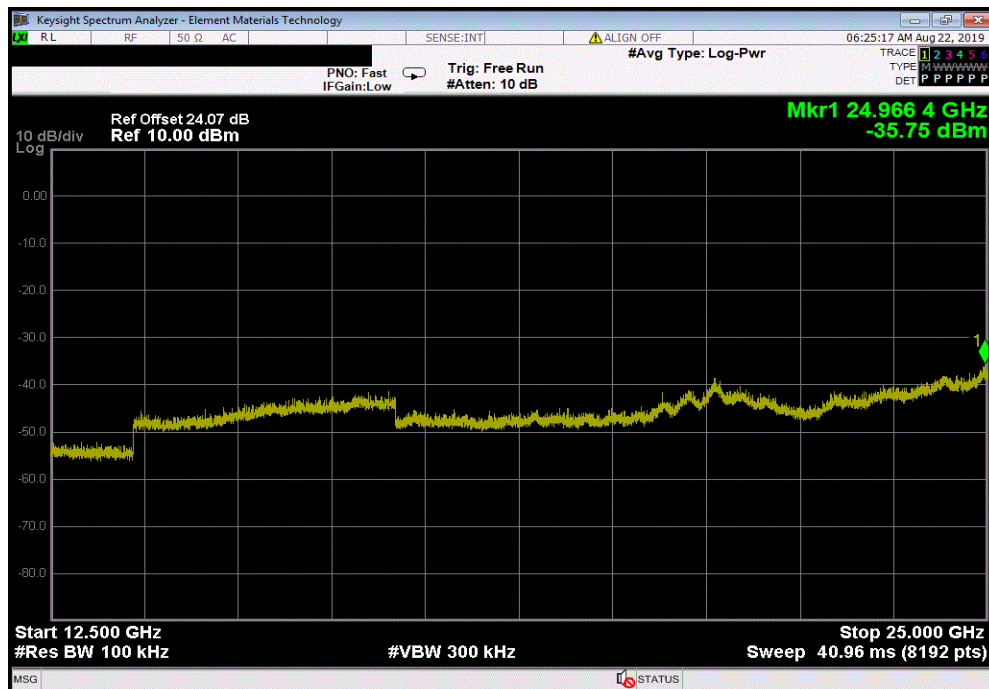


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2DH5, pi/4-DQPSK, Low Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	7206.61	-48.82	-20	Pass	



2DH5, pi/4-DQPSK, Low Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24966.43	-37.32	-20	Pass	

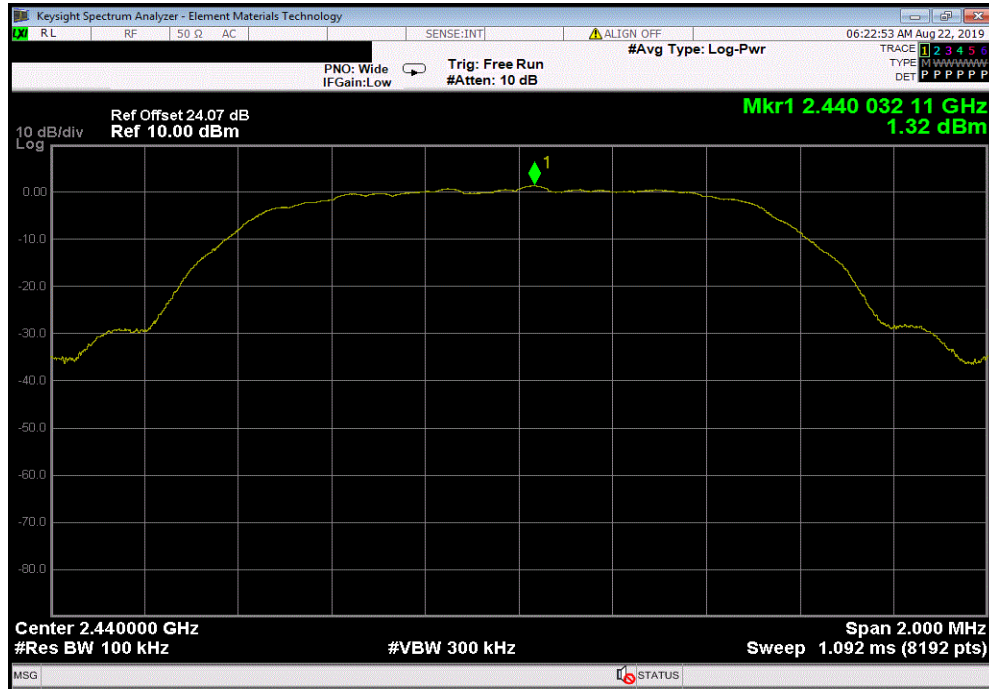


SPURIOUS CONDUCTED EMISSIONS

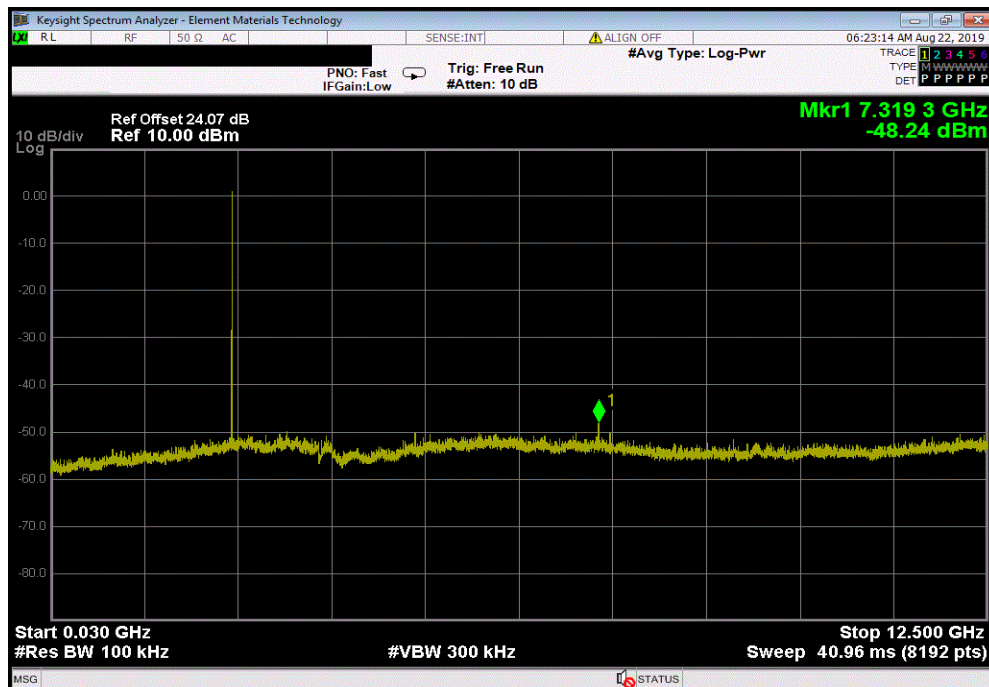


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2DH5, pi/4-DQPSK, Mid Channel						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2440.03	N/A	N/A	N/A		



2DH5, pi/4-DQPSK, Mid Channel						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
30 MHz - 12.5 GHz	7319.26	-49.56	-20	Pass		

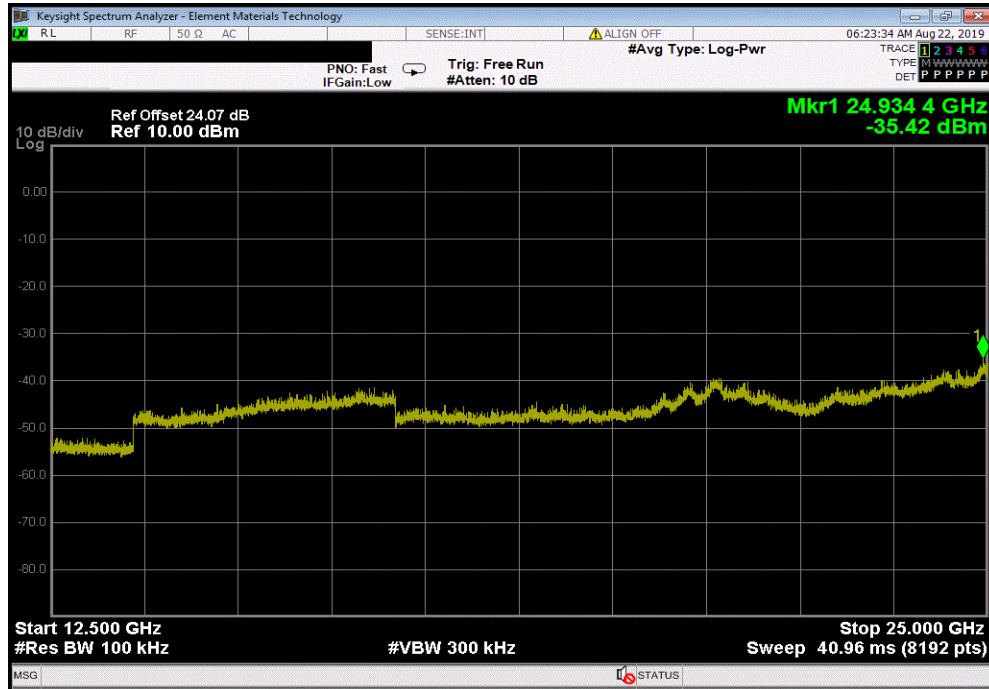


SPURIOUS CONDUCTED EMISSIONS

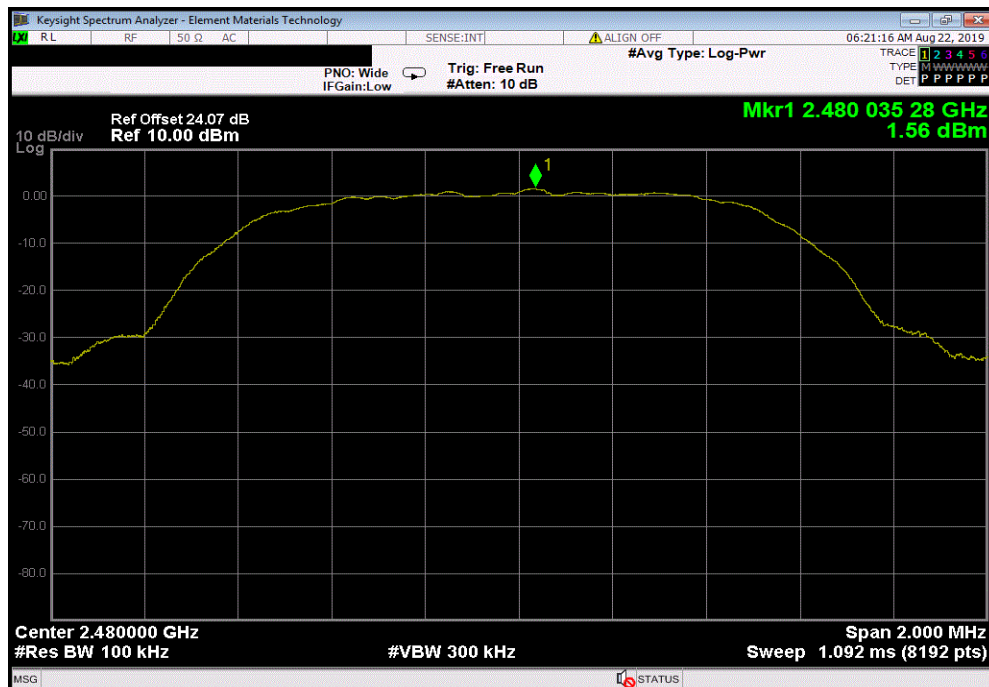


TMTx 2018.09.13 XMI 2019.06.11

2DH5, pi/4-DQPSK, Mid Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24934.38	-36.74	-20	Pass	



2DH5, pi/4-DQPSK, High Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2480.04	N/A	N/A	N/A	

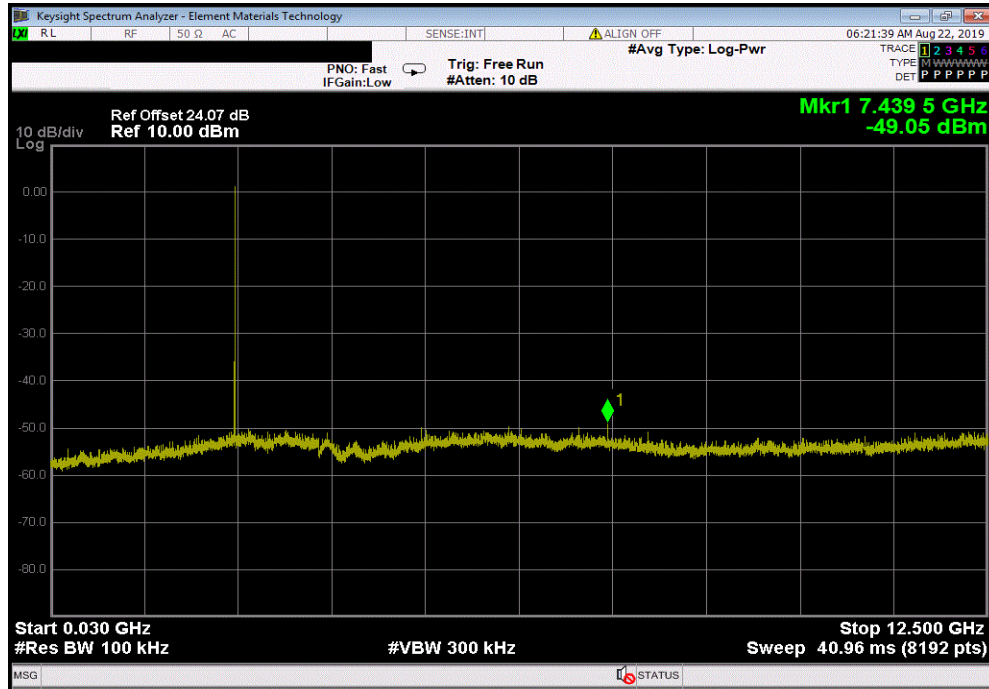


SPURIOUS CONDUCTED EMISSIONS

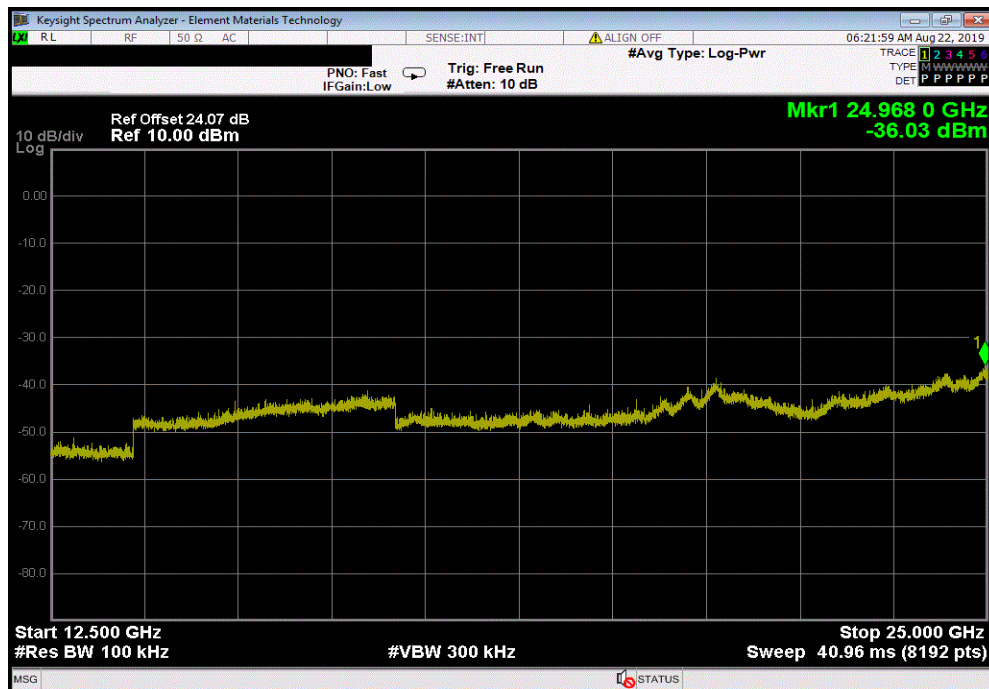


TMTx 2018.09.13 XMI 2019.06.11

2DH5, pi/4-DQPSK, High Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	7439.53	-50.61	-20	Pass	



2DH5, pi/4-DQPSK, High Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24967.95	-37.59	-20	Pass	

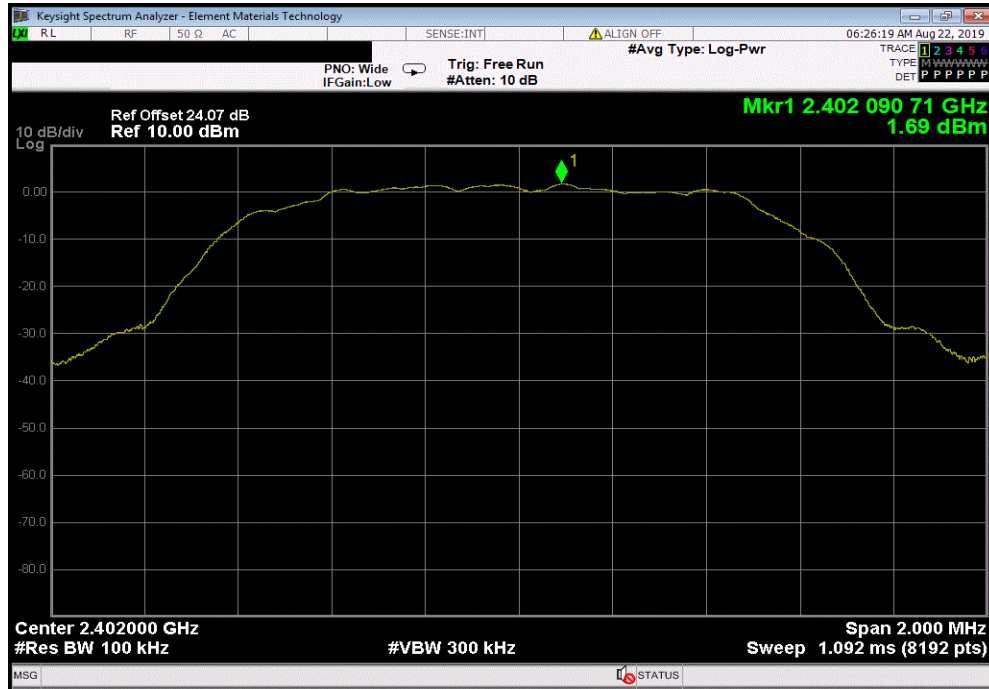


SPURIOUS CONDUCTED EMISSIONS

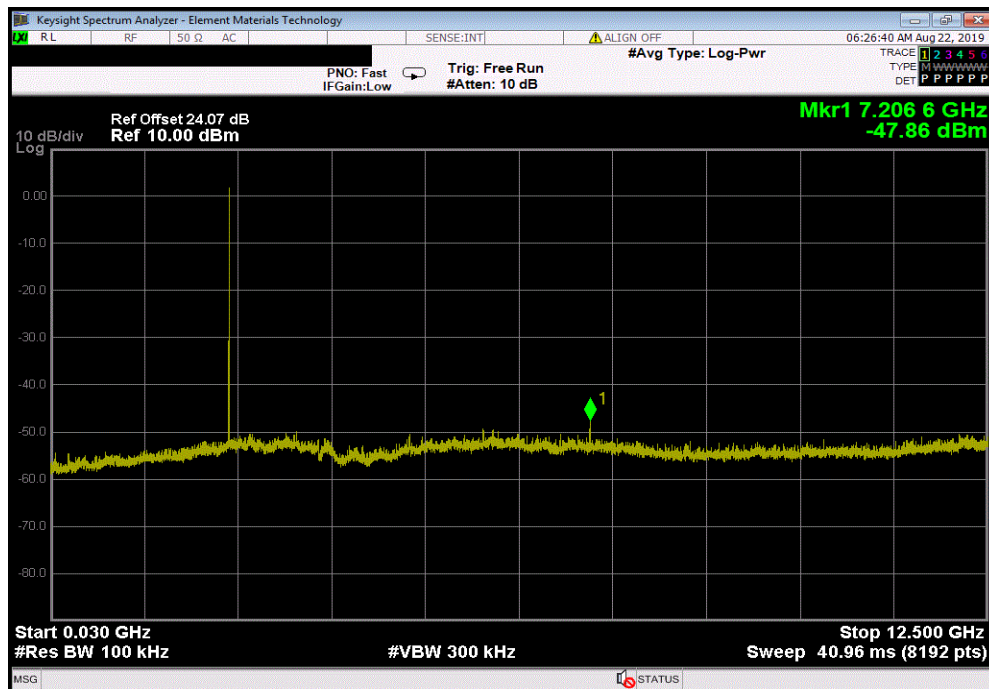


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3DH5, 8-DPSK, Low Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2402.09	N/A	N/A	N/A	



3DH5, 8-DPSK, Low Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	7206.61	-49.55	-20	Pass	

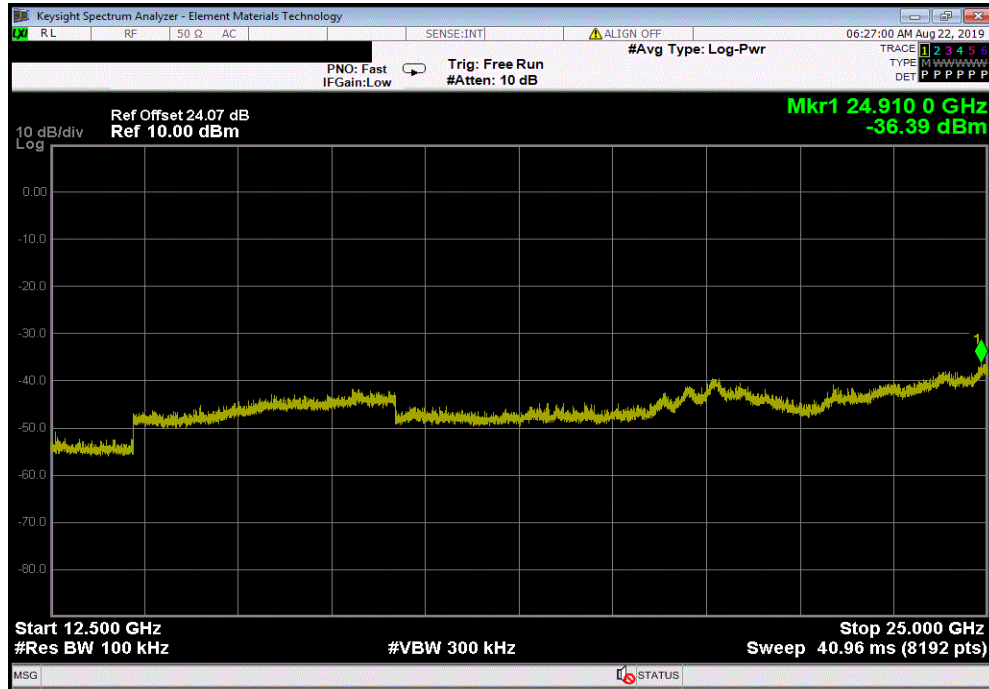


SPURIOUS CONDUCTED EMISSIONS

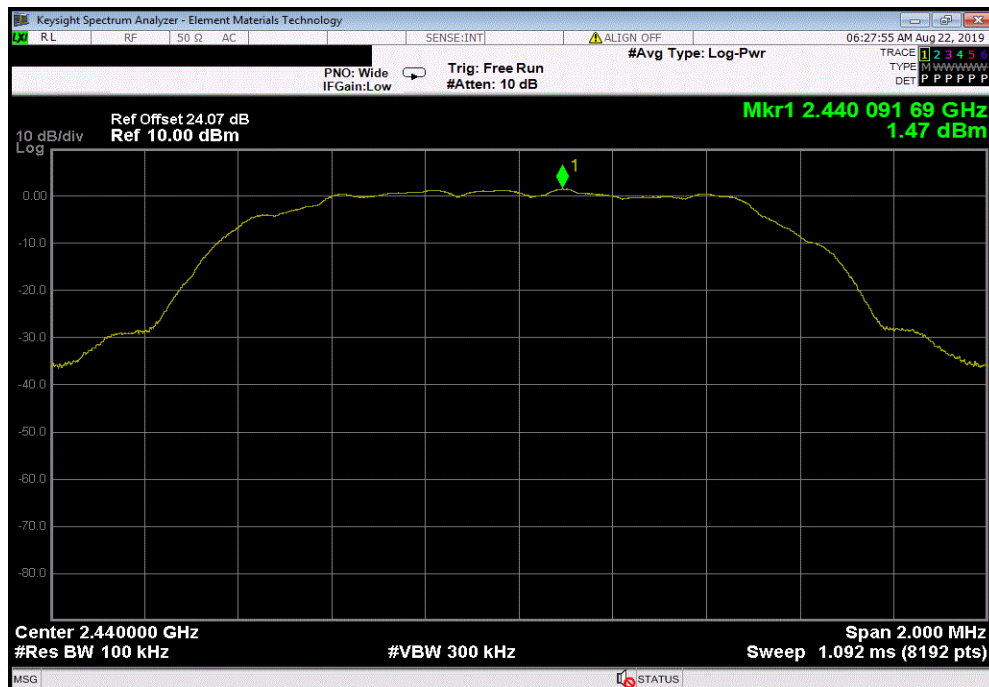


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3DH5, 8-DPSK, Low Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24909.96	-38.08	-20	Pass	



3DH5, 8-DPSK, Mid Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2440.09	N/A	N/A	N/A	

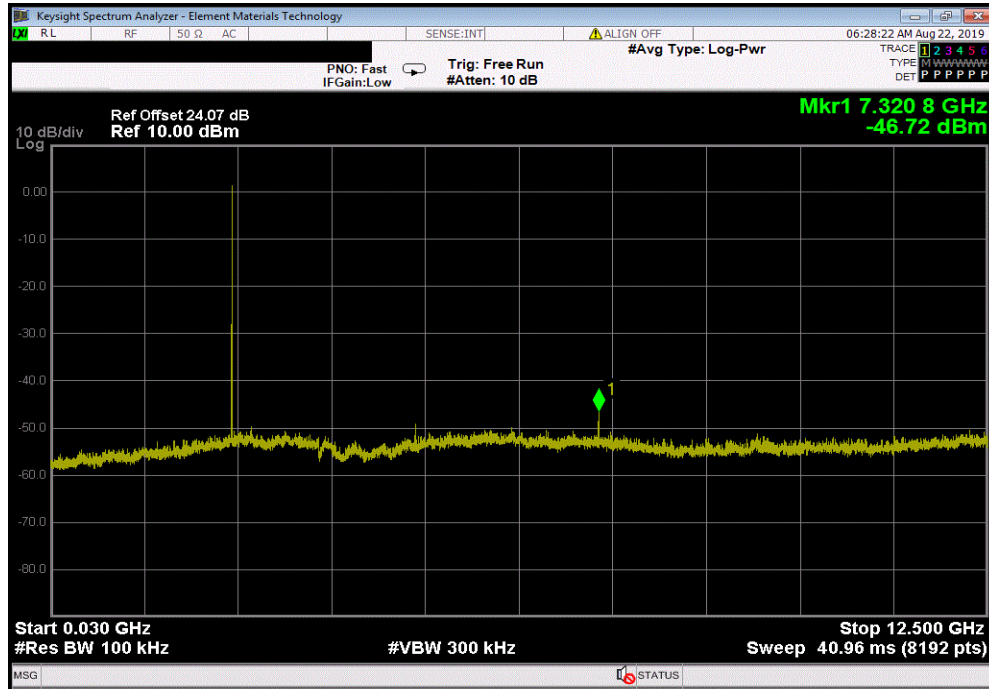


SPURIOUS CONDUCTED EMISSIONS

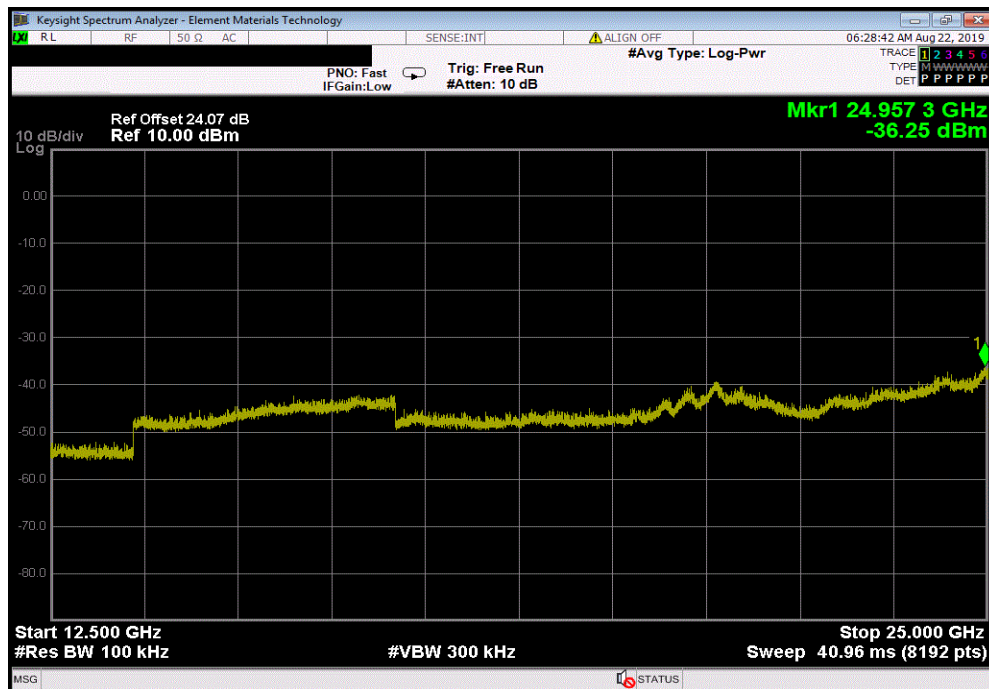


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3DH5, 8-DPSK, Mid Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	7320.79	-48.19	-20	Pass	



3DH5, 8-DPSK, Mid Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24957.27	-37.72	-20	Pass	

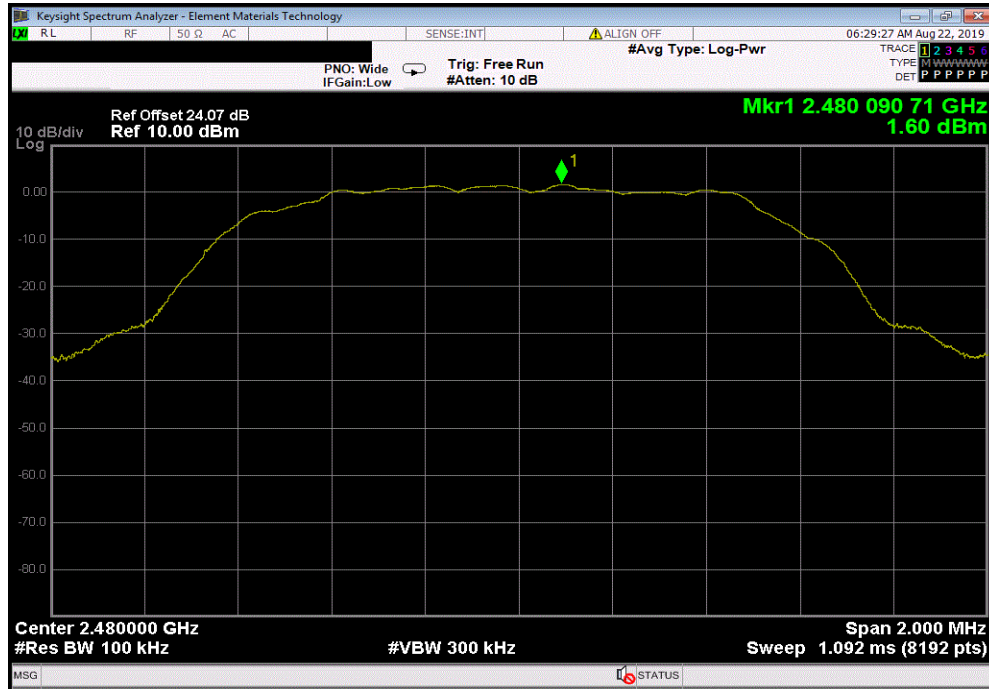


SPURIOUS CONDUCTED EMISSIONS

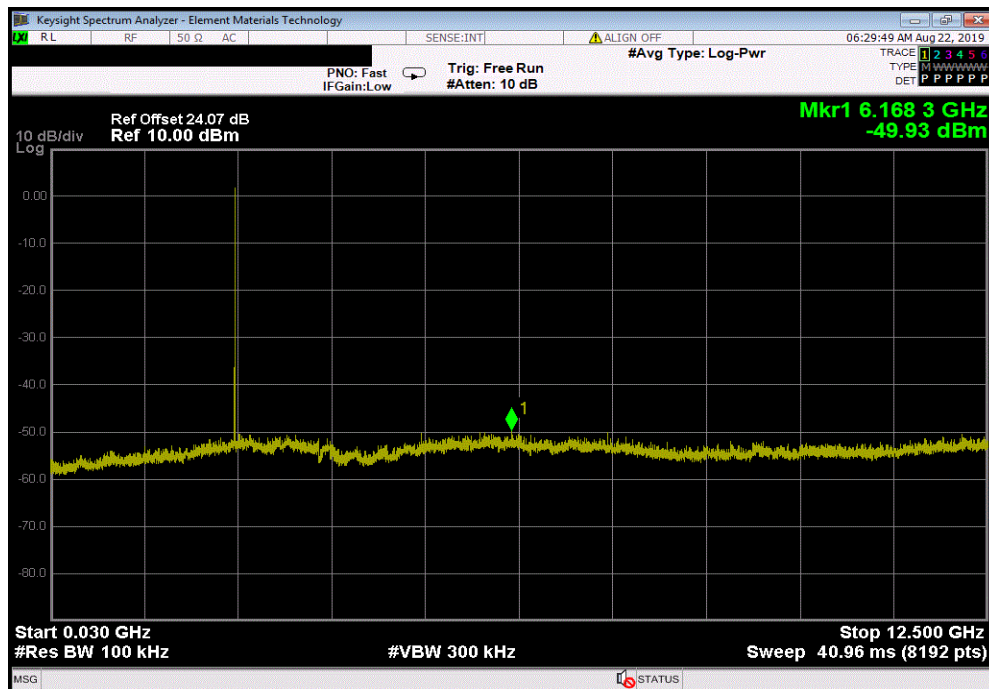


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3DH5, 8-DPSK, High Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2480.09	N/A	N/A	N/A	



3DH5, 8-DPSK, High Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	6168.33	-51.53	-20	Pass	



SPURIOUS CONDUCTED EMISSIONS



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3DH5, 8-DPSK, High Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24943.54	-37.18	-20	Pass	

