

BAND EDGE COMPLIANCE -HOPPING MODE



XMIR 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



TbTx 2018.09.13 XMt 2019.05.15

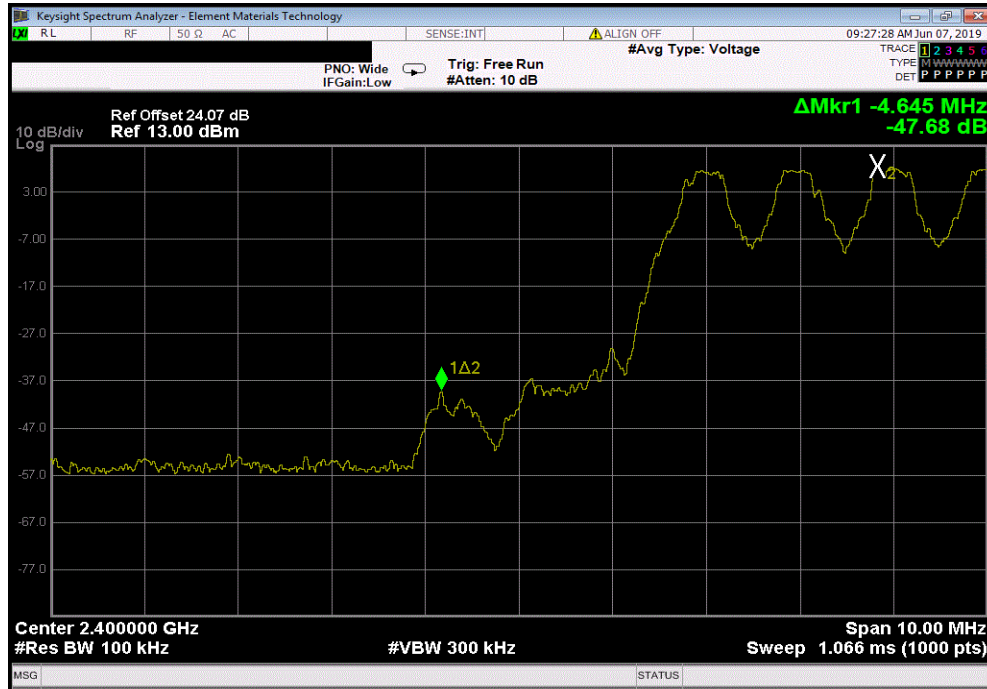
EUT: Jonah		Work Order: DROP0009	
Serial Number: PL1919P10034		Date: 6-Jun-19	
Customer: SonicSensory, Inc.		Temperature: 24.5 °C	
Attendees: Daniel Quiros		Humidity: 47.2% RH	
Project: None		Barometric Pres.: 1016 mbar	
Tested by: Salvador Solorzano		Job Site: OC13	
Power: 110VAC/60Hz			
TEST SPECIFICATIONS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

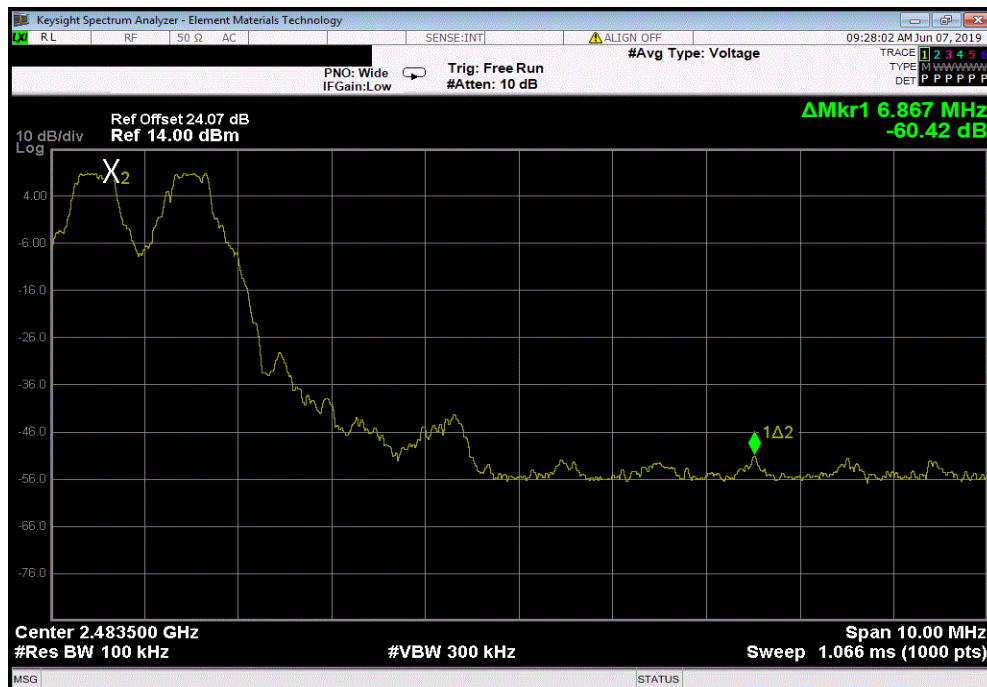


TMTx 2018.09.13 XMt 2019.05.15

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

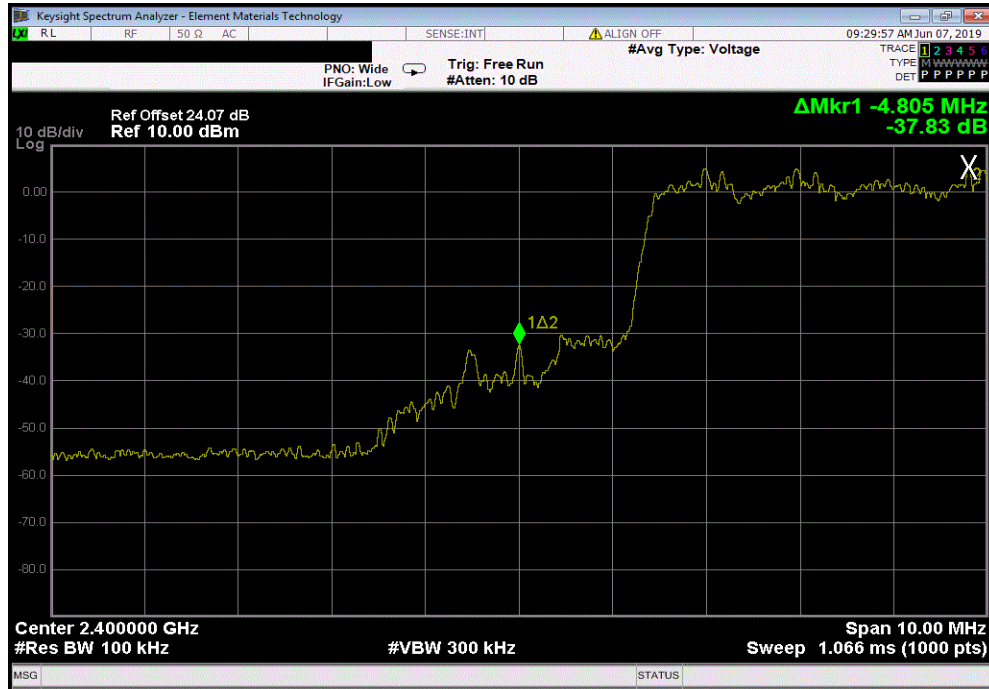


BAND EDGE COMPLIANCE -HOPPING MODE

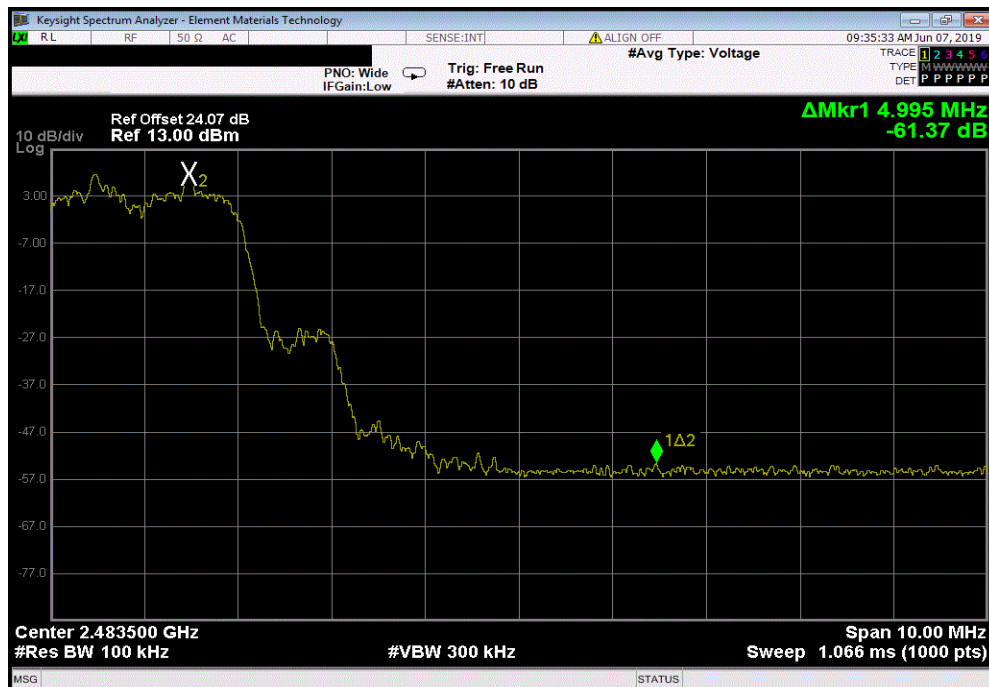


TMTx 2018.09.13 XMtX 2019.05.15

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

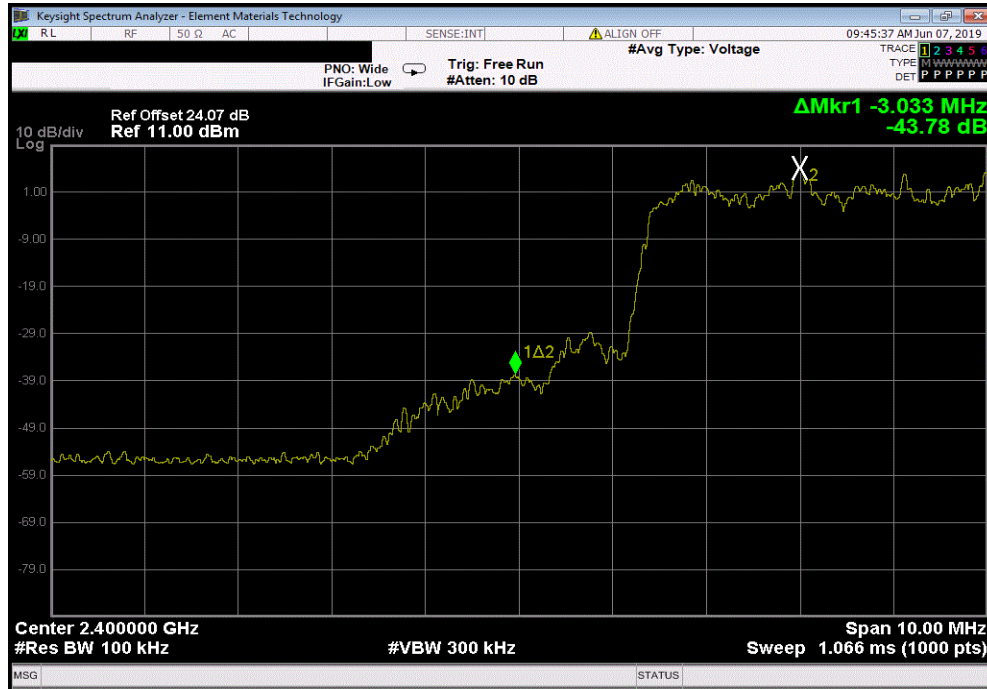


BAND EDGE COMPLIANCE -HOPPING MODE

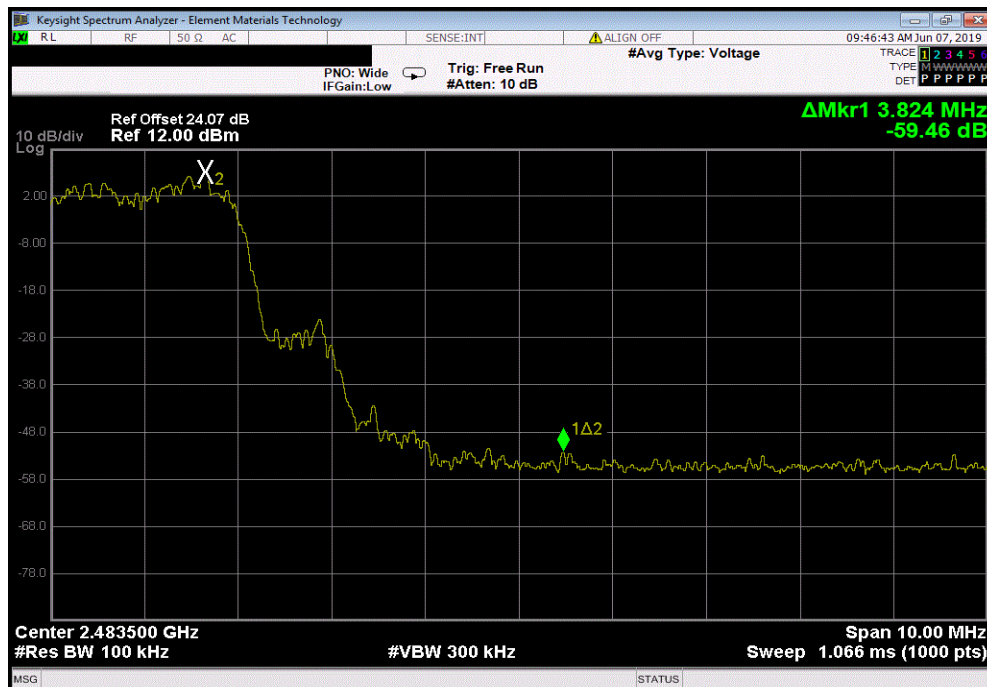


TMTx 2018.09.13 XMI 2019.05.15

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



TbTx 2018.09.13 XMt 2019.05.15

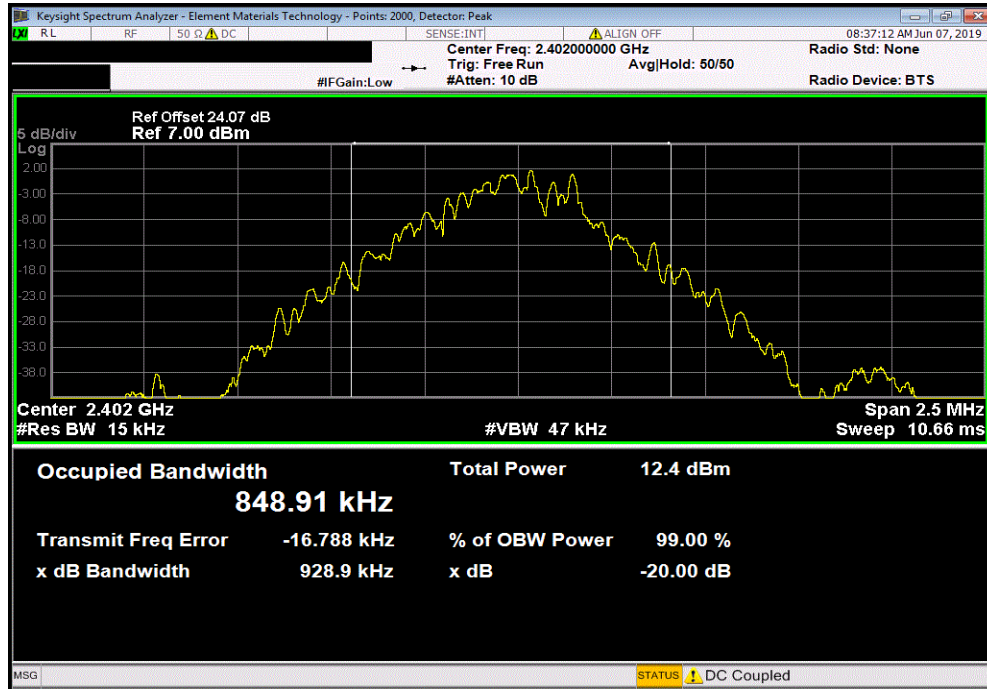
EUT: Jonah		Work Order: DROP0009	
Serial Number: PL1919P10034		Date: 6-Jun-19	
Customer: SonicSensory, Inc.		Temperature: 24.5 °C	
Attendees: Daniel Quiros		Humidity: 47.2% RH	
Project: None		Barometric Pres.: 1016 mbar	
Tested by: Salvador Solorzano		Power: 110VAC/60Hz	
		Job Site: OC13	
TEST SPECIFICATIONS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

OCCUPIED BANDWIDTH

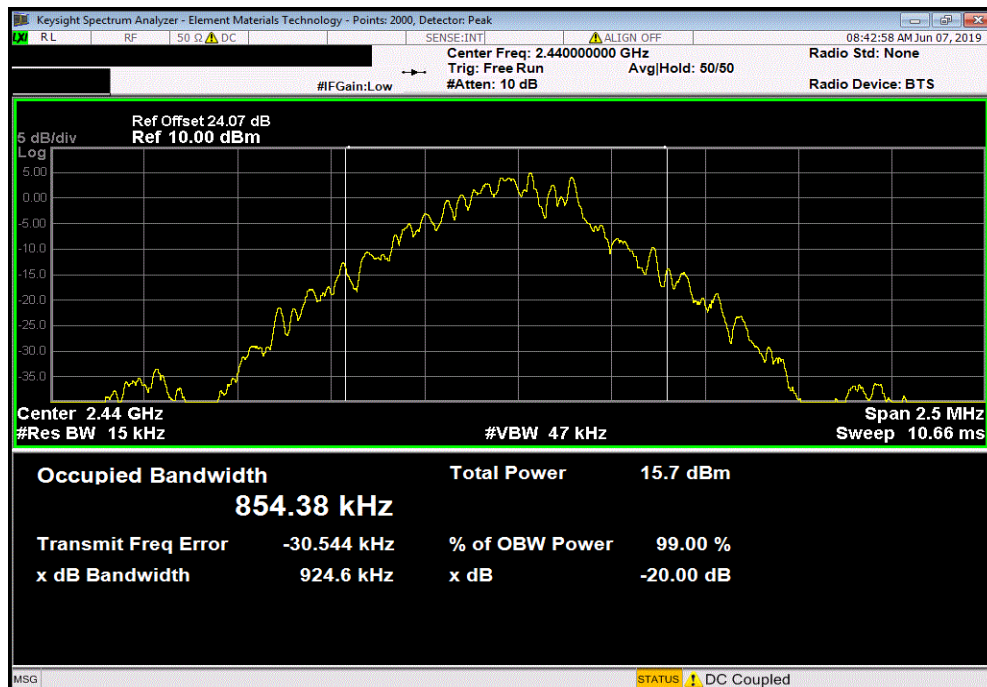


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DH5, GFSK, Low Channel						
				Value	Limit (<)	Result
				928.904 kHz	1.5 MHz	Pass



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

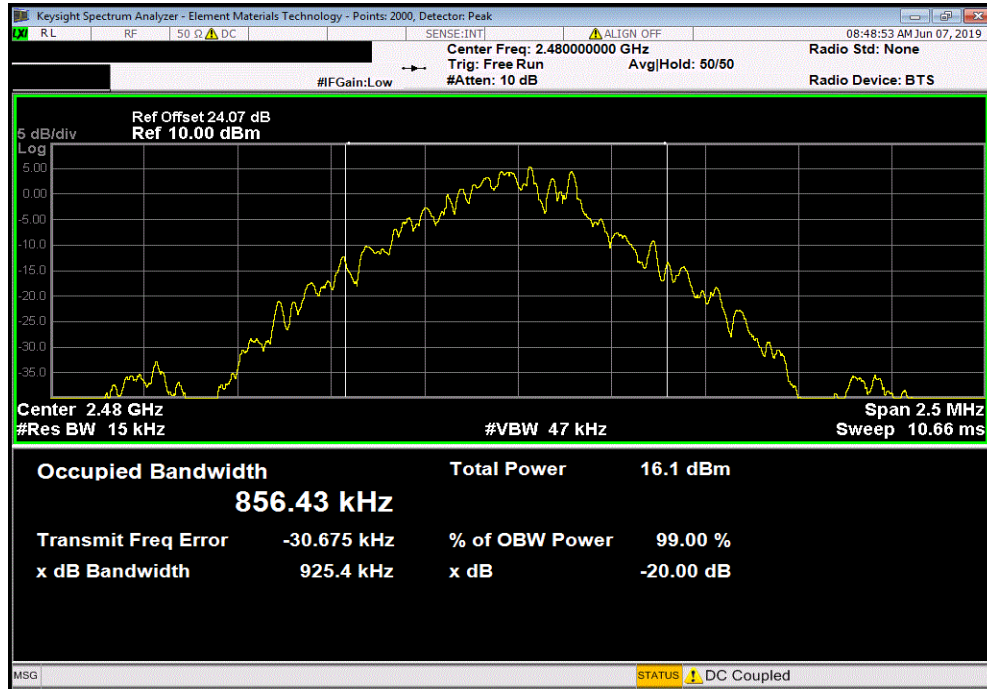


OCCUPIED BANDWIDTH

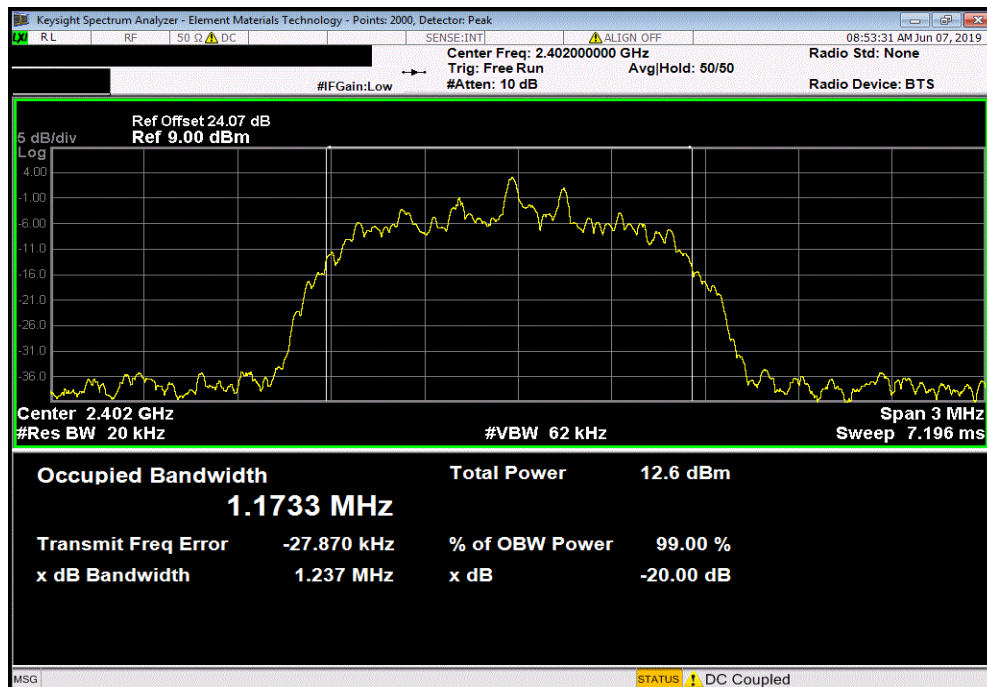


TMTx 2018.09.13 XMt 2019.05.15

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

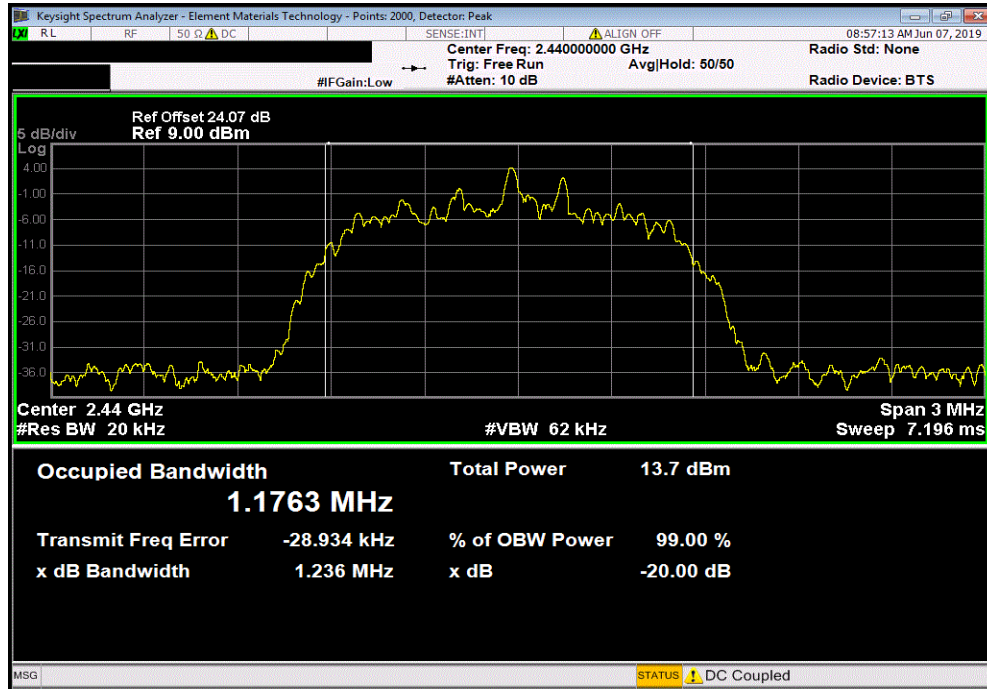


OCCUPIED BANDWIDTH

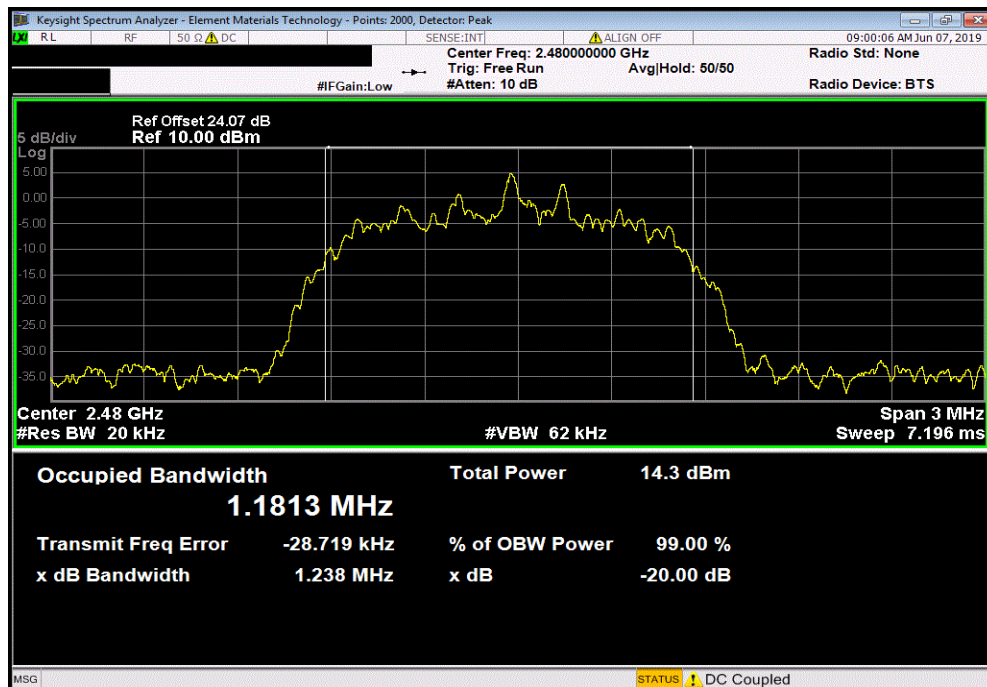


TMTx 2018.09.13 XMI 2019.05.15

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

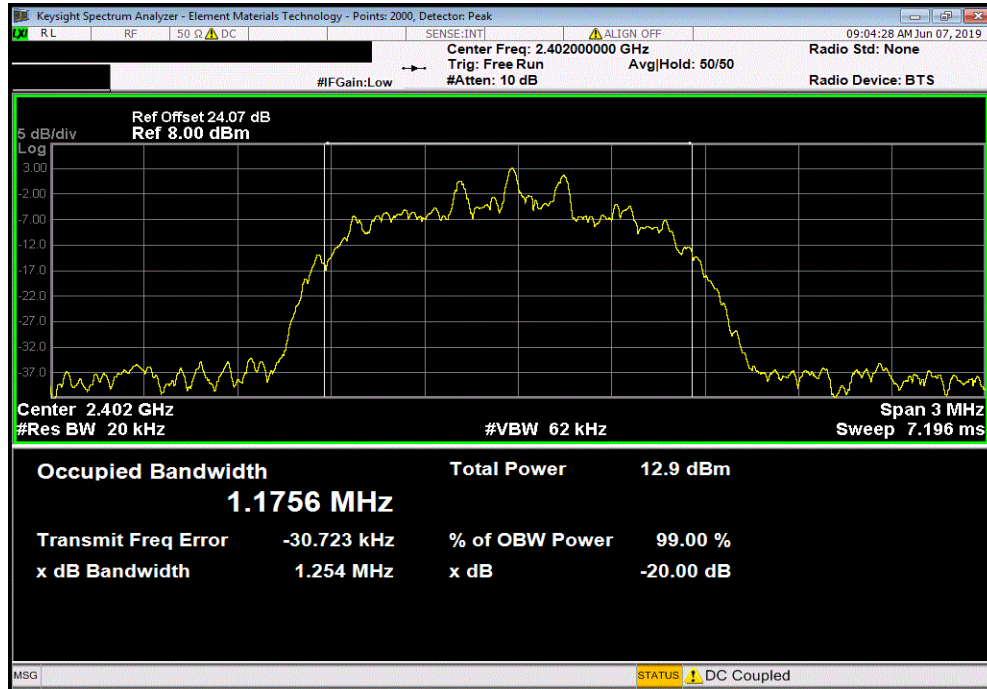


OCCUPIED BANDWIDTH

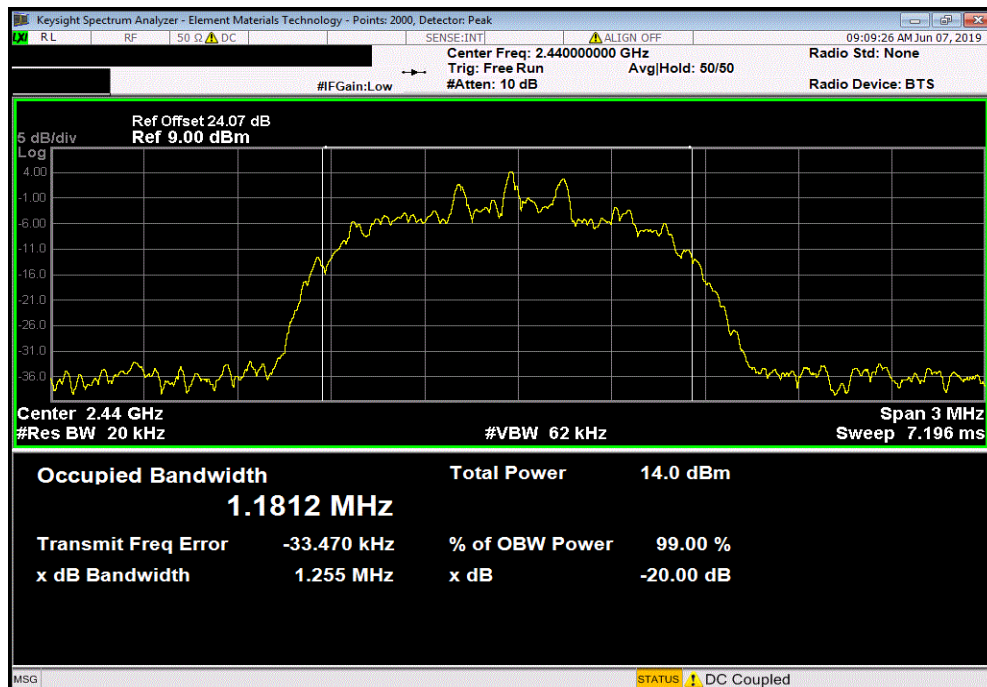


TMTx 2018.09.13 XMt 2019.05.15

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

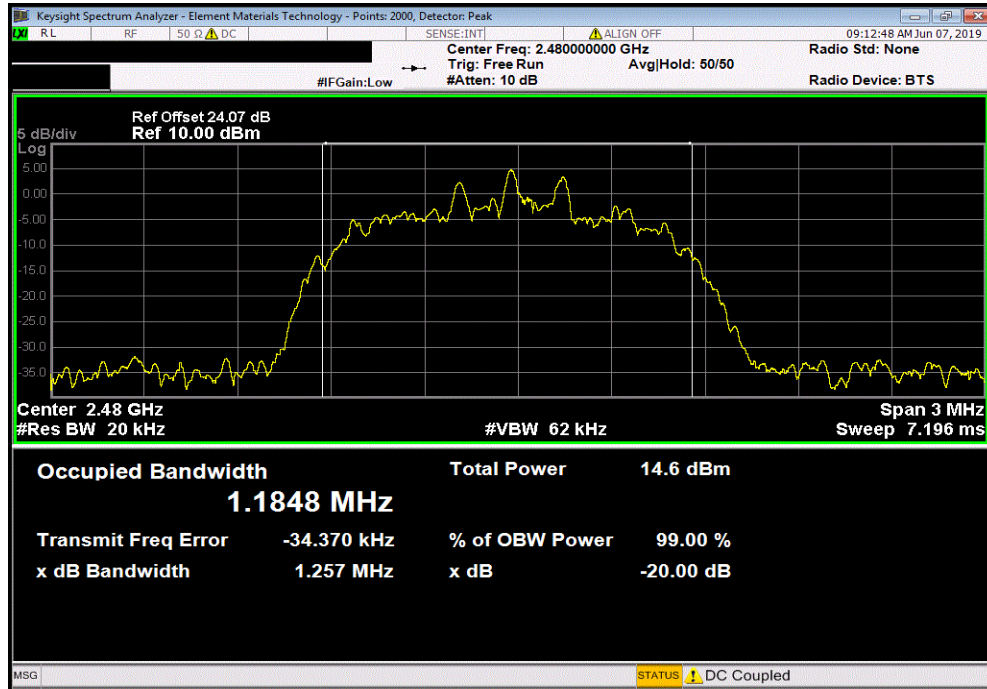


OCCUPIED BANDWIDTH



TMTx 2018.09.13 XMI 2019.05.15

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



SPURIOUS CONDUCTED EMISSIONS



XMI 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



TMTx 2018.09.13 XMM 2019.06.11

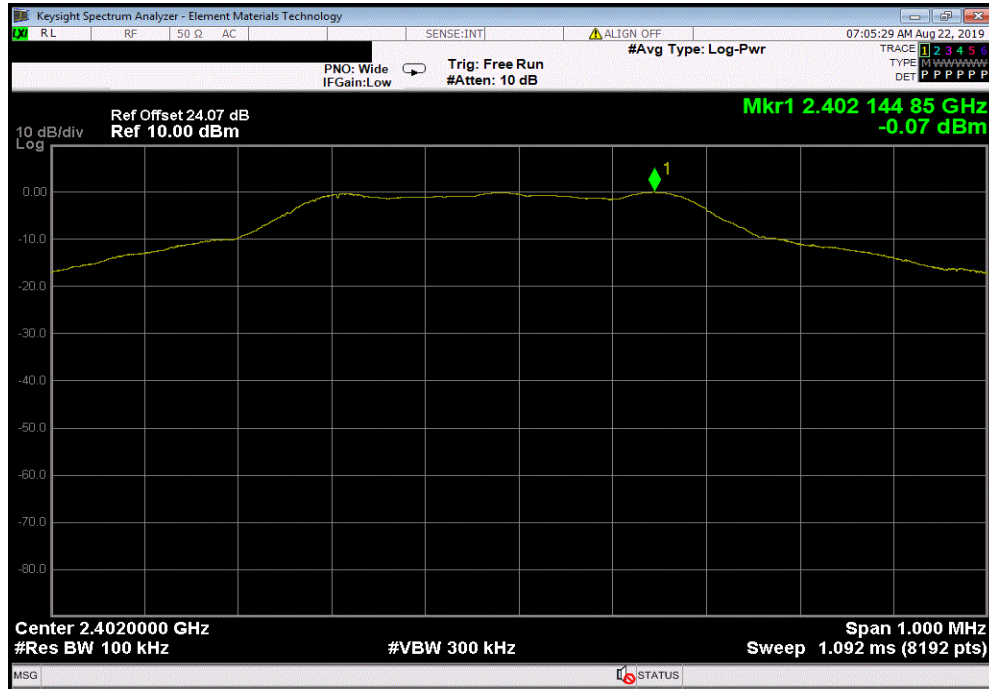
EUT: Jonah		Work Order: DROP0009			
Serial Number: PL1919P10034		Date: 21-Aug-19			
Customer: SonicSensory, Inc.		Temperature: 23 °C			
Attendees: Daniel Quiros		Humidity: 45.3% RH			
Project: None		Barometric Pres.: 1015 mbar			
Tested by: Johnny Candelas		Power: 110VAC/60Hz			
Job Site: OC13					
TEST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

SPURIOUS CONDUCTED EMISSIONS

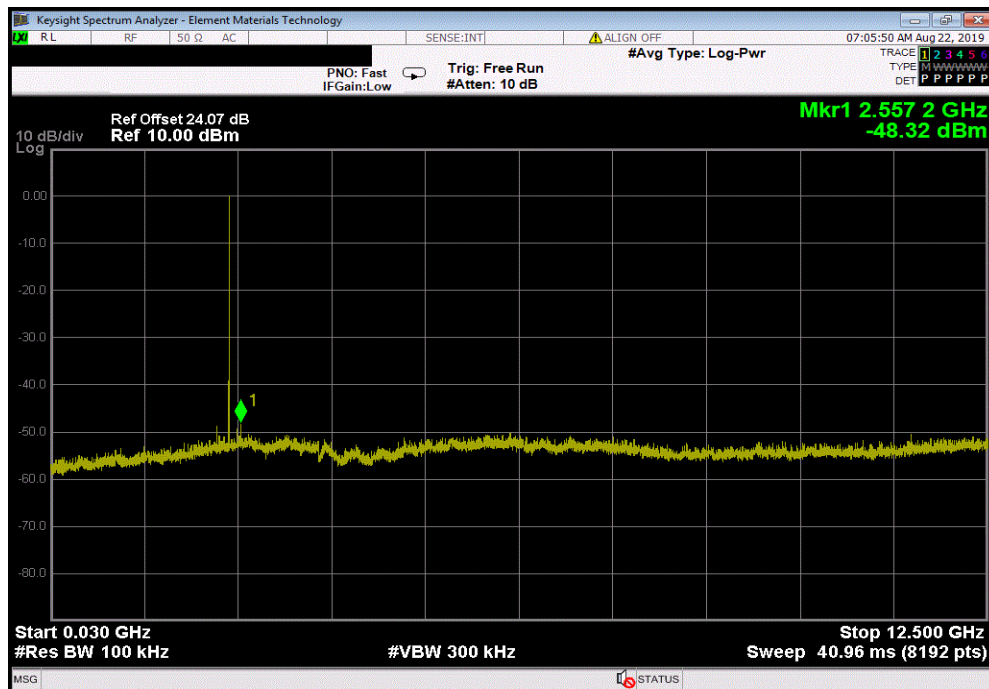


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DH5, GFSK, Low Channel						
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result		
Fundamental	2402.14	N/A	N/A	N/A		



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		

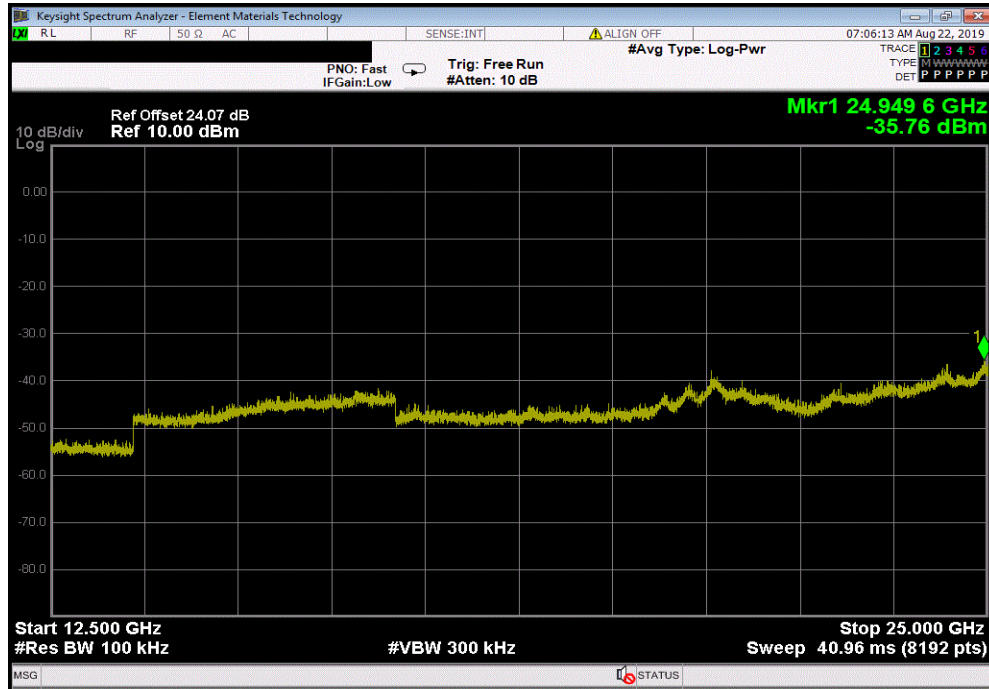


SPURIOUS CONDUCTED EMISSIONS

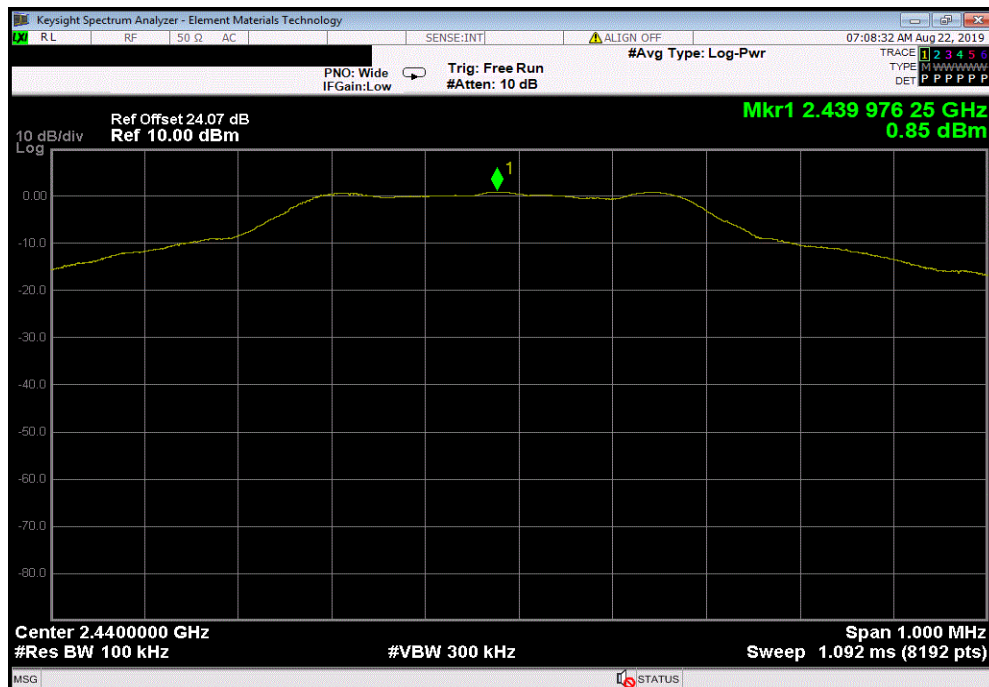


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DH5, GFSK, Low Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24949.64	-35.69	-20	Pass	



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

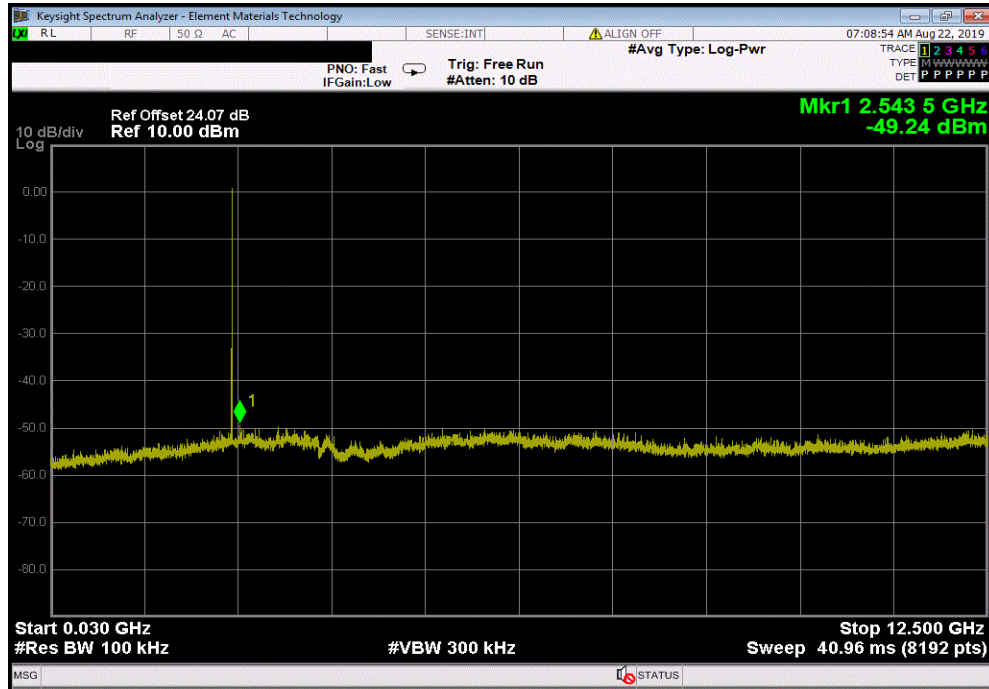


SPURIOUS CONDUCTED EMISSIONS

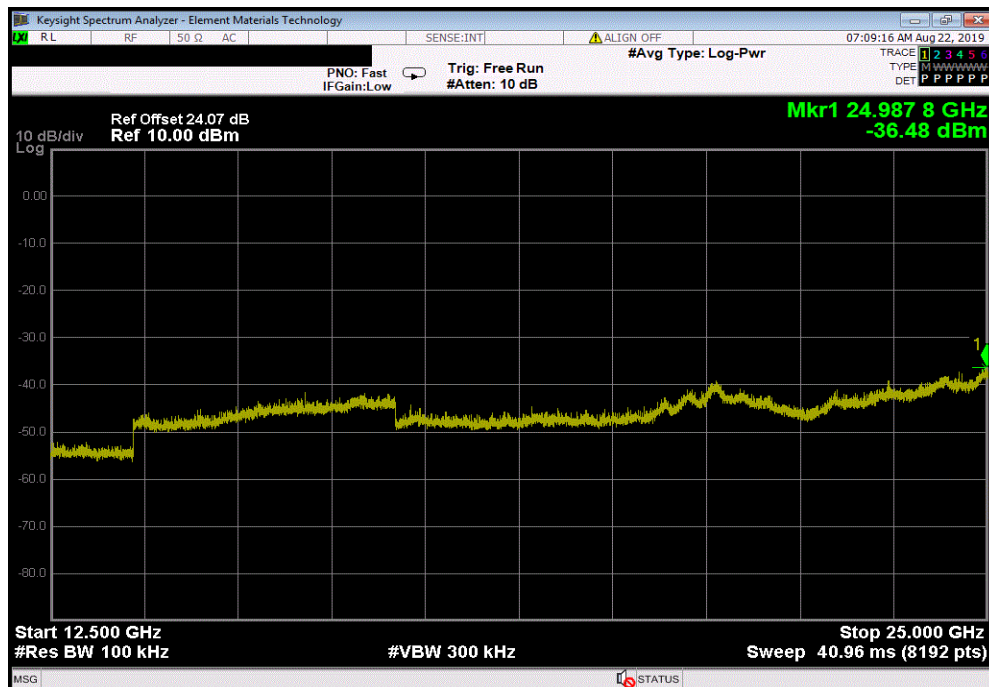


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DH5, GFSK, Mid Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	2543.49	-50.09	-20	Pass	



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	

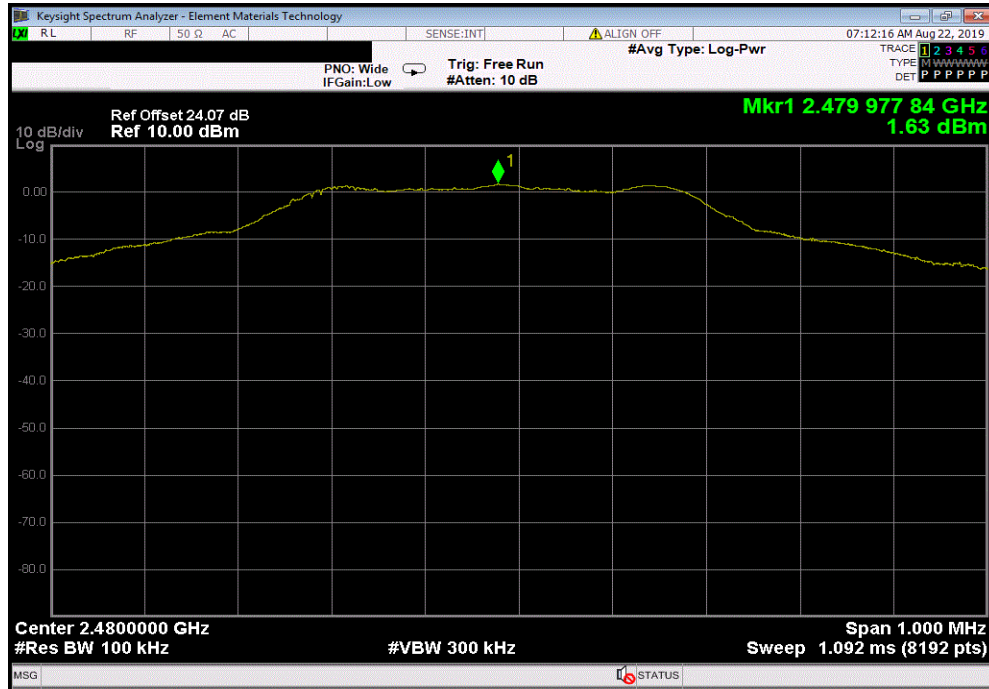


SPURIOUS CONDUCTED EMISSIONS

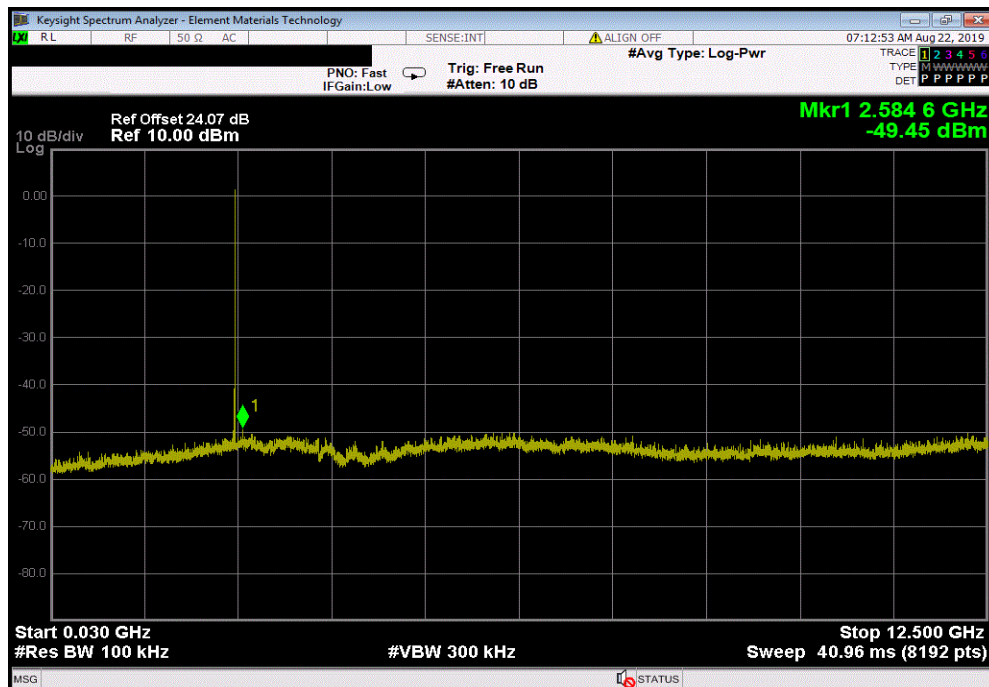


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DH5, GFSK, High Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
Fundamental	2479.98	N/A	N/A	N/A	



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	

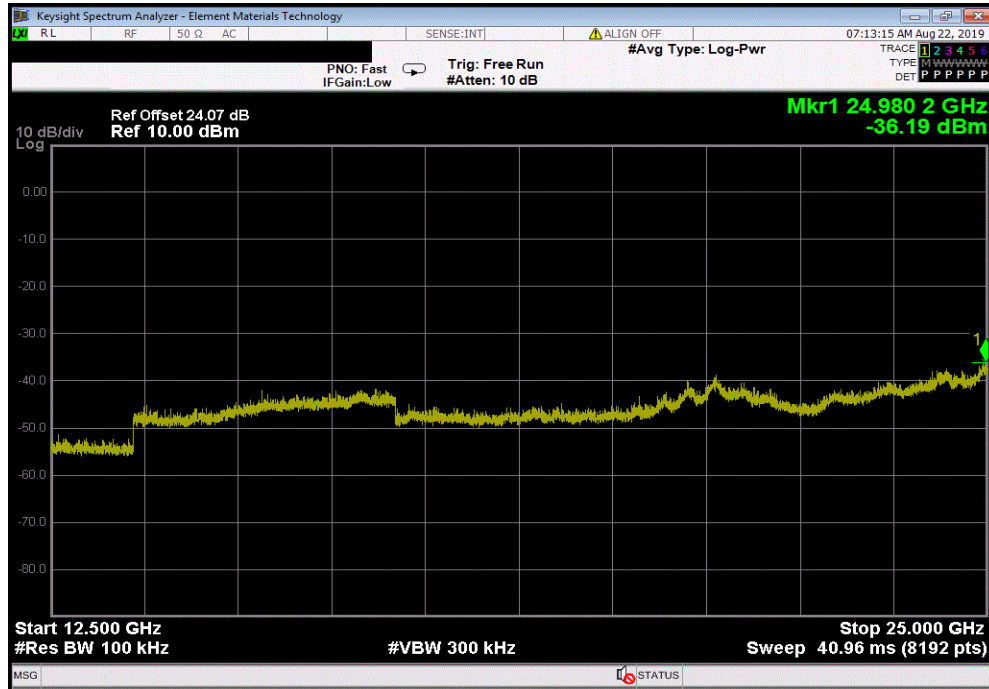


SPURIOUS CONDUCTED EMISSIONS

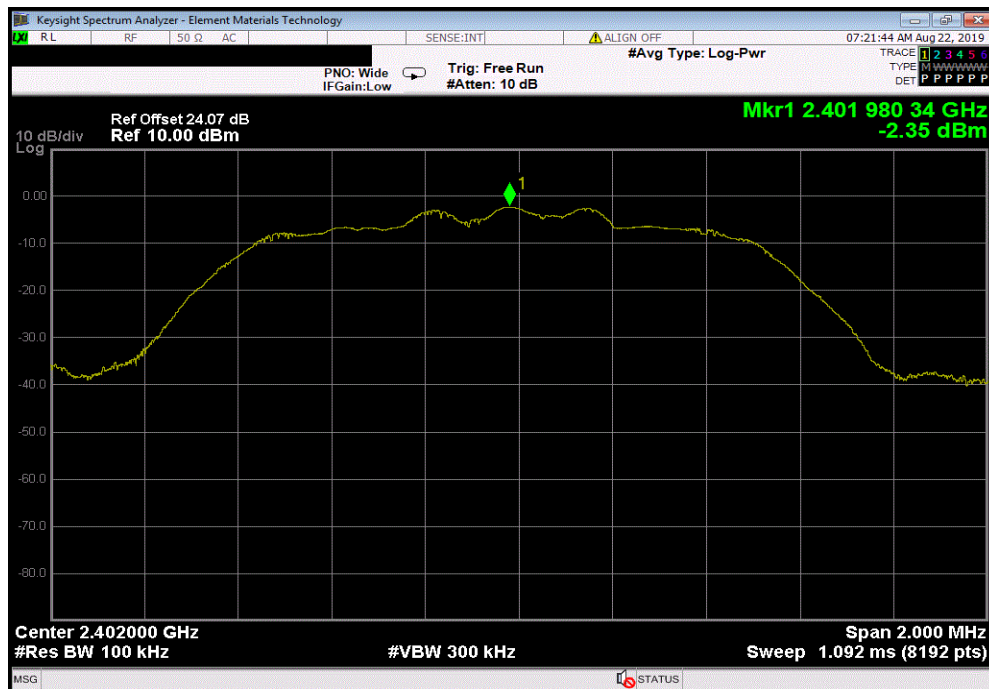


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DH5, GFSK, High Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
12.5 GHz - 25 GHz	24980.16	-37.82	-20	Pass	



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	

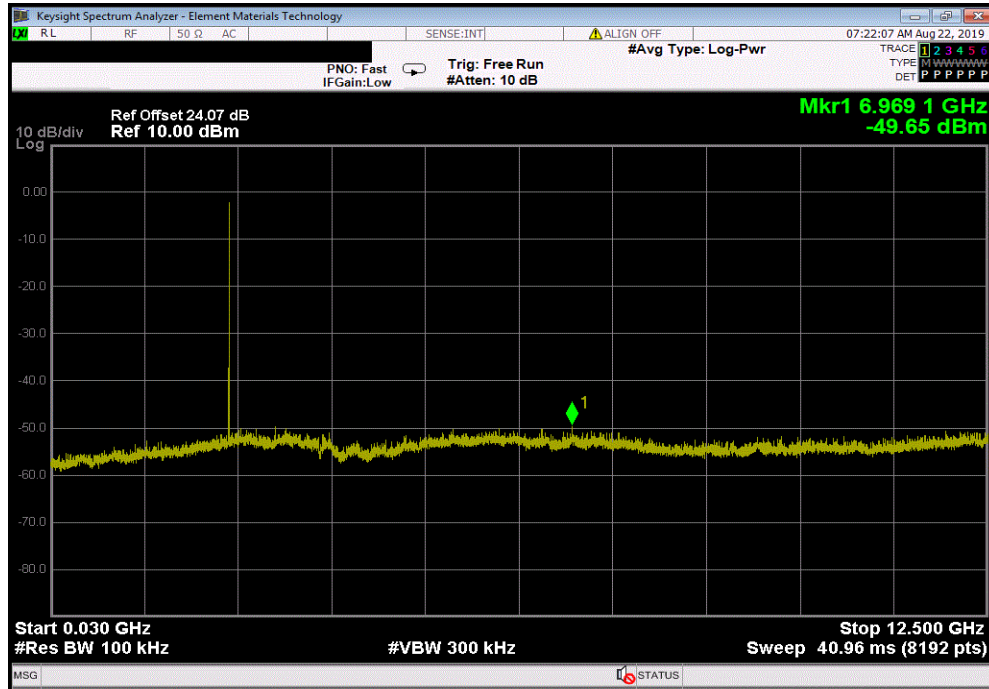


SPURIOUS CONDUCTED EMISSIONS

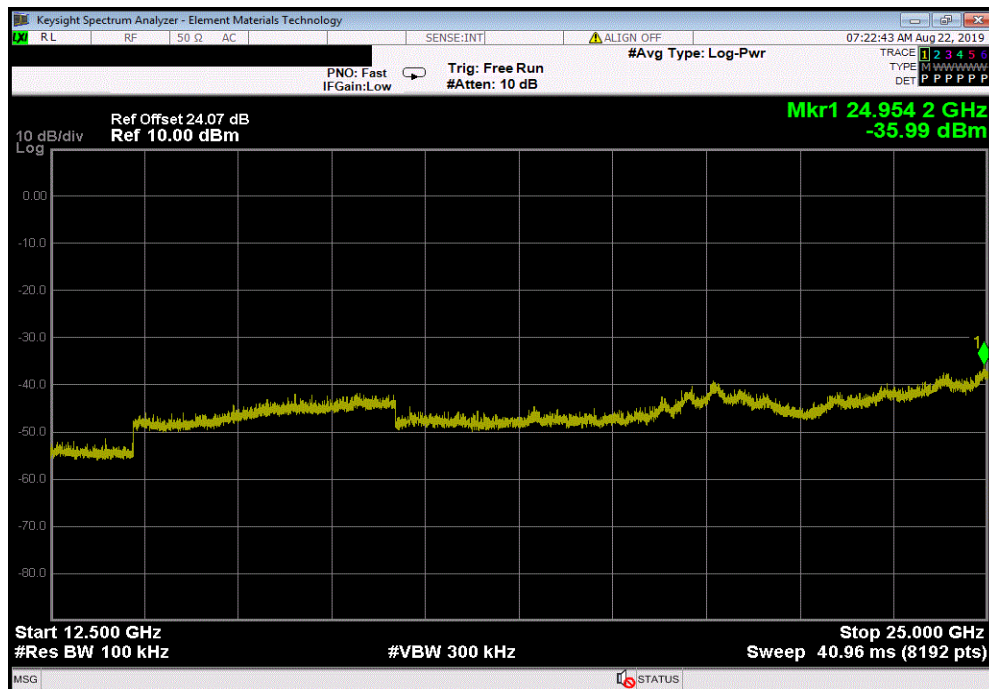


TMTx 2018.09.13 XMI 2019.06.11

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	

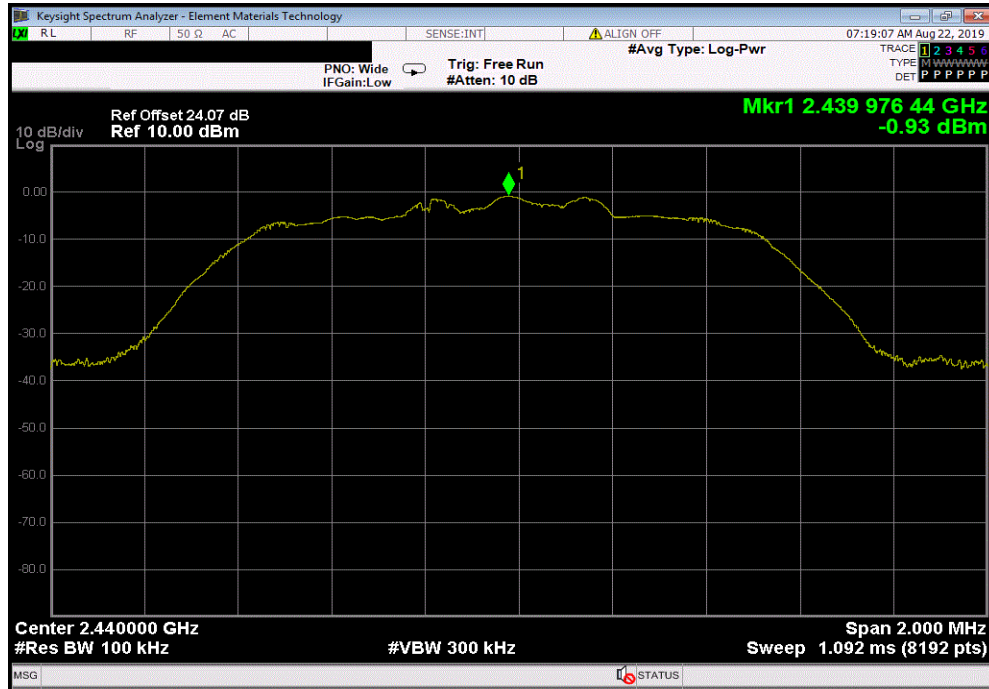


SPURIOUS CONDUCTED EMISSIONS

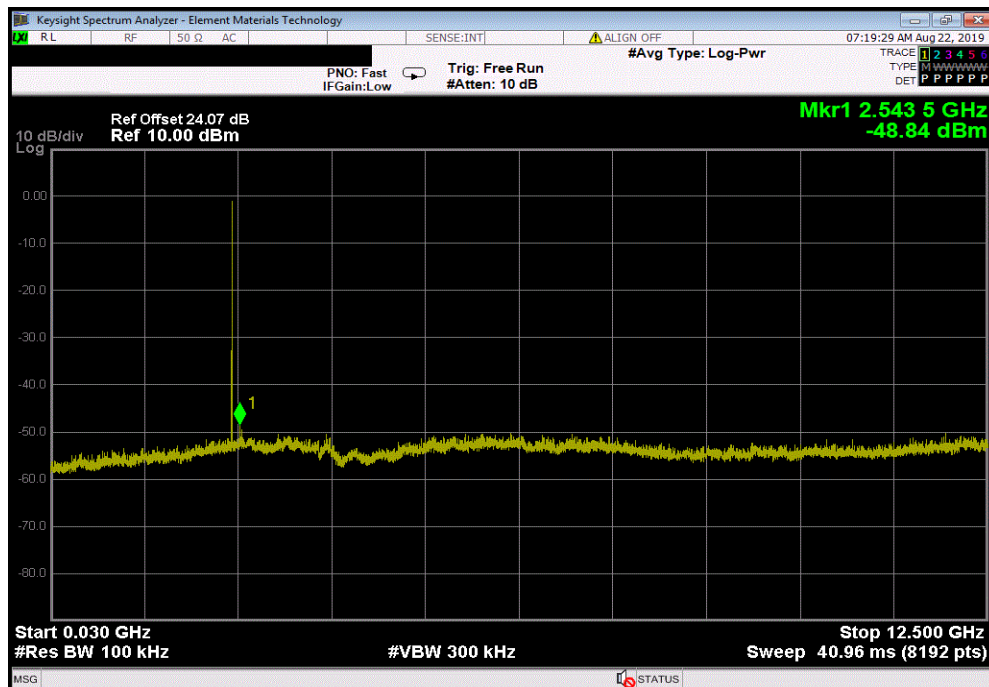


TMTx 2018.09.13 XMI 2019.06.11

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

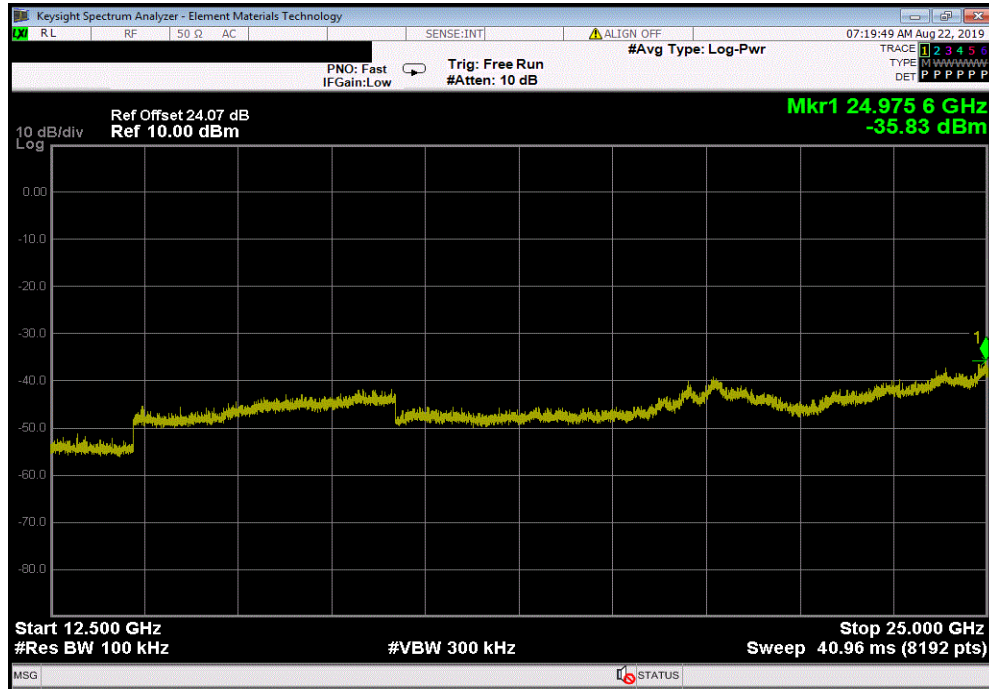


SPURIOUS CONDUCTED EMISSIONS

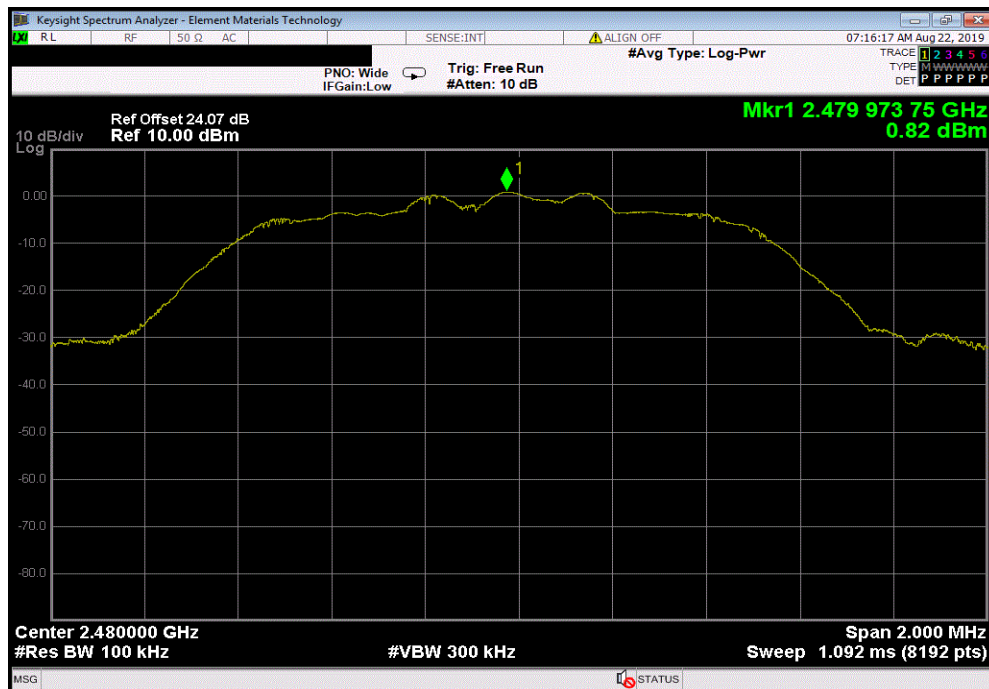


TMTx 2018.09.13 XMI 2019.06.11

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

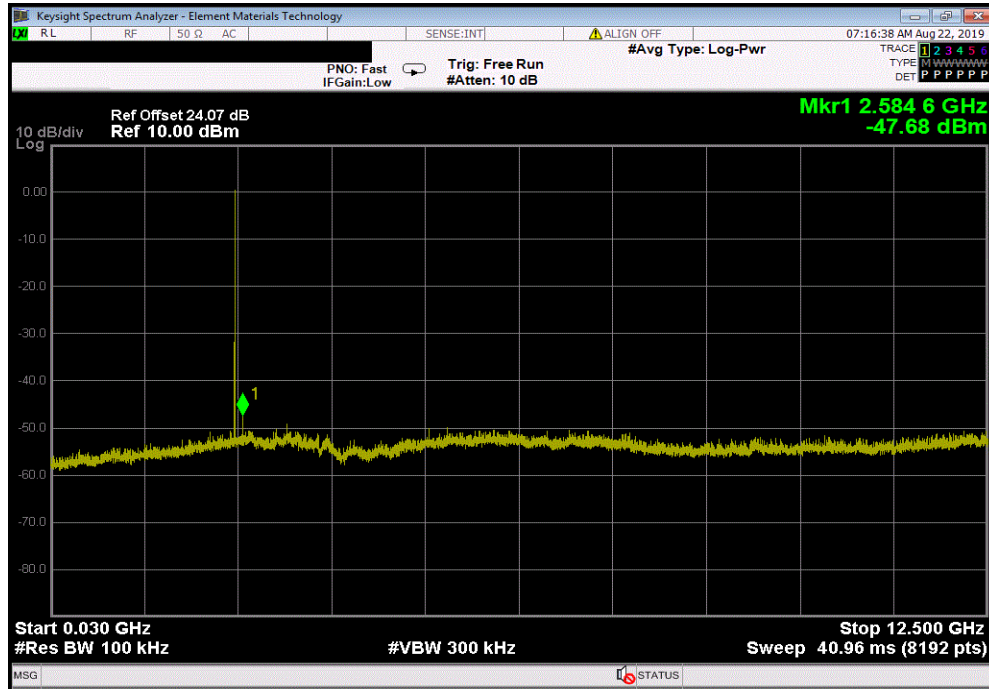


SPURIOUS CONDUCTED EMISSIONS

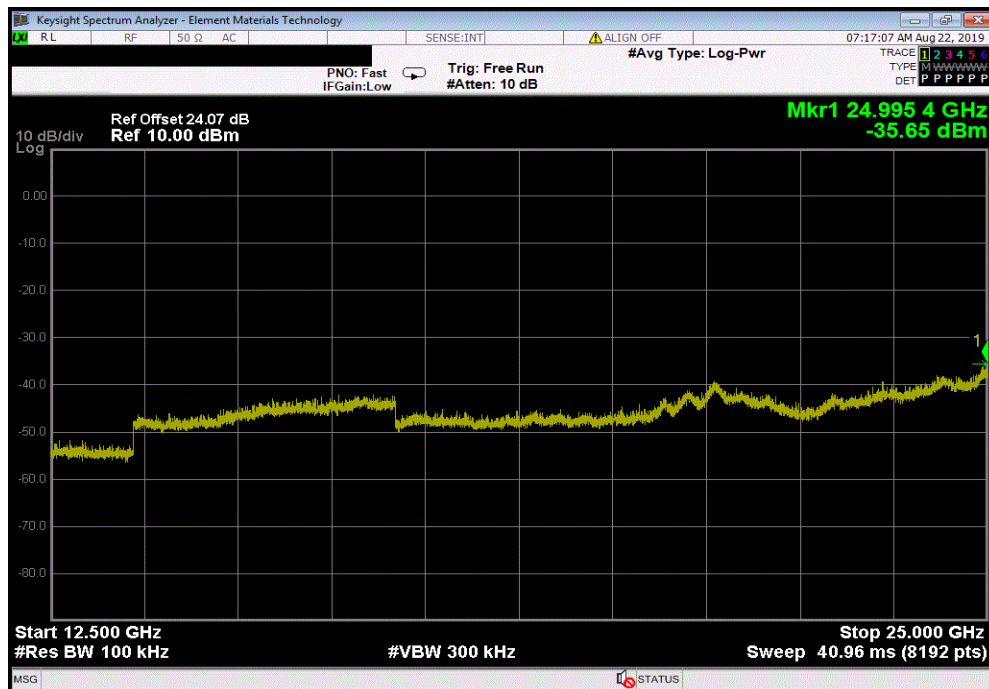


TMTx 2018.09.13 XMt 2019.06.11

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

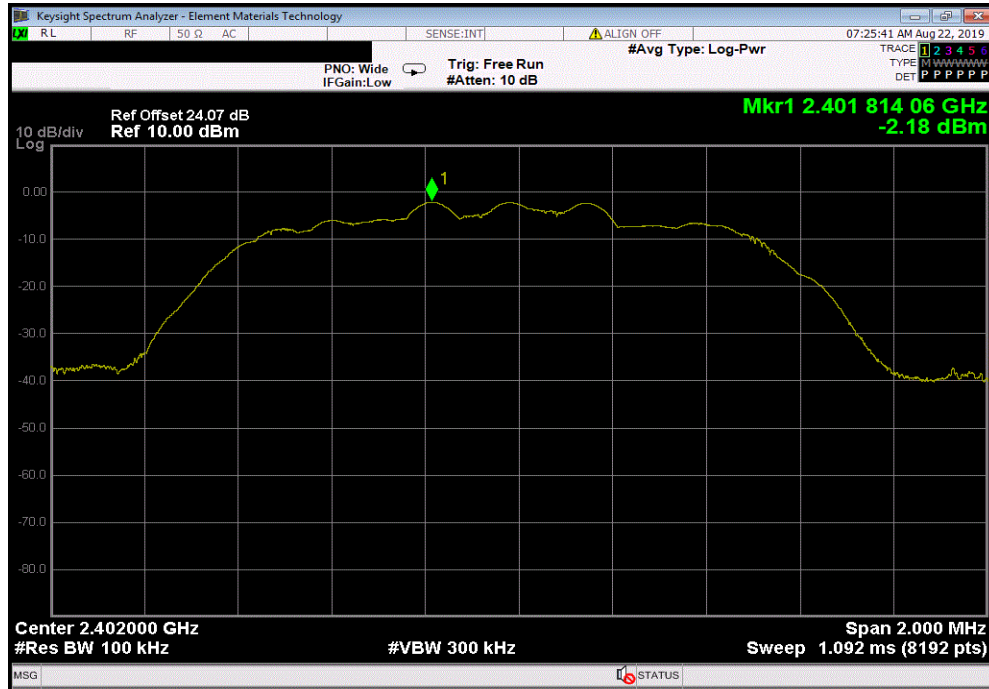


SPURIOUS CONDUCTED EMISSIONS

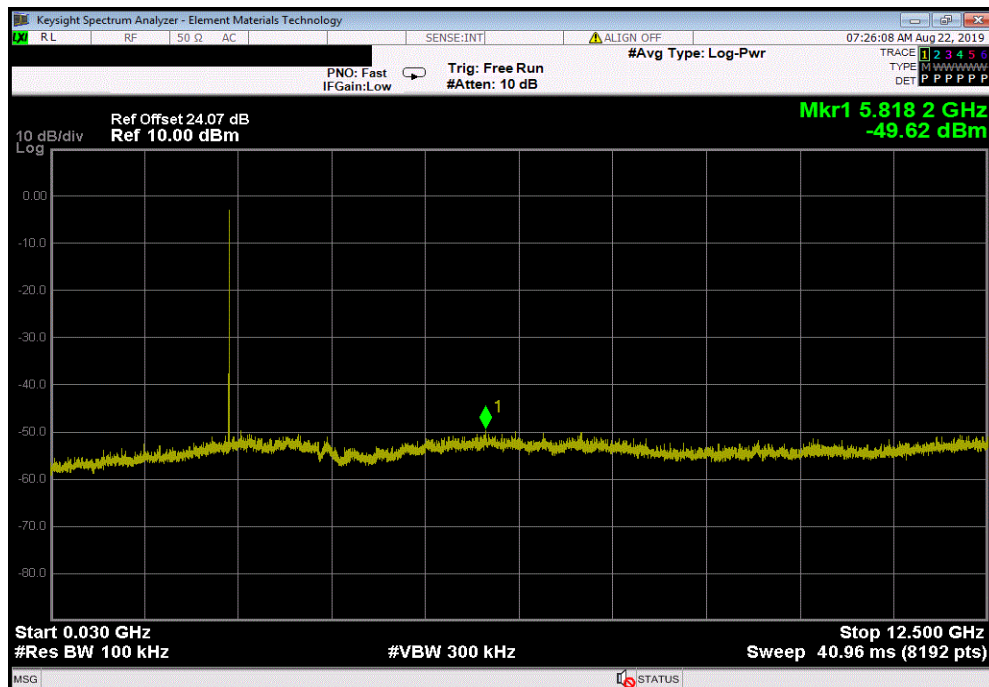


TMTx 2018.09.13 XMI 2019.06.11

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	

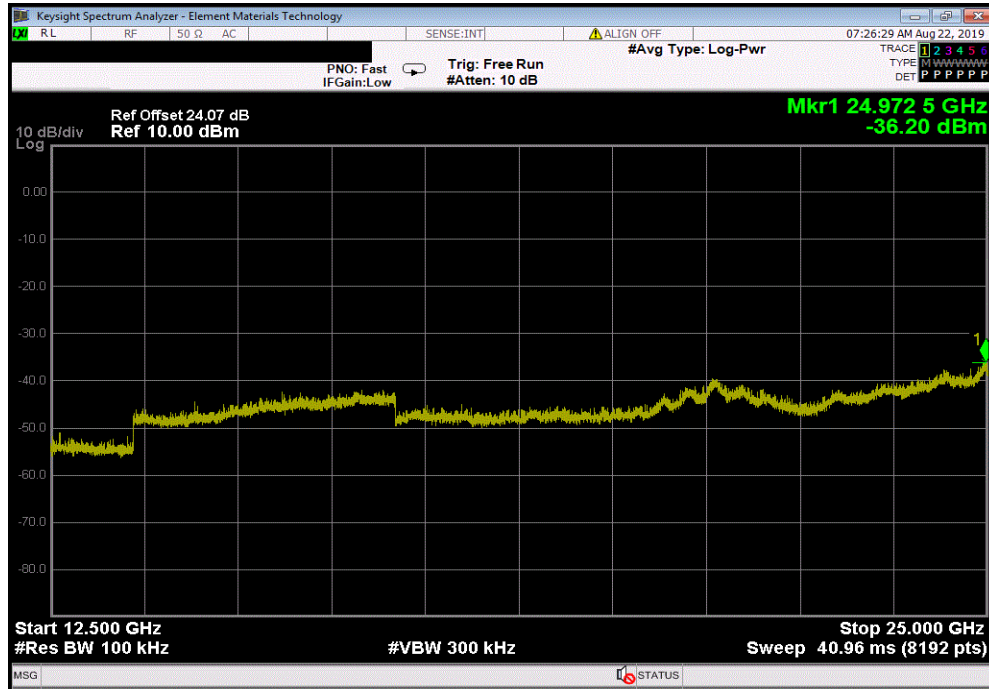


SPURIOUS CONDUCTED EMISSIONS

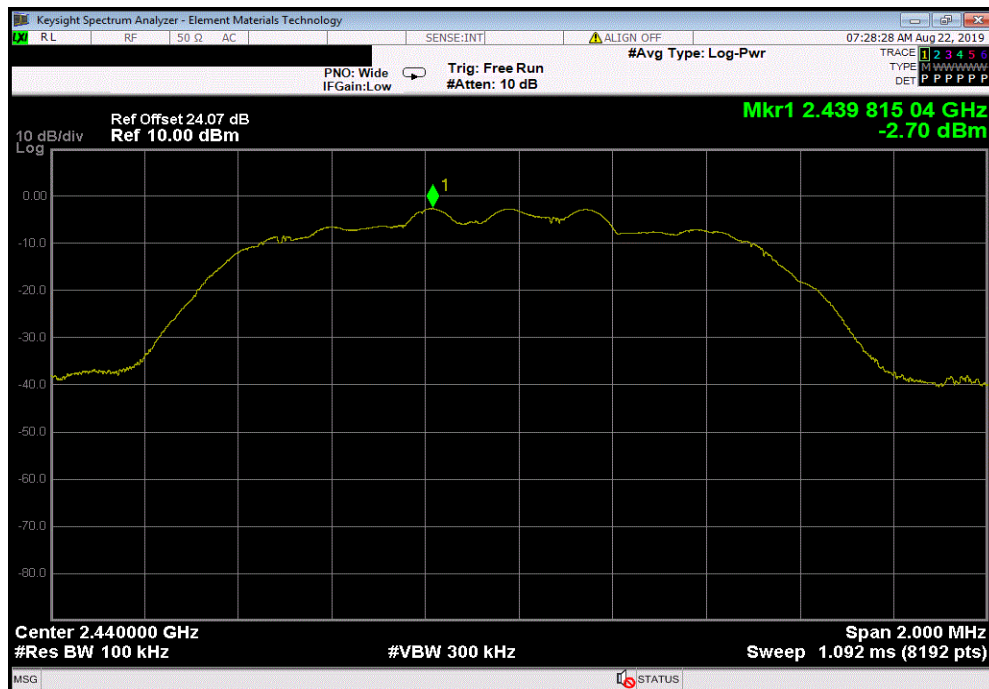


TMTx 2018.09.13 XMI 2019.06.11

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	

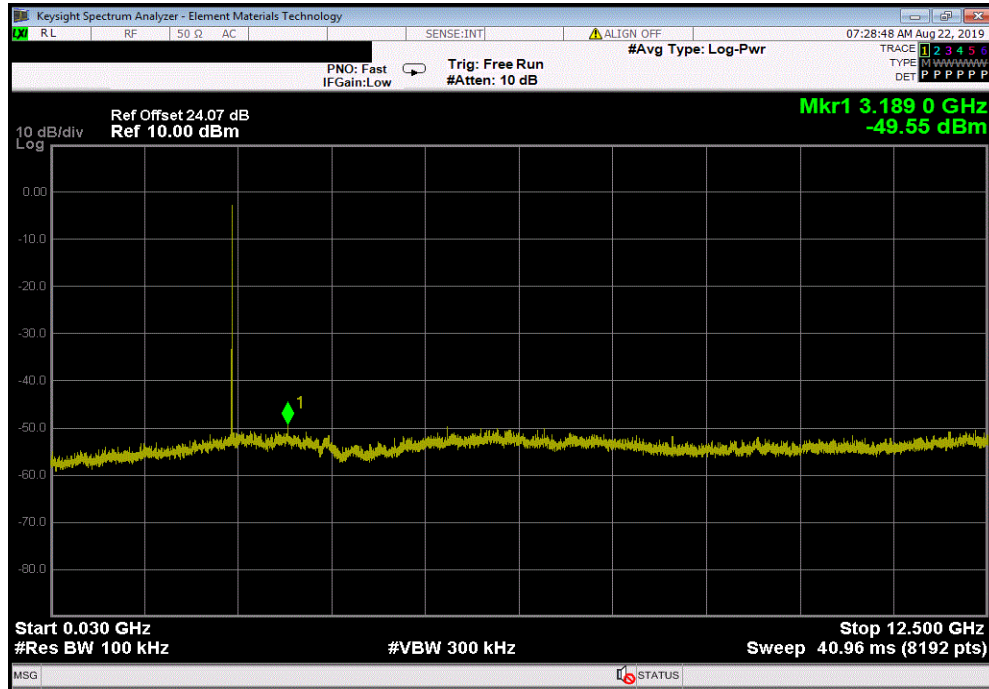


SPURIOUS CONDUCTED EMISSIONS

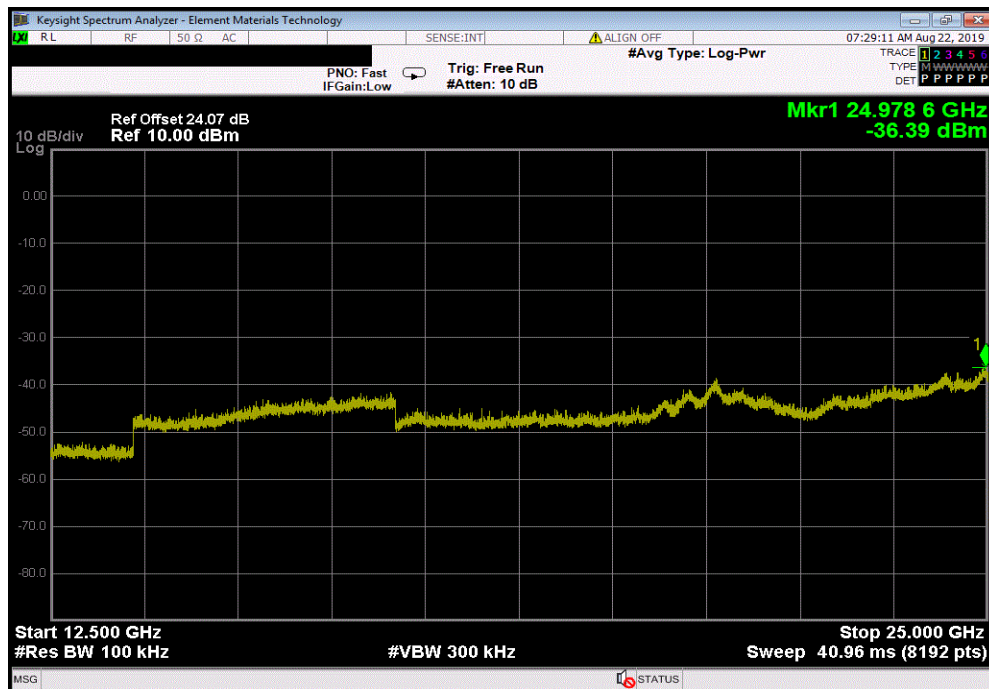


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3DH5, 8-DPSK, Mid Channel					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result	
30 MHz - 12.5 GHz	3188.99	-46.85	-20	Pass	



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	

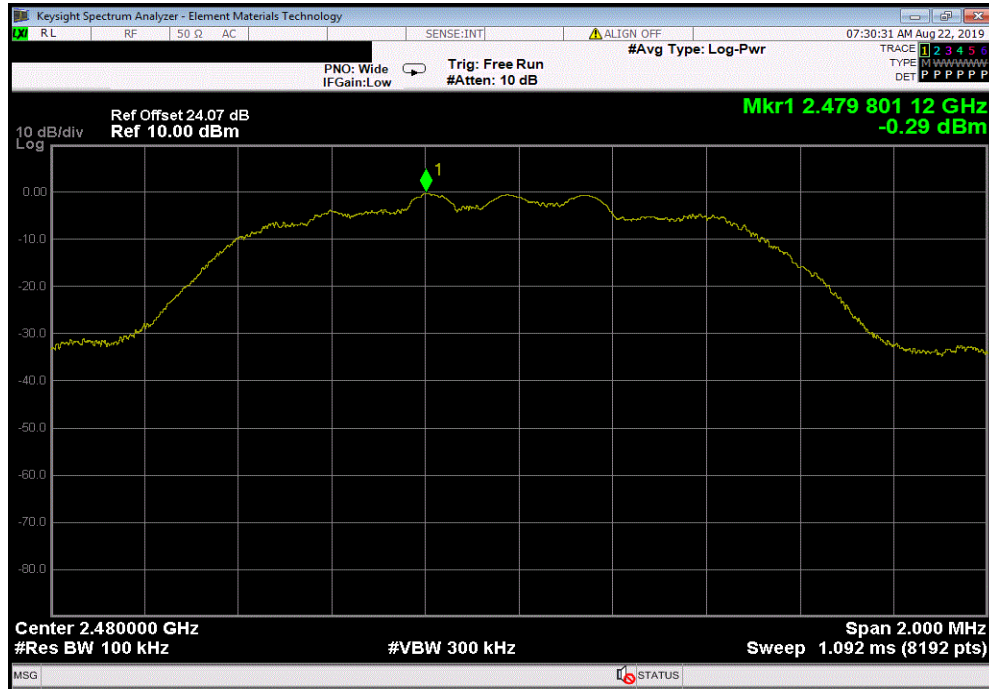


SPURIOUS CONDUCTED EMISSIONS

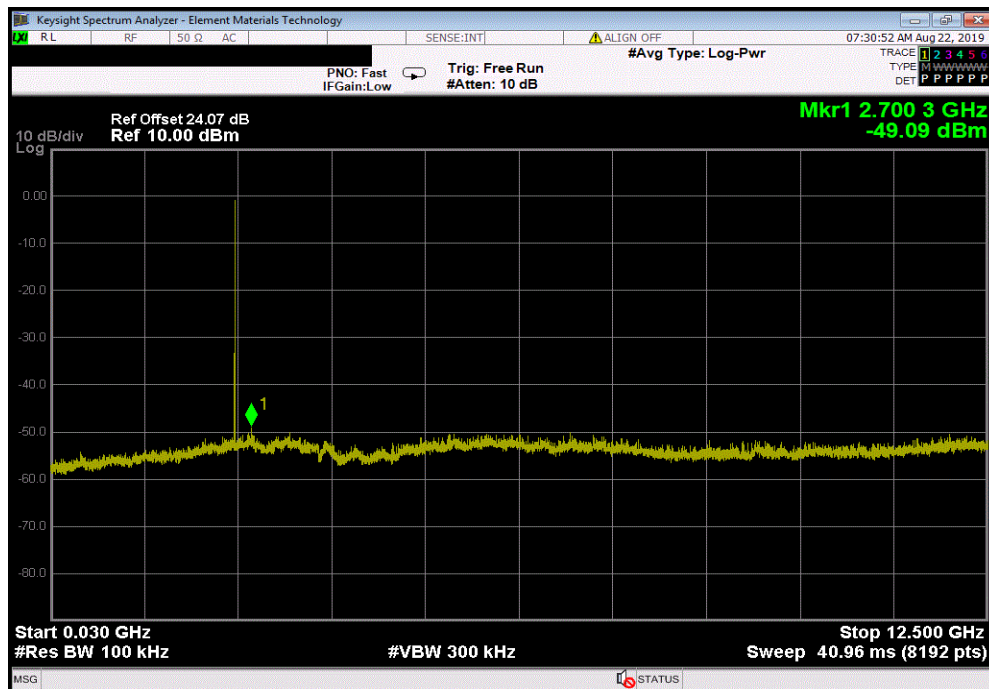


TMTx 2018.09.13 XMI 2019.06.11

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	



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	24983.21	-34.6	-20	Pass	

