

SPURIOUS CONDUCTED EMISSIONS



TEST DESCRIPTION

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.

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 fundamental was measured with a 100 kHz resolution bandwidth and the highest value was recorded. The rest of the spectrum was then measured with a 100 kHz resolution bandwidth and the highest value was found. The difference between the value found on the fundamental and the rest of the spectrum was compared against the limit to determine compliance.

The reference level offset for the fundamental screen capture was based on a measured value of the loss between the spectrum analyzer and the EUT which was verified at the time of test. The remaining screen capture(s) use an internal transducer factor on the analyzer to correct the displayed trace based on the cable loss over frequency. The reference level offset for the additional screen capture(s) is then based on the expected attenuator value and any other losses.

Fundamental Offset = Ref Lvl Offset showing measured composite factor of all losses

Remaining Screen capture(s) Offset = "Internal" cable loss factor not shown on screen capture + Ref Lvl Offset showing expected attenuator value and any other losses

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2023-10-04	2024-10-04
Block - DC	Fairview Microwave	SD3379	AMW	2023-03-13	2024-03-13
Attenuator	S.M. Electronics	SA26B-20	AUY	2023-03-13	2024-03-13
Cable	Micro-Coax	UFD150A-1-0720-200200	EVI	2022-12-02	2023-12-02
Generator - Signal	Keysight	N5182B	TFU	2022-12-02	2024-12-02

SPURIOUS CONDUCTED EMISSIONS



EUT:	APx516B	Work Order:	AUDI0315
Serial Number:	3516 B	Date:	2023-11-06
Customer:	Audio Precision	Temperature:	20.5°C
Attendees:	None	Relative Humidity:	51.3%
Customer Project:	None	Bar. Pressure (PMSL):	1002 mbar
Tested By:	Christopher Ladwig and Jeff Alcoke	Job Site:	EV06
Power:	110VAC/60Hz	Configuration:	AUDI0315-1
Signature:			

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2023	ANSI C63.10:2013
RSS-247 Issue 2:2023	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

TEST RESULTS

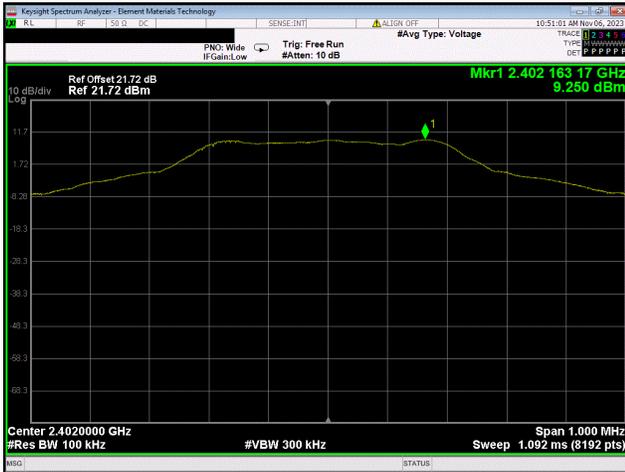
Source	Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
DH5, GFSK					
Low Channel, 2402 MHz	Fundamental	2402.16	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2505.43	-55.5	-20	Pass
	12.5 GHz - 25 GHz	23534.98	-59.25	-20	Pass
Mid Channel, 2441 MHz	Fundamental	2441.16	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2545.01	-55.59	-20	Pass
	12.5 GHz - 25 GHz	24053.84	-59.25	-20	Pass
High Channel, 2480 MHz	Fundamental	2480.16	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2376.02	-54.68	-20	Pass
	12.5 GHz - 25 GHz	23641.8	-59.04	-20	Pass
2DH5, pi/4-DQPSK					
Low Channel, 2402 MHz	Fundamental	2402	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2505.43	-54.86	-20	Pass
	12.5 GHz - 25 GHz	23609.75	-58.18	-20	Pass
Mid Channel, 2441 MHz	Fundamental	2441	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2336.44	-54.71	-20	Pass
	12.5 GHz - 25 GHz	23843.24	-57.85	-20	Pass
High Channel, 2480 MHz	Fundamental	2480	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2584.59	-54.76	-20	Pass
	12.5 GHz - 25 GHz	23686.06	-57.12	-20	Pass
3DH5, 8-DPSK					
Low Channel, 2402 MHz	Fundamental	2401.83	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2505.43	-57.46	-20	Pass
	12.5 GHz - 25 GHz	23963.8	-57.22	-20	Pass
Mid Channel, 2441 MHz	Fundamental	2440.83	N/A	N/A	N/A

SPURIOUS CONDUCTED EMISSIONS

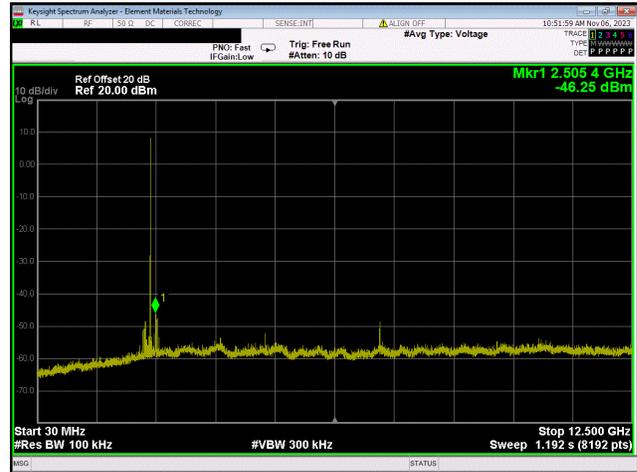


	Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
High Channel, 2480 MHz	30 MHz - 12.5 GHz	2545.01	-56.92	-20	Pass
	12.5 GHz - 25 GHz	23965.33	-58.32	-20	Pass
	Fundamental	2479.83	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2350.14	-55.63	-20	Pass
	12.5 GHz - 25 GHz	24905.38	-57.44	-20	Pass
Sink					
DH5, GFSK					
Low Channel, 2402 MHz	Fundamental	2402.16	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2558.71	-55.06	-20	Pass
	12.5 GHz - 25 GHz	24162.19	-59.08	-20	Pass
Mid Channel, 2441 MHz	Fundamental	2441.16	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2545.01	-55.83	-20	Pass
	12.5 GHz - 25 GHz	23889.02	-59.03	-20	Pass
High Channel, 2480 MHz	Fundamental	2480.16	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2376.02	-54.1	-20	Pass
	12.5 GHz - 25 GHz	23957.7	-58.4	-20	Pass
2DH5, pi/4-DQPSK					
Low Channel, 2402 MHz	Fundamental	2402	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2505.43	-55.43	-20	Pass
	12.5 GHz - 25 GHz	23658.59	-57.65	-20	Pass
Mid Channel, 2441 MHz	Fundamental	2441	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2310.56	-56.76	-20	Pass
	12.5 GHz - 25 GHz	23850.87	-57.55	-20	Pass
High Channel, 2480 MHz	Fundamental	2480	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2376.02	-55.27	-20	Pass
	12.5 GHz - 25 GHz	24136.25	-57.49	-20	Pass
3DH5, 8-DPSK					
Low Channel, 2402 MHz	Fundamental	2401.84	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2505.43	-55.51	-20	Pass
	12.5 GHz - 25 GHz	24076.73	-57.89	-20	Pass
Mid Channel, 2441 MHz	Fundamental	2440.83	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2545.01	-55.84	-20	Pass
	12.5 GHz - 25 GHz	23657.06	-58.06	-20	Pass
High Channel, 2480 MHz	Fundamental	2479.83	N/A	N/A	N/A
	30 MHz - 12.5 GHz	2376.02	-54.5	-20	Pass
	12.5 GHz - 25 GHz	24572.7	-57.69	-20	Pass

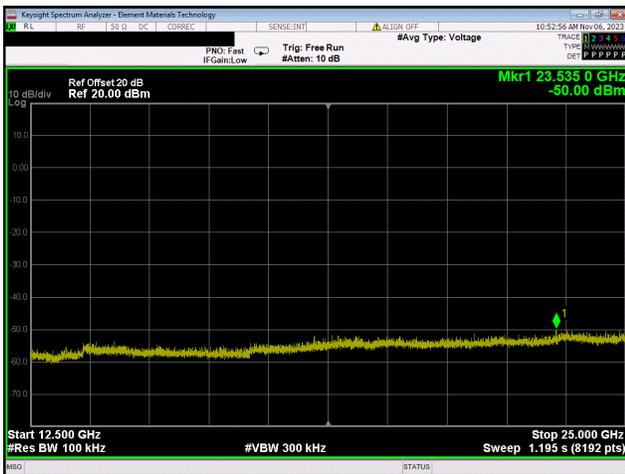
SPURIOUS CONDUCTED EMISSIONS



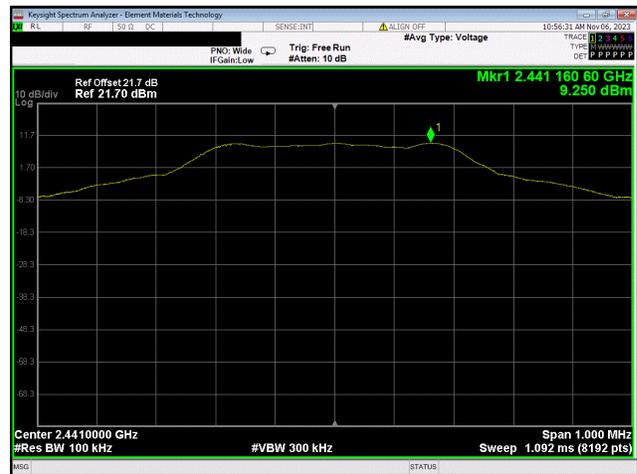
Source
DH5, GFSK
Low Channel, 2402 MHz



Source
DH5, GFSK
Low Channel, 2402 MHz

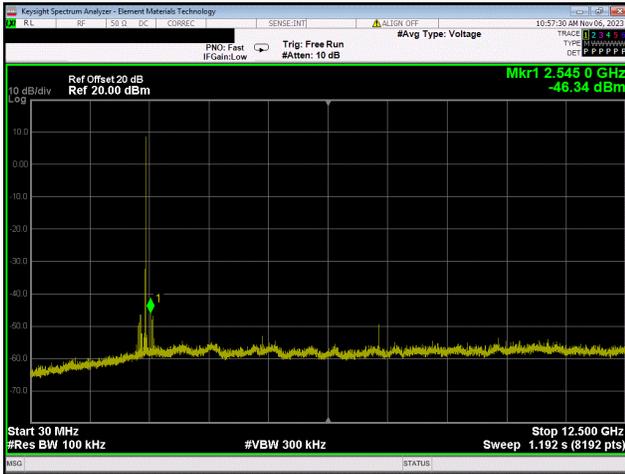


Source
DH5, GFSK
Low Channel, 2402 MHz

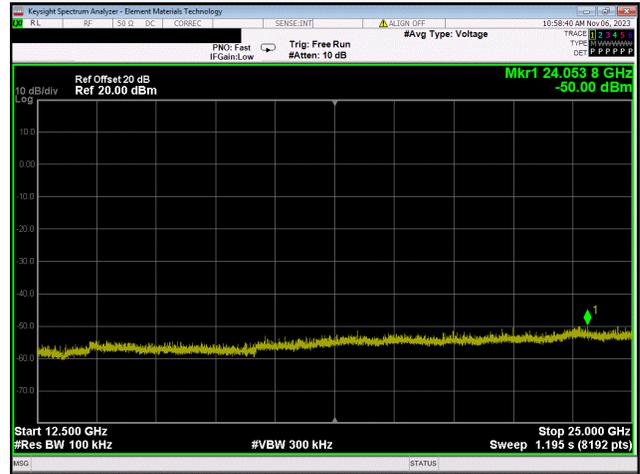


Source
DH5, GFSK
Mid Channel, 2441 MHz

SPURIOUS CONDUCTED EMISSIONS



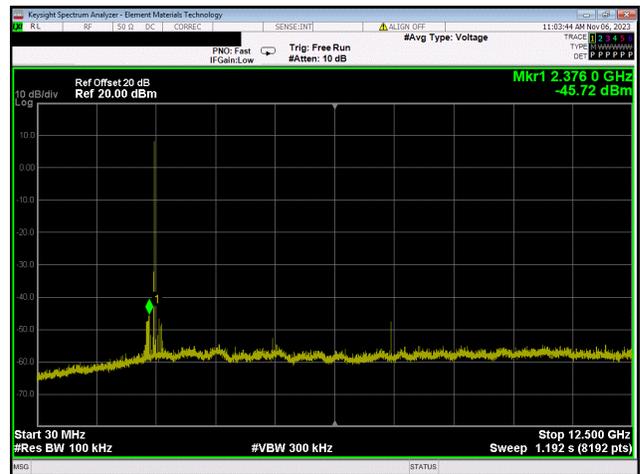
Source
DH5, GFSK
Mid Channel, 2441 MHz



Source
DH5, GFSK
Mid Channel, 2441 MHz

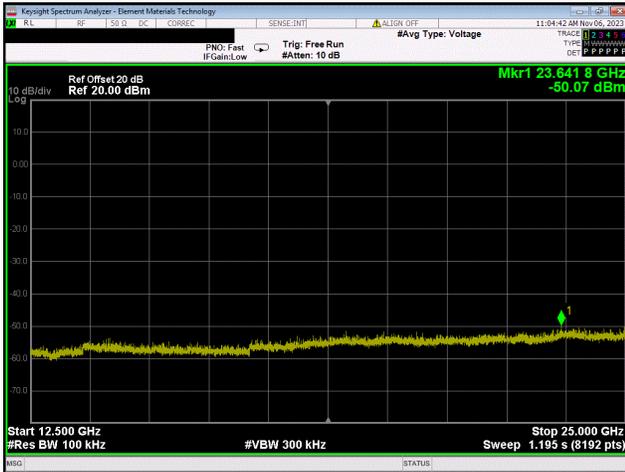


Source
DH5, GFSK
High Channel, 2480 MHz

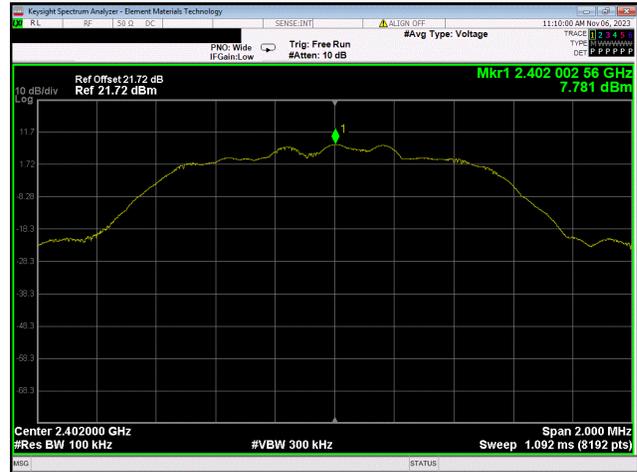


Source
DH5, GFSK
High Channel, 2480 MHz

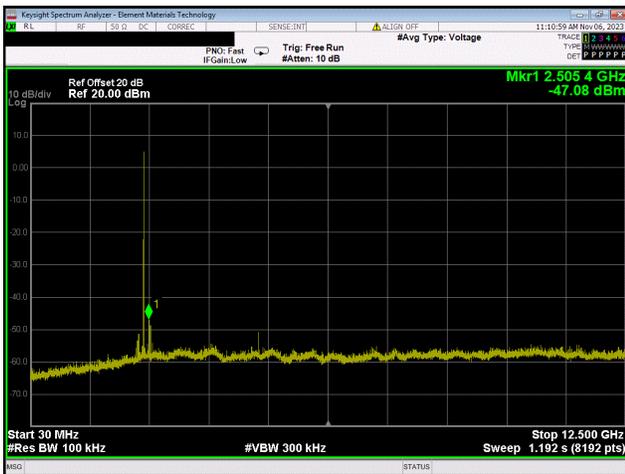
SPURIOUS CONDUCTED EMISSIONS



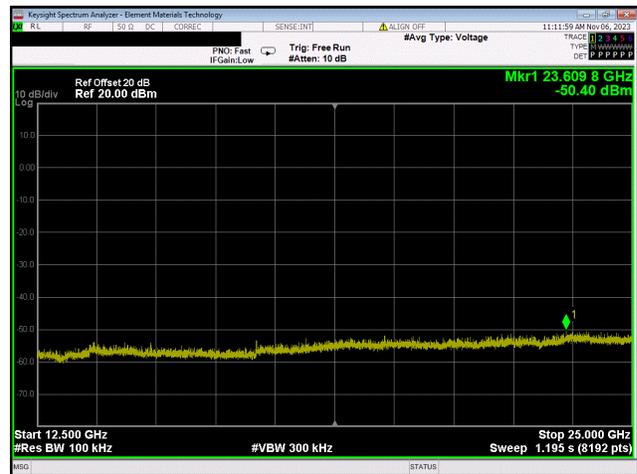
Source
DH5, GFSK
High Channel, 2480 MHz



Source
2DH5, pi/4-DQPSK
Low Channel, 2402 MHz

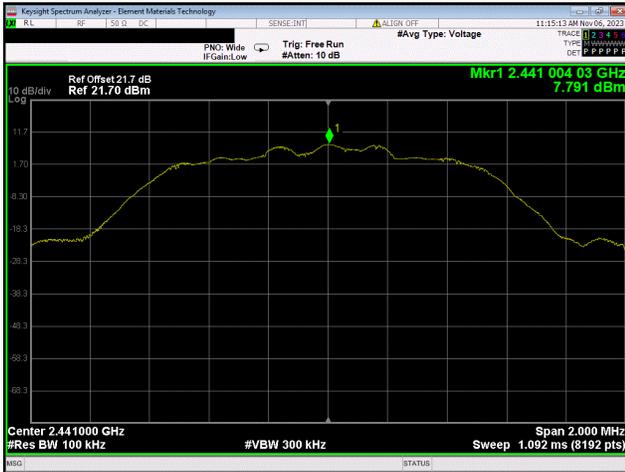


Source
2DH5, pi/4-DQPSK
Low Channel, 2402 MHz

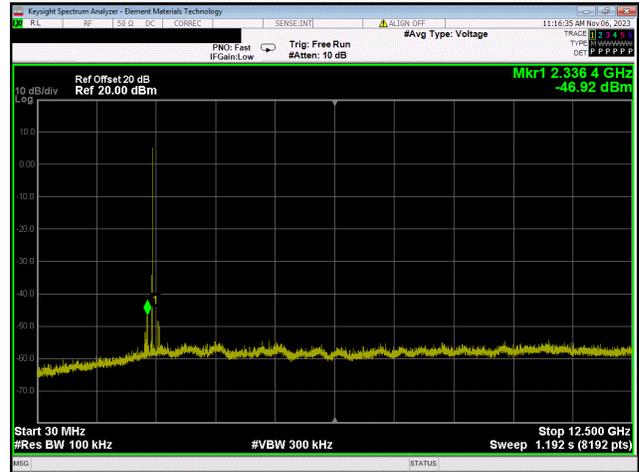


Source
2DH5, pi/4-DQPSK
Low Channel, 2402 MHz

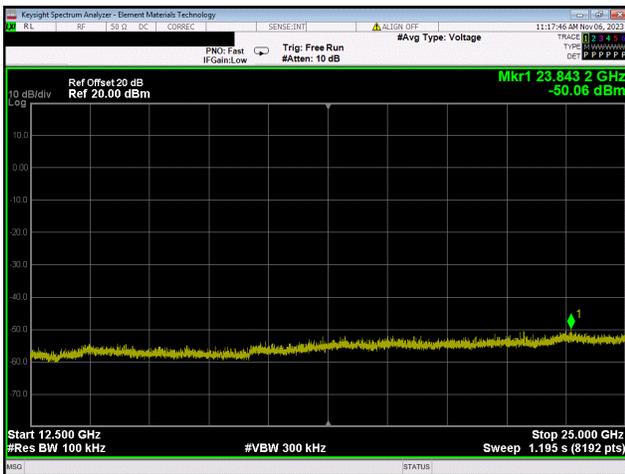
SPURIOUS CONDUCTED EMISSIONS



Source
2DH5, pi/4-DQPSK
Mid Channel, 2441 MHz



Source
2DH5, pi/4-DQPSK
Mid Channel, 2441 MHz

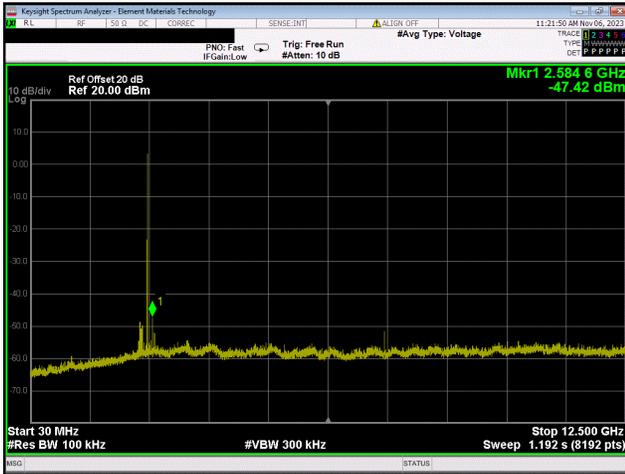


Source
2DH5, pi/4-DQPSK
Mid Channel, 2441 MHz

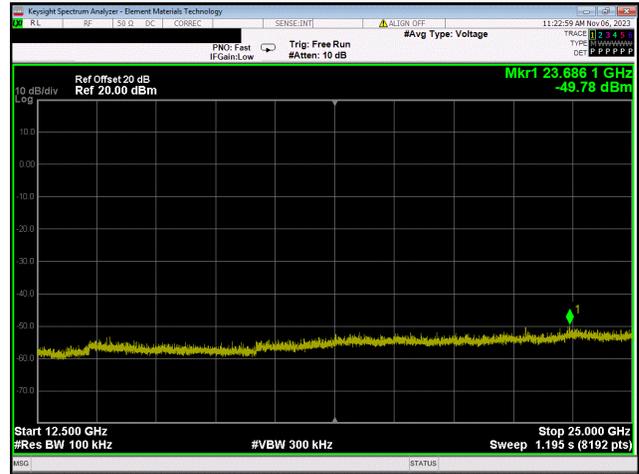


Source
2DH5, pi/4-DQPSK
High Channel, 2480 MHz

SPURIOUS CONDUCTED EMISSIONS



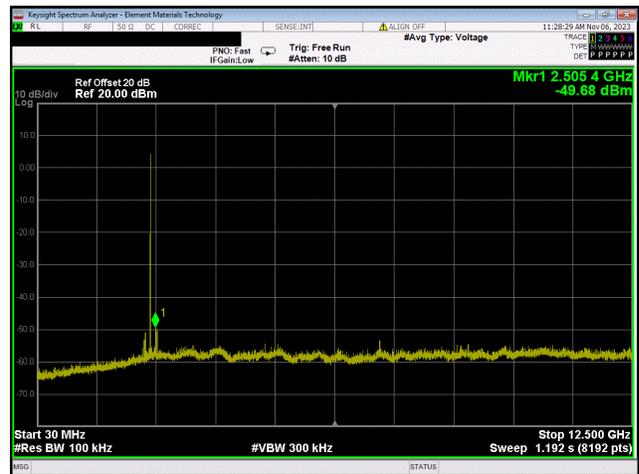
Source
2DH5, pi/4-DQPSK
High Channel, 2480 MHz



Source
2DH5, pi/4-DQPSK
High Channel, 2480 MHz

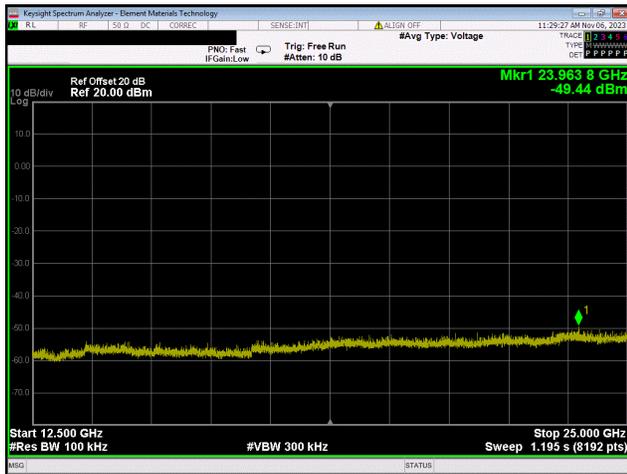


Source
3DH5, 8-DPSK
Low Channel, 2402 MHz



Source
3DH5, 8-DPSK
Low Channel, 2402 MHz

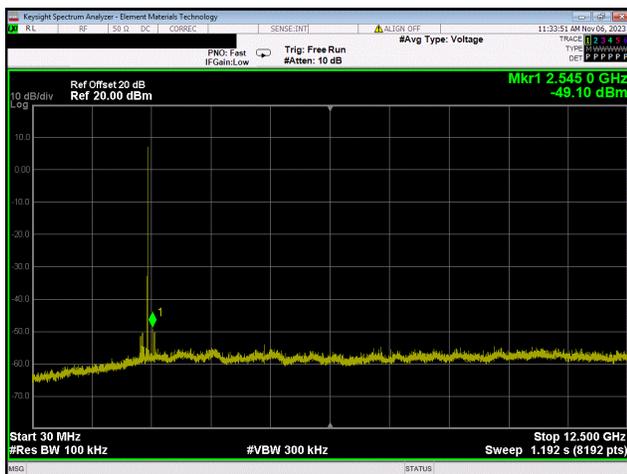
SPURIOUS CONDUCTED EMISSIONS



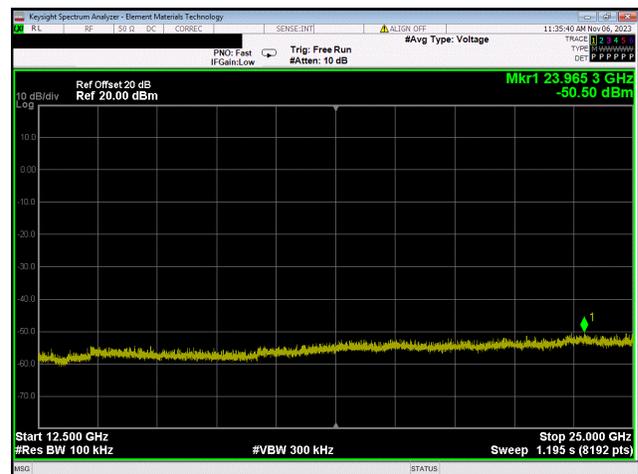
Source
3DH5, 8-DPSK
Low Channel, 2402 MHz



Source
3DH5, 8-DPSK
Mid Channel, 2441 MHz

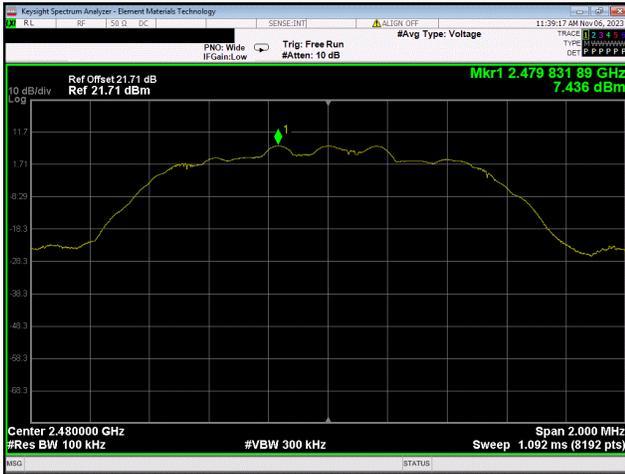


Source
3DH5, 8-DPSK
Mid Channel, 2441 MHz

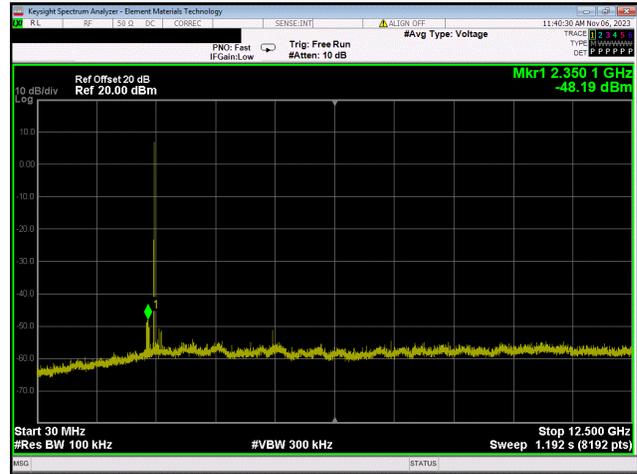


Source
3DH5, 8-DPSK
Mid Channel, 2441 MHz

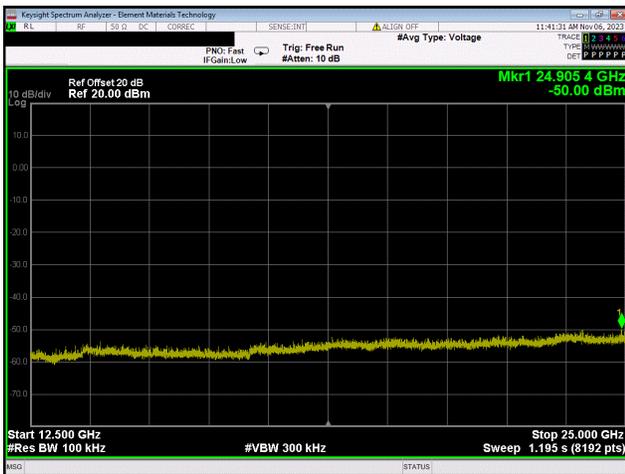
SPURIOUS CONDUCTED EMISSIONS



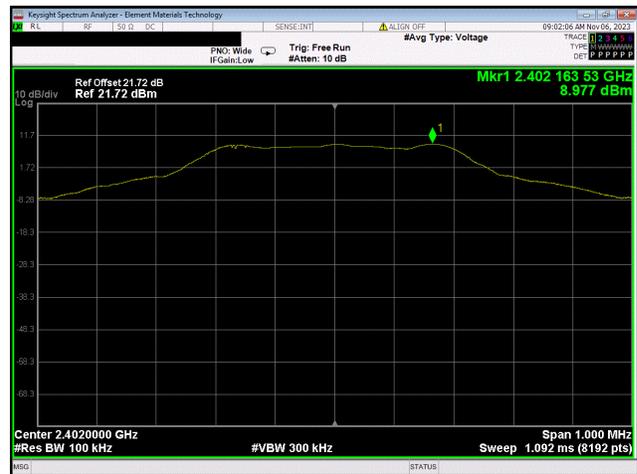
Source
3DH5, 8-DPSK
High Channel, 2480 MHz



Source
3DH5, 8-DPSK
High Channel, 2480 MHz

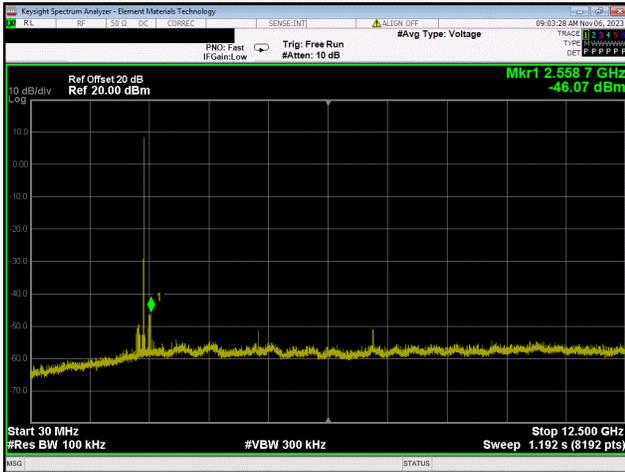


Source
3DH5, 8-DPSK
High Channel, 2480 MHz

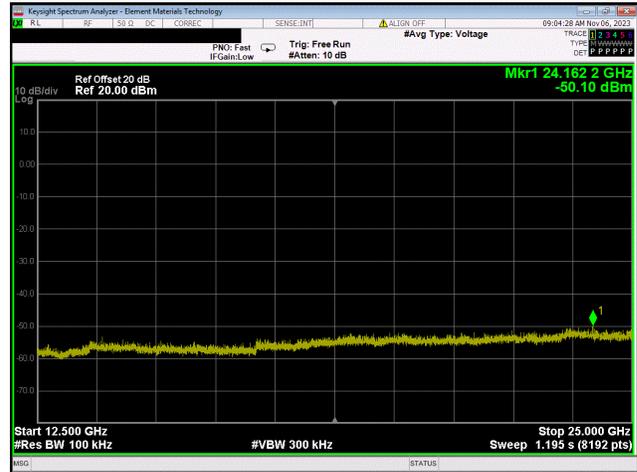


Sink
DH5, GFSK
Low Channel, 2402 MHz

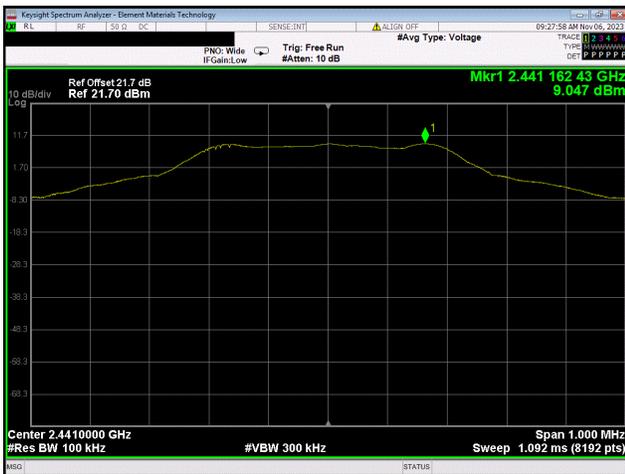
SPURIOUS CONDUCTED EMISSIONS



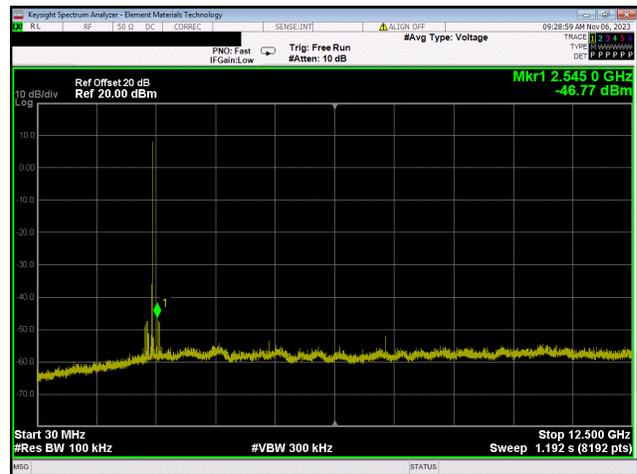
Sink
DH5, GFSK
Low Channel, 2402 MHz



Sink
DH5, GFSK
Low Channel, 2402 MHz

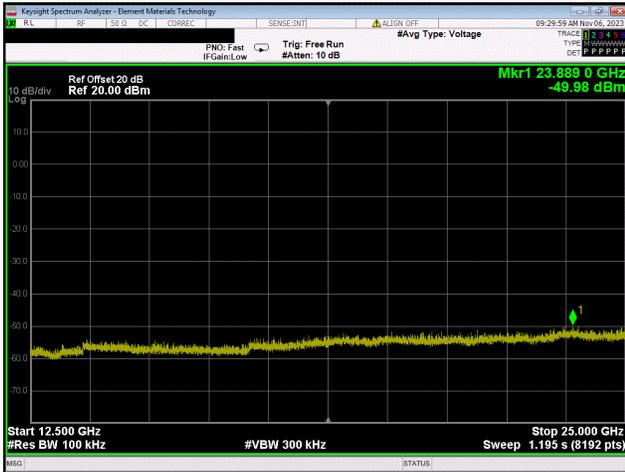


Sink
DH5, GFSK
Mid Channel, 2441 MHz



Sink
DH5, GFSK
Mid Channel, 2441 MHz

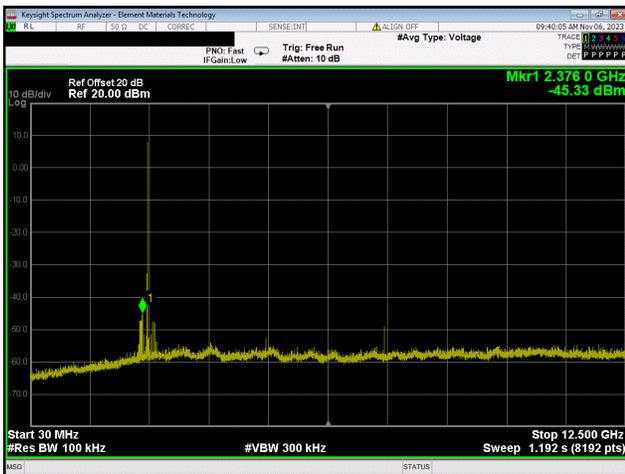
SPURIOUS CONDUCTED EMISSIONS



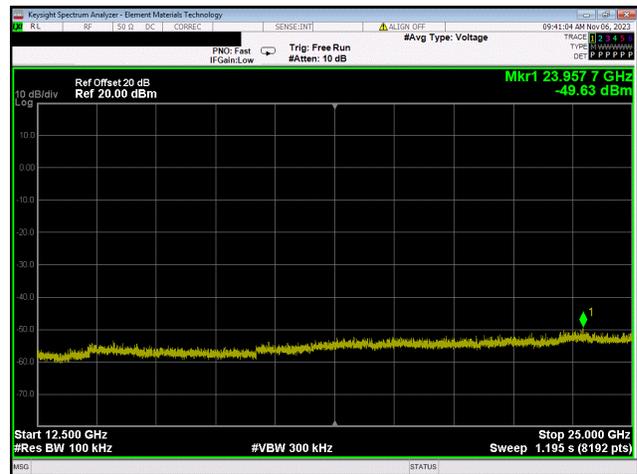
Sink
DH5, GFSK
Mid Channel, 2441 MHz



Sink
DH5, GFSK
High Channel, 2480 MHz

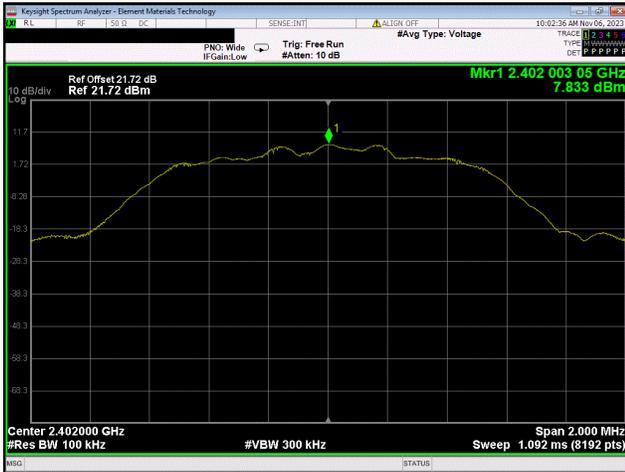


Sink
DH5, GFSK
High Channel, 2480 MHz

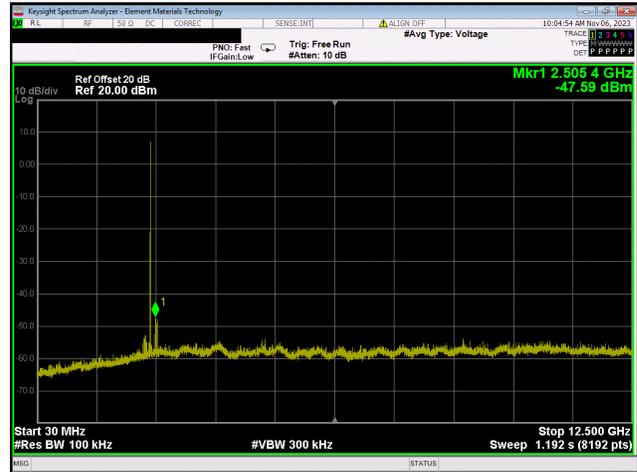


Sink
DH5, GFSK
High Channel, 2480 MHz

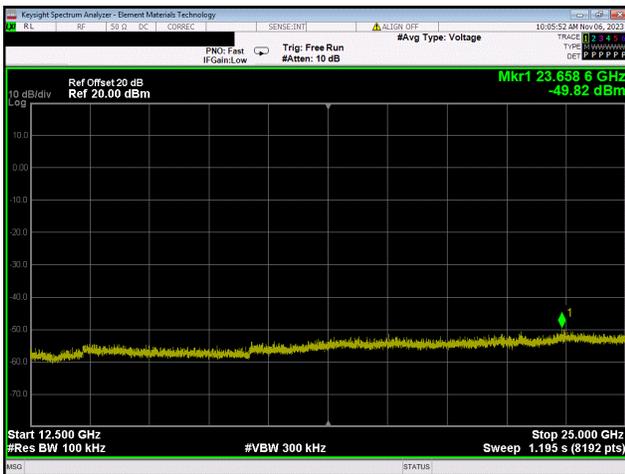
SPURIOUS CONDUCTED EMISSIONS



Sink
2DH5, pi/4-DQPSK
Low Channel, 2402 MHz



Sink
2DH5, pi/4-DQPSK
Low Channel, 2402 MHz

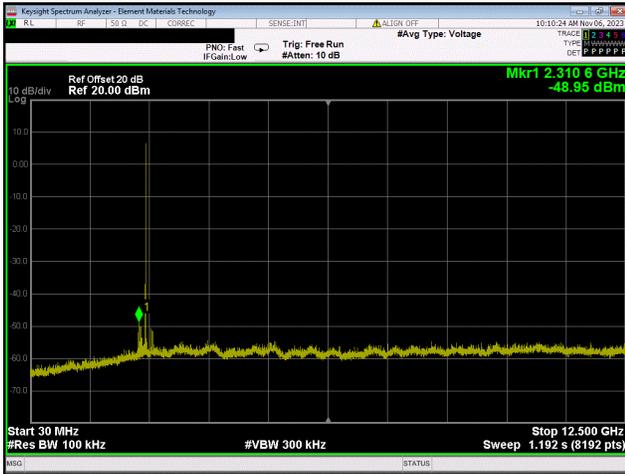


Sink
2DH5, pi/4-DQPSK
Low Channel, 2402 MHz

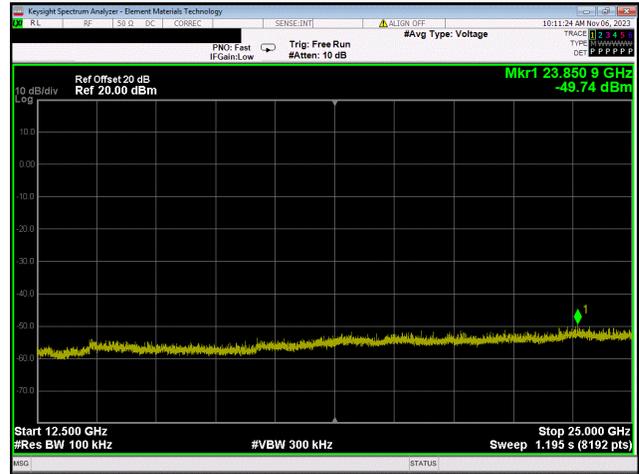


Sink
2DH5, pi/4-DQPSK
Mid Channel, 2441 MHz

SPURIOUS CONDUCTED EMISSIONS



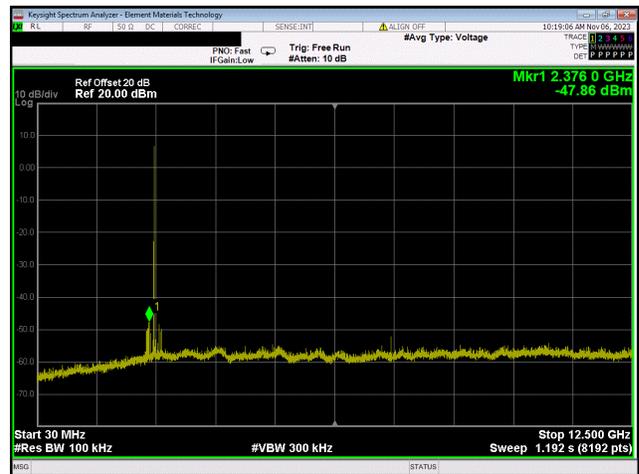
Sink
2DH5, pi/4-DQPSK
Mid Channel, 2441 MHz



Sink
2DH5, pi/4-DQPSK
Mid Channel, 2441 MHz

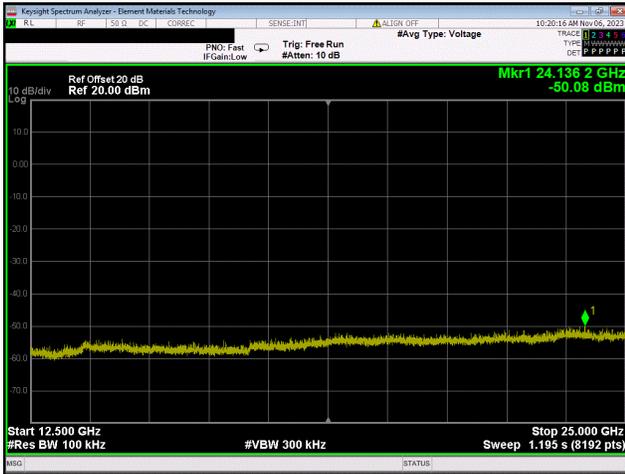


Sink
2DH5, pi/4-DQPSK
High Channel, 2480 MHz



Sink
2DH5, pi/4-DQPSK
High Channel, 2480 MHz

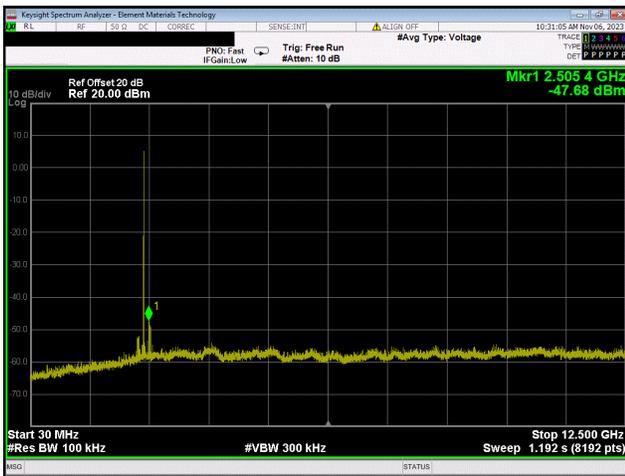
SPURIOUS CONDUCTED EMISSIONS



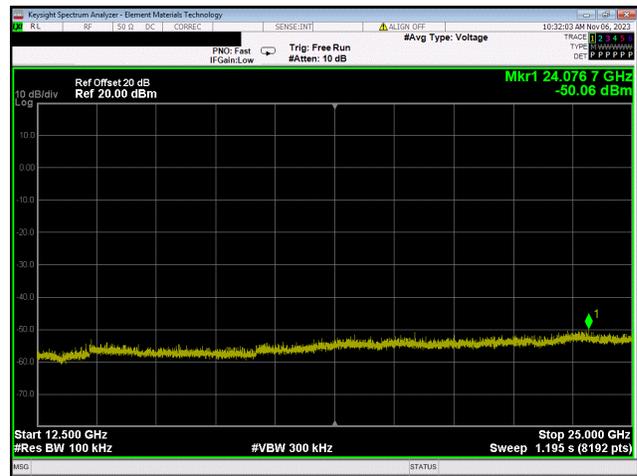
Sink
2DH5, pi/4-DQPSK
High Channel, 2480 MHz



Sink
3DH5, 8-DPSK
Low Channel, 2402 MHz



Sink
3DH5, 8-DPSK
Low Channel, 2402 MHz

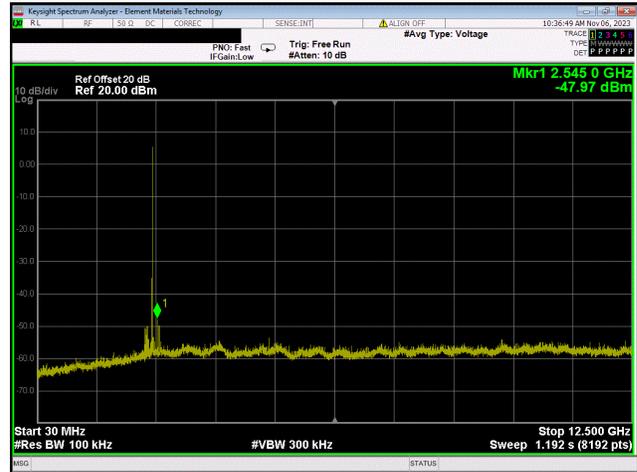


Sink
3DH5, 8-DPSK
Low Channel, 2402 MHz

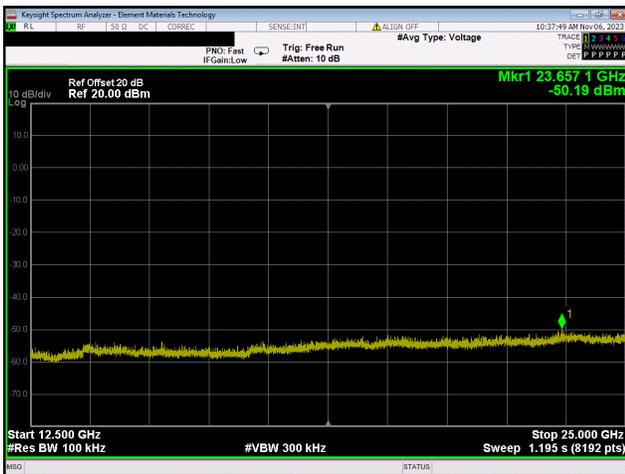
SPURIOUS CONDUCTED EMISSIONS



Sink
3DH5, 8-DPSK
Mid Channel, 2441 MHz



Sink
3DH5, 8-DPSK
Mid Channel, 2441 MHz

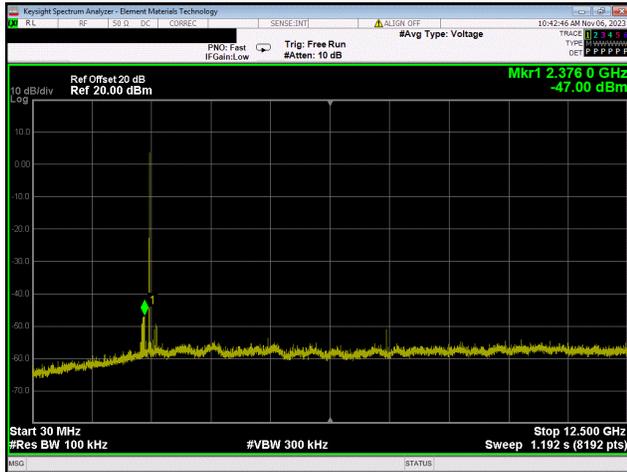


Sink
3DH5, 8-DPSK
Mid Channel, 2441 MHz

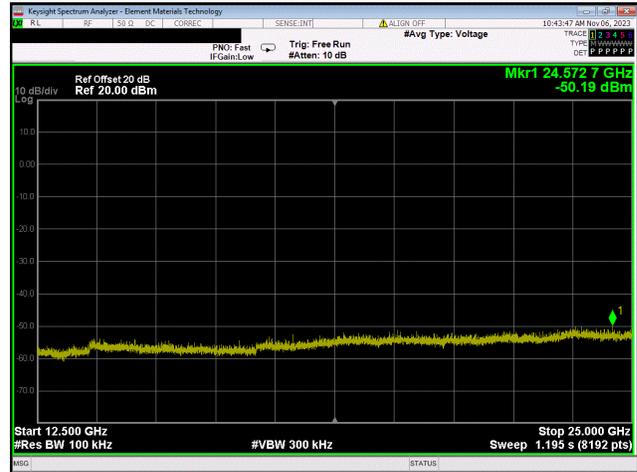


Sink
3DH5, 8-DPSK
High Channel, 2480 MHz

SPURIOUS CONDUCTED EMISSIONS



Sink
3DH5, 8-DPSK
High Channel, 2480 MHz



Sink
3DH5, 8-DPSK
High Channel, 2480 MHz

OCCUPIED BANDWIDTH (99%)



TEST DESCRIPTION

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.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The 99% occupied bandwidth was measured with the EUT configured for continuous modulated operation.

Per ANSI C63.10:2013, 6.9.3, the spectrum analyzer was configured as follows:

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) of the spectrum analyzer was set to the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) bandwidth was set to at least 3 times the resolution bandwidth. The analyzer sweep time was set to auto to prevent video filtering or averaging. A sample detector was used unless the device was not able to be operated in a continuous transmit mode, in which case a peak detector was used.

The spectrum analyzer occupied bandwidth measurement function was used to sum the power of the transmission in linear terms to obtain the 99% bandwidth.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2023-10-04	2024-10-04
Block - DC	Fairview Microwave	SD3379	AMW	2023-03-13	2024-03-13
Attenuator	S.M. Electronics	SA26B-20	AUY	2023-03-13	2024-03-13
Cable	Micro-Coax	UFD150A-1-0720-200200	EVI	2022-12-02	2023-12-02
Generator - Signal	Keysight	N5182B	TFU	2022-12-02	2024-12-02

OCCUPIED BANDWIDTH (99%)



EUT:	APx516B	Work Order:	AUDI0315
Serial Number:	3516 B	Date:	2023-11-06
Customer:	Audio Precision	Temperature:	20.5°C
Attendees:	None	Relative Humidity:	51.5%
Customer Project:	None	Bar. Pressure (PMSL):	1002 mbar
Tested By:	Christopher Ladwig and Jeff Alcoke	Job Site:	EV06
Power:	110VAC/60Hz	Configuration:	AUDI0315-1
Signature:			

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.247:2023	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

COMMENTS

Reference level offset includes: DC Block, 20 dB attenuator, and measurement cable

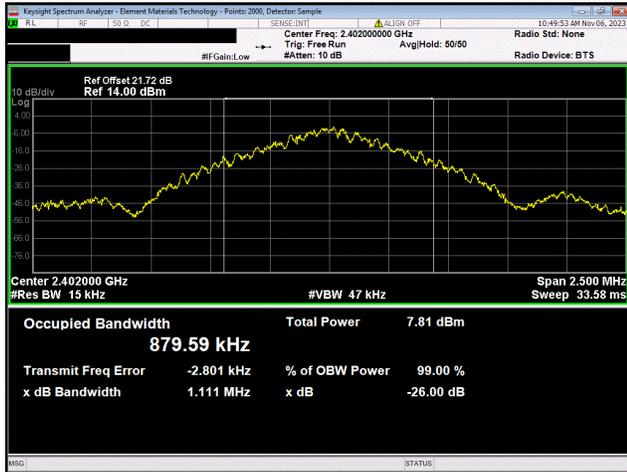
DEVIATIONS FROM TEST STANDARD

None

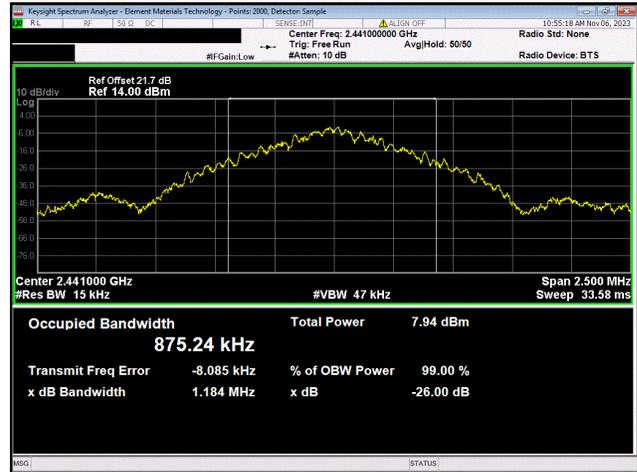
TEST RESULTS

		Value	Limit	Result
Source				
	DH5, GFSK			
	Low Channel, 2402 MHz	879.589 kHz	N/A	N/A
	Mid Channel, 2441 MHz	875.242 kHz	N/A	N/A
	High Channel, 2480 MHz	872.268 kHz	N/A	N/A
	2DH5, pi/4-DQPSK			
	Low Channel, 2402 MHz	1.244 MHz	N/A	N/A
	Mid Channel, 2441 MHz	1.252 MHz	N/A	N/A
	High Channel, 2480 MHz	1.237 MHz	N/A	N/A
	3DH5, 8-DPSK			
	Low Channel, 2402 MHz	1.245 MHz	N/A	N/A
	Mid Channel, 2441 MHz	1.24 MHz	N/A	N/A
	High Channel, 2480 MHz	1.238 MHz	N/A	N/A
Sink				
	DH5, GFSK			
	Low Channel, 2402 MHz	878.013 kHz	N/A	N/A
	Mid Channel, 2441 MHz	878.392 kHz	N/A	N/A
	High Channel, 2480 MHz	872.688 kHz	N/A	N/A
	2DH5, pi/4-DQPSK			
	Low Channel, 2402 MHz	1.27 MHz	N/A	N/A
	Mid Channel, 2441 MHz	1.269 MHz	N/A	N/A
	High Channel, 2480 MHz	1.255 MHz	N/A	N/A
	3DH5, 8-DPSK			
	Low Channel, 2402 MHz	1.261 MHz	N/A	N/A
	Mid Channel, 2441 MHz	1.256 MHz	N/A	N/A
	High Channel, 2480 MHz	1.251 MHz	N/A	N/A

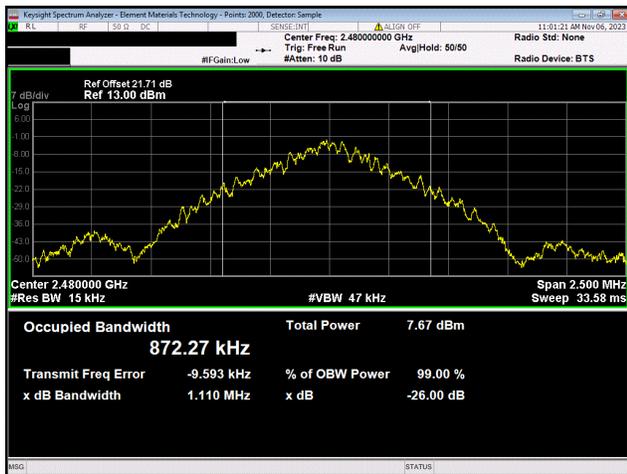
OCCUPIED BANDWIDTH (99%)



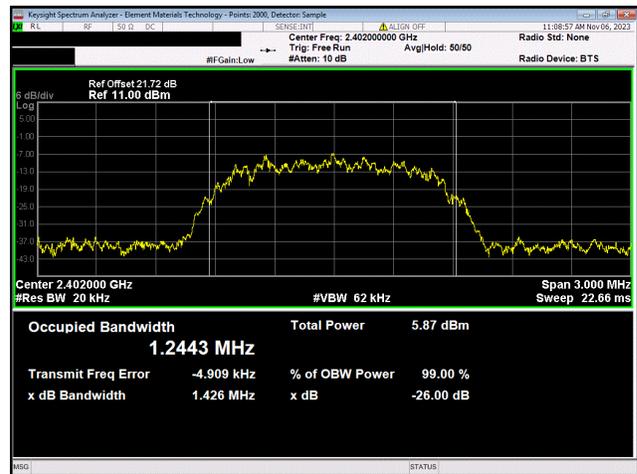
Source
DH5, GFSK
Low Channel, 2402 MHz



Source
DH5, GFSK
Mid Channel, 2441 MHz

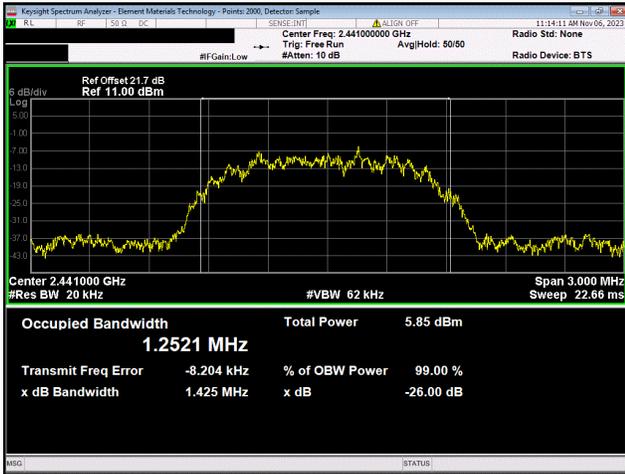


Source
DH5, GFSK
High Channel, 2480 MHz

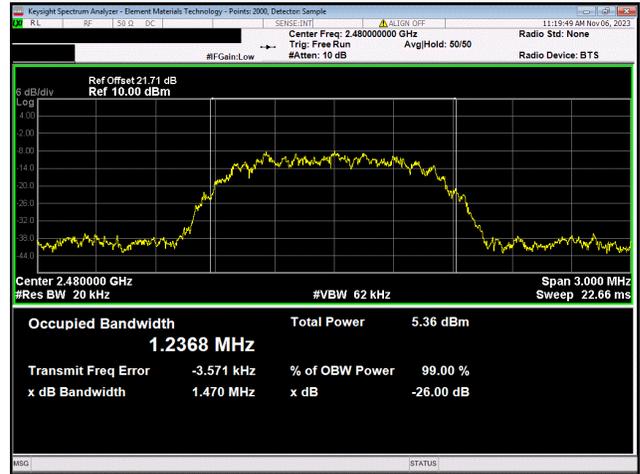


Source
2DH5, pi/4-DQPSK
Low Channel, 2402 MHz

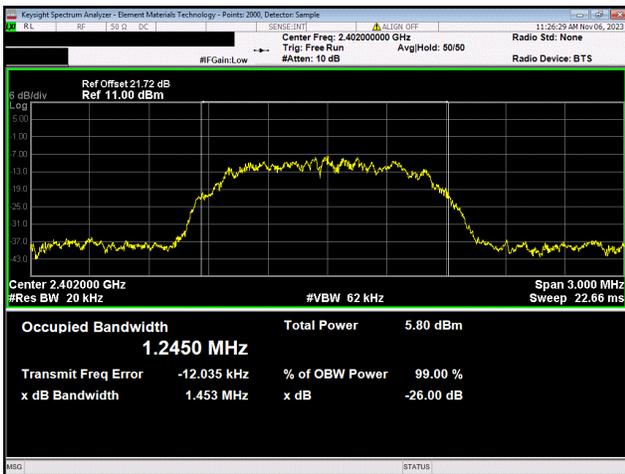
OCCUPIED BANDWIDTH (99%)



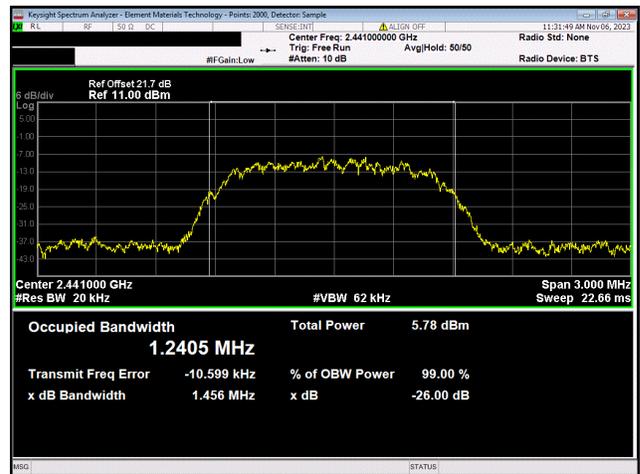
Source
2DH5, pi/4-DQPSK
Mid Channel, 2441 MHz



Source
2DH5, pi/4-DQPSK
High Channel, 2480 MHz

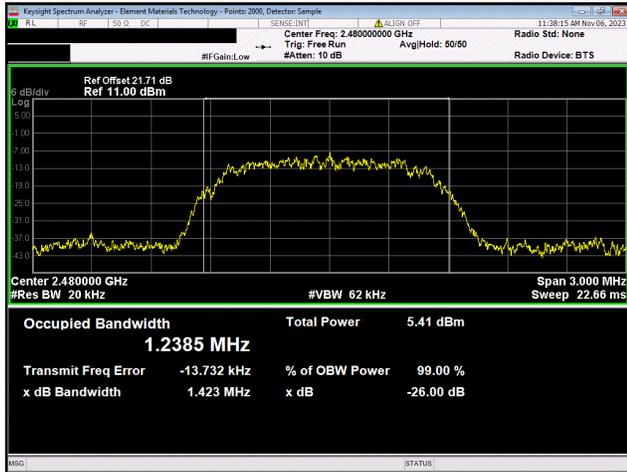


Source
3DH5, 8-DPSK
Low Channel, 2402 MHz

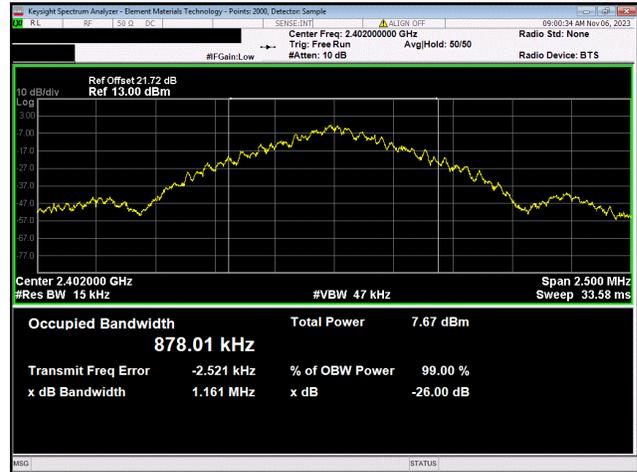


Source
3DH5, 8-DPSK
Mid Channel, 2441 MHz

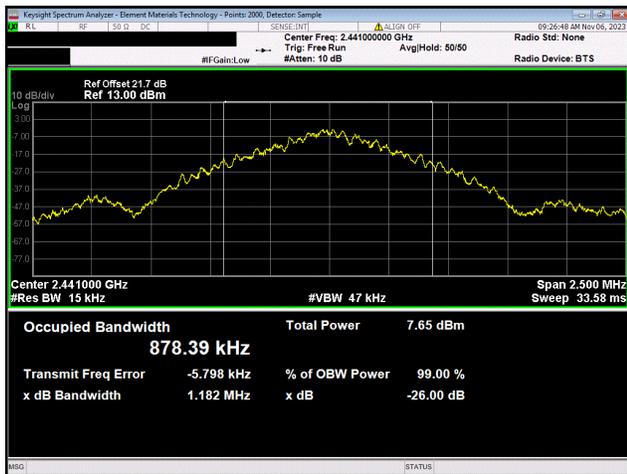
OCCUPIED BANDWIDTH (99%)



Source
3DH5, 8-DPSK
High Channel, 2480 MHz



Sink
DH5, GFSK
Low Channel, 2402 MHz

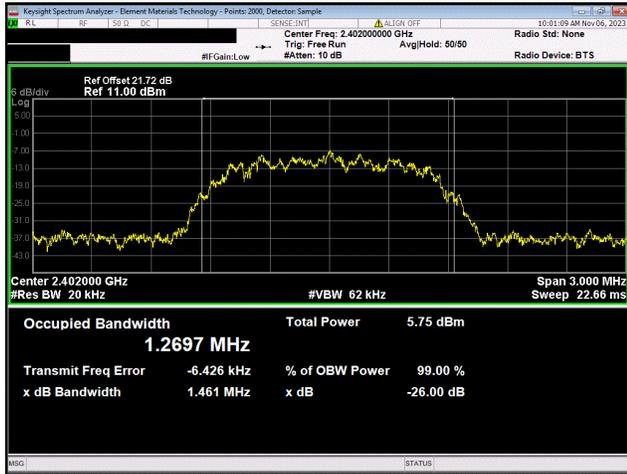


Sink
DH5, GFSK
Mid Channel, 2441 MHz

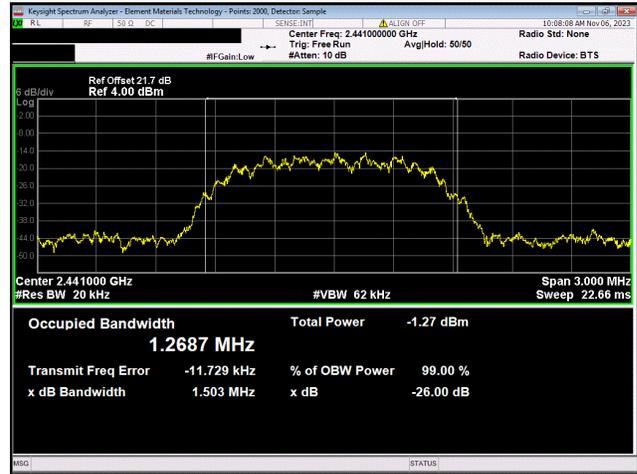


Sink
DH5, GFSK
High Channel, 2480 MHz

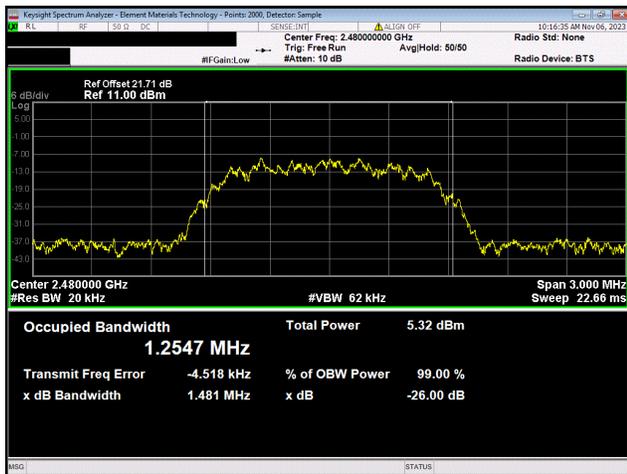
OCCUPIED BANDWIDTH (99%)



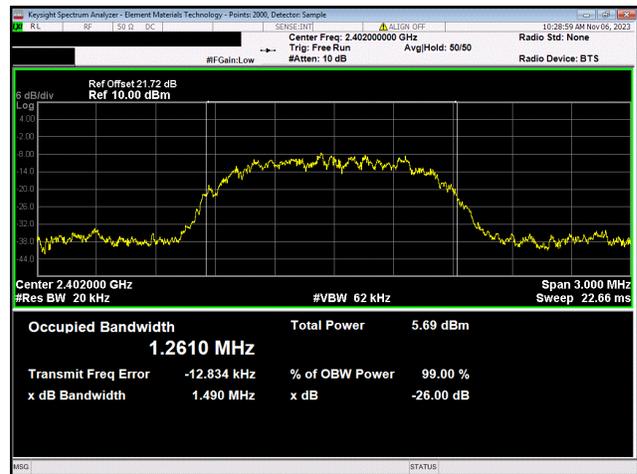
Sink
2DH5, pi/4-DQPSK
Low Channel, 2402 MHz



Sink
2DH5, pi/4-DQPSK
Mid Channel, 2441 MHz

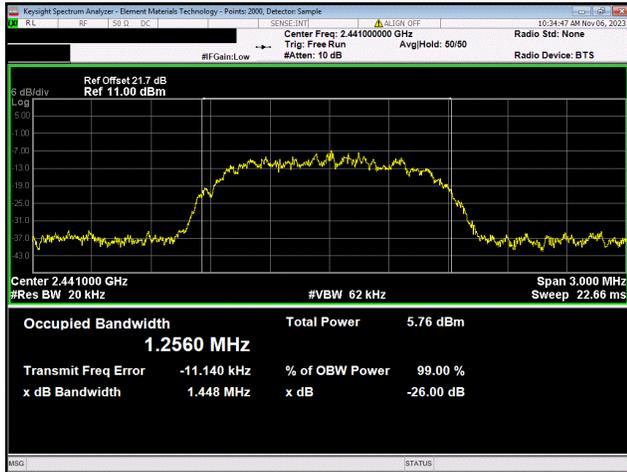


Sink
2DH5, pi/4-DQPSK
High Channel, 2480 MHz

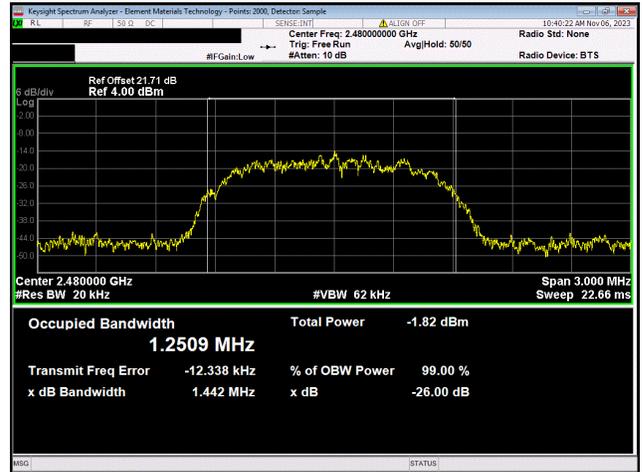


Sink
3DH5, 8-DPSK
Low Channel, 2402 MHz

OCCUPIED BANDWIDTH (99%)



Sink
3DH5, 8-DPSK
Mid Channel, 2441 MHz



Sink
3DH5, 8-DPSK
High Channel, 2480 MHz

End of Test Report