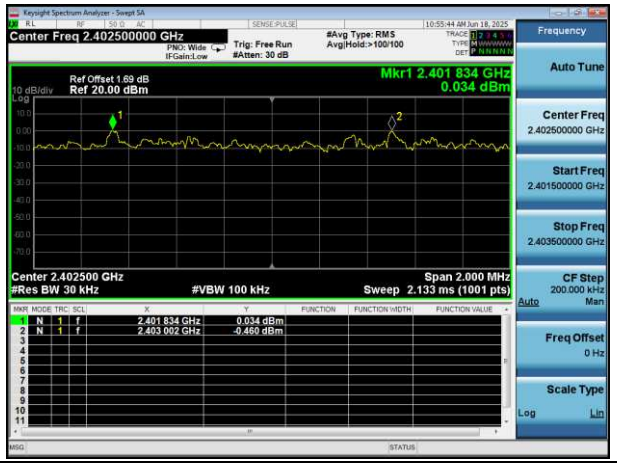
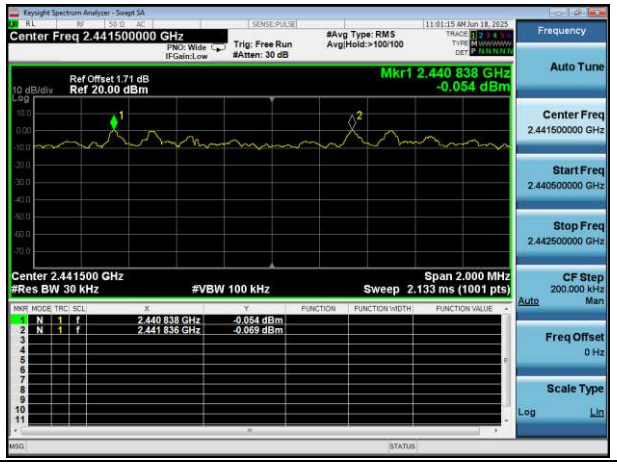
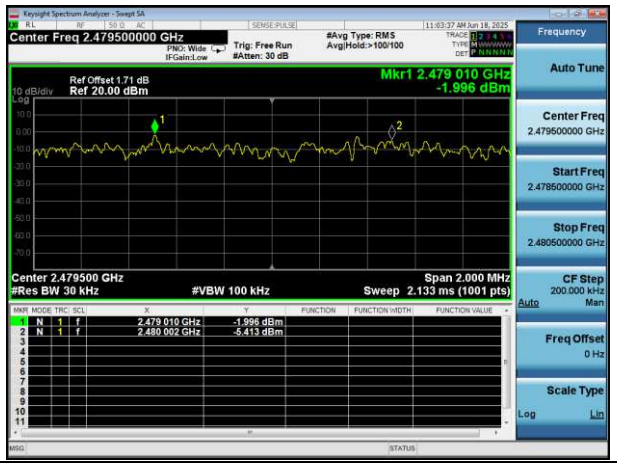
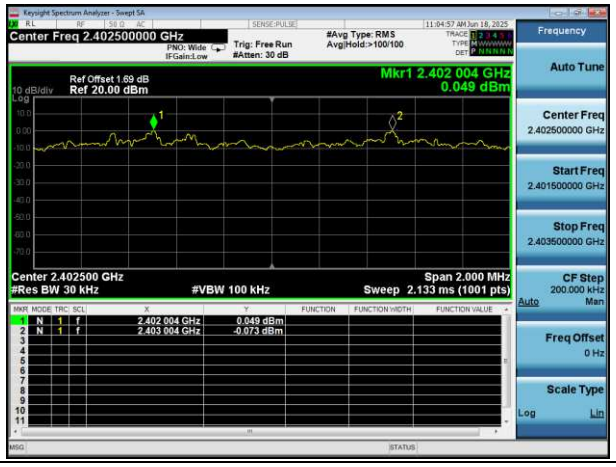
Right earphone:

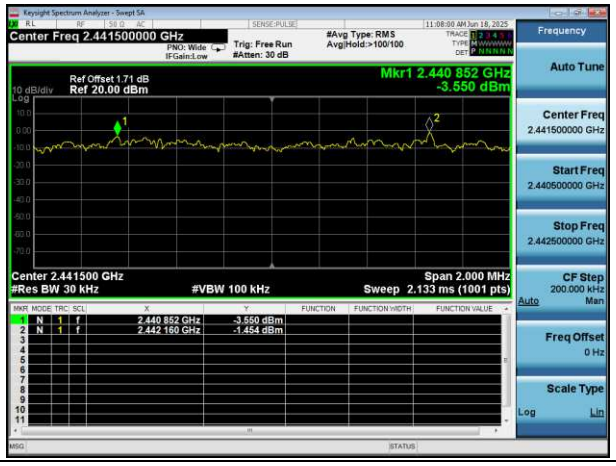
GFSK	Pi/4 DQPSK
Lowest	Lowest
	
Middle	Middle
	
Highest	Highest
	

8DPSK

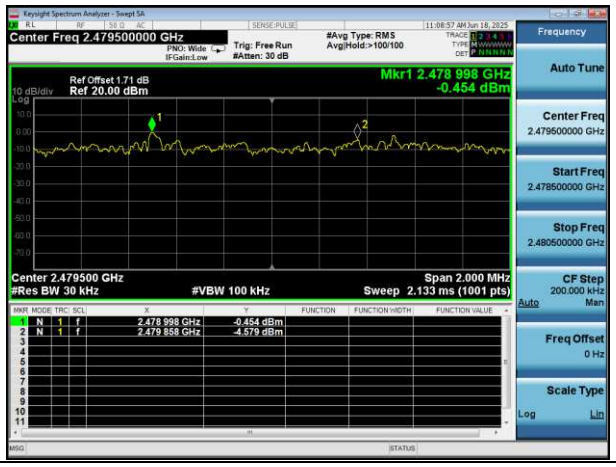
Lowest



Middle



Highest



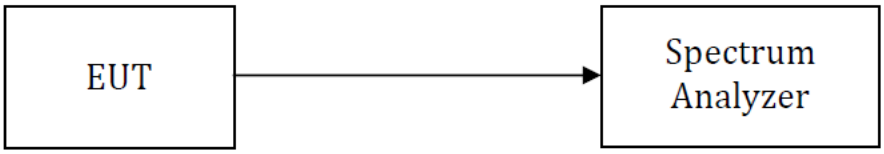
12. Number of Hopping Channel

12.1 Standard and Limit

According to FCC 15.247(a)(1), frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, and frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

12.2 Test Procedure

1) Remove the antenna from the EUT and connect to the spectrum analyzer via a low loss RF cable.
2) Set the spectrum analyzer to any one measured frequency within its operating range.
3) Set RBW = 100kHz, VBW = 300kHz, Sweep = Auto, Detector = Peak.
4) Set the spectrum analyzer on Max hold mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
5) Set the spectrum analyzer on View mode and then plot the result on the screen of the spectrum analyzer.
6) Repeat the above procedures until all frequencies measured were complete.



Test Setup Block Diagram

12.3 Test Data and Results

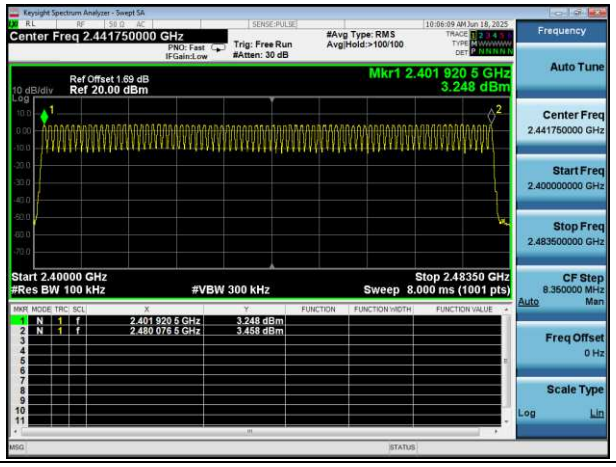
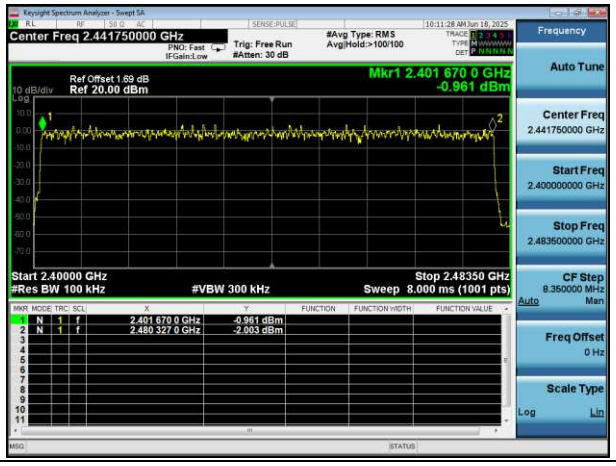
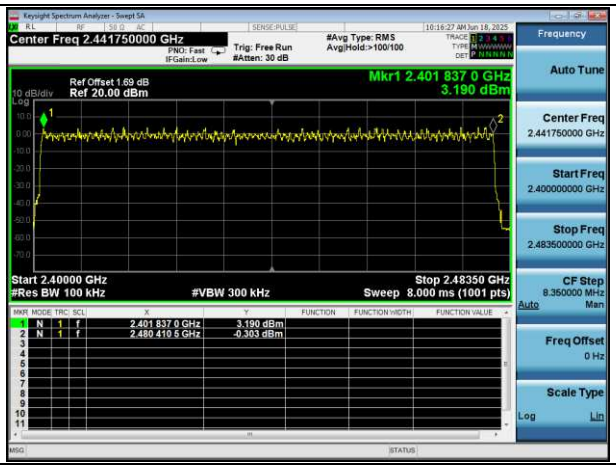
Left earphone:

Test Mode	Number of Hopping Channel	Limit	Test Result
GFSK	79	15	Pass
Pi/4 DQPSK	79	15	Pass
8DPSK	79	15	Pass

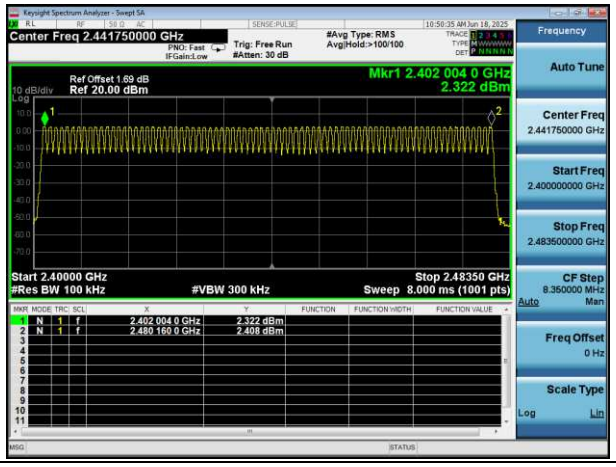
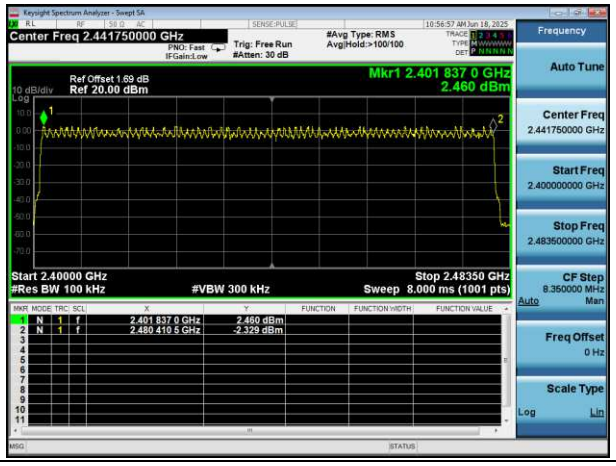
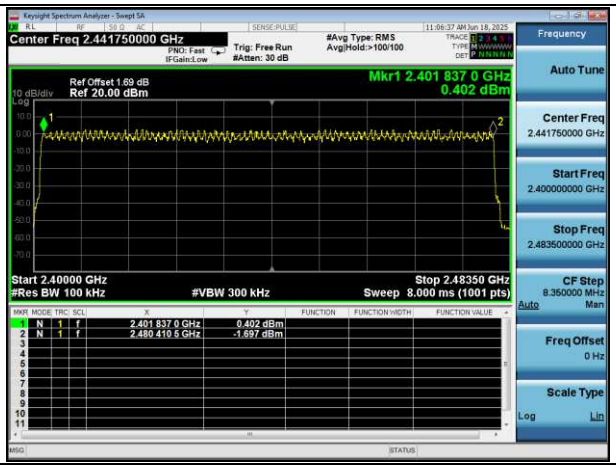
Right earphone:

Test Mode	Number of Hopping Channel	Limit	Test Result
GFSK	79	15	Pass
Pi/4 DQPSK	79	15	Pass
8DPSK	79	15	Pass

Left earphone:

Number of Hopping Channel
GFSK

Pi/4 DQPSK

8DPSK


Right earphone:

Number of Hopping Channel
GFSK 
Pi/4 DQPSK 
8DPSK 

13. Band-edge Emission(Conducted)

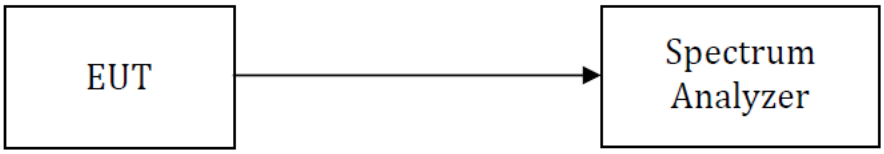
13.1 Standard and Limit

According to §15.247(d), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

13.2 Test Procedure

Test is conducting under the description of ANSI C63.10 - 2013 section 6.10.

1) Remove the antenna from the EUT and connect to the spectrum analyzer via a low loss RF cable.
2) Set the spectrum analyzer to any one measured frequency within its operating range.
3) Set RBW = 100kHz, VBW = 300kHz, Sweep = Auto, Detector = Peak.
4) Measure the highest amplitude appearing on spectral display and set it as a reference level.
5) Set a convenient frequency span including 100 kHz bandwidth from band edge.
6) Measure the emission and marking the edge frequency.
7) Repeat above procedures until all frequencies measured were complete.



Test Setup Block Diagram

13.3 Test Data and Results

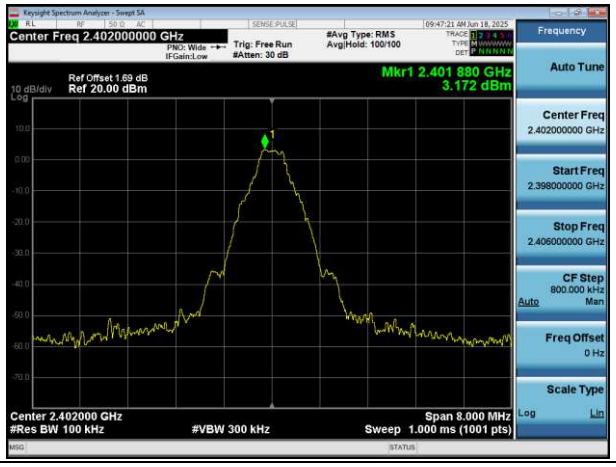
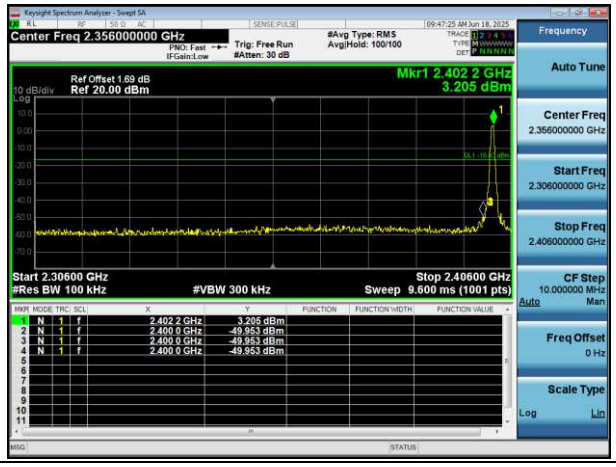
Left earphone:

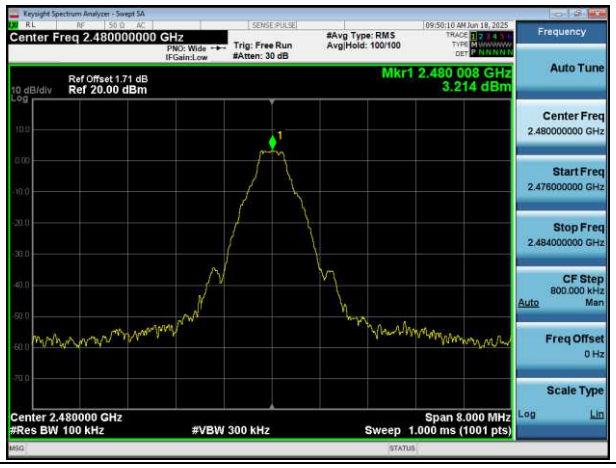
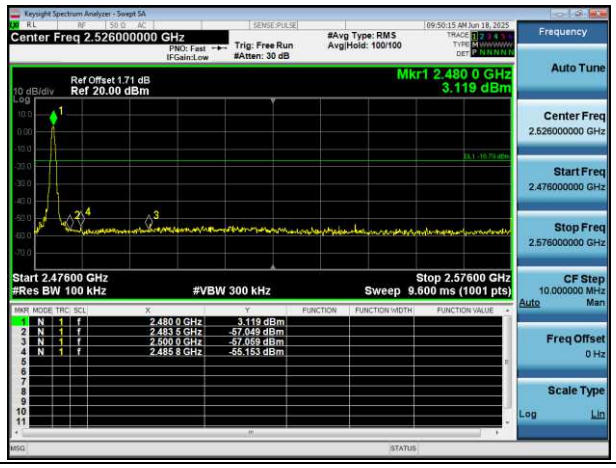
Test Mode	Band-edge	Test Channel (MHz)	Max. Value (dBc)	Limit (dBc)	Test Result
No-Hopping					
GFSK	Lowest	2402	-53.12	-20	Pass
	Highest	2480	-58.36	-20	Pass
Pi/4 DQPSK	Lowest	2402	-50.13	-20	Pass
	Highest	2480	-57.37	-20	Pass
8DSK	Lowest	2402	-49.89	-20	Pass
	Highest	2480	-58.39	-20	Pass
Hopping					
GFSK	Lowest	2402	-51.98	-20	Pass
	Highest	2480	-53.41	-20	Pass
Pi/4 DQPSK	Lowest	2402	-52.72	-20	Pass
	Highest	2480	-53.48	-20	Pass
8DSK	Lowest	2402	-52.33	-20	Pass
	Highest	2480	-56.07	-20	Pass

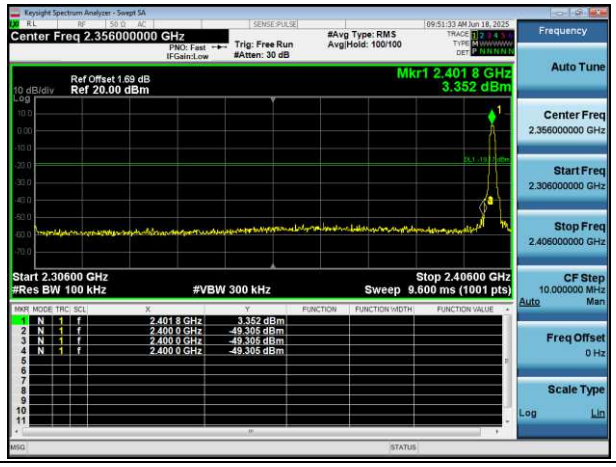
Right earphone:

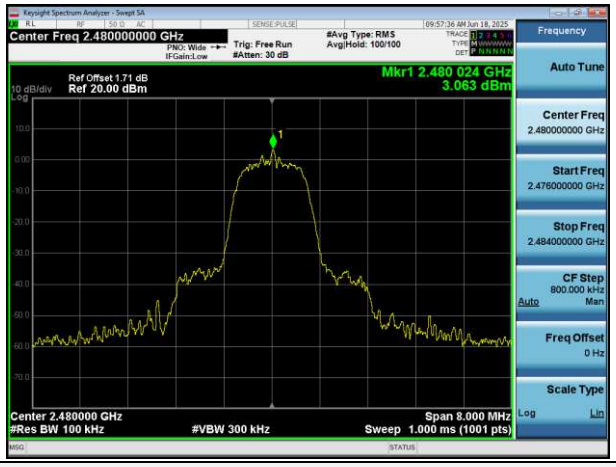
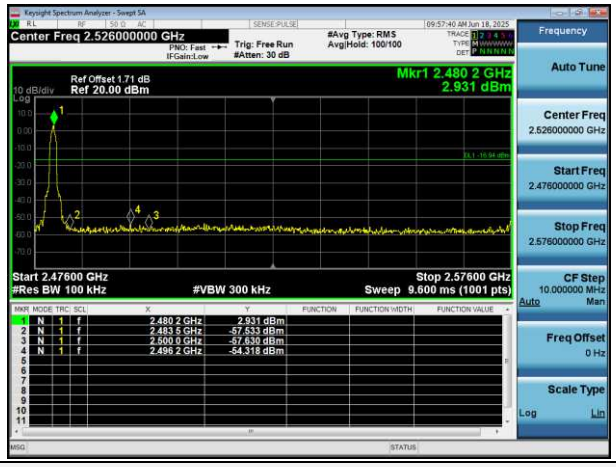
Test Mode	Band-edge	Test Channel (MHz)	Max. Value (dBc)	Limit (dBc)	Test Result
No-Hopping					
GFSK	Lowest	2402	-54.89	-20	Pass
	Highest	2480	-57.25	-20	Pass
Pi/4 DQPSK	Lowest	2402	-52.08	-20	Pass
	Highest	2480	-56.6	-20	Pass
8DSK	Lowest	2402	-53.15	-20	Pass
	Highest	2480	-57.49	-20	Pass
Hopping					
GFSK	Lowest	2402	-53.37	-20	Pass
	Highest	2480	-55.31	-20	Pass
Pi/4 DQPSK	Lowest	2402	-54.15	-20	Pass
	Highest	2480	-54.52	-20	Pass
8DSK	Lowest	2402	-54.66	-20	Pass
	Highest	2480	-55.62	-20	Pass

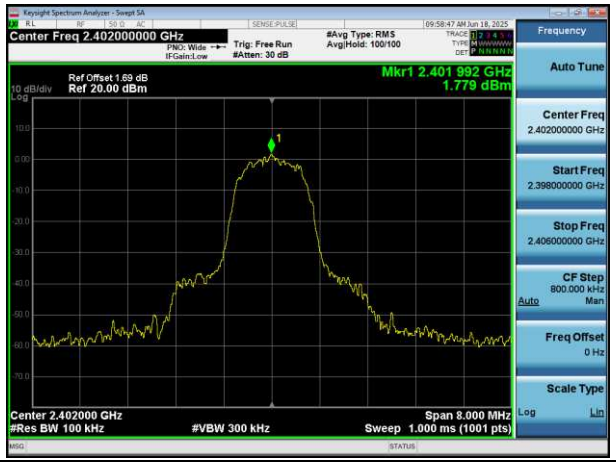
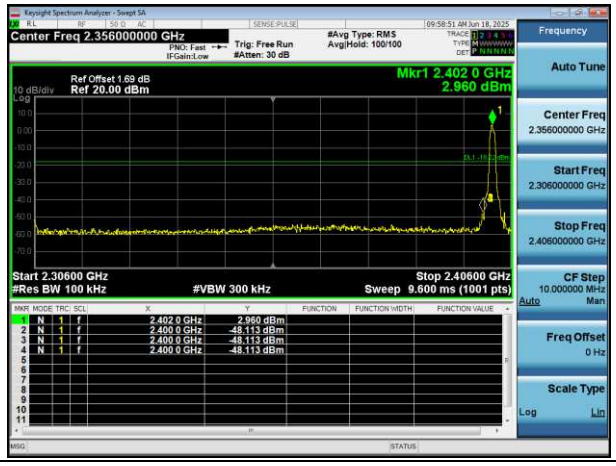
Left earphone:

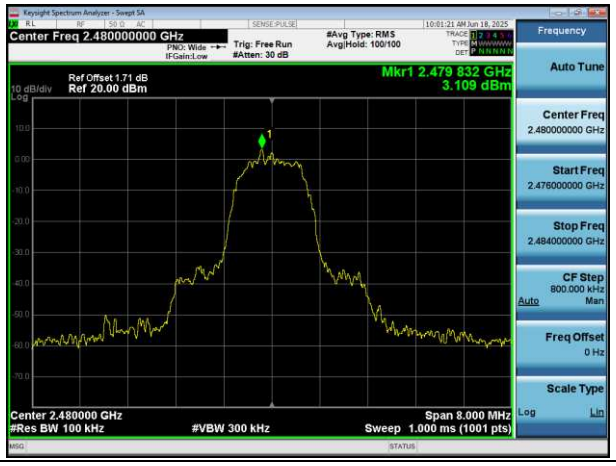
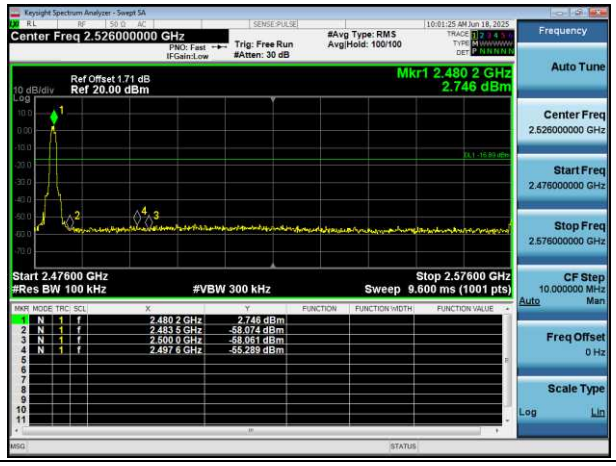
No-Hopping GFSK Lowest	
Reference Power	Band-edge Emission
	

No-Hopping GFSK Highest	
Reference Power	Band-edge Emission
	

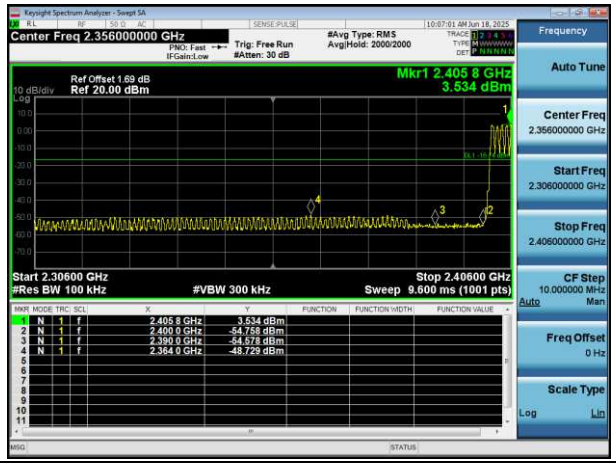
No-Hopping Pi/4 DQPSK Lowest	
Reference Power	Band-edge Emission
	

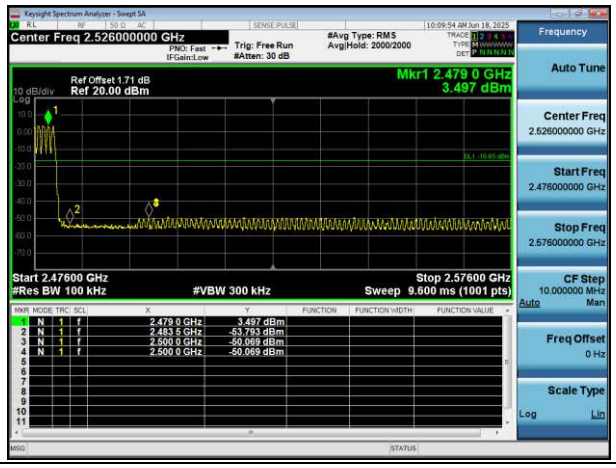
No-Hopping Pi/4 DQPSK Highest	
Reference Power	Band-edge Emission
	

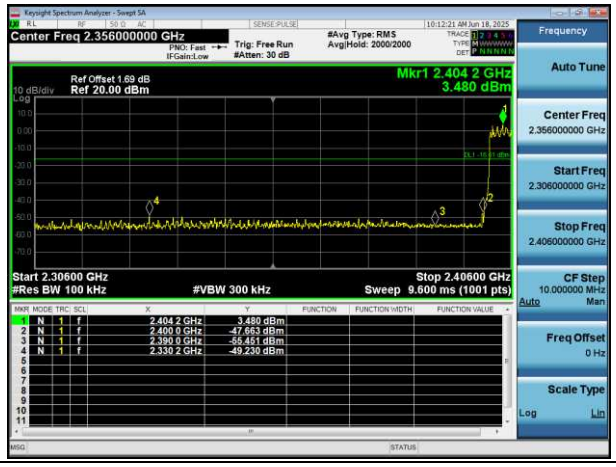
No-Hopping 8DPSK Lowest	
Reference Power	Band-edge Emission
	

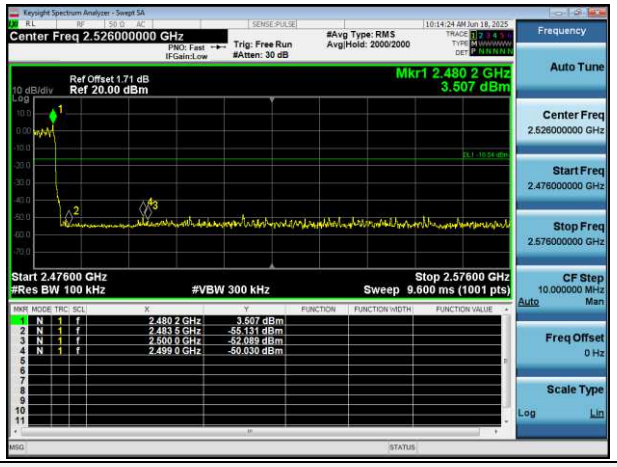
No-Hopping 8DPSK Highest	
Reference Power	Band-edge Emission
	

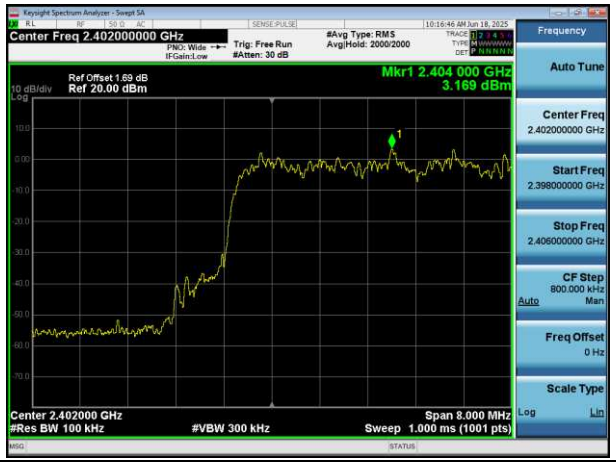
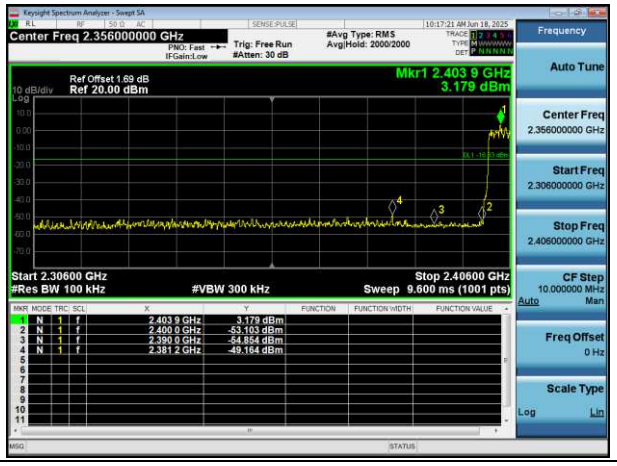
Left earphone:

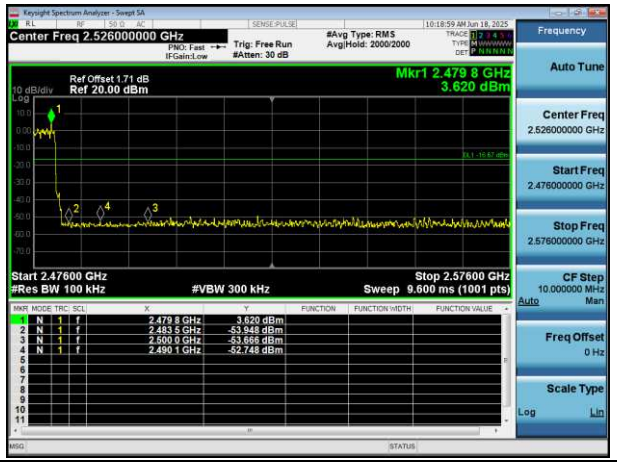
Hopping GFSK Lowest	
Reference Power	Band-edge Emission
	

Hopping GFSK Highest	
Reference Power	Band-edge Emission
	

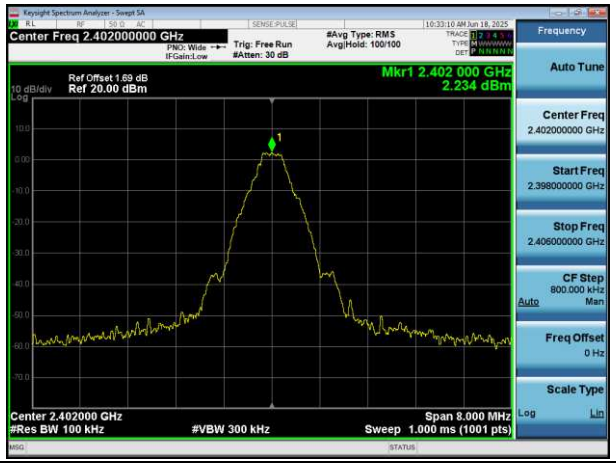
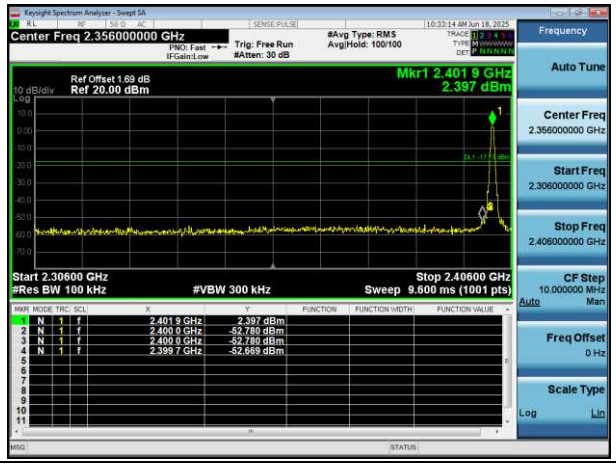
Hopping Pi/4 DQPSK Lowest	
Reference Power	Band-edge Emission
	

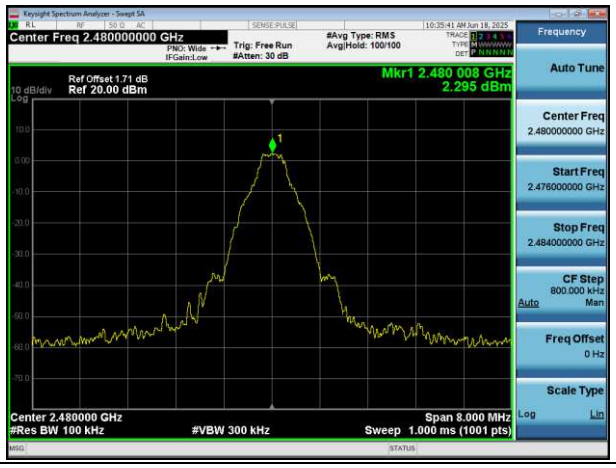
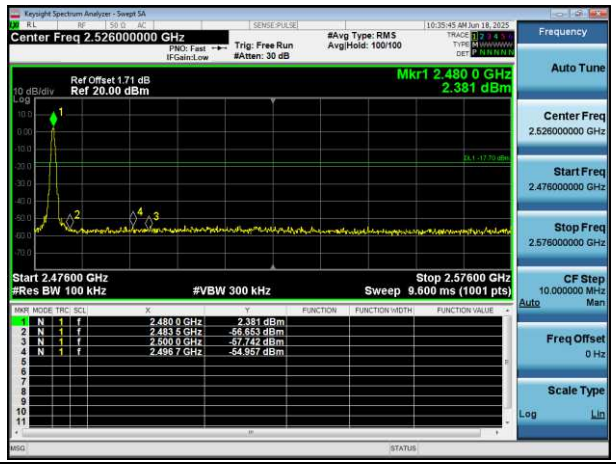
Hopping Pi/4 DQPSK Highest	
Reference Power	Band-edge Emission
	

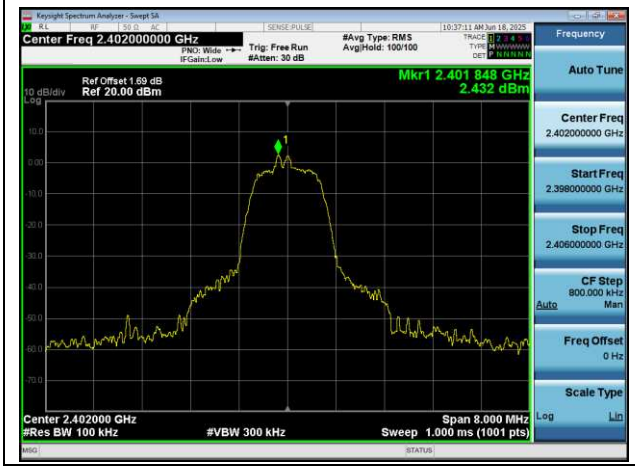
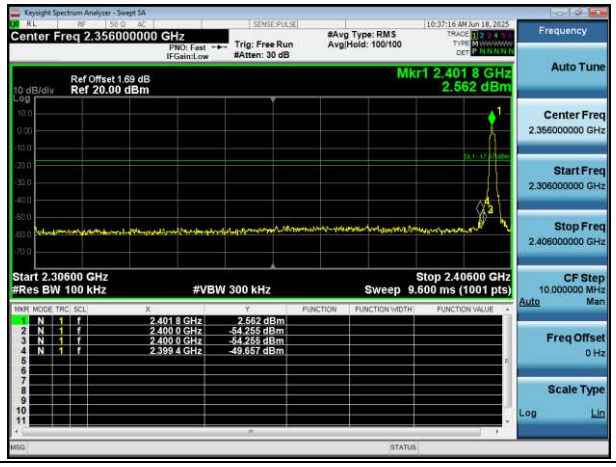
Hopping 8DPSK Lowest	
Reference Power	Band-edge Emission
	

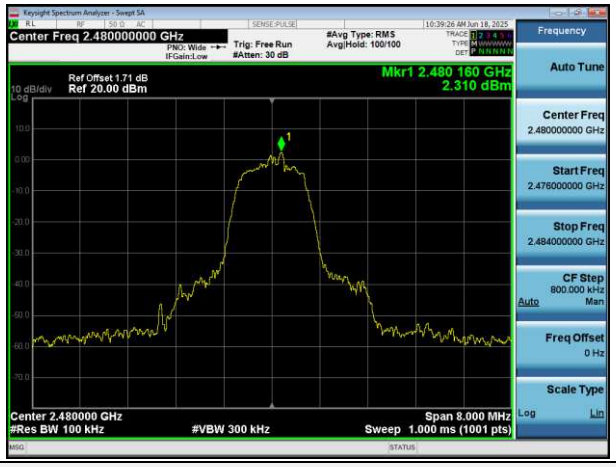
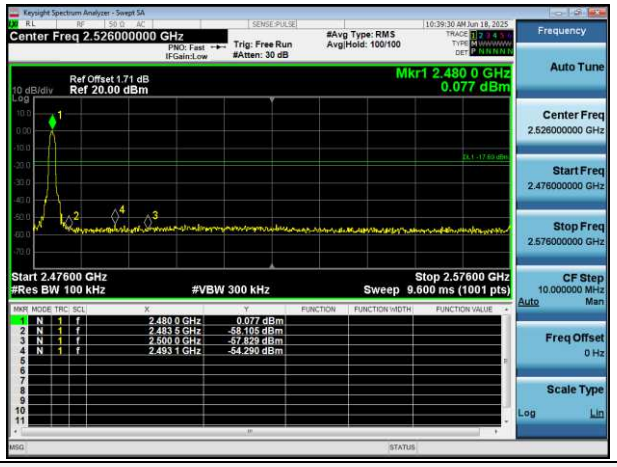
Hopping 8DPSK Highest	
Reference Power	Band-edge Emission
	

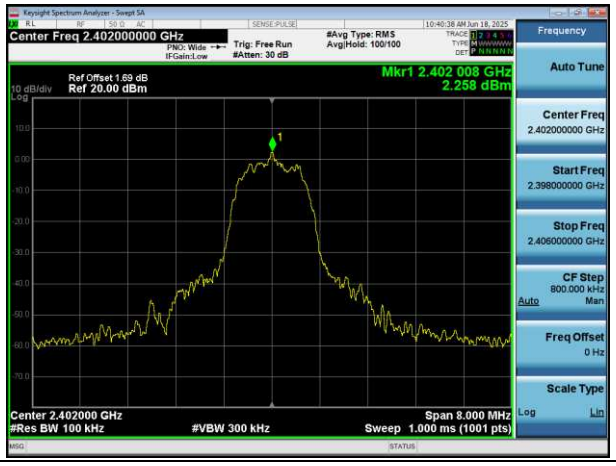
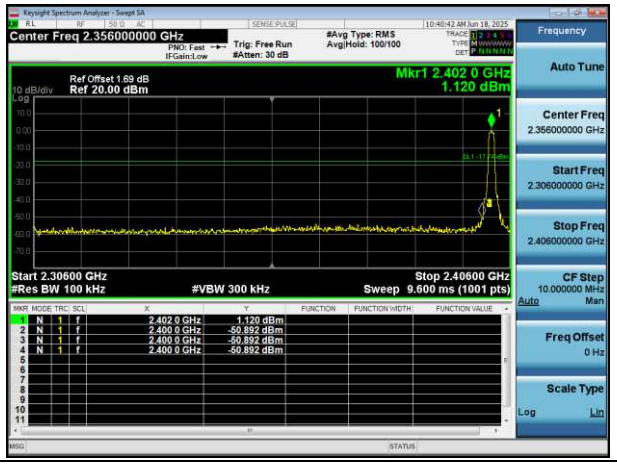
Right earphone:

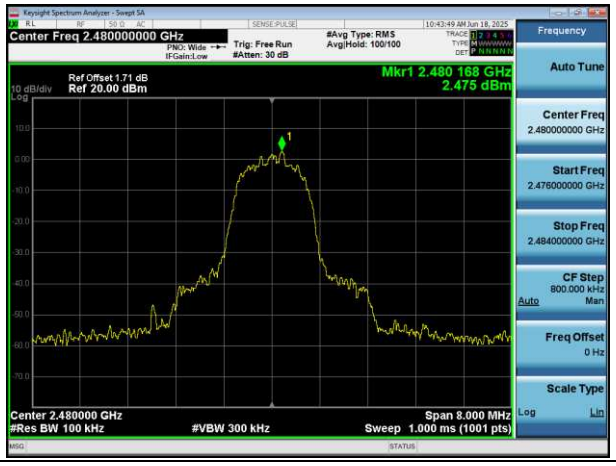
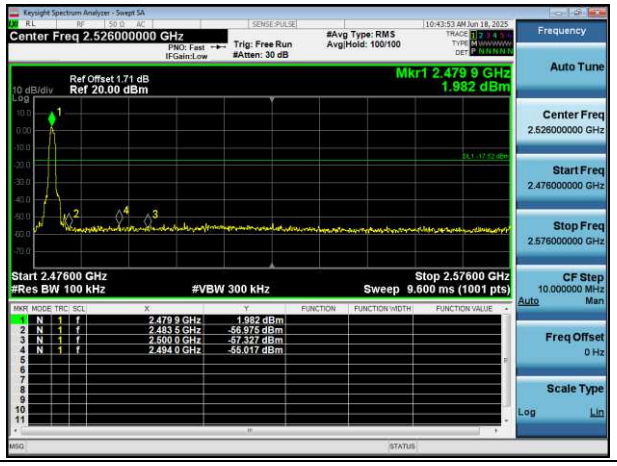
No-Hopping GFSK Lowest	
Reference Power	Band-edge Emission
	

No-Hopping GFSK Highest	
Reference Power	Band-edge Emission
	

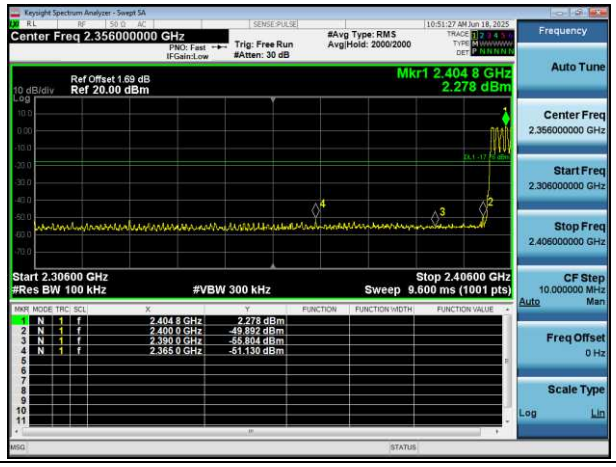
No-Hopping Pi/4 DQPSK Lowest	
Reference Power	Band-edge Emission
	

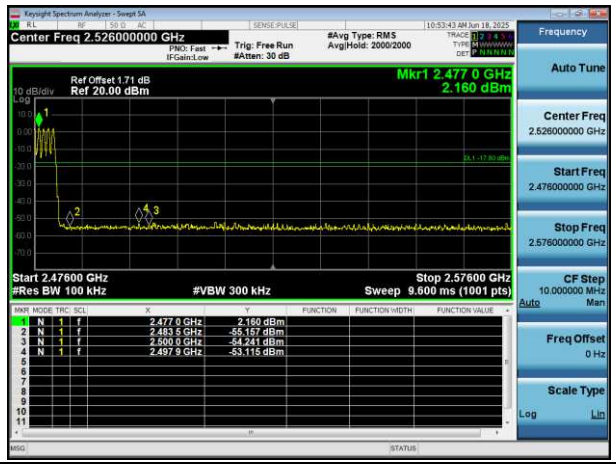
No-Hopping Pi/4 DQPSK Highest	
Reference Power	Band-edge Emission
	

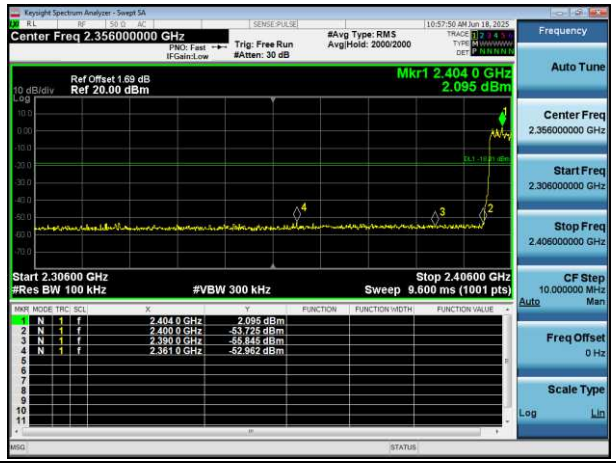
No-Hopping 8DPSK Lowest	
Reference Power	Band-edge Emission
	

No-Hopping 8DPSK Highest	
Reference Power	Band-edge Emission
	

Right earphone:

Hopping GFSK Lowest	
Reference Power	Band-edge Emission
	

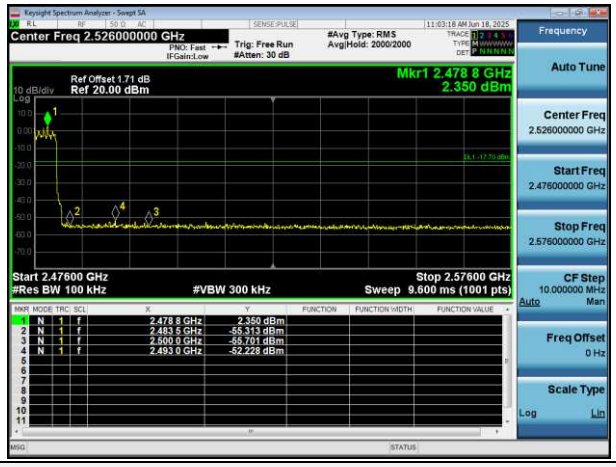
Hopping GFSK Highest	
Reference Power	Band-edge Emission
	

Hopping Pi/4 DQPSK Lowest	
Reference Power	Band-edge Emission
	

Hopping Pi/4 DQPSK Highest

Reference Power

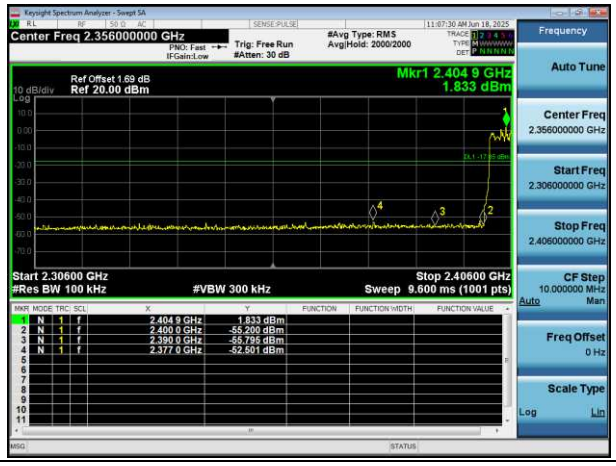
Band-edge Emission



Hopping 8DPSK Lowest

Reference Power

Band-edge Emission



Hopping 8DPSK Highest

Reference Power

Band-edge Emission

14. Conducted RF Spurious Emissions

14.1 Standard and Limit

According to §15.247(d), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

14.2 Test Procedure

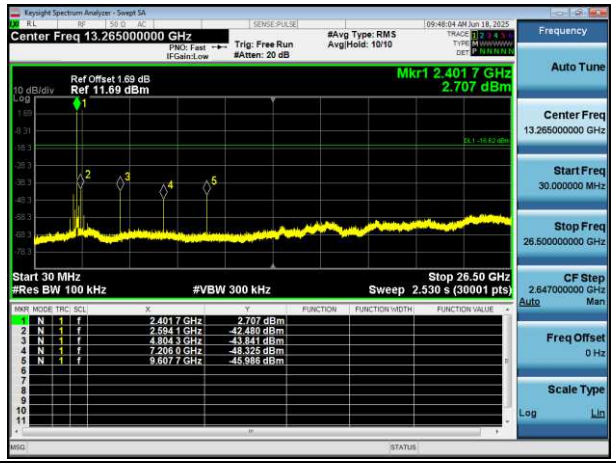
Test is conducting under the description of ANSI C63.10 - 2013 section 6.7.
1) Remove the antenna from the EUT and connect to the spectrum analyzer via a low loss RF cable.
2) Set the spectrum analyzer to any one measured frequency within its operating range.
3) Set RBW = 100kHz, VBW = 300kHz, Sweep = Auto, Detector = Peak.
4) Measure the highest amplitude appearing on spectral display and set it as a reference level.
5) Measure the spurious emissions with frequency range from 9kHz to 26.5GHz.
6) Repeat above procedures until all measured frequencies were complete.

Test Setup Block Diagram

14.3 Test Data and Results

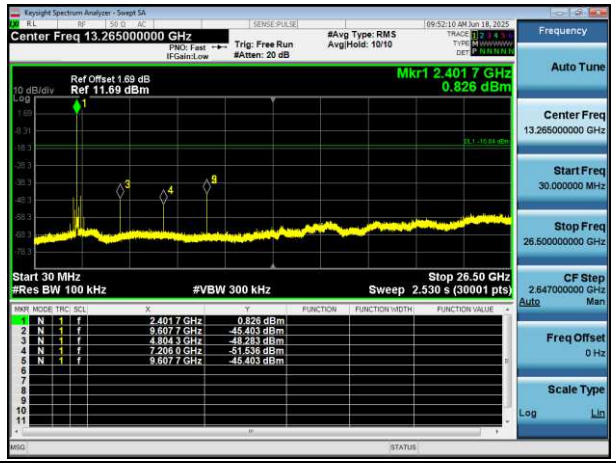
Note: The measurement frequency range is from 9kHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions measurement data.

Left earphone:

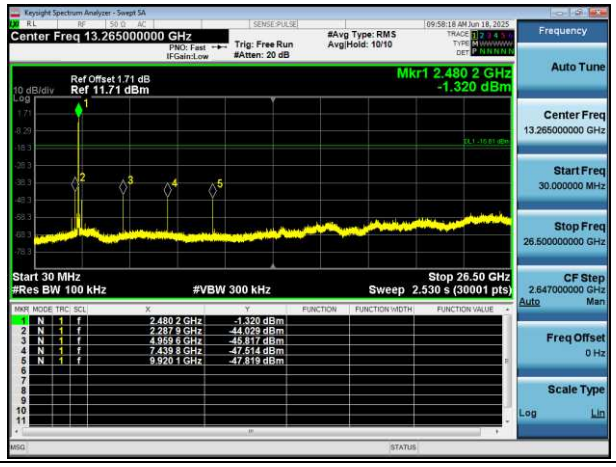
GFSK Lowest	
Reference Power	Spurious Emissions
	

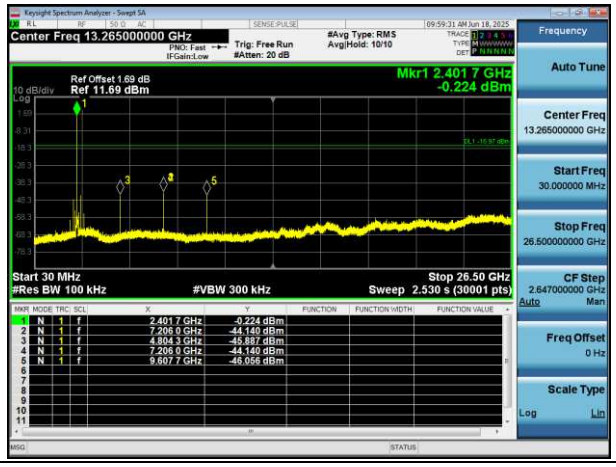
GFSK Middle	
Reference Power	Spurious Emissions

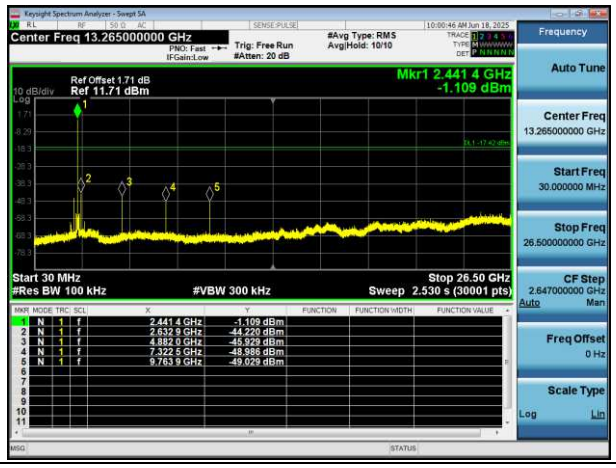
GFSK Highest	
Reference Power	Spurious Emissions

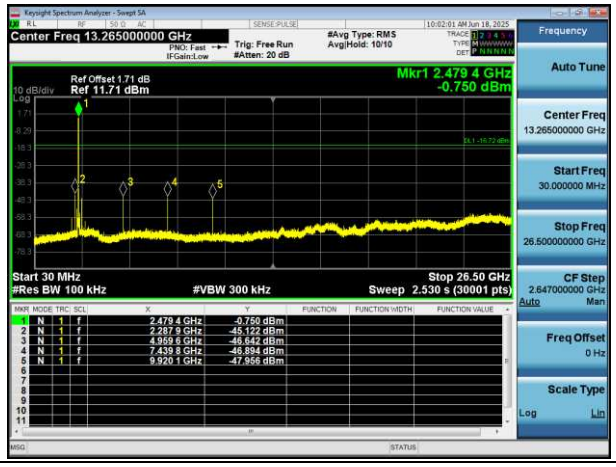
Pi/4 DQPSK Lowest	
Reference Power	Spurious Emissions
	

Pi/4 DQPSK Middle	
Reference Power	Spurious Emissions

Pi/4 DQPSK Highest	
Reference Power	Spurious Emissions
	

8DPSK Lowest	
Reference Power	Spurious Emissions
	

8DPSK Middle	
Reference Power	Spurious Emissions
	

8DPSK Highest	
Reference Power	Spurious Emissions
	

Right earphone:

GFSK Lowest

Reference Power

Spurious Emissions

GFSK Middle

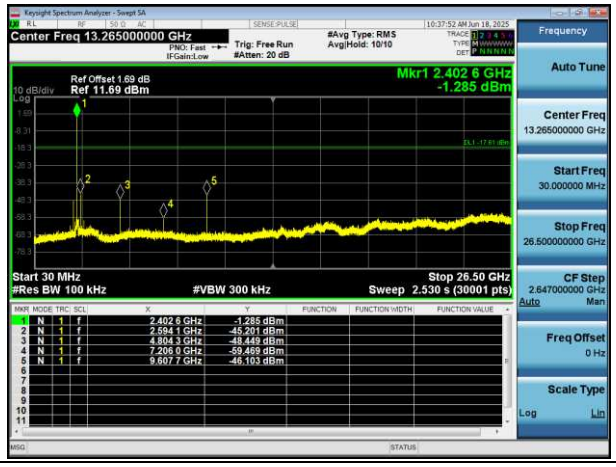
Reference Power

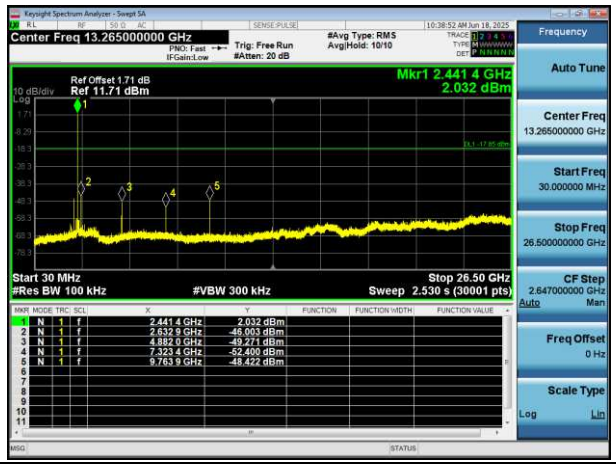
Spurious Emissions

GFSK Highest

Reference Power

Spurious Emissions

Pi/4 DQPSK Lowest	
Reference Power	Spurious Emissions
	

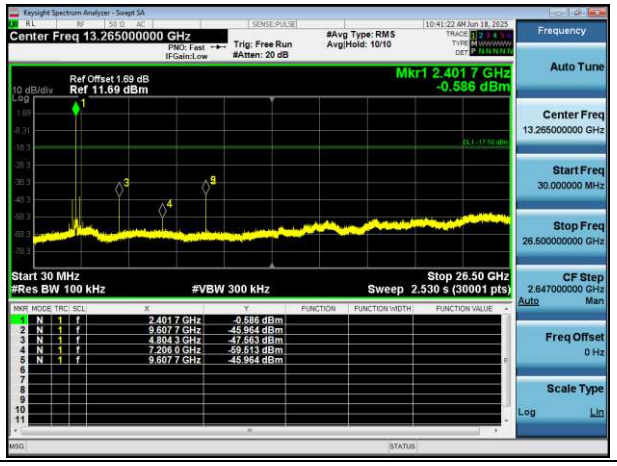
Pi/4 DQPSK Middle	
Reference Power	Spurious Emissions
	

Pi/4 DQPSK Highest	
Reference Power	Spurious Emissions

8DPSK Lowest

Reference Power

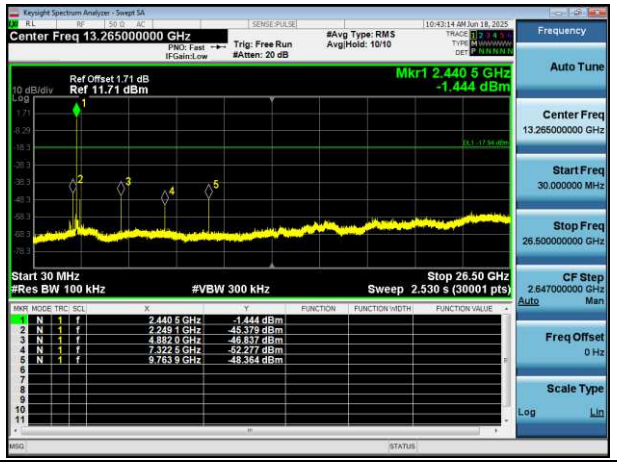
Spurious Emissions



8DPSK Middle

Reference Power

Spurious Emissions



8DPSK Highest

Reference Power

Spurious Emissions

******* END OF REPORT *******