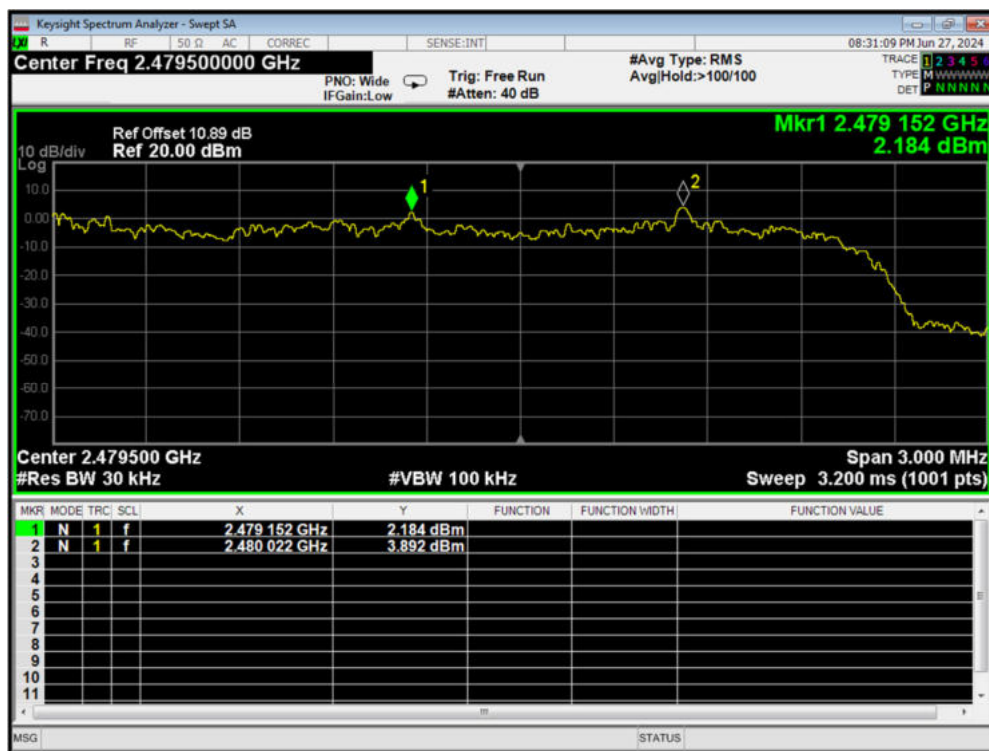


CFS 3-DH5 2480MHz



5.4 Time of Occupancy (Dwell Time)

Ambient condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

Methods of Measurement

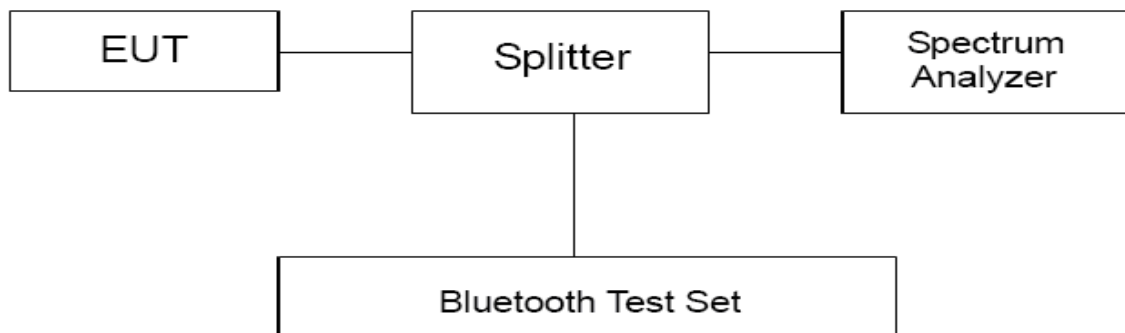
The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. RBW is set to 1MHz and VBW is set to 1MHz on spectrum analyzer. The dwell time is calculated by:

Dwell time = Pulse Time * Number of Pulses in 31.6 seconds.

In normal mode, The selected EUT Packet type uses a slot type of DH5 packet and a hopping rate of 1600(ch*hop/s) for all channels. So the final hopping rate for all channel is $1600/5=320(\text{ch*hop/s})$

In AFH mode, The selected EUT Packet type uses a slot type of DH5 packet and a hopping rate of 800(ch*hop/s) for all channels. So the final hopping rate for all channel is $800/5=160(\text{ch*hop/s})$

Test Setup



Limits

Rule Part15.247(a) specifies that " Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed."

Dwell time	$\leq 400\text{ms}$
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$.

Requirements	Uncertainty					
Dwell Time	DH5	$U=0.70\text{ms}$	2DH5	$U=0.70\text{ms}$	3DH5	$U=0.70\text{ms}$

Test Results:

In normal mode:

Antenna 1

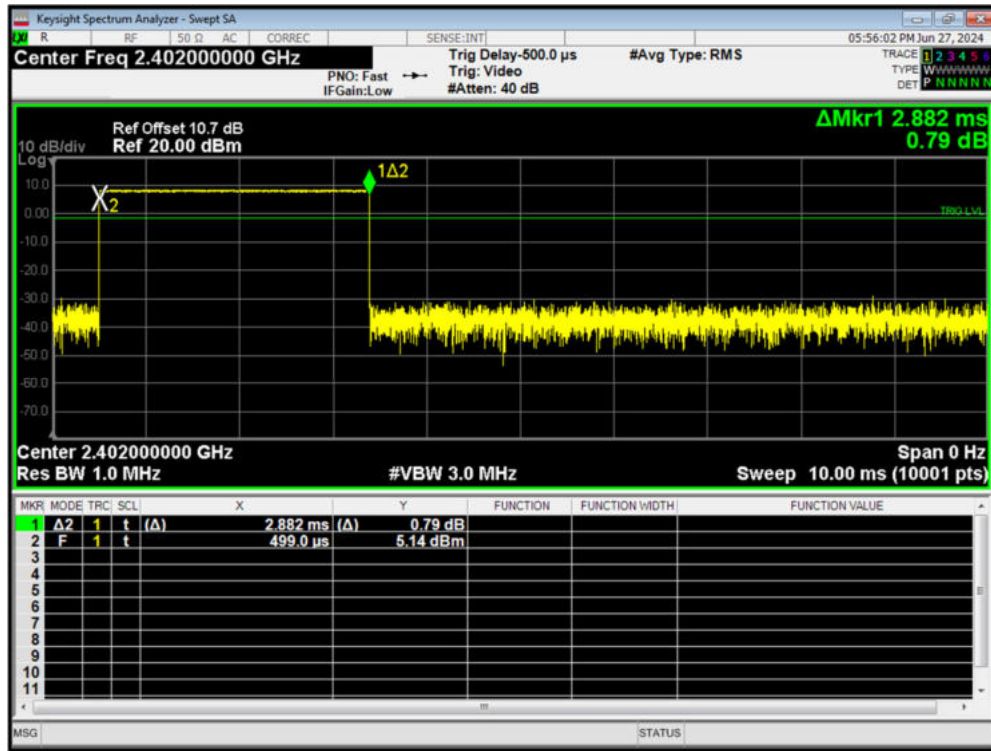
Test Mode	Frequency (MHz)	Number of Pulses in 31.6 seconds	Pulse Time (ms)	Dwell time (ms)	Limit (ms)	Conclusion
DH5	2402	111	2.882	319.902	400	PASS
	2441	109	2.883	314.247	400	PASS
	2480	98	2.883	282.534	400	PASS
2DH5	2402	113	2.885	326.005	400	PASS
	2441	108	2.884	311.472	400	PASS
	2480	112	2.884	323.008	400	PASS
3DH5	2402	106	2.886	305.916	400	PASS
	2441	110	2.885	317.350	400	PASS
	2480	104	2.887	300.248	400	PASS
Note: Dwell time = Pulse Time * Number of Pulses in 31.6 seconds						

Antenna 2

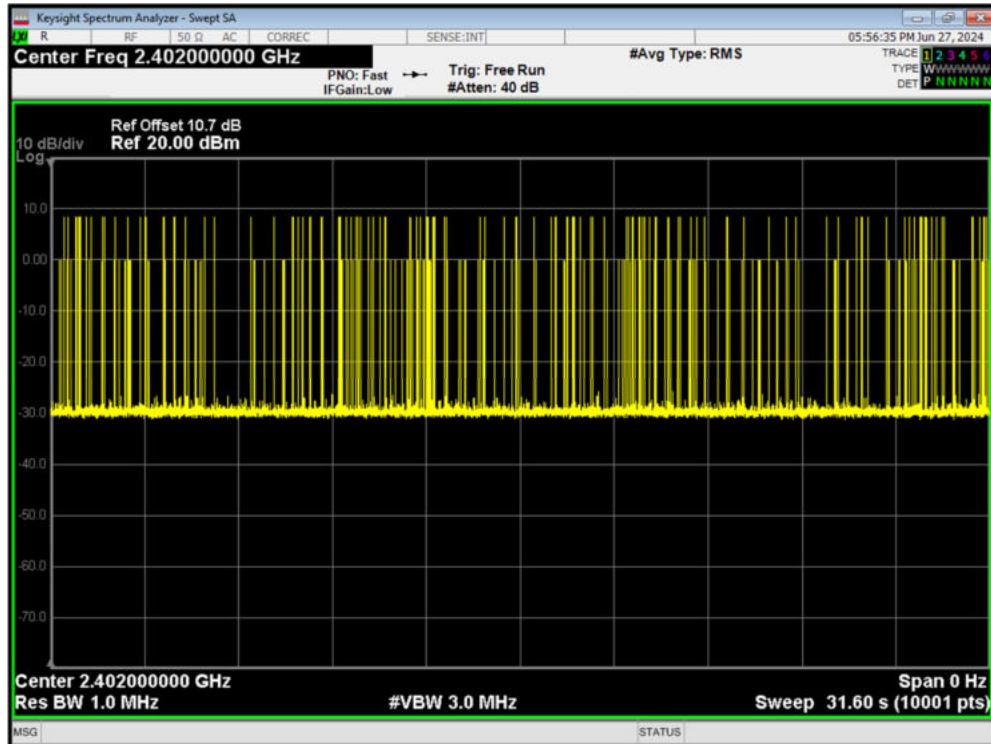
Test Mode	Frequency (MHz)	Number of Pulses in 31.6 seconds	Pulse Time (ms)	Dwell time (ms)	Limit (ms)	Conclusion
DH5	2402	99	2.884	285.516	400	PASS
	2441	104	2.884	299.936	400	PASS
	2480	100	2.882	288.200	400	PASS
2DH5	2402	108	2.883	311.364	400	PASS
	2441	113	2.884	325.892	400	PASS
	2480	99	2.885	285.615	400	PASS
3DH5	2402	107	2.887	308.909	400	PASS
	2441	102	2.887	294.474	400	PASS
	2480	105	2.886	303.030	400	PASS
Note: Dwell time = Pulse Time * Number of Pulses in 31.6 seconds						

Antenna 1

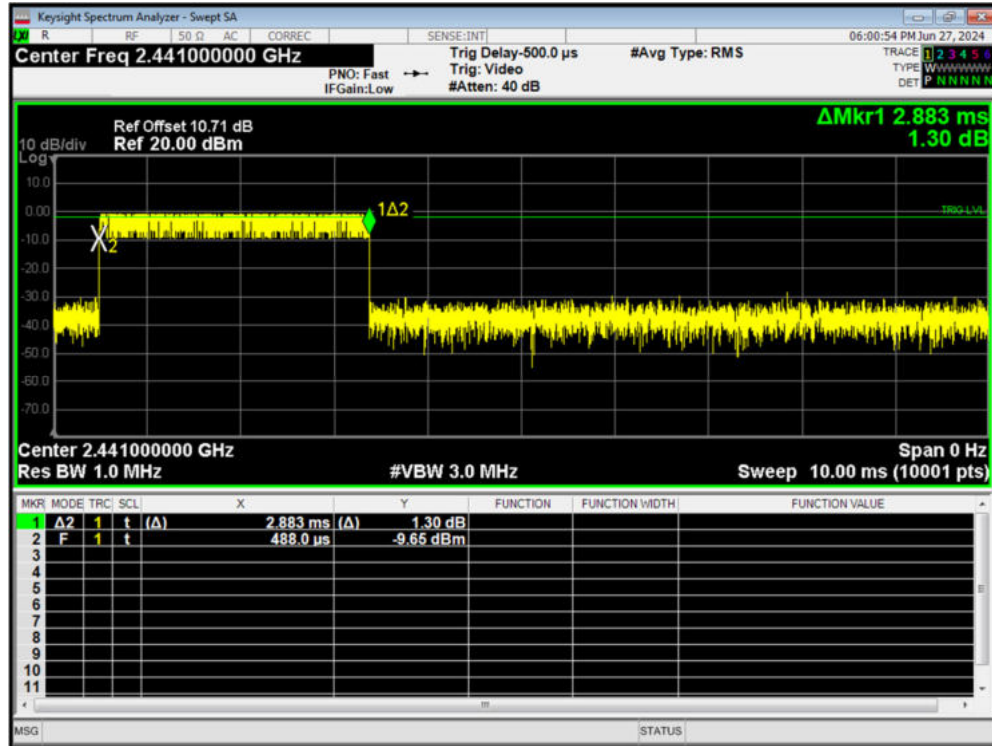
Dwell 1-DH5 2402MHz One Burst



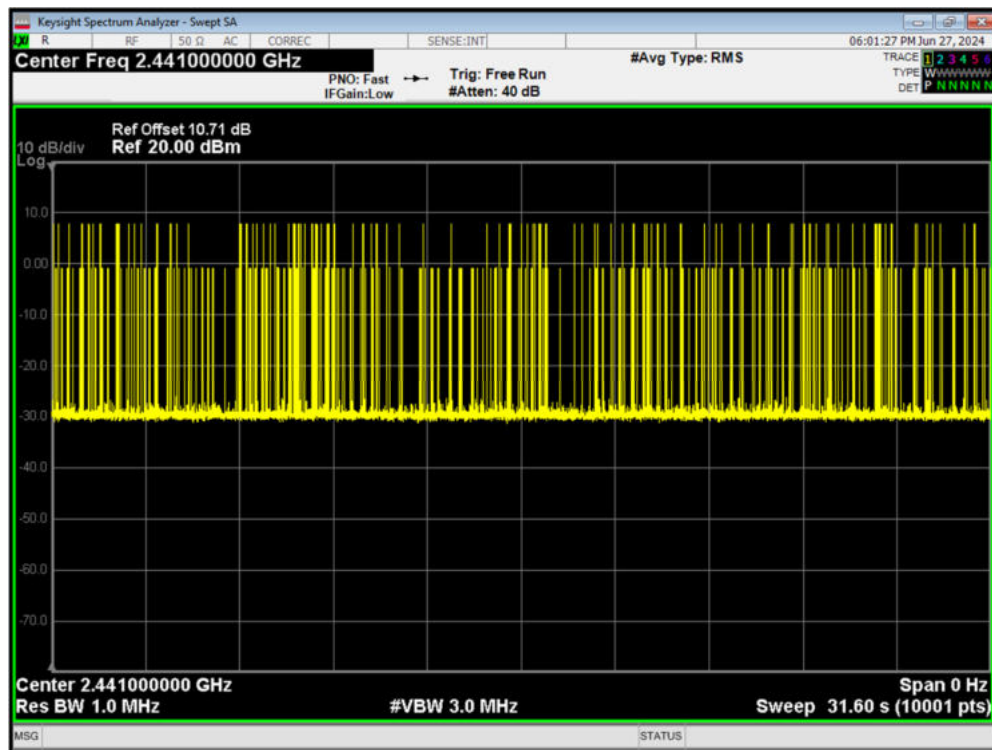
Dwell 1-DH5 2402MHz Accumulated



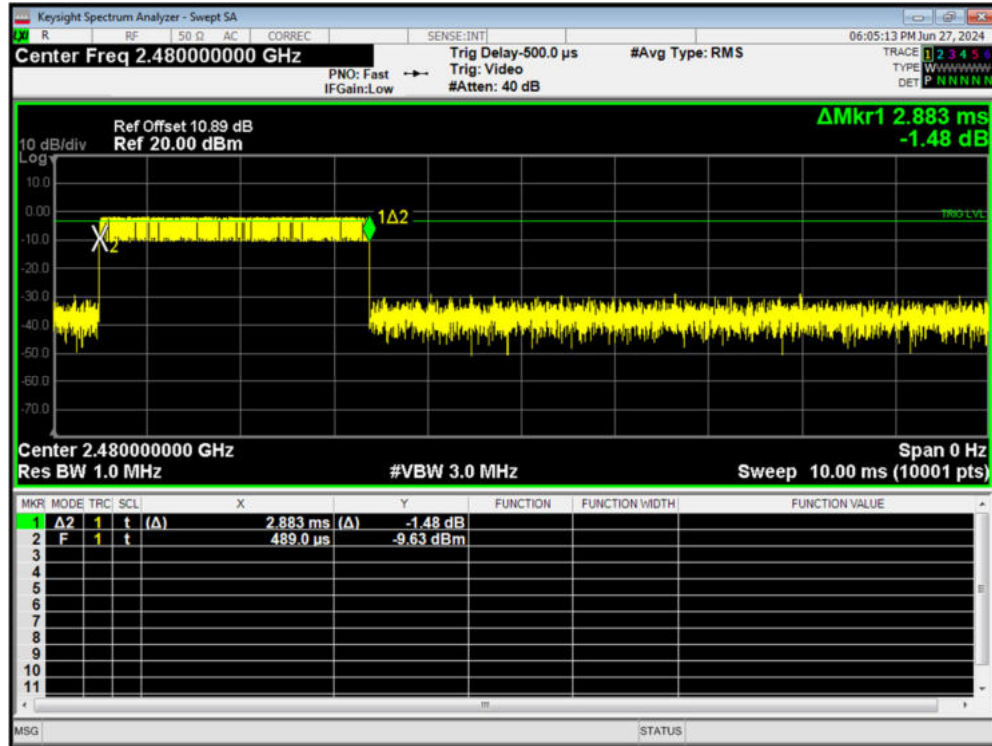
Dwell 1-DH5 2441MHz One Burst



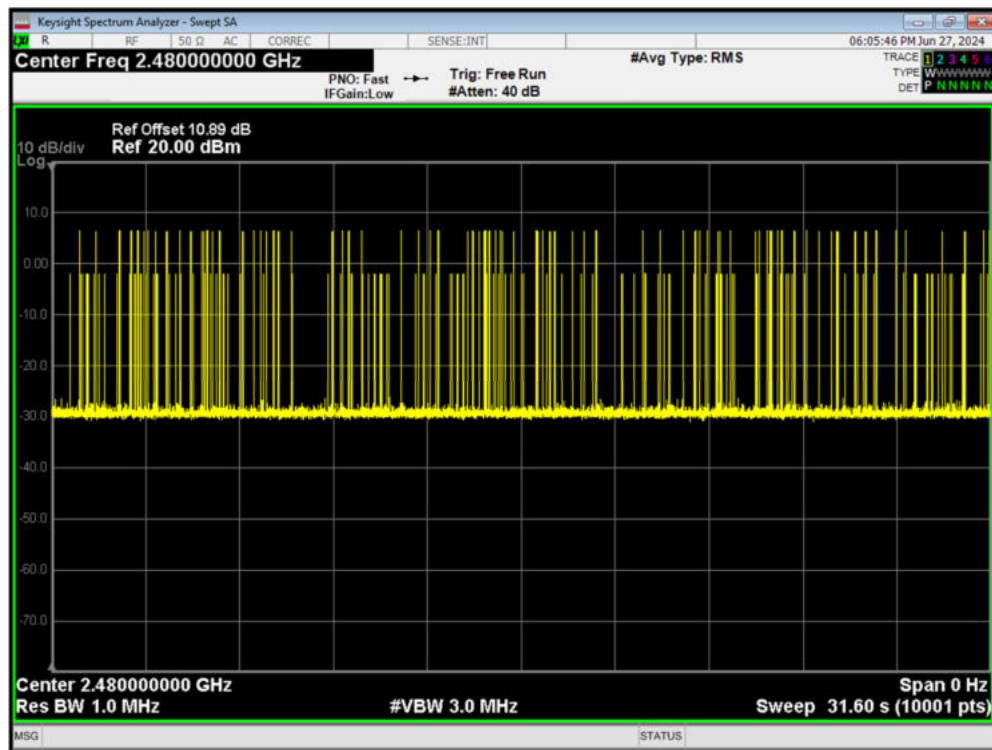
Dwell 1-DH5 2441MHz Accumulated



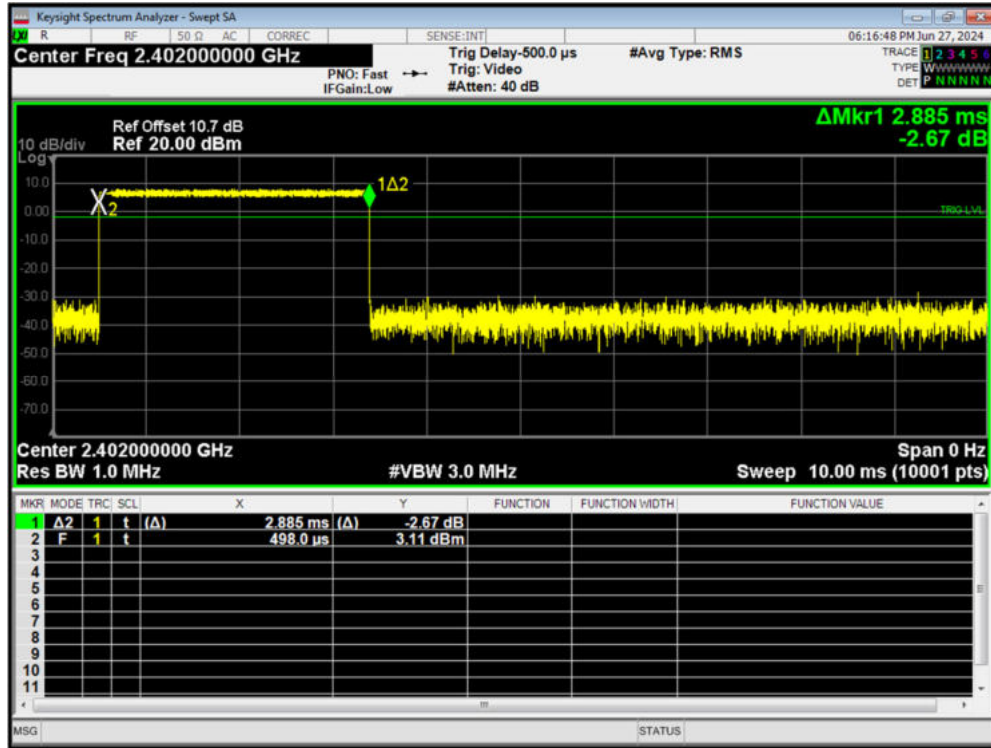
Dwell 1-DH5 2480MHz One Burst



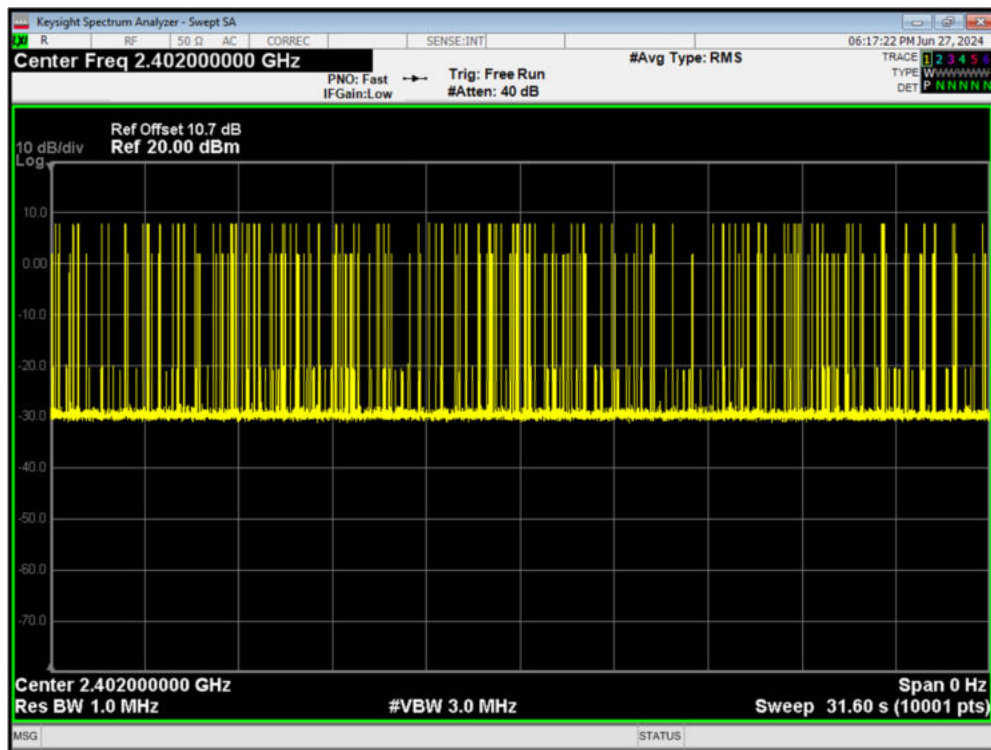
Dwell 1-DH5 2480MHz Accumulated



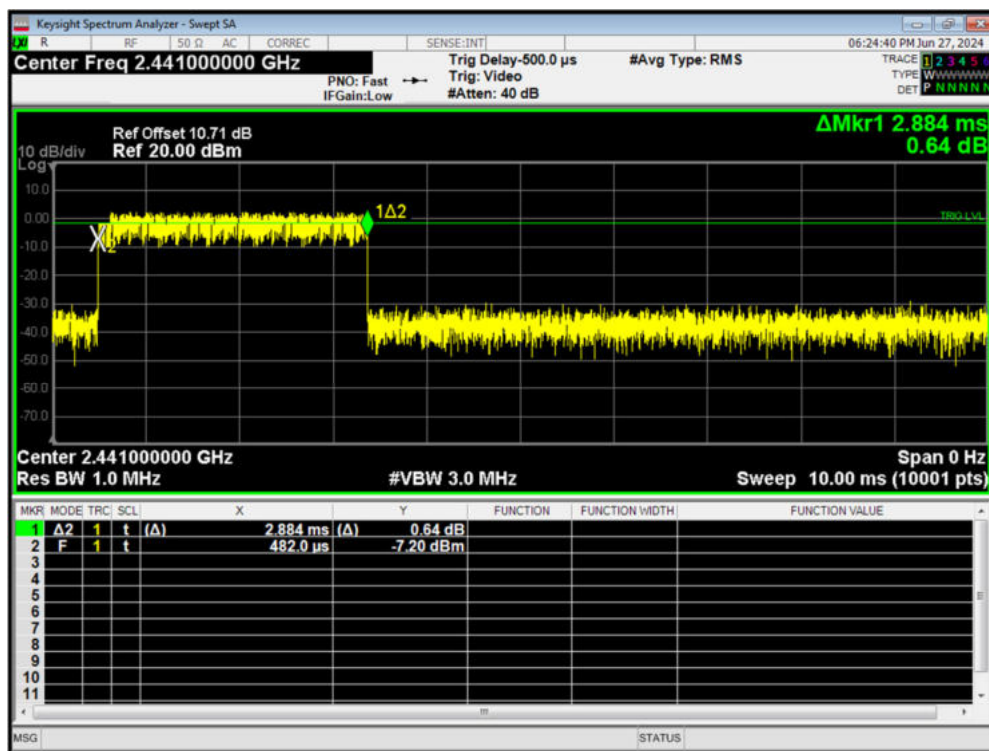
Dwell 2-DH5 2402MHz One Burst



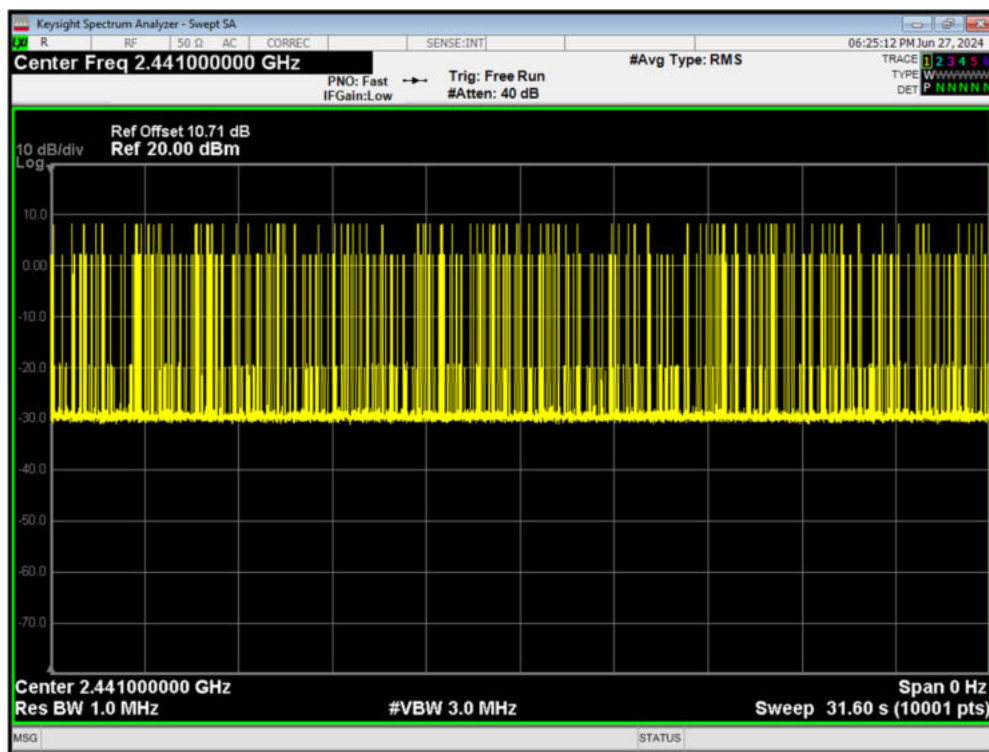
Dwell 2-DH5 2402MHz Accumulated



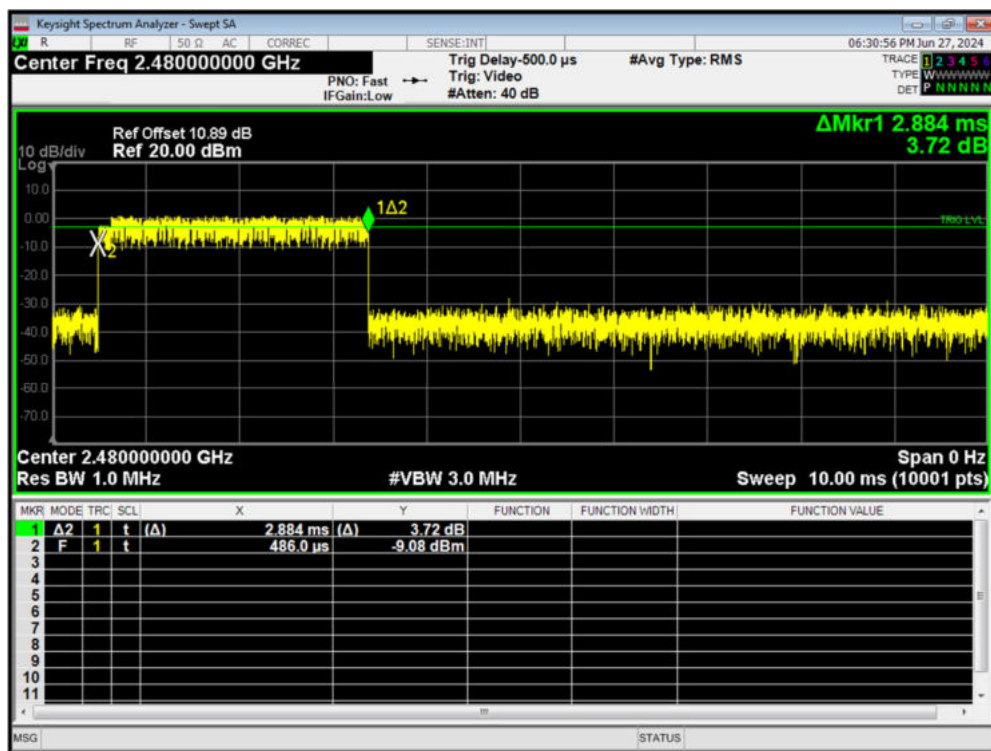
Dwell 2-DH5 2441MHz One Burst



Dwell 2-DH5 2441MHz Accumulated



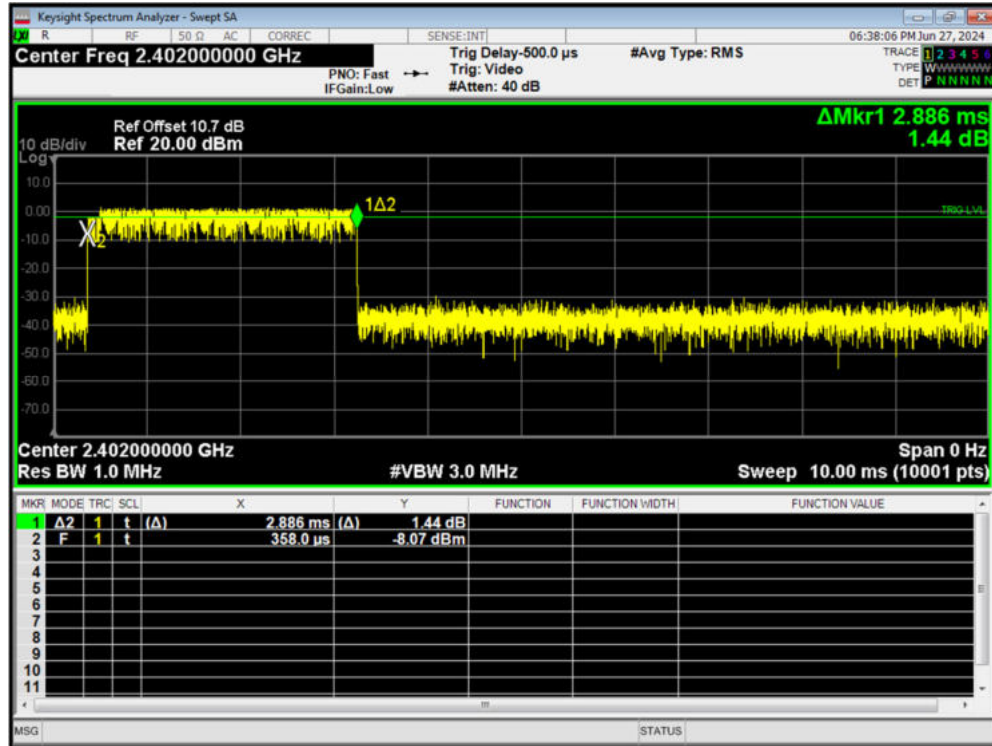
Dwell 2-DH5 2480MHz One Burst



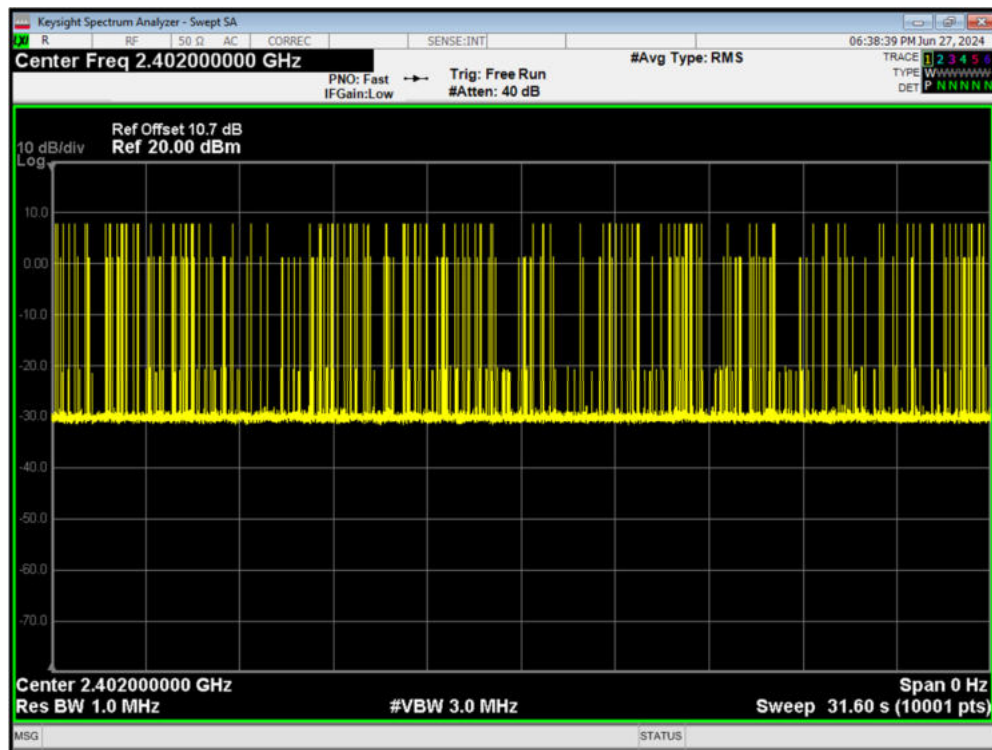
Dwell 2-DH5 2480MHz Accumulated



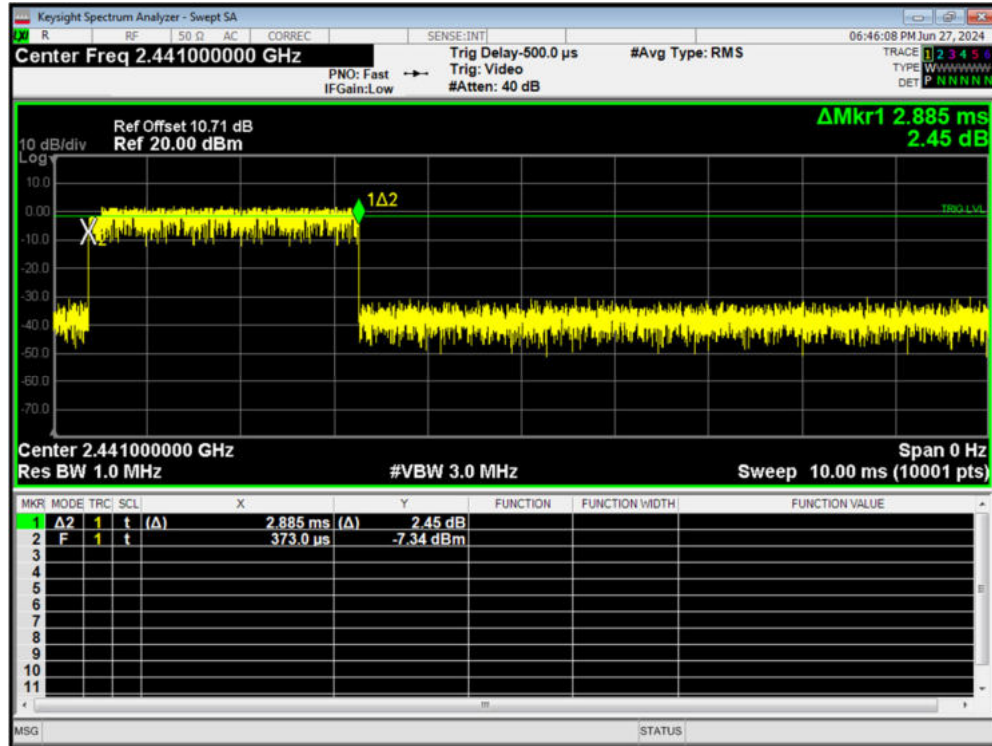
Dwell 3-DH5 2402MHz One Burst



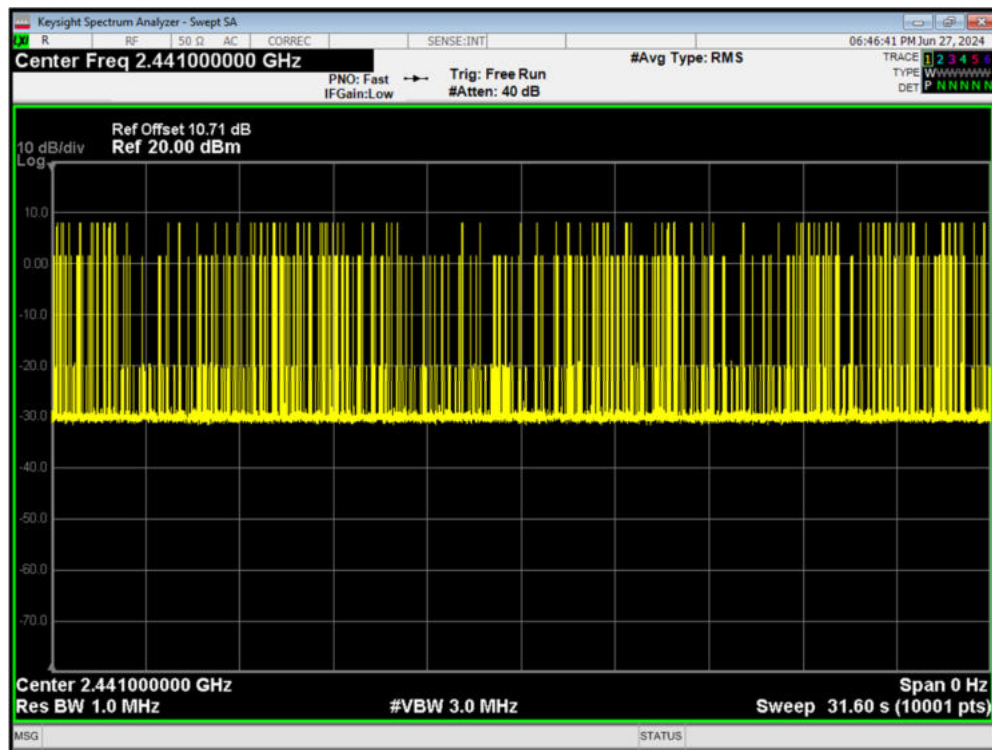
Dwell 3-DH5 2402MHz Accumulated



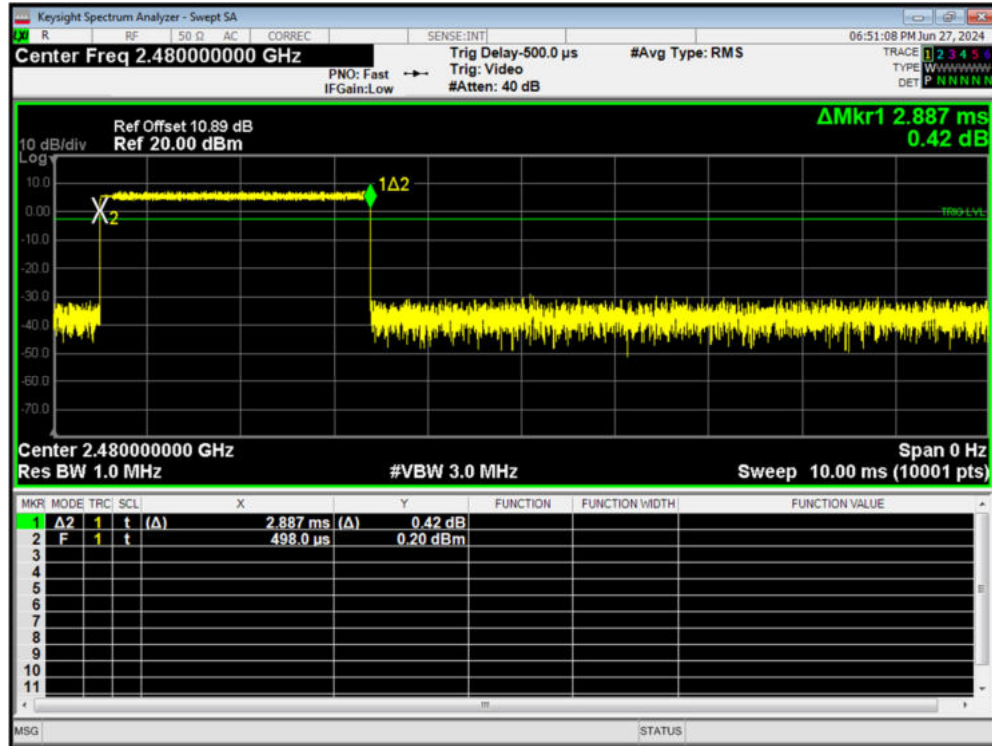
Dwell 3-DH5 2441MHz One Burst



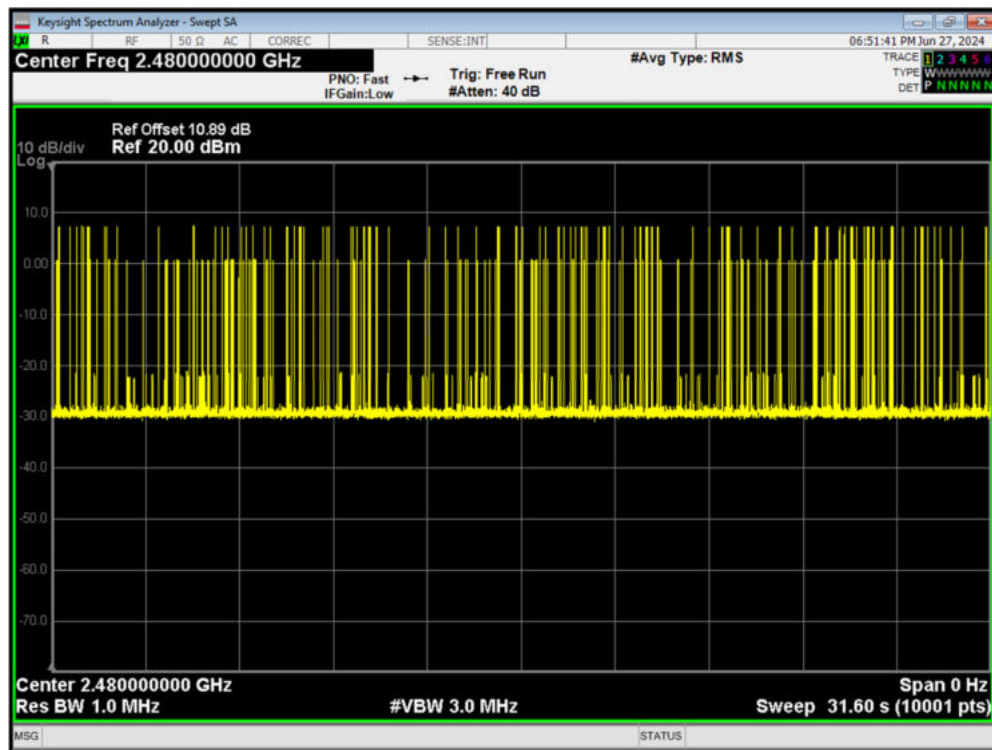
Dwell 3-DH5 2441MHz Accumulated



Dwell 3-DH5 2480MHz One Burst

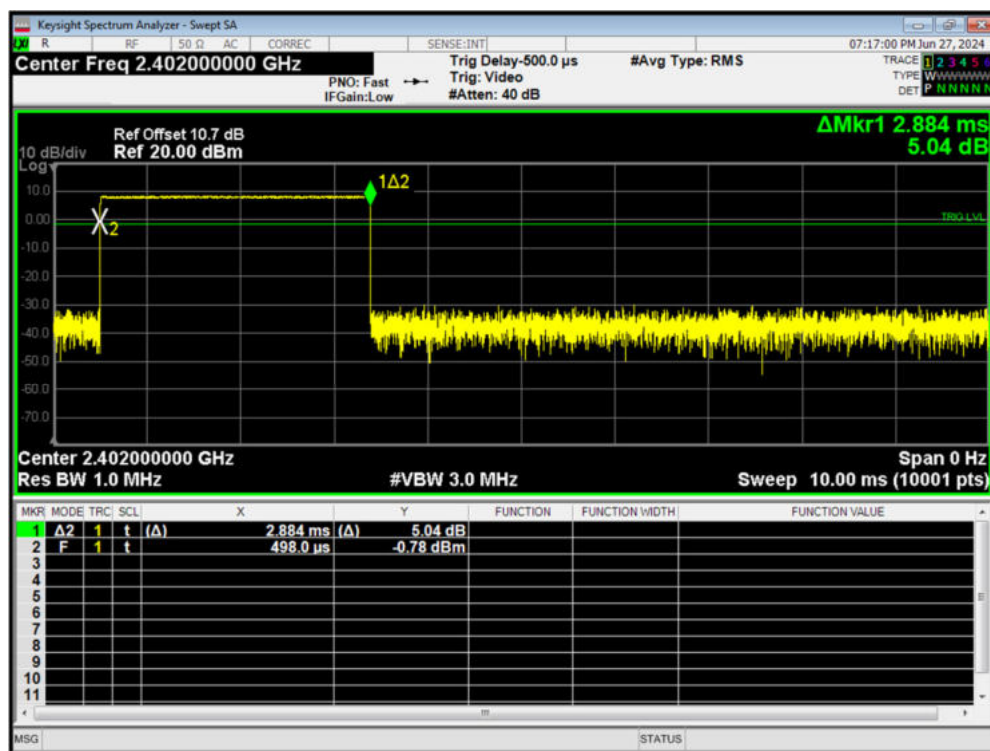


Dwell 3-DH5 2480MHz Accumulated



Antenna 2

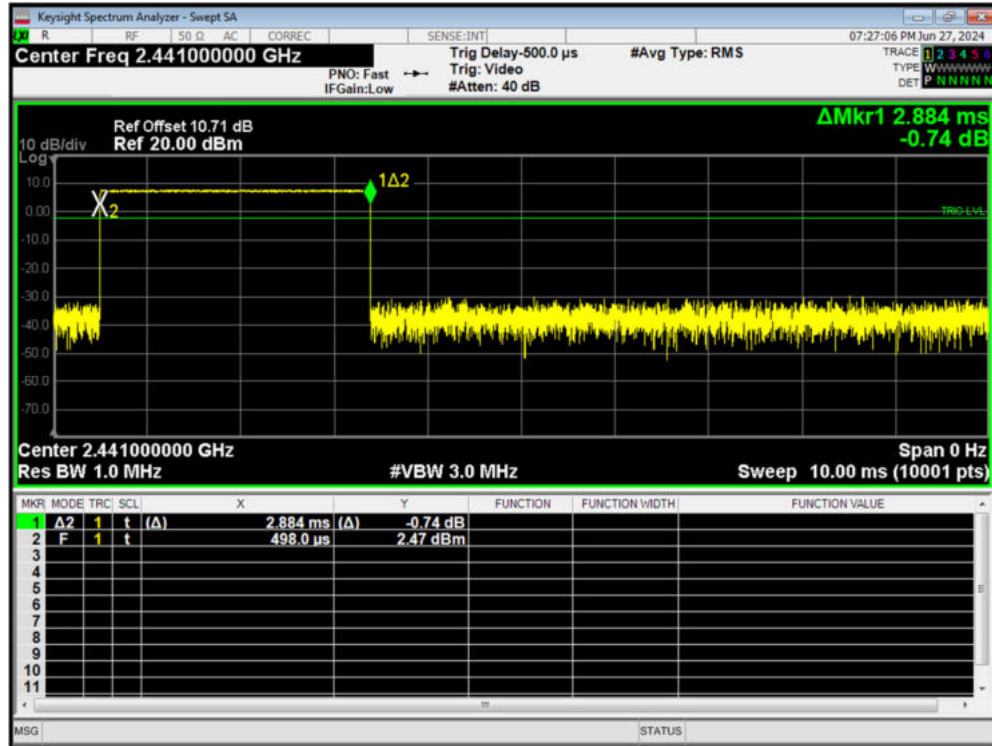
Dwell 1-DH5 2402MHz One Burst



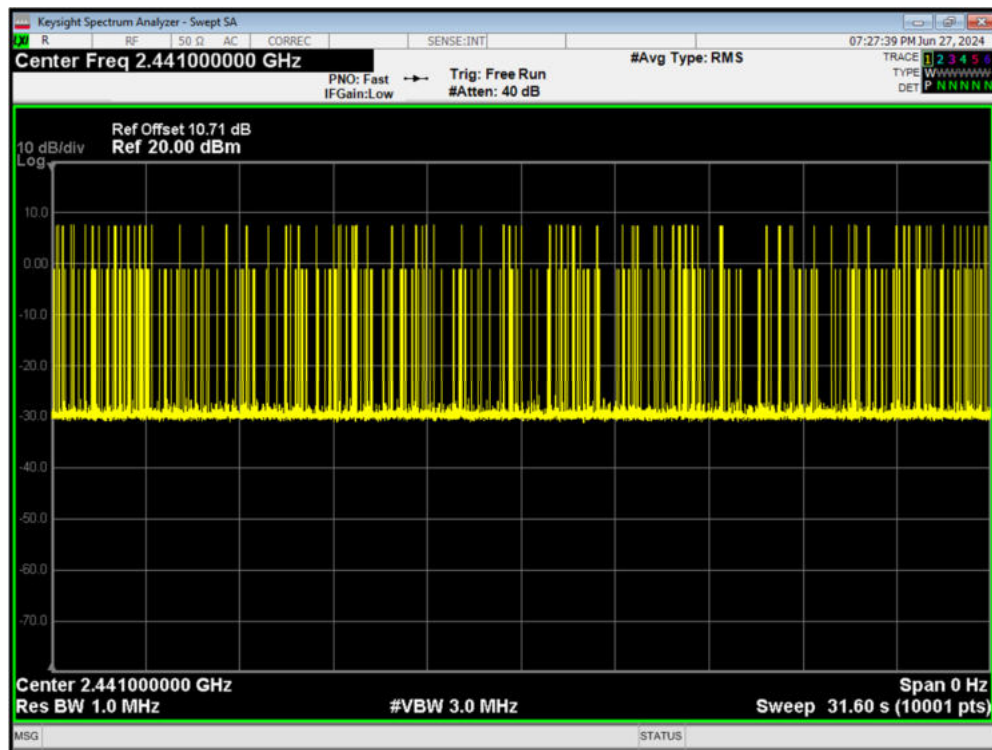
Dwell 1-DH5 2402MHz Accumulated



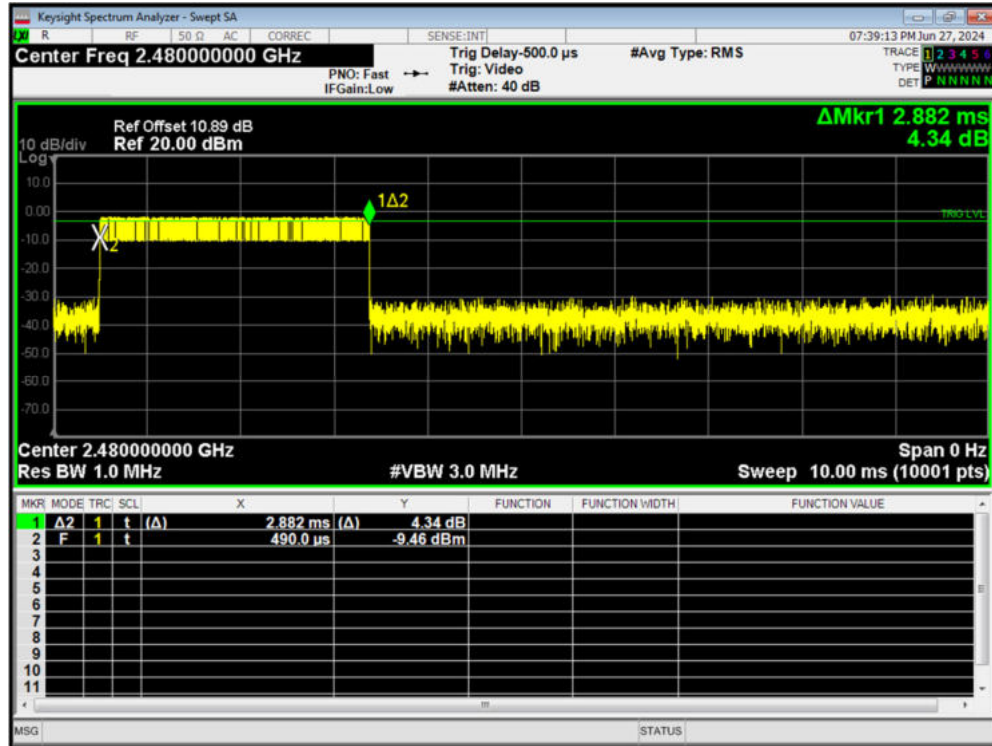
Dwell 1-DH5 2441MHz One Burst



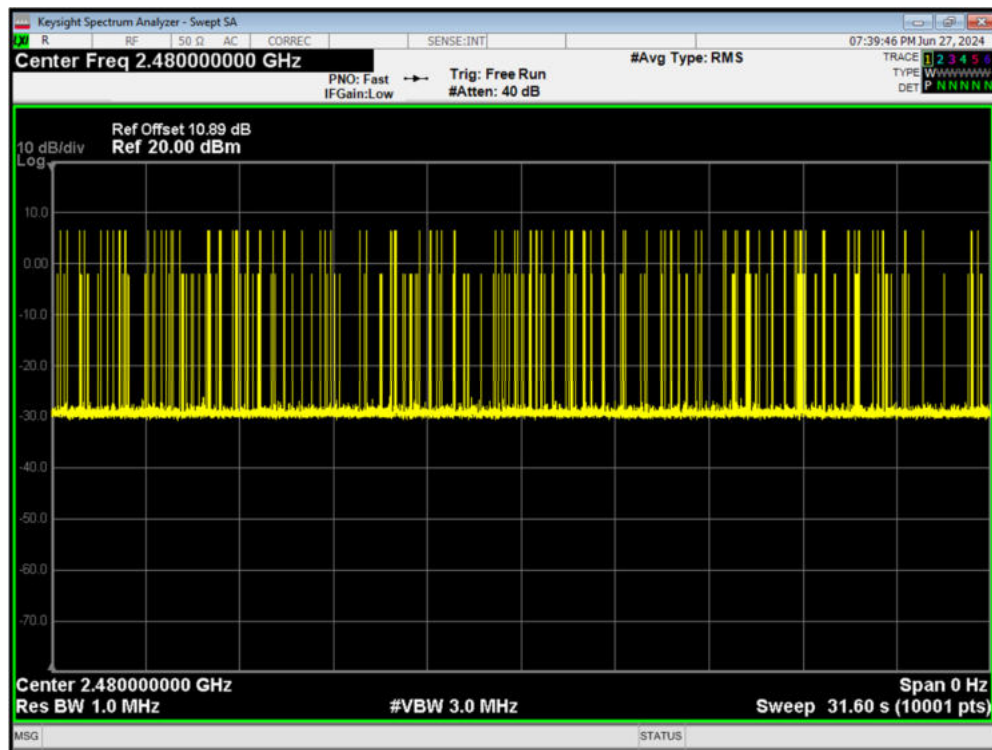
Dwell 1-DH5 2441MHz Accumulated



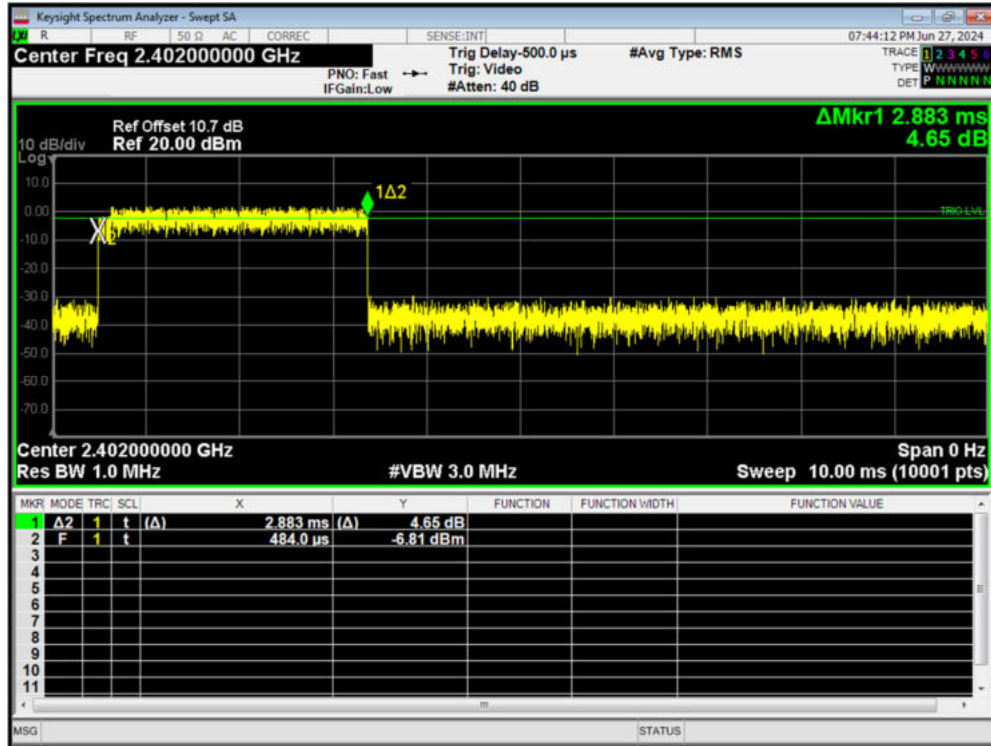
Dwell 1-DH5 2480MHz One Burst



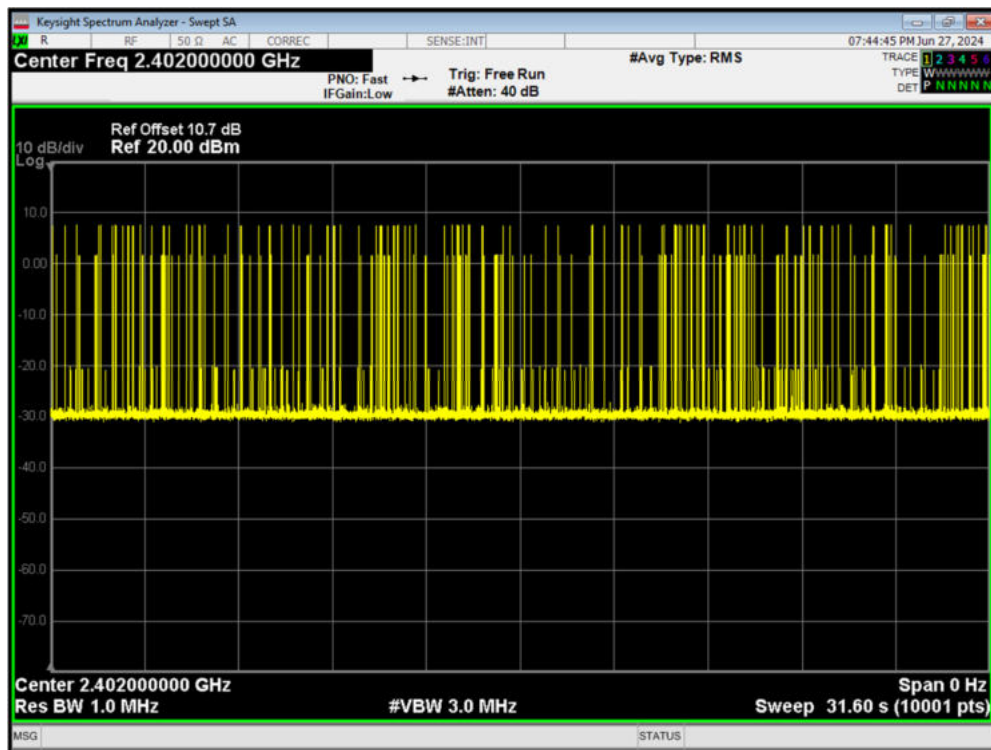
Dwell 1-DH5 2480MHz Accumulated



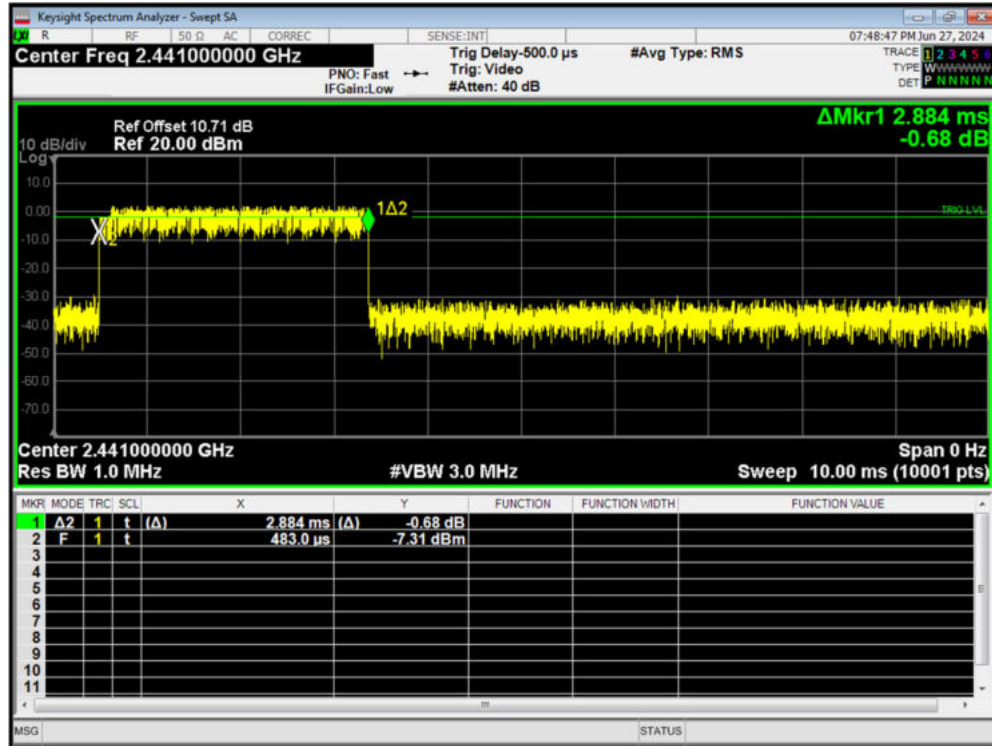
Dwell 2-DH5 2402MHz One Burst



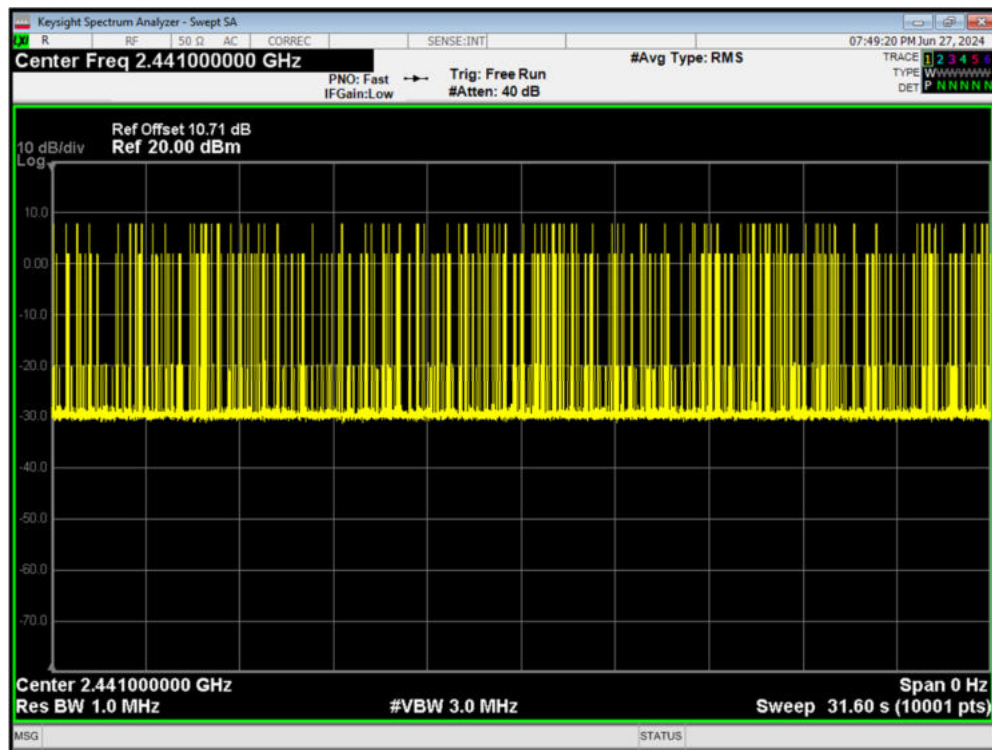
Dwell 2-DH5 2402MHz Accumulated



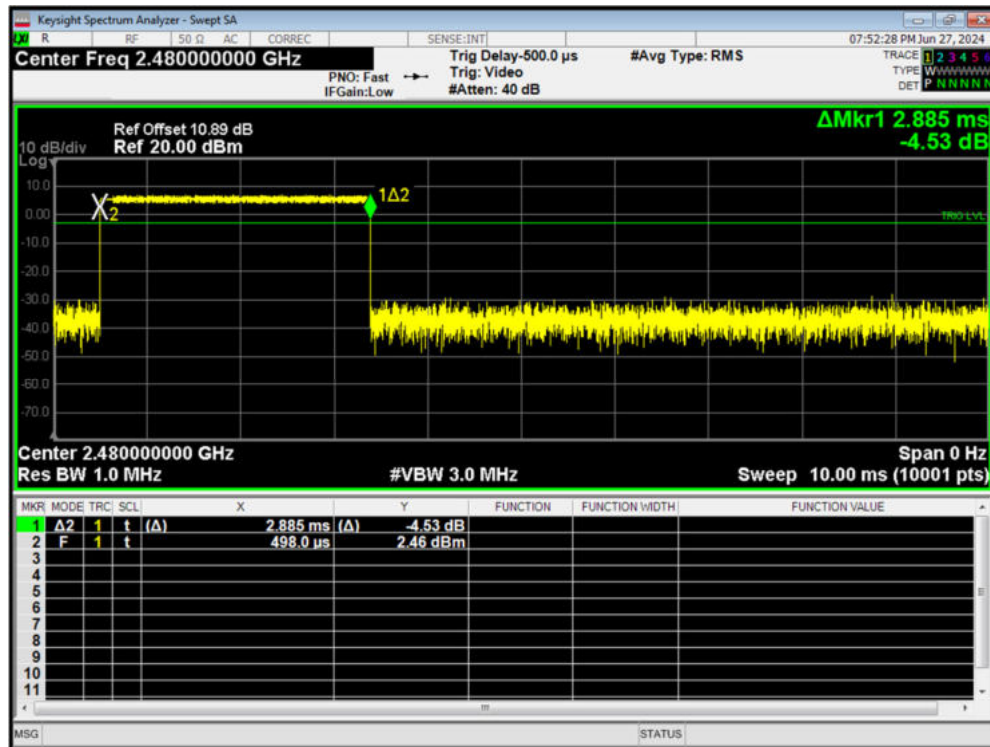
Dwell 2-DH5 2441MHz One Burst



Dwell 2-DH5 2441MHz Accumulated



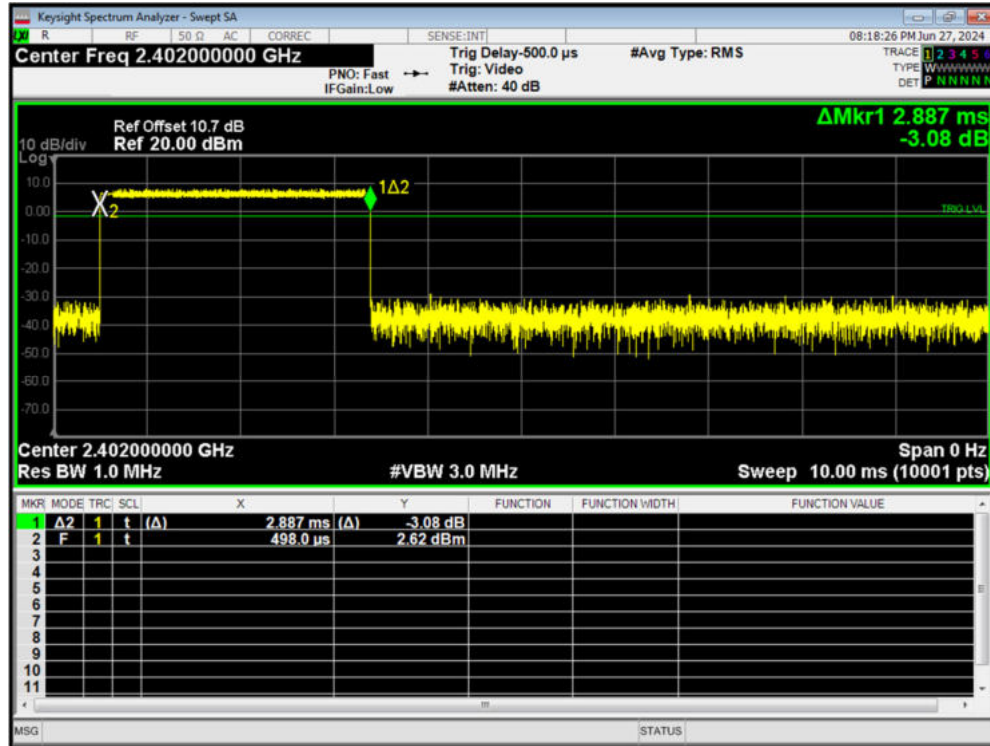
Dwell 2-DH5 2480MHz One Burst



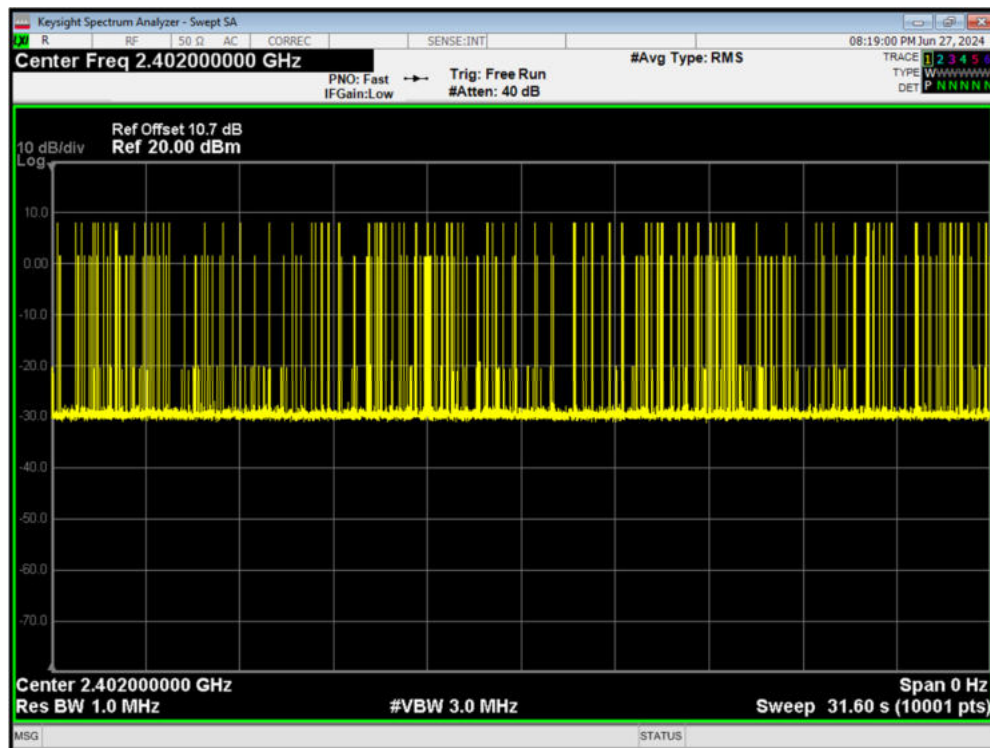
Dwell 2-DH5 2480MHz Accumulated



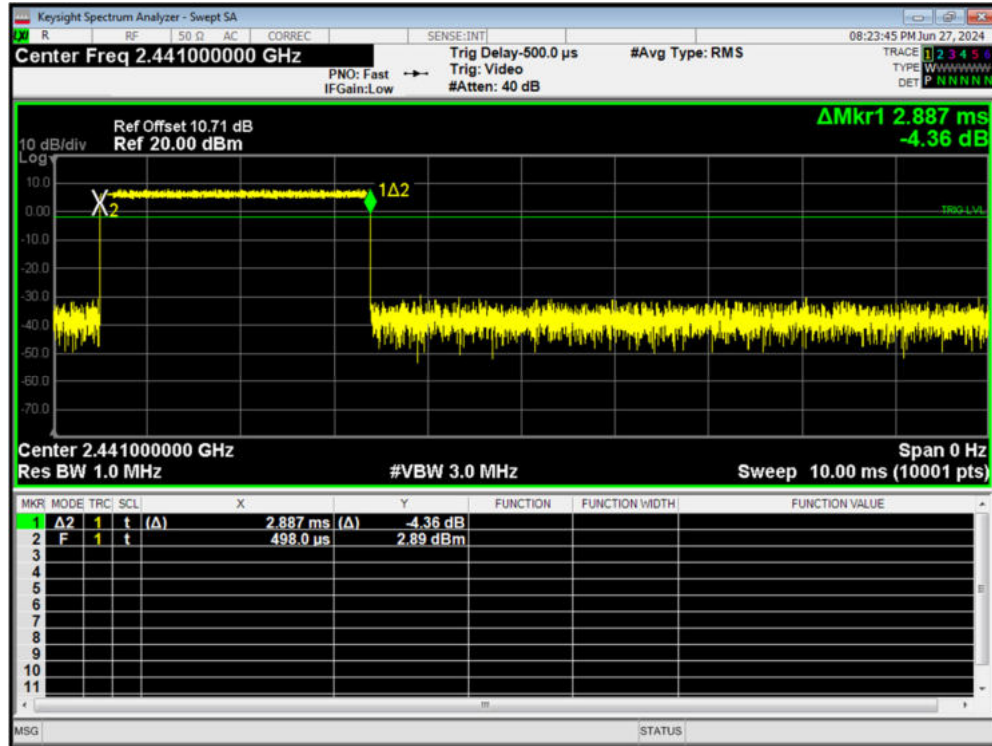
Dwell 3-DH5 2402MHz One Burst



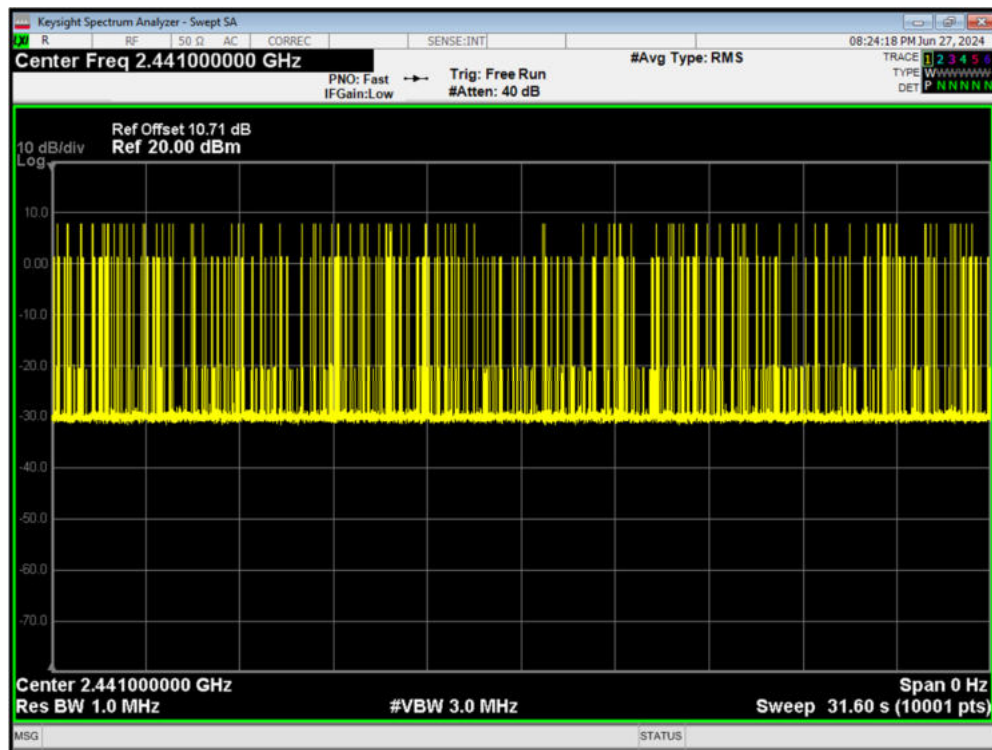
Dwell 3-DH5 2402MHz Accumulated



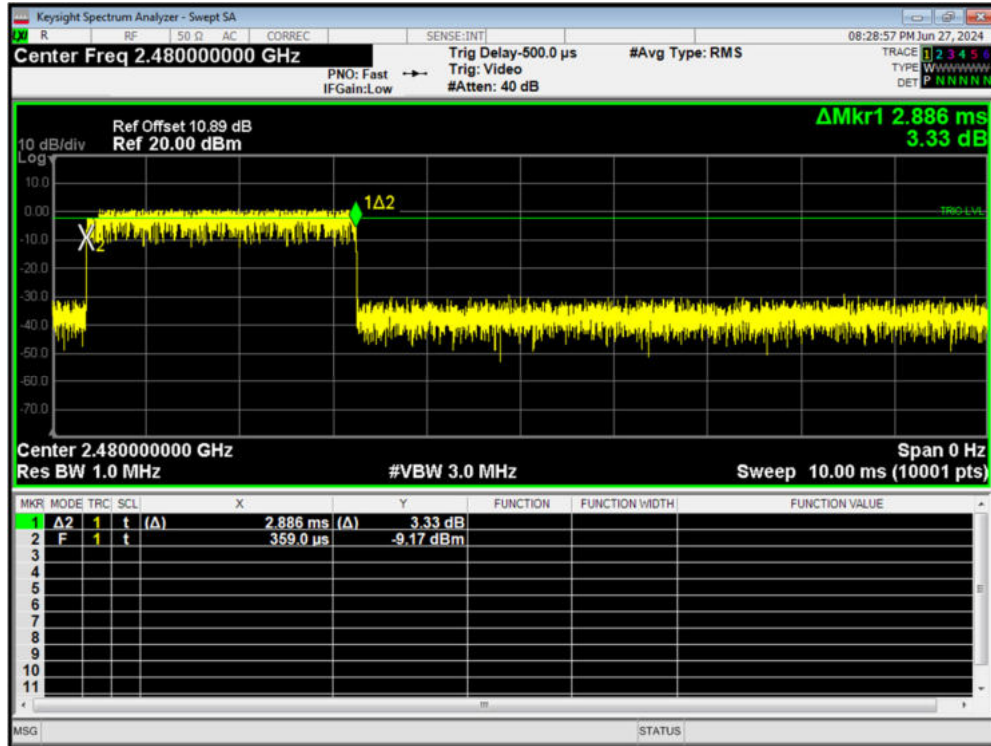
Dwell 3-DH5 2441MHz One Burst



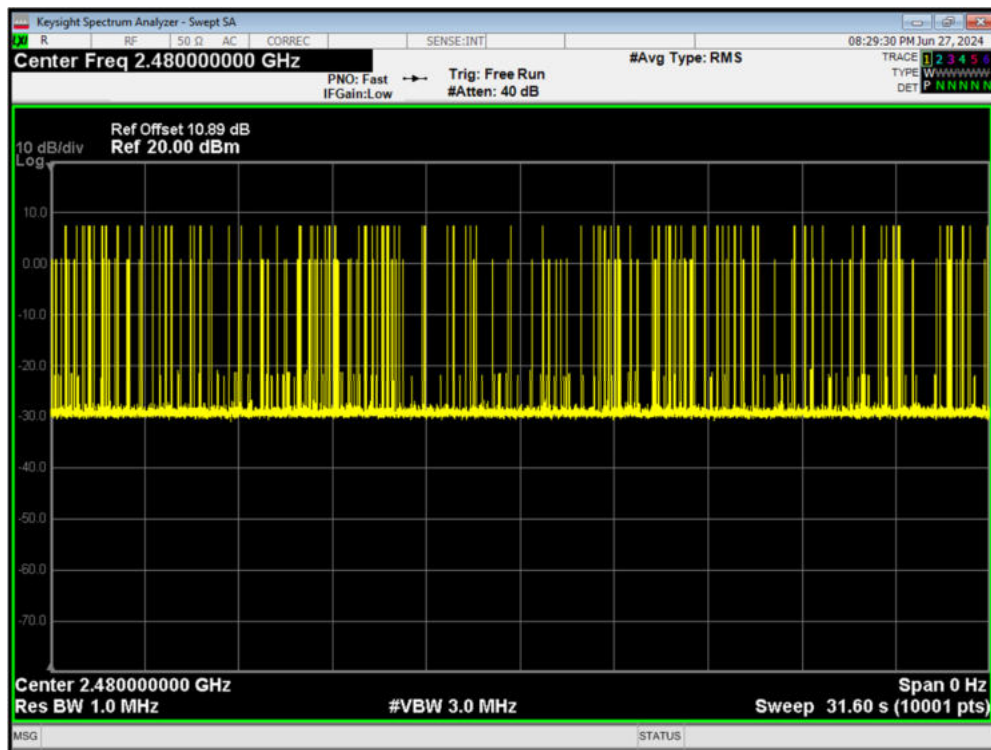
Dwell 3-DH5 2441MHz Accumulated



Dwell 3-DH5 2480MHz One Burst



Dwell 3-DH5 2480MHz Accumulated



5.5 Band Edge Compliance

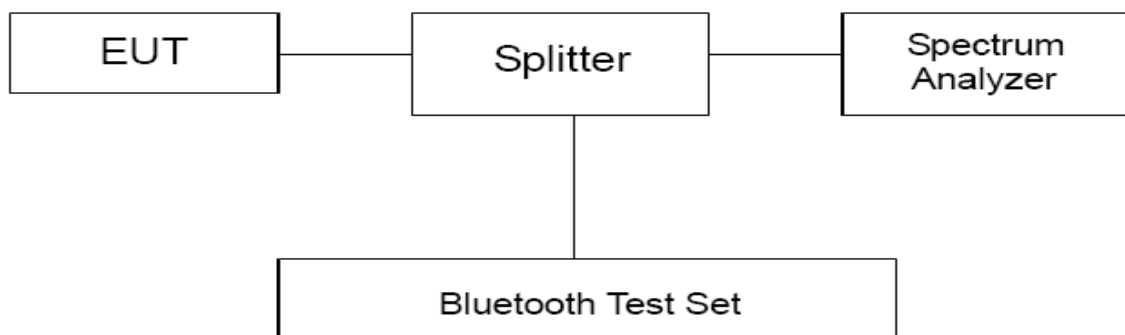
Ambient condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The lowest and highest channels were measured. The peak detector is used. RBW is set to 100 kHz and VBW is set to 300 kHz on spectrum analyzer. EUT test for Hopping On mode and Hopping Off mode.

Test Setup



Limits

Rule Part 15.247(d) specifies that “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.”

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

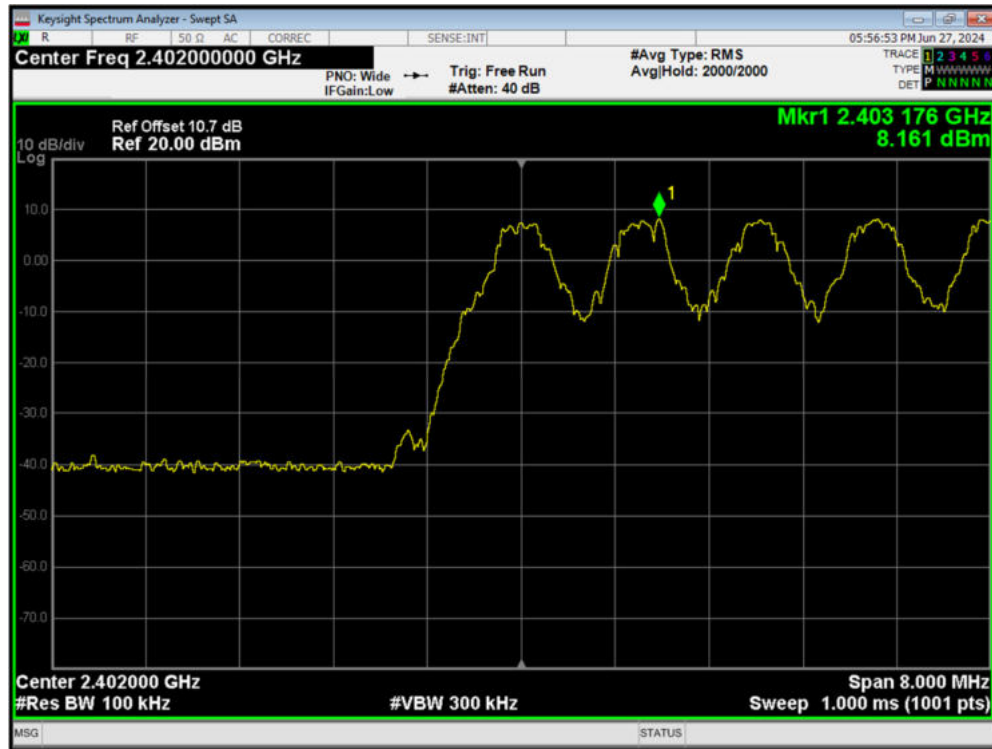
Frequency	Uncertainty
2GHz-3GHz	1.407 dB

Test Results

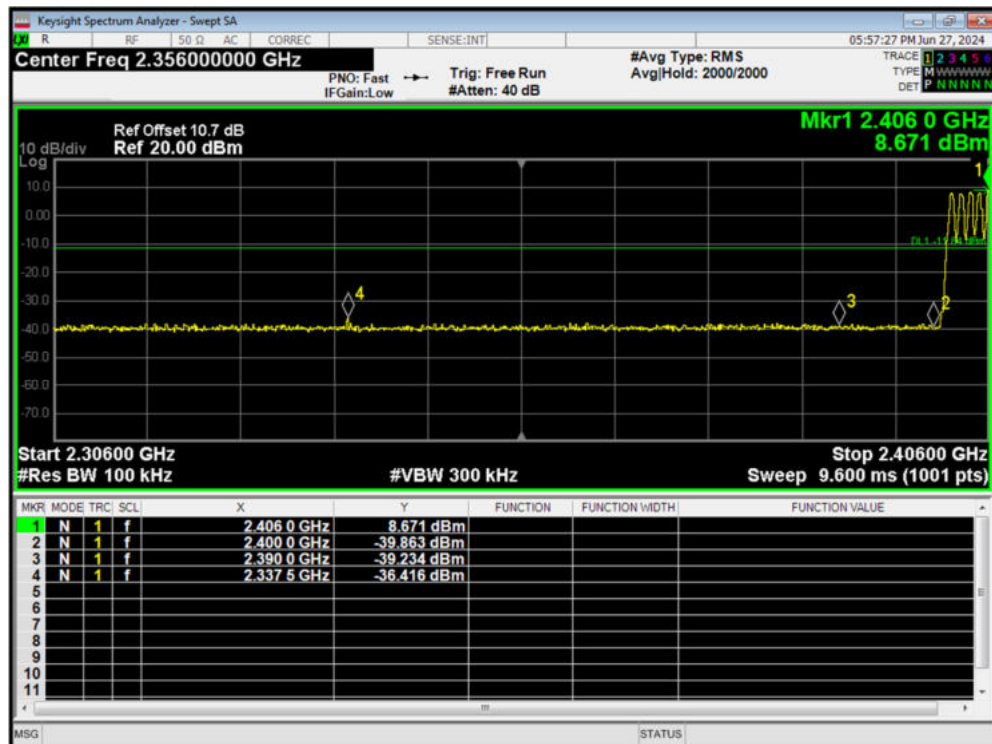
Hopping On

Antenna 1

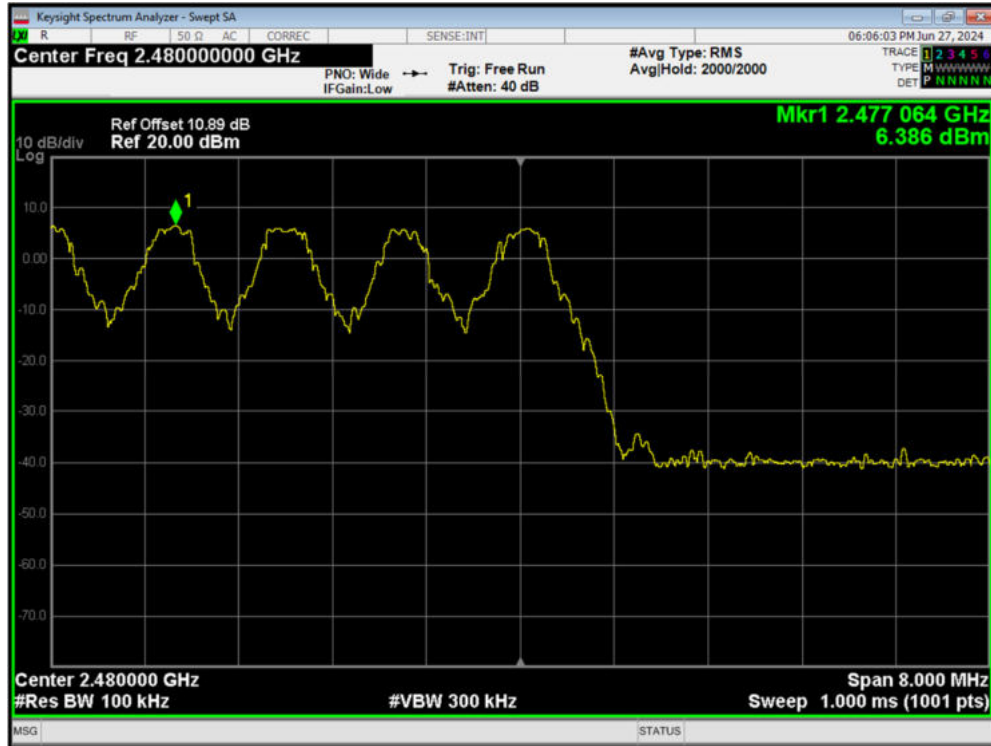
Band Edge(Hopping) 1-DH5 2402MHz Hopping Ref



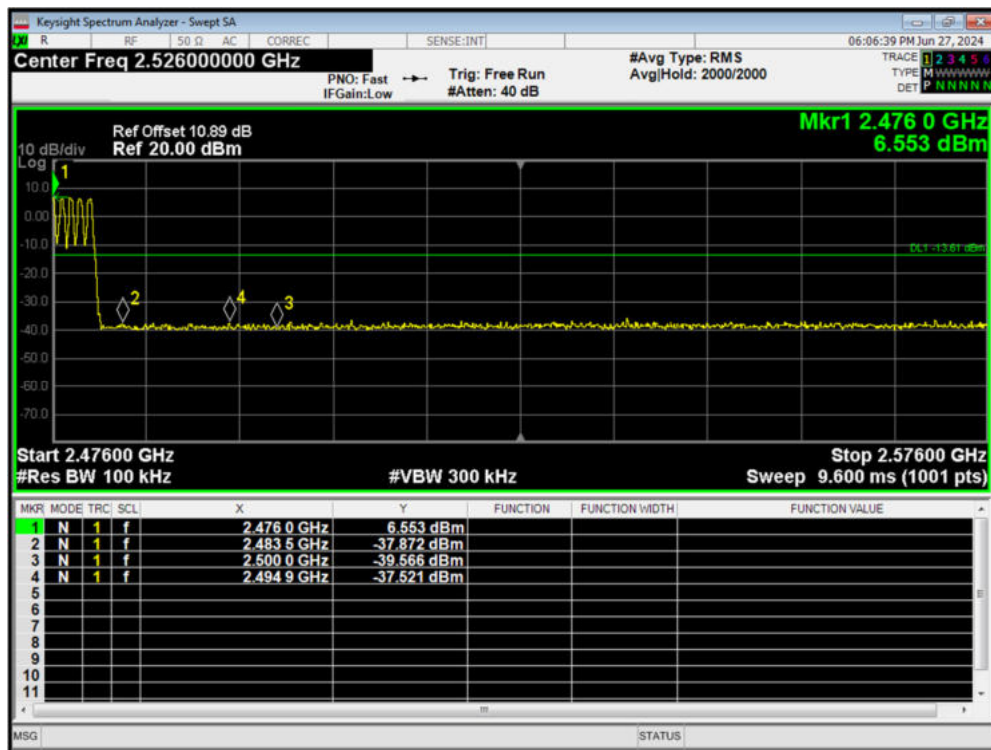
Band Edge(Hopping) 1-DH5 2402MHz Hopping Emission



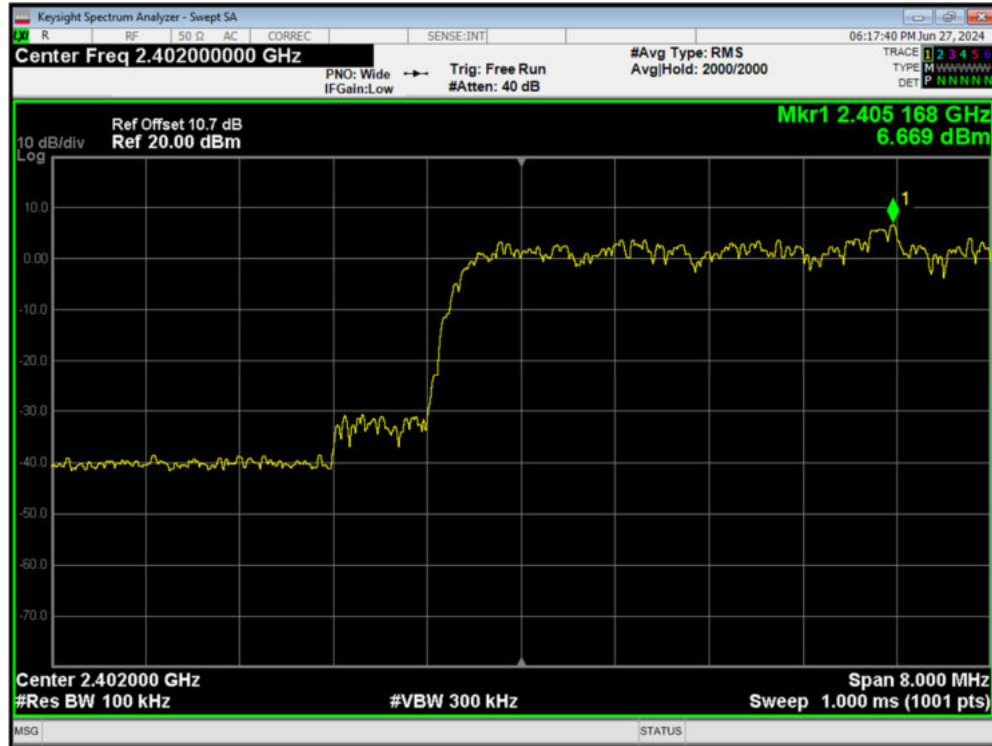
Band Edge(Hopping) 1-DH5 2480MHz Hopping Ref



Band Edge(Hopping) 1-DH5 2480MHz Hopping Emission



Band Edge(Hopping) 2-DH5 2402MHz Hopping Ref



Band Edge(Hopping) 2-DH5 2402MHz Hopping Emission

