

### GFSK Middle Channel



### GFSK High Channel



### Pi/4 DQPSK Low Channel



### Pi/4 DQPSK Middle Channel



### Pi/4 DQPSK High Channel



### 8DPSK Low Channel



### 8DPSK Middle Channel



### 8DPSK High Channel



**Right**

Modulation	Test Channel	Separation (MHz)	Limit(MHz)	Result
GFSK	Low	0.998	0.625	PASS
GFSK	Middle	1.000	0.627	PASS
GFSK	High	1.002	0.627	PASS
Pi/4 DQPSK	Low	1.002	0.839	PASS
Pi/4 DQPSK	Middle	1.002	0.836	PASS
Pi/4 DQPSK	High	1.000	0.825	PASS
8DPSK	Low	1.000	0.815	PASS
8DPSK	Middle	0.998	0.813	PASS
8DPSK	High	1.004	0.813	PASS

**Test plots**  
**GFSK Low Channel**


### GFSK Middle Channel



### GFSK High Channel



### Pi/4 DQPSK Low Channel



### Pi/4 DQPSK Middle Channel



### Pi/4 DQPSK High Channel



### 8DPSK Low Channel





### 8DPSK Middle Channel



### 8DPSK High Channel



## 13. NUMBER OF HOPPING FREQUENCY

### 13.1 Block Diagram Of Test Setup



### 13.2 Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

### 13.3 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100kHz. VBW = 300kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.4835GHz. Sweep=auto;

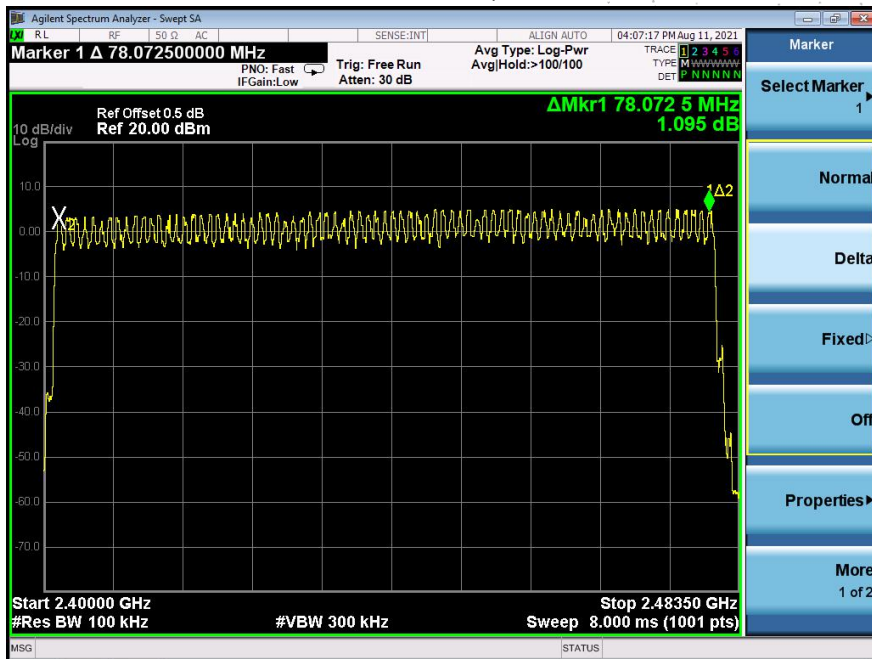
### 13.4 Test Result

#### Test Plots:

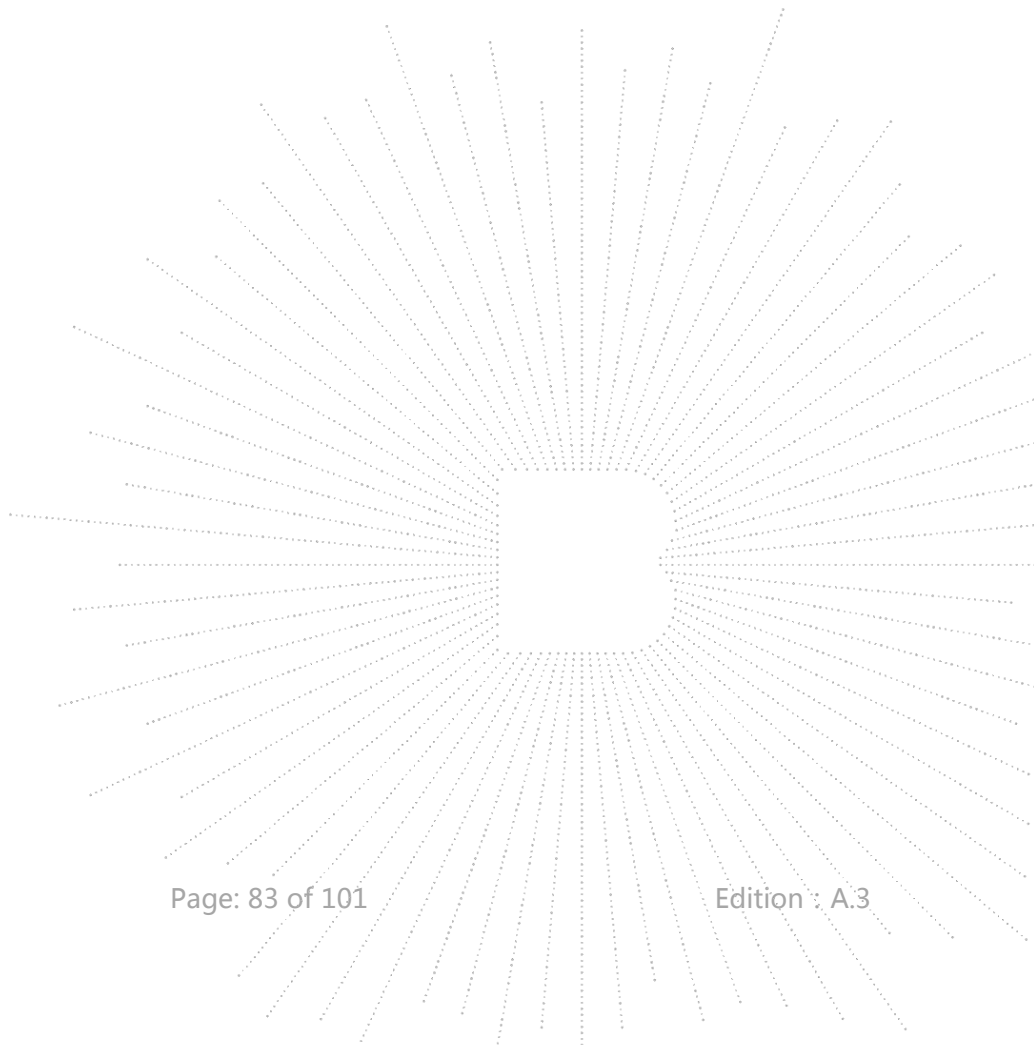
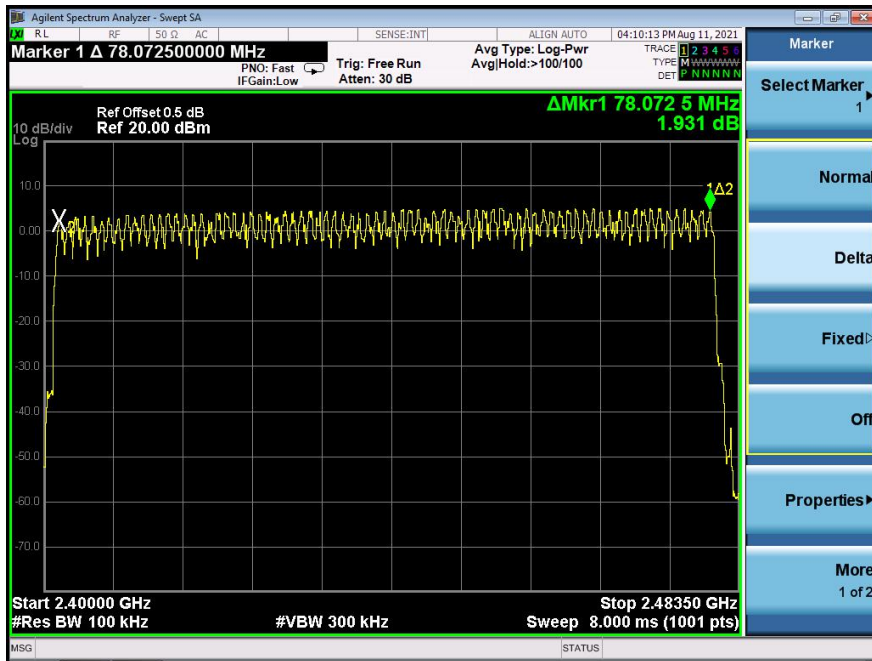
**Left**  
79 Channels in total  
GFSK



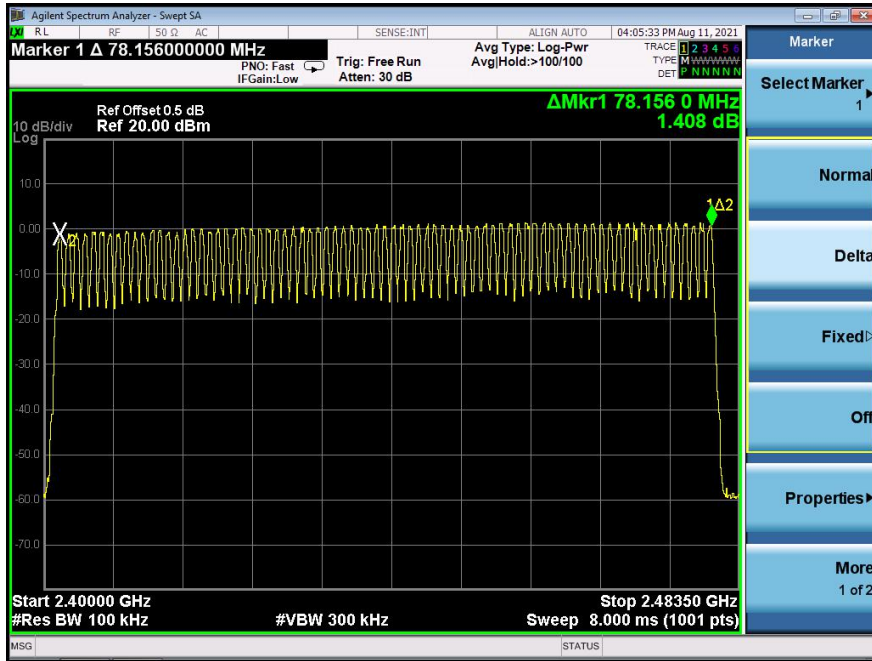
**Pi/4 DQPSK**



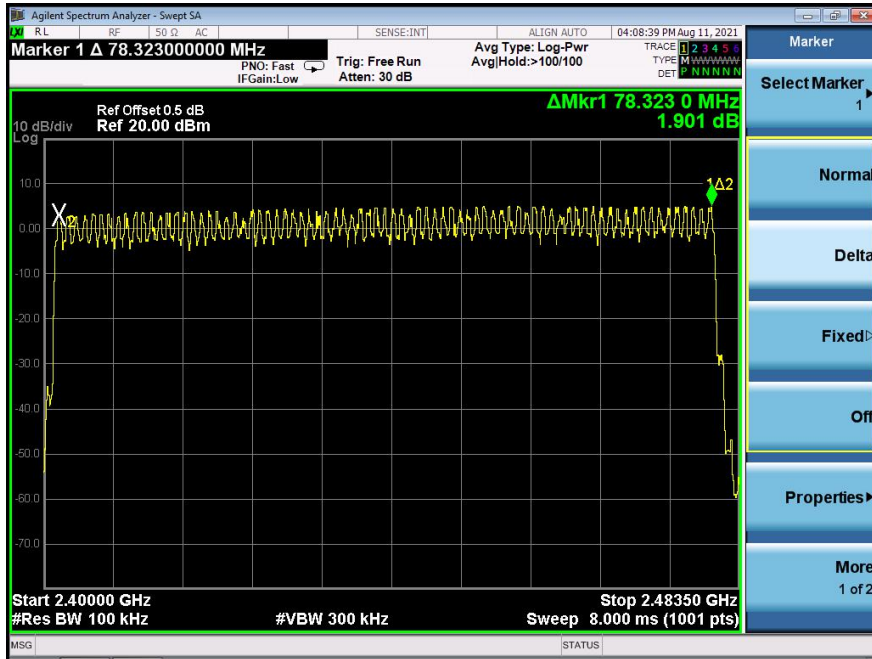
### 8DPSK



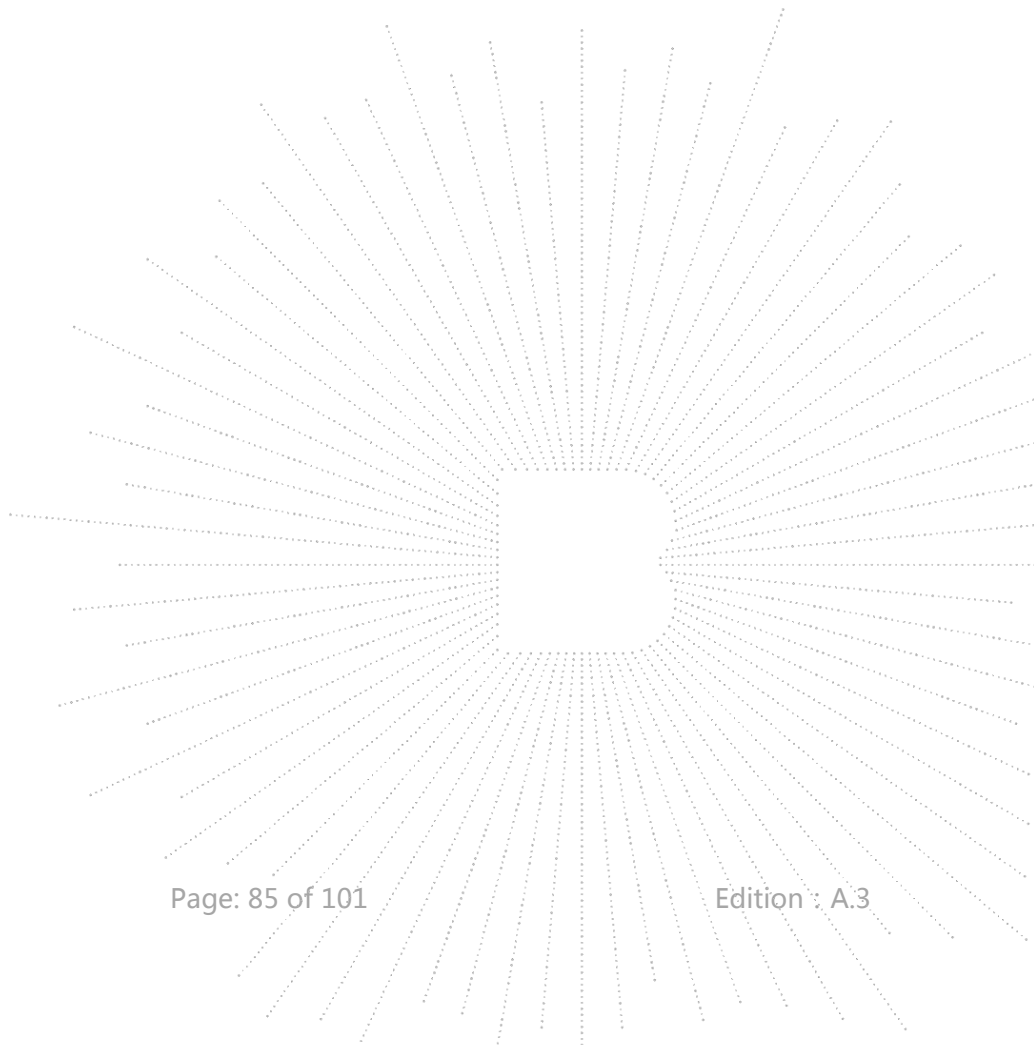
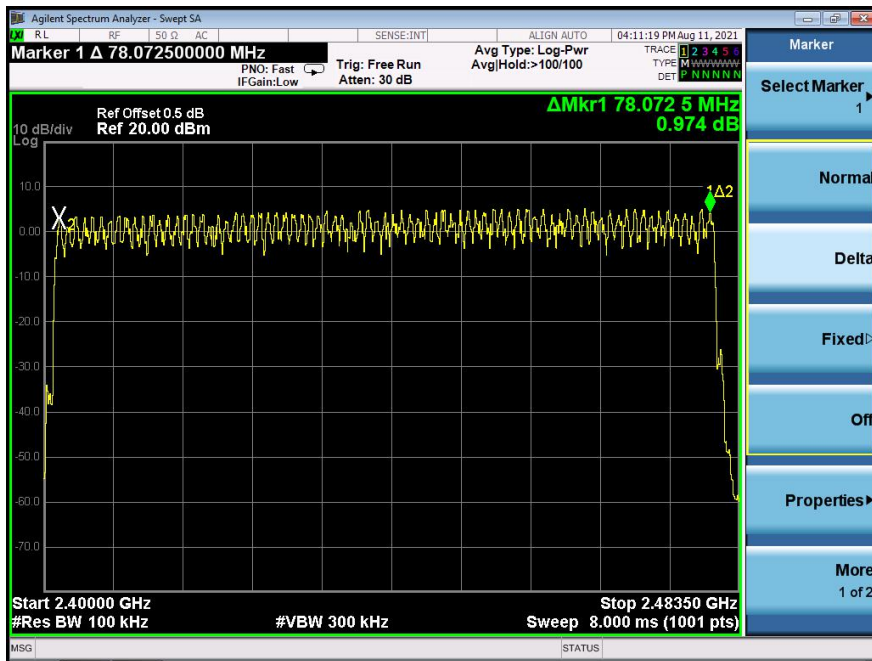
**Right  
79 Channels in total  
GFSK**



**Pi/4 DQPSK**



8DPSK



## 14. DWELL TIME

### 14.1 Block Diagram Of Test Setup



### 14.2 Limit

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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### 14.3 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set spectrum analyzer span = 0. Centred on a hopping channel;
3. Set RBW = 1MHz and VBW = 3MHz. Sweep = as necessary to capture the entire dwell time per hopping channel. Set the EUT for DH5, DH3 and DH1 packet transmitting.
4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.) repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

## 14.4 Test Result

DH5 Packet permit maximum 1600 / 79 / 6 hops per second in each channel (5 time slots RX, 1 time slot TX).

DH3 Packet permit maximum 1600 / 79 / 4 hops per second in each channel (3 time slots RX, 1 time slot TX).

DH1 Packet permit maximum 1600 / 79 / 2 hops per second in each channel (1 time slot RX, 1 time slot TX). So, the Dwell Time can be calculated as follows:

DH5:  $1600/79/6*0.4*79*(MkrDelta)/1000$

DH3:  $1600/79/4*0.4*79*(MkrDelta)/1000$

DH1:  $1600/79/2*0.4*79*(MkrDelta)/1000$

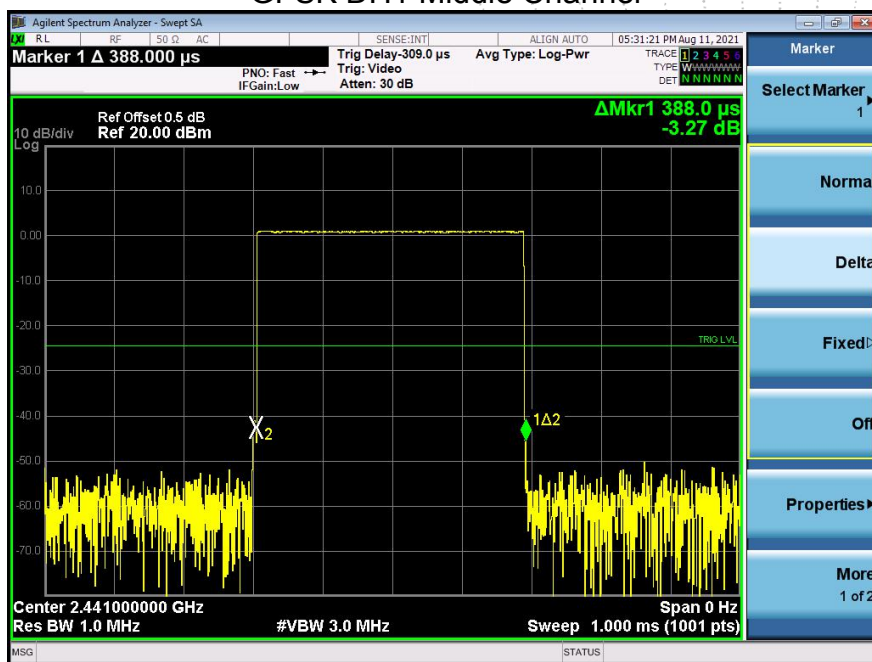
Remark: Mkr Delta is once pulse time.

### Left

Modulation	Channel Data	Packet	pulse time(ms)	Dwell Time(s)	Limits(s)
GFSK	Middle	DH1	0.388	0.124	0.4
		DH3	1.662	0.266	0.4
		DH5	2.910	0.310	0.4
Pi/4DQPSK	Middle	2DH1	0.404	0.129	0.4
		2DH3	1.668	0.267	0.4
		2DH5	2.920	0.311	0.4
8DPSK	Middle	3DH1	0.406	0.130	0.4
		3DH3	1.662	0.266	0.4
		3DH5	2.920	0.311	0.4

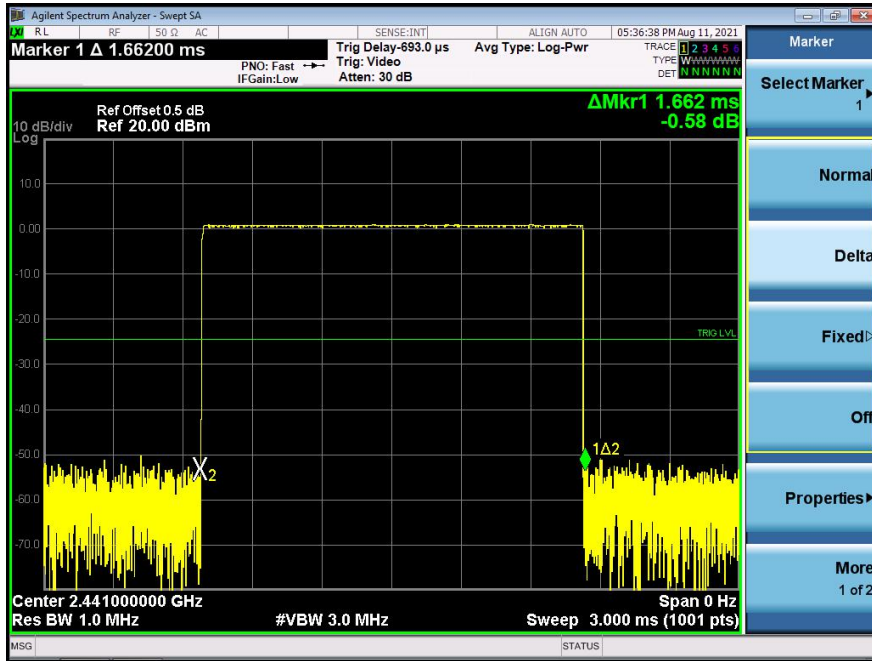
### Test Plots

#### GFSK DH1 Middle Channel

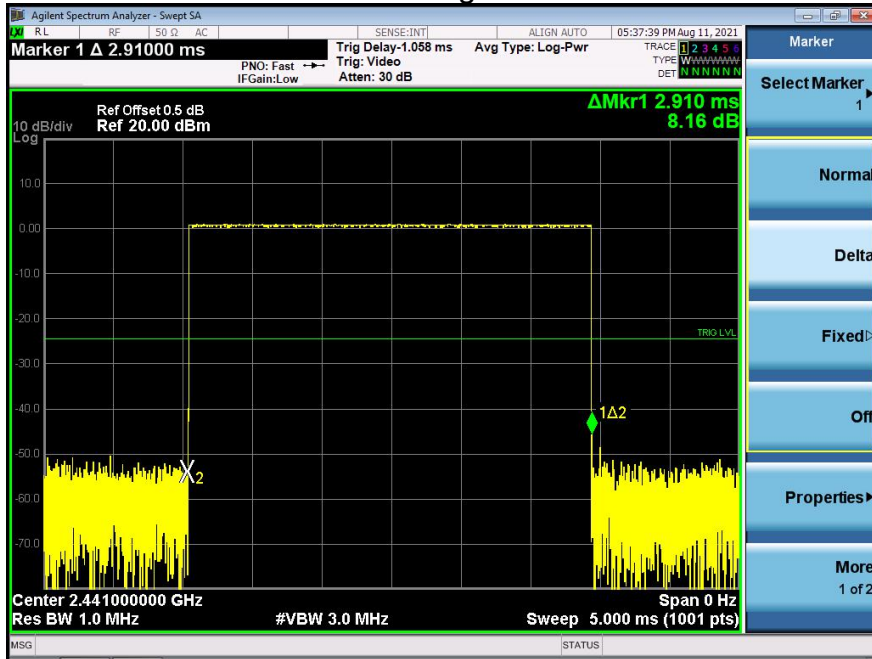




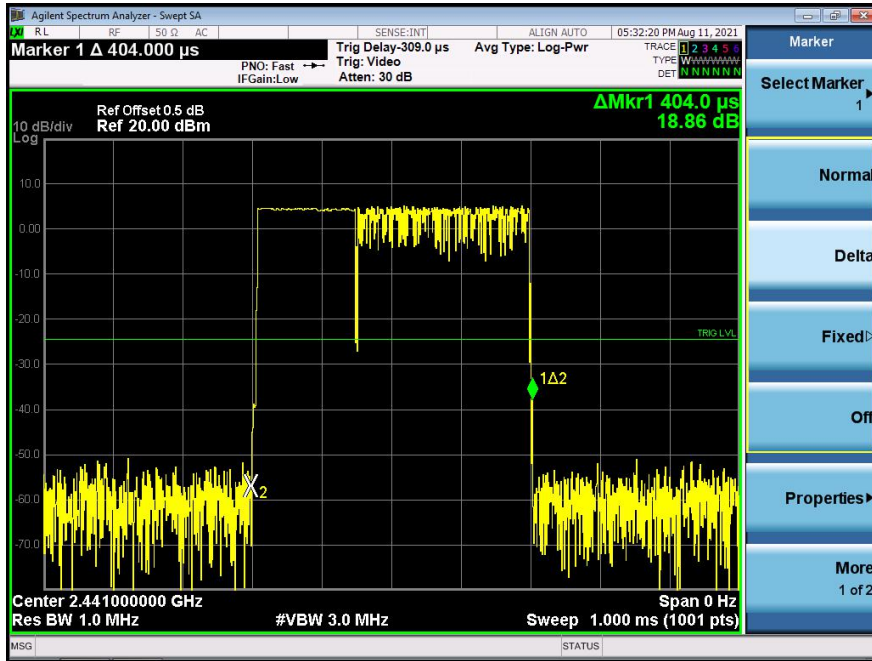
### GFSK DH3 Middle Channel



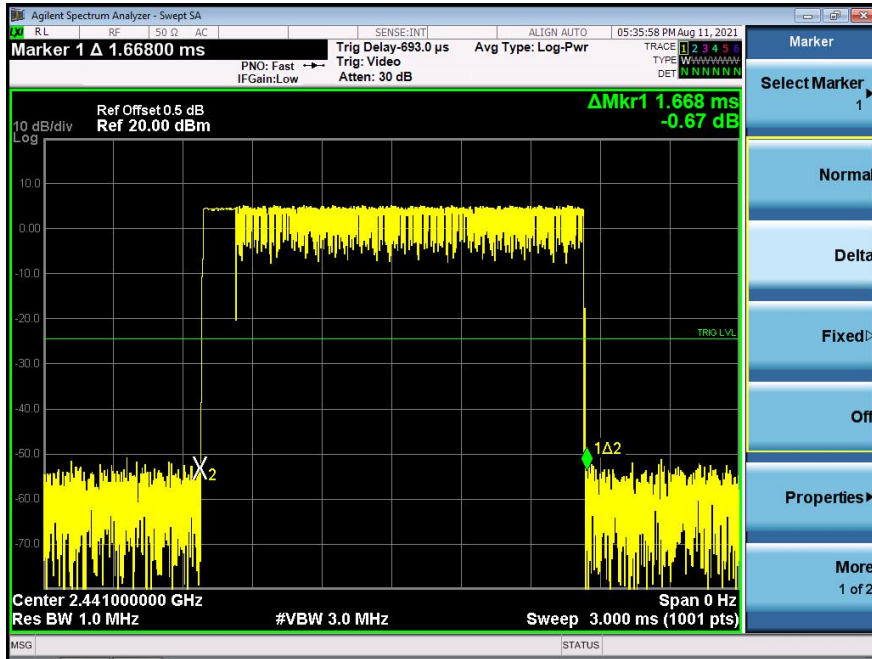
### GFSK DH5 High Middle Channel



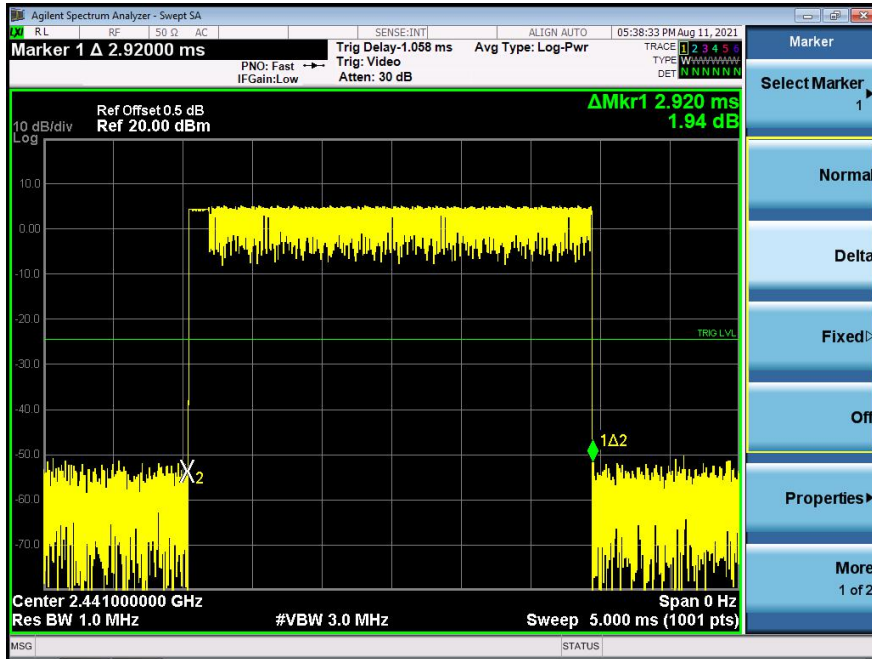
### Pi/4DQPSK DH1 Middle Channel



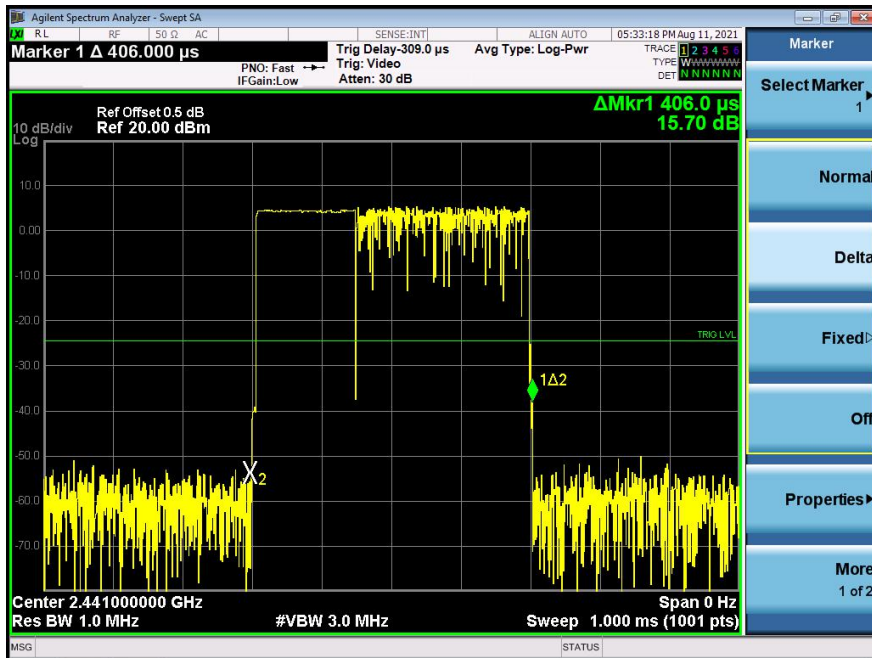
### Pi/4DQPSK DH3 Middle Channel



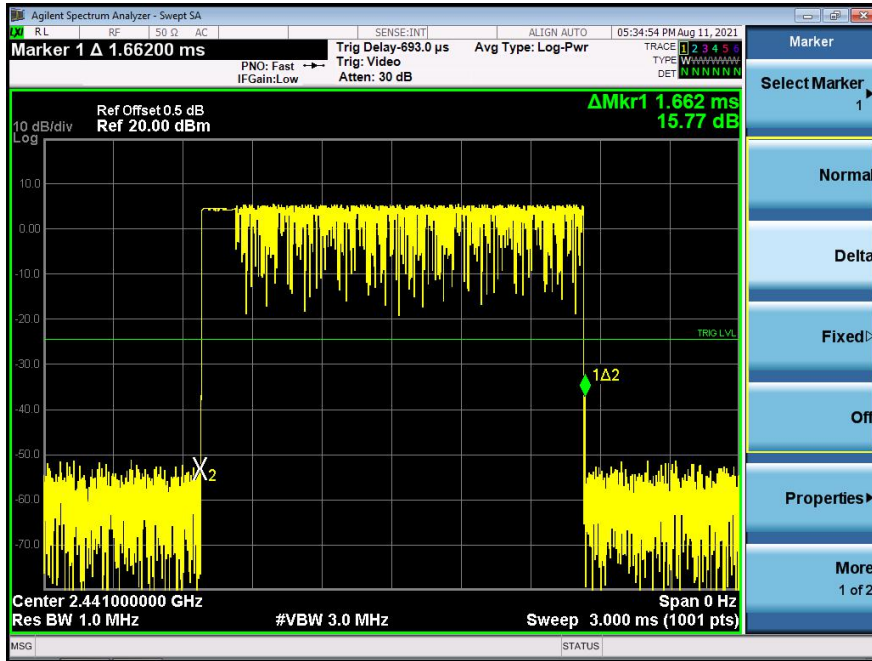
### Pi/4DQPSK DH5 Middle Channel



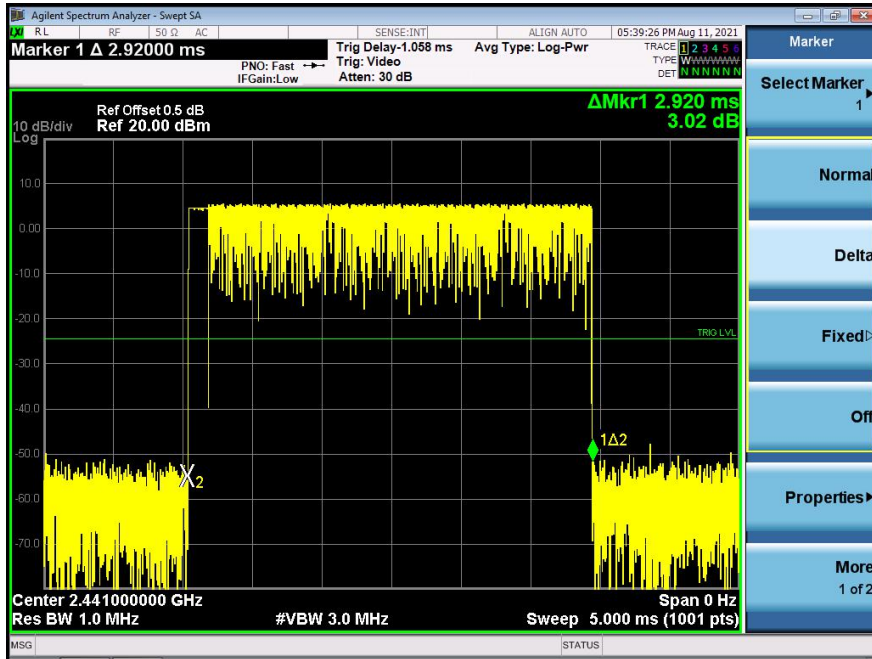
### 8DPSK DH1 Middle Channel



### 8DPSK DH3 Middle Channel

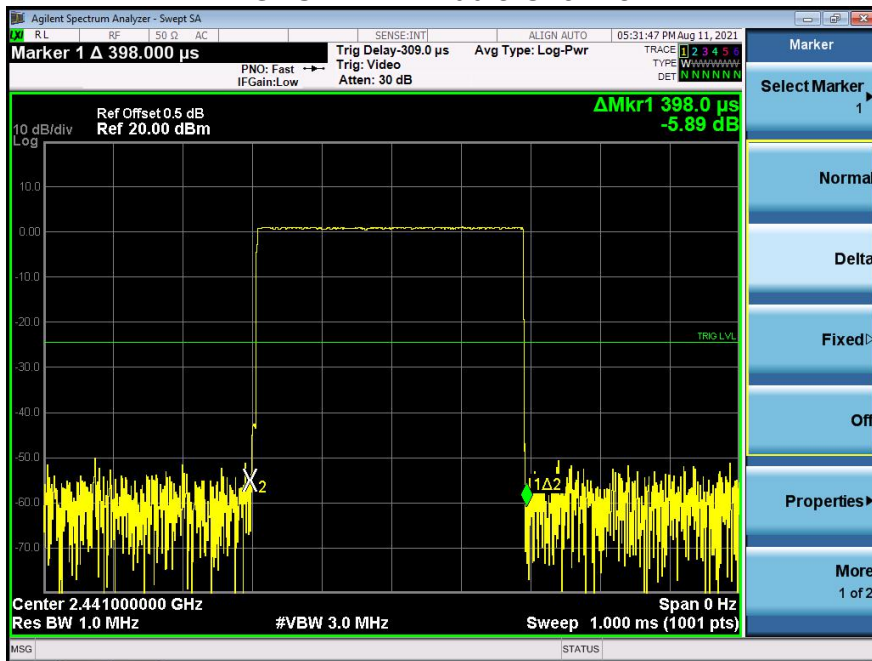


### 8DPSK DH5 Middle Channel

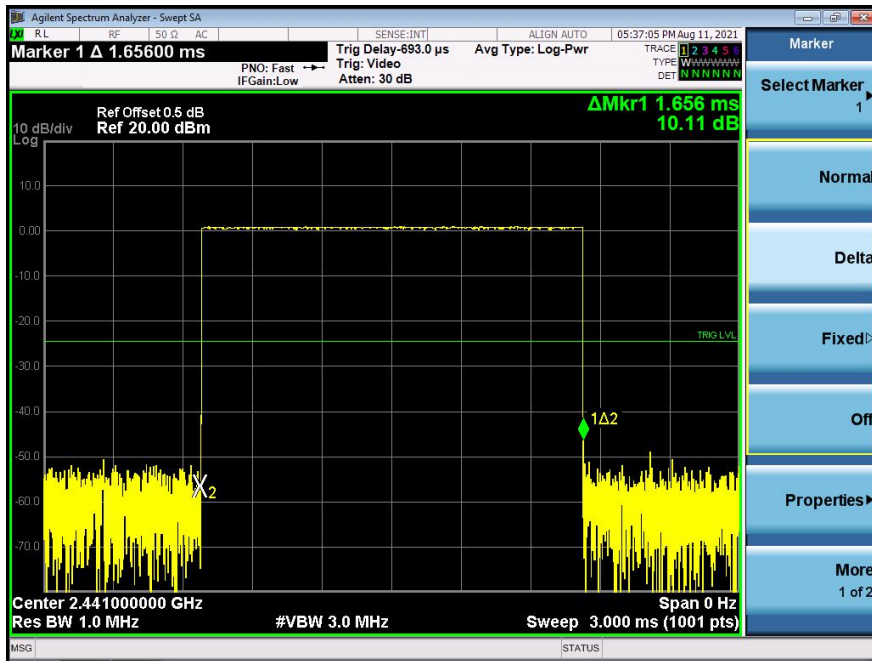


**Right**

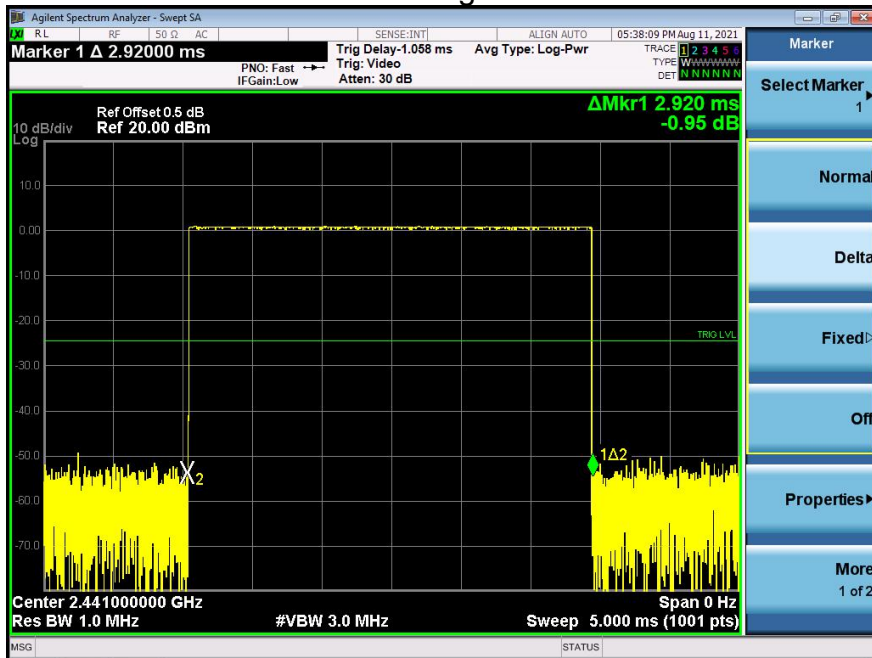
Modulation	Channel Data	Packet	pulse time(ms)	Dwell Time(s)	Limits(s)
GFSK	Middle	DH1	0.398	0.127	0.4
		DH3	1.656	0.265	0.4
		DH5	2.920	0.311	0.4
Pi/4DQPSK	Middle	2DH1	0.410	0.131	0.4
		2DH3	1.662	0.266	0.4
		2DH5	2.930	0.313	0.4
8DPSK	Middle	3DH1	0.398	0.127	0.4
		3DH3	1.668	0.267	0.4
		3DH5	2.920	0.311	0.4

**Test Plots**
**GFSK DH1 Middle Channel**


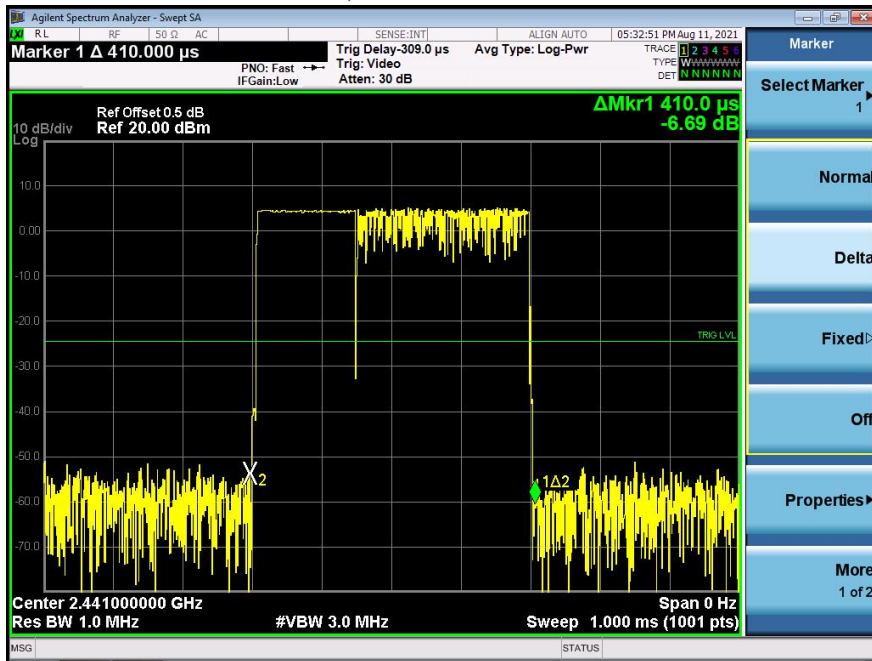
### GFSK DH3 Middle Channel



### GFSK DH5 High Middle Channel



### Pi/4DQPSK DH1 Middle Channel



### Pi/4DQPSK DH3 Middle Channel

