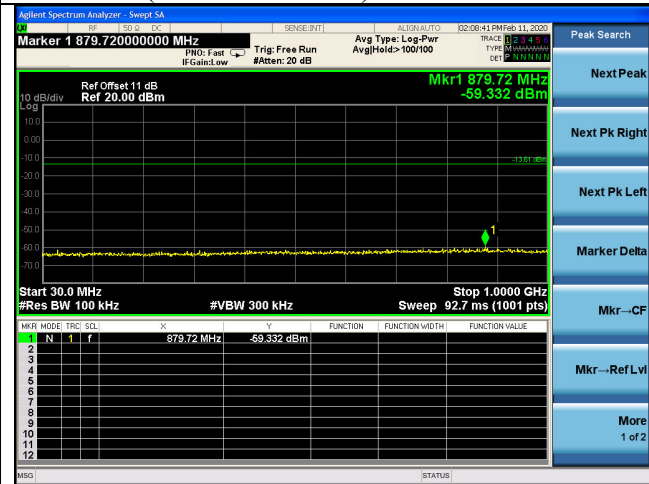
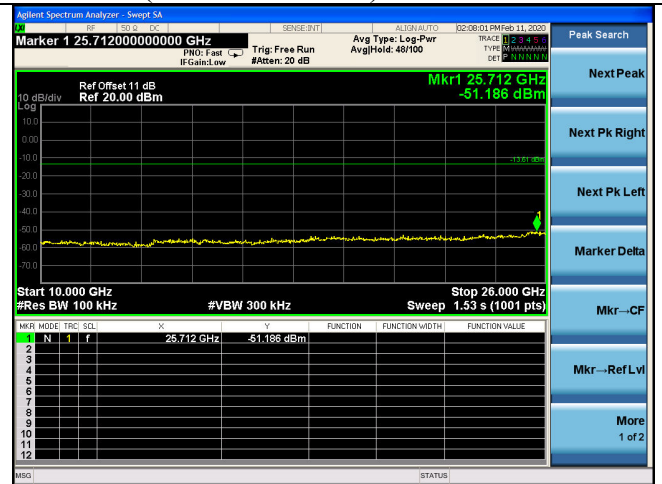


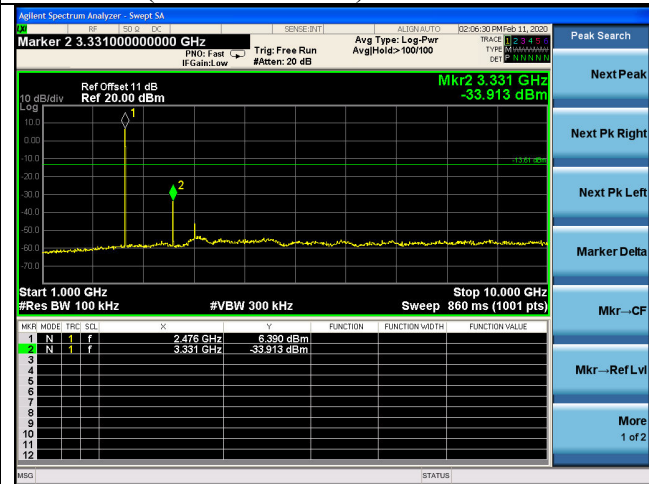
2480MHz(30MHz – 1GHz)



2480MHz(10GHz – 26GHz)

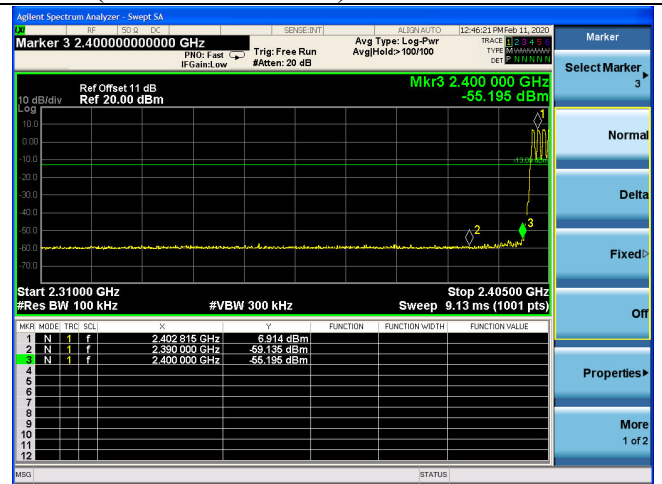


2480MHz(1GHz – 10GHz)

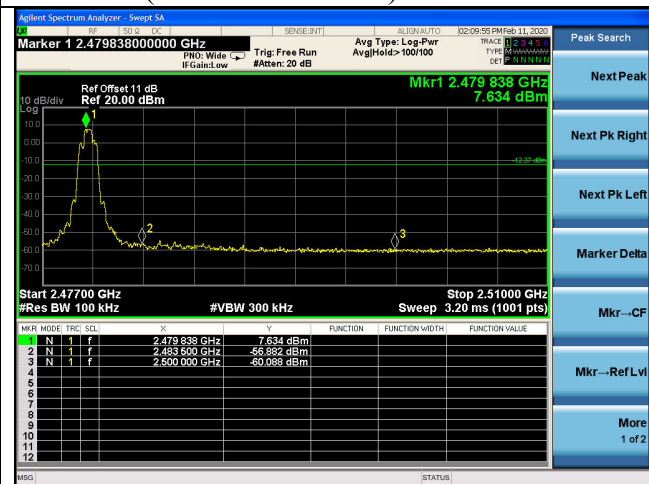


Hopping on

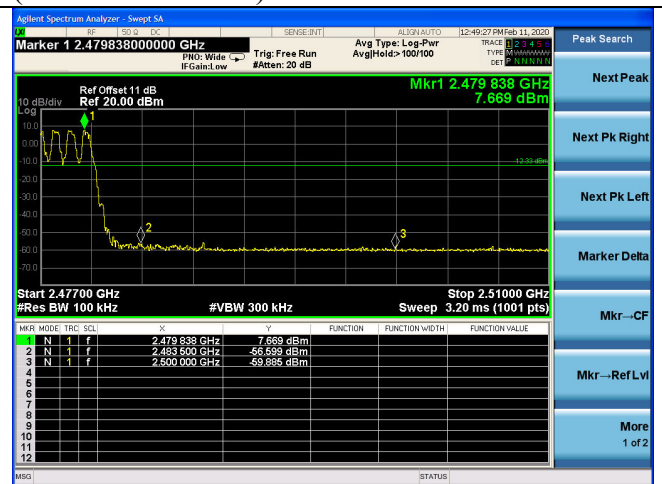
GFSK(2.3GHz – 2.4GHz)

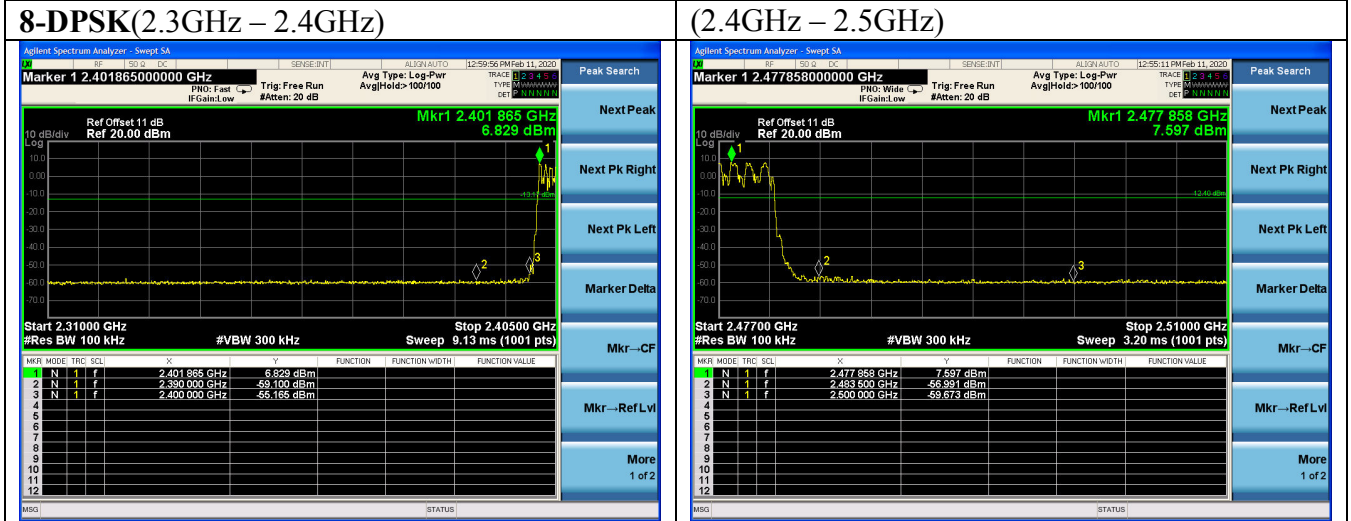


2480MHz(2.4GHz – 2.5GHz)



(2.4GHz – 2.5GHz)





## 6. 20 DB & 99% BANDWIDTH TEST

### 6.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Jun.30,19	1 Year
2.	Attenuator	Agilent	8491B	MY39269201	Oct.13,19	1 Year
3.	RF Cable	EMCI	EMC102-KM-KM 3500	170702	May.13,19	1 Year

### 6.2. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

### 6.3. Test Procedure

Use the test method described in ANSI C63.10 clause 7.8.7:

1. Connect the antenna port of the EUT to the spectrum analyzer.
2. Let the EUT transmit at Low/ Mid/ High channel with test software.
3. Setting of SA is following as: RBW: 30kHz / VBW: 100kHz  
Sweep Mode: Continuous sweep  
Detect mode: Positive peak  
Trace mode: Max hold.
4. Use the occupied bandwidth function of the SA measure the 20dB bandwidth directly.

6.4. Test Results

EUT: WiFi +BT module		
M/N: WCT5GM2511		
Test date: 2020-02-11	Pressure: 102.1±1.0 kpa	Humidity: 51.1±3.0%
Tested by: Lynn	Test site: RF site	Temperature: 22.8±0.6 °C

Test Mode	Frequency (MHz)	20dB bandwidth (KHz)	Limit (KHz)
GFSK	2402	830.1	N/A
	2441	828.9	N/A
	2480	829.5	N/A
8-DPSK	2402	1162	N/A
	2441	1163	N/A
	2480	1162	N/A

Conclusion : PASS

Test Mode	Frequency (MHz)	99% Bandwidth (KHz)	Limit (KHz)
GFSK	2402	819.66	N/A
	2441	820.37	N/A
	2480	819.94	N/A
8-DPSK	2402	1083	N/A
	2441	1083.5	N/A
	2480	1083.7	N/A

Conclusion : PASS

**GFSK**

**2402MHz**



**8-DPSK**

**2402MHz**



**2441MHz**



**2441MHz**



**2480MHz**



**2480MHz**



## 7. CARRIER FREQUENCY SEPARATION TEST

### 7.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Jun.30,19	1 Year
2.	RF Cable	EMCI	EMC102-KM-KM 3500	170702	May.13,19	1 Year

### 7.2. Limit

Frequency hopping systems shall have hopping channel carrier frequency separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, 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, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

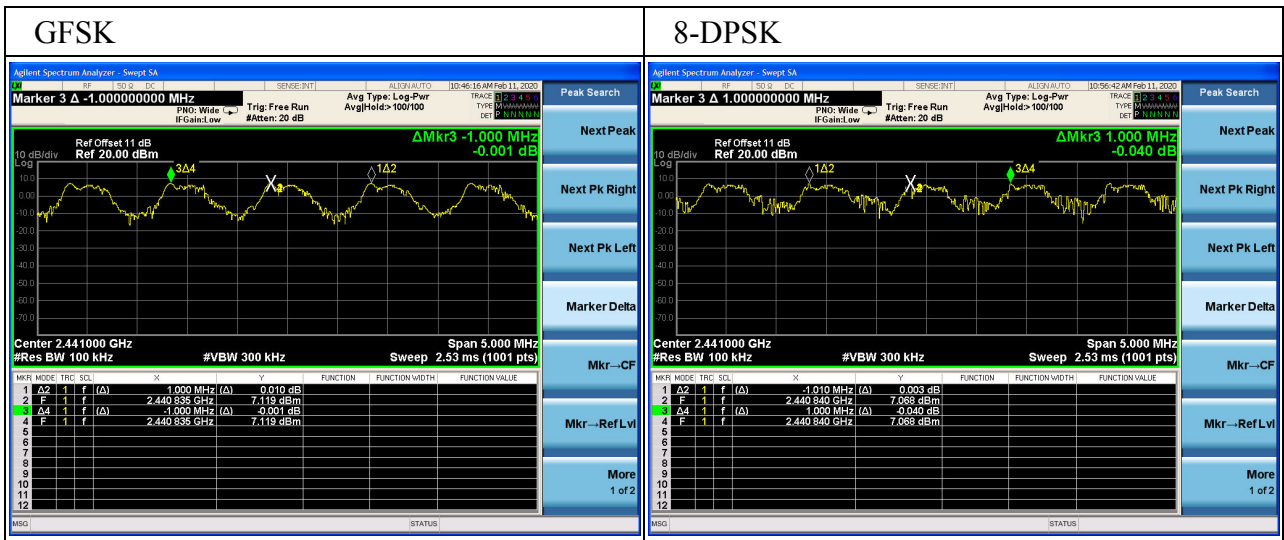
### 7.3. Test Procedure

Use the test method described in ANSI C63.10 clause 7.8.2:

1. Connect the antenna port of the EUT to the Spectrum analyzer.
2. Let the EUT transmit at Low/ Mid/ High channel.
3. Setting of SA is following as: RBW: 100kHz / VBW: 300kHz.Span: 3MHz
4. Use the mark Delta function of the SA measure out the channel separation.

7.4. Test Results.

EUT: WiFi +BT module			
M/N: WCT5GM2511			
Test date: 2020-02-11		Pressure: 102.1±1.0 kpa	Humidity: 51.1±3.0%
Tested by: Lynn		Test site: RF site	Temperature: 22.8±0.6 °C
Test Mode	Channel separation	Limit(KHz)	Conclusion
GFSK	1.0MHz	553.400	PASS
8-DPSK	1.0MHz	775.333	PASS



## 8. NUMBER OF HOPPING FREQUENCY TEST

### 8.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Jun.30,19	1 Year
2.	RF Cable	EMCI	EMC102-KM-KM 3500	170702	May.13,19	1 Year

### 8.2. Limit

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

### 8.3. Test Procedure

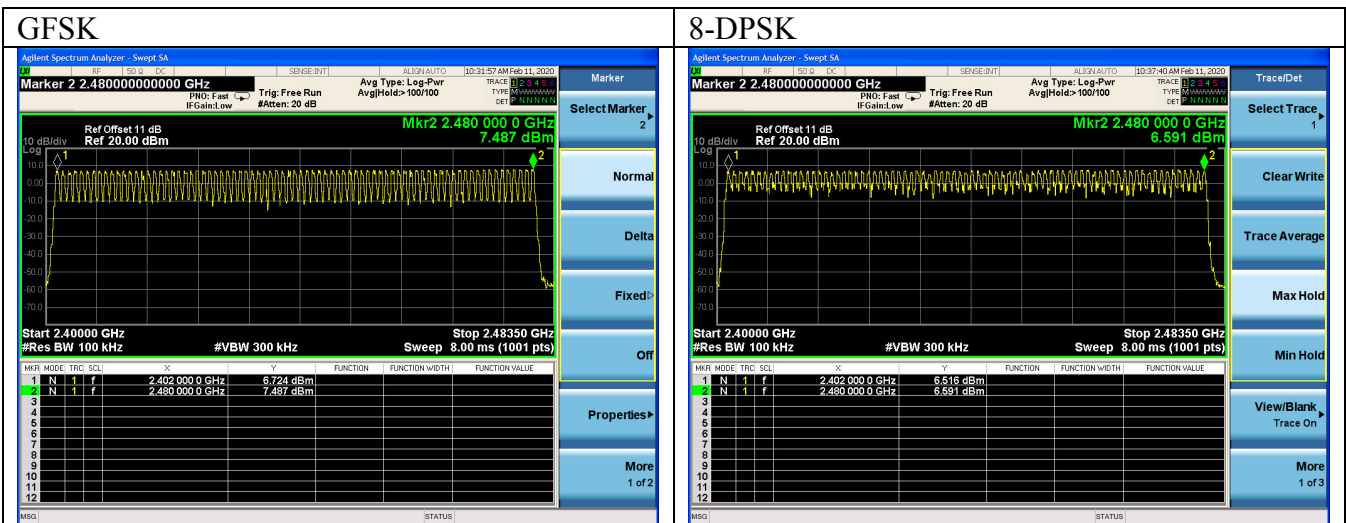
Use the test method described in ANSI C63.10 clause 7.8.3:

1. Connect the antenna of the EUT to Spectrum analyzer and let the EUT working at hopping mode.
2. Setting of SA is following as: RBW: 100kHz / VBW: 300kHz  
 Start frequency: 2390MHz  
 Stop frequency: 2483.5MHz  
 And waiting for the hopping trace until stability, count out the number of the hopping.

### 8.4. Test Results

EUT: WiFi +BT module		
M/N: WCT5GM2511		
Test date: 2020-02-11	Pressure: 102.1±1.0 kpa	Humidity: 51.1±3.0%
Tested by: Lynn	Test site: RF site	Temperature: 22.8±0.6 °C

Test Mode	Number of channel	Limit	Conclusion
GFSK	79	>=15	PASS
8-DPSK	79	>=15	PASS





## 9. DWELL TIME

### 9.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Jun.30,19	1 Year
2.	RF Cable	EMCI	EMC102-KM-KM 3500	170702	May.13,19	1 Year

### 9.2. Limit

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.

### 9.3. Test Procedure

Use the test method described in ANSI C63.10 clause 7.8.4:

1. Connect the antenna of the EUT to Spectrum analyzer and let the EUT working at hopping mode.
2. Setting of SA is following as:  
 RBW: 100kHz / VBW: 100kHz  
 Sweep Mode: Single  
 Detect mode: Positive peak  
 Trace mode: Auto  
 Span: 0Hz  
 Sweep time: 5s and big enough to measure one hopping signal
3. Use below formula calculate the Dwell time  
 Dwell time=Hopping number per second\*0.4\*channel number\*Pulse bandwidth per hopping.

### 9.4. Test Results

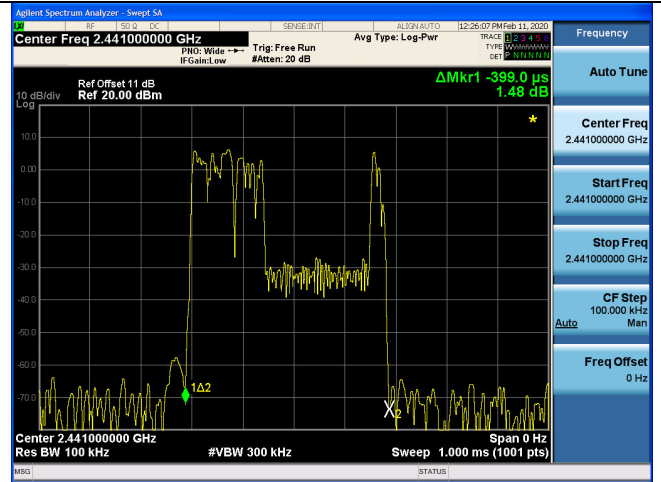
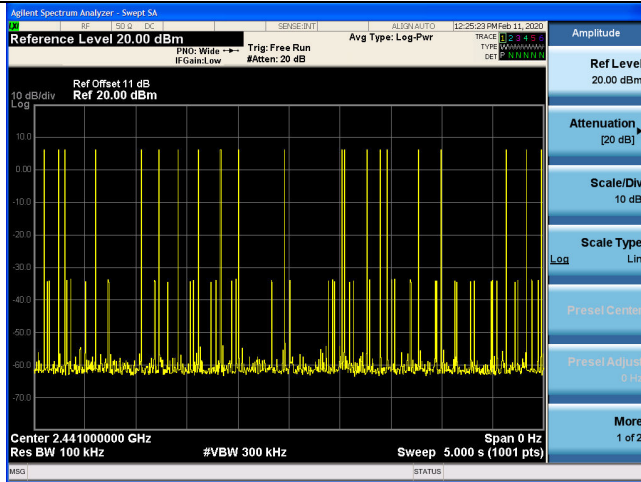
EUT: WiFi +BT module		
M/N: WCT5GM2511		
Test date: 2020-02-11	Pressure: 102.1±1.0 kpa	Humidity: 51.1±3.0%
Tested by: Lynn	Test site: RF site	Temperature:22.8±0.6 °C

Mode		dwell time	Limit	Conclusion
GFSK	DH1	21 hops/5s*0.4*79channels* 0.399 ms =52.955ms	≅ 400ms	PASS
	DH3	20 hops/5s*0.4*79channels* 1.674 ms =211.594ms	≅ 400ms	PASS
	DH5	16 hops/5s*0.4*79channels* 2.915 ms =294.765ms	≅ 400ms	PASS
8-DPSK	3-DH1	21 hops/5s*0.4*79channels* 0.406 ms =53.884ms	≅ 400ms	PASS
	3-DH3	29 hops/5s*0.4*79channels* 1.671 ms =306.261ms	≅ 400ms	PASS
	3-DH5	13 hops/5s*0.4*79channels* 2.935 ms =241.140ms	≅ 400ms	PASS

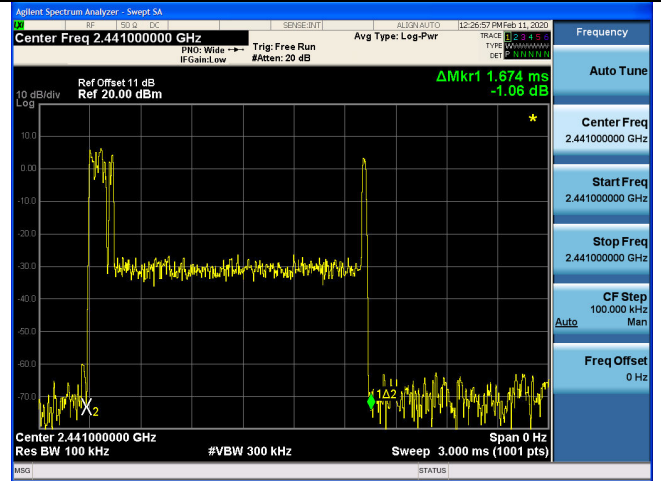
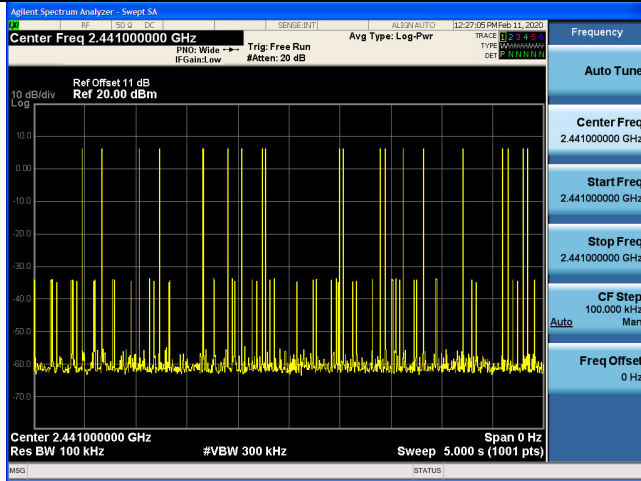
Note: All the lower levels were signaled from receiver and should not be considered in here.

### GFSK

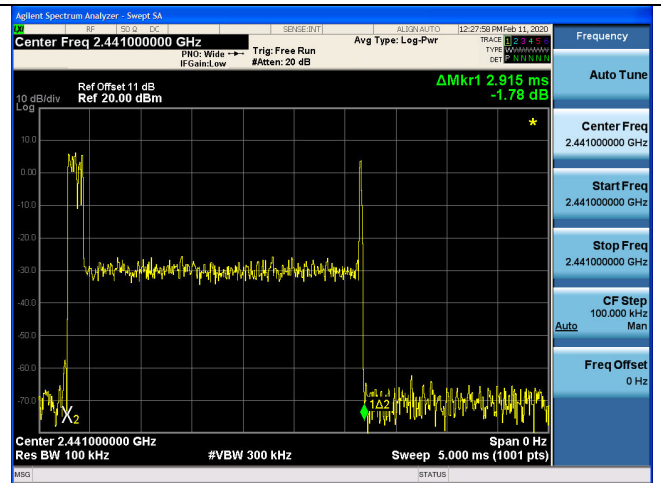
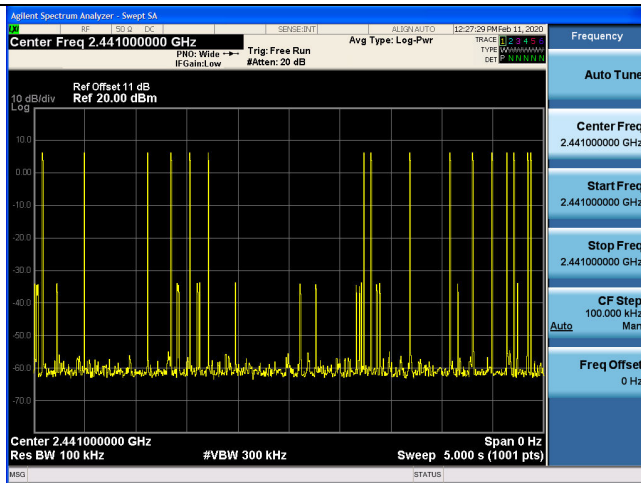
#### DH 1



#### DH 3

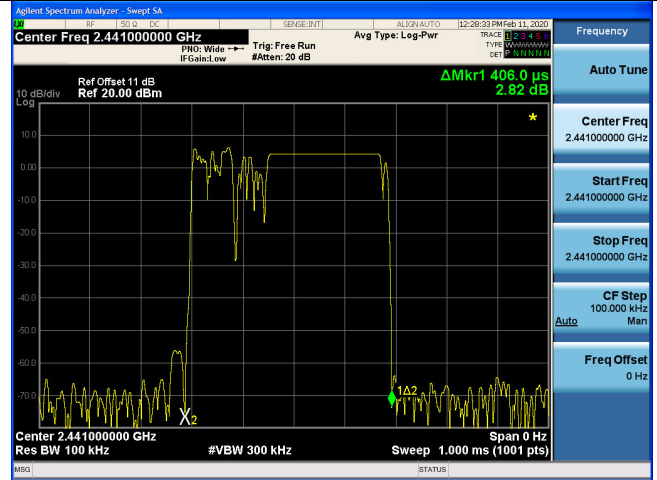
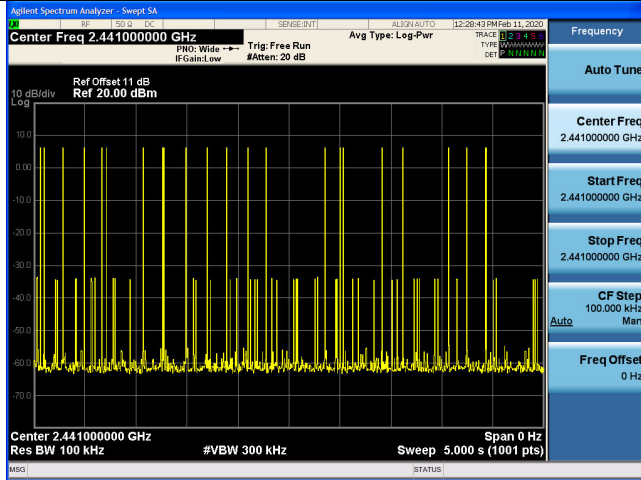


#### DH 5

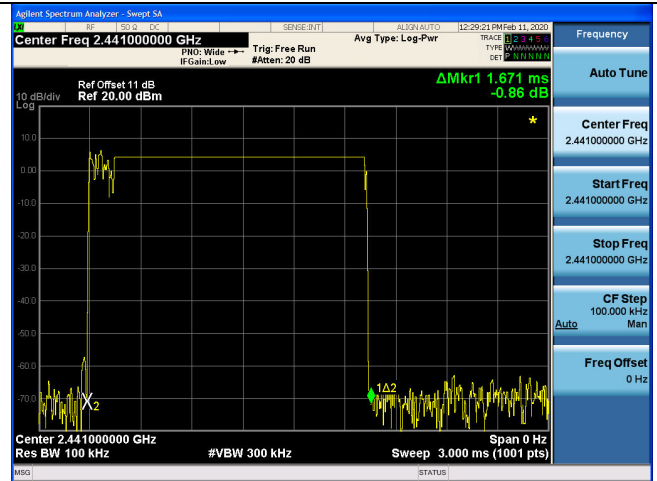
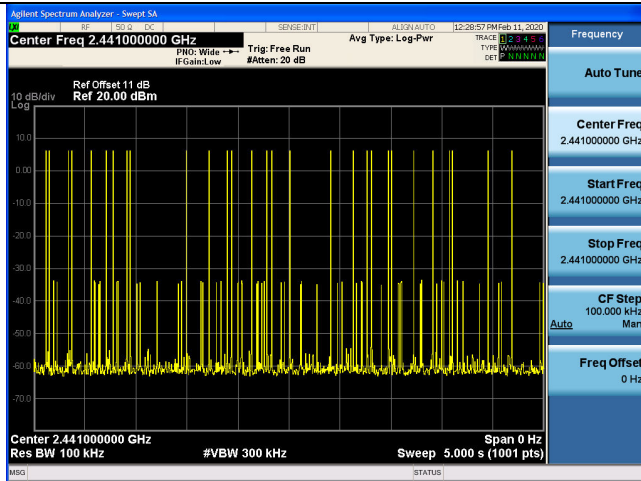


### 8-DPSK

#### 3DH 1



#### 3DH 3



#### 3DH 5

