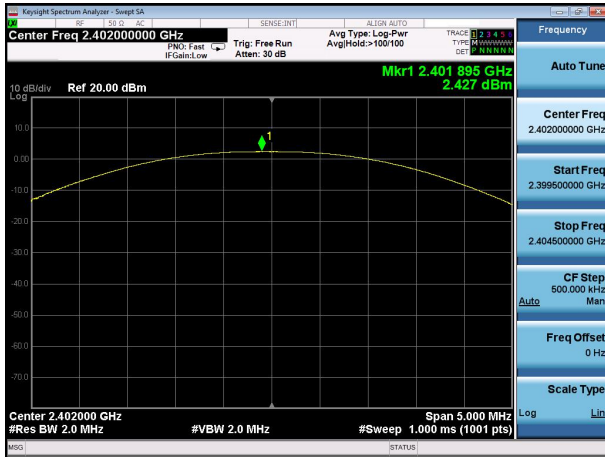


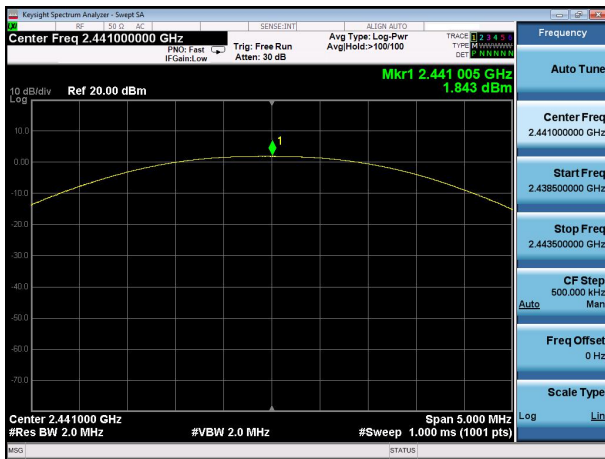


8DPSK



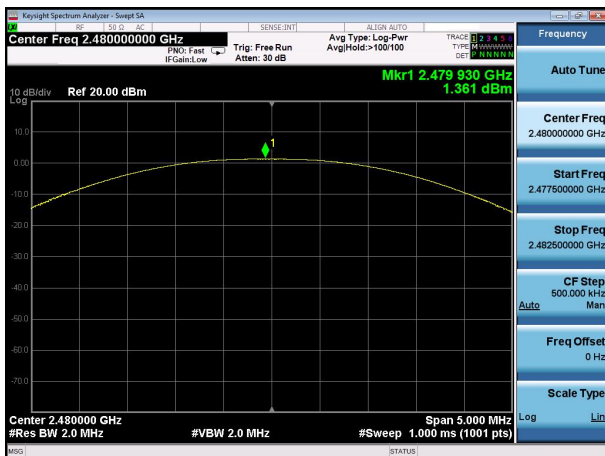
/

2402MHz



/

2441MHz



/

2480MHz



**6. NUMBER OF HOPPING CHANNEL**

**6.1 APPLIED PROCEDURES / LIMIT**

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Number of Hopping Channel	≥15	2400-2483.5	PASS

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	= the frequency band of operation
RB	RBW ≥ 1% of the span
VB	VBW ≥ RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

**6.1.1 TEST PROCEDURE**

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = Auto.

**6.1.2 DEVIATION FROM STANDARD**

No deviation.

**6.1.3 TEST SETUP**



**6.1.4 EUT OPERATION CONDITIONS**

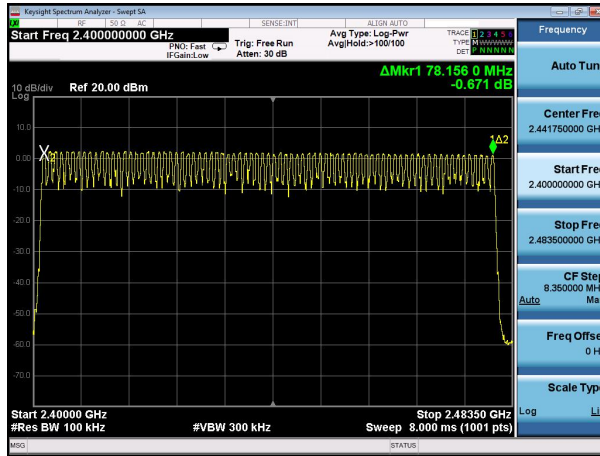
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

**6.1.5 TEST RESULTS**

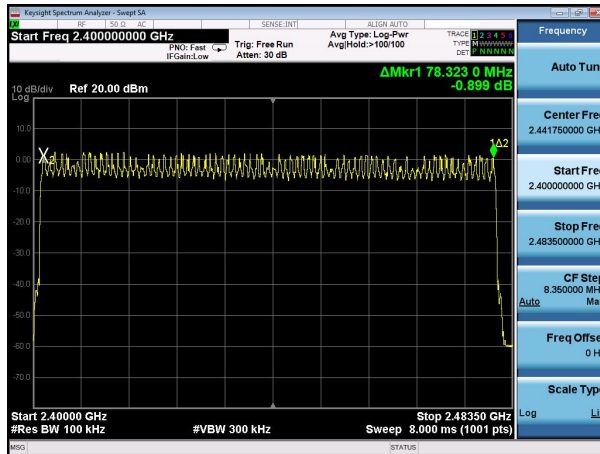
Test Mode :	Hopping Mode	
Number of Hopping Channel	GFSK	79
	$\pi/4$ DQPSK	79
	8DPSK	79



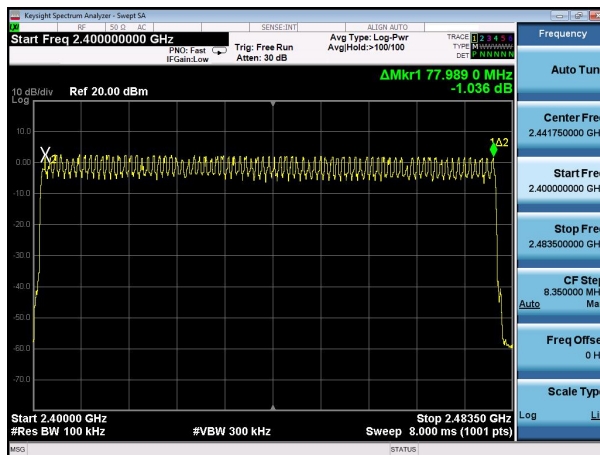
### GFSK



### $\pi/4$ DQPSK



### 8DPSK





## 7. BANDWIDTH TEST

### 7.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C	
Section	Test Item
15.247(a)(1)	Bandwidth

#### 7.1.1 TEST PROCEDURE

1. Set RBW = 30 kHz.
2. Set the video bandwidth (VBW)  $\geq$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

#### 7.1.2 DEVIATION FROM STANDARD

No deviation.

#### 7.1.3 TEST SETUP



#### 7.1.4 EUT OPERATION CONDITIONS

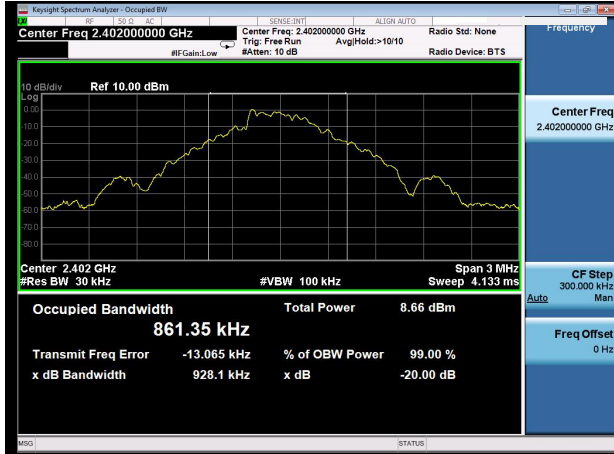
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

**7.1.5 TEST RESULTS**

	Frequency (MHz)	20dB Bandwidth (MHz)	Result
GFSK	2402	0.928	Pass
	2441	0.927	Pass
	2480	0.927	Pass
$\pi/4$ DQPSK	2402	1.221	Pass
	2441	1.219	Pass
	2480	1.223	Pass
8DPSK	2402	1.217	Pass
	2441	1.212	Pass
	2480	1.216	Pass

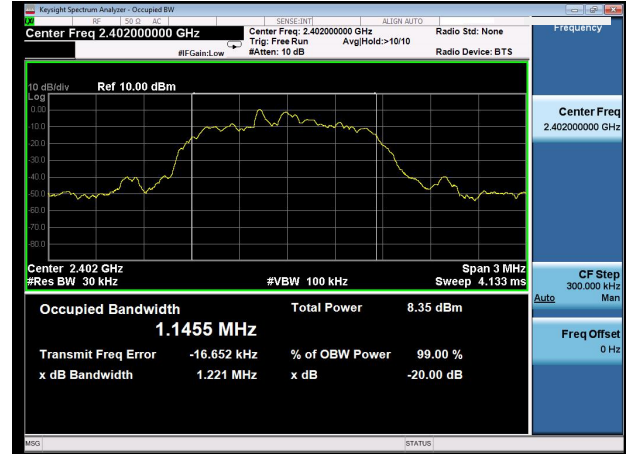


GFSK



2402MHz

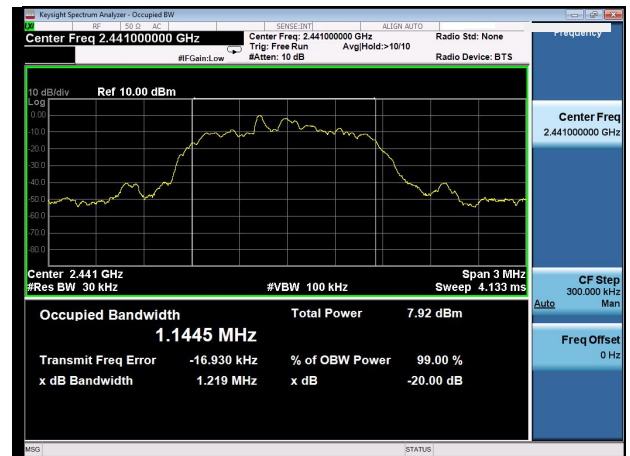
$\pi/4$  DQPSK



2402MHz



2441MHz



2441MHz



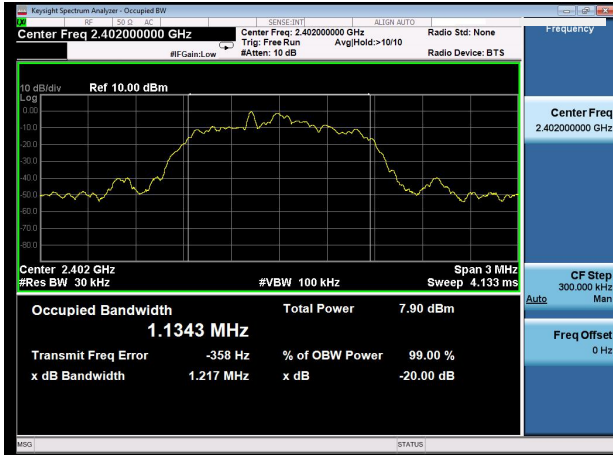
2480MHz



2480MHz

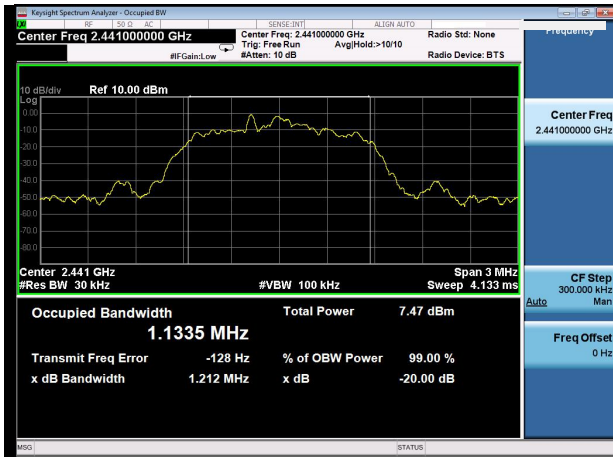


8DPSK



/

2402MHz



/

2441MHz



/

2480MHz



**8. HOPPING CHANNEL SEPARATION MEASUREMENT**

**8.1 APPLIED PROCEDURES / LIMIT**

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.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	100 kHz (Channel Separation)
VB	300 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

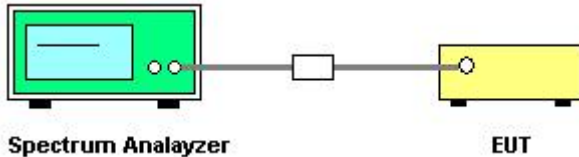
**8.1.1 TEST PROCEDURE**

- a. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
- b. The resolution bandwidth of 100 kHz and the video bandwidth of 300 kHz were utilised for channel separation measurement.

**8.1.2 DEVIATION FROM STANDARD**

No deviation.

**8.1.3 TEST SETUP**



**8.1.4 EUT OPERATION CONDITIONS**

The EUT was programmed to be in continuously transmitting mode.

**8.1.5 TEST RESULTS**

Temperature:	25 °C	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 3.8V

Test Mode	Ch. Separation (MHz)	Limit (MHz)	Result
GFSK	1.004	0.618	Complies
$\pi/4$ DQPSK	0.992	0.813	Complies
8DPSK	1.002	0.808	Complies





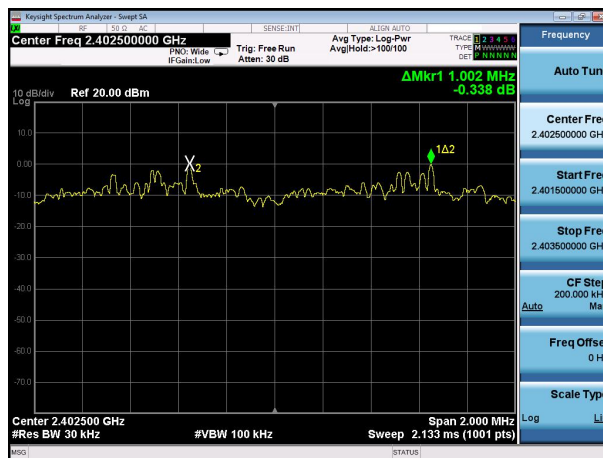
### GFSK



### $\pi/4$ DPSK



### 8DPSK





9. DWELL TIME OF OCCUPANCY

9.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

9.1.1 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 = 0Hz;
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).

9.1.2 DEVIATION FROM STANDARD

No deviation.

9.1.3 TEST SETUP



9.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



### 9.1.5 TEST RESULTS

GFSK DH5 mode:

Frequency	Packet	Dwell time(ms)	Limit(ms)	Result
2402MHz	DH5	312.85	400	Pass
2441MHz	DH5	312.85	400	Pass
2480MHz	DH5	312.85	400	Pass

Remarks:

The test period:  $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$

Test channel: as blow

CH:2402MHz time slot= $2.933(\text{ms}) \times (1600 / (6 \times 79)) \times 31.6 = 312.85\text{ms}$

CH:2441MHz time slot= $2.933(\text{ms}) \times (1600 / (6 \times 79)) \times 31.6 = 312.85\text{ms}$

CH:2480MHz time slot= $2.933(\text{ms}) \times (1600 / (6 \times 79)) \times 31.6 = 312.85\text{ms}$

$\pi/4$ -DQPSK mode:

Frequency	Packet	Dwell time(ms)	Limit(ms)	Result
2402MHz	2DH5	311.15	400	Pass
2441MHz	2DH5	310.19	400	Pass
2480MHz	2DH5	311.15	400	Pass

Remarks:

The test period:  $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$

Test channel: as blow

CH:2402MHz time slot= $2.917(\text{ms}) \times (1600 / (6 \times 79)) \times 31.6 = 311.15\text{ms}$

CH:2441MHz time slot= $2.908(\text{ms}) \times (1600 / (6 \times 79)) \times 31.6 = 310.19\text{ms}$

CH:2480MHz time slot= $2.917(\text{ms}) \times (1600 / (6 \times 79)) \times 31.6 = 311.15\text{ms}$

8DPSK mode:

Frequency	Packet	Dwell time(ms)	Limit(ms)	Result
2402MHz	3DH5	312.85	400	Pass
2441MHz	3DH5	312.85	400	Pass
2480MHz	3DH5	311.15	400	Pass

Remarks:

The test period:  $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$

Test channel: as blow

CH:2402MHz time slot= $2.933(\text{ms}) \times (1600 / (6 \times 79)) \times 31.6 = 312.85\text{ms}$

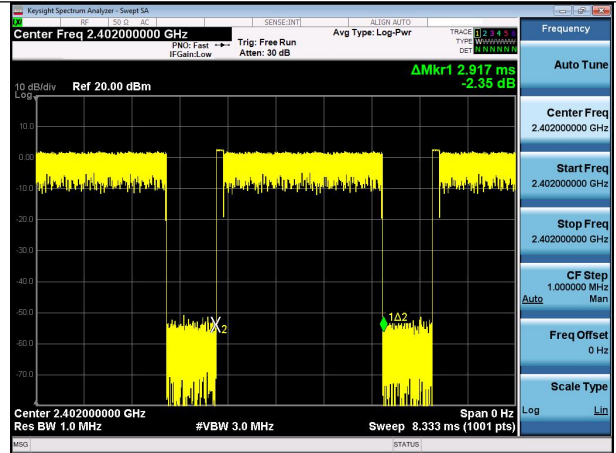
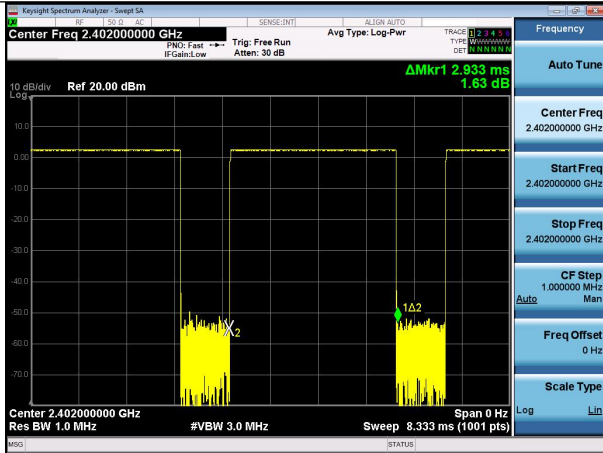
CH:2441MHz time slot= $2.933(\text{ms}) \times (1600 / (6 \times 79)) \times 31.6 = 312.85\text{ms}$

CH:2480MHz time slot= $2.917(\text{ms}) \times (1600 / (6 \times 79)) \times 31.6 = 311.15\text{ms}$



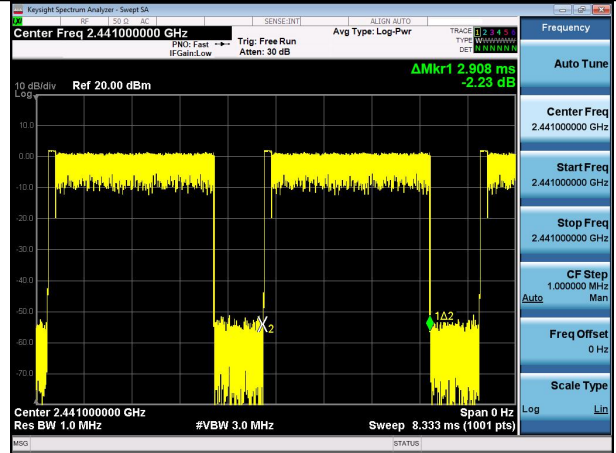
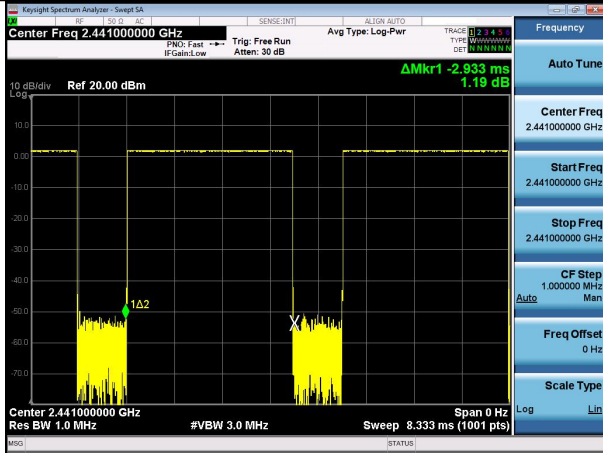
GFSK

$\pi/4$ -DQPSK



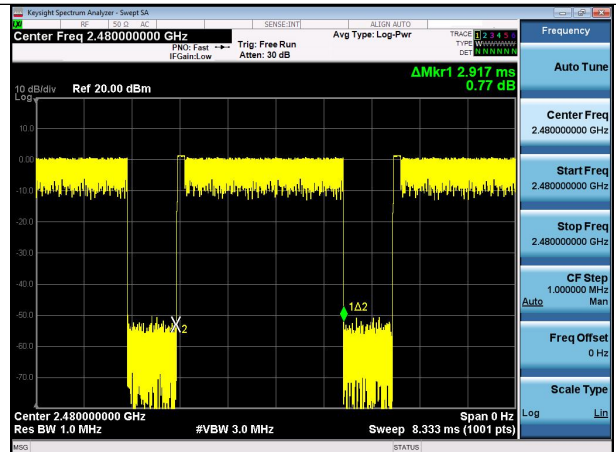
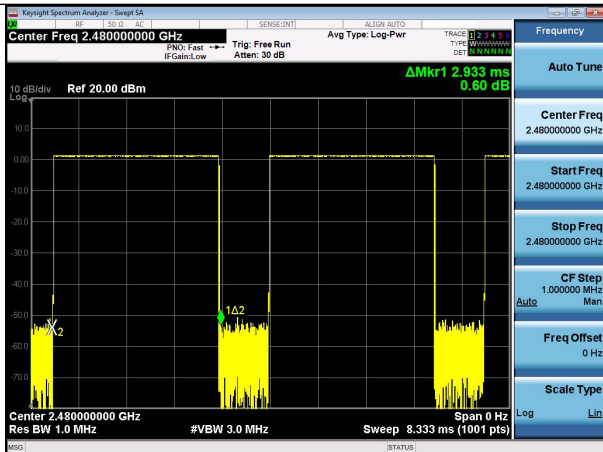
2402MHz

2402MHz



2441MHz

2441MHz

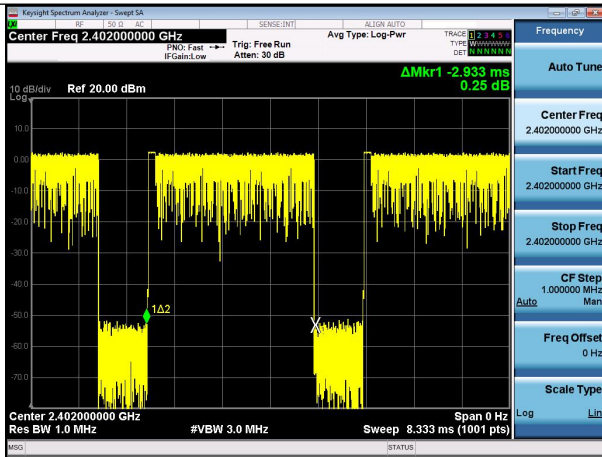


2480MHz

2480MHz



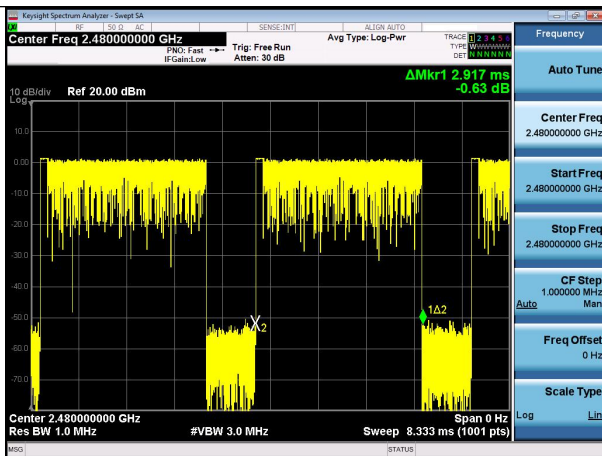
8DPSK



2402MHz



2441MHz



2480MHz



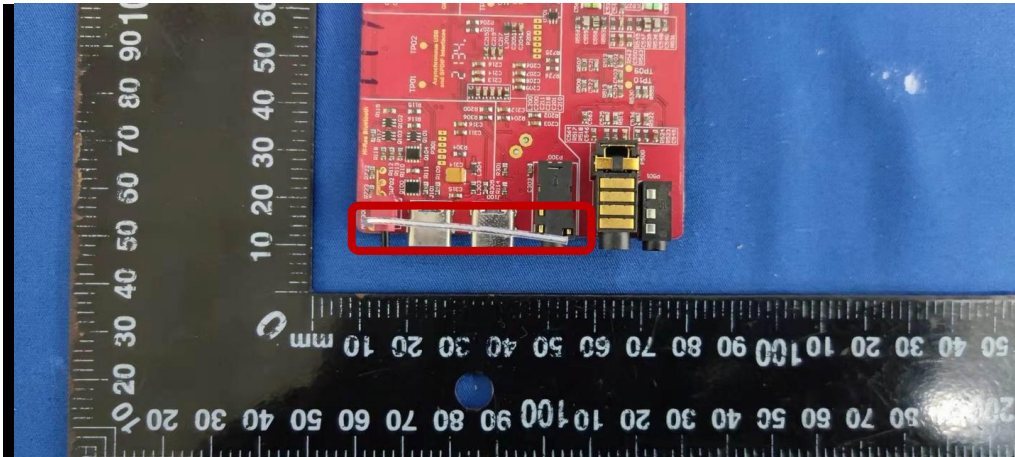
## 10. ANTENNA REQUIREMENT

### 10.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### 10.2 EUT ANTENNA

The EUT antenna is Internal antenna,. It comply with the standard requirement.





## 11. TEST SEUUP PHOTO

Reference to the appendix I for details.

## 12. EUT PHOTO

Reference to the appendix II for details.

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