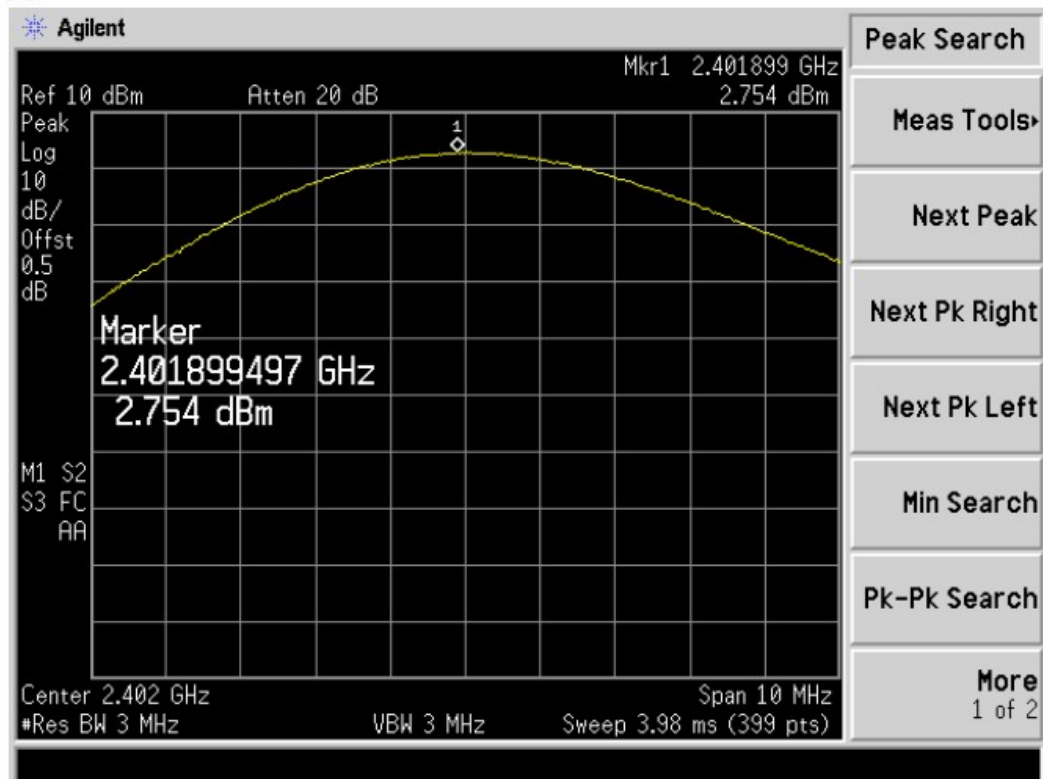
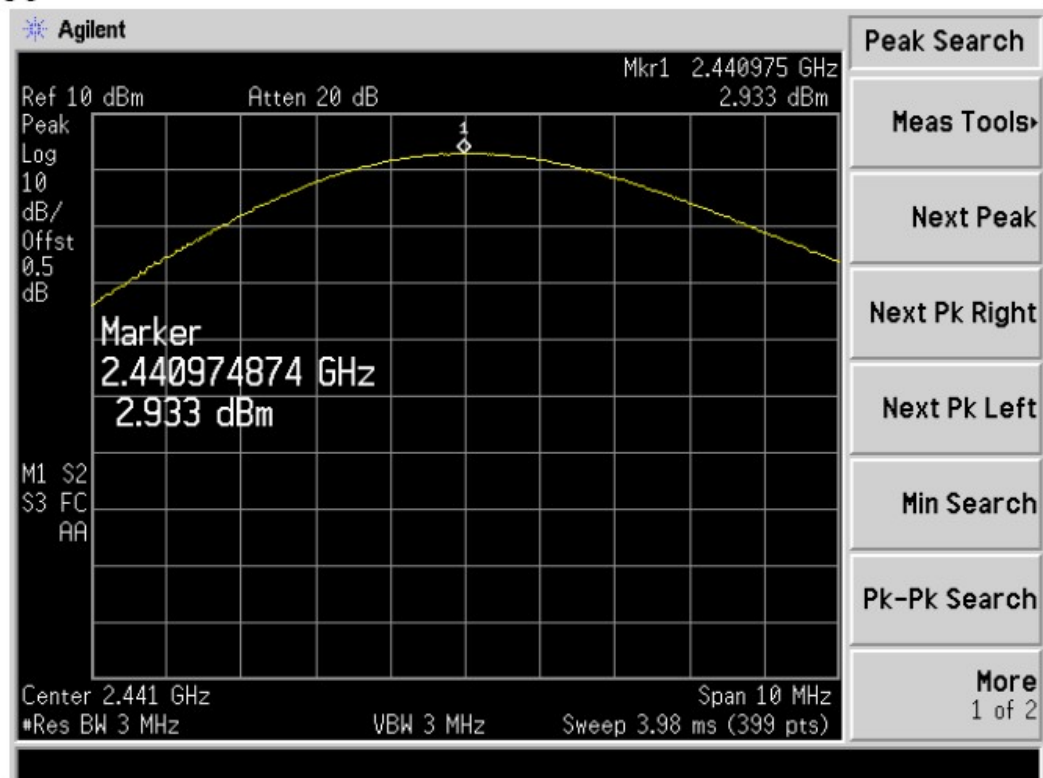


Modulation Type: 8DPSK

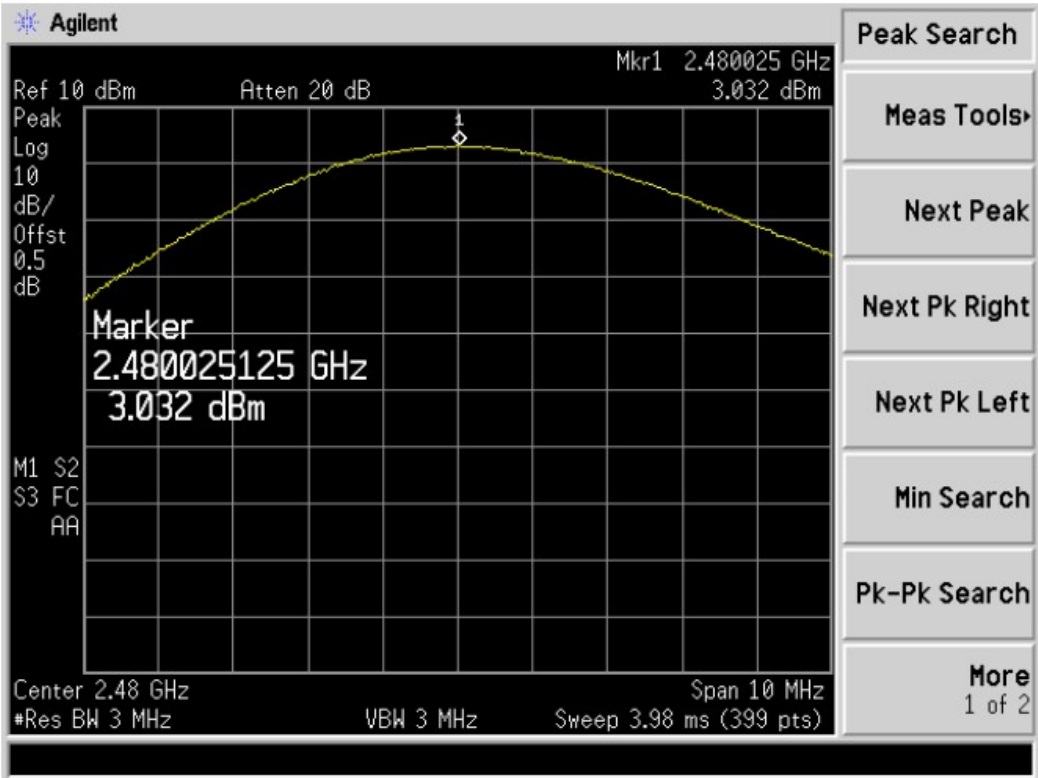
CH00



CH39



CH78



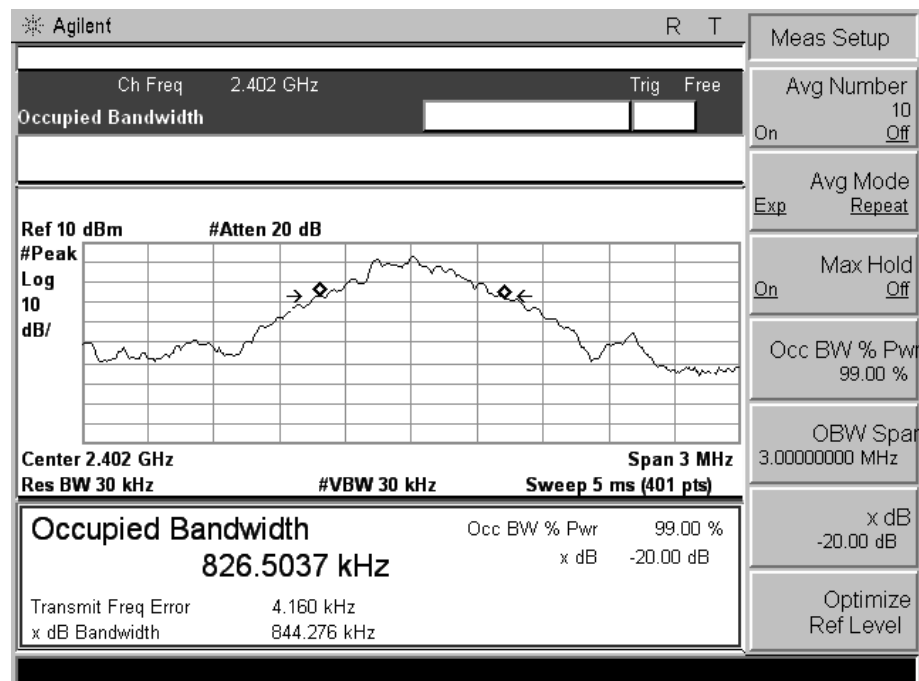
## 7.5. 20dB Bandwidth

Maximum 20dB RF Bandwidth, FCC Rule 15.247(a) (1):

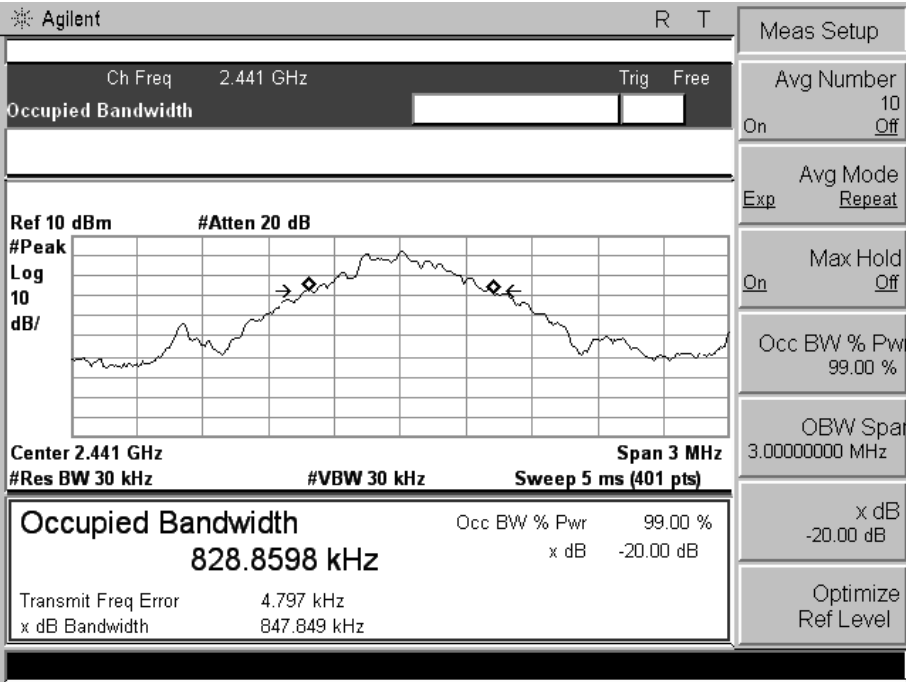
The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RBW was chosen so that the display was a result of the hopping channel modulation. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. Use the spectrum 20dB down delta function to measure the bandwidth.

Frequency (MHz)	20dB Bandwidth (MHz)		
	GFSK	$\pi/4$ -DQPSK	8DPSK
2402	0.8443	1.274	1.272
2441	0,8478	1.270	1.252
2480	0.8469	1,284	1.275

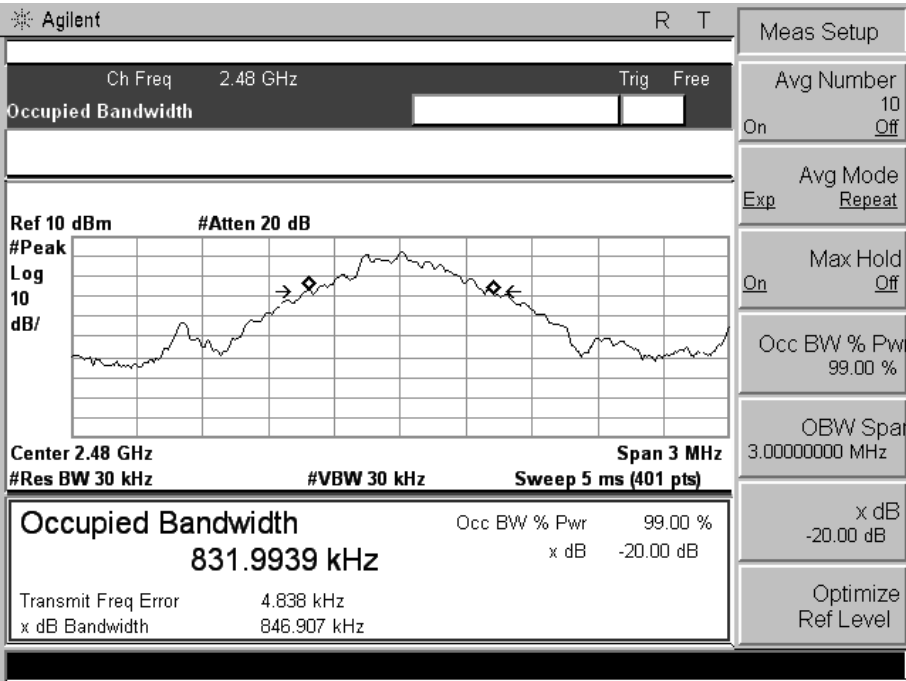
### GFSK:CH00



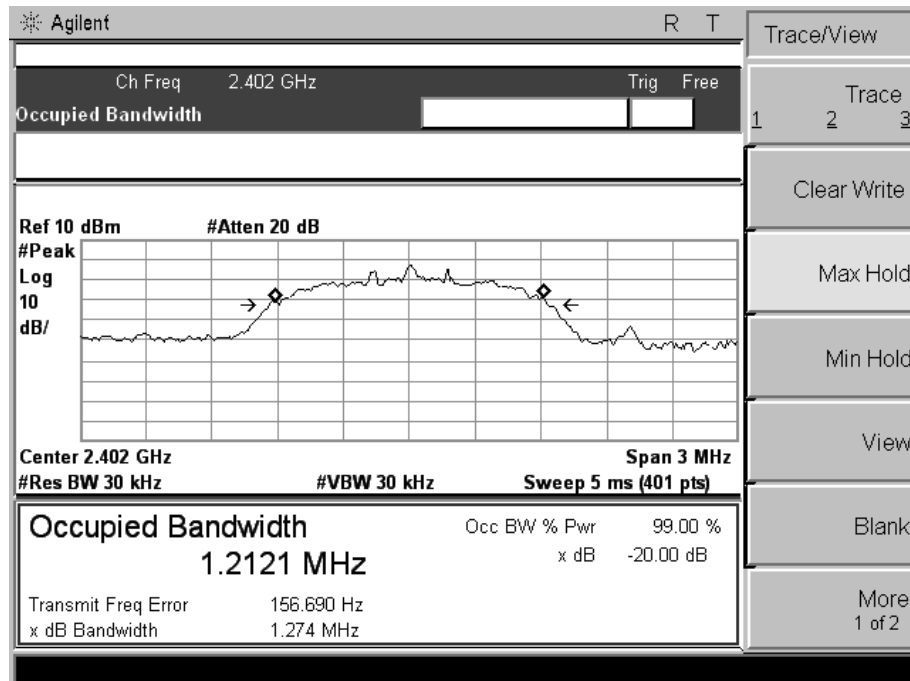
GFSK:CH39



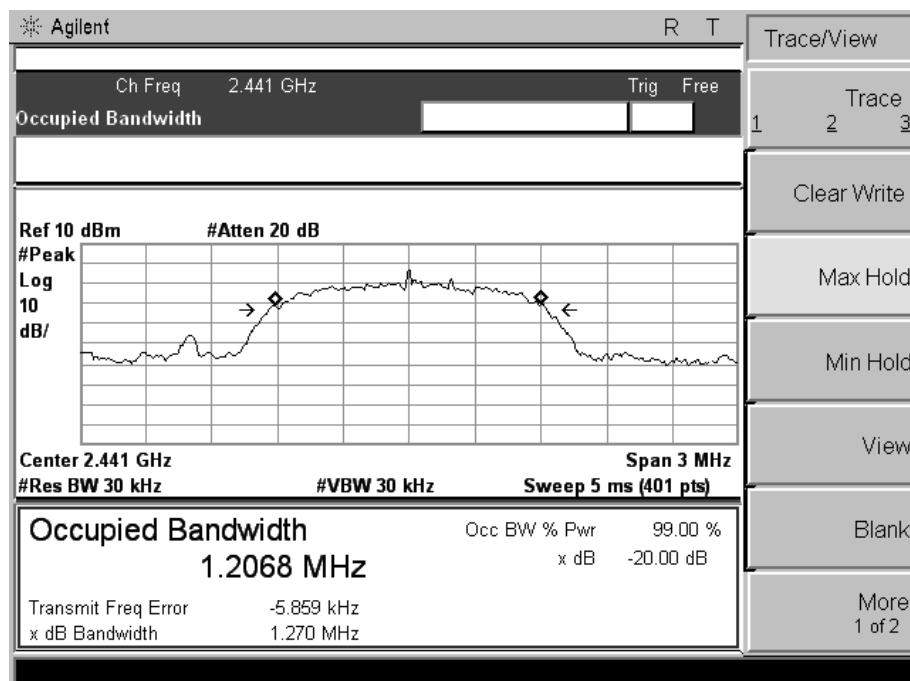
GFSK:CH78



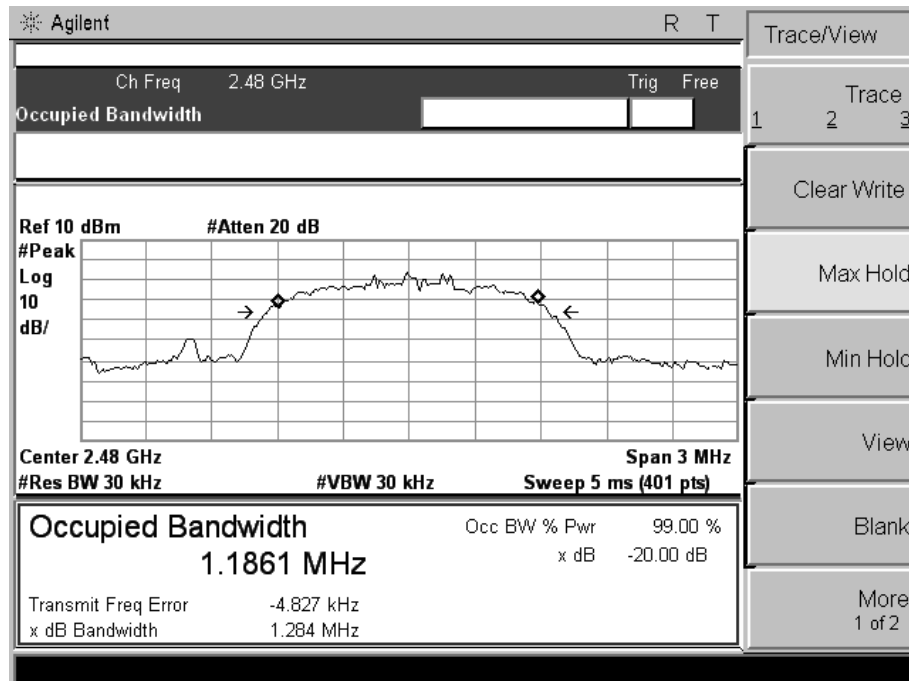
$\pi$  /4-DQPSK:CH00



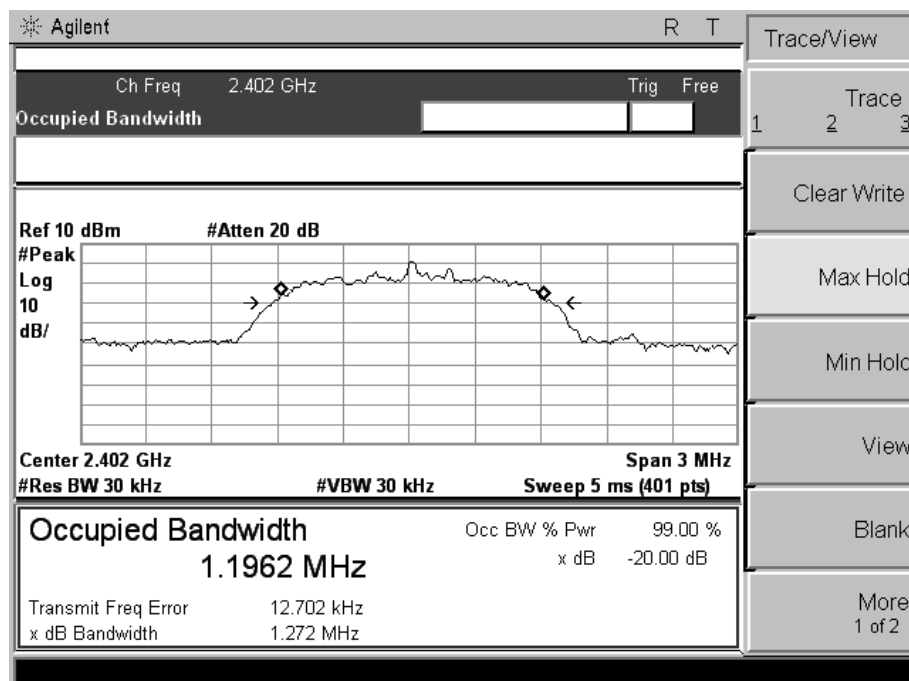
$\pi$  /4-DQPSK:CH39



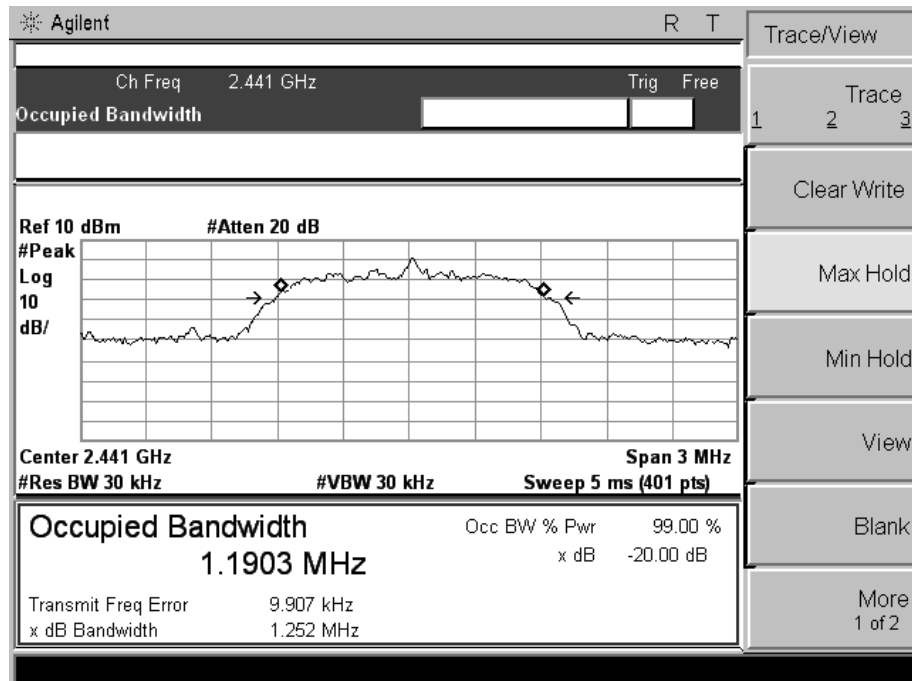
**$\pi$  /4-DQPSK:CH78**



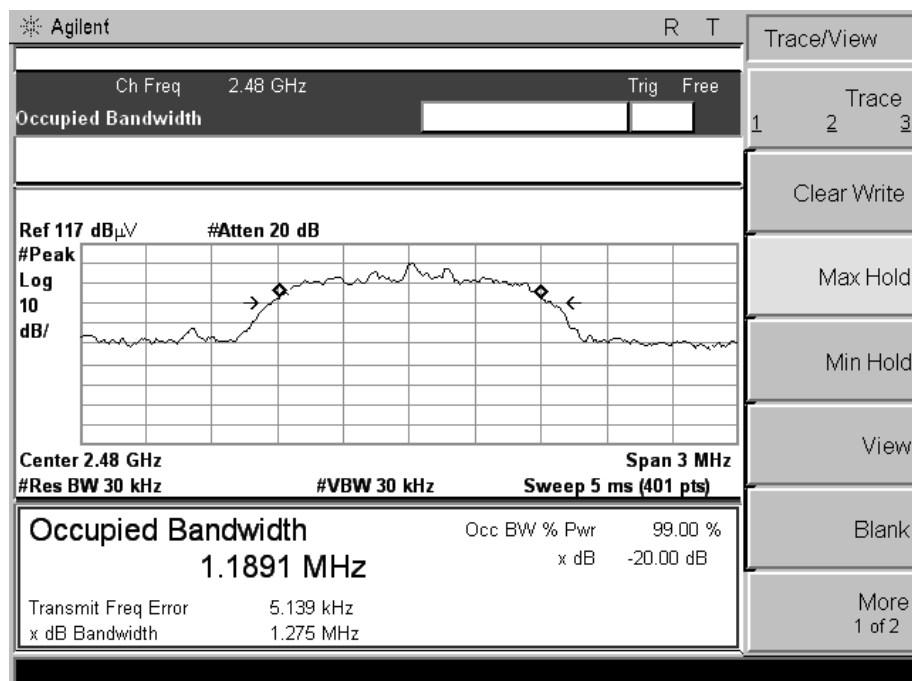
**8DPSK:CH00**



### 8DPSK:CH39



### 8DPSK:CH78



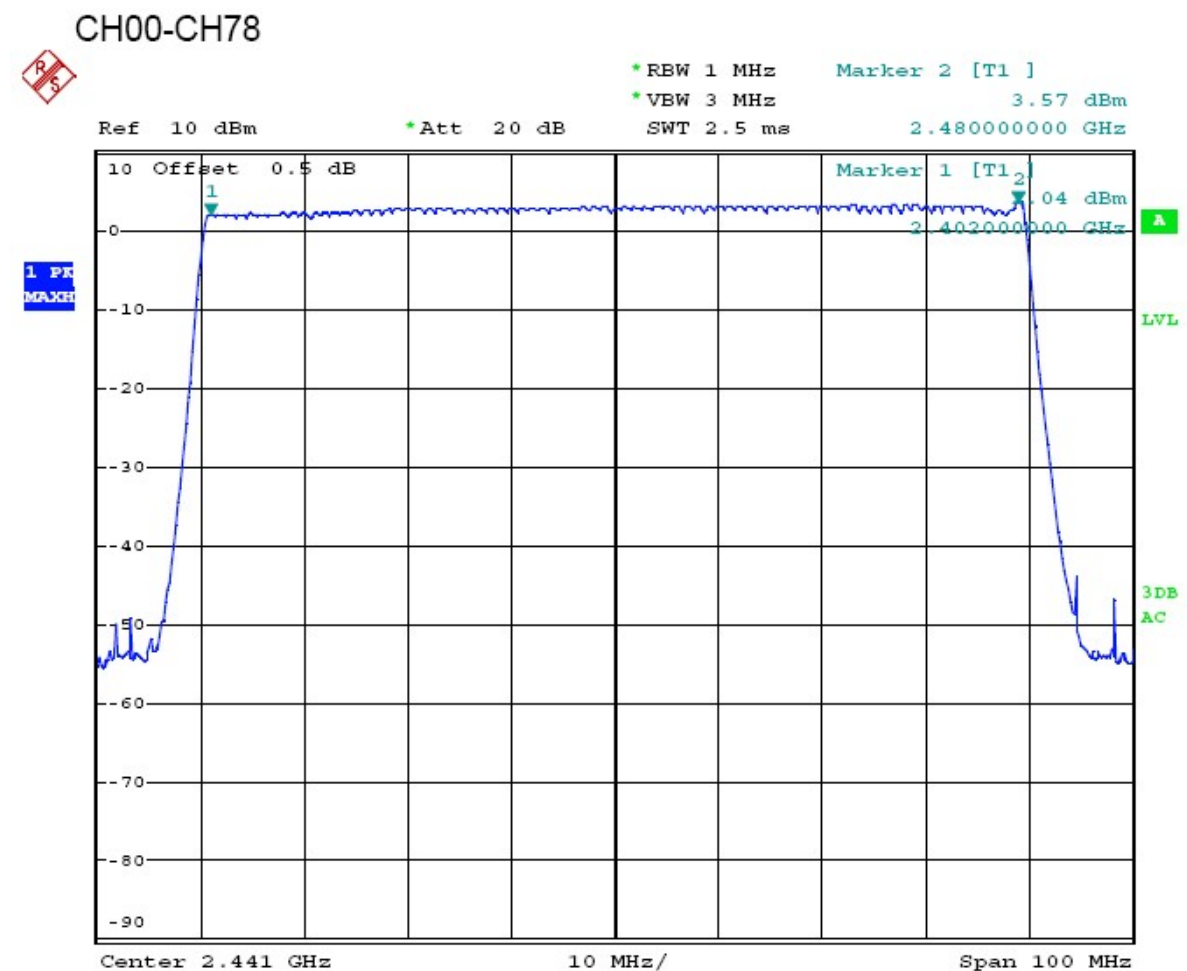
## 7.6. Channel Number (Number of Hopping Frequency)

Minimum Number of Hopping Frequencies, FCC Rule 15.247(a) (1) (iii):

The RF passband of the EUT was divided into 5 approximately equal bands. With the analyzer set to MAX HOLD reading were taken for 2-3 minutes. The channel peaks so recorded were added together, and the total number compared to the minimum number of channels required in the regulation.

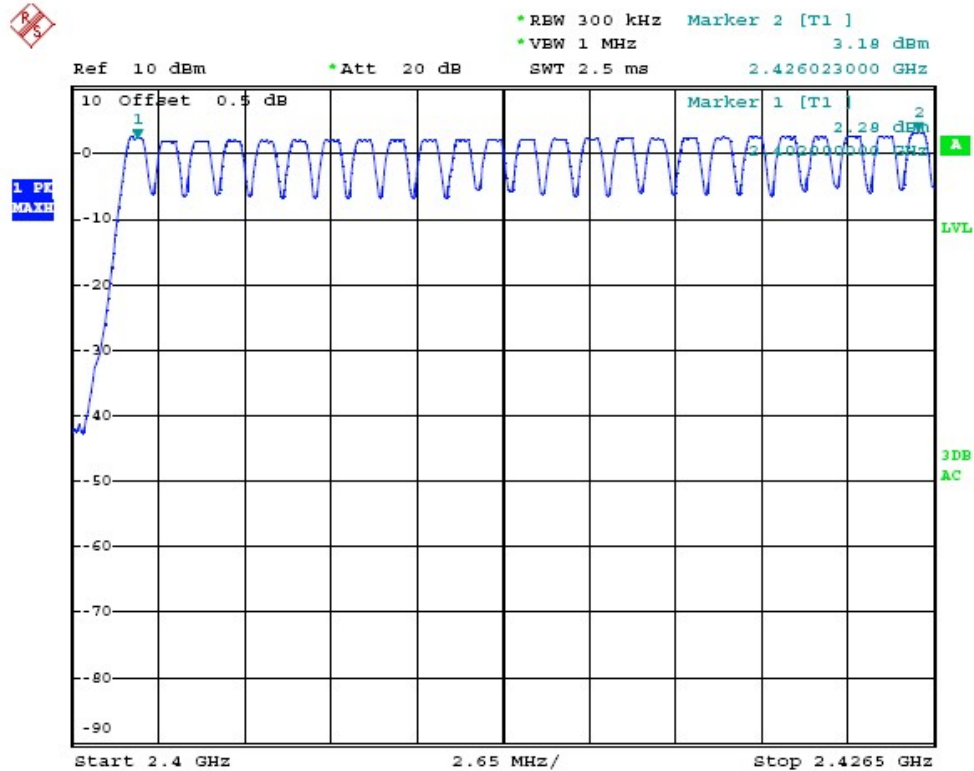
Number of hopping channels =	79
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Modulation type: GFSK

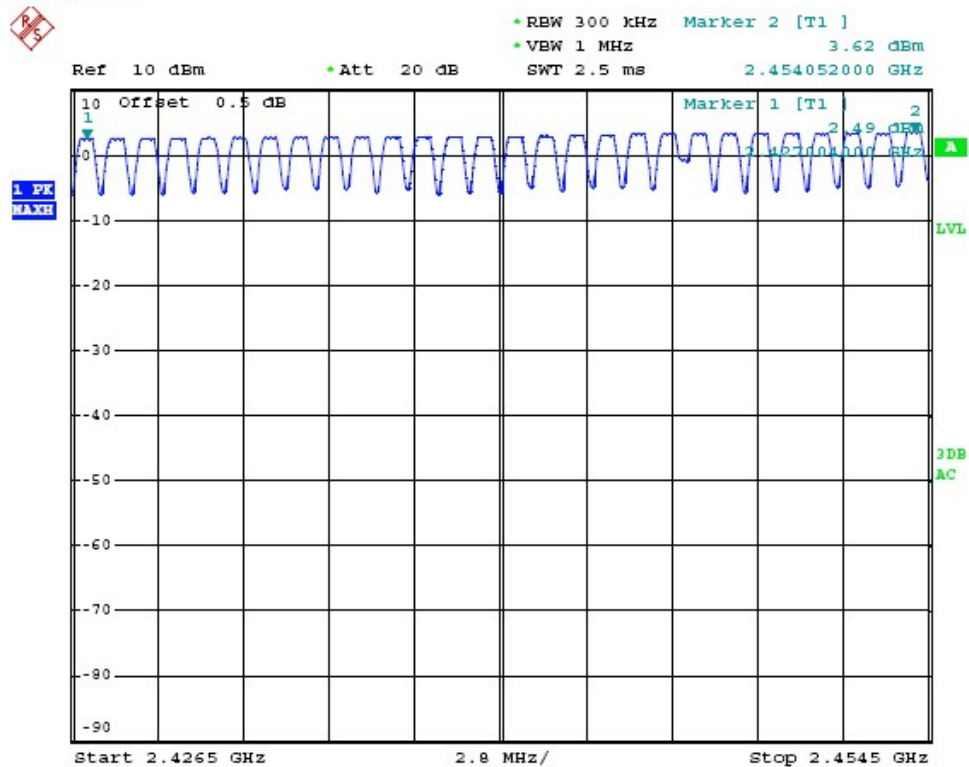




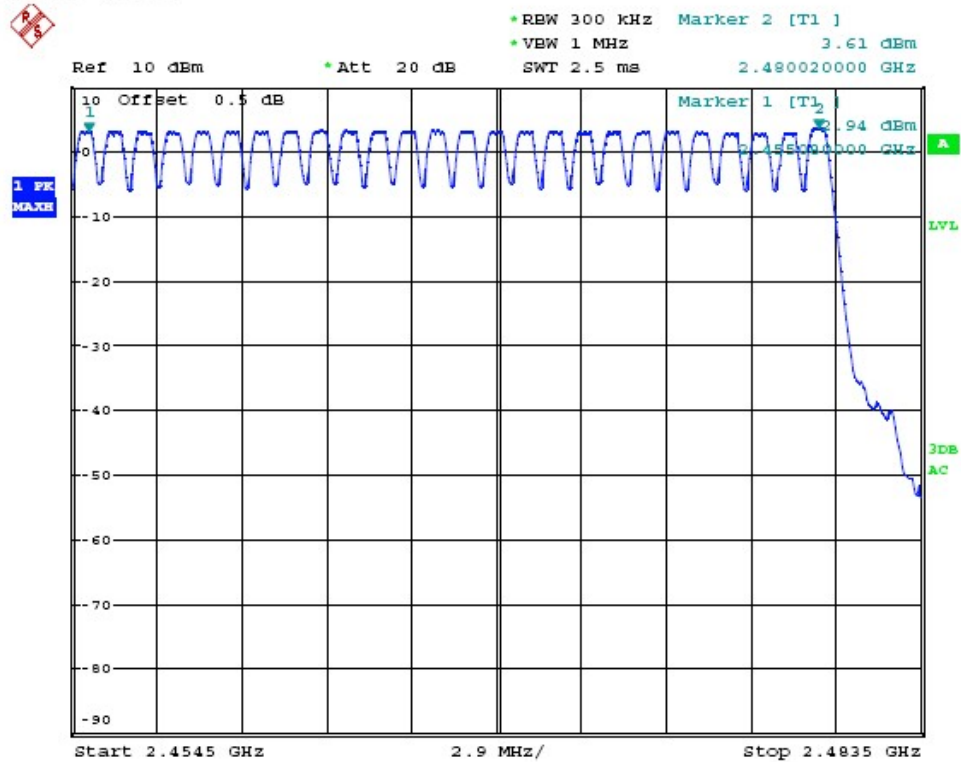
### CH00-CH24



### CH25-CH52



### CH53-CH78



## 7.7. Channel Separation (Carrier Frequency Separation)

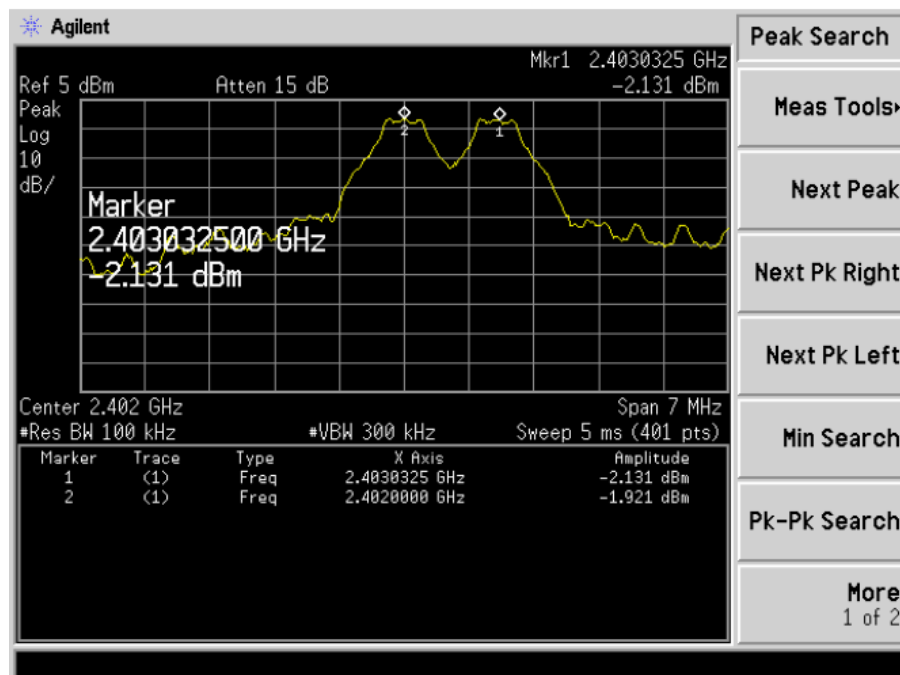
Minimum Hopping Channel Carrier Frequency Separation, FCC Ref: 15.247(a)(1):

Using the DELTA MARKER function of the analyzer, the frequency separation between two adjacent channels was measured and compared against the limit:

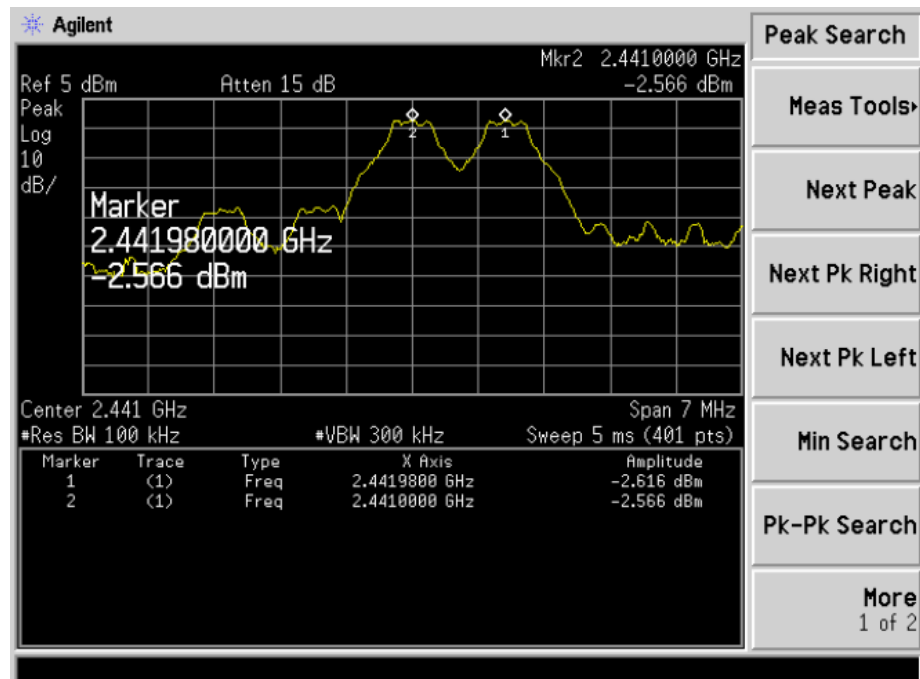
**Modulation type: GFSK**

Channel frequency (MHz)	Separation Read Value (kHz)	Separation Limit 2/3 20dB Down BW(kHz)
2402	1032.50	>562.87
2441	980.000	>565.21
2480	1015.00	>564.60

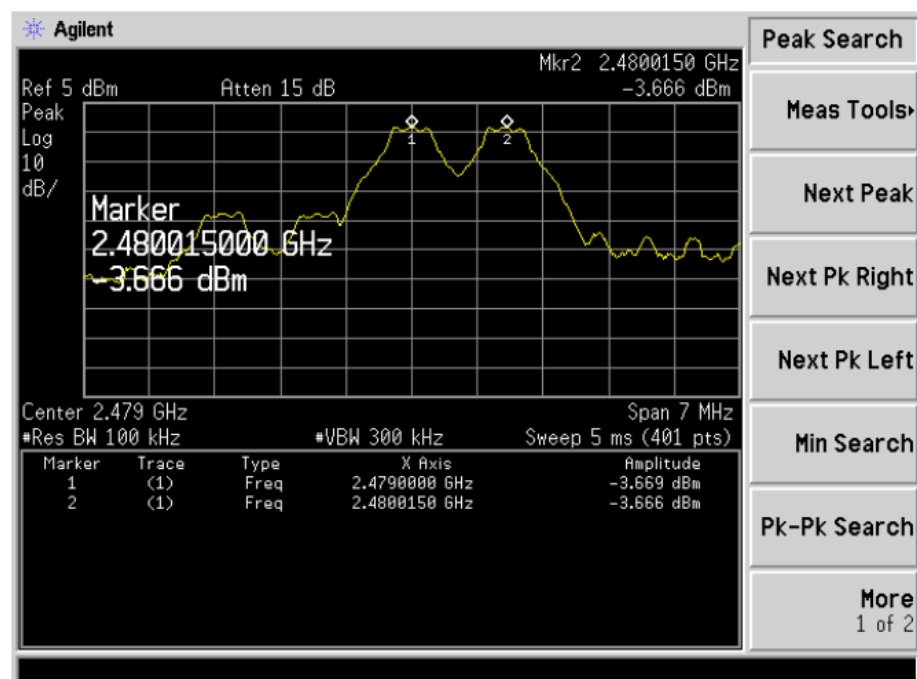
### GFSK CH00



## GFSK CH39



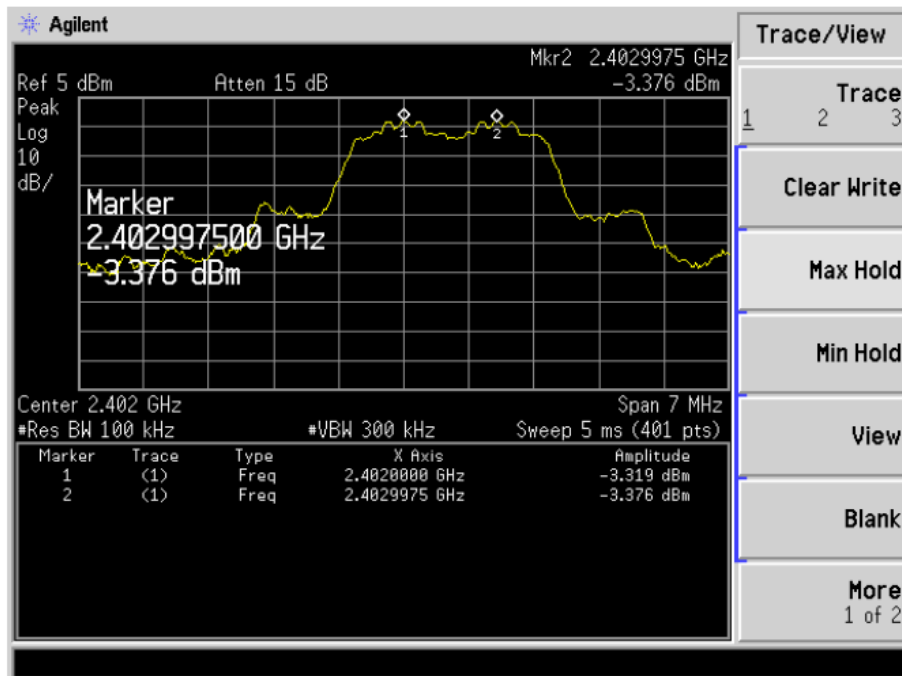
## GFSK CH78



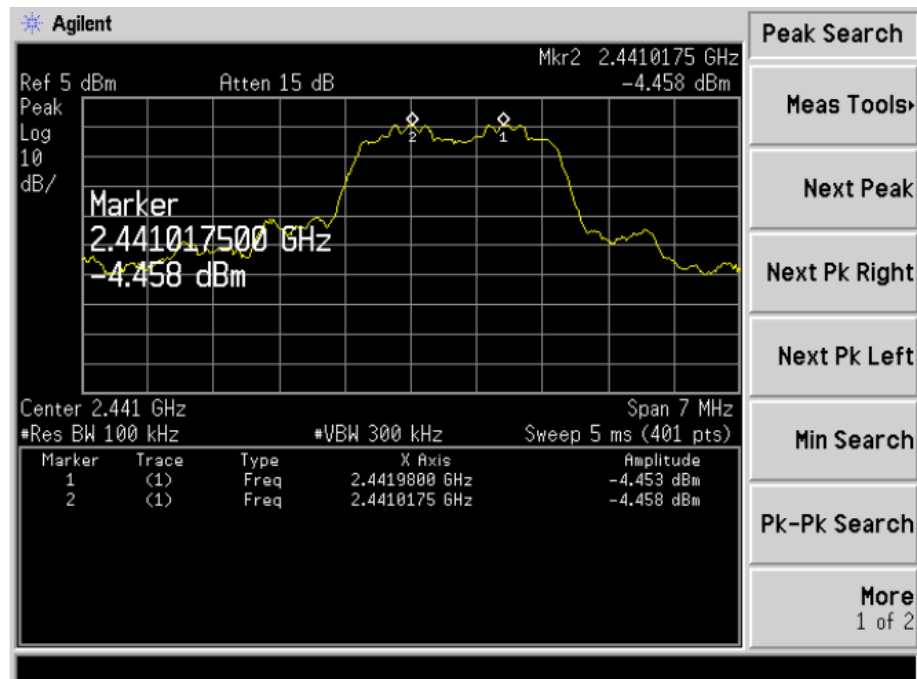
**Modulation type:  $\pi/4$ - DQPSK**

Channel frequency (MHz)	Separation Read Value (kHz)	Separation Limit 2/3 20dB Down BW(kHz)
2402	997.5	>849.33
2441	962.5	>846.67
2480	997.5	>856.00

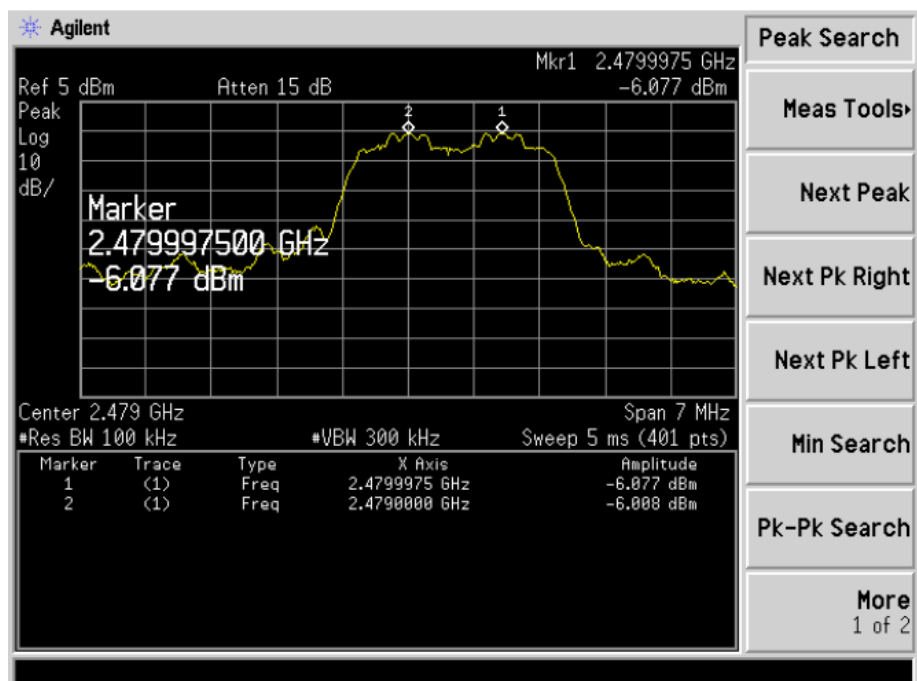
**$\pi/4$ - DQPSK CH00**



$\pi$  /4- DQPSK CH39



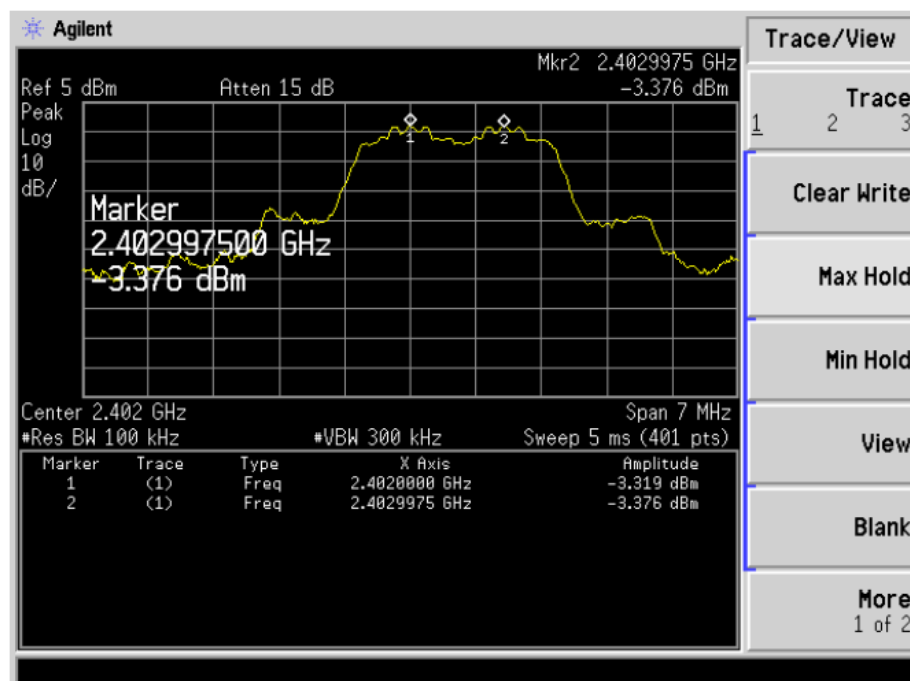
$\pi$  /4- DQPSK CH78



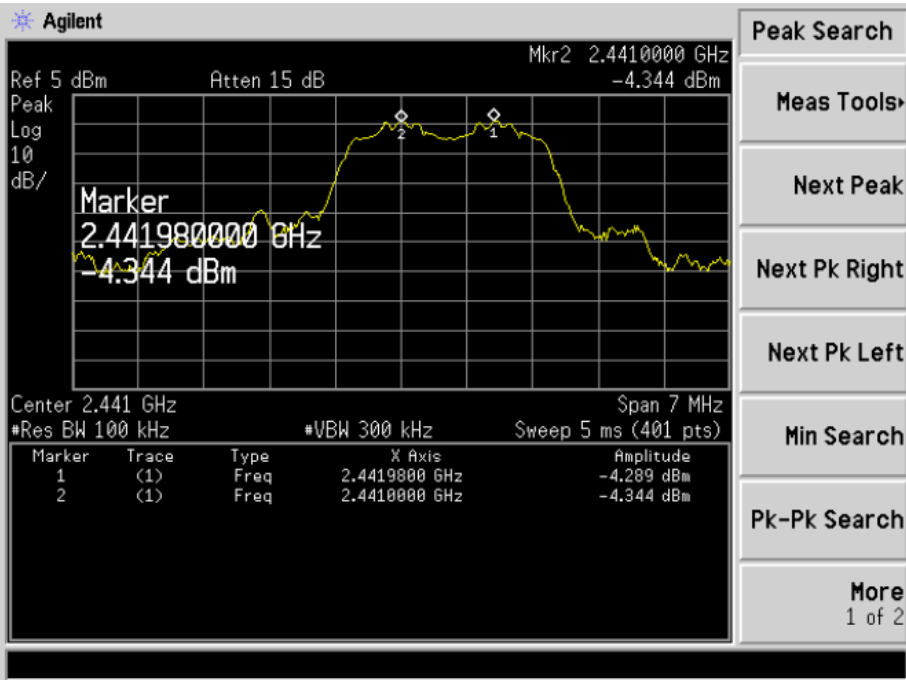
**Modulation type: 8DPSK**

Channel frequency (MHz)	Separation Read Value (kHz)	Separation Limit 2/3 20dB Down BW(kHz)
2402	997.5	>848.00
2441	980.0	>834.67
2480	1015.0	>850.00

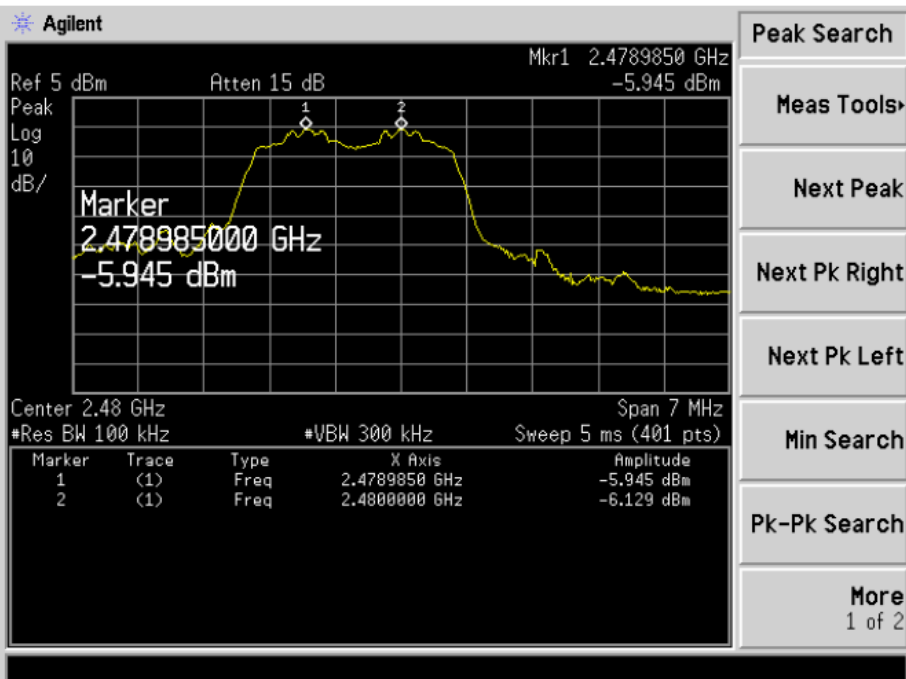
**8DPSK CH00**



8DPSK CH39



8DPSK CH78





## 7.8. Dwell Time (Time of Occupancy)

Average Channel Occupancy Time, FCC Ref: 15.247(a)(1)(iii):

The Spectrum analyzer center frequency was set to one of the known hopping channels. The SWEEP was set to 10ms, the SPAN was set to ZERO SPAN, and the TRIGGER was set to VIDEO. The time duration of the transmissions so captured was measured with the MARKER DELTA function.

The SWEEP was then set to the time required by the regulation (0.4s x number of hopping channels employed for 2400-2483.5 MHz). The analyzer was set to SINGLE SWEEP, the total ON time was added and compared against the limit (0.4s)

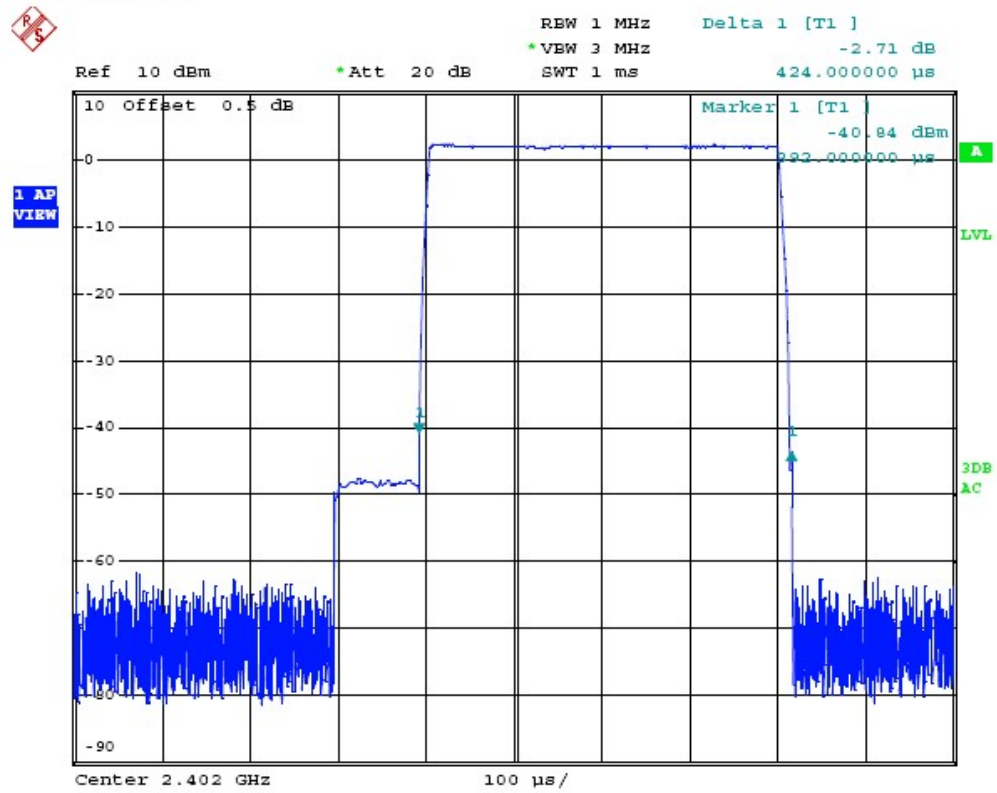
The maximum number of hopping channels in 31.6s for DH1= $1600 / 2 / 79 * 31.6=320$

The maximum number of hopping channels in 31.6s for DH3= $1600 / 4 / 79 * 31.6=160$

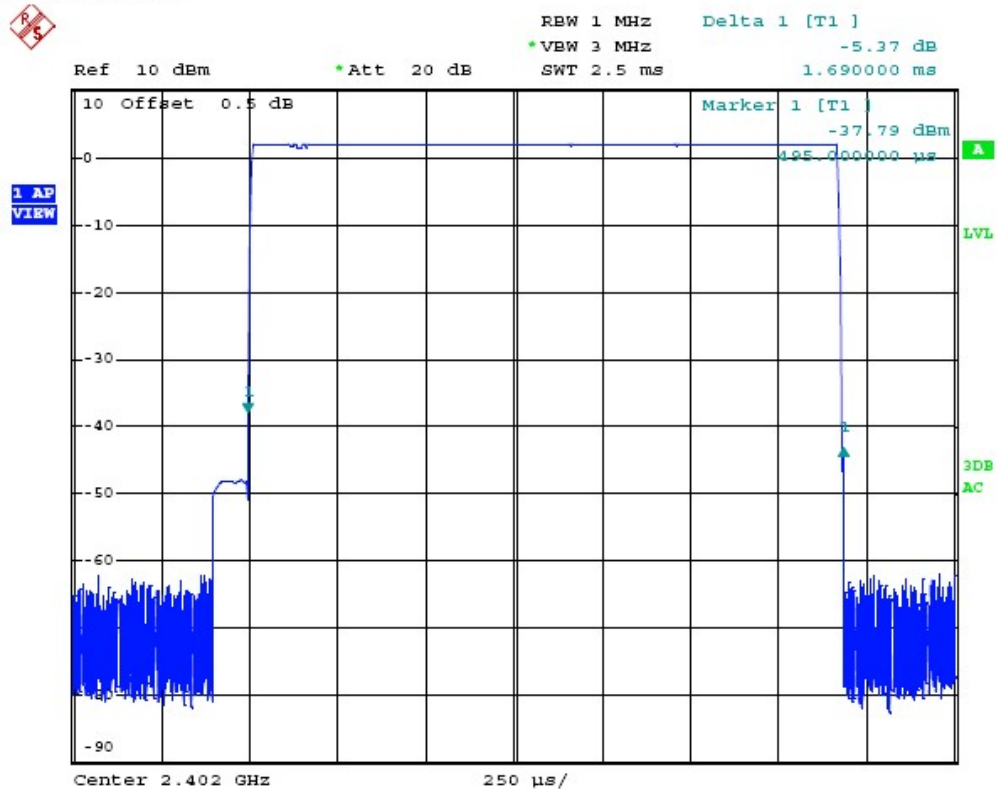
The maximum number of hopping channels in 31.6s for DH5= $1600 / 6 / 79 * 31.6=107$

Modulation Type	Packet	Max Dwell Time	Limit (s)	Result
GFSK	DH1	0.424 ms * 320= 135.7 ms	0.4	Pass
	DH3	1.690 ms * 160= 270.4 ms	0.4	Pass
	DH5	2.936 ms * 107= 314.2 ms	0.4	Pass
$\pi/4$ -DQPSK	DH1	0.436 ms * 320= 139.5 ms	0.4	Pass
	DH3	1.700 ms * 160= 272.0 ms	0.4	Pass
	DH5	2.745 ms * 107= 293.7 ms	0.4	Pass
8DPSK	DH1	0.434 ms * 320= 138.9 ms	0.4	Pass
	DH3	1.700 ms * 160= 272.0 ms	0.4	Pass
	DH5	2.952 ms * 107= 315.9 ms	0.4	Pass

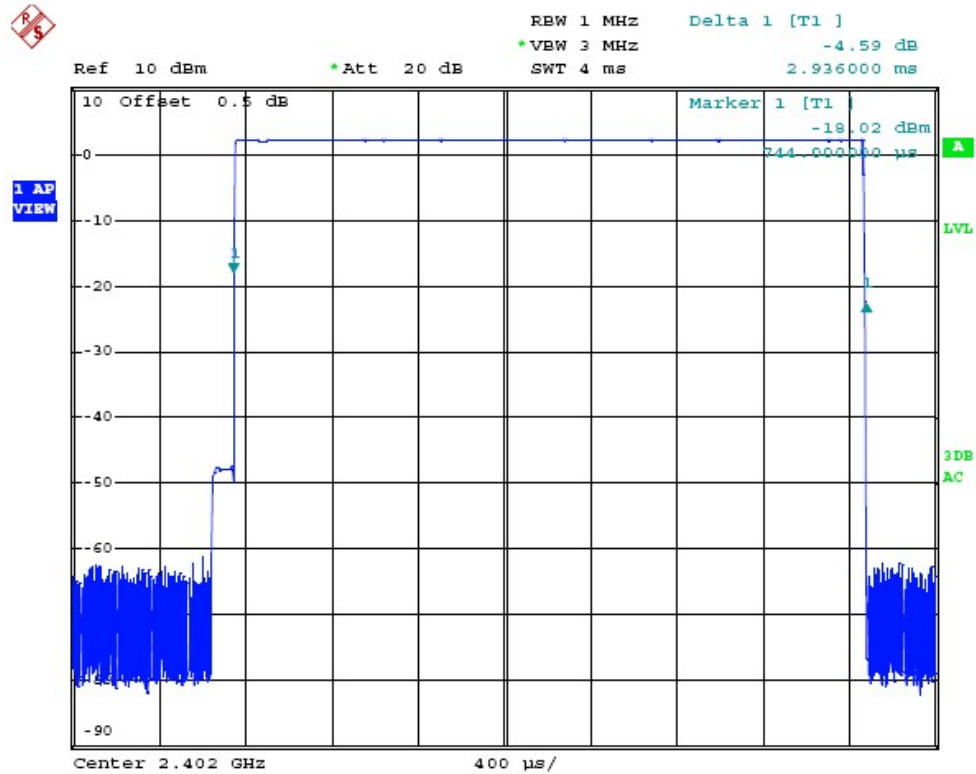
Modulation Type: GFSK  
Packet: DH1



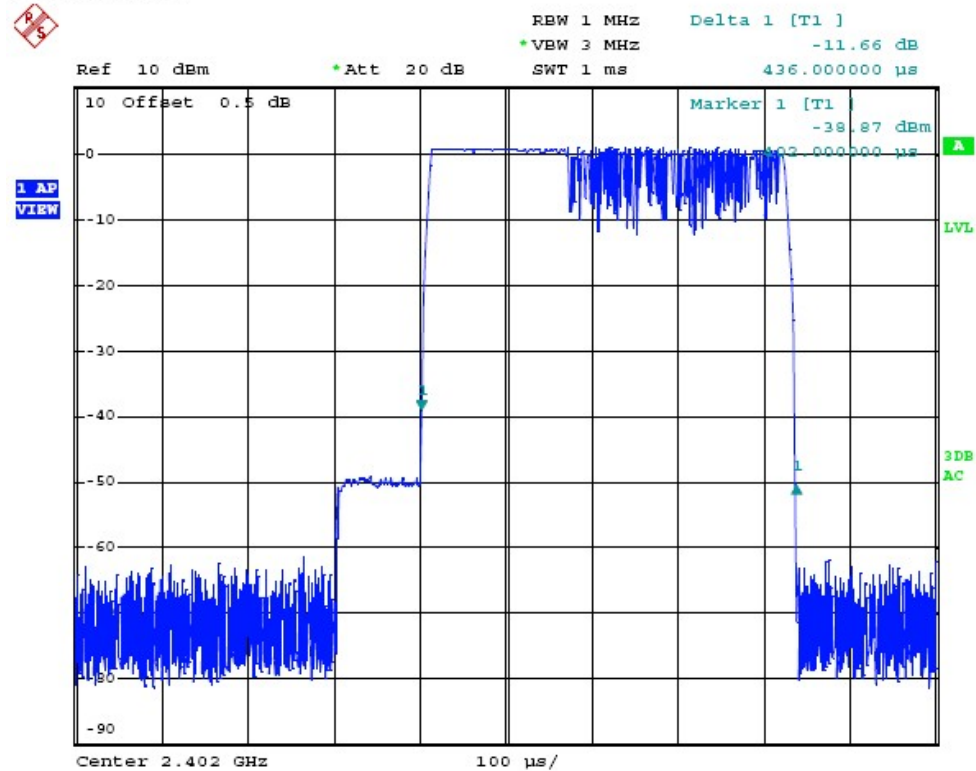
Packet: DH3



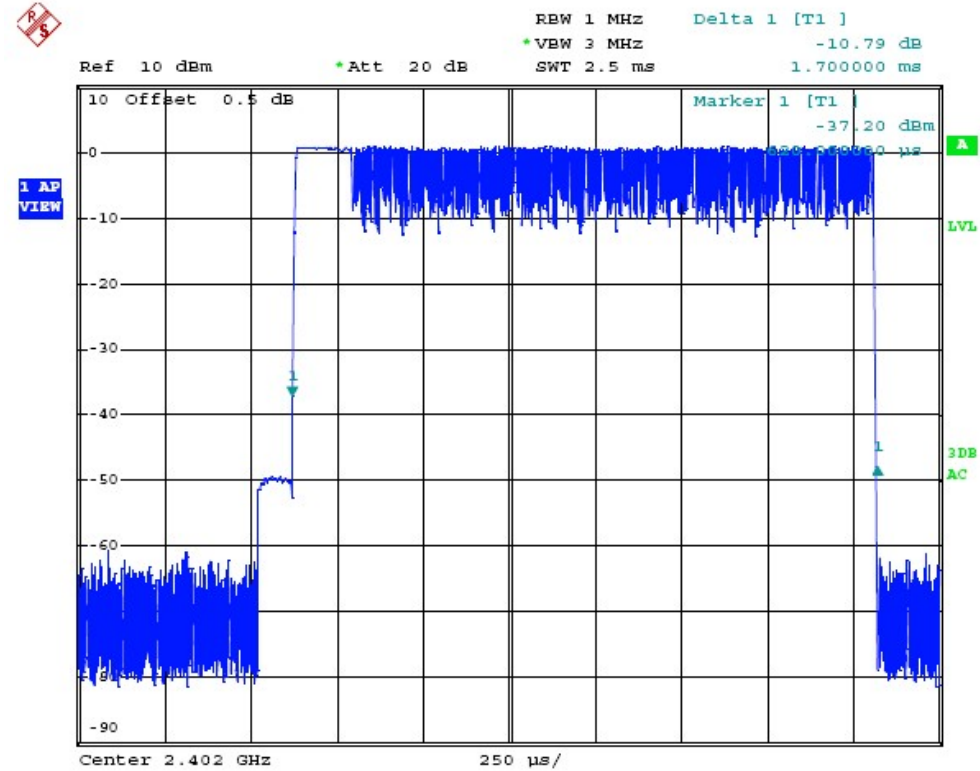
### Packet: DH5



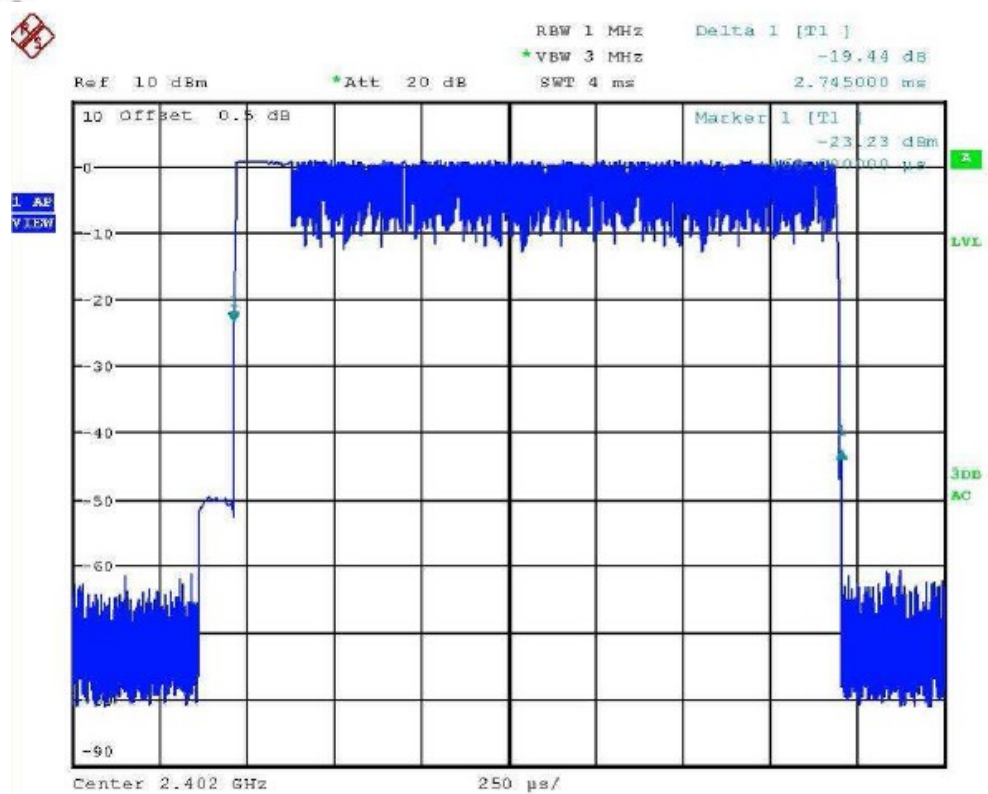
### Modulation Type: $\pi/4$ -DQPSK Packet: DH1



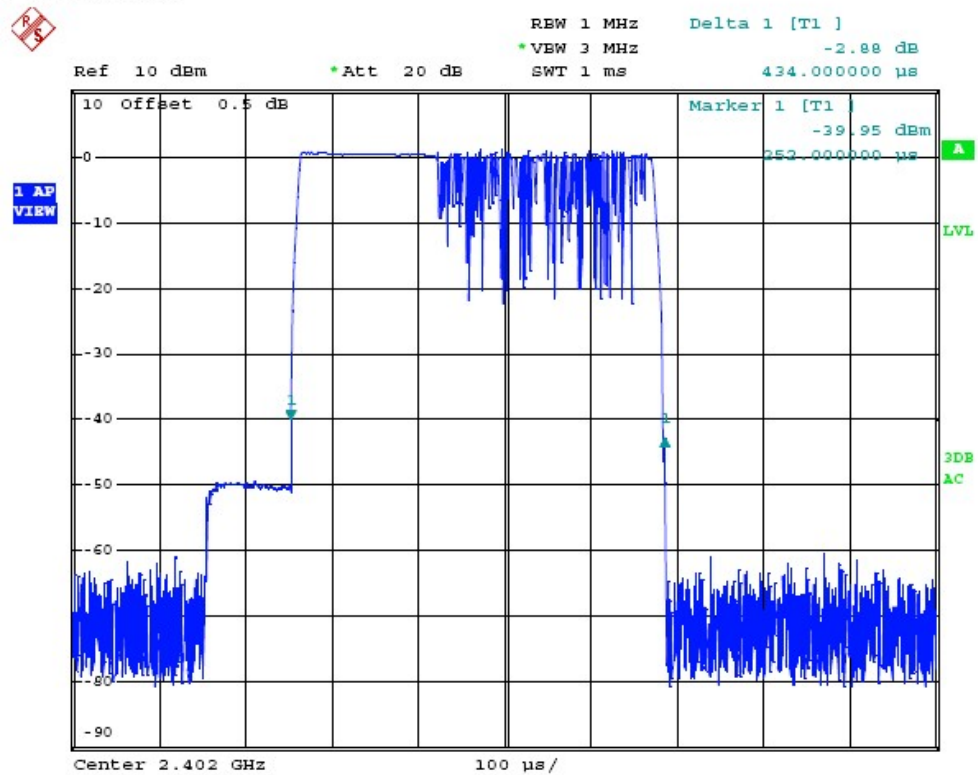
### Packet: DH3



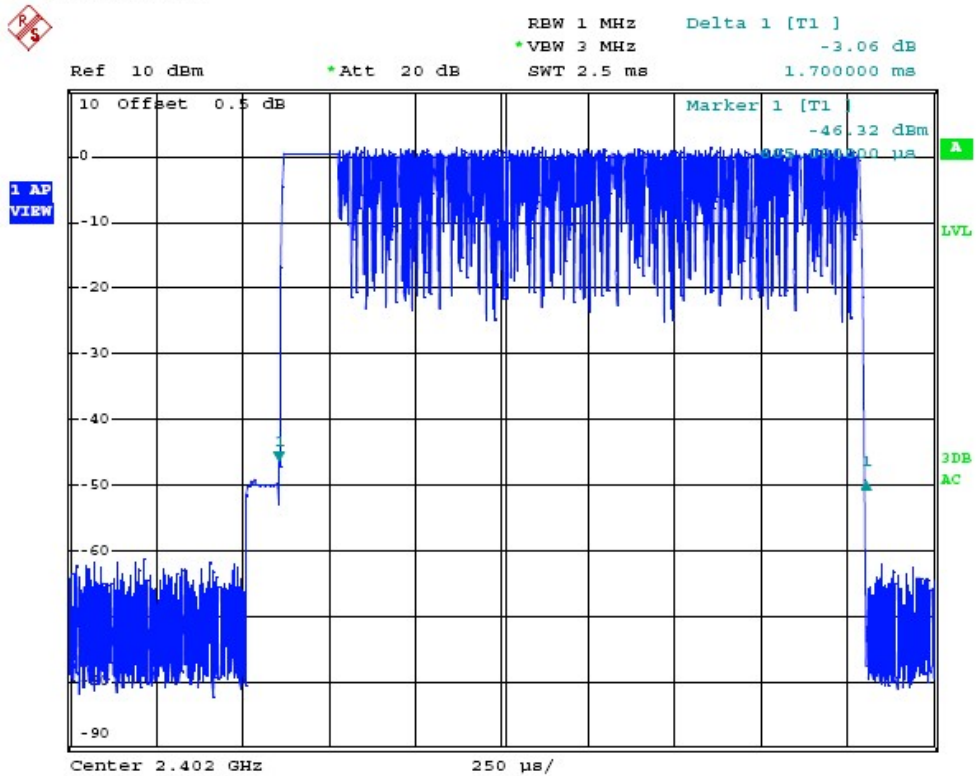
### Packet: DH5



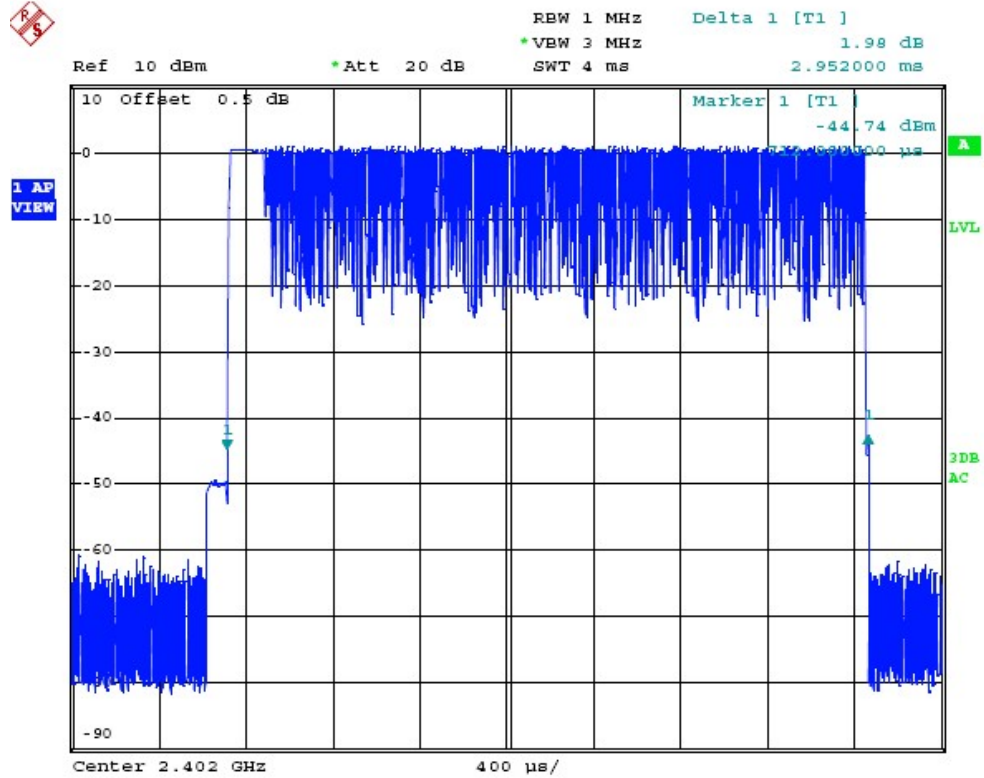
Modulation Type: 8DPSK  
Packet: DH1



Packet: DH3



Packet: DH5

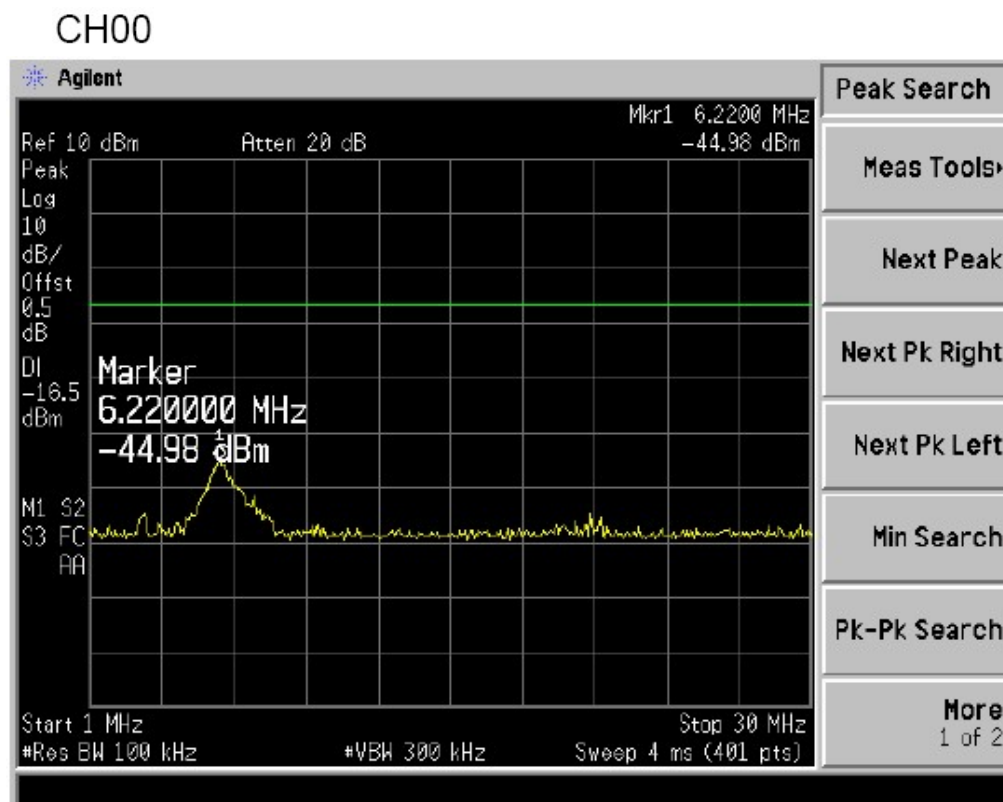


## 7.9. transmitter Spurious Emission (Conducted)

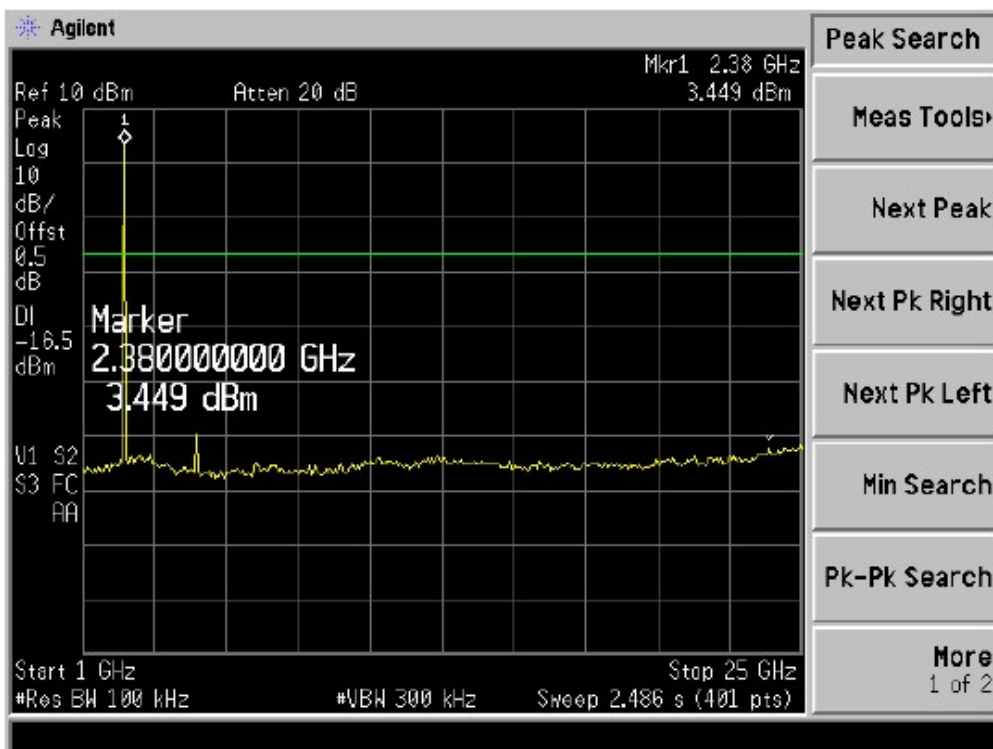
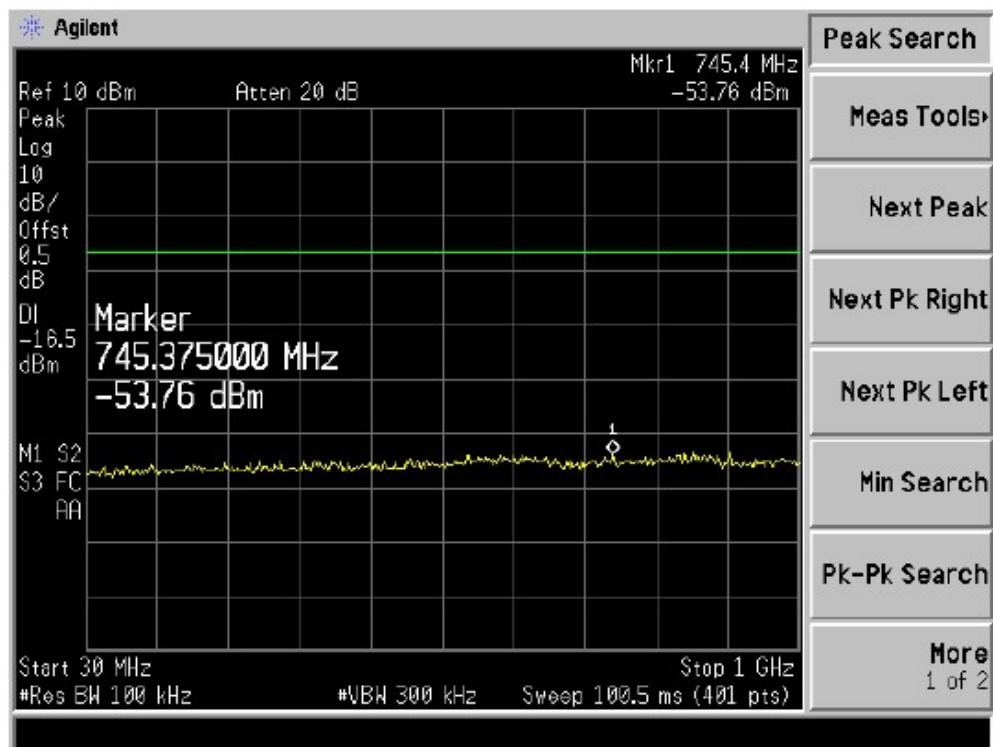
Average Channel Occupancy Time, FCC Ref: 15.247(a)(1)(iii):

All spurious emission and up to the tenth harmonic was measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

Modulation Type: GFSK

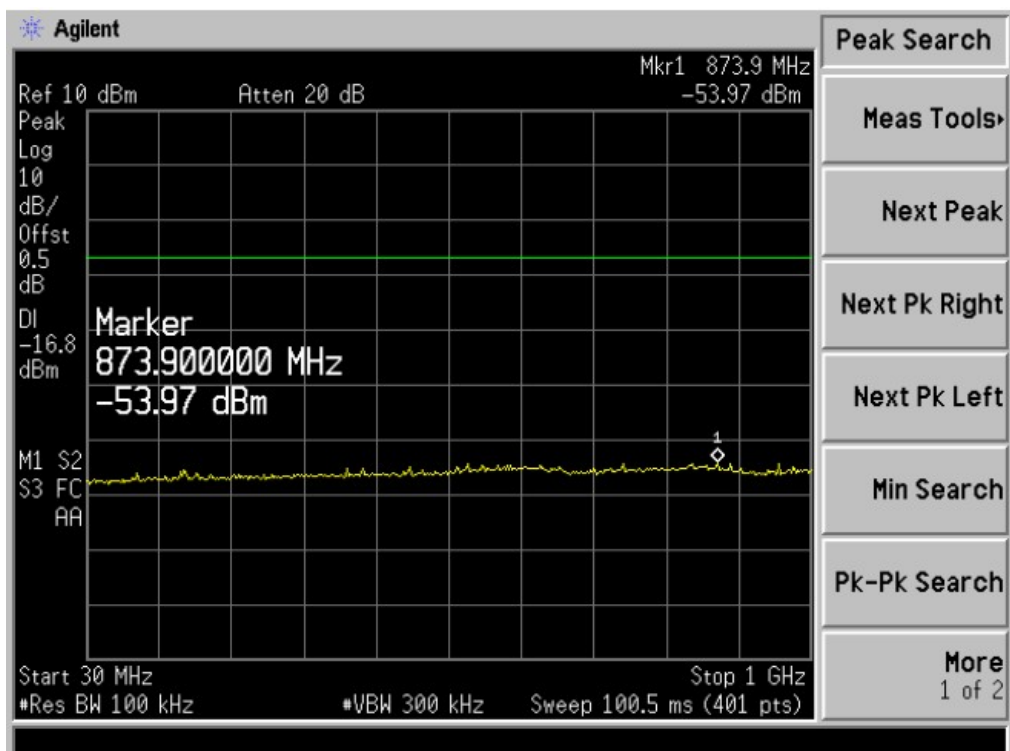
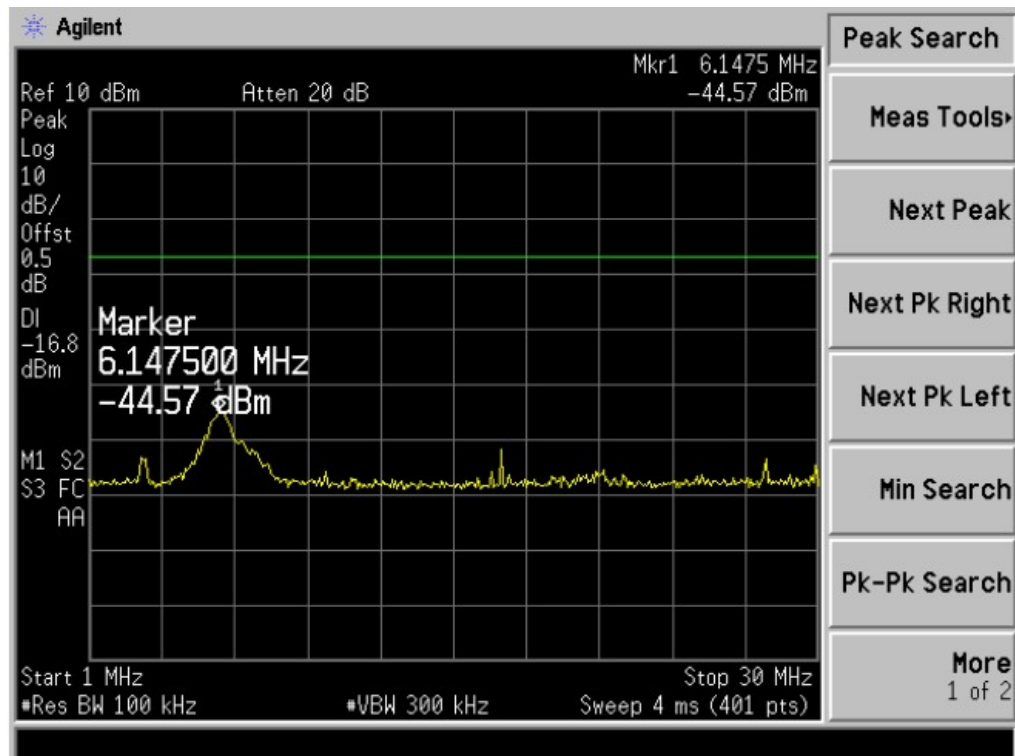


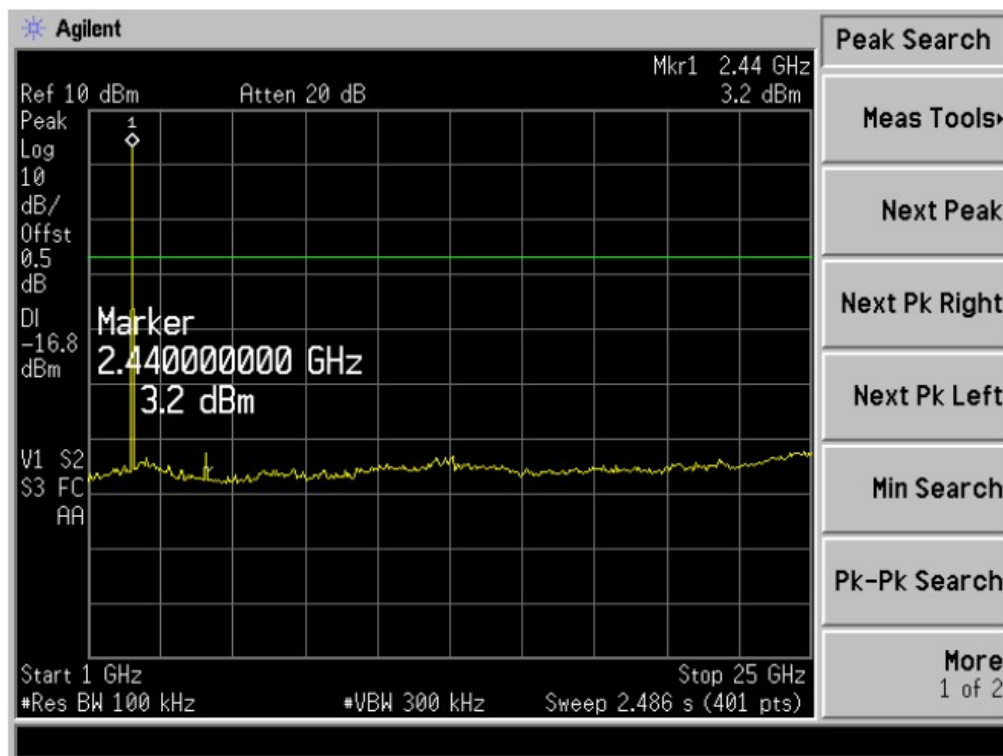




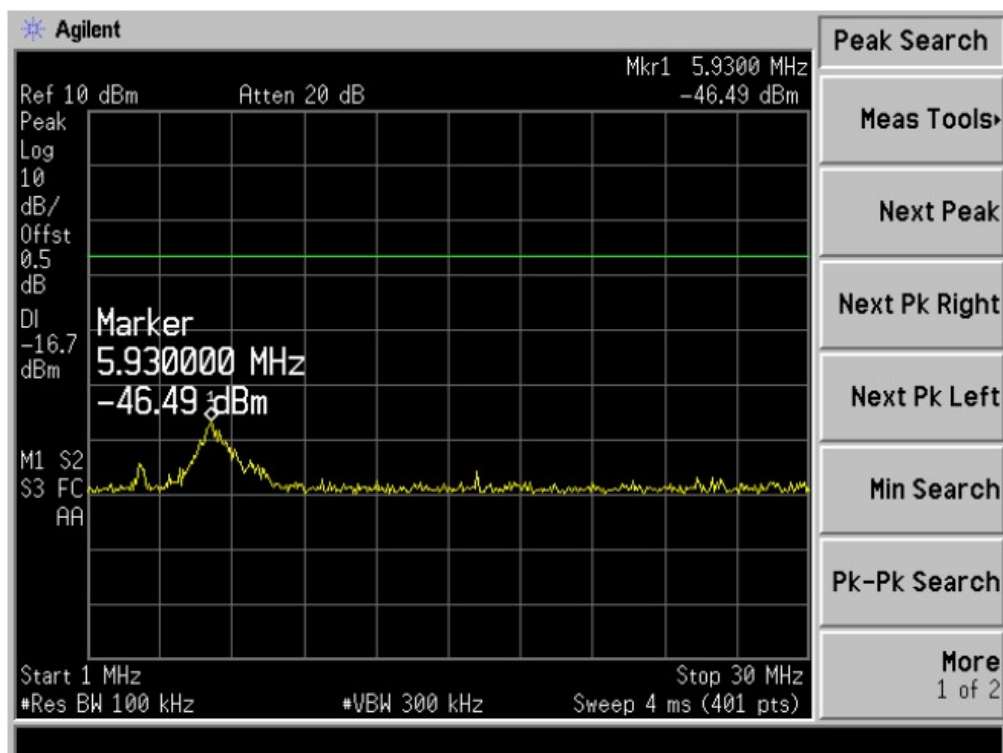


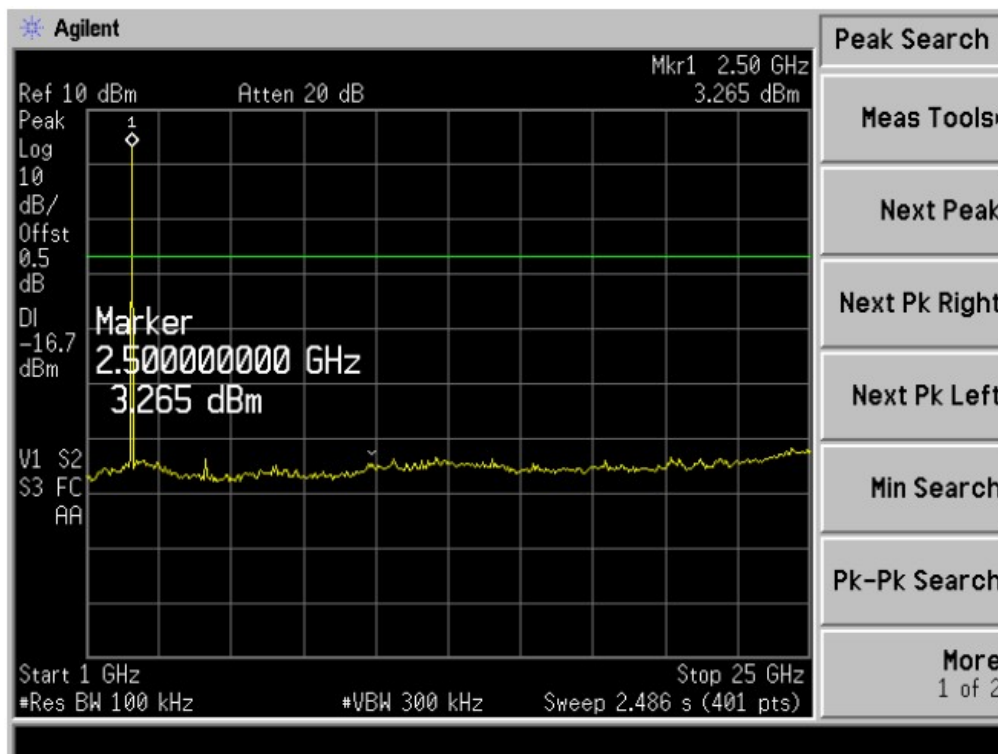
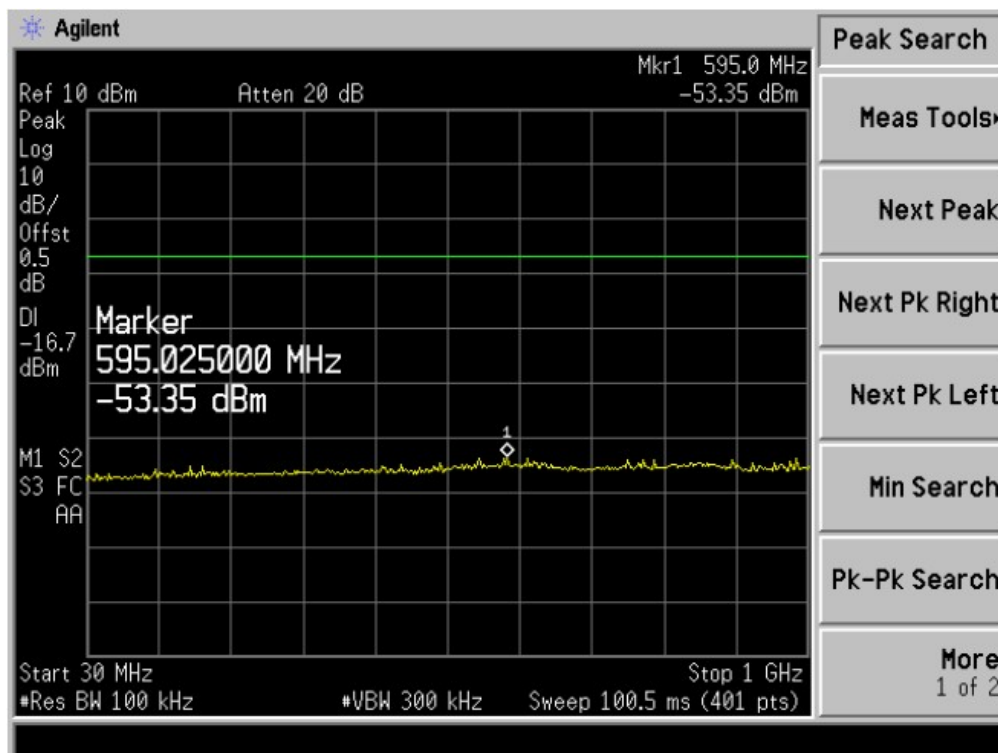
## CH39





CH78





## **8. ANTENNA REQUIREMENT**

### **8.1. Standard applicable**

For intentional device, according to FCC part 15C section 15.247 requirements, 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.

### **8.2. Antenna connected construction**

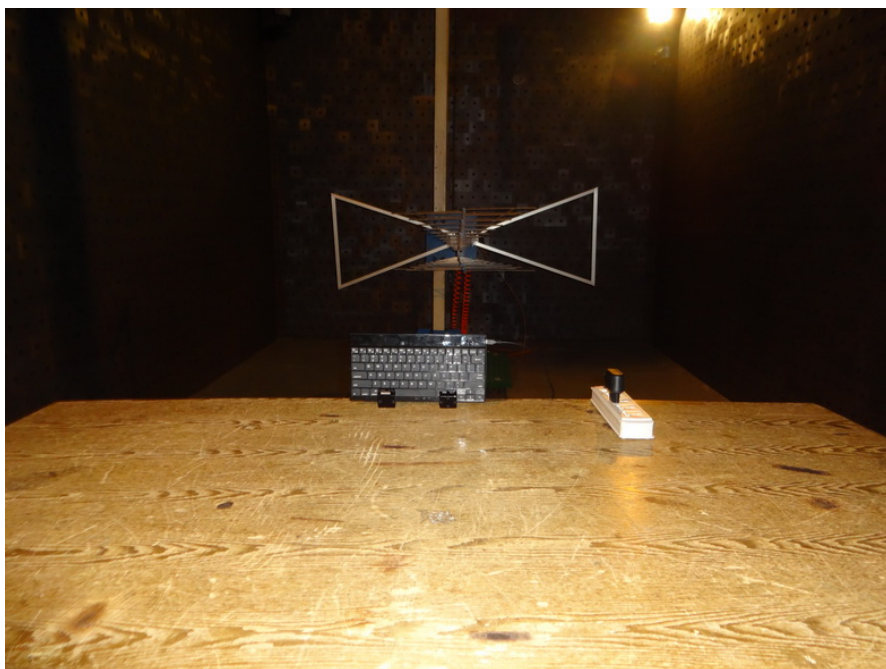
The antenna used in this product is PCB ANTENNA and no consideration of replacement.

## 9    PHOTOGRAPHS OF THE TEST CONFIGURATION

### CONDUCTED EMISSION TEST



### RADIATED EMISSION TEST





## 10      PHOTOGRAPHS OF EUT

Appearance photograph of EUT



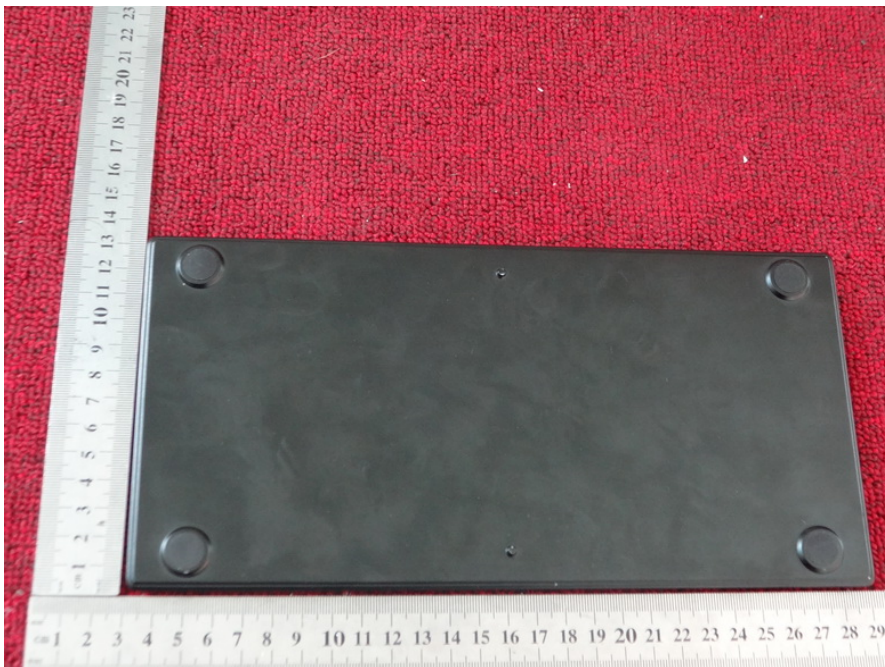
Appearance photograph of EUT



Appearance photograph of EUT



Appearance photograph of EUT





Appearance photograph of EUT

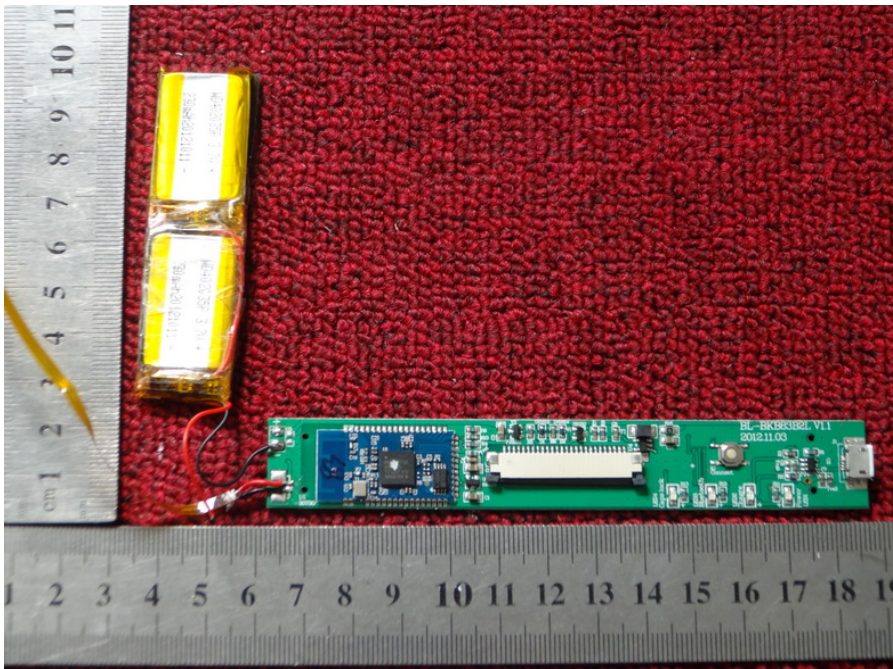


Internal photograph of EUT

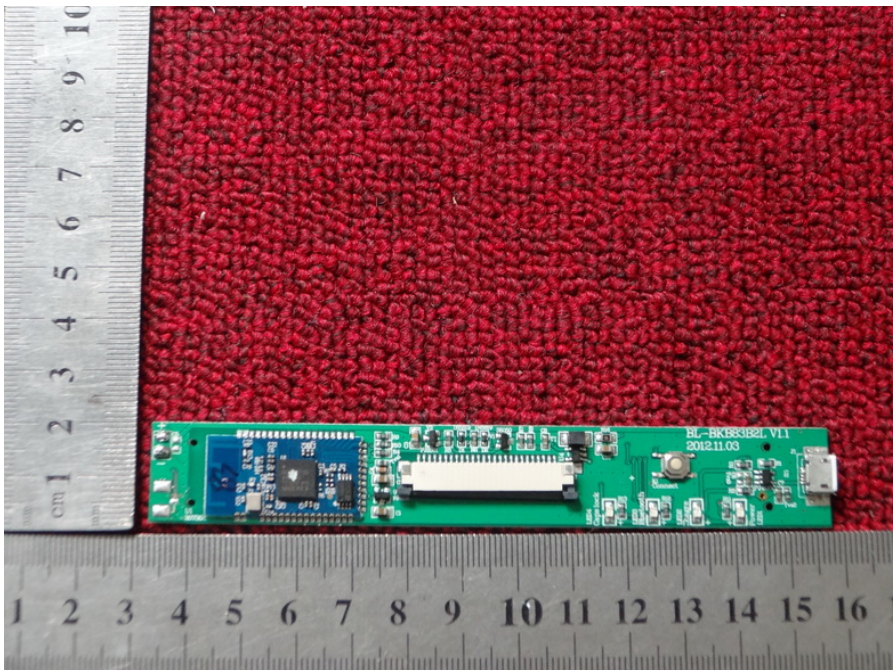




PCB photograph of EUT



PCB photograph of EUT



PCB photograph of EUT

