TX CH40

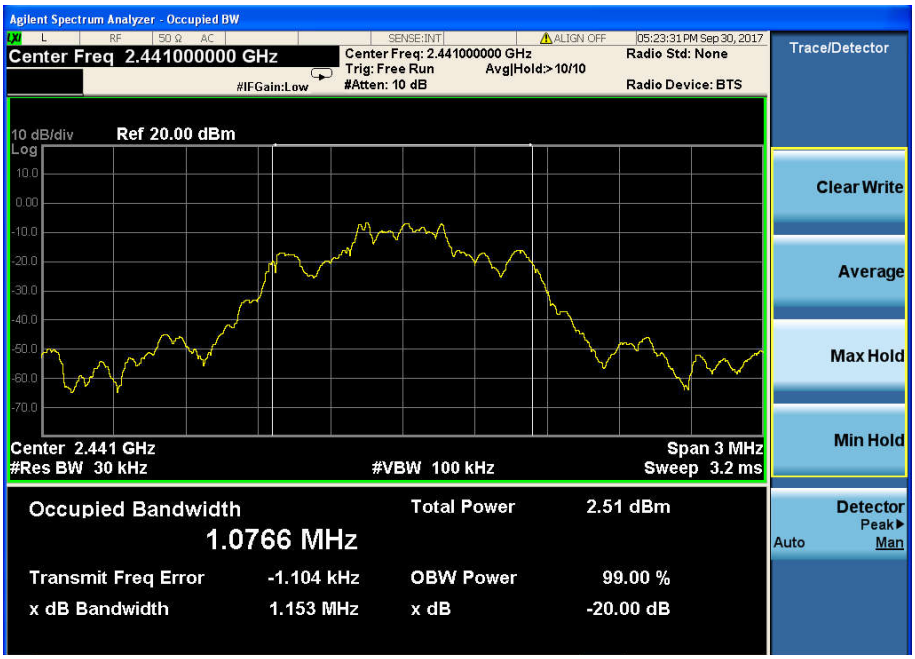
TX CH79

EUT：	Smart Mirror	Model Name ：	RVM740SM
Temperature：	22℃	Relative Humidtity：	55%
Pressure：	1015 hPa	Test Voltage ：	DC 12V
Test Mode ：	8-DPSK Mode /CH01, CH40, CH79		

Frequency	20dB Bandwidth (MHz)	Limit	Result
2402 MHz	1.154	/	PASS
2441 MHz	1.153	/	PASS
2480 MHz	1.153	/	PASS

TX CH01

TX CH40



TX CH79

5. CARRIER FREQUENCY SEPARATION TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC ParCN186-W5 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(1)	Channel Separation	>25KHz or >two-thirds of the 20 dB bandwidth (Which is greater)	2400-2483.5	PASS

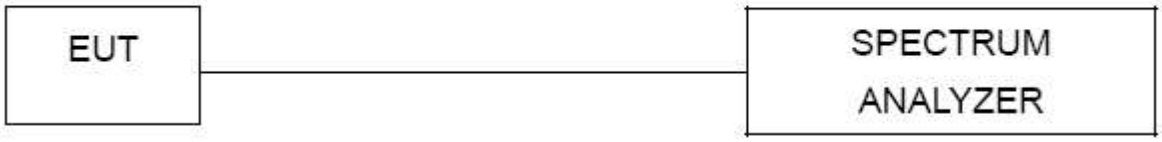
5.1.1 TEST PROCEDURE

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
(2) Spectrum Setting:
RBW=100 kHz, VBW=300 kHz, detector= Peak, Sweep Time =auto.
(3) The EUT was set to the Hopping Mode for Channel Separation Test and continuously transmitting for the Test.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 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.

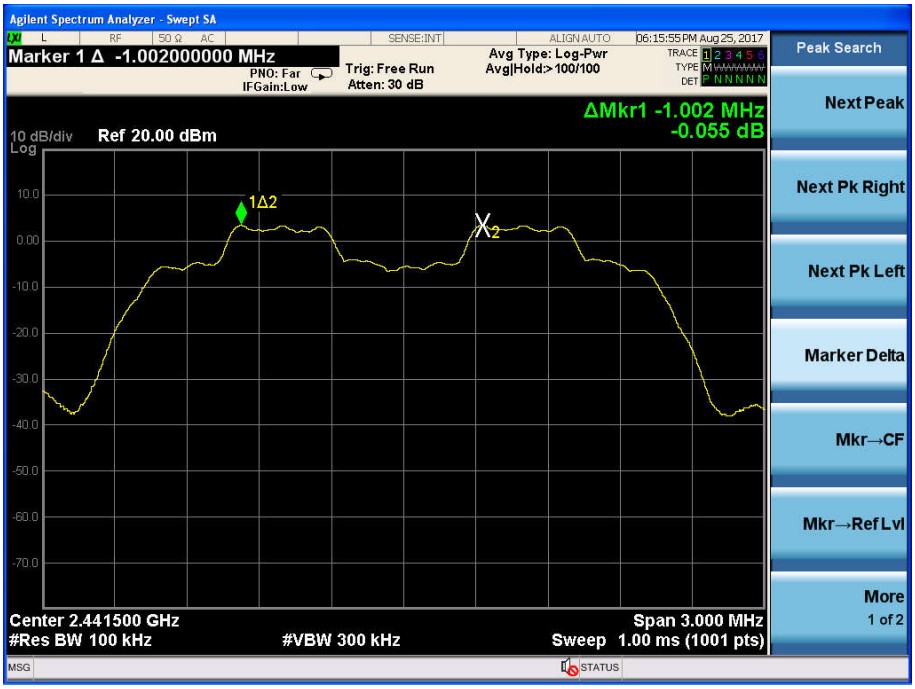
5.1.5 TEST RESULTS

EUT：	Smart Mirror	Model Name ：	RVM740SM
Temperature：	22℃	Relative Humidtity：	55%
Pressure：	1012 hPa	Test Voltage ：	DC 12V
Test Mode ：	CH MID		

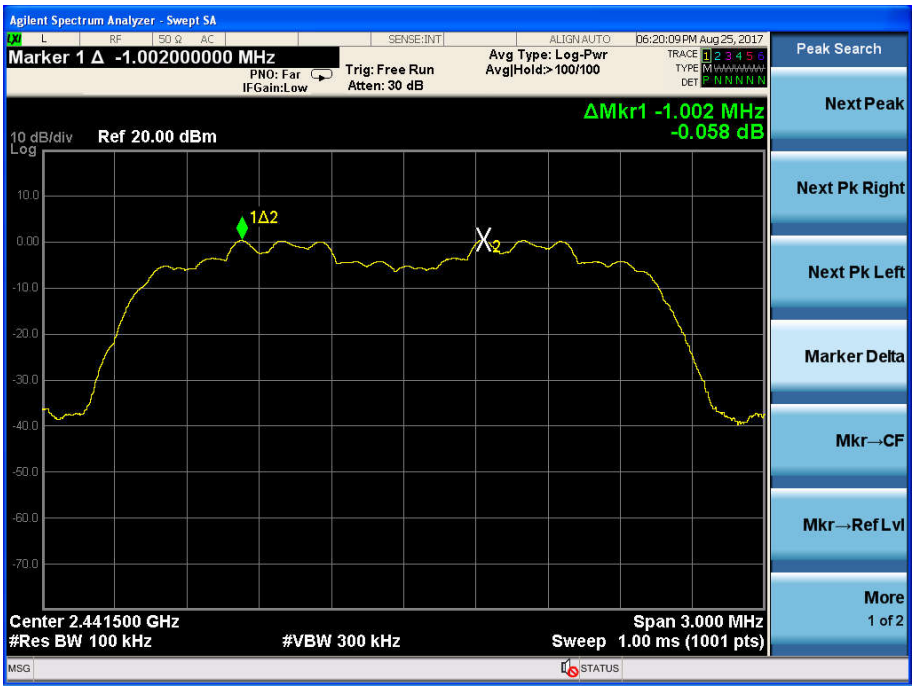
Mode	Channel	Frequency (MHz)	Test Result (KHz)	Result
GFSK	Middle	2441	1002	Pass
π/4-DQPSK	Middle	2441	1002	Pass
8DPSK	Middle	2441	1002	Pass

GFSK mode

π/4-DQPSK mode



8DPSK mode



6. NUMBER OF HOPPING CHANNEL

6.1 APPLIED PROCEDURES / LIMIT

FCC ParCN186-W5 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(a)	Number of Hopping Channel	>15 channels	2400-2483.5	PASS

6.1.1 TEST PROCEDURE

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
(2) Spectrum Setting: RBW=100 kHz, VBW=300 kHz, Detector=Peak, Sweep time= Auto.
(3) The EUT was set to the Hopping Mode for Channel Separation Test and continuously transmitting for the Test.

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

EUT：	Smart Mirror	Model Name ：	RVM740SM
Temperature：	22℃	Relative Humidtity：	55%
Pressure：	1012 hPa	Test Voltage ：	DC 12V
Test Mode ：	GFSK, π/4-DQPSK, 8-DPSK		

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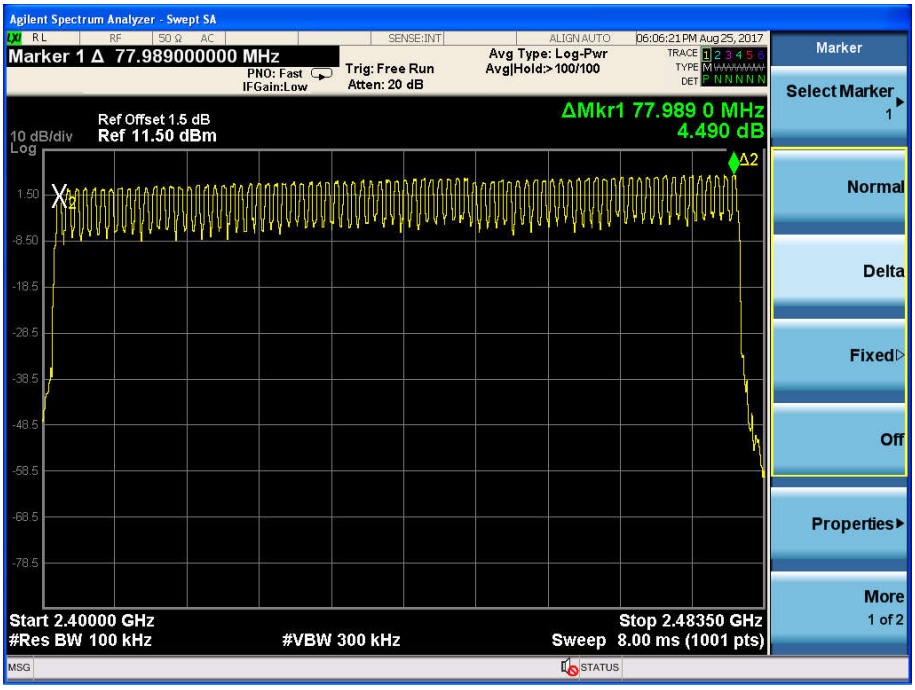
Mode	Quantity of Hopping Channel	Limit	Judgment
GFSK, π/4-DQPSK, 8DPSK	79	>15	PASSED

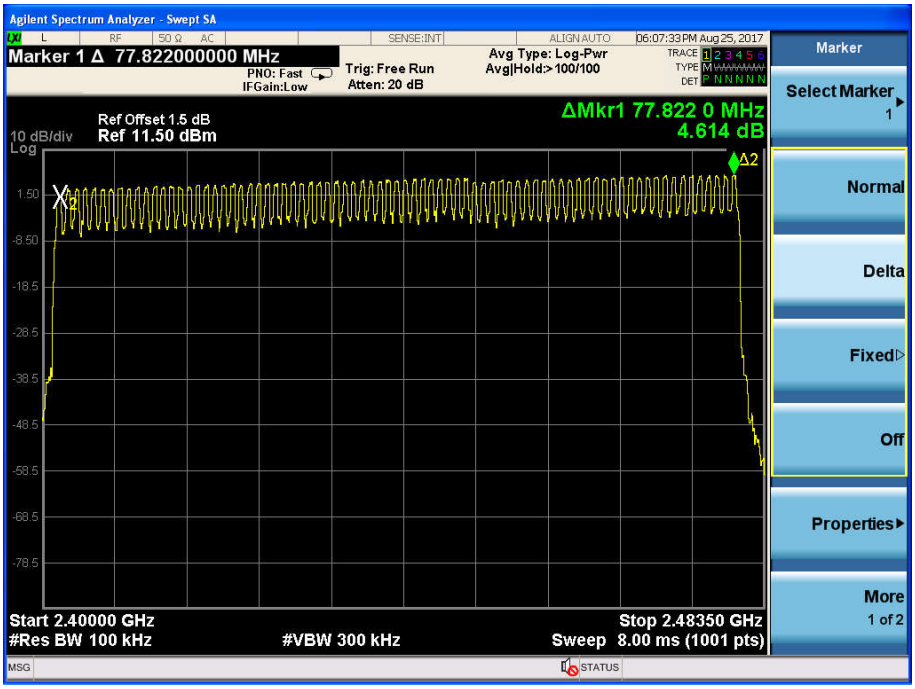
GFSK mode

Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 78.156000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
06:02:47 PM Aug 25, 2017
Ref Offset 1.5 dB
10 dB/div
Ref 11.50 dBm
ΔMkr1 78.156 0 MHz
5.542 dB
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep 8.00 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

π/4-DQPSK mode



8DPSK mode



7. DWELL TIME

7.1 APPLIED PROCEDURES / LIMIT

FCC ParCN186-W5 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Dwell time	0.4 sec	2400-2483.5	PASS

7.1.1 TEST PROCEDURE

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
(2) Spectrum Setting: RBW=1MHz, VBW=1MHz, Span=0Hz, Detector=Peak
(3) Use video trigger with the trigger level set to enable triggering only on full pulses.
(4) Sweep Time is more than once pulse time.
(5) Set the center frequency on any frequency would be measure and set the frequency span to zero span.
(6) Measure the maximum time duration of one single pulse.
(7) Set the EUT for packet transmitting.
(8) Measure the maximum time duration of one single pulse.
(9) The EUT was set to the Hopping Mode for Dwell Time Test

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP

7.1.4 EUT OPERATION CONDITIONS

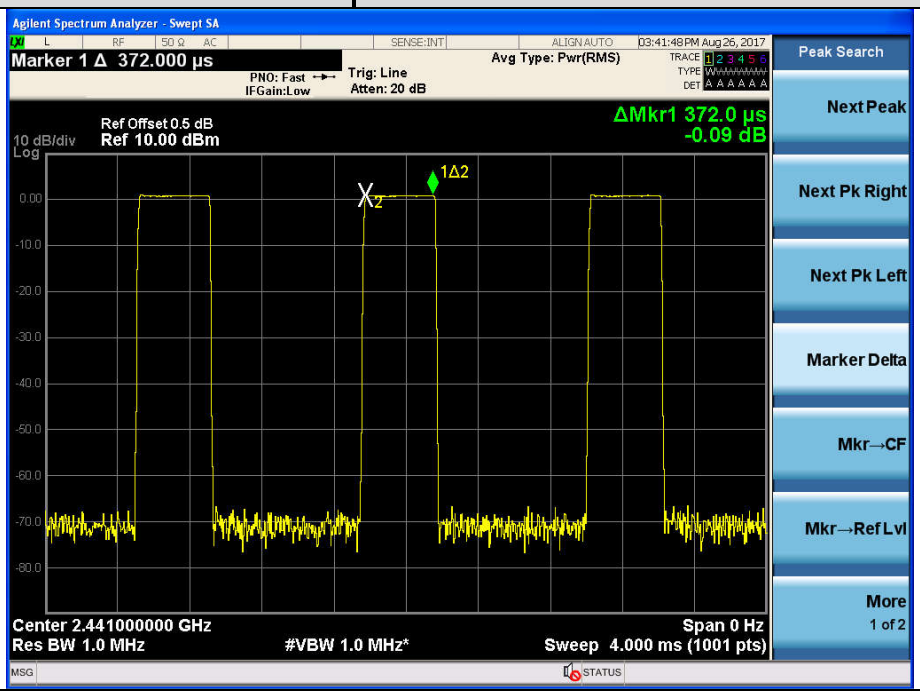
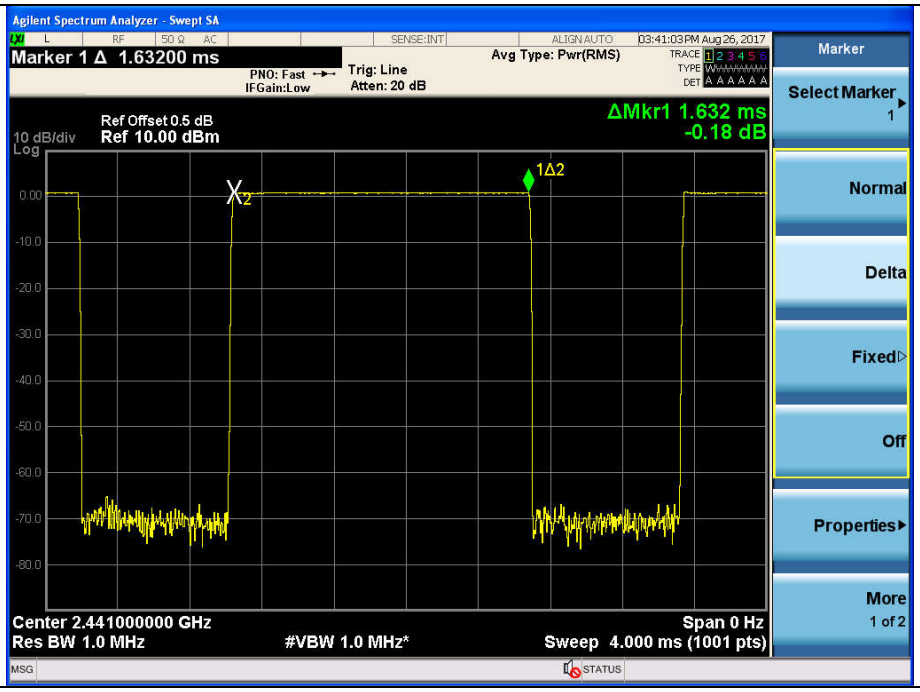
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

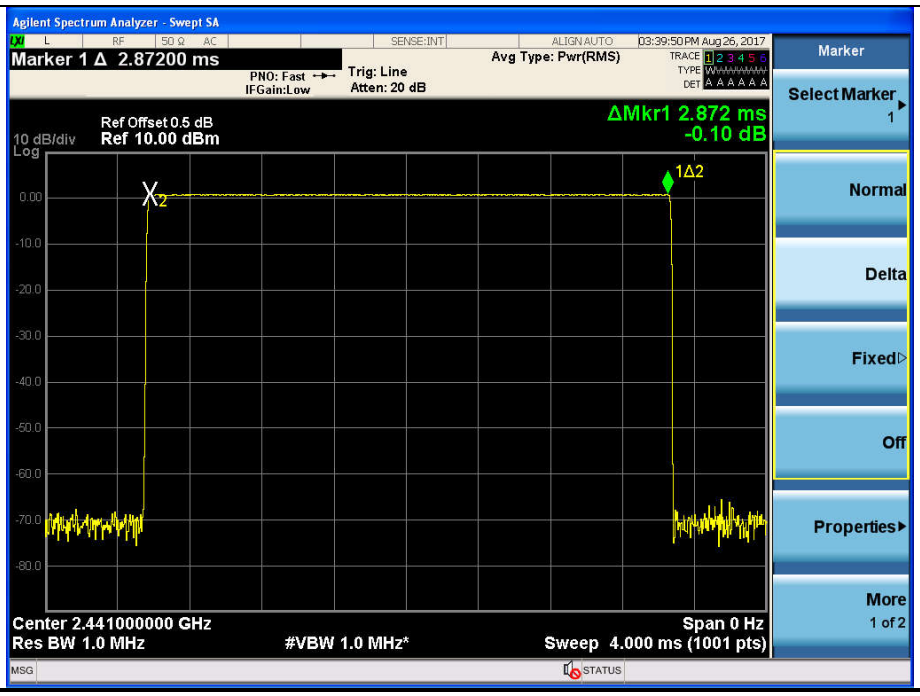
7.1.5 TEST RESULTS

EUT：	Smart Mirror	Model Name ：	RVM740SM
Temperature：	22℃	Relative Humidtity：	55%
Pressure：	1012 hPa	Test Voltage ：	DC 12V
Test Mode ：	GFSK, π/4-DQPSK, 8-DPSK Mode		

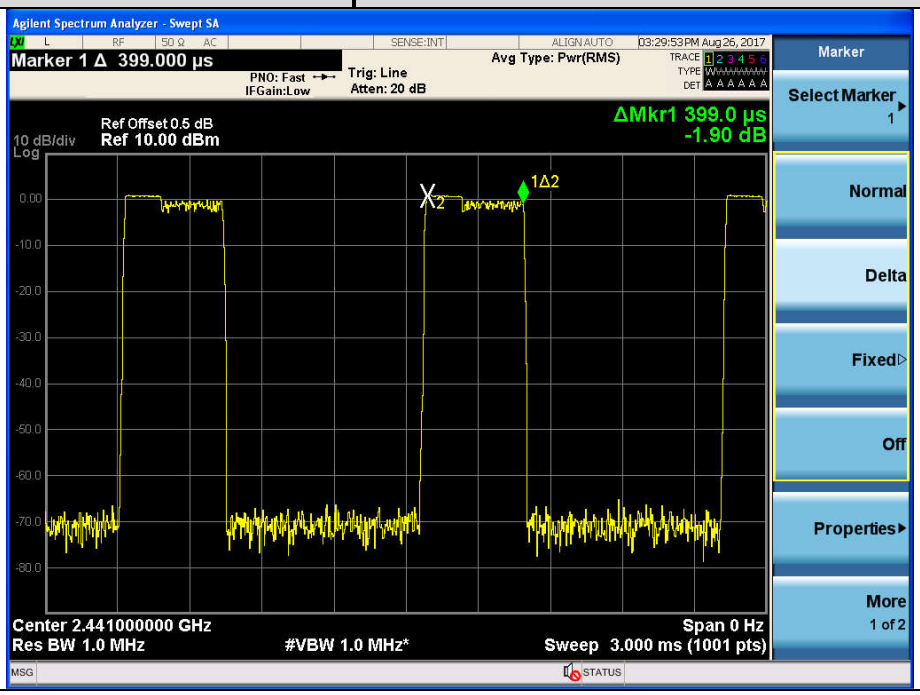
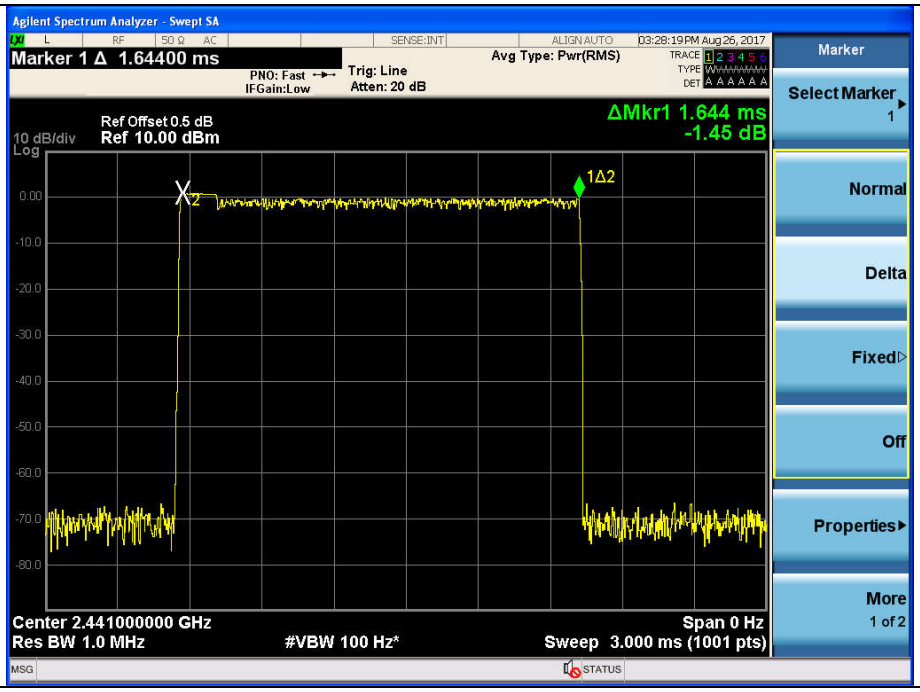
For GFSK, π/4-DQPSK and 8DPSK:
The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s

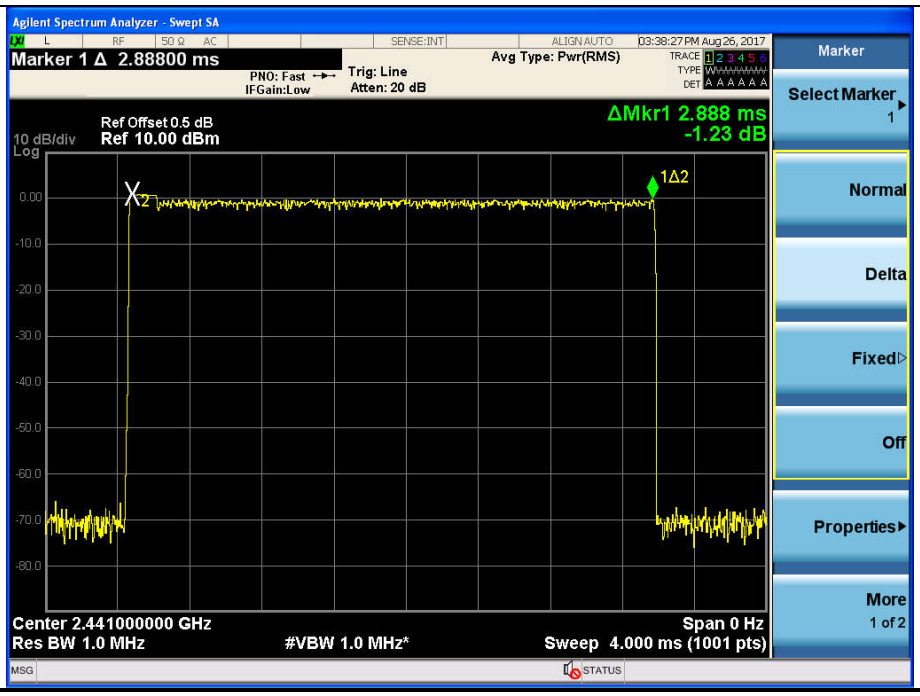
Mode	Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (ms)	Limit (s)	Conclusion
GFSK	DH1	2441	0.372	119.04	<0.4	PASS
	DH3	2441	1.632	261.12	<0.4	PASS
	DH5	2441	2.872	306.35	<0.4	PASS
π/4 DQPSK	DH1	2441	0.399	127.68	<0.4	PASS
	DH3	2441	1.644	263.04	<0.4	PASS
	DH5	2441	2.888	308.05	<0.4	PASS
8- DQPSK	DH1	2441	0.384	122.88	<0.4	PASS
	DH3	2441	1.641	262.56	<0.4	PASS
	DH5	2441	2.888	308.05	<0.4	PASS
Note: 1 A period time = 0.4 (s) * 79 = 31.6(s) 2 DH1 time slot = Pulse Duration * (1600/(2*79)) * A period time DH3 time slot = Pulse Duration * (1600/(4*79)) * A period time DH5 time slot = Pulse Duration * (1600/(6*79)) * A period time						

Modulation mode		GFSK mode
DH1		
DH3		

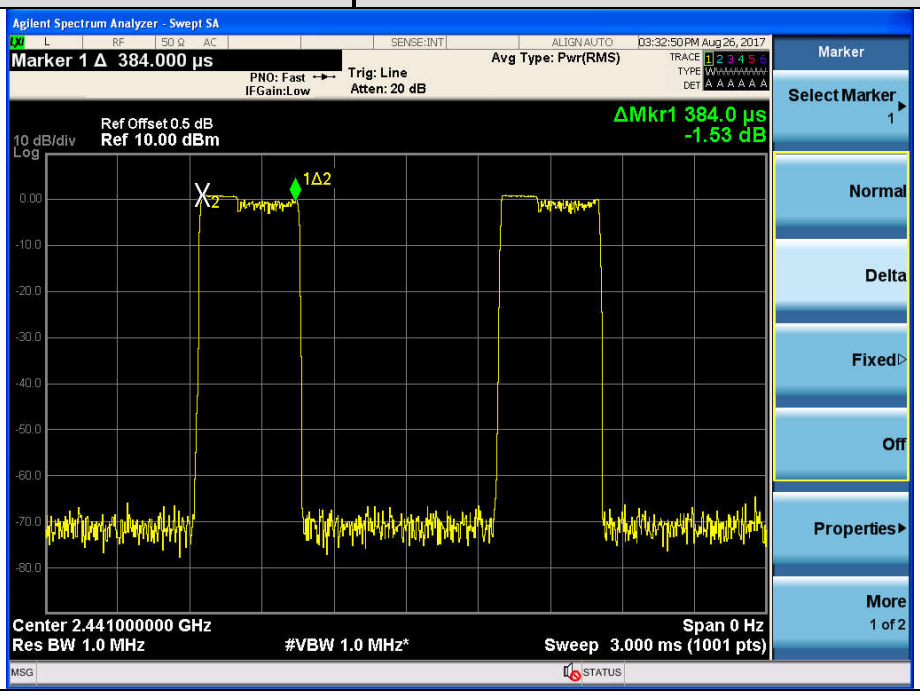
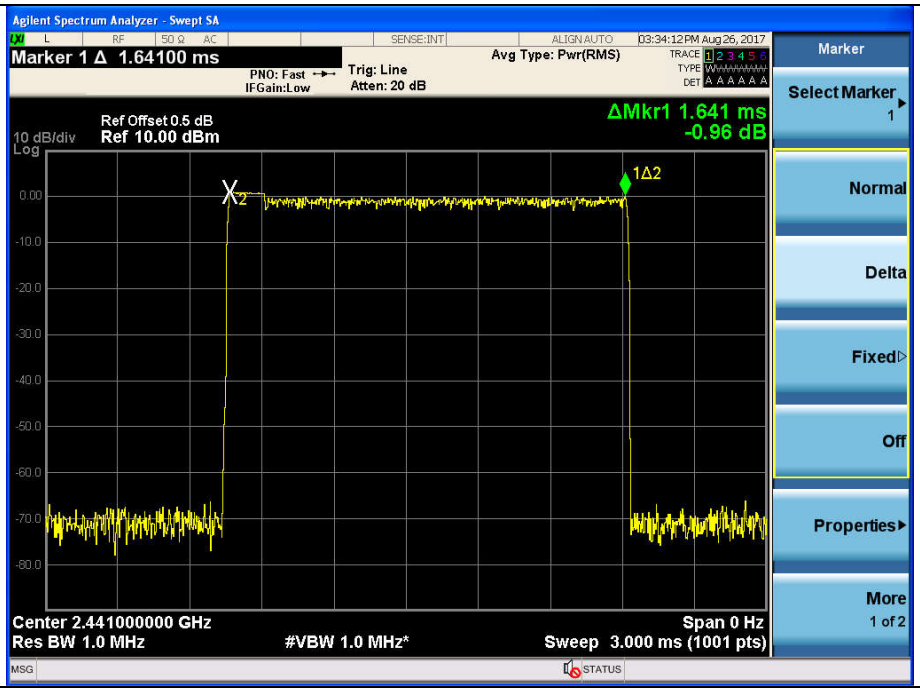
DH5		

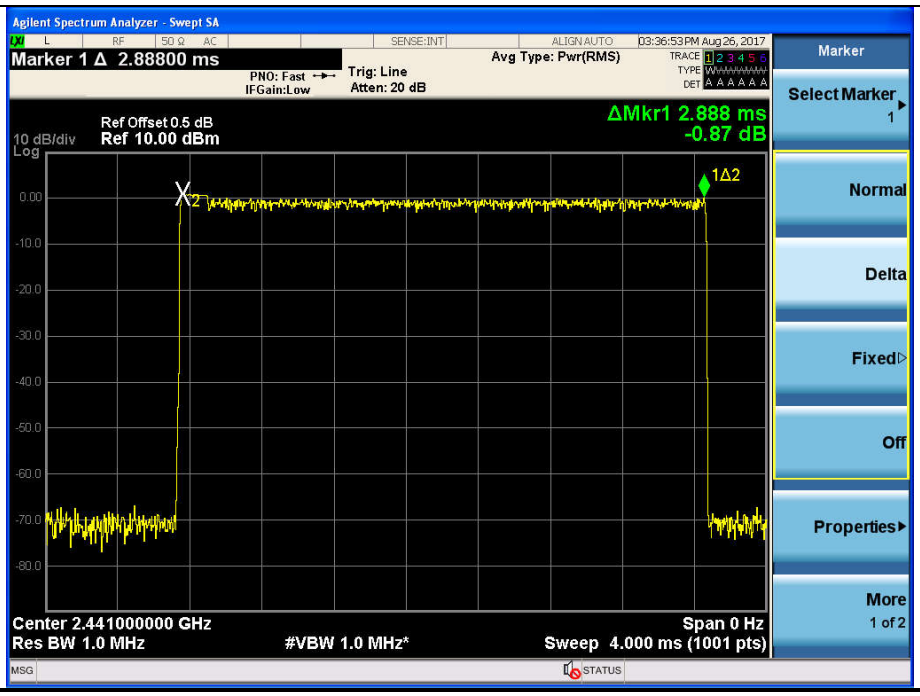
Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 2.87200 ms
PNO: Fast
IFGain:Low
Trig: Line
Atten: 20 dB
Avg Type: Pwr(RMS)
03:39:50 PM Aug 26, 2017
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Log
ΔMkr1 2.872 ms
-0.10 dB
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz*
Span 0 Hz
Sweep 4.000 ms (1001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2

Modulation mode		π/4-DQPSK
2-DH1		
2-DH3		

2-DH5		

Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 2.88800 ms
Avg Type: Pwr(RMS)
03:38:27 PM Aug 26, 2017
PNO: Fast
IFGain:Low
Trig: Line
Atten: 20 dB
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Log
ΔMkr1 2.888 ms
-1.23 dB
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz*
Span 0 Hz
Sweep 4.000 ms (1001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2

Modulation mode		8DPSK
3-DH1		
3-DH3		

3-DH5		

Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 2.88800 ms
PNO: Fast
IFGain:Low
Trig: Line
Atten: 20 dB
Avg Type: Pwr(RMS)
03:36:53 PM Aug 26, 2017
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Log
ΔMkr1 2.888 ms
-0.87 dB
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz*
Span 0 Hz
Sweep 4.000 ms (1001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2

8. PEAK OUTPUT POWER TEST

8.1 APPLIED PROCEDURES / LIMIT

FCC ParCN186-W5 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	Hopping Channels>75 Power<1W(30dBm) Other <125 mW(21dBm)	2400-2483.5	PASS

8.1.1 TEST PROCEDURE

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
(2) Spectrum Setting:
RBW=1MHz, VBW=3MHz, Detector=Peak (If 20dB BW ≤1 MHz)
RBW=3MHz, VBW=10MHz, Detector=Peak (If 20dB BW > 1 MHz)
(3) The EUT was set to continuously transmitting in the max power during the test.

8.1.2 DEVIATION FROM STANDARD

No deviation.

8.1.3 TEST SETUP

8.1.4 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.

8.1.5 TEST RESULTS

EUT：	Smart Mirror	Model Name ：	RVM740SM
Temperature：	22℃	Relative Humidtity：	55%
Pressure：	1012 hPa	Test Voltage ：	DC 12V
Test Mode ：	GFSK, π/4-DQPSK, 8-DPSK Mode /CH01, CH40, CH79		

Test Channel	Frequency	Maximum Conducted Output Power(PK) (dBm)	LIMIT
	(MHz)	TX GFSK Mode	dBm
CH01	2402	0.22	30
CH40	2441	3.064	30
CH79	2480	4.262	30
TX π /4-DQPSK Mode			
CH01	2402	-2.6	30
CH40	2441	1.139	30
CH79	2480	2.143	30
TX 8-DPSK Mode			
CH01	2402	-2.624	30
CH40	2441	1.423	30
CH79	2480	2.402	30

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9. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE

APPLICABLE STANDARD

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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

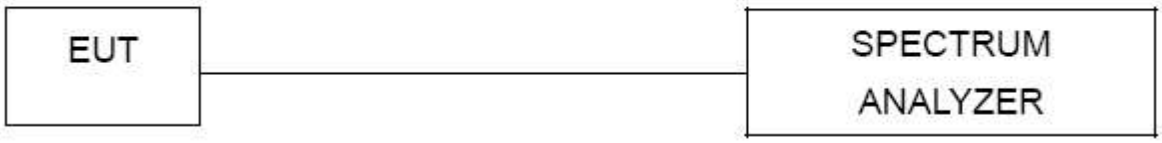
TEST PROCEDURE

a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
c) Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
e) Repeat above procedures until all measured frequencies were complete.

9.1 DEVIATION FROM STANDARD

No deviation.

9.2 TEST SETUP



9.3 EUT OPERATION CONDITIONS

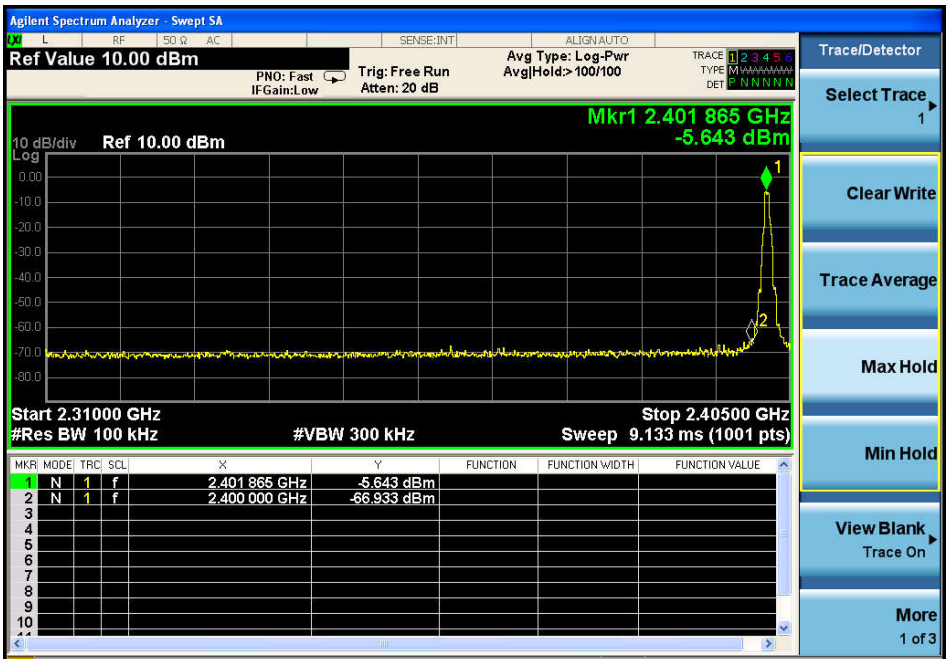
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

9.4 TEST RESULTS

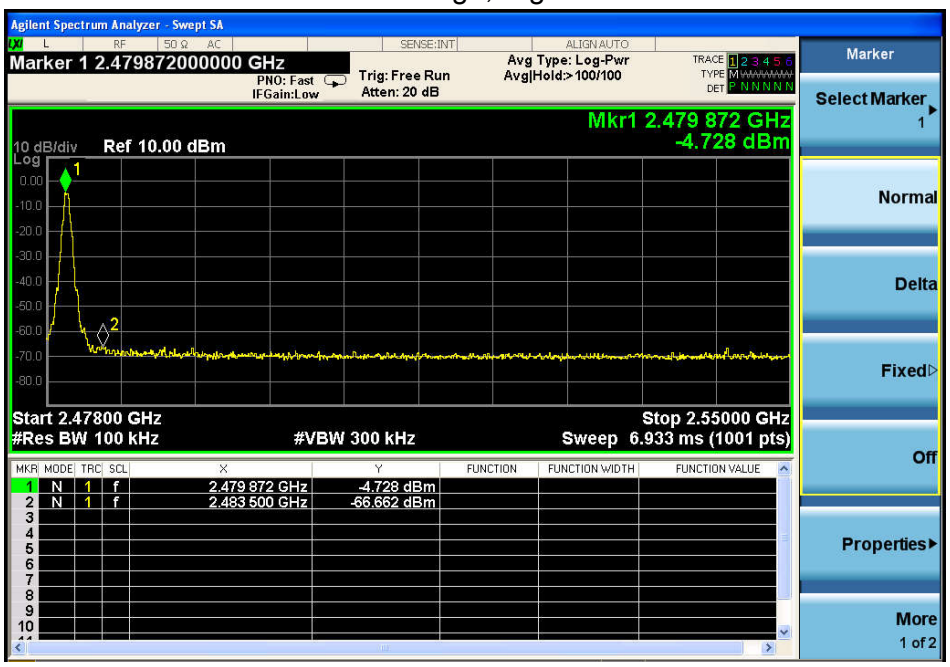
EUT：	Smart Mirror	Model Name ：	RVM740SM
Temperature：	22℃	Relative Humidtity：	55%
Pressure：	1012 hPa	Test Voltage ：	DC 12V

Frequency Band	Delta Peak to band emission (dBc)	> Limit (dBc)	Result
GFSK mode			
Left-band	41.096	20	Pass
Right-band	63.037	20	Pass
π/4-DQPSK mode			
Left-band	45.031	20	Pass
Right-band	59.982	20	Pass
8-DPSK mode			
Left-band	46.949	20	Pass
Right-band	61.965	20	Pass

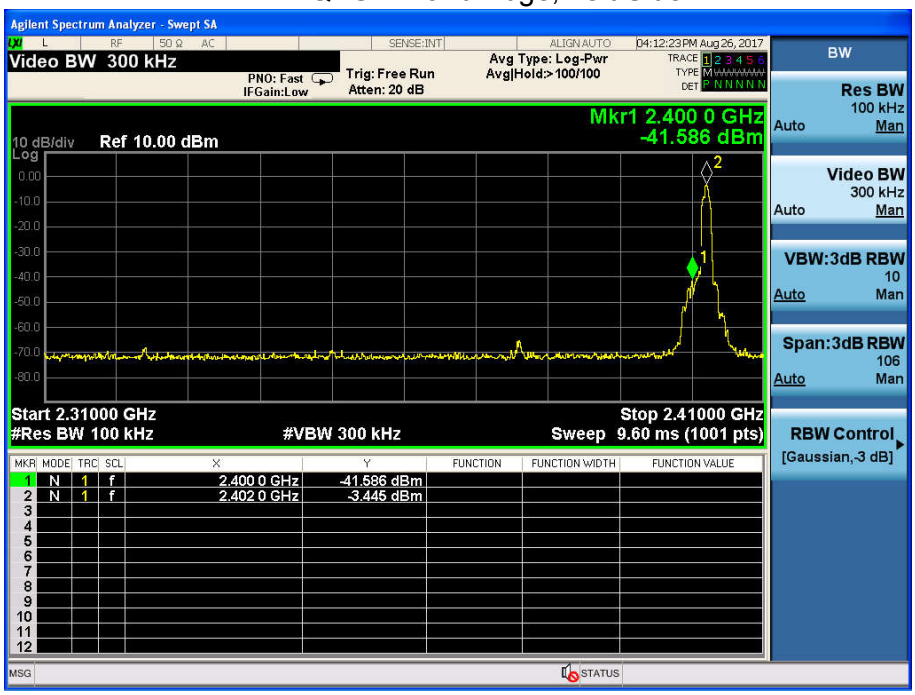
GFSK: Band Edge, Left Side



GFSK: Band Edge, Right Side

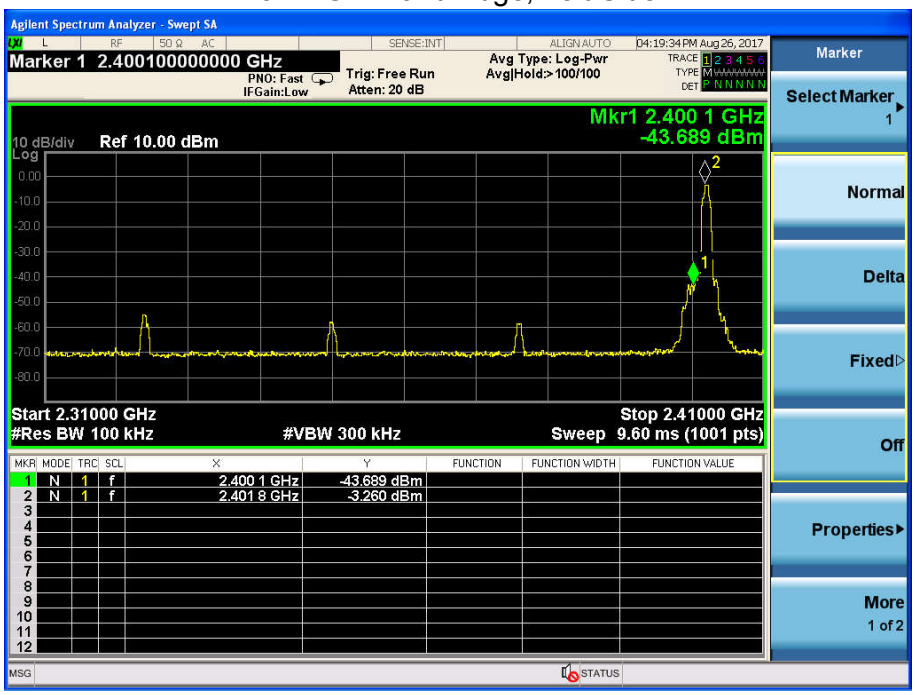


π/4-DQPSK: Band Edge, Left Side



π/4-DQPSK: Band Edge, Right Side

8-DPSK: Band Edge, Left Side

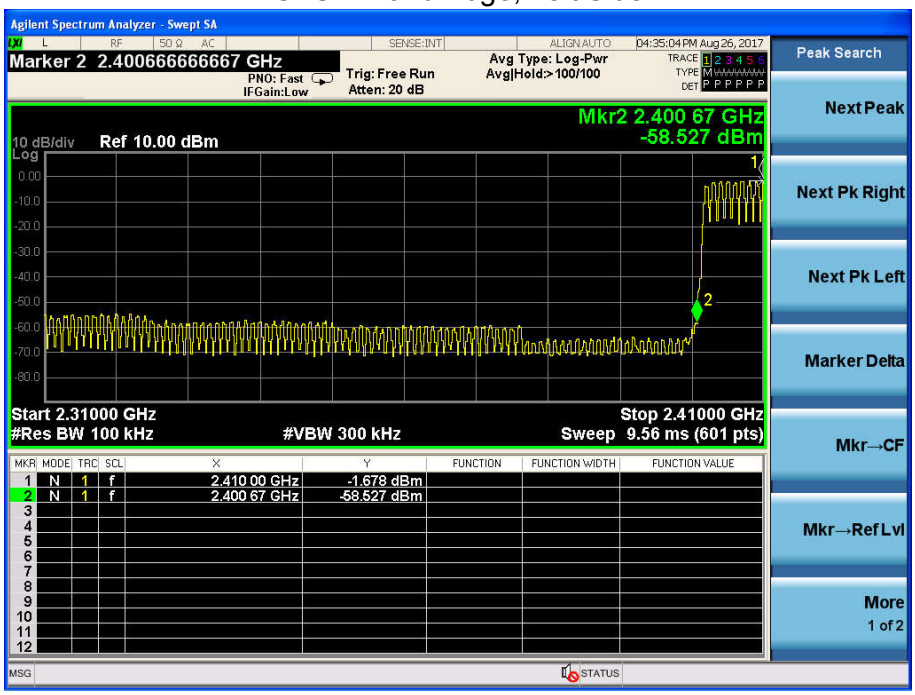


8-DPSK: Band Edge, Right Side

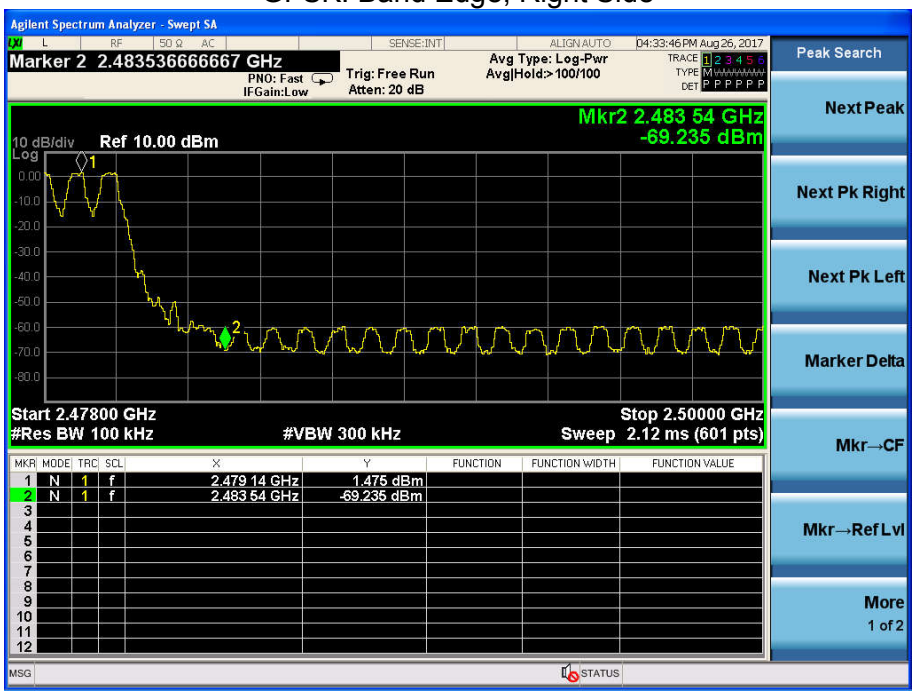
Hopping Mode

Frequency Band	Delta Peak to band emission (dBc)	> Limit (dBc)	Result
GFSK mode			
Left-band	56.849	20	Pass
Right-band	70.71	20	Pass
π/4-DQPSK mode			
Left-band	40.317	20	Pass
Right-band	62.256	20	Pass
8-DPSK mode			
Left-band	39.026	20	Pass
Right-band	65.142	20	Pass

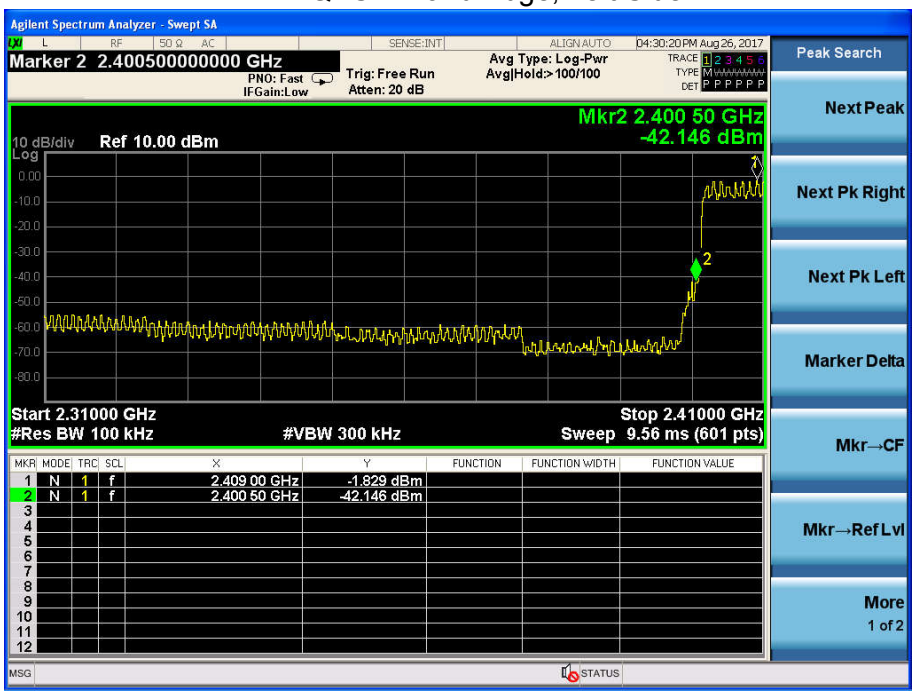
GFSK: Band Edge, Left Side



GFSK: Band Edge, Right Side

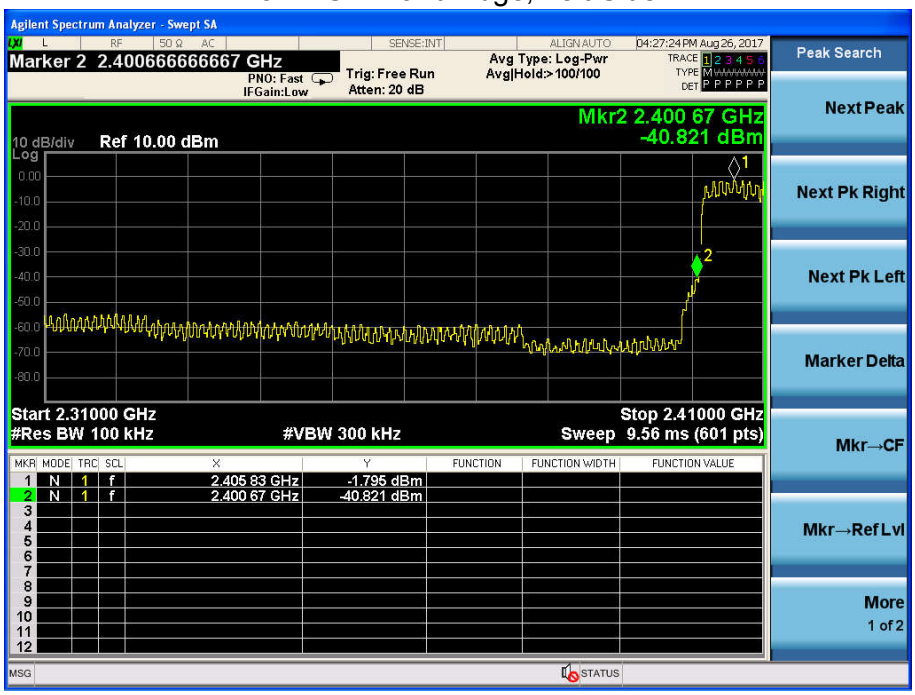


π/4-DQPSK: Band Edge, Left Side

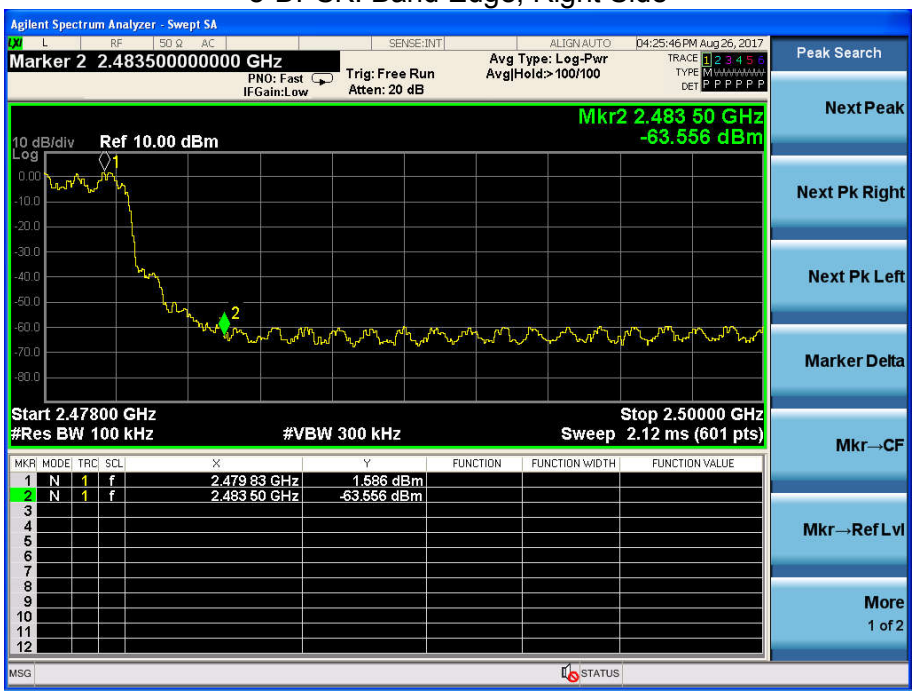


π/4-DQPSK: Band Edge, Right Side

8-DPSK: Band Edge, Left Side



8-DPSK: Band Edge, Right Side



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 PCB antenna. It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used.

----END OF REPORT----