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APPENDIX A

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APPENDIX A

TEST PLOTS

(Model: mPAD-7.....)

File Number: C1M1607289

Report Number: EM-F160524

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A.1 20dB BANDWIDTH MEASUREMENT

Test Date	2016/07/28	Temp./Hum.	25°C/58%
Cable Loss	---	Test Voltage	DC 3.7V

A.1.1 20dB Bandwidth Result

Modulation	Centre Frequency (MHz)	20 dB Bandwidth (MHz)	2/3 (20dB Bandwidth)
GFSK	2402	0.9329	0.622
	2441	0.9331	0.622
	2480	0.9334	0.622

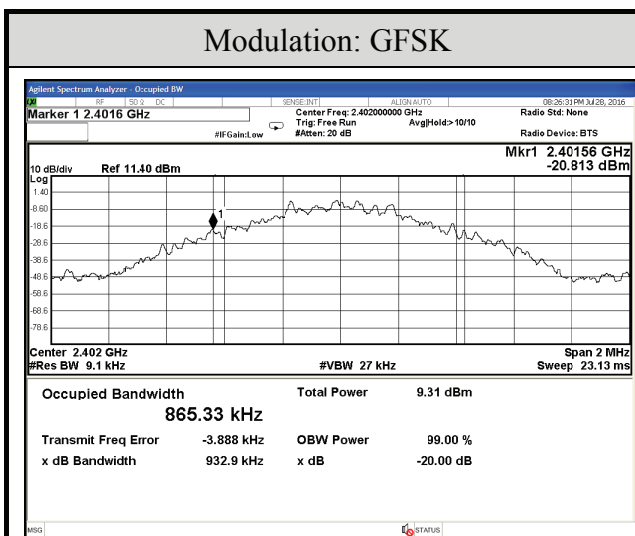
Remark: The maximum two-thirds of the 20dB bandwidth is the limit for carrier frequency separation presented.

Modulation	Centre Frequency (MHz)	20 dB Bandwidth (MHz)	2/3 (20dB Bandwidth)
8-DPSK	2402	1.264	0.843
	2441	1.264	0.843
	2480	1.264	0.843

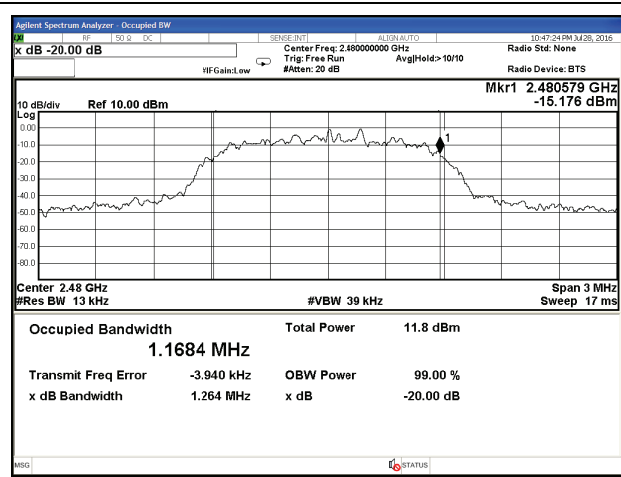
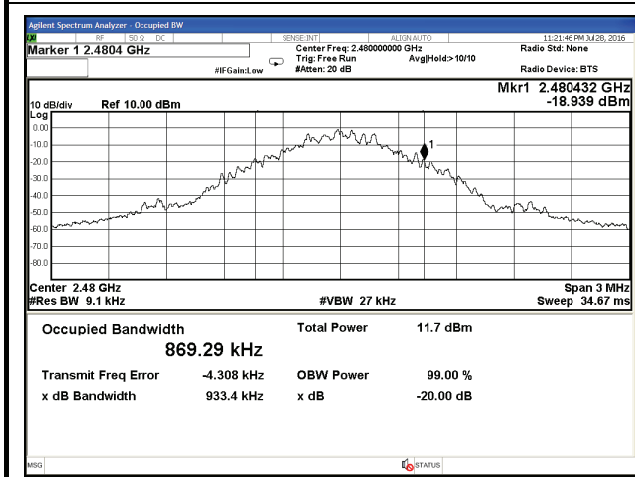
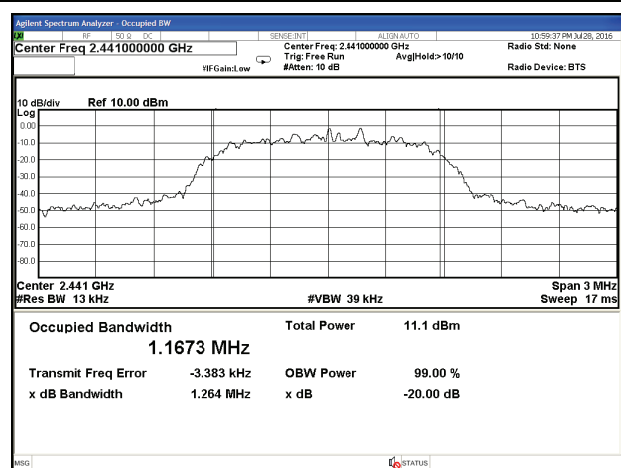
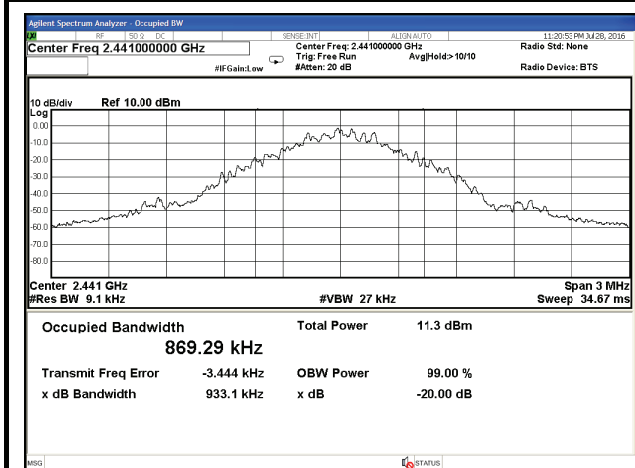
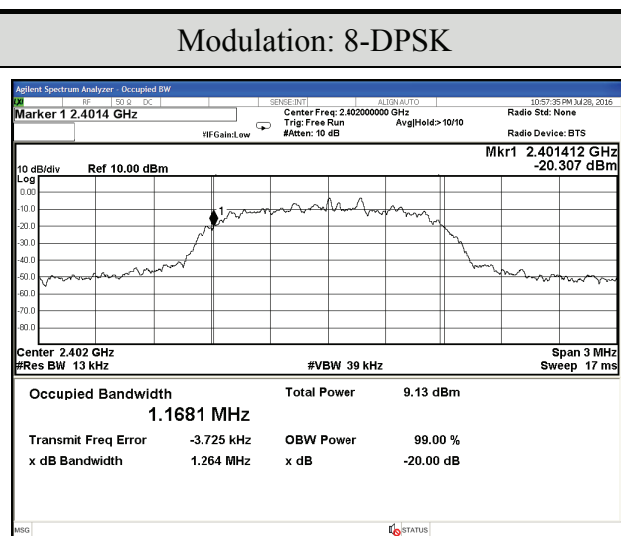
Remark: The maximum two-thirds of the 20dB bandwidth is the limit for carrier frequency separation presented.

A.1.2 Measurement Plots

Modulation: GFSK



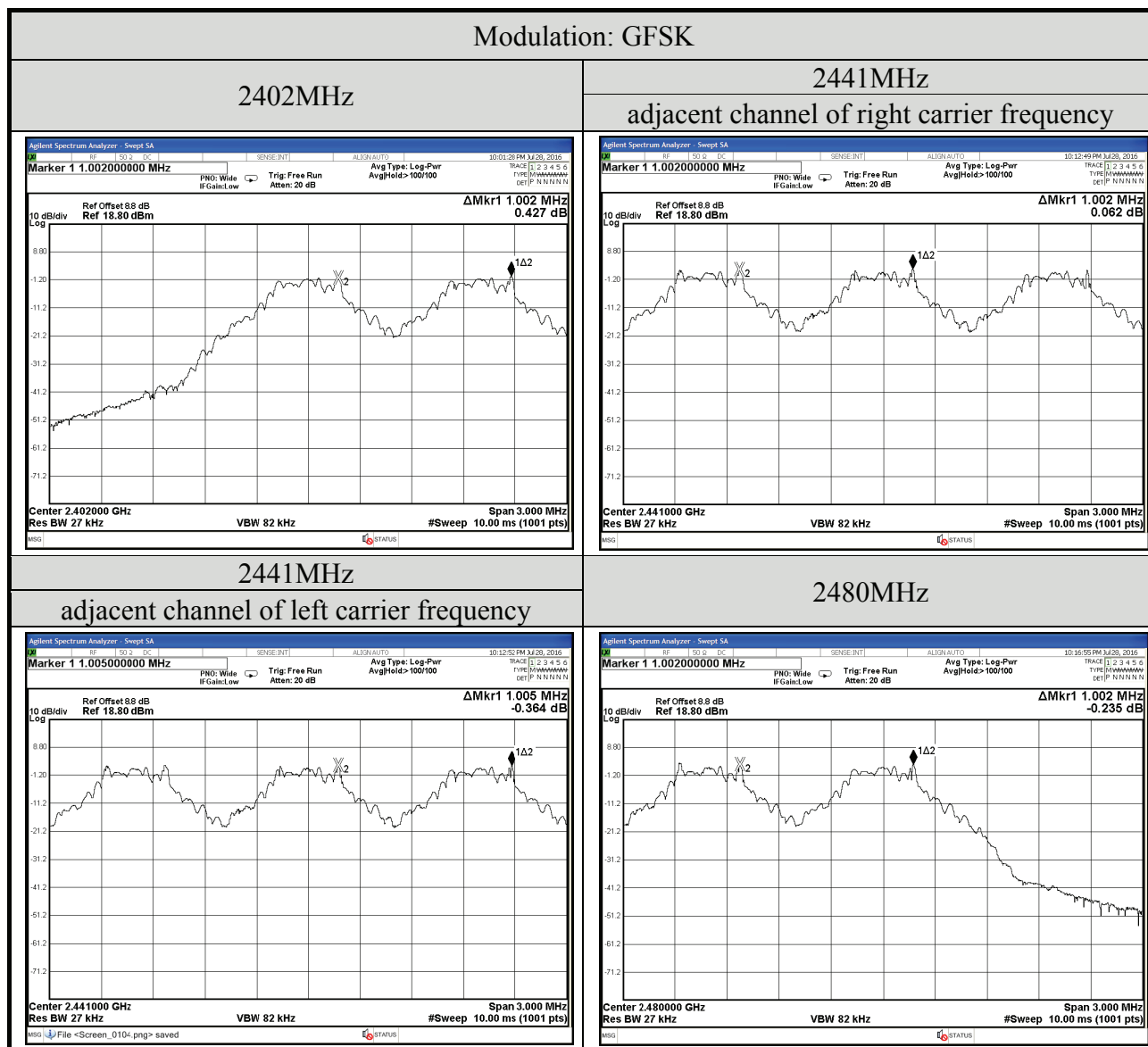
Modulation: 8-DPSK



A.2 CARRIER FREQUENCY SEPARATION MEASUREMENT

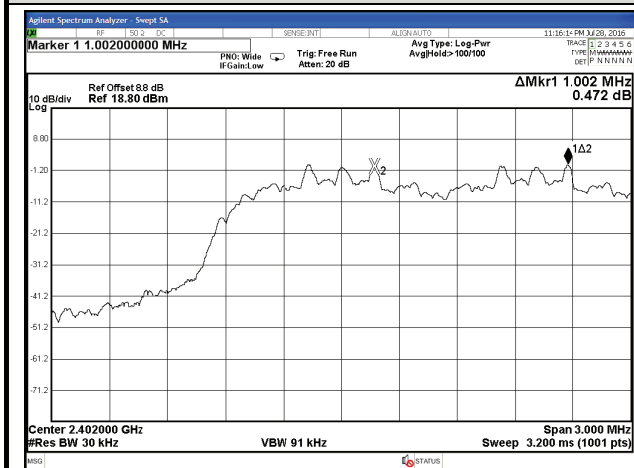
Test Date	2016/07/28	Temp./Hum.	25°C/58%
Cable Loss	8.8dB	Test Voltage	DC 3.7V

A.2.1 Measurement Plots



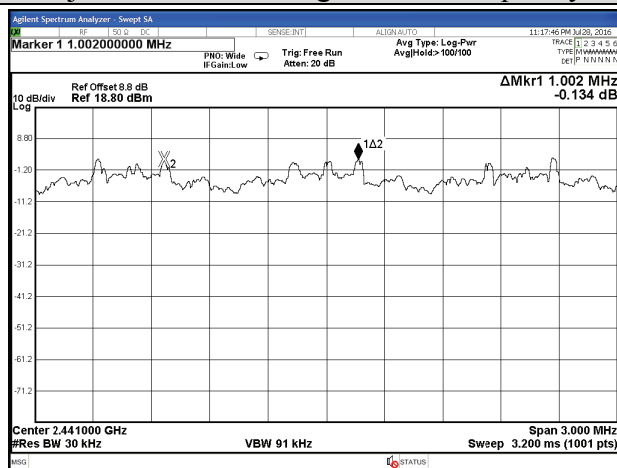
Modulation: 8-DPSK

2402MHz



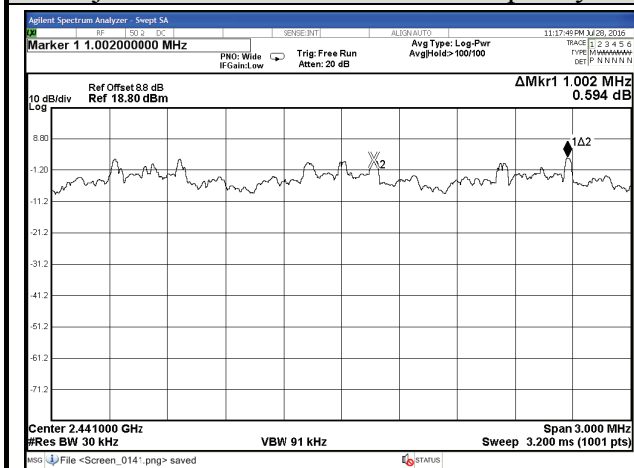
2441MHz

adjacent channel of right carrier frequency

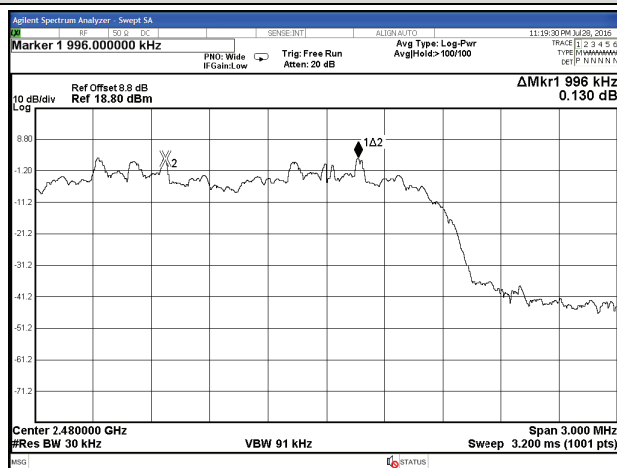


2441MHz

adjacent channel of left carrier frequency



2480MHz



A.3 TIME OF OCCUPANCY MEASUREMENT

Test Date	2016/07/28	Temp./Hum.	25°C/58%
Cable Loss	8.8dB	Test Voltage	DC 3.7V

A.3.1 Time of Occupancy

Modulation	Centre Frequency (MHz)	Mode	Time of Occupancy (ms)	Maximum accumulated Time of Occupancy (ms)	Limit (ms)
GFSK	2402	DH1	0.390	123.240	<400
		DH3	1.650	208.560	<400
		DH5	2.900	183.280	<400
	2441	DH1	0.390	123.240	<400
		DH3	1.650	208.560	<400
		DH5	2.900	183.280	<400
	2480	DH1	0.390	123.240	<400
		DH3	1.640	207.296	<400
		DH5	2.890	182.648	<400

Observation Period: 79 channels*0.4 seconds = 31.6 seconds

Centre Frequency: 2402MHz

DH1: For each second of 10 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

$$10 \text{ channels} * 31.6 \text{ seconds} * 0.390 \text{ ms} = 123.240 \text{ ms}$$

DH3: For each second of 4 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

$$4 \text{ channels} * 31.6 \text{ seconds} * 1.650 \text{ ms} = 208.560 \text{ ms}$$

DH5: For each second of 2 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

$$2 \text{ channels} * 31.6 \text{ seconds} * 2.900 \text{ ms} = 183.280 \text{ ms}$$

Centre Frequency: 2441MHz

DH1: For each second of 10 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

10 channels*31.6 seconds* **0.390** ms= **123.240** ms

DH3: For each second of 4 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

4 channels*31.6 seconds* **1.650** ms= **208.560** ms

DH5: For each second of 2 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

2 channels*31.6 seconds* **2.900** ms= **183.280** ms

Centre Frequency: 2480MHz

DH1: For each second of 10 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

10 channels*31.6 seconds* **0.390** ms= **123.240** ms

DH3: For each second of 4 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

4 channels*31.6 seconds* **1.640** ms= **207.296** ms

DH5: For each second of 2 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

2 channels*31.6 seconds* **2.890** ms= **182.648** ms

Modulation	Centre Frequency (MHz)	Mode	Time of Occupancy (ms)	Maximum accumulated Time of Occupancy (ms)	Limit (ms)
8-DPSK	2402	3DH1	0.400	126.400	<400
		3DH3	1.650	208.560	<400
		3DH5	2.900	183.280	<400
	2441	3DH1	0.400	126.400	<400
		3DH3	1.640	207.296	<400
		3DH5	2.900	183.280	<400
	2480	3DH1	0.400	126.400	<400
		3DH3	1.650	208.560	<400
		3DH5	2.900	183.283	<400

Observation Period: 79 channels*0.4 seconds = 31.6 seconds

Centre Frequency: 2402MHz

3DH1: For each second of 10 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

10 channels*31.6 seconds* **0.400** ms= **126.400** ms

3DH3: For each second of 4 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

4 channels*31.6 seconds* **1.650** ms= **208.560** ms

3DH5: For each second of 2 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

2 channels*31.6 seconds* **2.900** ms= **183.280** ms

Centre Frequency: 2441MHz

3DH1: For each second of 10 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

10 channels*31.6 seconds* **0.400** ms= **126.400** ms

3DH3: For each second of 4 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

4 channels*31.6 seconds* **1.640** ms= **207.296** ms

3DH5: For each second of 2 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

2 channels*31.6 seconds* **2.900** ms= **183.280** ms

Centre Frequency: 2480MHz

3DH1: For each second of 10 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

10 channels*31.6 seconds* **0.400** ms= **126.400** ms

3DH3: For each second of 4 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

4 channels*31.6 seconds* **1.650** ms= **208.560** ms

3DH5: For each second of 2 channel appearance, the longest time of occupancy for each of 31.6 seconds is:

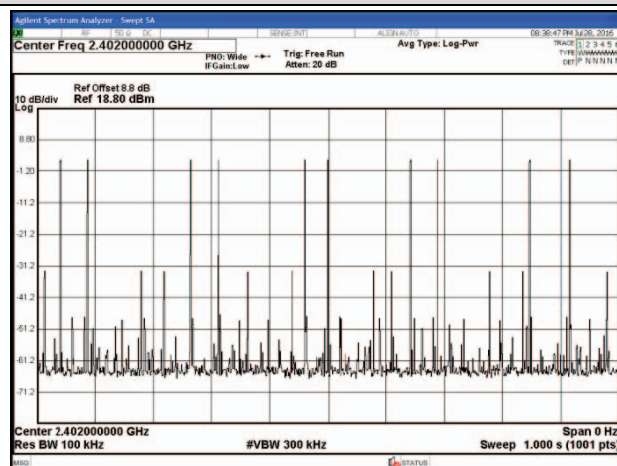
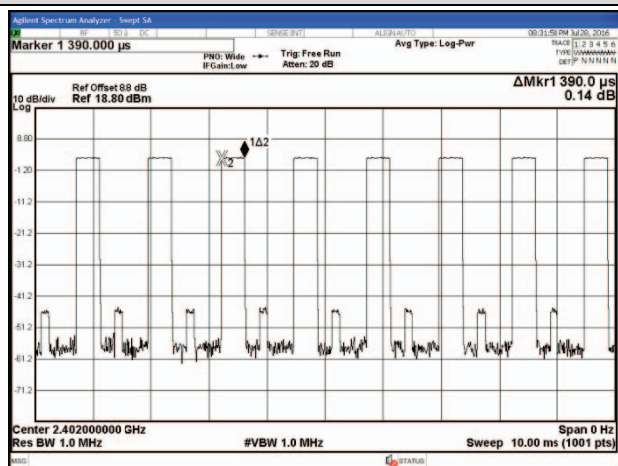
2 channels*31.6 seconds* **2.900** ms= **183.280** ms

A.3.2 Measurement Plots

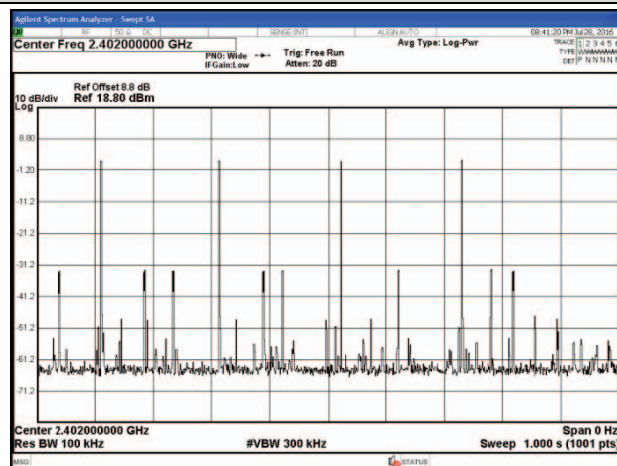
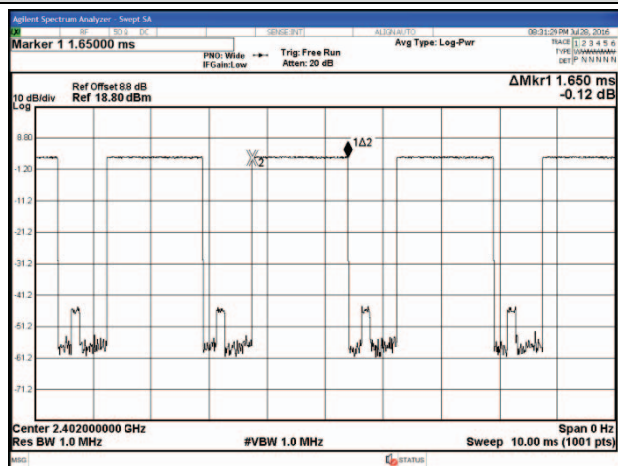
Modulation: GFSK

Centre Frequency: 2402MHz

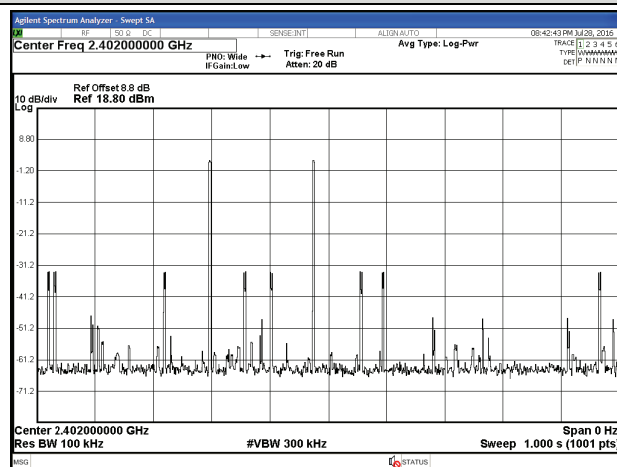
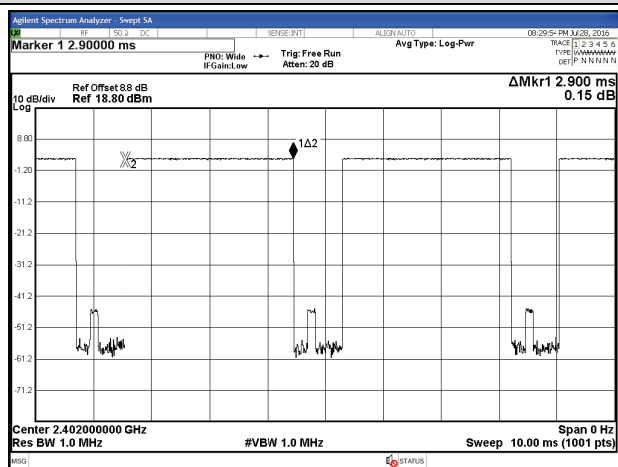
Mode: DH1



Mode: DH3



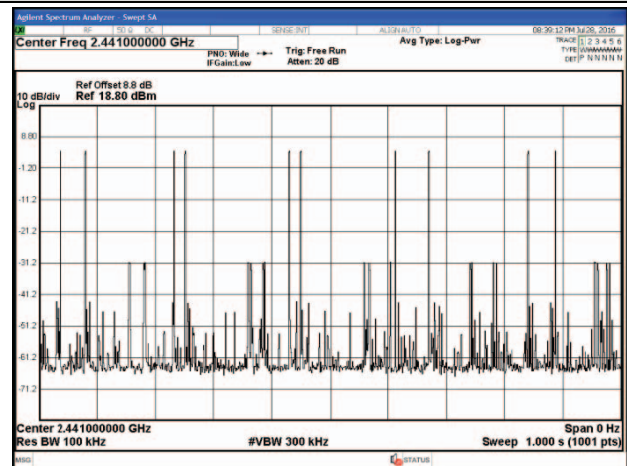
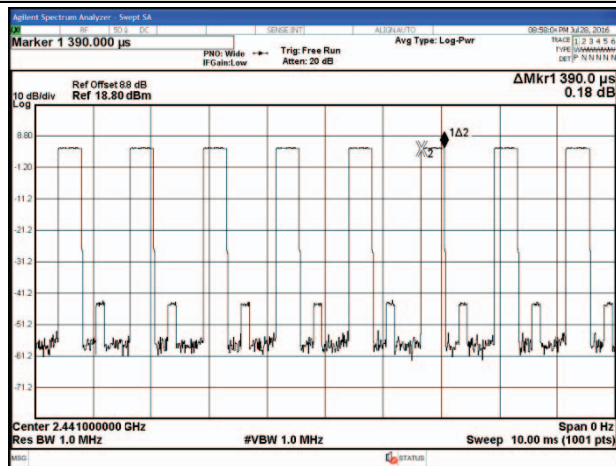
Mode: DH5



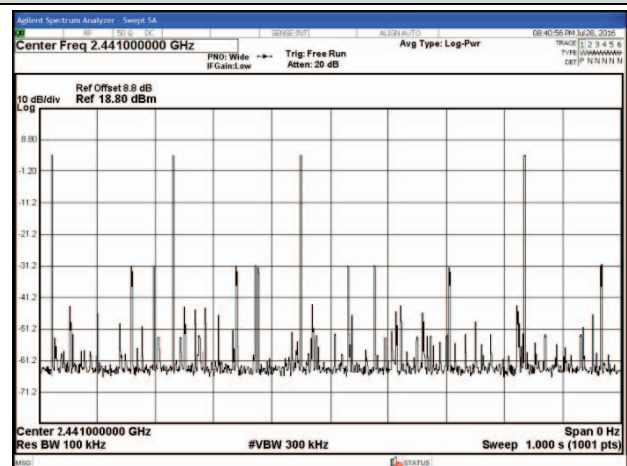
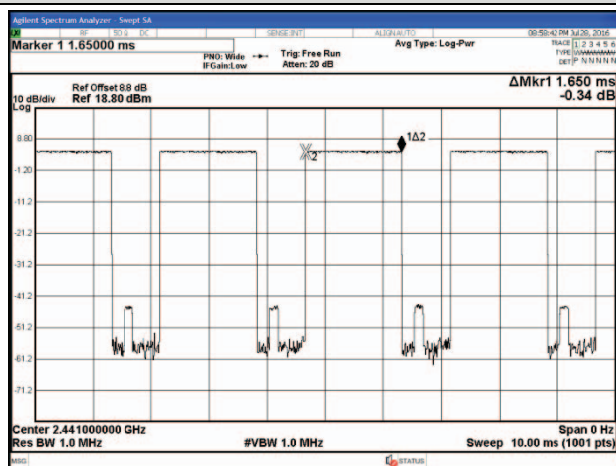
Modulation: GFSK

Centre Frequency: 2441MHz

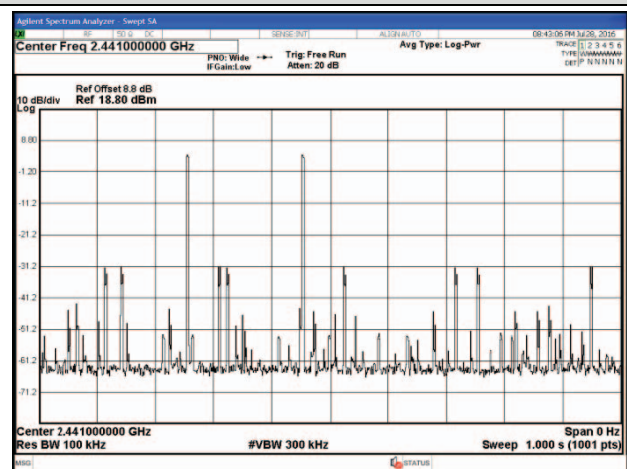
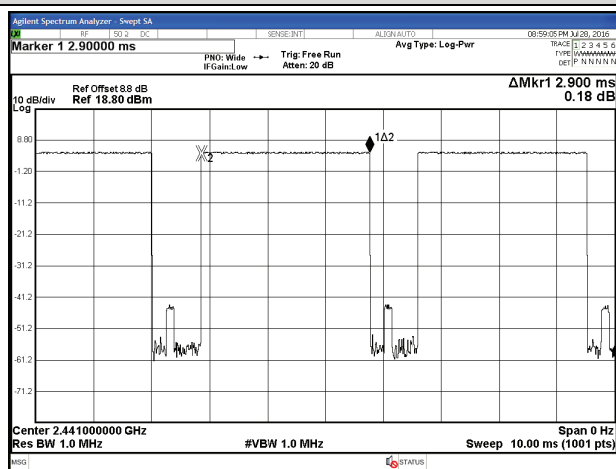
Mode: DH1



Mode: DH3



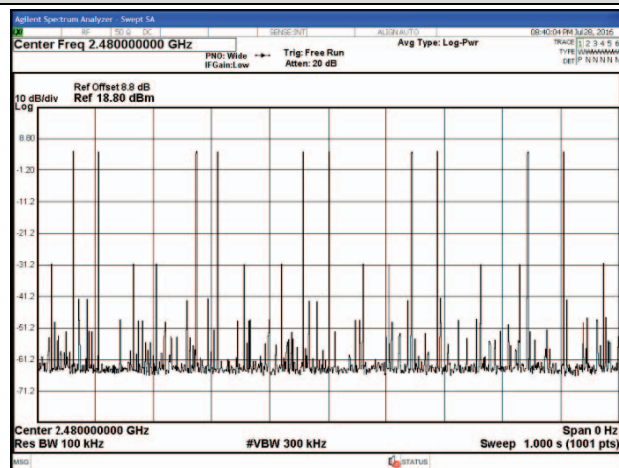
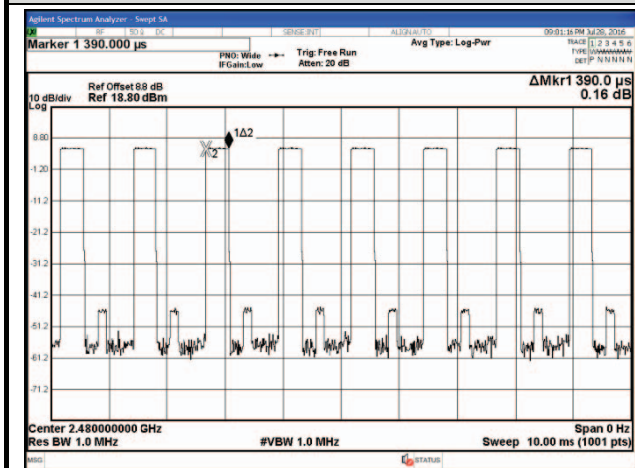
Mode: DH5



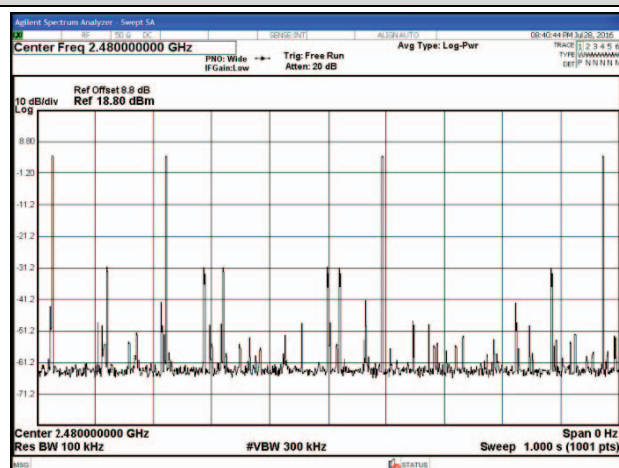
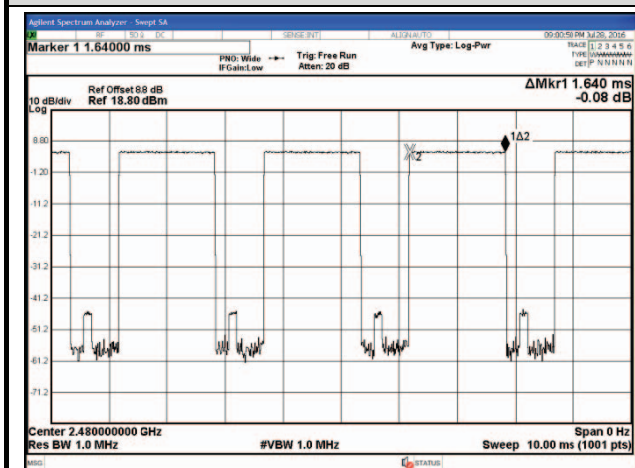
Modulation: GFSK

Centre Frequency: 2480MHz

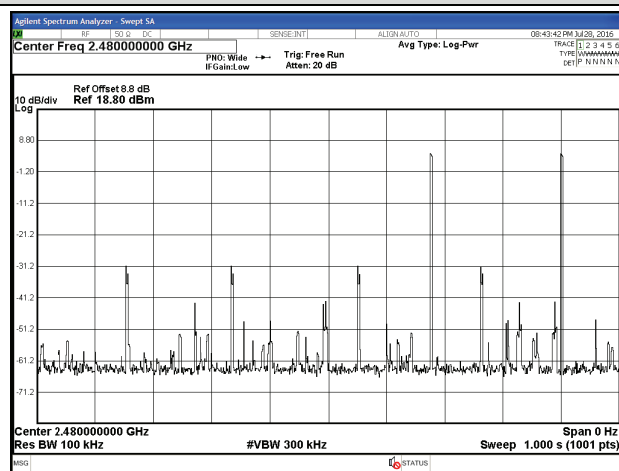
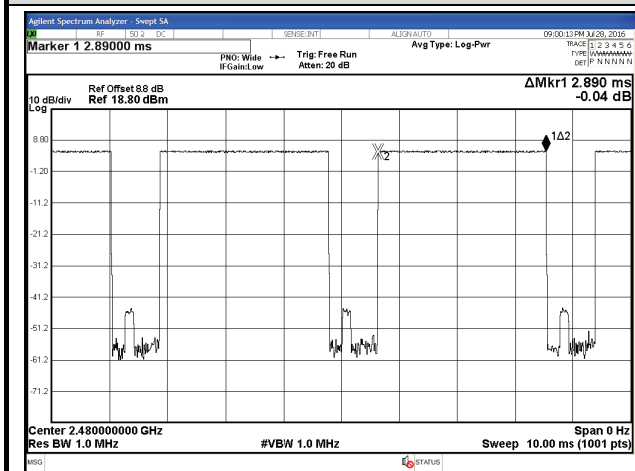
Mode: DH1



Mode: DH3



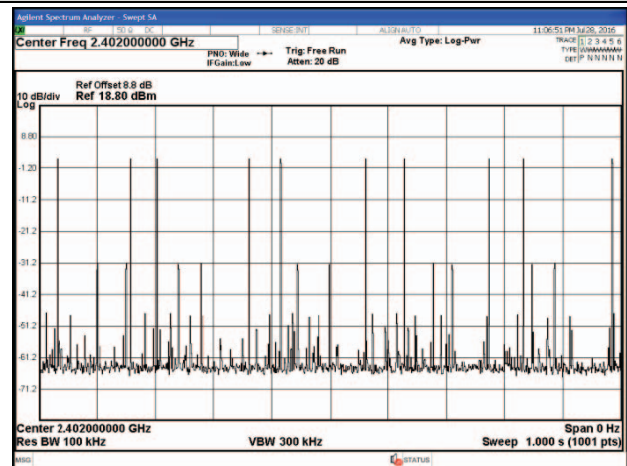
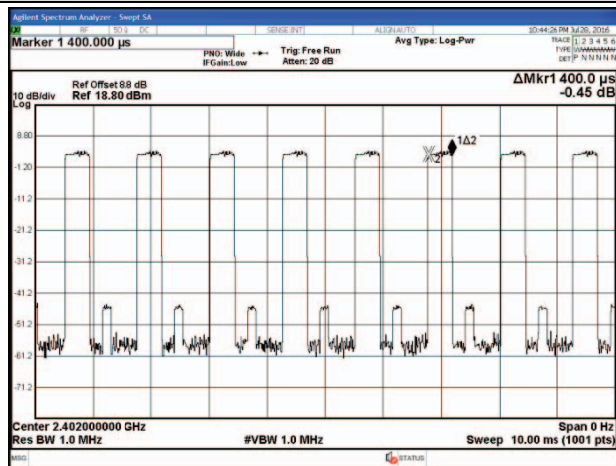
Mode: DH5



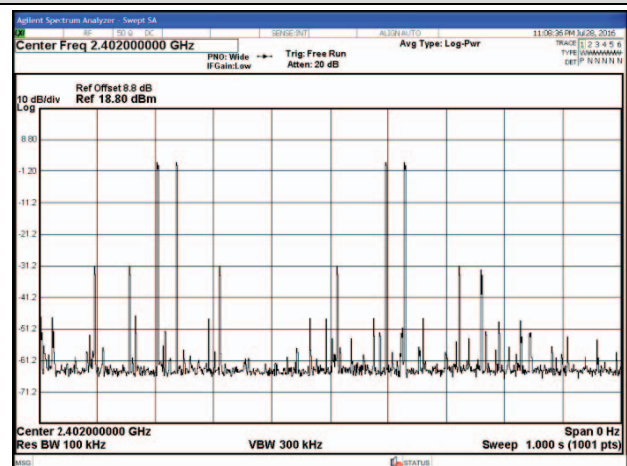
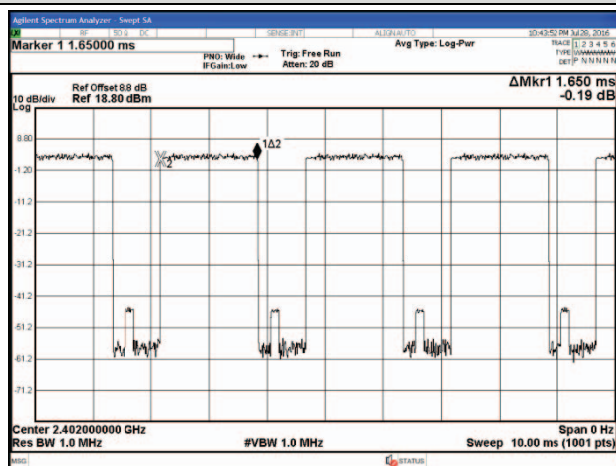
Modulation: 8-DPSK

Centre Frequency: 2402MHz

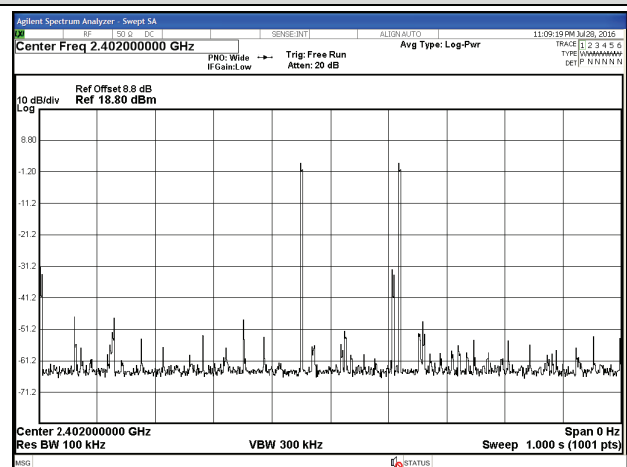
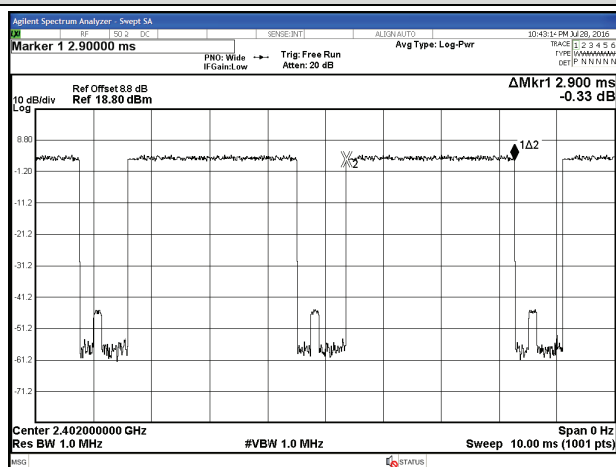
Mode: 3DH1



Mode: 3DH3



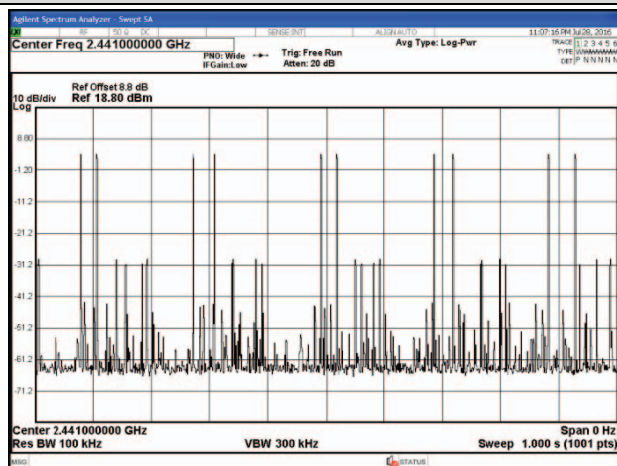
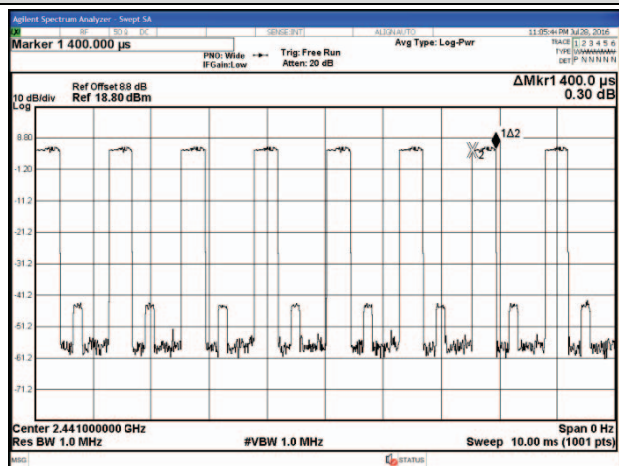
Mode: 3DH5



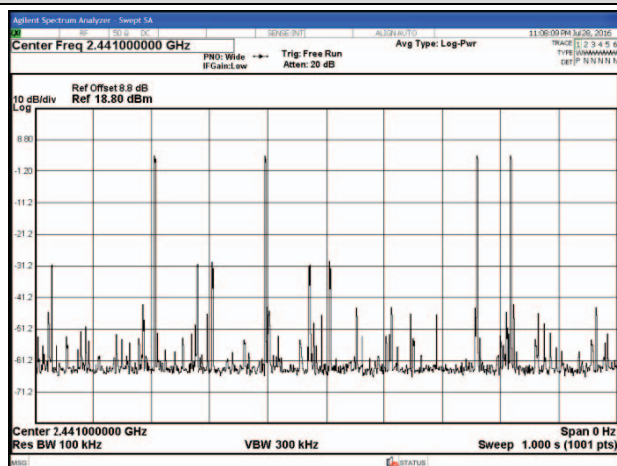
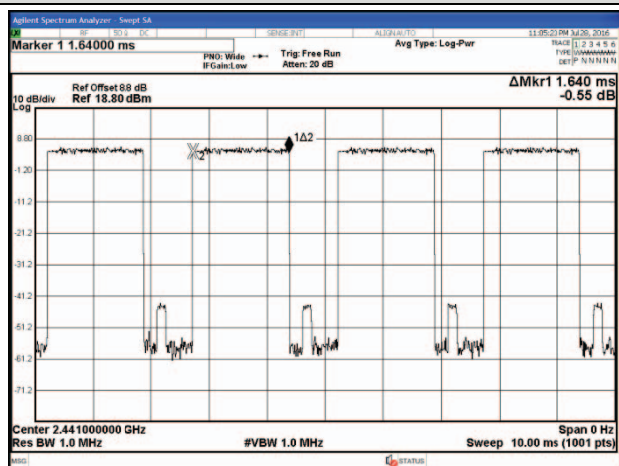
Modulation: 8-DPSK

Centre Frequency: 2441MHz

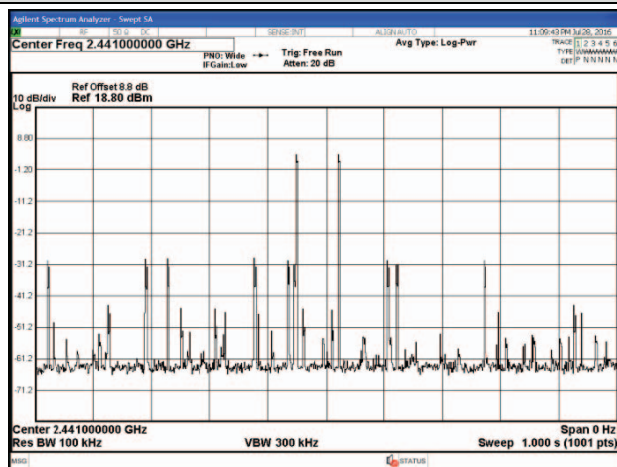
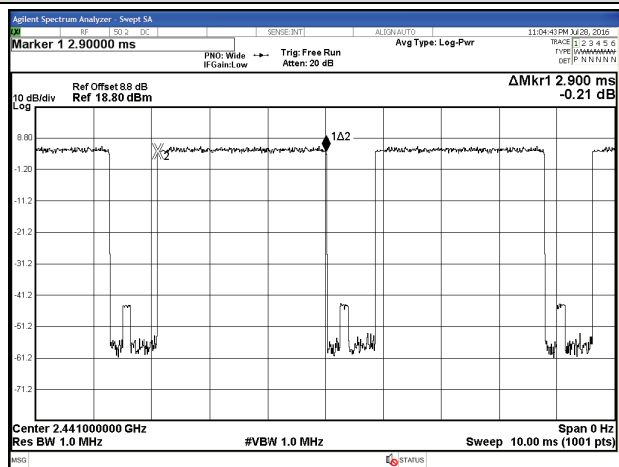
Mode: 3DH1



Mode: 3DH3



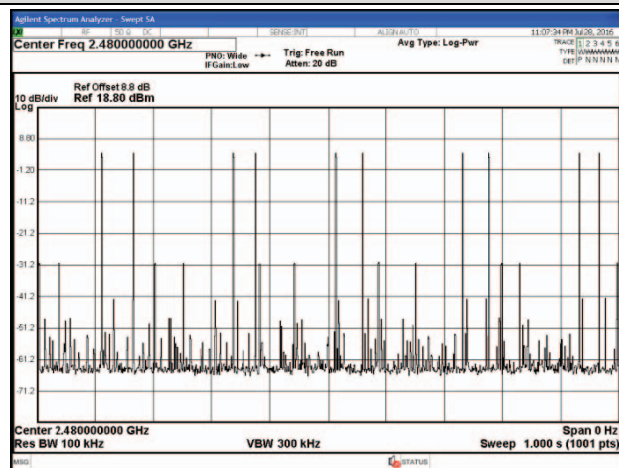
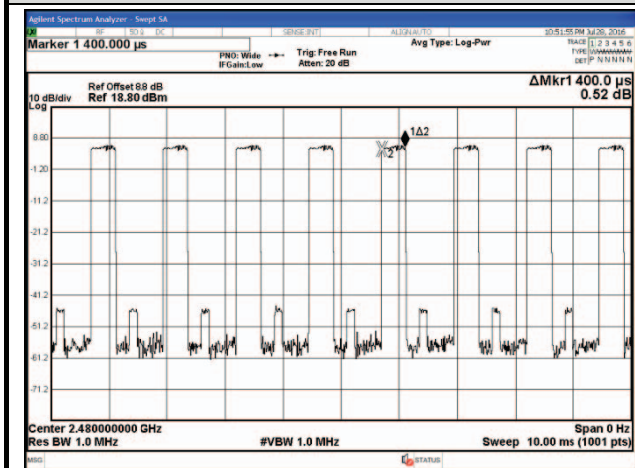
Mode: 3DH5



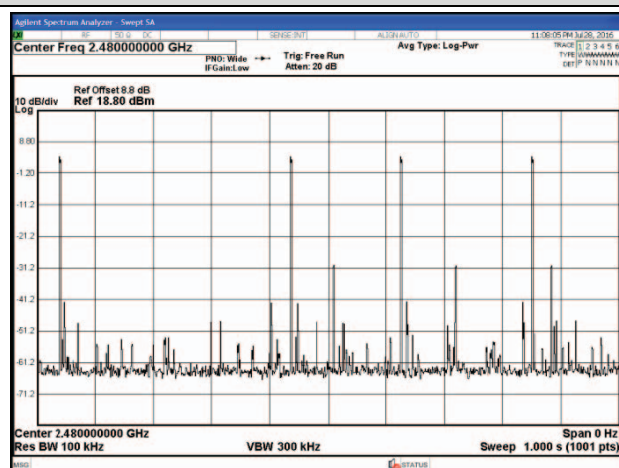
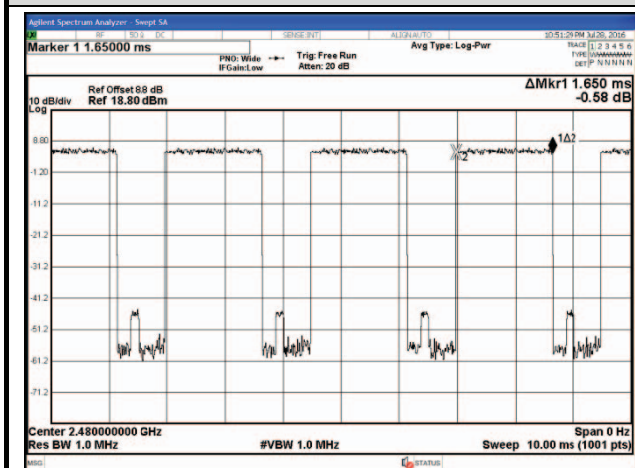
Modulation: 8-DPSK

Centre Frequency: 2480MHz

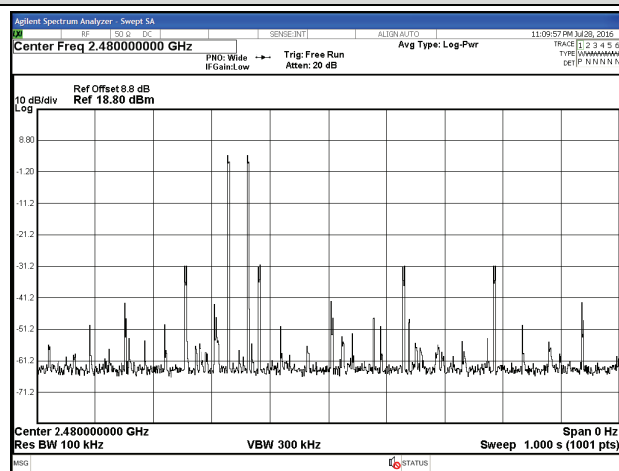
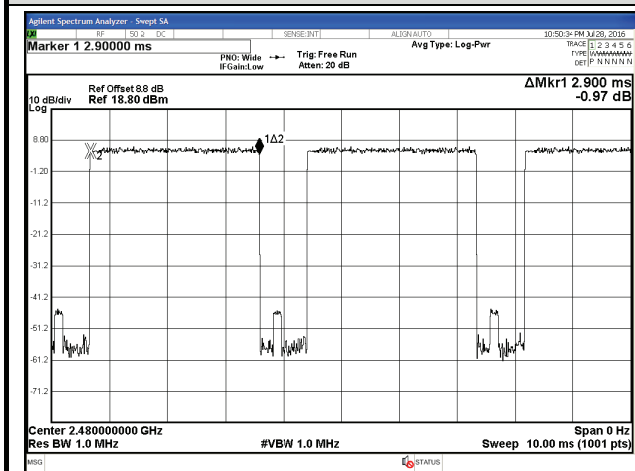
Mode: 3DH1



Mode: 3DH3



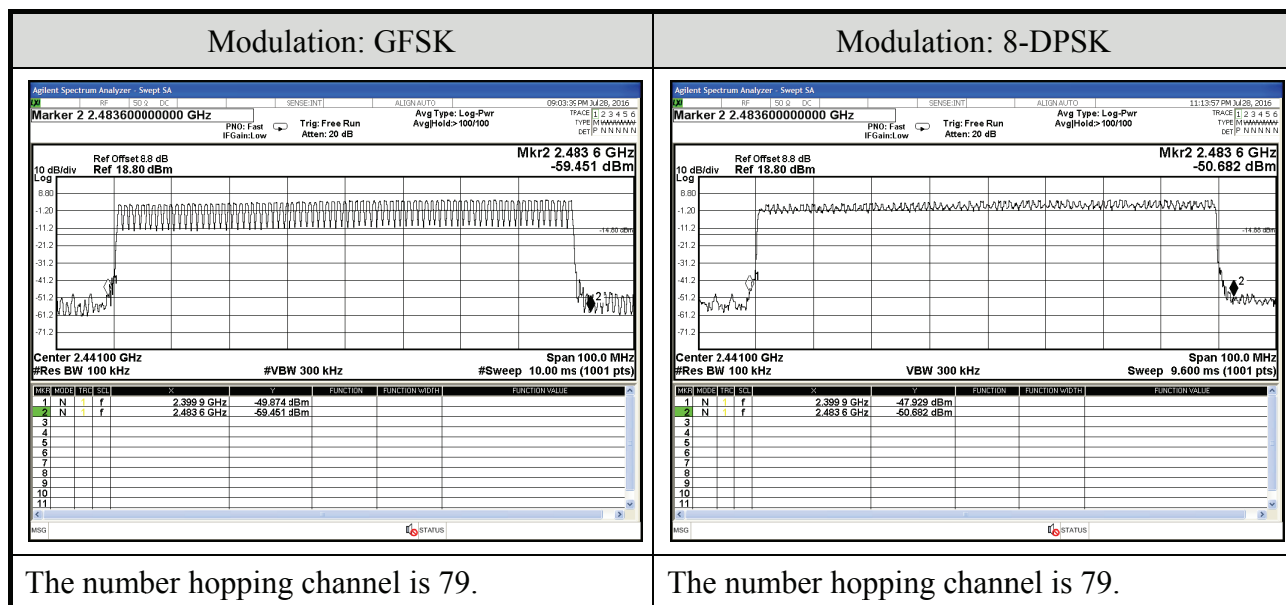
Mode: 3DH5



A.4 NUMBER OF HOPPING CHANNELS MEASUREMENT

Test Date	2016/07/28	Temp./Hum.	25°C/58%
Cable Loss	8.8dB	Test Voltage	DC 3.7V

A.4.1 Measurement Plots



A.5 MAXIMUM PEAK OUTPUT POWER MEASUREMENT

Test Date	2016/07/28	Temp./Hum.	25°C/58%
Cable Loss	8.7dB	Test Voltage	DC 3.7V

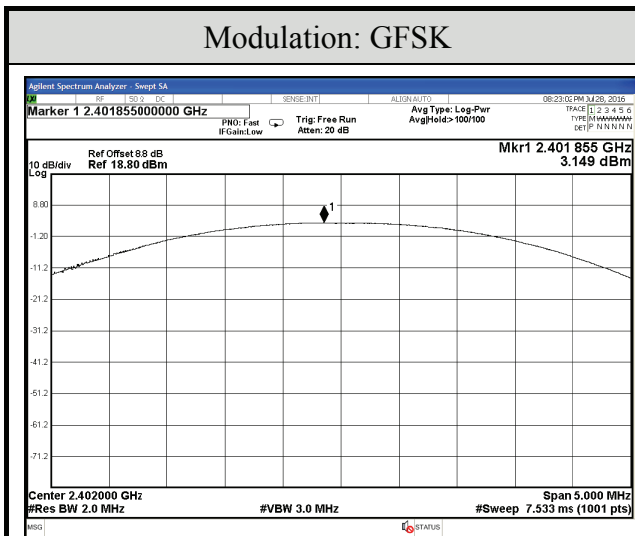
A.5.1 Output Power

Modulation	Centre Frequency (MHz)	Peak Output Power		Limit
		dBm	W	
GFSK	2402	3.149	0.002065	21dBm (0.125W)
	2441	5.072	0.003215	
	2480	5.642	0.003666	

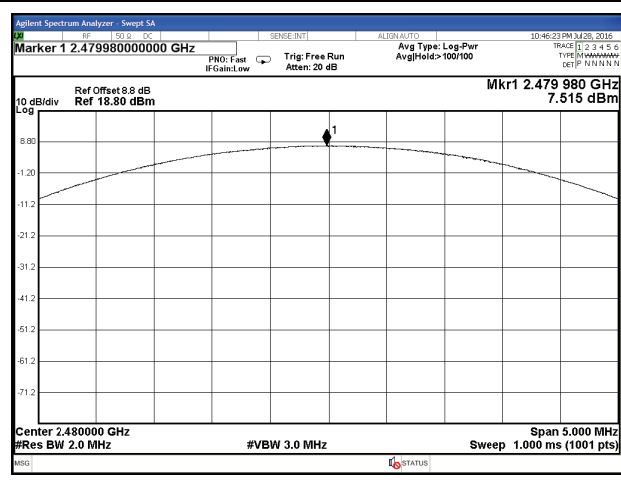
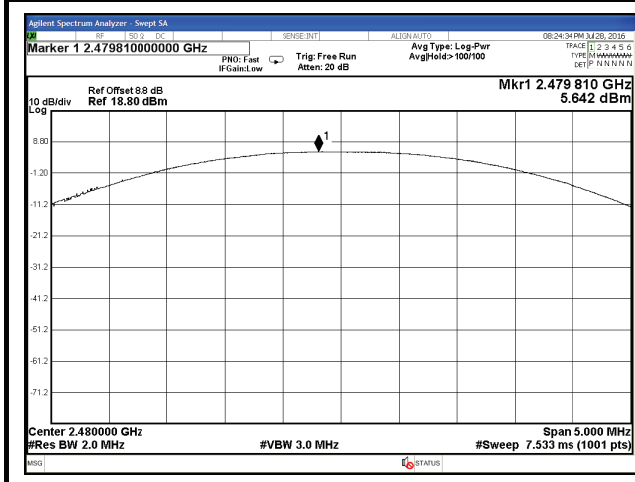
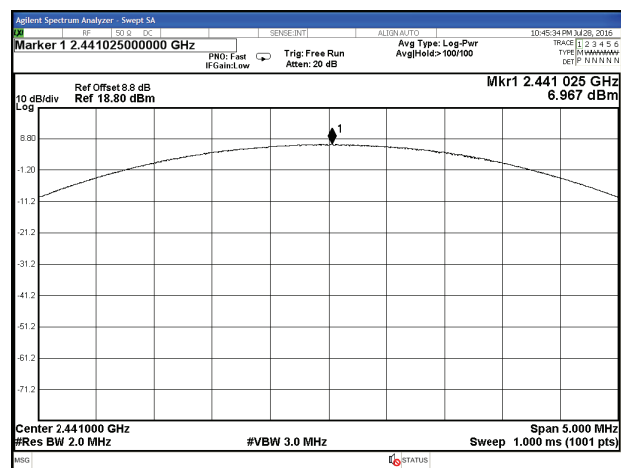
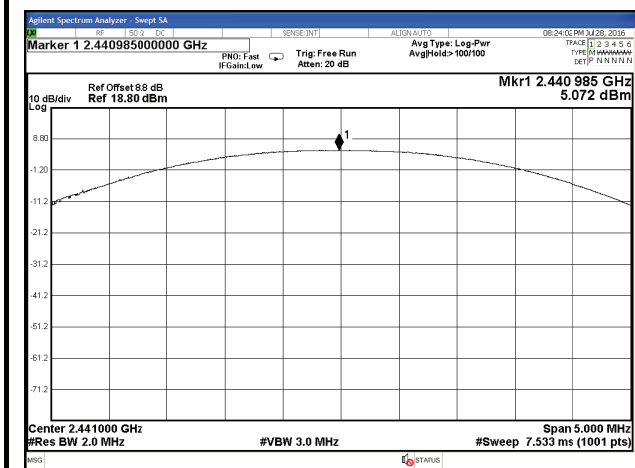
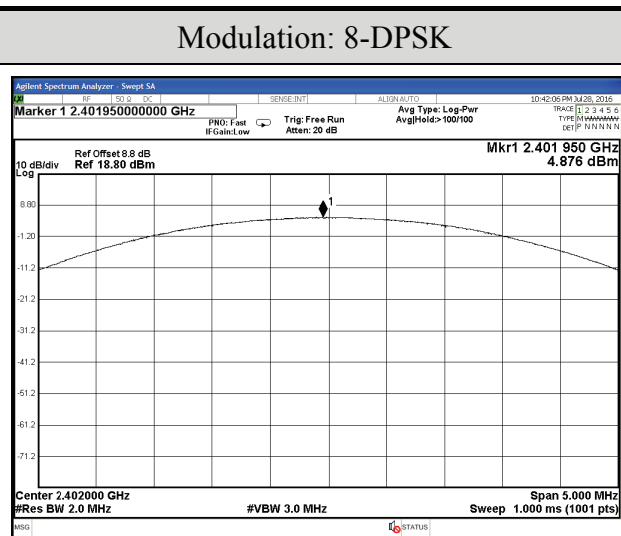
Modulation	Centre Frequency (MHz)	Peak Output Power		Limit
		dBm	W	
8-DPSK	2402	4.876	0.003073	21dBm (0.125W)
	2441	6.967	0.004974	
	2480	7.515	0.005643	

A.5.2 Measurement Plots

Modulation: GFSK



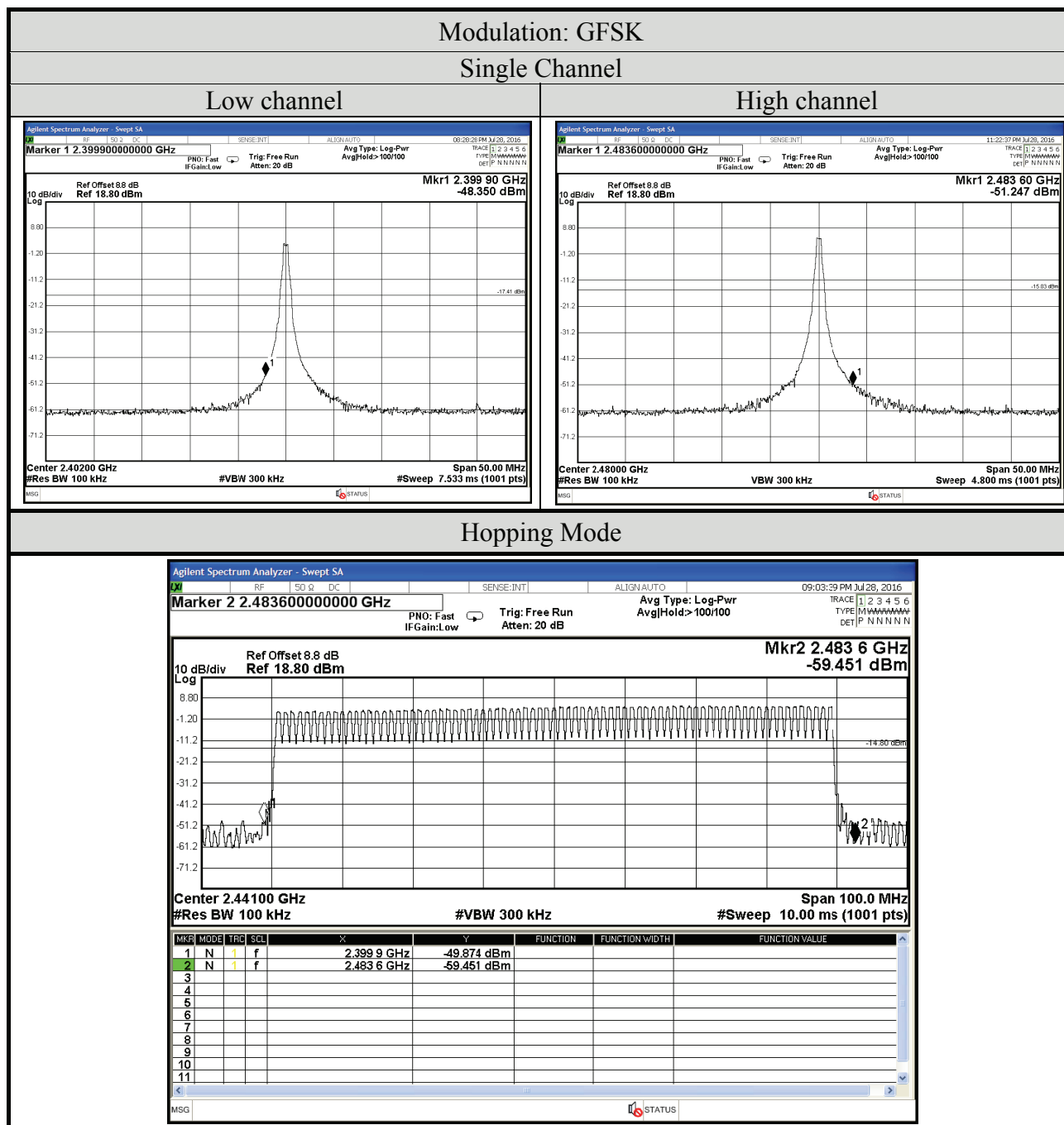
Modulation: 8-DPSK



A.6 EMISSION LIMITATIONS MEASUREMENT

A.6.1 Band Edge

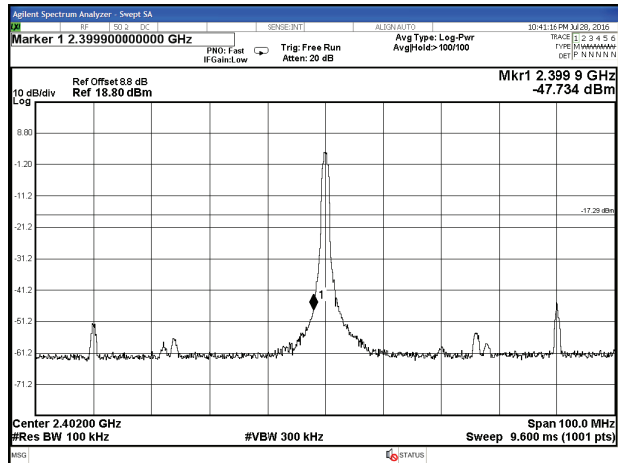
Test Date	2016/07/28	Temp./Hum.	25°C/58%
Cable Loss	8.8dB	Test Voltage	DC 3.7V



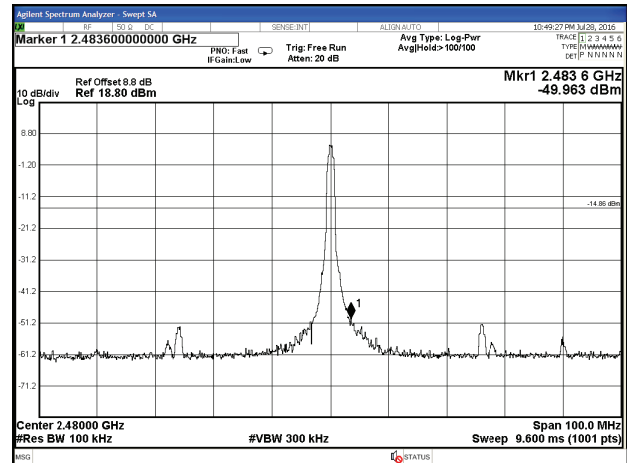
Modulation: 8-DPSK

Single Channel

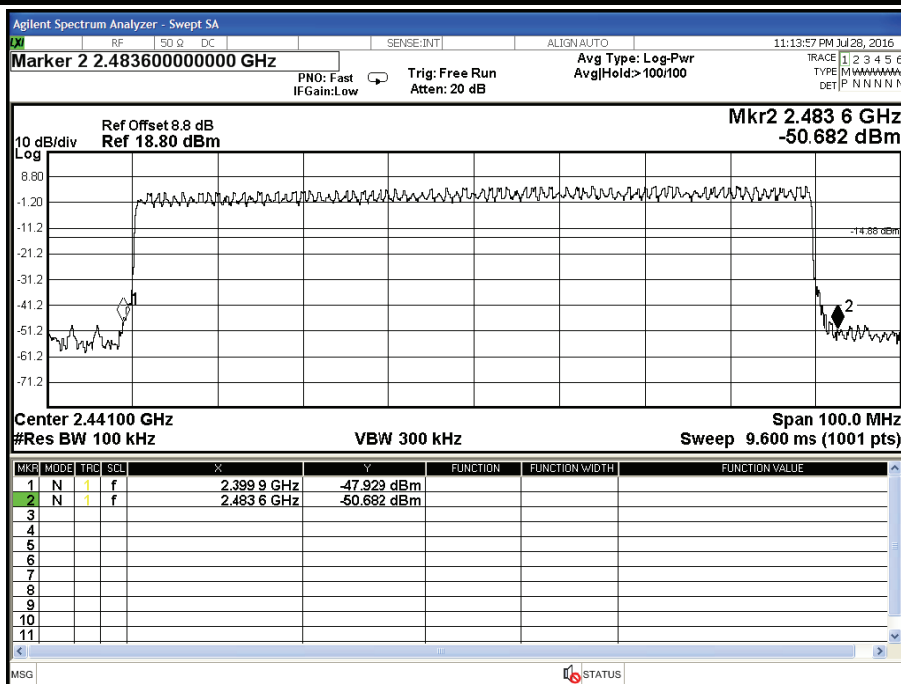
Low channel



High channel

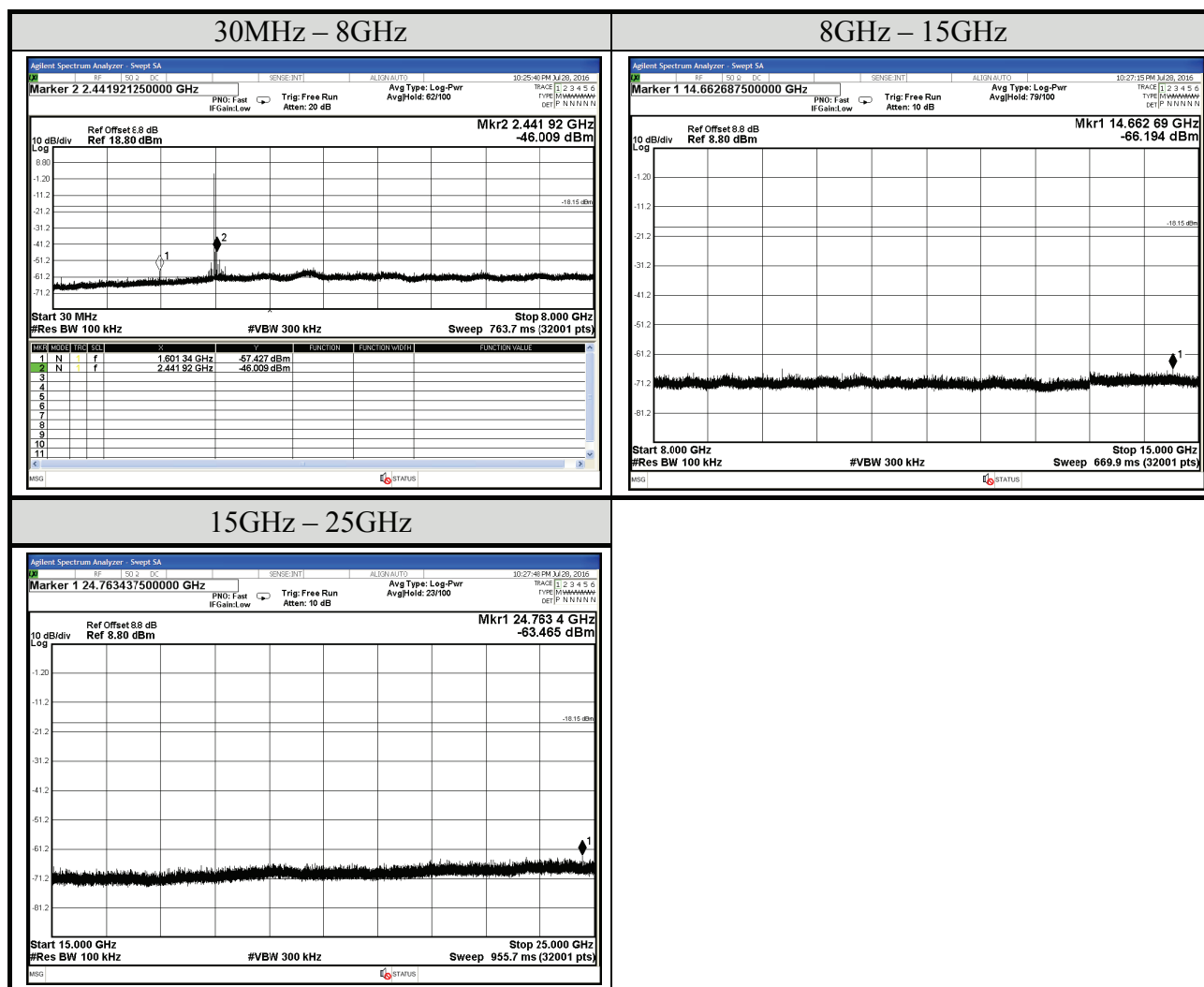


Hopping Mode



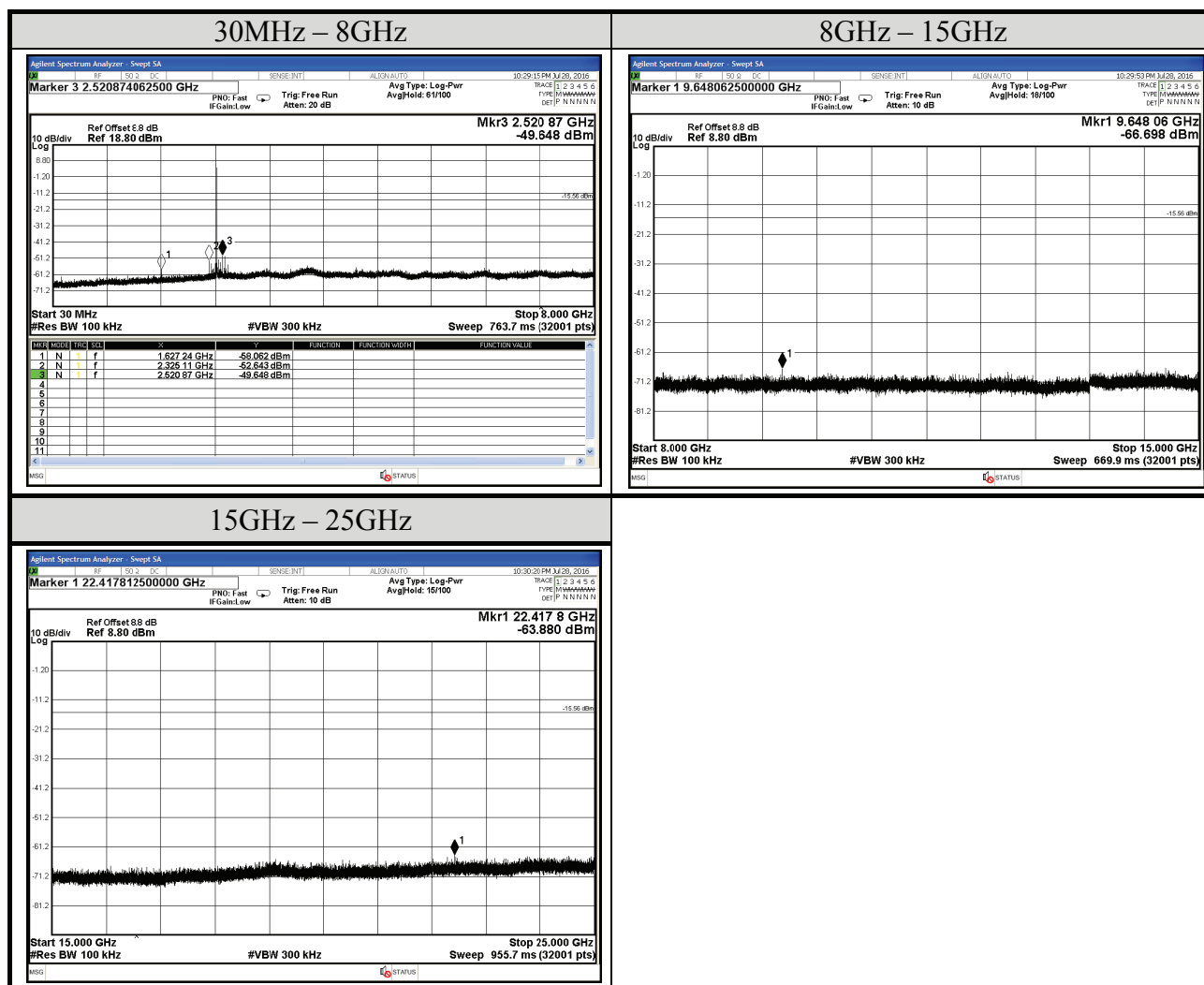
A.6.2 Spurious Emission

Test Date	2016/07/28	Temp./Hum.	25°C/58%
Modulation	GFSK	Frequency	2402MHz
Cable Loss	8.8dB	Test Voltage	DC 3.7V



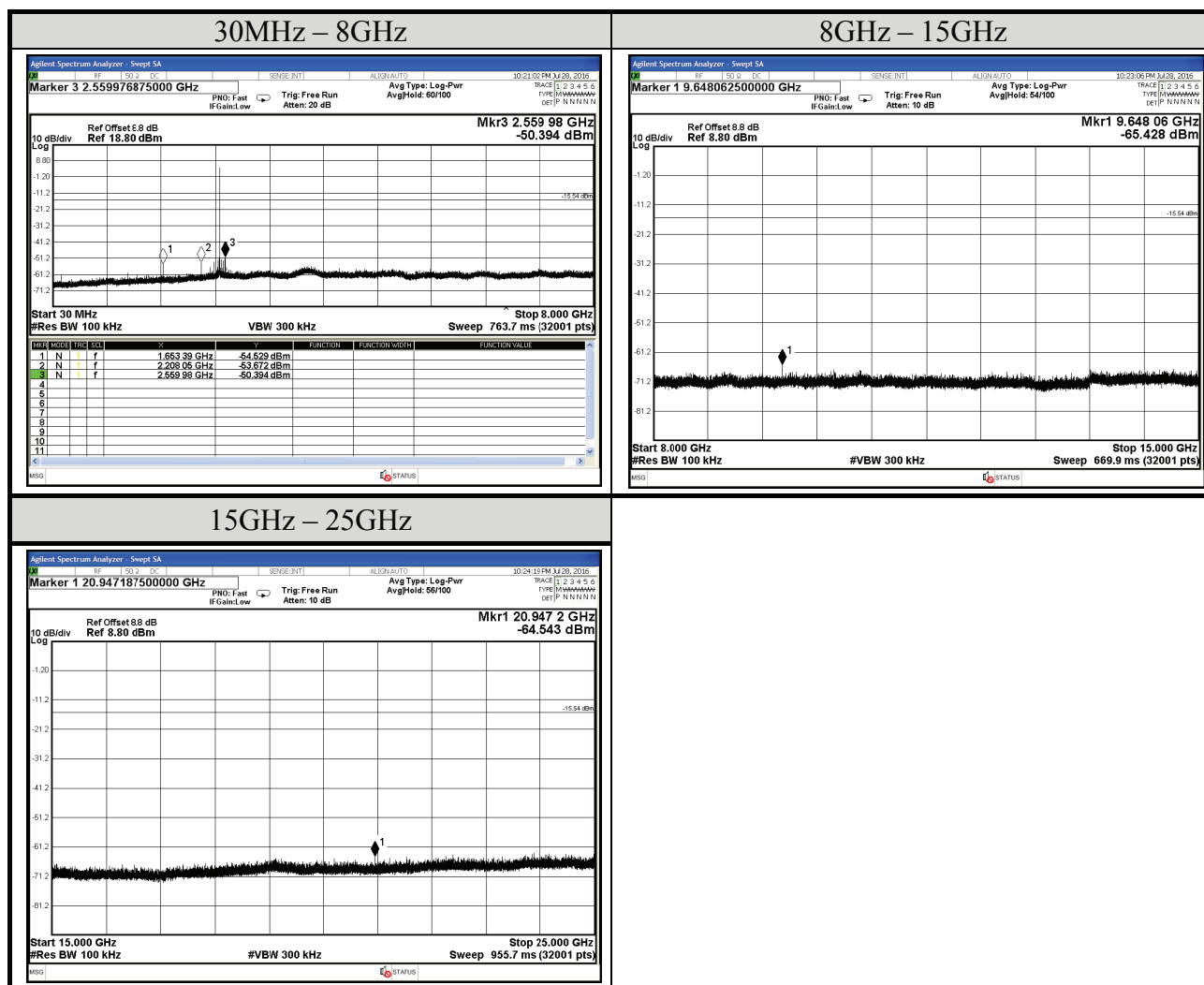
Note: All results have been included cable loss.

Test Date	2016/07/28	Temp./Hum.	25°C/58%
Modulation	GFSK	Frequency	2441MHz
Cable Loss	8.8dB	Test Voltage	DC 3.7V



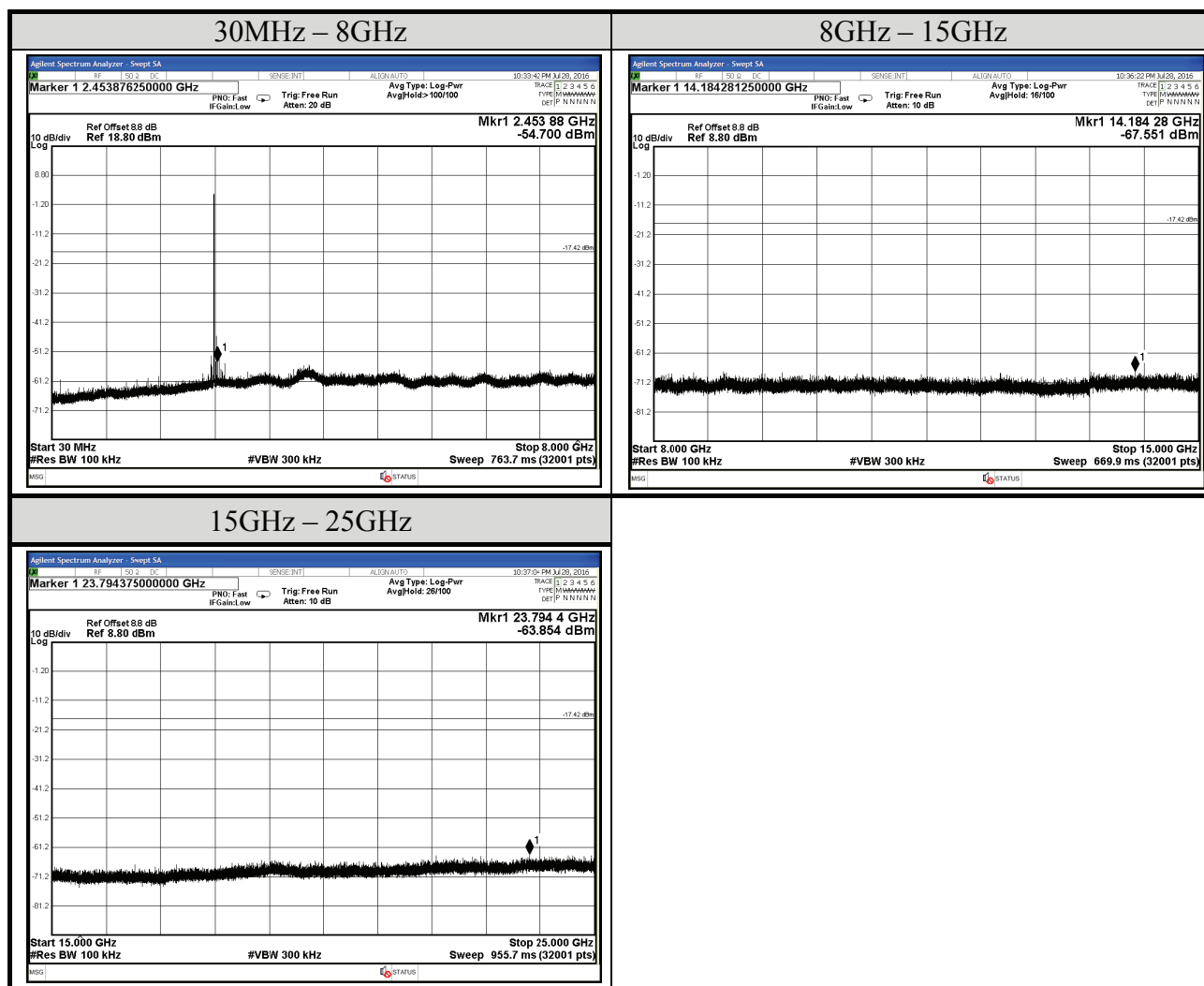
Note: All results have been included cable loss.

Test Date	2016/07/28	Temp./Hum.	25°C/58%
Modulation	GFSK	Frequency	2480MHz
Cable Loss	8.8dB	Test Voltage	DC 3.7V



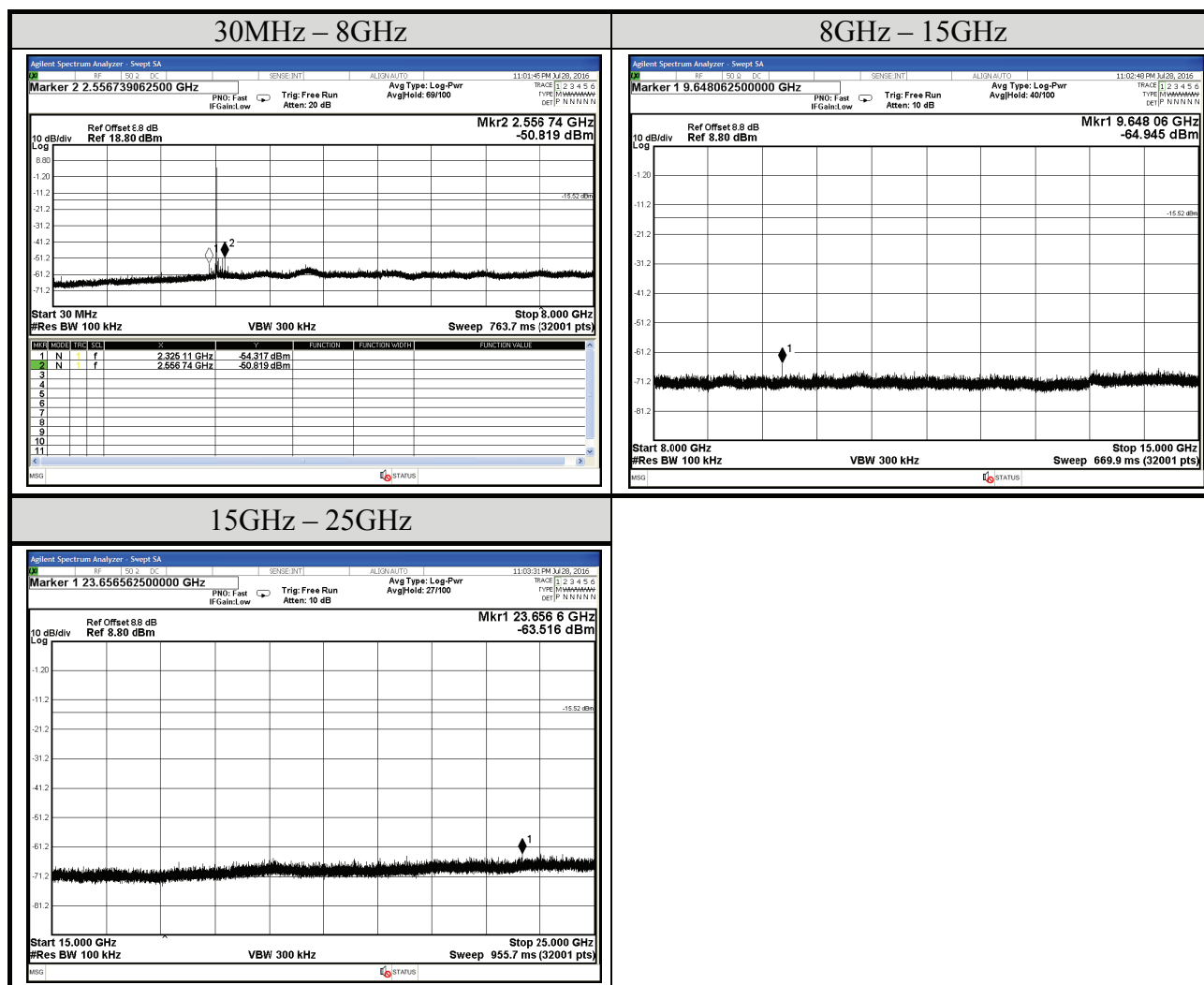
Note: All results have been included cable loss.

Test Date	2016/07/28	Temp./Hum.	25°C/58%
Modulation	8-DPSK	Frequency	2402MHz
Cable Loss	8.8dB	Test Voltage	DC 3.7V



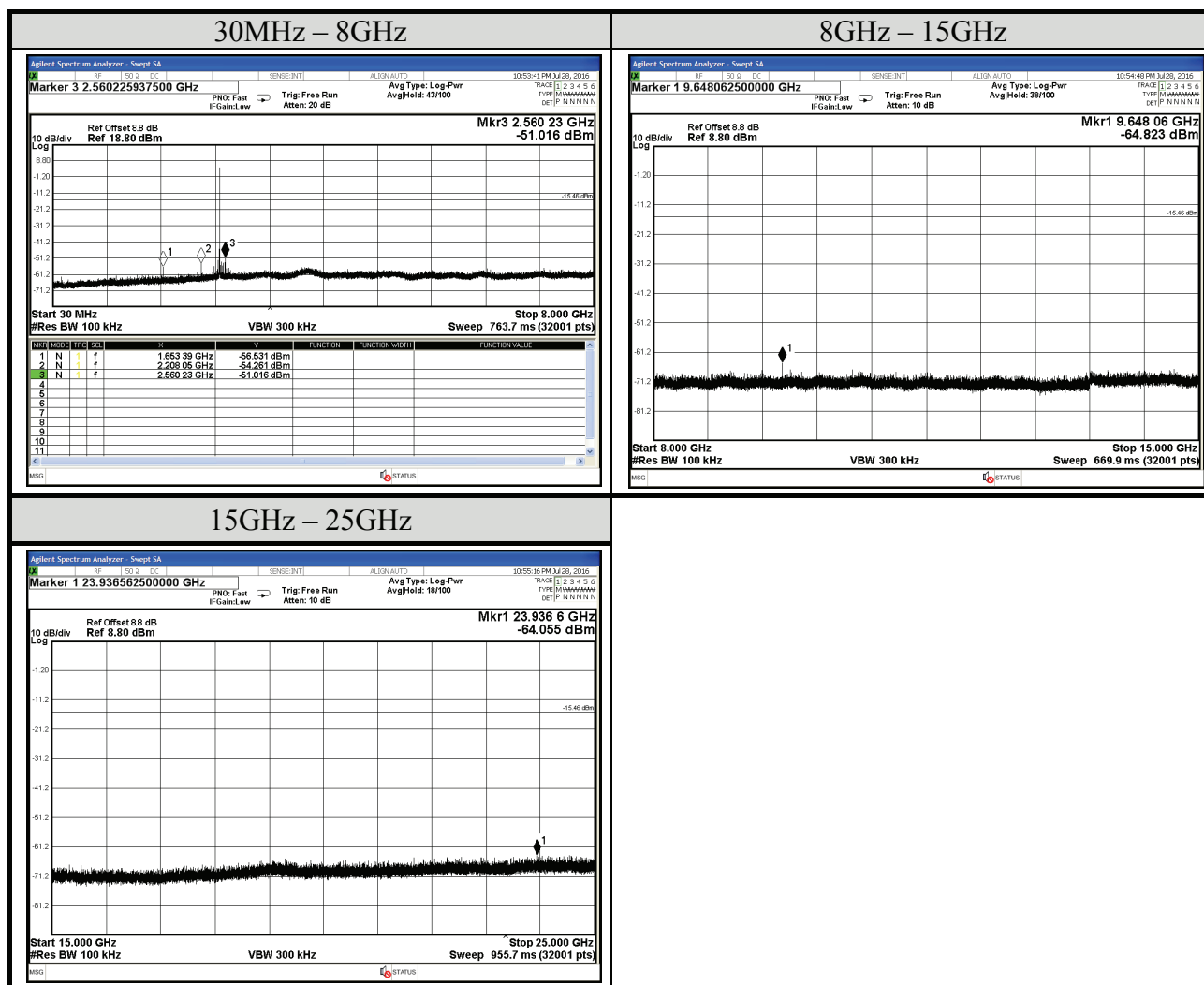
Note: All results have been included cable loss.

Test Date	2016/07/28	Temp./Hum.	25°C/58%
Modulation	8-DPSK	Frequency	2441MHz
Cable Loss	8.8dB	Test Voltage	DC 3.7V



Note: All results have been included cable loss.

Test Date	2016/07/28	Temp./Hum.	25°C/58%
Modulation	8-DPSK	Frequency	2480MHz
Cable Loss	8.8dB	Test Voltage	DC 3.7V



Note: All results have been included cable loss.