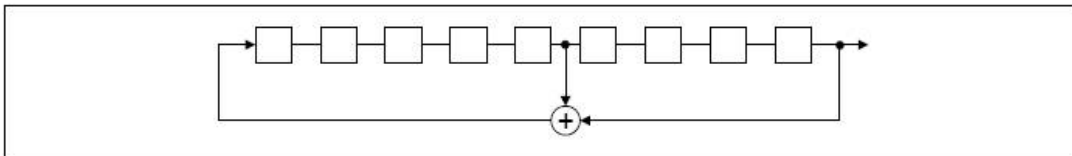


12. Pseudorandom Frequency Hopping Sequence

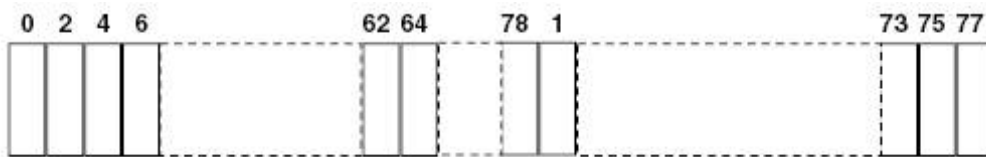
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONES; i.e. the shift register is initialized with nine ones.

- Number of shift register stages: 9
- Length of pseudo-random sequence: $2^9 - 1 = 511$ bits
- Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:



Each frequency used equally on the average by each transmitter.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

13. Maximum Peak Output Power

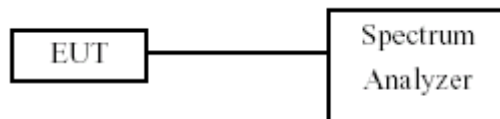
13.1 Test Limit

The Maximum Peak Output Power Measurement is 30dBm.

13.2 Test Procedures

- a. The transmitter output was connected to spectrum analyzer.
- b. Set RBW of spectrum analyzer to 3 MHz and VBW to 3 MHz.
- c. The peak output power was measured and recorded.

13.3 Test Setup Layout





13.4 Test Result and Data

Test Date: Sep. 07, 2015

Temperature: 25 °C

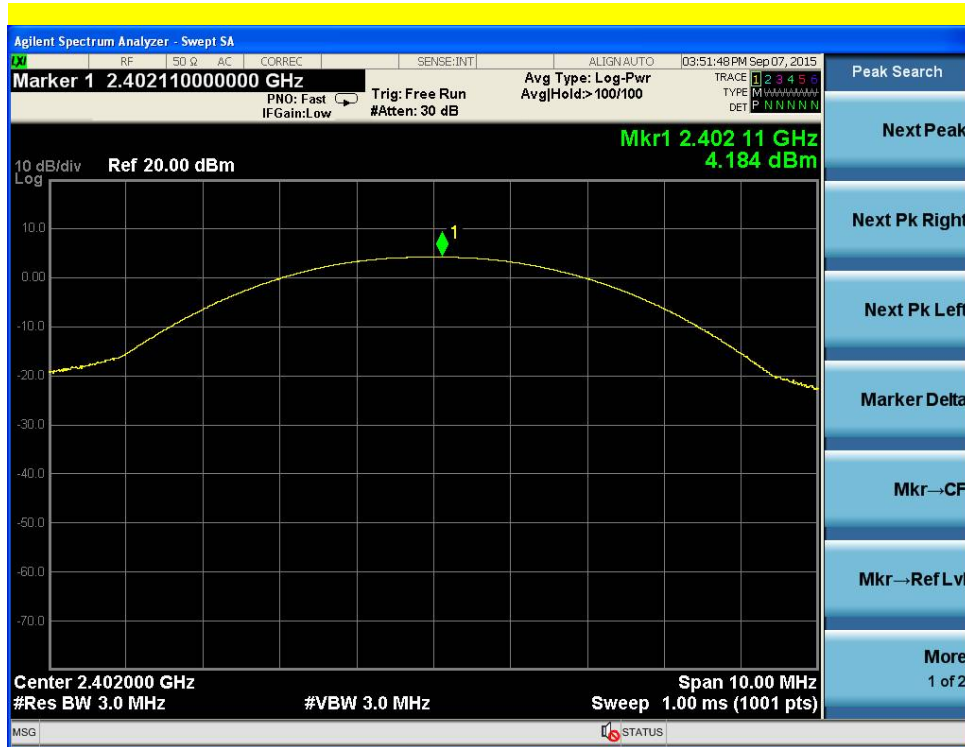
Atmospheric pressure: 1010 hPa

Humidity: 50 %

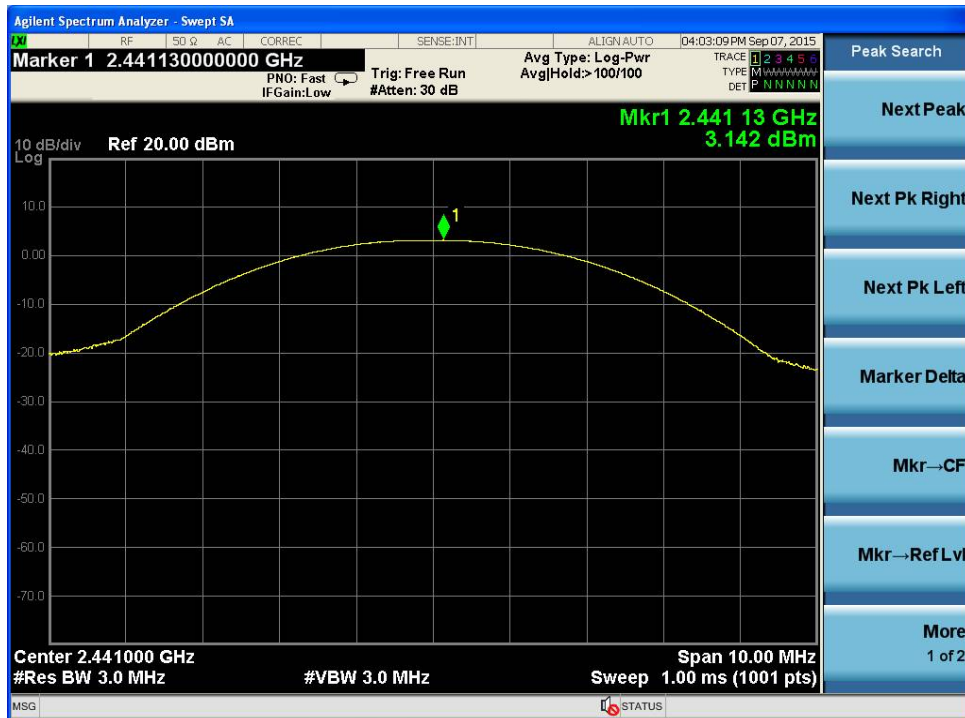
Modulation Type	Channel	Frequency (MHz)	Output Power (dBm)	Output Power (mW)
GFSK (1Mbps)	00	2402	4.184	2.62
	39	2441	3.142	2.06
	78	2480	3.012	2.00
$\pi/4$ -DQPSK (2Mbps)	00	2402	4.093	2.57
	39	2441	2.719	1.87
	78	2480	2.294	1.70
8DPSK (3Mbps)	00	2402	4.484	2.81
	39	2441	3.164	2.07
	78	2480	2.738	1.88



Modulation Standard: GFSK (1Mbps)
Channel: 00



Modulation Standard: GFSK (1Mbps)
Channel: 39





Modulation Standard: GFSK (1Mbps)
Channel: 78



Modulation Standard: $\pi/4$ -DQPSK (2Mbps)
Channel: 00

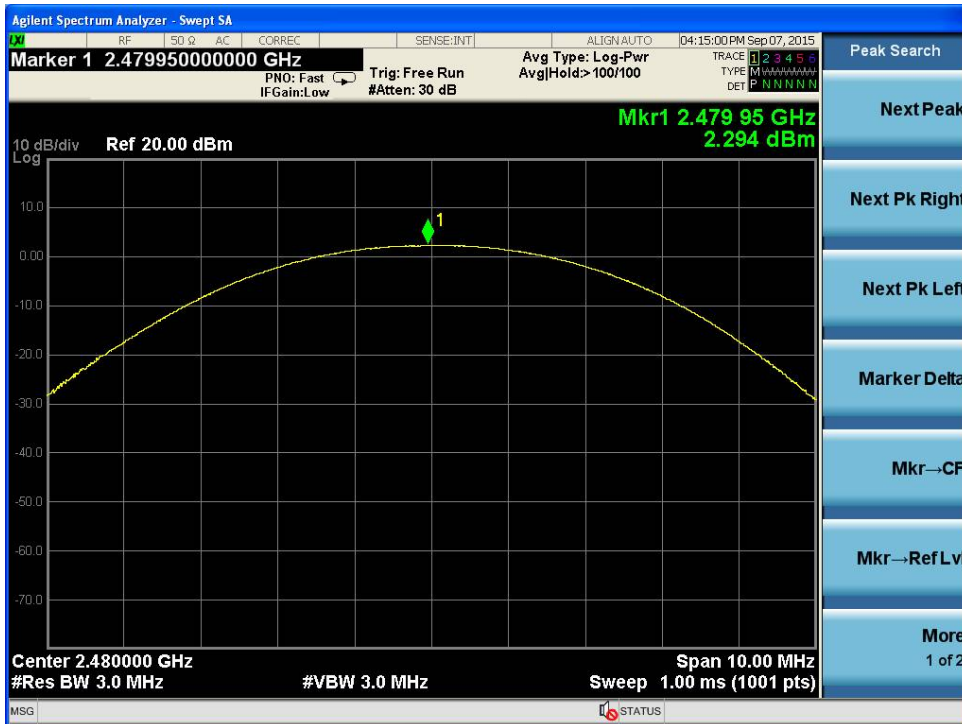




Modulation Standard: $\pi/4$ -DQPSK (2Mbps)
Channel: 39



Modulation Standard: $\pi/4$ -DQPSK (2Mbps)
Channel: 78

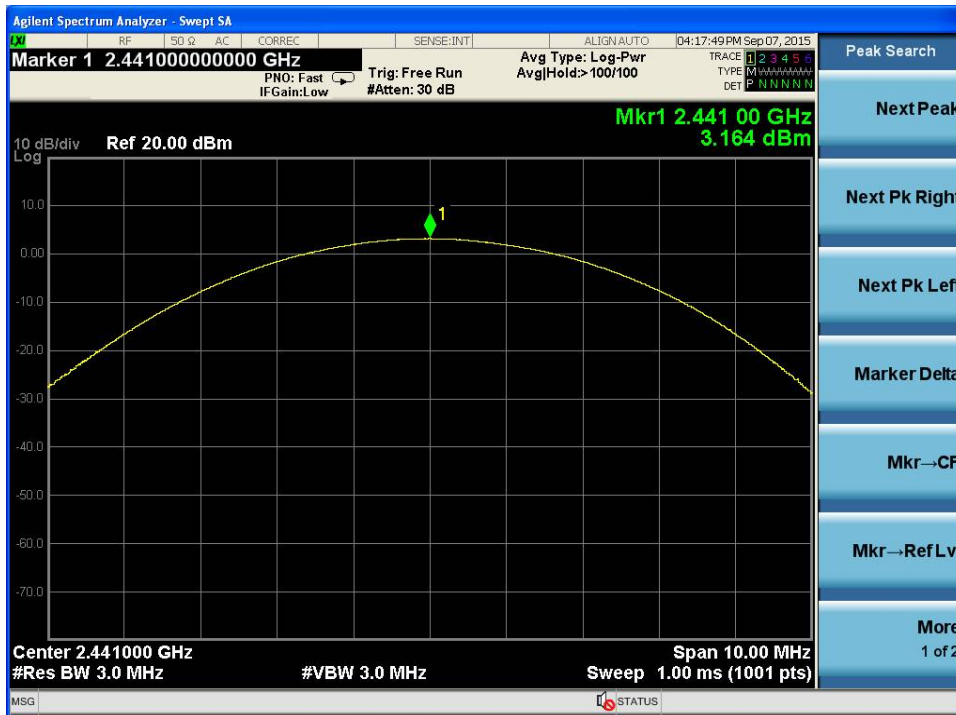




Modulation Standard: 8DPSK (3Mbps)
Channel: 00



Modulation Standard: 8DPSK (3Mbps)
Channel: 39





Modulation Standard: 8DPSK (3Mbps)
Channel: 78



14. Band Edges Measurement

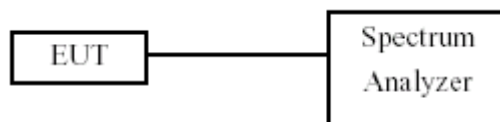
14.1 Test Limit

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

14.2 Test Procedure

- a. The transmitter output was connected to the spectrum analyzer via a low lose cable.
- b. Set both RBW and VBW of spectrum analyzer to 100 KHz with convenient frequency span including 100 KHz bandwidth from band edge.
- c. The band edges was measured and recorded.

14.3 Test Setup Layout



14.4 Test Result and Data

Test Date: Sep. 08, 2015

Temperature: 25 °C

Atmospheric pressure: 1010 hPa

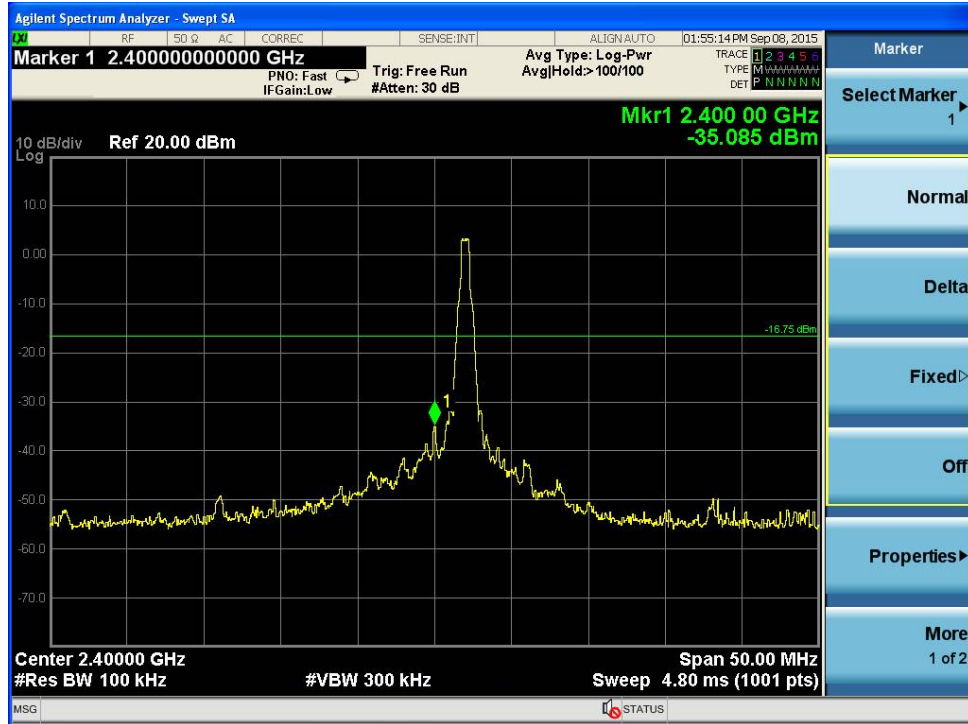
Humidity: 50 %

Modulation Type	Channel	Frequency	Max. Value in frequency(MHz)	Max. Value (dBm)
GFSK (1Mbps)	00	2402	2400.00	-35.08
	78	2480	2483.85	-44.10
$\pi/4$ -DQPSK (2Mbps)	00	2402	2399.65	-35.44
	78	2480	24808.00	-49.20
8DPSK (3Mbps)	00	2402	2399.65	-34.56
	78	2480	24744.00	-48.58

Remark: Hopping on and Hopping off mode all have been tested, only worse case (hopping off mode) is reported.

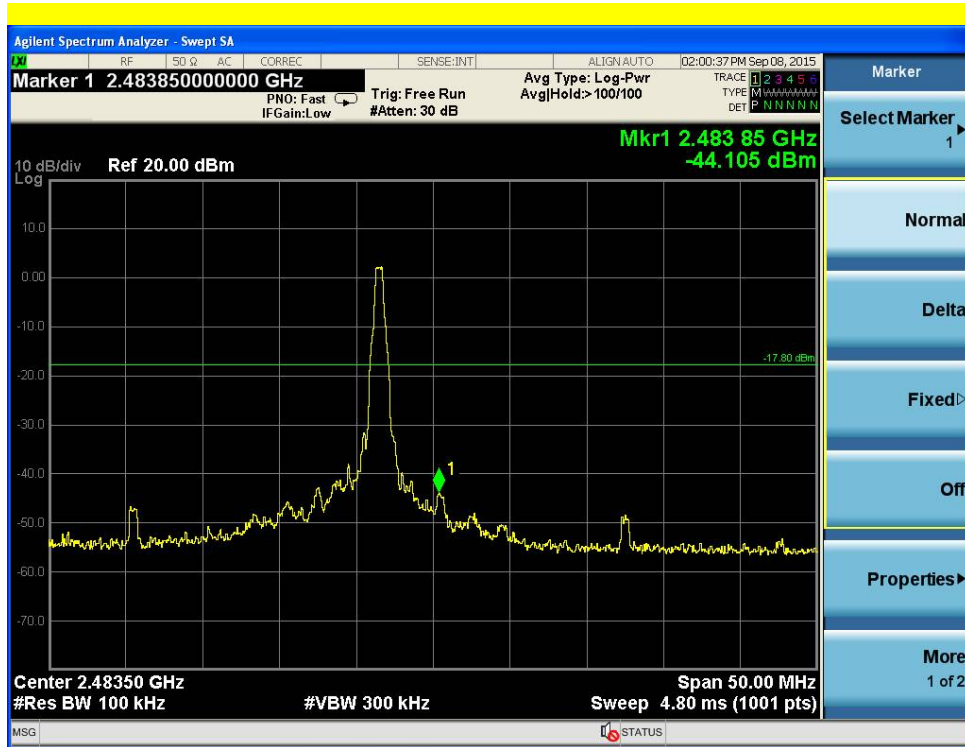


Modulation Standard: GFSK (1Mbps)
Channel: 00



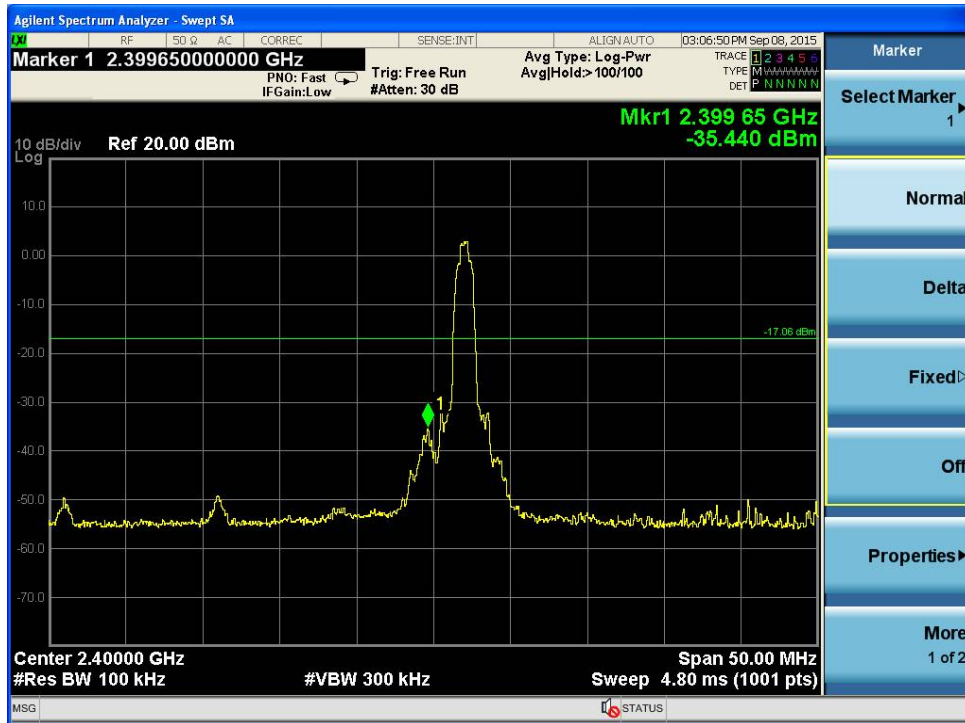


Modulation Standard: GFSK (1Mbps)
Channel: 78



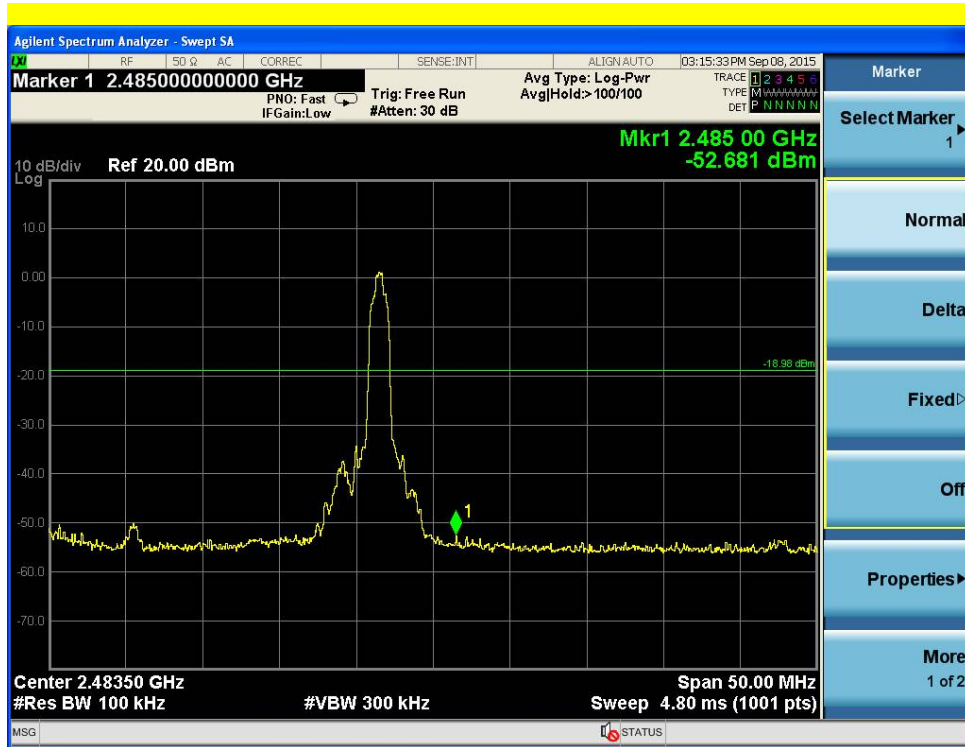


Modulation Standard: $\pi/4$ -DQPSK (2Mbps)
Channel: 00



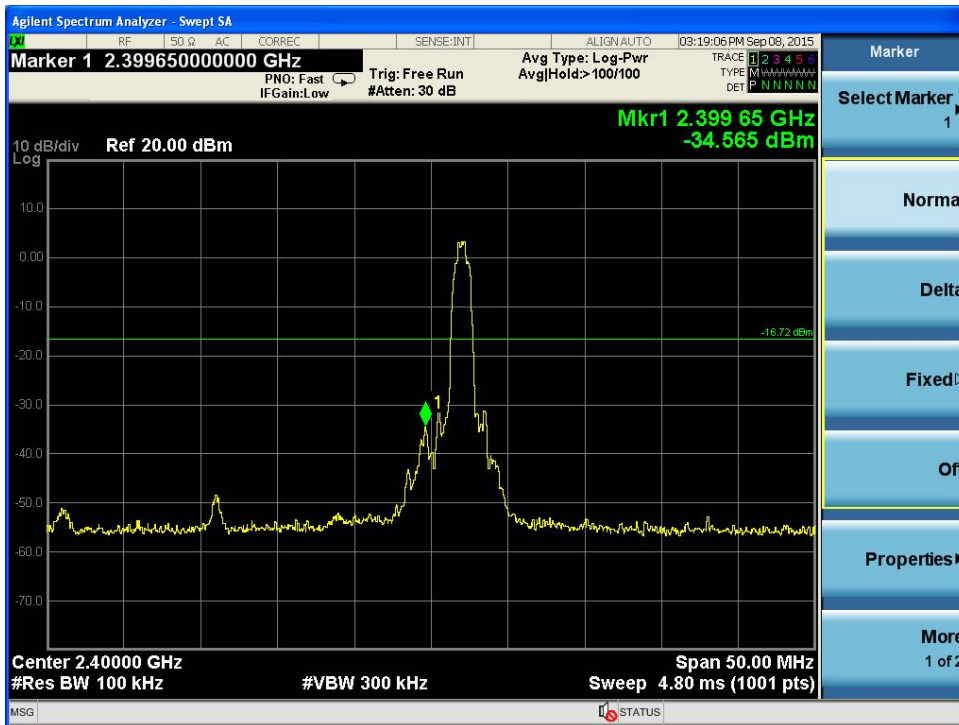


Modulation Standard: $\pi/4$ -DQPSK (2Mbps)
Channel: 78



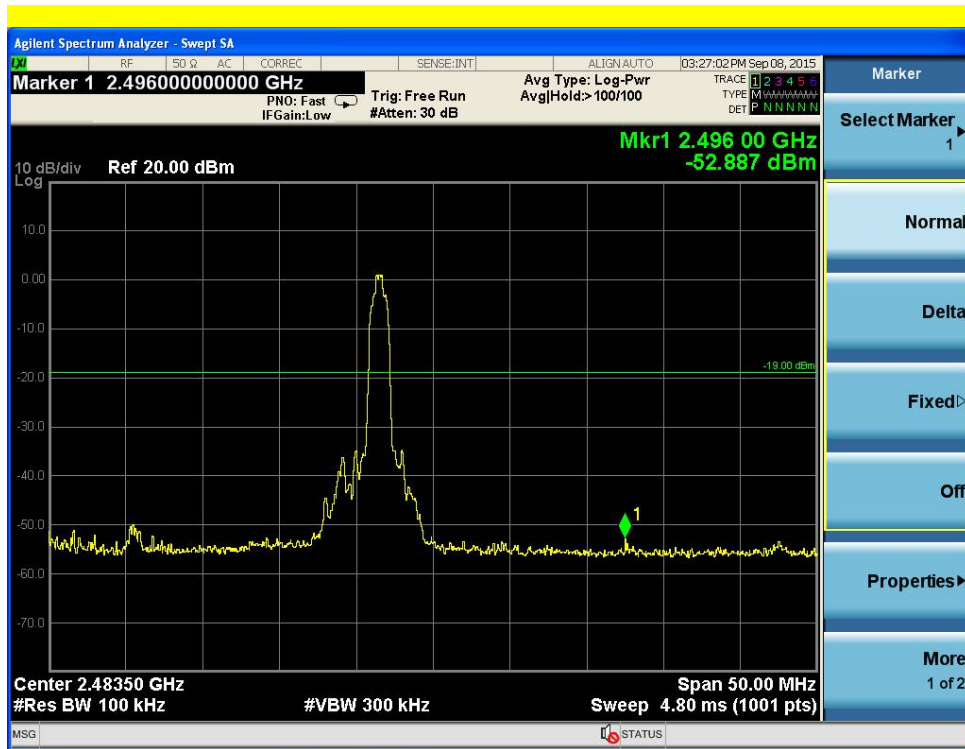


Modulation Standard: 8DPSK (3Mbps)
Channel: 00





Modulation Standard: 8DPSK (3Mbps)
Channel: 78





14.5 Restrict Band Emission Measurement Data

Test Date: Sep. 10, 2015

Temperature: 30 °C

Atmospheric pressure: 1010 hPa

Humidity: 68 %

Modulation Standard: GFSK (1Mbps)

Memo: Z axis

Channel 0						Fundamental Frequency: 2402 MHz				
Frequency (MHz)	Ant-Pol H/V	Meter Reading (dBuV/m)	Corrected Factor (dB)	Result (dBuV/m)	Remark	Limit@3m (dBuV/m)		Margin (dB)	Table (Deg.)	Ant High (m)
						Peak	Ave.			
2315.49	H	60.75	-16.08	44.67	Peak	74	54	-29.33	155	1.50
---	H	---	---	---	Ave	74	54	---	---	---
2376.68	V	65.33	-15.87	49.46	Peak	74	54	-24.54	180	1.50
---	V	---	---	---	Ave	74	54	---	---	---
Channel 78						Fundamental Frequency: 2480 MHz				
2483.52	H	72.33	-15.46	56.87	Peak	74	54	-17.13	160	1.50
2483.98	H	53.38	-15.46	37.92	Ave	74	54	-16.08	160	1.50
2483.54	V	72.59	-15.46	57.13	Peak	74	54	-16.87	177	1.50
2483.77	V	54.16	-15.46	38.70	Ave	74	54	-15.30	177	1.50

Notes:

1. Result = Meter Reading + Factor
2. Factor = Antenna Factor + Cable Loss – Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3 MHz for Peak detection at frequency above 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz Peak detector for Average Value at frequency above 1GHz
5. All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
6. Where limits are specified for both average and peak detector functions, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.



Test Date: Sep. 10, 2015

Temperature: 30 °C

Atmospheric pressure: 1010 hPa

Humidity: 68 %

Modulation Standard: $\pi/4$ -DQPSK (2Mbps)

Channel 0						Fundamental Frequency: 2402 MHz				
Frequency (MHz)	Ant-Pol H/V	Meter Reading (dBuV/m)	Corrected Factor (dB)	Result (dBuV/m)	Remark	Limit@3m (dBuV/m)		Margin (dB)	Table (Deg.)	Ant High (m)
						Peak	Ave.			
2381.05	H	60.35	-15.84	44.51	Peak	74	54	-29.49	157	1.50
---	H	---	---	---	Ave	74	54	---	---	---
2389.52	V	61.39	-15.81	45.58	Peak	74	54	-28.42	175	1.50
---	V	---	---	---	Ave	74	54	---	---	---
Channel 78						Fundamental Frequency: 2480 MHz				
2495.38	H	62.94	-15.40	47.54	Peak	74	54	-26.46	161	1.50
---	H	---	---	---	Ave	74	54	---	---	---
2484.06	V	67.00	-15.45	51.55	Peak	74	54	-22.45	180	1.50
---	V	---	---	---	Ave	74	54	---	---	---

Notes:

1. Result = Meter Reading + Factor
2. Factor = Antenna Factor + Cable Loss – Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3 MHz for Peak detection at frequency above 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz Peak detector for Average Value at frequency above 1GHz
5. All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
6. Where limits are specified for both average and peak detector functions, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.



Test Date: Sep. 10, 2015

Temperature: 30 °C

Atmospheric pressure: 1010 hPa

Humidity: 68 %

Modulation Standard: 8DPSK (3Mbps)

Channel 0						Fundamental Frequency: 2402 MHz				
Frequency (MHz)	Ant-Pol H/V	Meter Reading (dBUV/m)	Corrected Factor (dB)	Result (dBUV/m)	Remark	Limit@3m (dBUV/m)		Margin (dB)	Table (Deg.)	Ant High (m)
						Peak	Ave.			
2361.01	H	61.41	-15.91	45.50	Peak	74	54	-28.50	153	1.50
---	H	---	---	---	Ave	74	54	---	---	---
2380.12	V	60.63	-15.85	44.78	Peak	74	54	-29.22	175	1.50
---	V	---	---	---	Ave	74	54	---	---	---
Channel 78						Fundamental Frequency: 2480 MHz				
2492.59	H	63.41	-15.42	47.99	Peak	74	54	-26.01	159	1.50
---	H	---	---	---	Ave	74	54	---	---	---
2495.86	V	64.32	-15.40	48.92	Peak	74	54	-25.08	176	1.50
---	V	---	---	---	Ave	74	54	---	---	---

Notes:

1. Result = Meter Reading + Factor
2. Factor = Antenna Factor + Cable Loss – Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3 MHz for Peak detection at frequency above 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz Peak detector for Average Value at frequency above 1GHz
5. All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
6. Where limits are specified for both average and peak detector functions, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.



15. Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.150
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

15.1 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

~End of test report~