5. CONDUCTED SPURIOUS EMISSIONS

5.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Oct.31, 12	1 Year
2.	Attenuator	Agilent	8491B	MY39262165	May.08,13	1 Year
3.	RF Cable	Hubersuhner	SUCOFLEX102	28618/2	May.08,13	1Year

5.2. Limit

In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

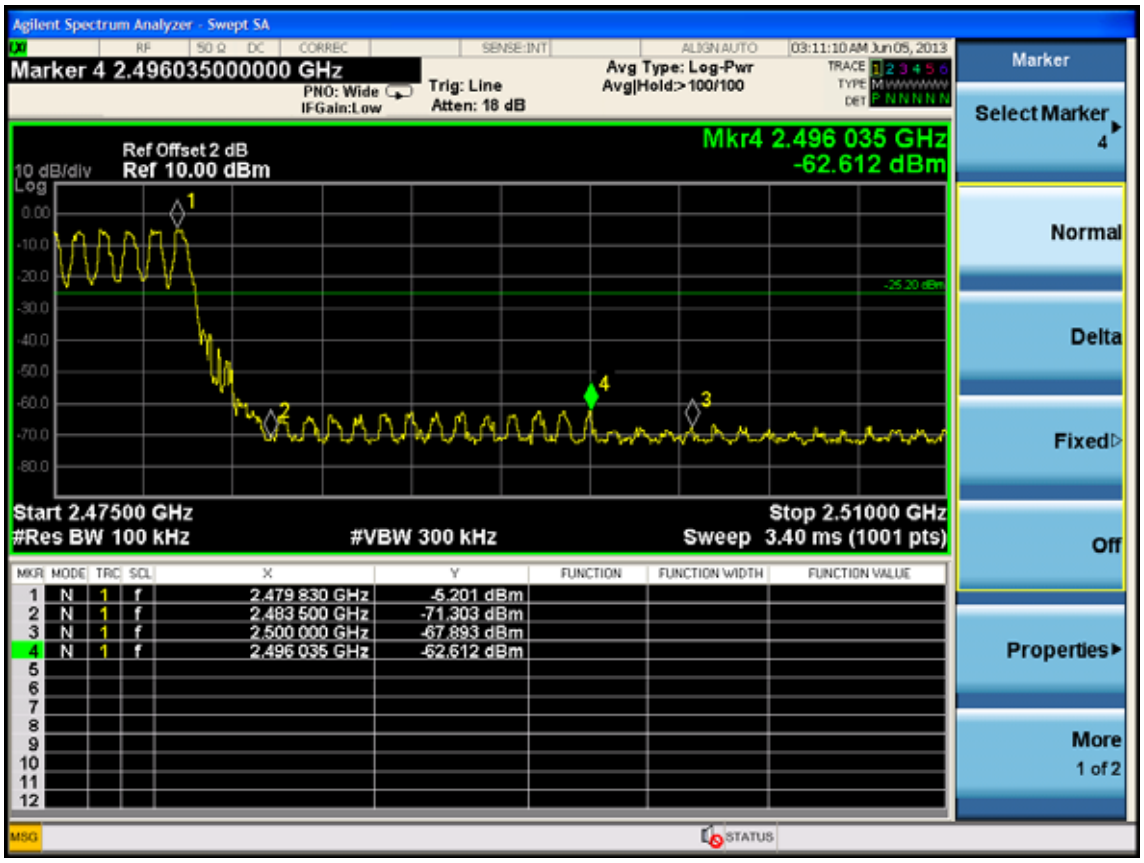
5.3. Test Procedure

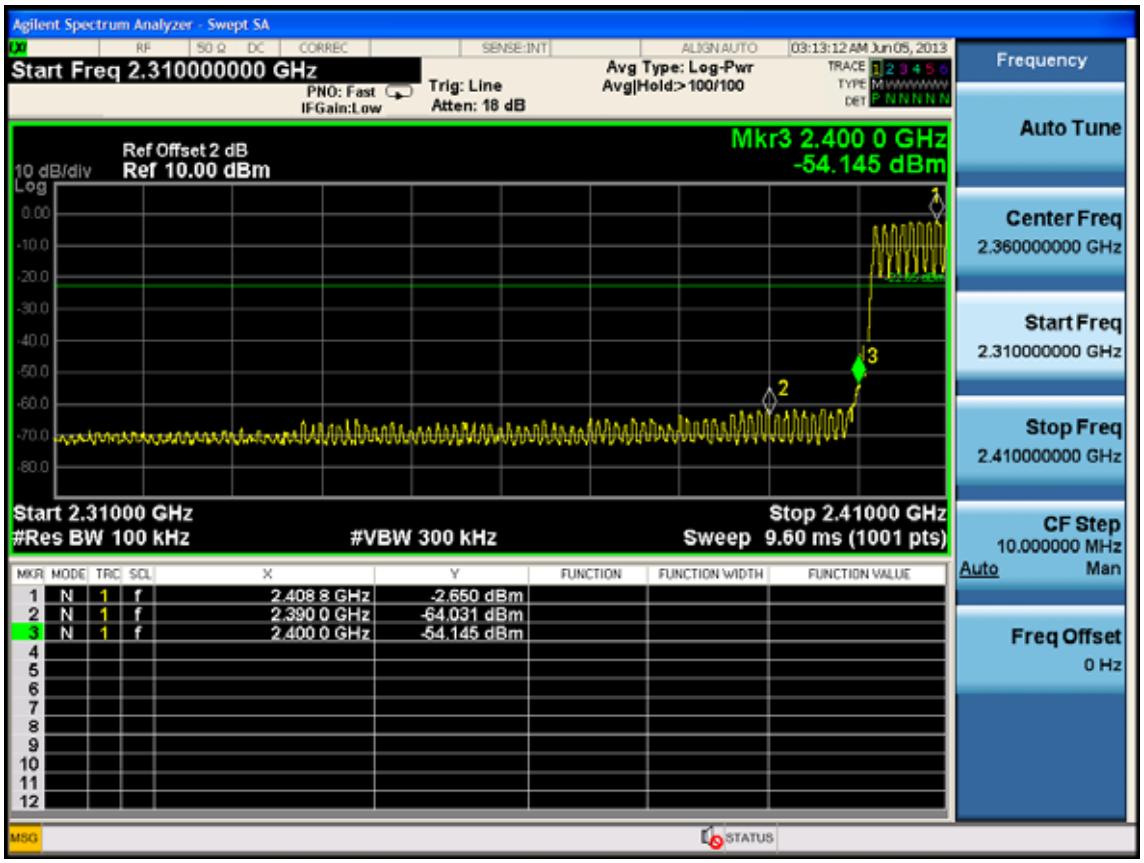
The transmitter output was connected to a spectrum analyzer, The resolution bandwidth is set to 100 kHz, The video bandwidth is set to 300 kHz and measure all the emissions detected.

5.4. Test result

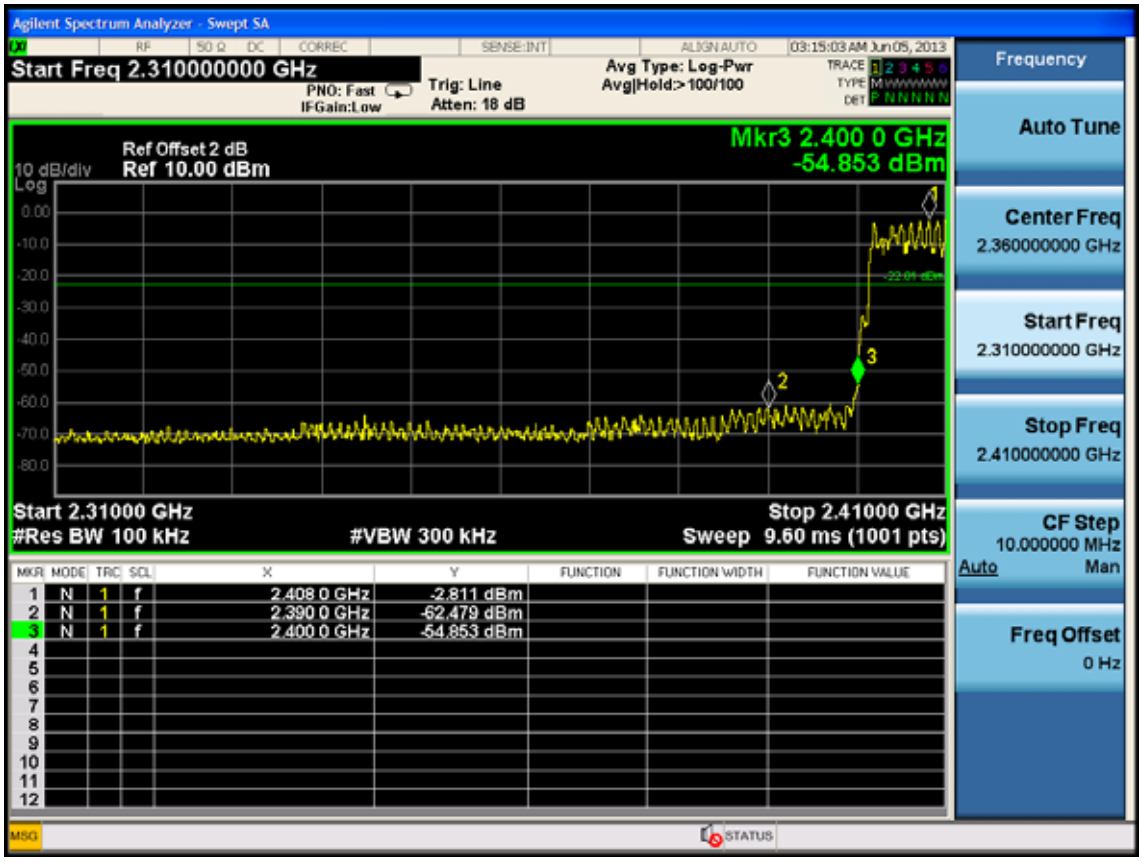
PASS (The testing data was attached in the next pages.)

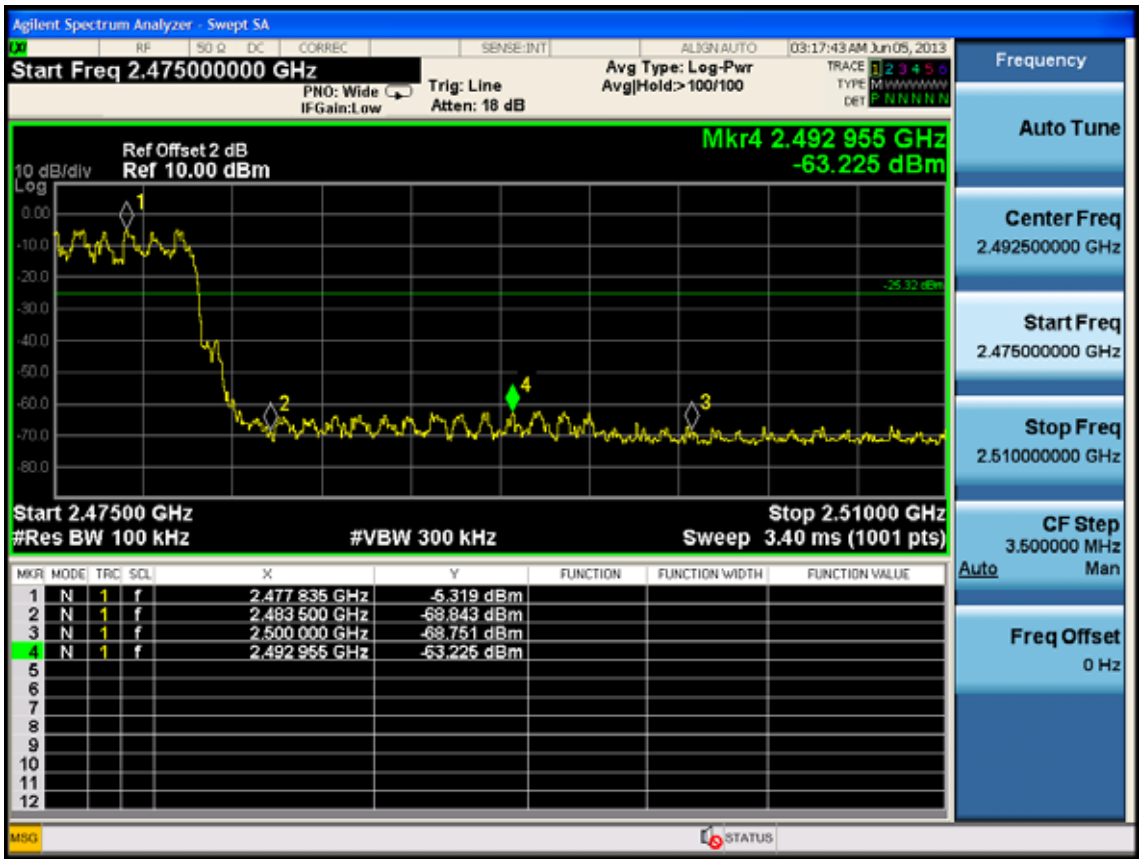
Hopping On
GFSK
2402MHz



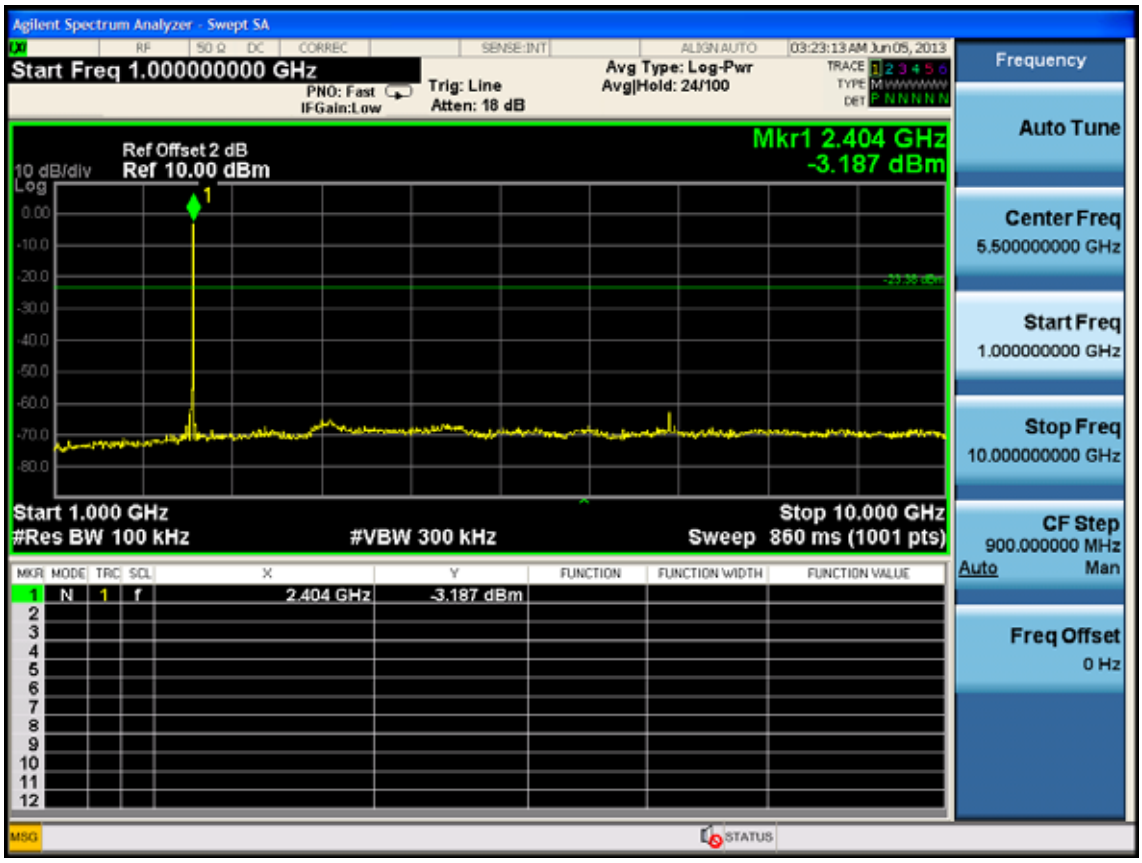


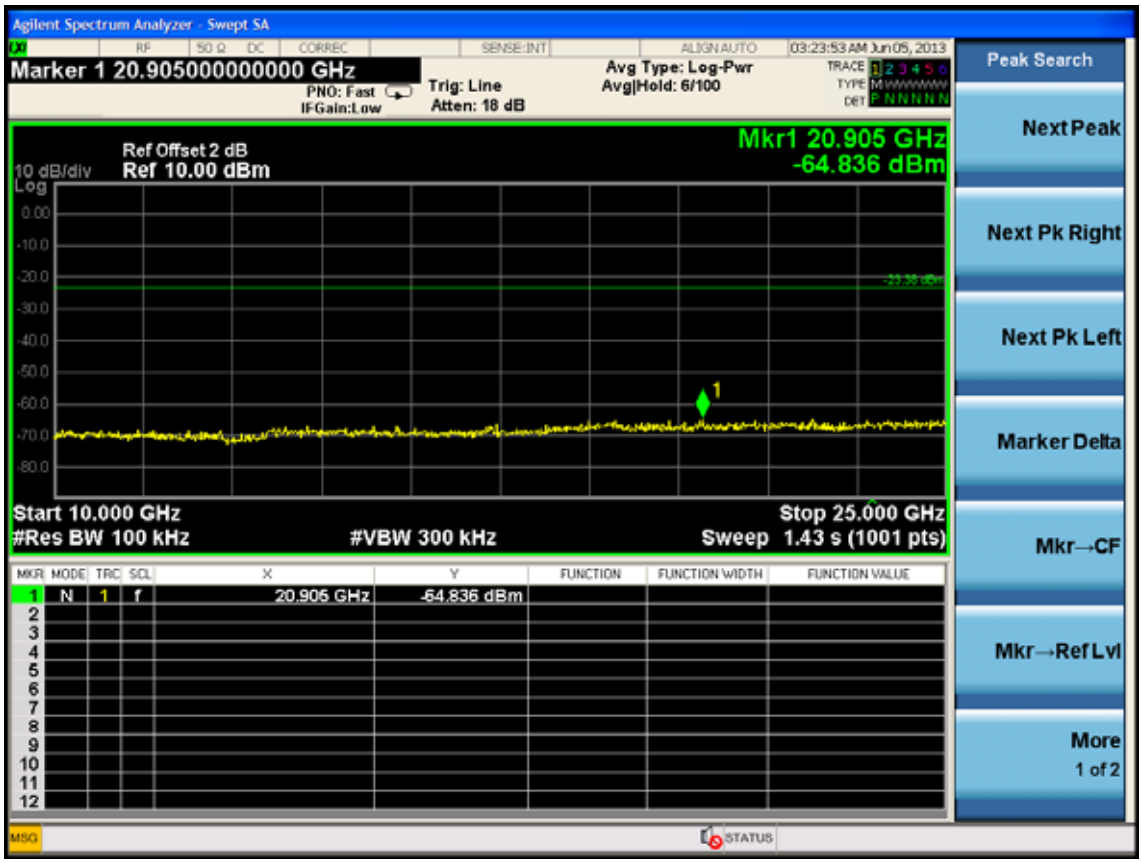
Hopping On
8-DPSK

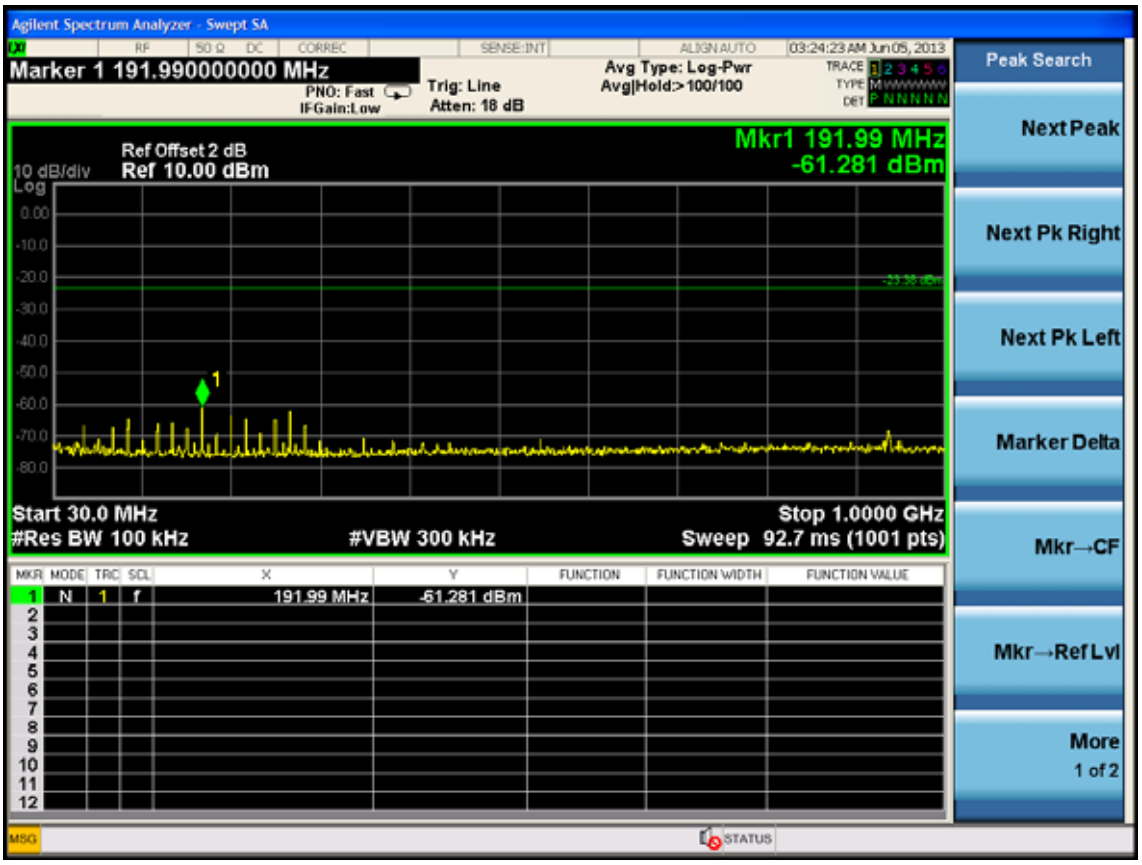


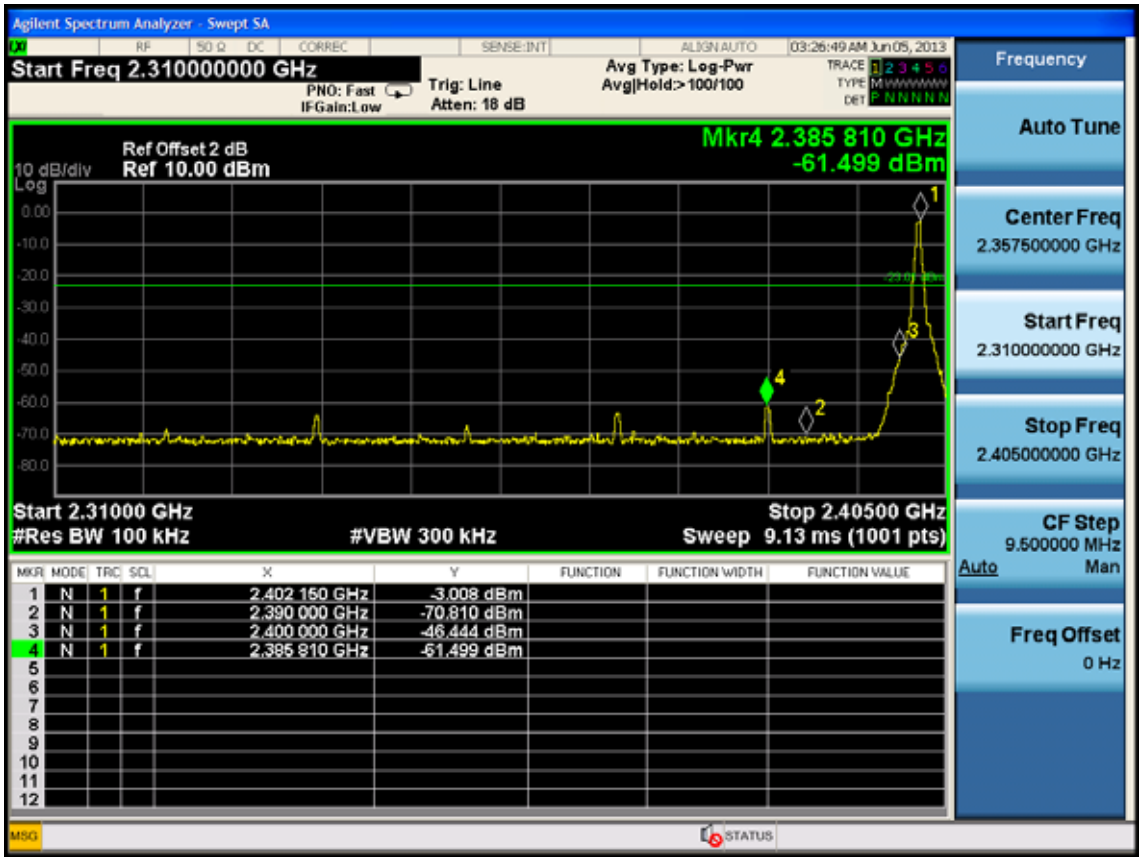


Hopping Off
GFSK
2402 MHz

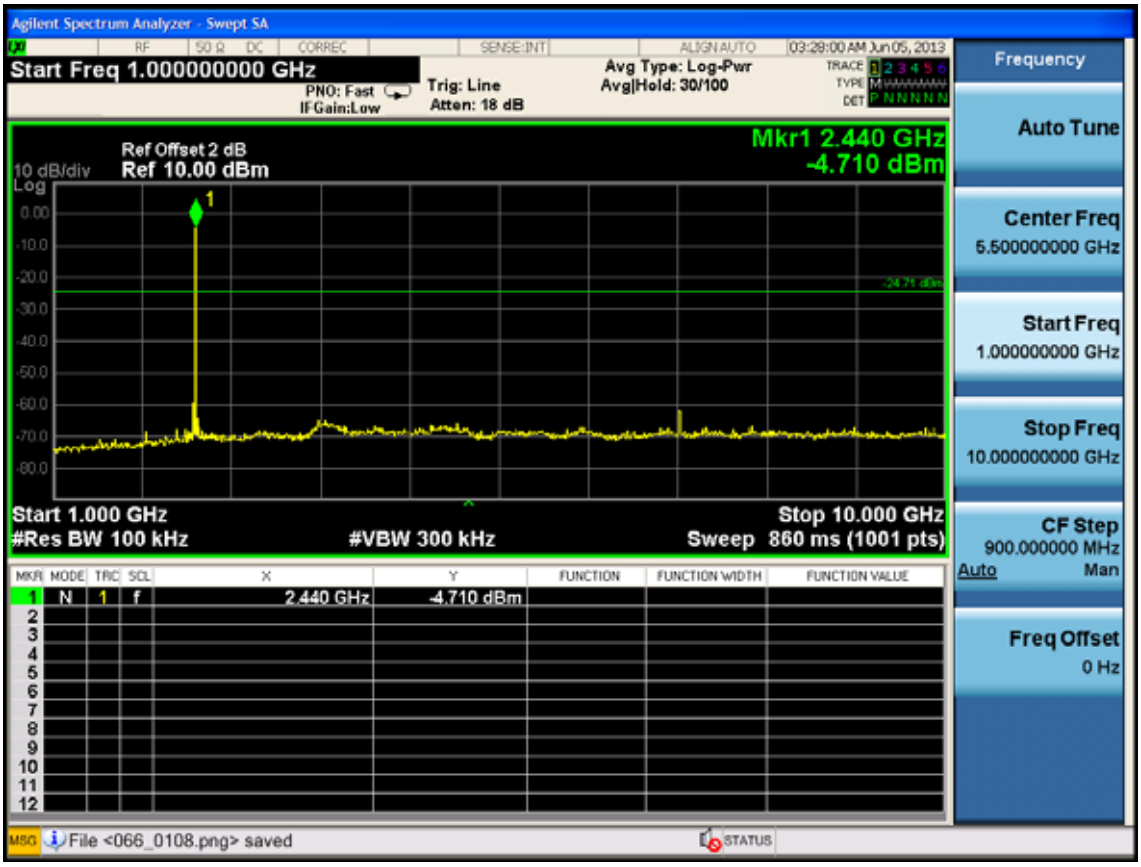


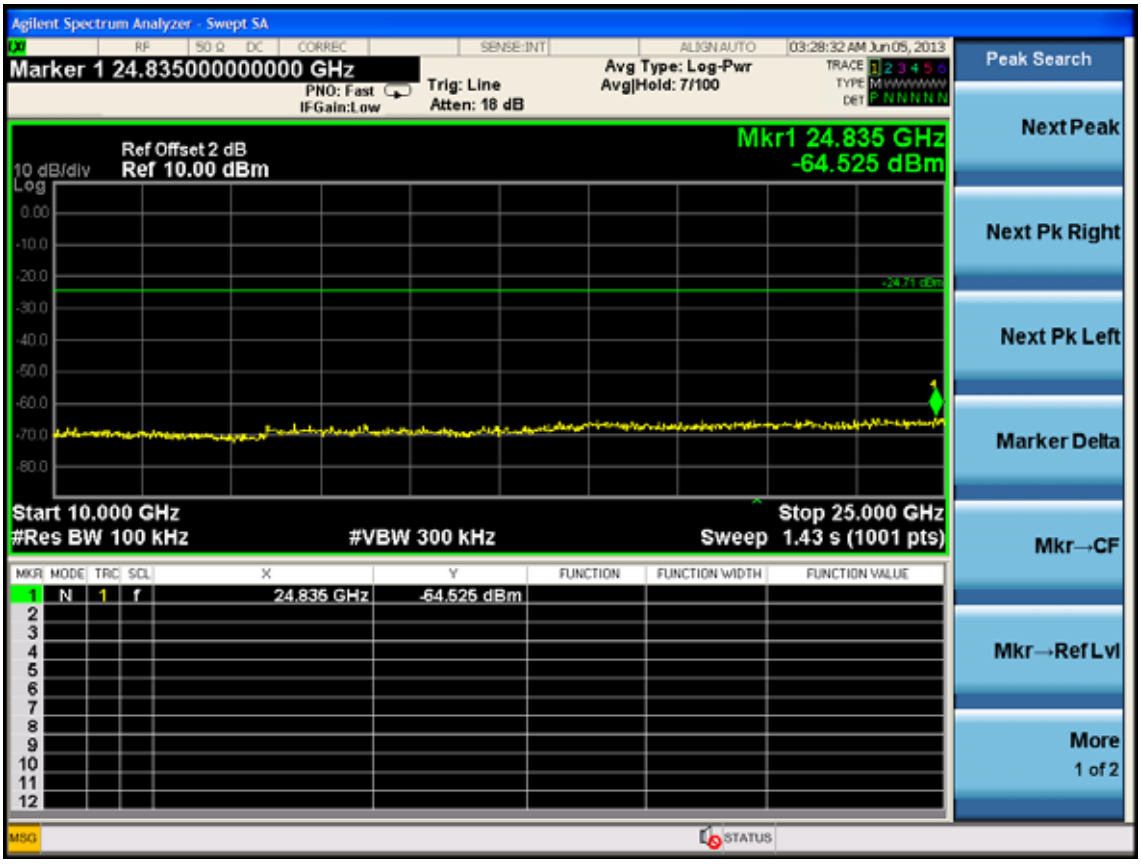


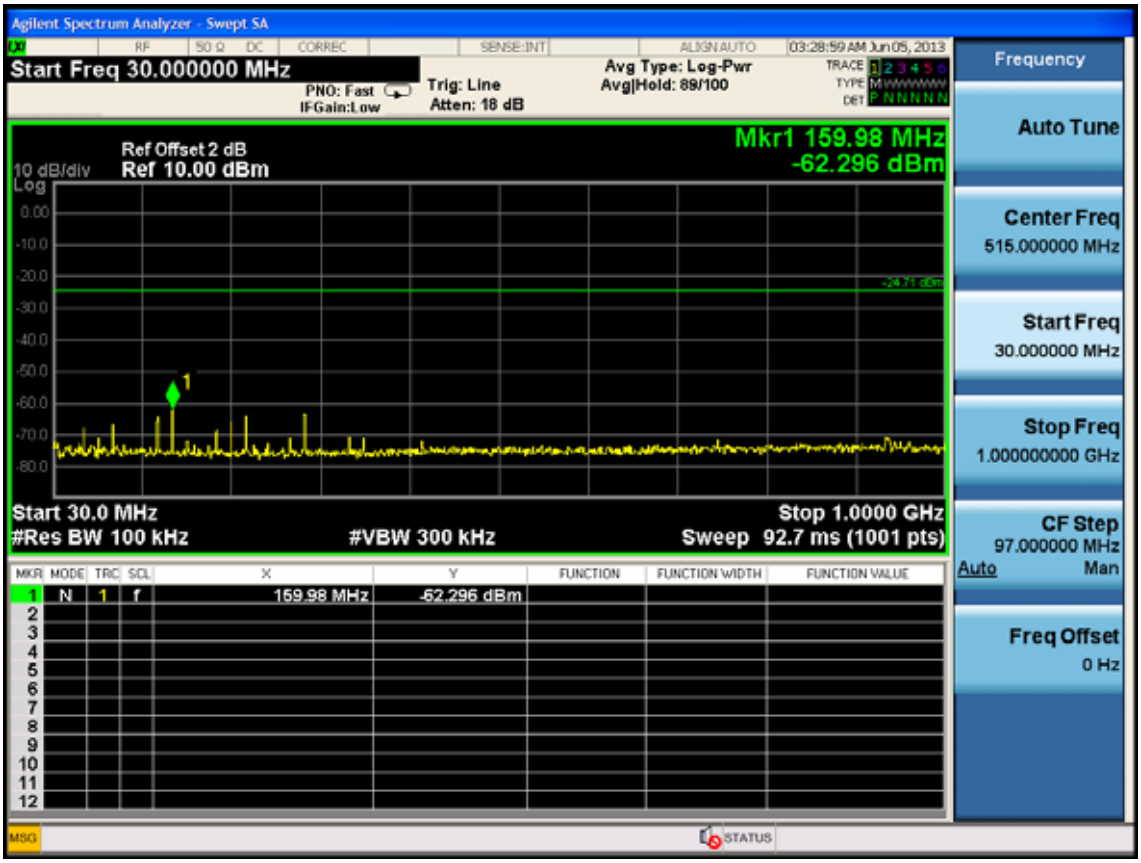

Agilent Spectrum Analyzer - Swept SA
Marker 1 191.990000000 MHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:24:23 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 191.99 MHz
-61.281 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)
1 N 1 f 191.99 MHz -61.281 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
Start Freq 2.310000000 GHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:26:49 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr4 2.385 810 GHz
-61.499 dBm
Start 2.31000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.40500 GHz
Sweep 9.13 ms (1001 pts)
1 N 1 f 2.402 150 GHz -3.008 dBm
2 N 1 f 2.390 000 GHz -70.810 dBm
3 N 1 f 2.400 000 GHz -46.444 dBm
4 N 1 f 2.385 810 GHz -61.499 dBm
Frequency
Auto Tune
Center Freq
2.357500000 GHz
Start Freq
2.310000000 GHz
Stop Freq
2.405000000 GHz
CF Step
9.500000 MHz
Auto
Man
Freq Offset
0 Hz

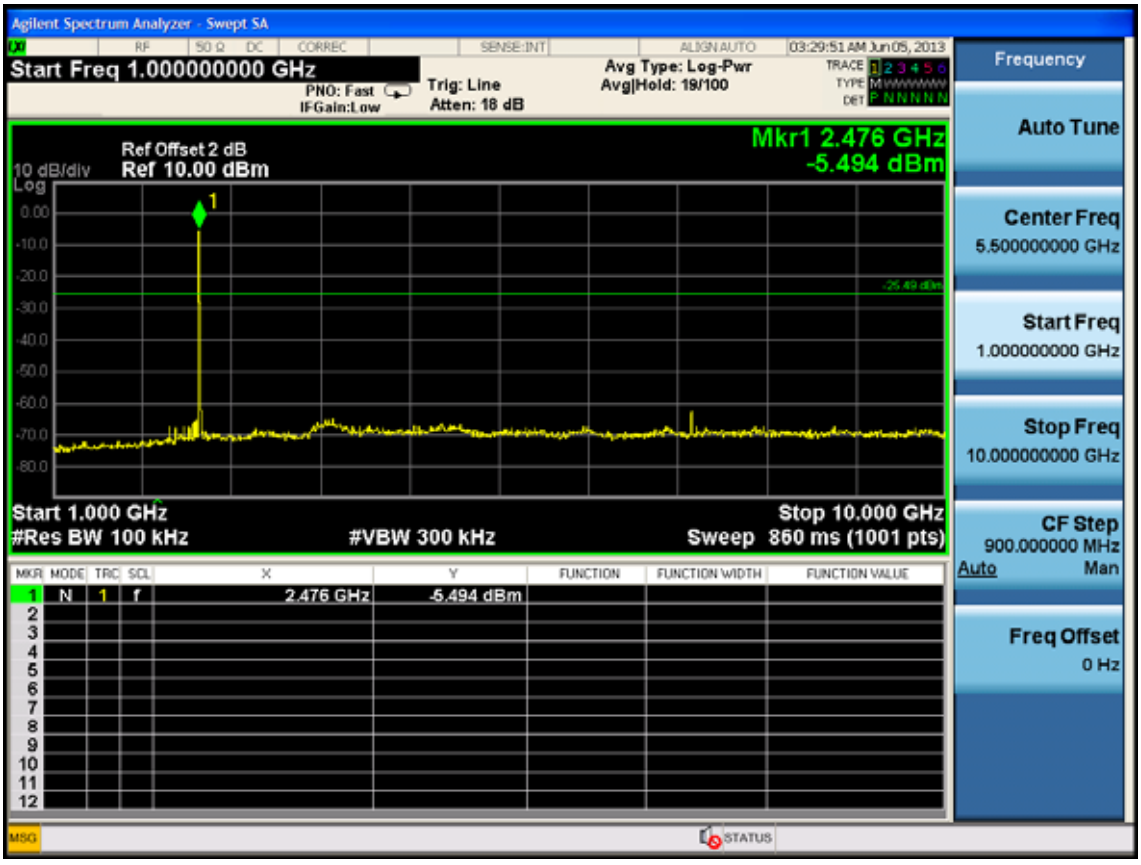
2441 MHz

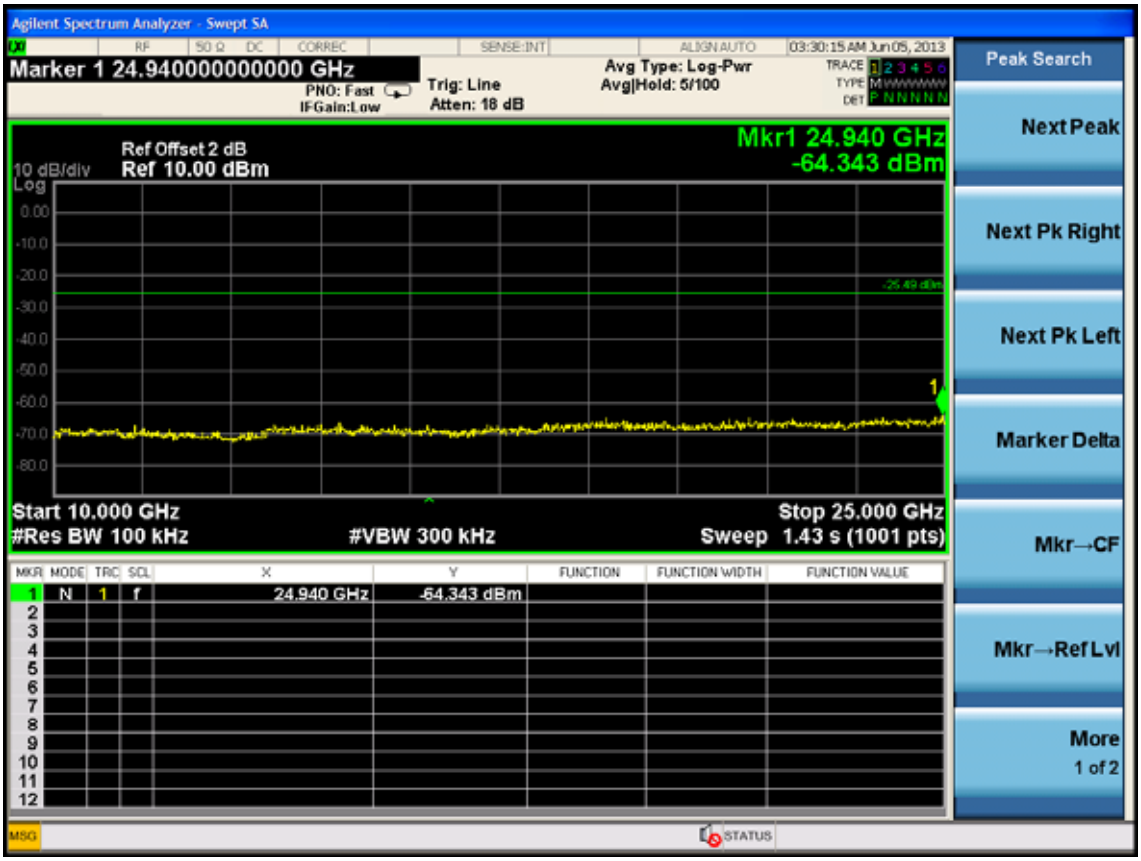

Agilent Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold: 30/100
03:28:00 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.440 GHz
-4.710 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
1 N 1 f 2.440 GHz -4.710 dBm
File <066_0108.png> saved
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz

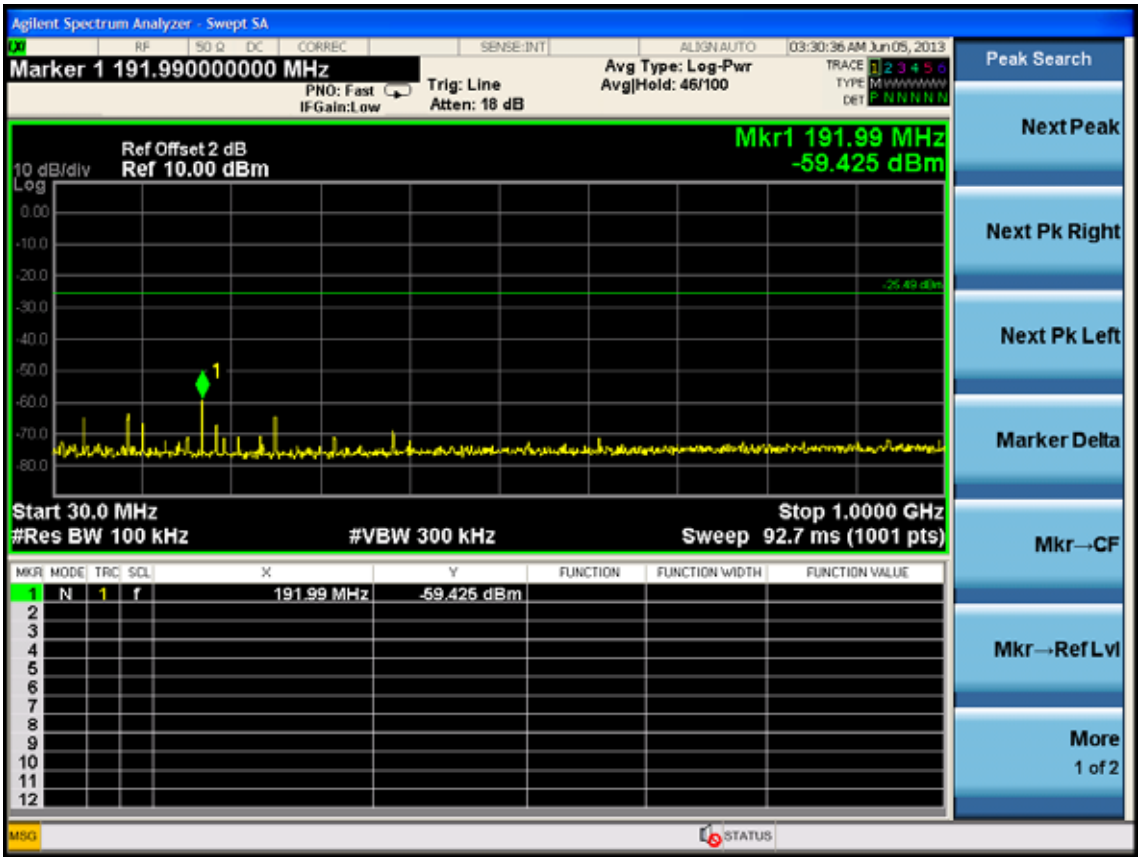

Agilent Spectrum Analyzer - Swept SA
Marker 1 24.835000000000 GHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold: 7/100
03:28:32 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Mkr1 24.835 GHz
-64.525 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 24.835 GHz -64.525 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

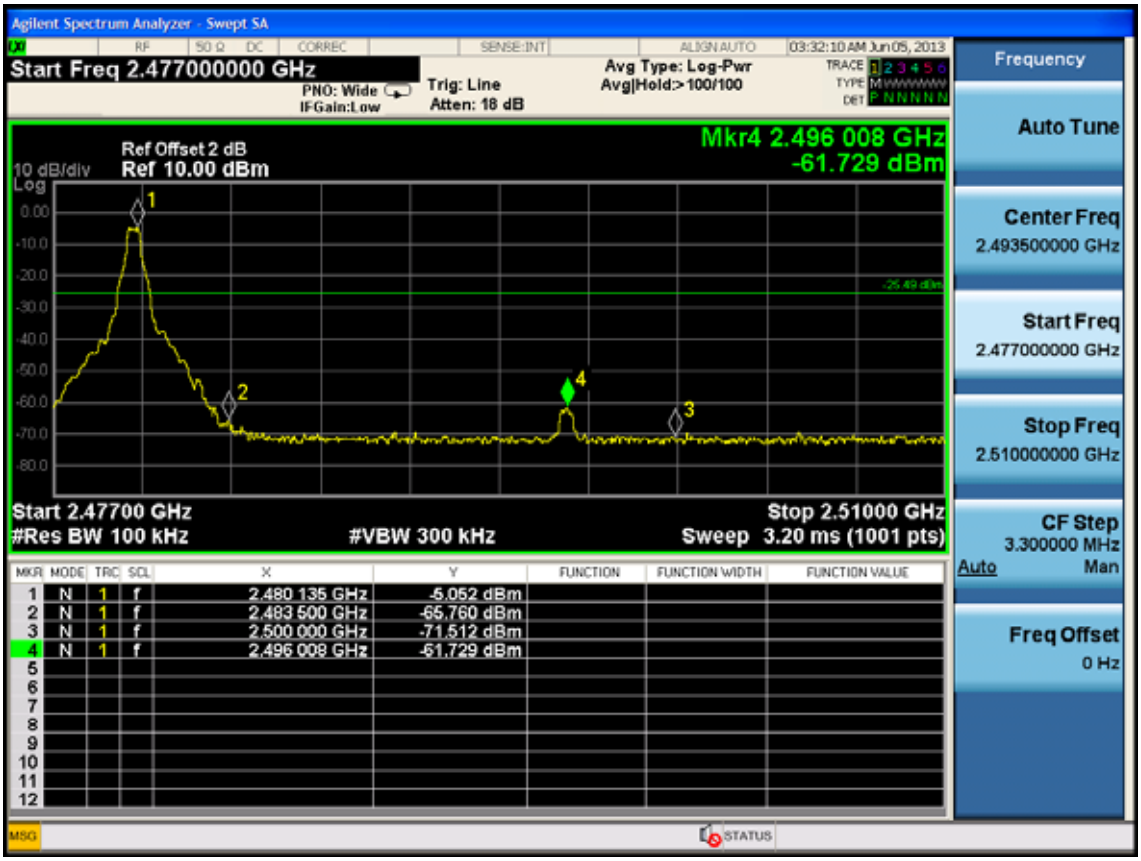

Agilent Spectrum Analyzer - Swept SA
Start Freq 30.000000 MHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold: 89/100
03:28:59 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 159.98 MHz
-62.296 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)
1 N 1 f 159.98 MHz -62.296 dBm
Frequency
Auto Tune
Center Freq
515.000000 MHz
Start Freq
30.000000 MHz
Stop Freq
1.000000000 GHz
CF Step
97.000000 MHz
Auto
Man
Freq Offset
0 Hz

2408 MHz


Agilent Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold: 19/100
03:29:51 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 2.476 GHz
-5.494 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
1 N 1 f 2.476 GHz -5.494 dBm
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz

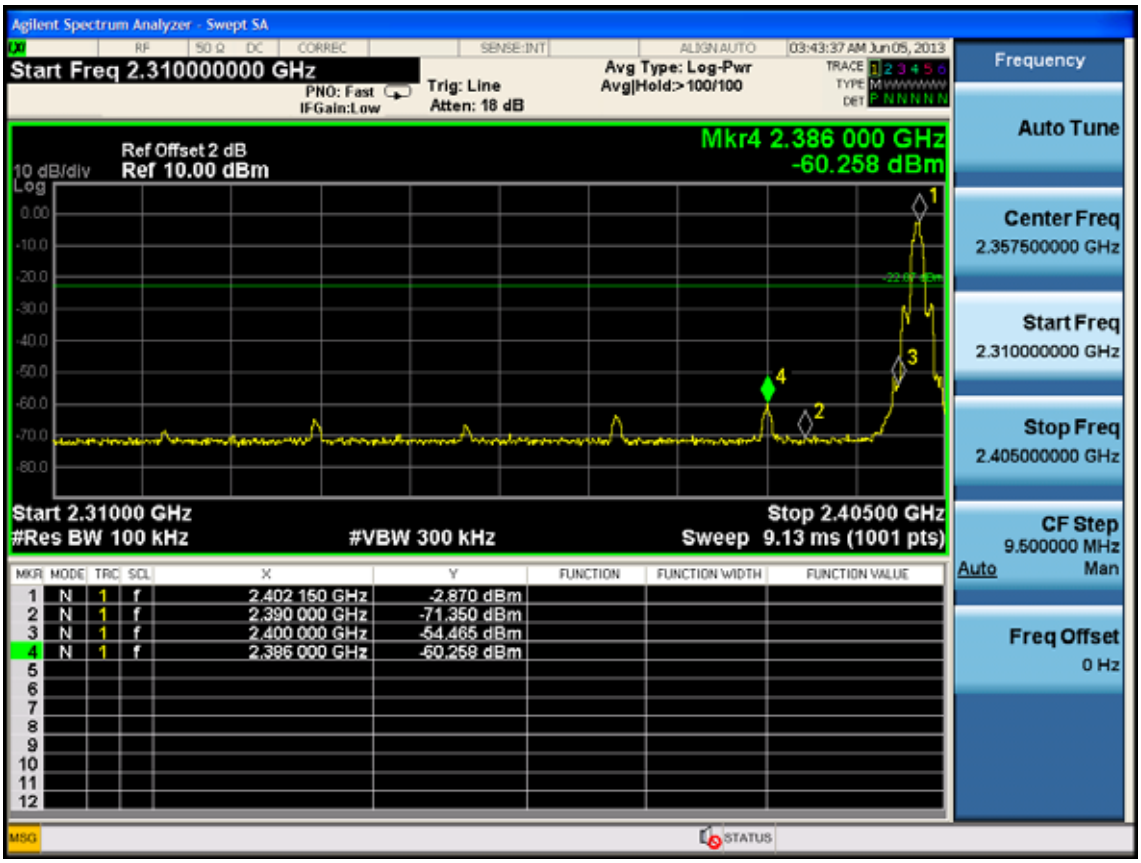

Agilent Spectrum Analyzer - Swept SA
Marker 1 24.940000000000 GHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold: 5/100
03:30:15 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Mkr1 24.940 GHz
-64.343 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 24.940 GHz -64.343 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

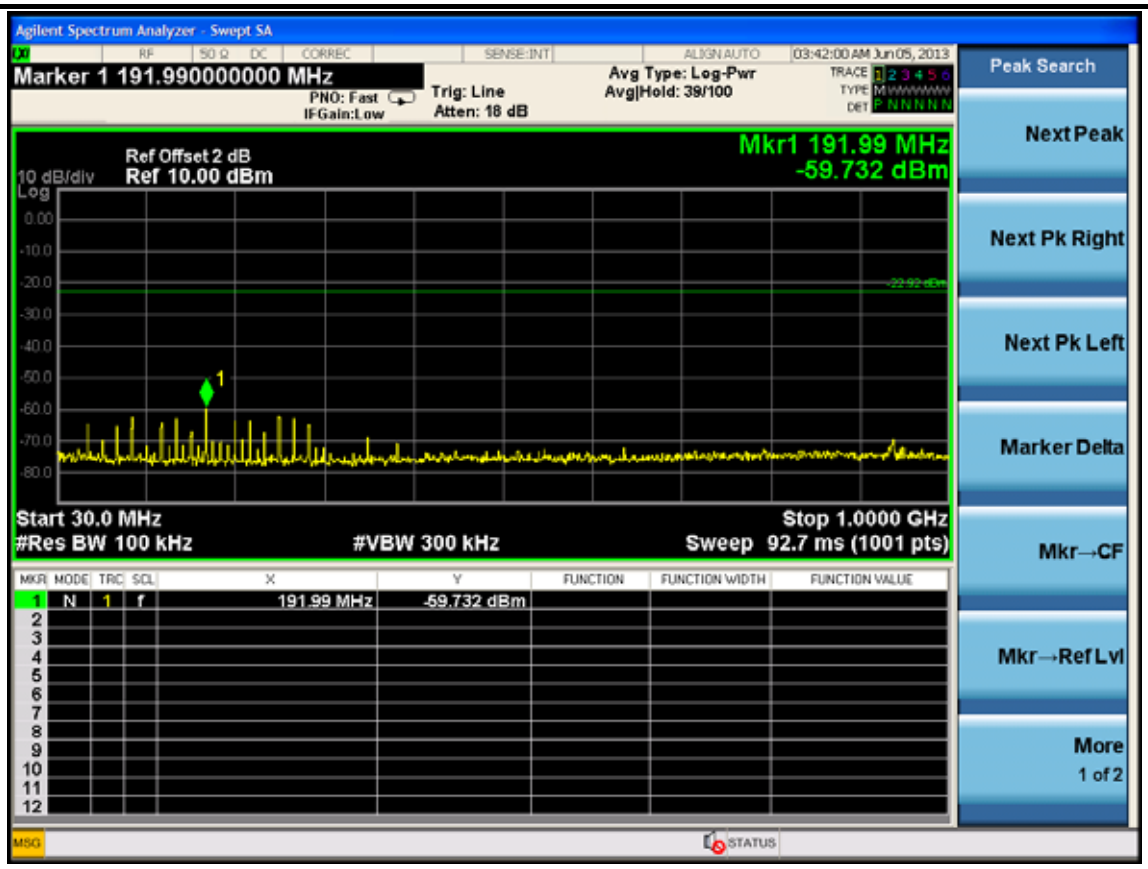

Agilent Spectrum Analyzer - Swept SA
Marker 1 191.990000000 MHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold: 46/100
03:30:36 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Mkr1 191.99 MHz
-59.425 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)
1 N 1 f 191.99 MHz -59.425 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

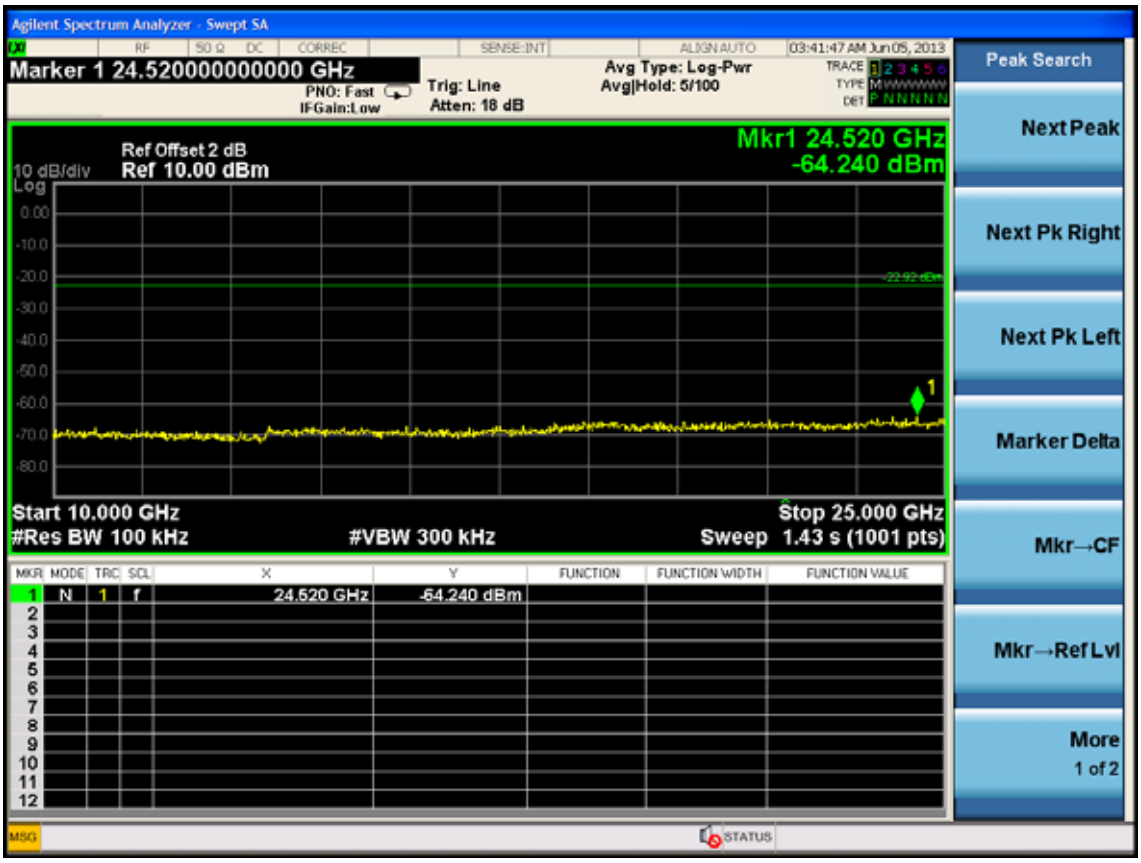


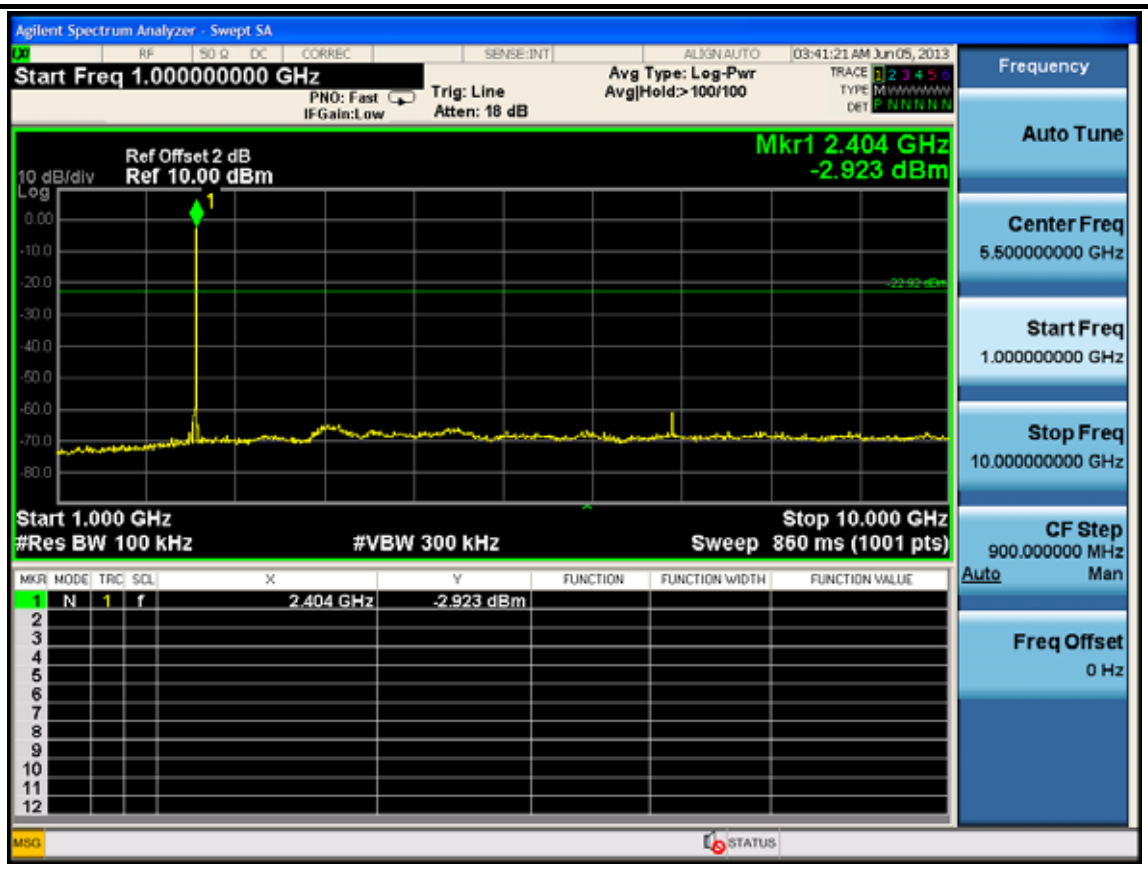
8-DPSK

2402 MHz

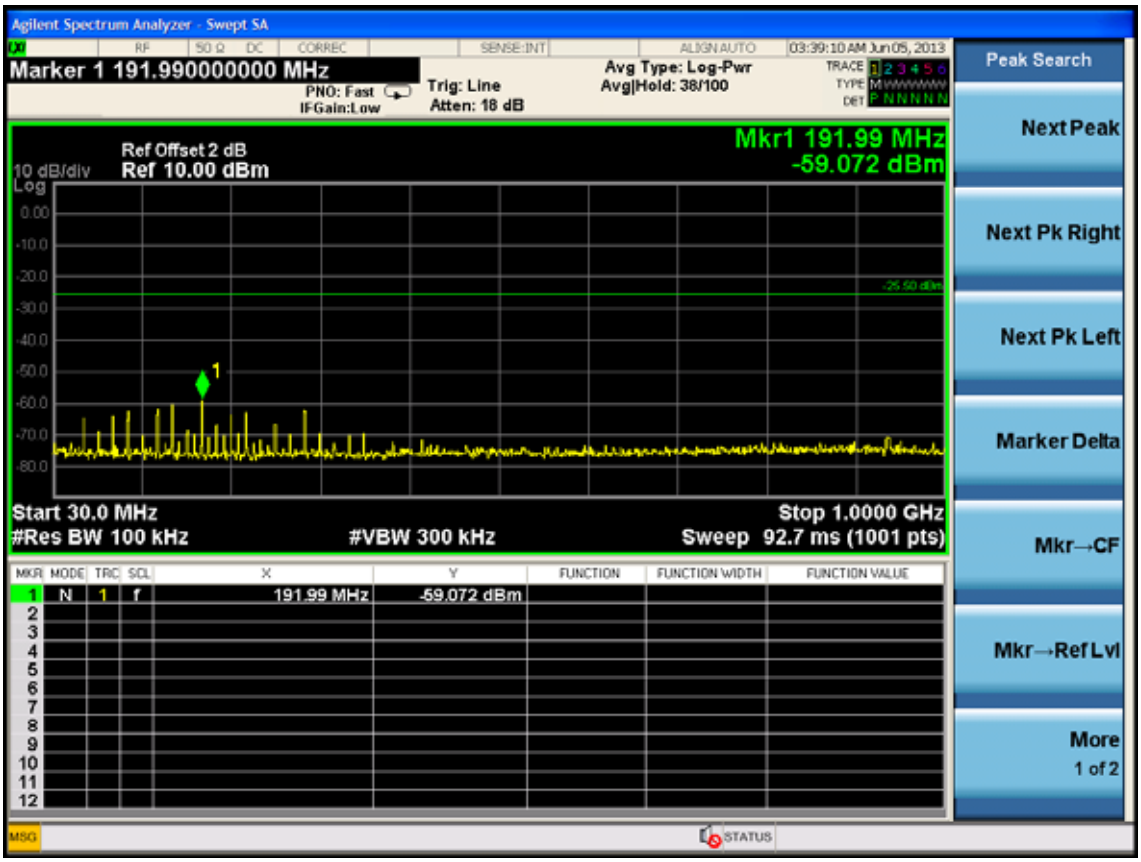


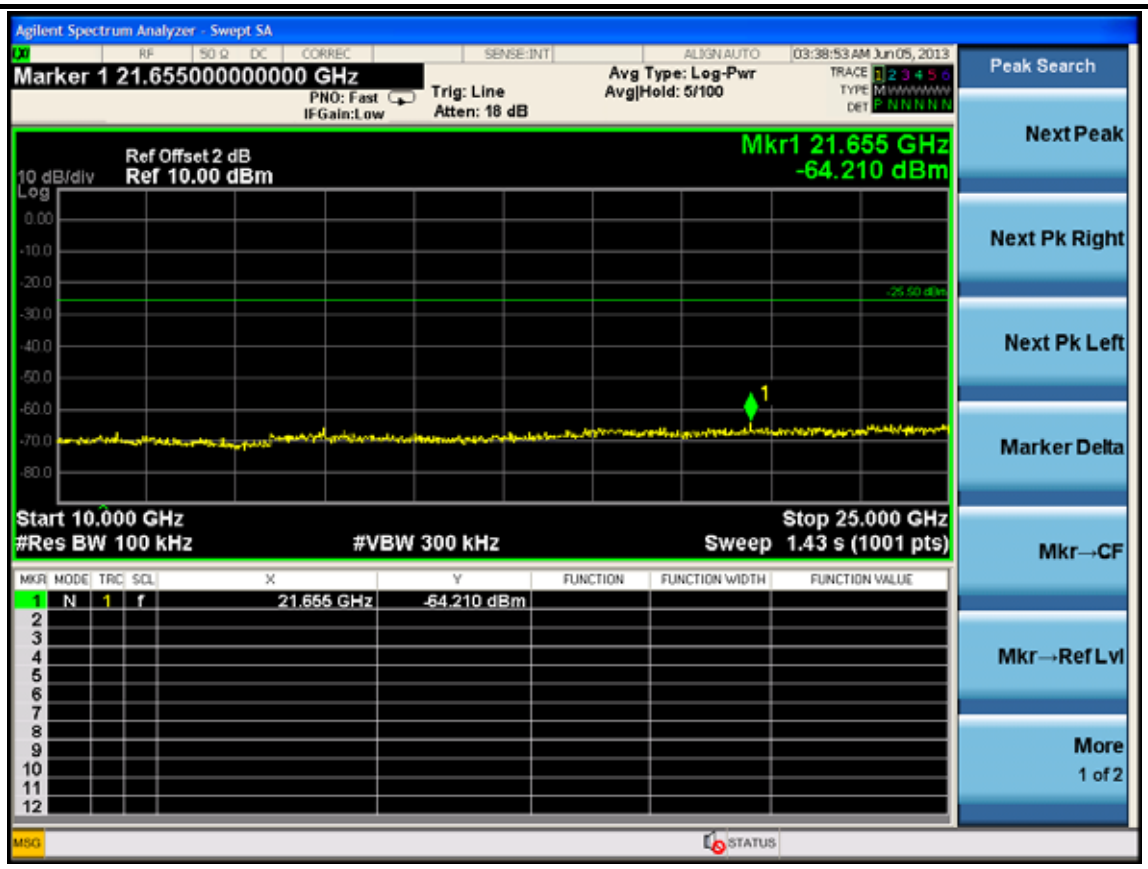

Agilent Spectrum Analyzer - Swept SA
Marker 1 191.990000000 MHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold: 39/100
03:42:00 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 191.99 MHz
-59.732 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)
1 N 1 f 191.99 MHz -59.732 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

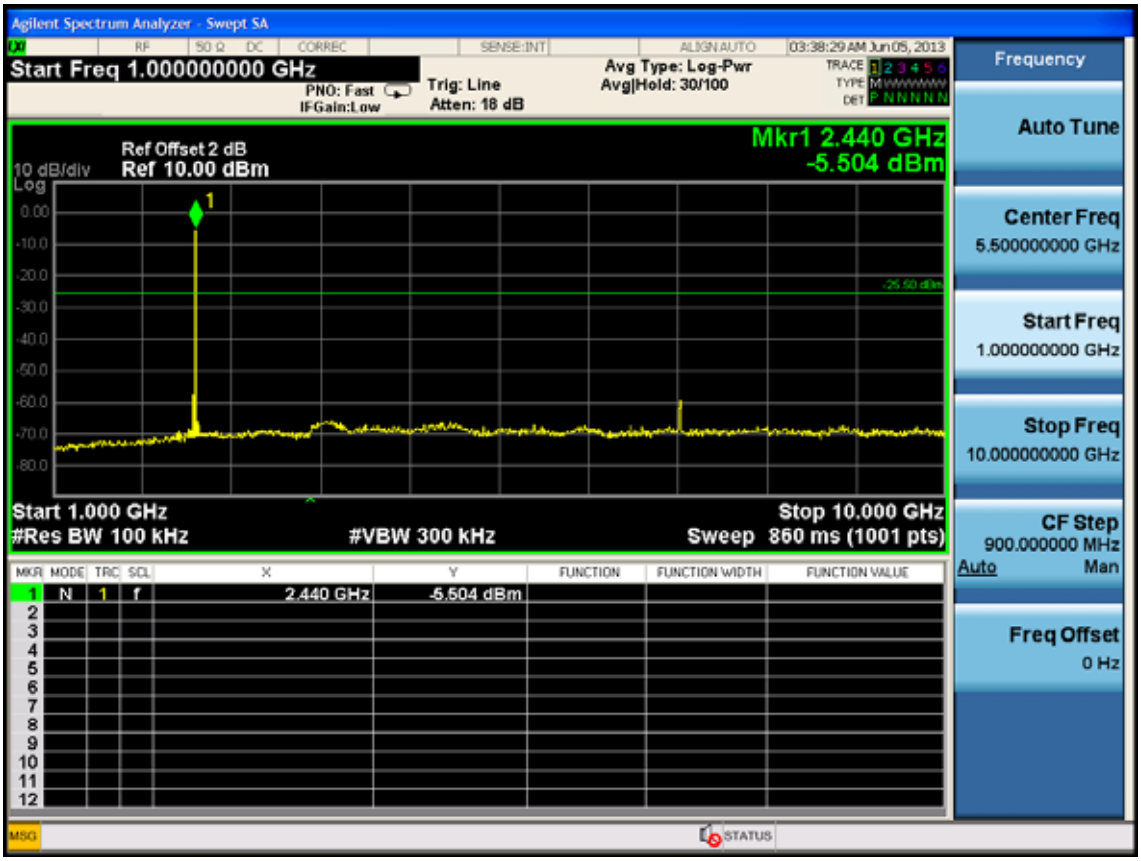

Agilent Spectrum Analyzer - Swept SA
Marker 1 24.520000000000 GHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold: 5/100
03:41:47 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 24.520 GHz
-64.240 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 24.520 GHz -64.240 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:41:21 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 2.404 GHz
-2.923 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
1 N 1 f 2.404 GHz -2.923 dBm
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz

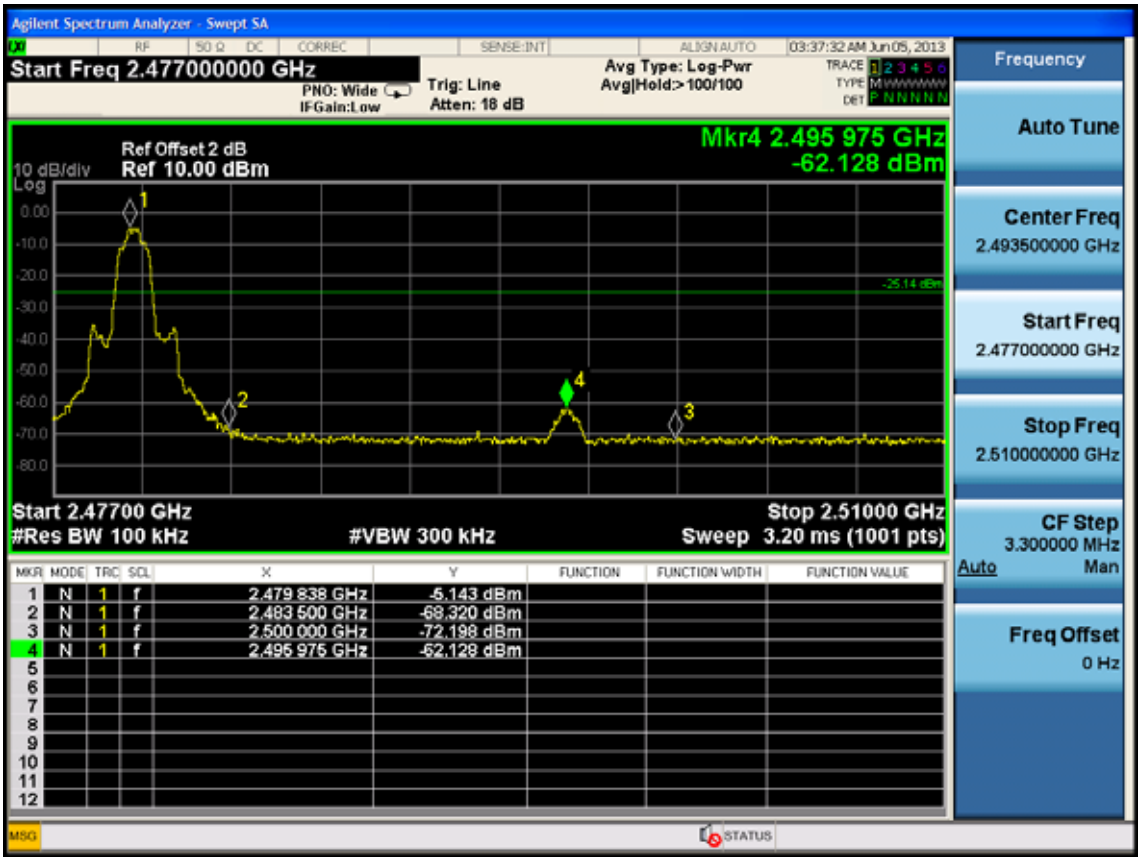
2441 MHz

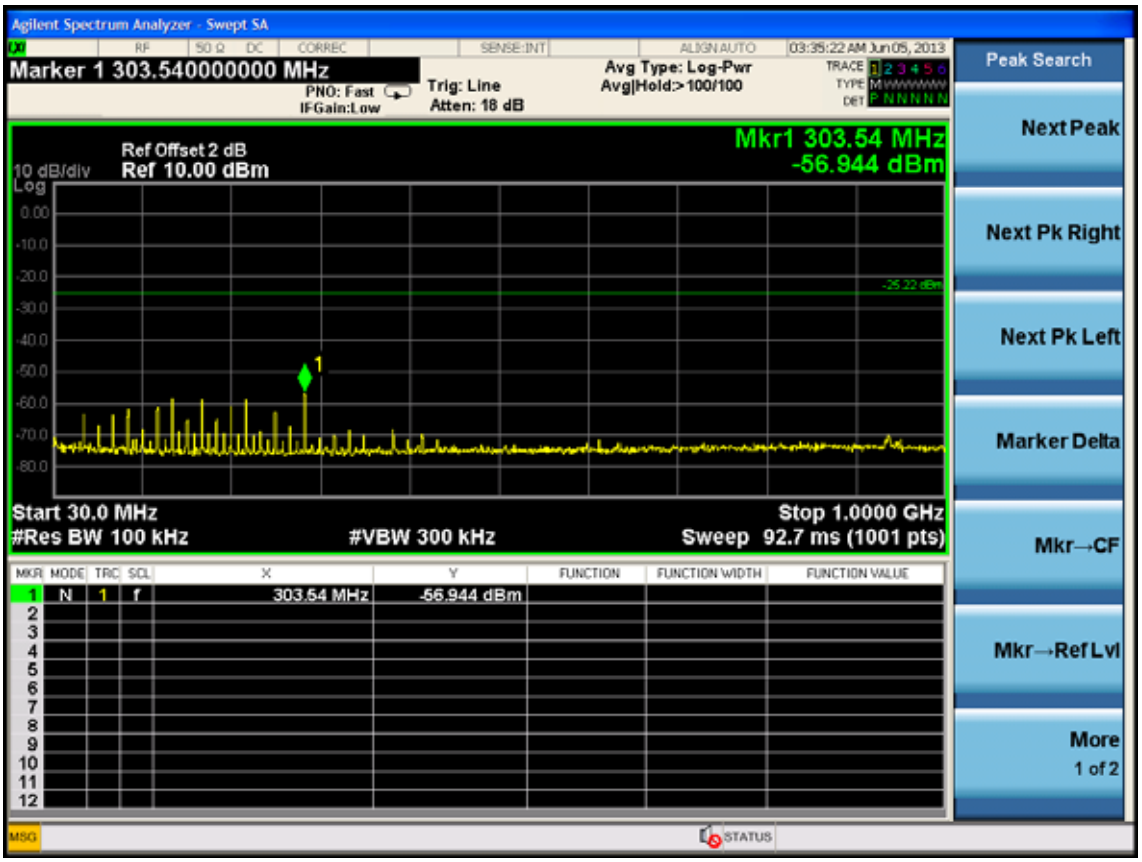

Agilent Spectrum Analyzer - Swept SA
Marker 1 191.990000000 MHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold: 38/100
03:39:10 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 191.99 MHz
-59.072 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)
1 N 1 f 191.99 MHz -59.072 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

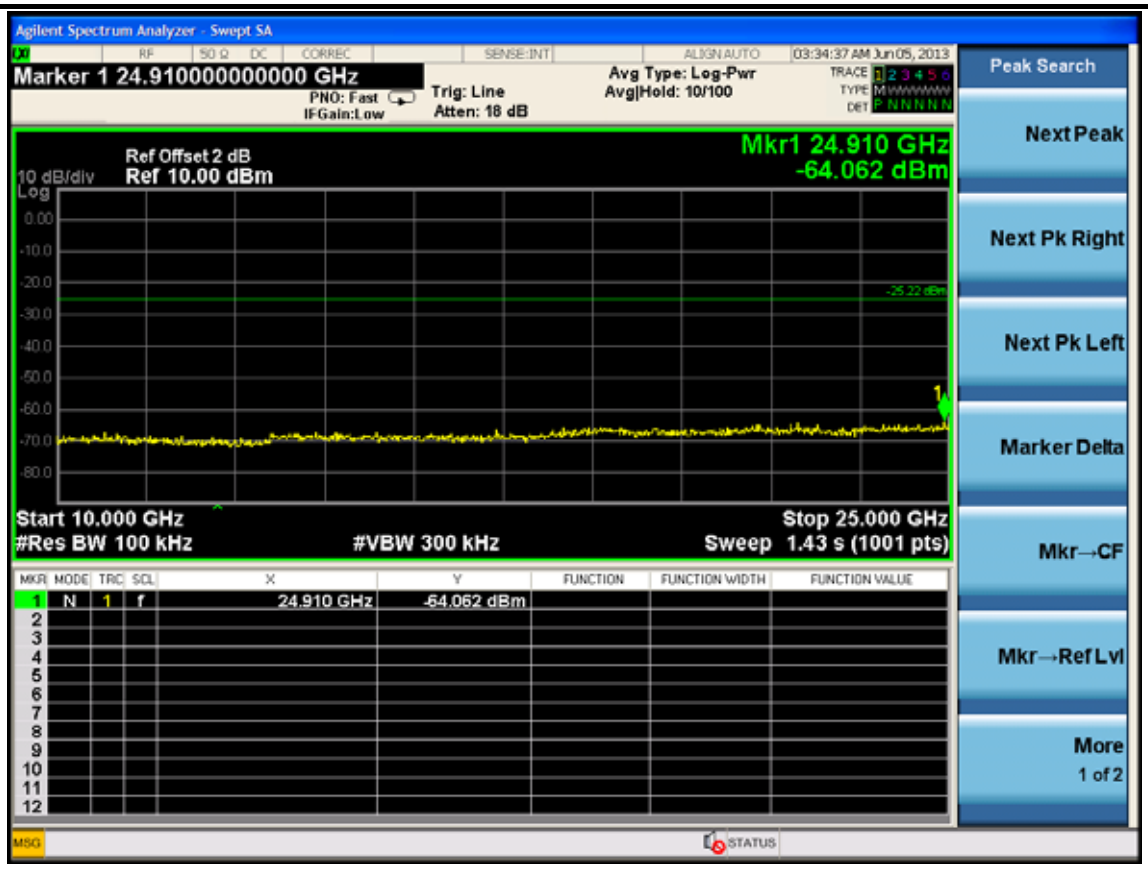

Agilent Spectrum Analyzer - Swept SA
Marker 1 21.655000000000 GHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold: 5/100
03:38:53 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 21.655 GHz
-64.210 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 21.655 GHz -64.210 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

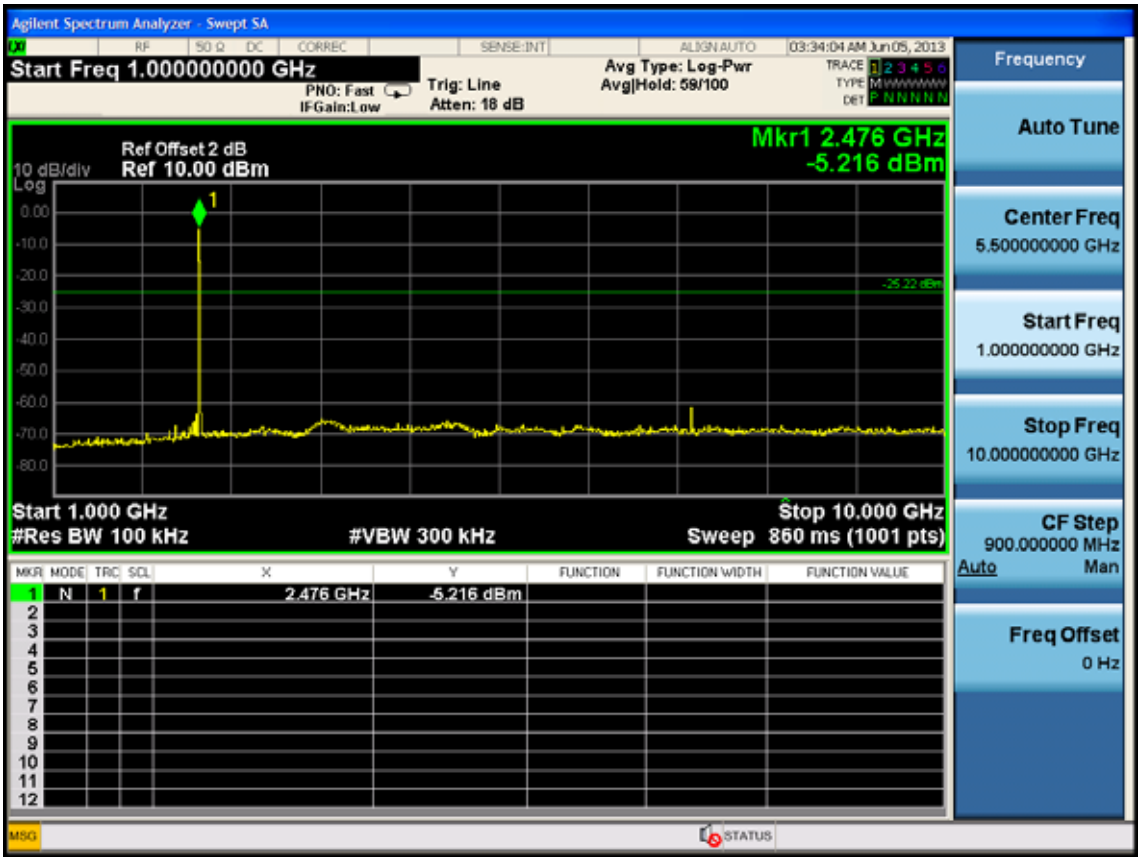

Agilent Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold: 30/100
03:38:29 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 2.440 GHz
-5.504 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
1 N 1 f 2.440 GHz -5.504 dBm
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz

2480 MHz


Agilent Spectrum Analyzer - Swept SA
Start Freq 2.477000000 GHz
PNO: Wide
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:37:32 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr4 2.495 975 GHz
-62.128 dBm
-25.14 dBm
Start 2.47700 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.51000 GHz
Sweep 3.20 ms (1001 pts)
1 N 1 f 2.479 838 GHz -5.143 dBm
2 N 1 f 2.483 500 GHz -68.320 dBm
3 N 1 f 2.500 000 GHz -72.198 dBm
4 N 1 f 2.495 975 GHz -62.128 dBm
Frequency
Auto Tune
Center Freq
2.493500000 GHz
Start Freq
2.477000000 GHz
Stop Freq
2.510000000 GHz
CF Step
3.300000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Marker 1 303.540000000 MHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:35:22 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 303.54 MHz
-56.944 dBm
-25.22 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)
1 N 1 f 303.54 MHz -56.944 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Marker 1 24.910000000000 GHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold: 10/100
03:34:37 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 24.910 GHz
-64.062 dBm
-25.22 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 24.910 GHz -64.062 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Line
Atten: 18 dB
Avg Type: Log-Pwr
Avg|Hold: 59/100
03:34:04 AM Jun 05, 2013
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 2.476 GHz
-5.216 dBm
-25.22 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
1 N 1 f 2.476 GHz -5.216 dBm
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz

6. CARRIER FREQUENCY SEPARATION TEST

6.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	N9030A	MY51380221	Oct.31, 12	1 Year

6.2.Limit

Frequency hopping systems shall have hopping channel carrier frequency separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, 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, provided the systems operate with an output power no greater than 125 mW.

6.3.Test Results.

EUT: Bluetooth Mono Speaker		
M/N: MET1207		
Test date:2013-06-28	Pressure:101.2 ±1.0kpa	Humidity:53±3.0%
Tested by: Leo-Li	Test site: RF site	Temperature:22.6± 0.6℃

Channel separation	Conclusion
1.00MHz	PASS


Agilent Spectrum Analyzer - Swept SA
Marker 2 Δ 980.000000 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
11:18:15 PM Jun 29, 2013
ΔMkr2 980 kHz
-0.245 dB
10 dB/div
Log
Ref -10.00 dBm
2Δ3
1Δ2
Center 2.441000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Span 5.000 MHz
Sweep 2.53 ms (1001 pts)
1 Δ2 1 f (Δ) 1.015 MHz (Δ) -24.614 dB
2 Δ3 1 f (Δ) 980 kHz (Δ) -0.245 dB
3 F 1 f 2.439 865 GHz -24.689 dBm
Marker
Select Marker 2
Normal
Delta
Fixed
Off
Properties
More 1 of 2
Align Now, All required

7. 20 DB BANDWIDTH TEST

7.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9030A	MY51380221	Oct.31, 12	1 Year

7.2. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

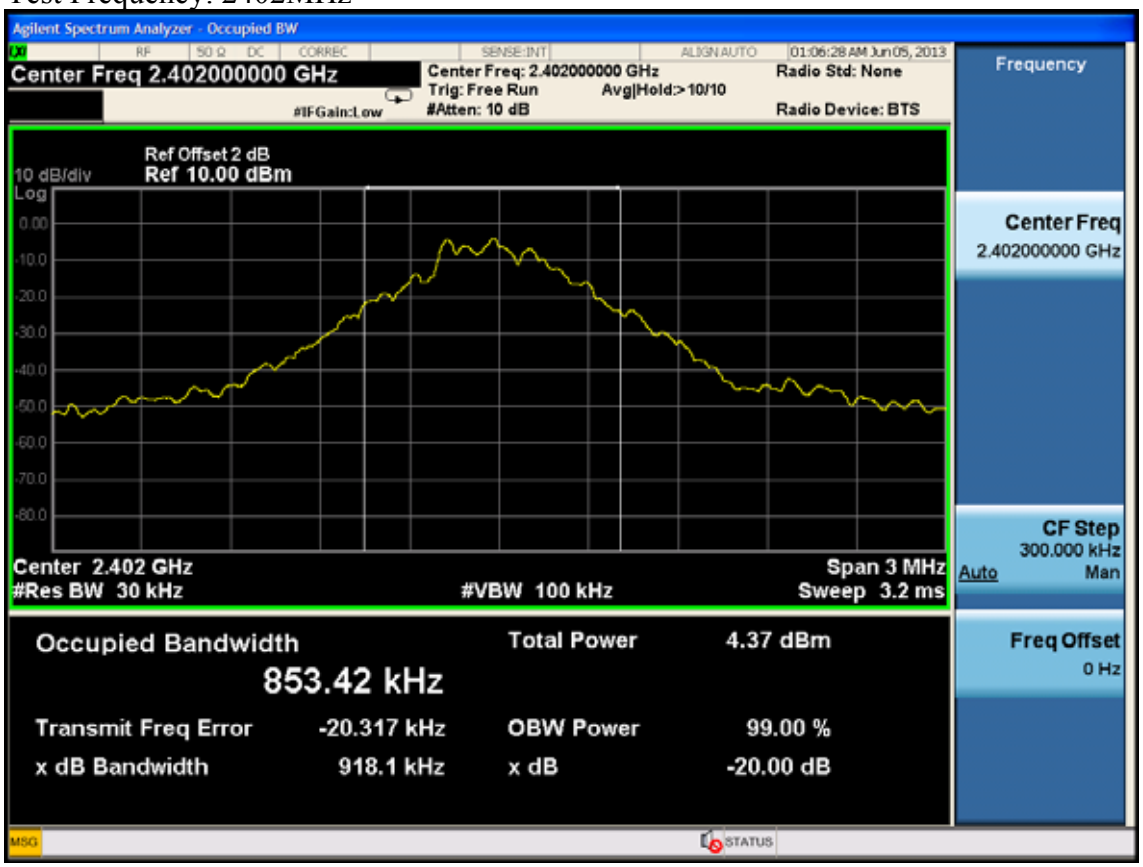
7.3. Test Results

EUT: Bluetooth Mono Speaker		
M/N: MET1207		
Test date: 2013-06-28	Pressure: 101.2±1.0 kpa	Humidity: 52.3±3.0%
Tested by: Leo-Li	Test site: RF Site	Temperature：22.6±0.6℃

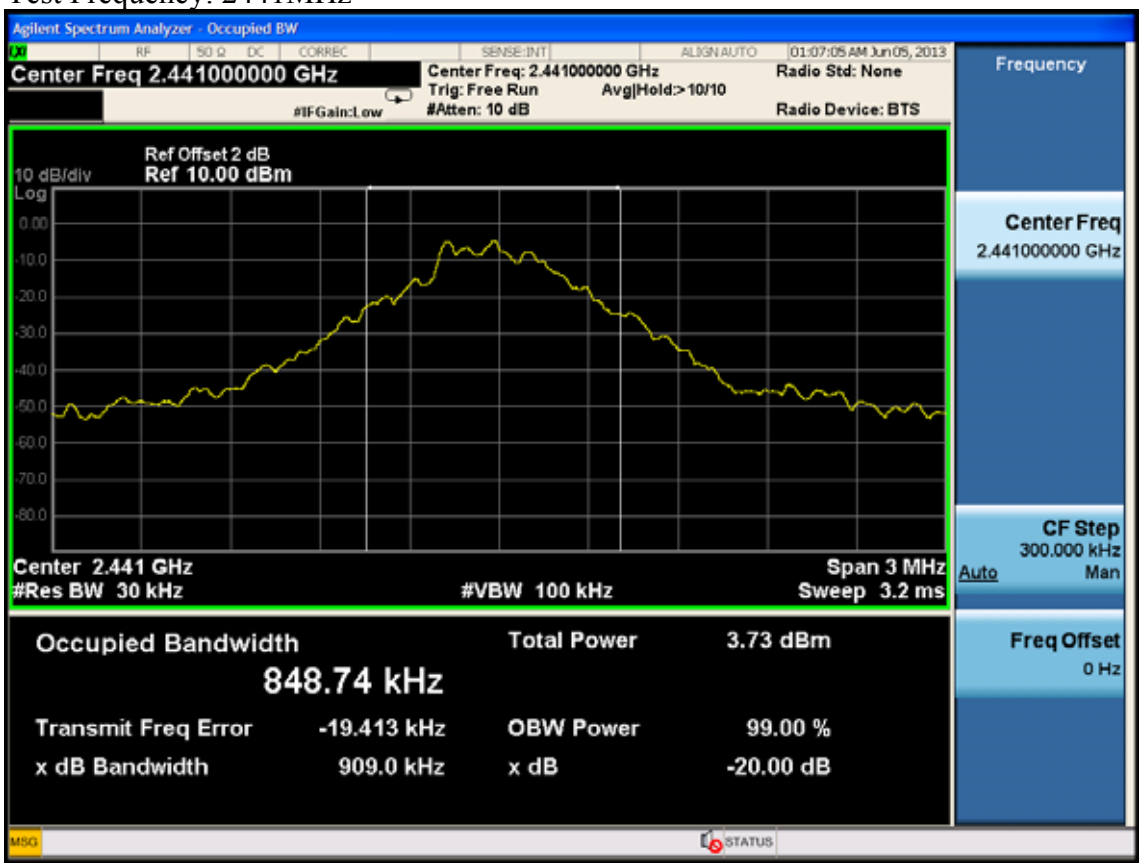
Test Mode	CH (MHz)	20dB bandwidth (MHz)	Limit (KHz)
GFSK	2402	918.1	N/A
	2441	909.0	N/A
	2480	862.2	N/A
8DPSK	2402	1222	N/A
	2441	1218	N/A
	2480	1215	N/A
Conclusion：PASS			

GFSK

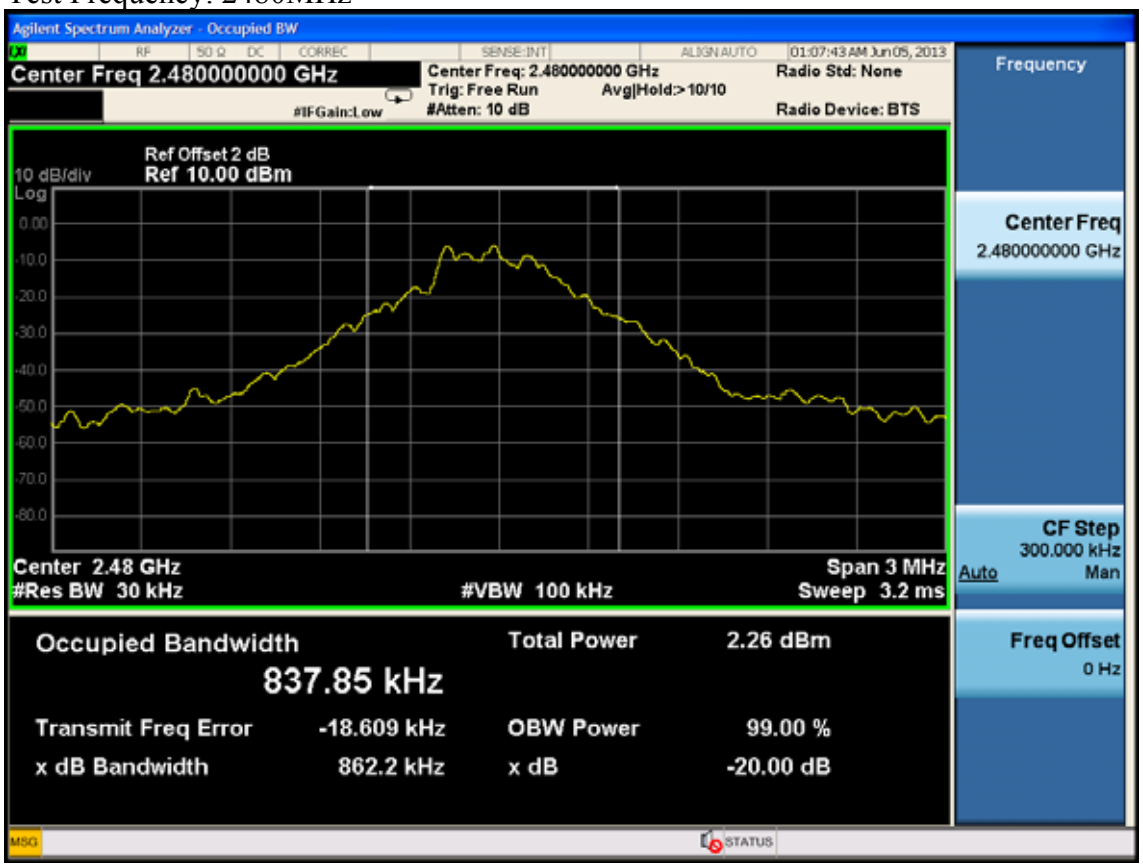
Test Frequency: 2402MHz



Test Frequency: 2441MHz

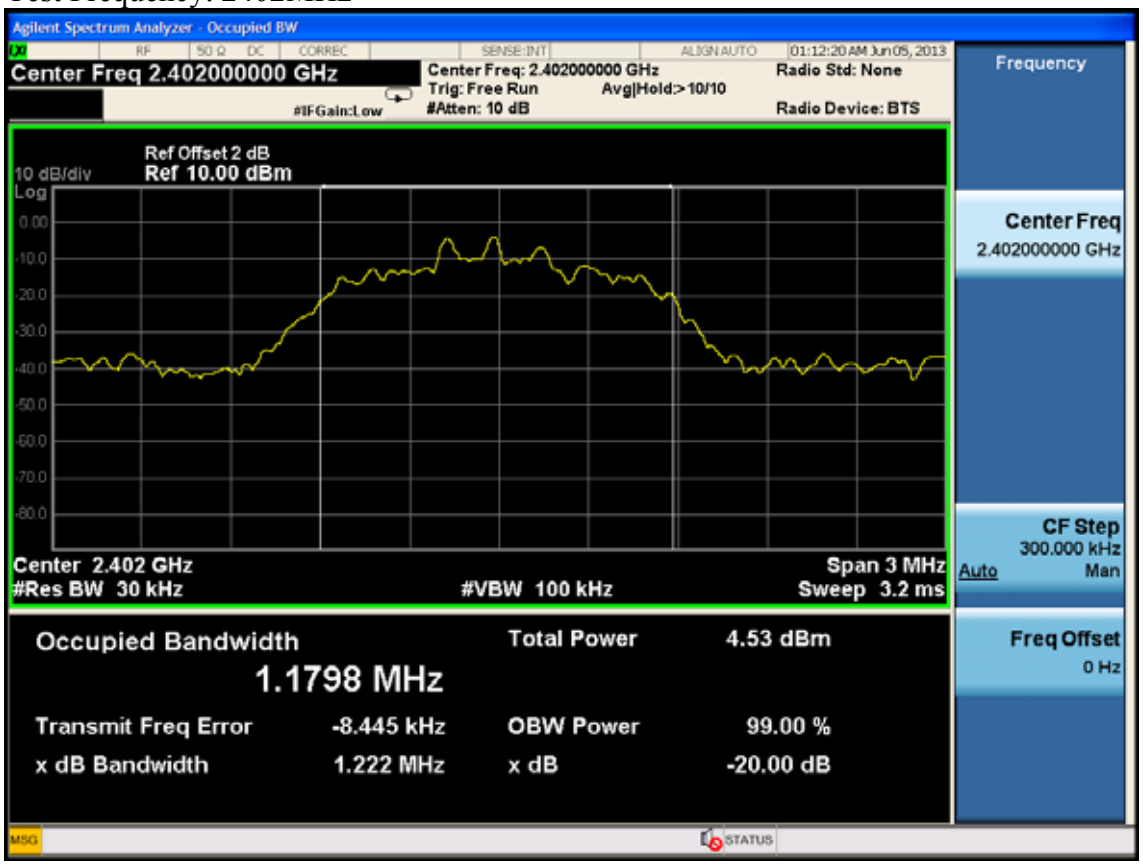


Test Frequency: 2480MHz

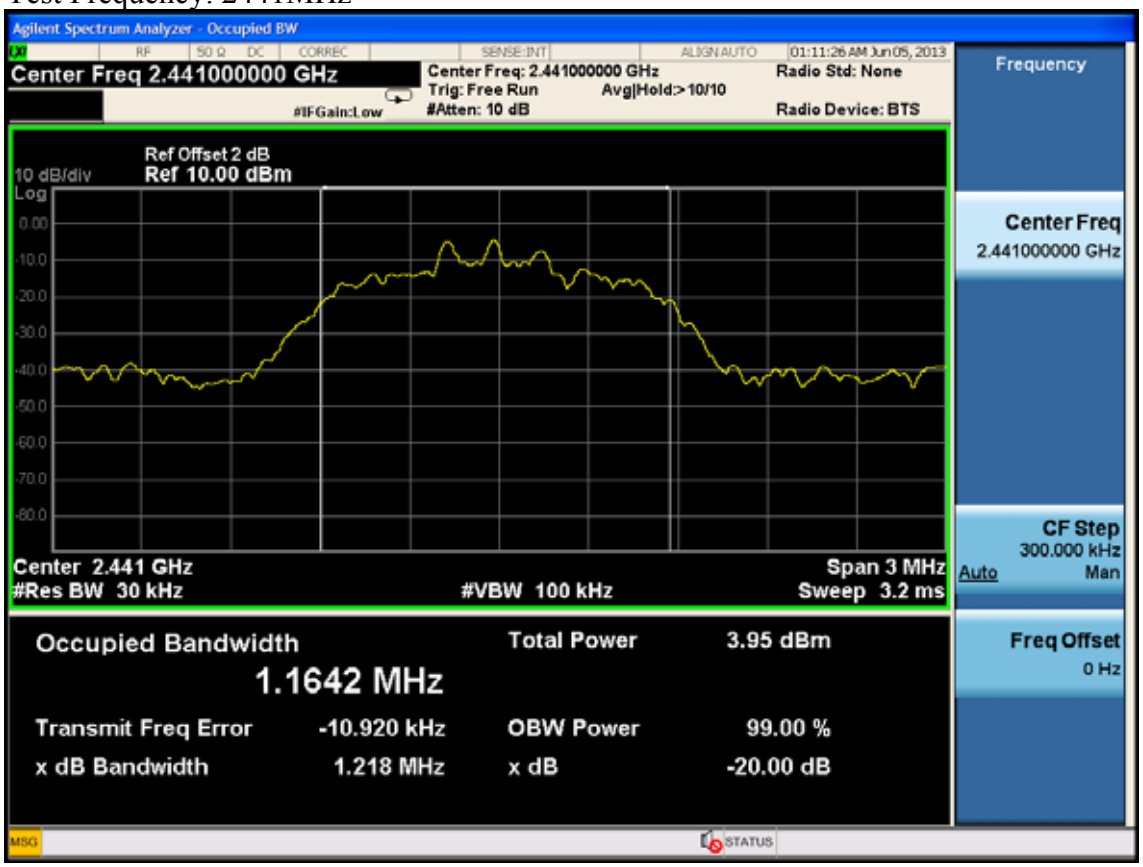


8DPSK

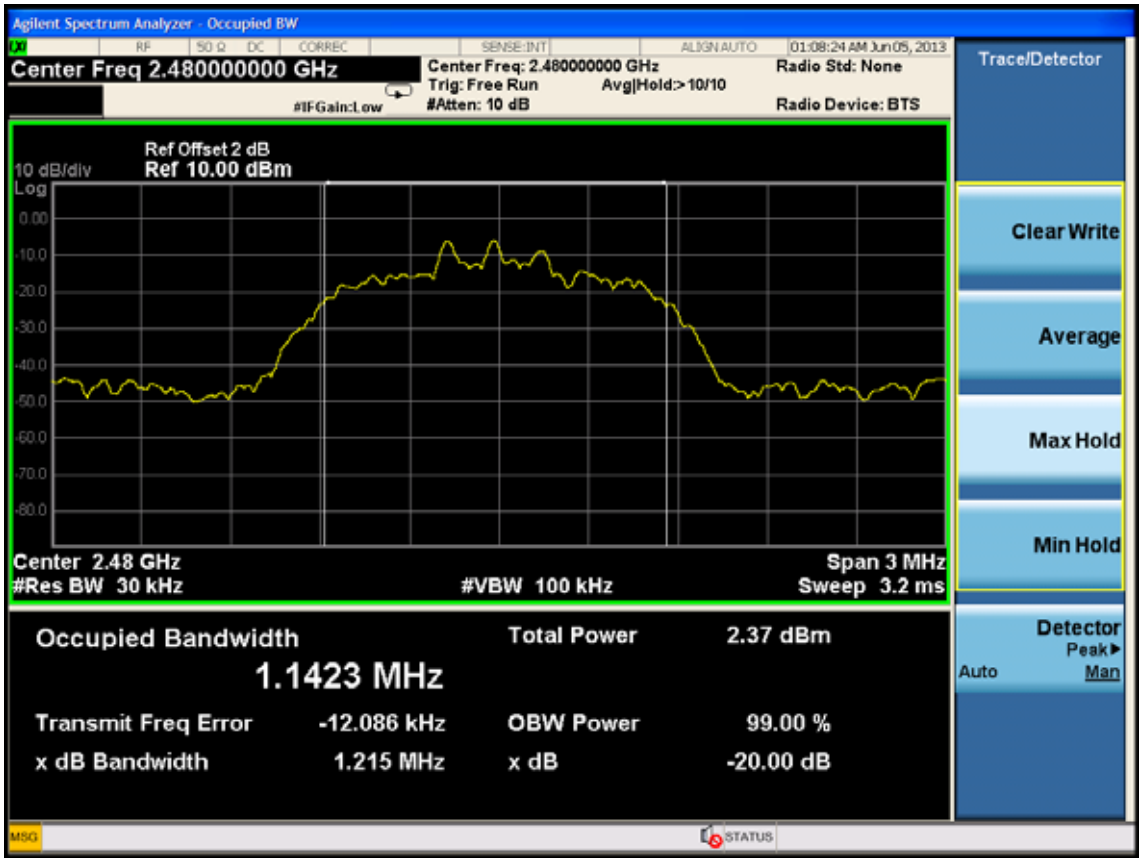
Test Frequency: 2402MHz



Test Frequency: 2441MHz



Test Frequency: 2480MHz



8. NUMBER OF HOPPING FREQUENCY TEST

8.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	N9030A	MY51380221	Oct.31, 12	1 Year

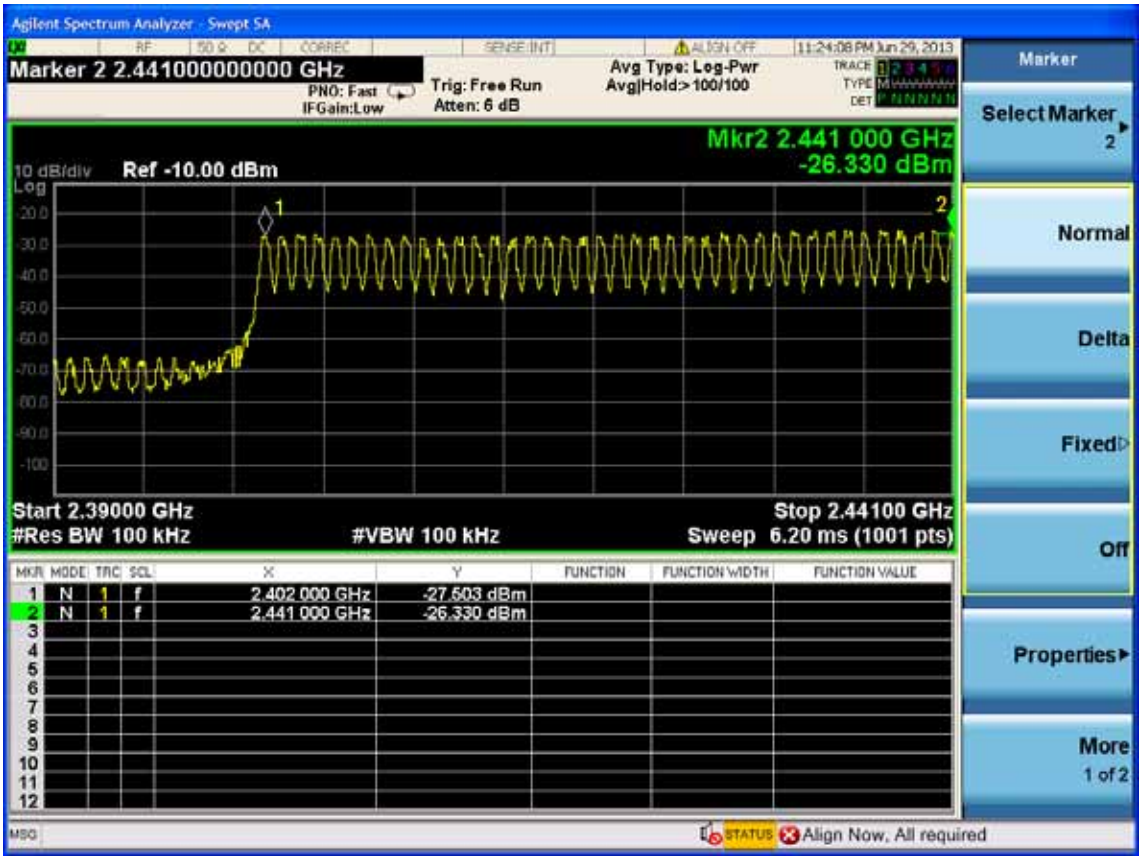
8.2.Limit

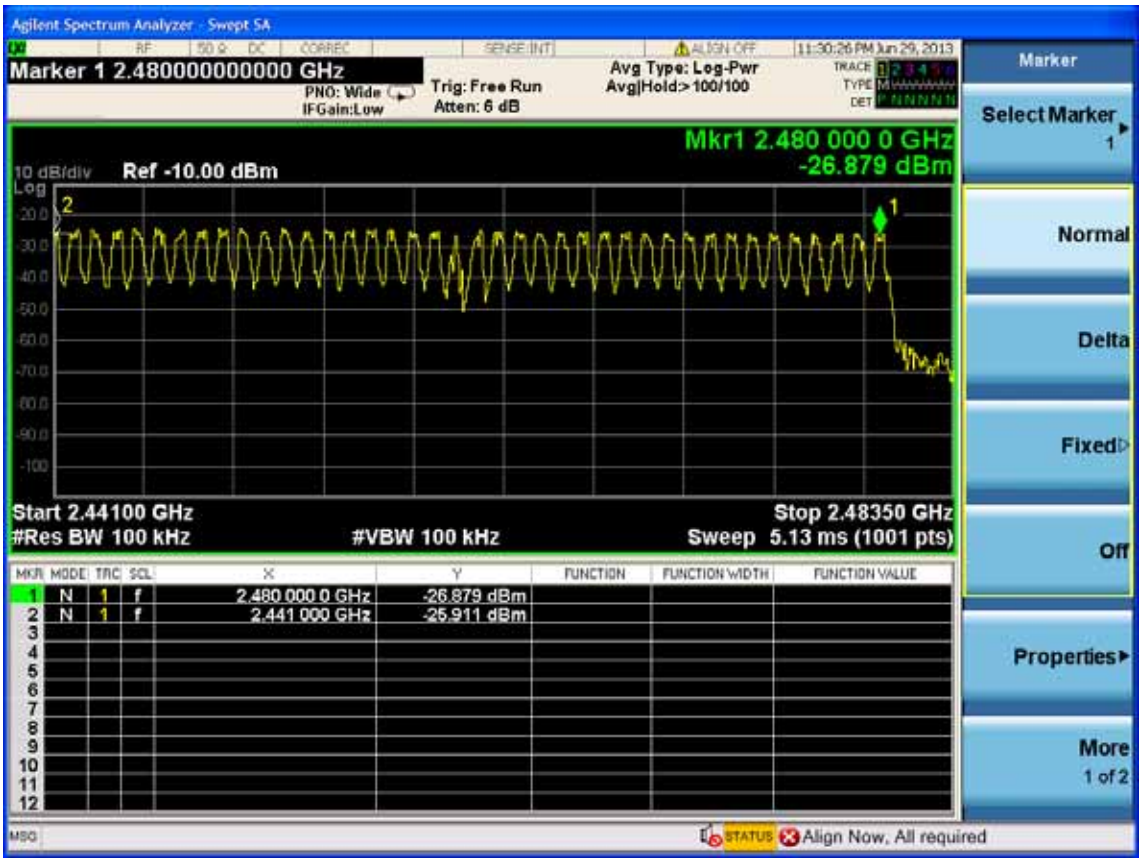
Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels

8.3.Test Results

EUT: Bluetooth Mono Speaker		
M/N: MET1207		
Test date: 2013-06-28	Pressure: 101.2±1.0 kpa	Humidity: 52.3±3.0%
Tested by: Leo-Li	Test site: RF Site	Temperature：22.6±0.6℃

Number of channel	Limit	Conclusion
79	>=15	PASS


Agilent Spectrum Analyzer - Swept SA
Marker 2 2.441000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
11:24:08 PM Jun 29, 2013
Mkr2 2.441 000 GHz
-26.330 dBm
10 dB/div
Log
Ref -10.00 dBm
Start 2.39000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 2.44100 GHz
Sweep 6.20 ms (1001 pts)
1 N 1 f 2.402 000 GHz -27.503 dBm
2 N 1 f 2.441 000 GHz -26.330 dBm
Marker
Select Marker 2
Normal
Delta
Fixed
Off
Properties
More 1 of 2
Align Now, All required


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.480000000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
11:30:26 PM Jun 29, 2013
Mkr1 2.480 000 0 GHz
-26.879 dBm
10 dB/div
Log
Ref -10.00 dBm
Start 2.44100 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 2.48350 GHz
Sweep 5.13 ms (1001 pts)
1 N 1 f 2.480 000 0 GHz -26.879 dBm
2 N 1 f 2.441 000 GHz -25.911 dBm
Marker
Select Marker 1
Normal
Delta
Fixed
Off
Properties
More 1 of 2
Align Now, All required

9. DWELL TIME

9.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	N9030A	MY51380221	Oct.31, 12	1 Year

9.2. Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

9.3. Test Results

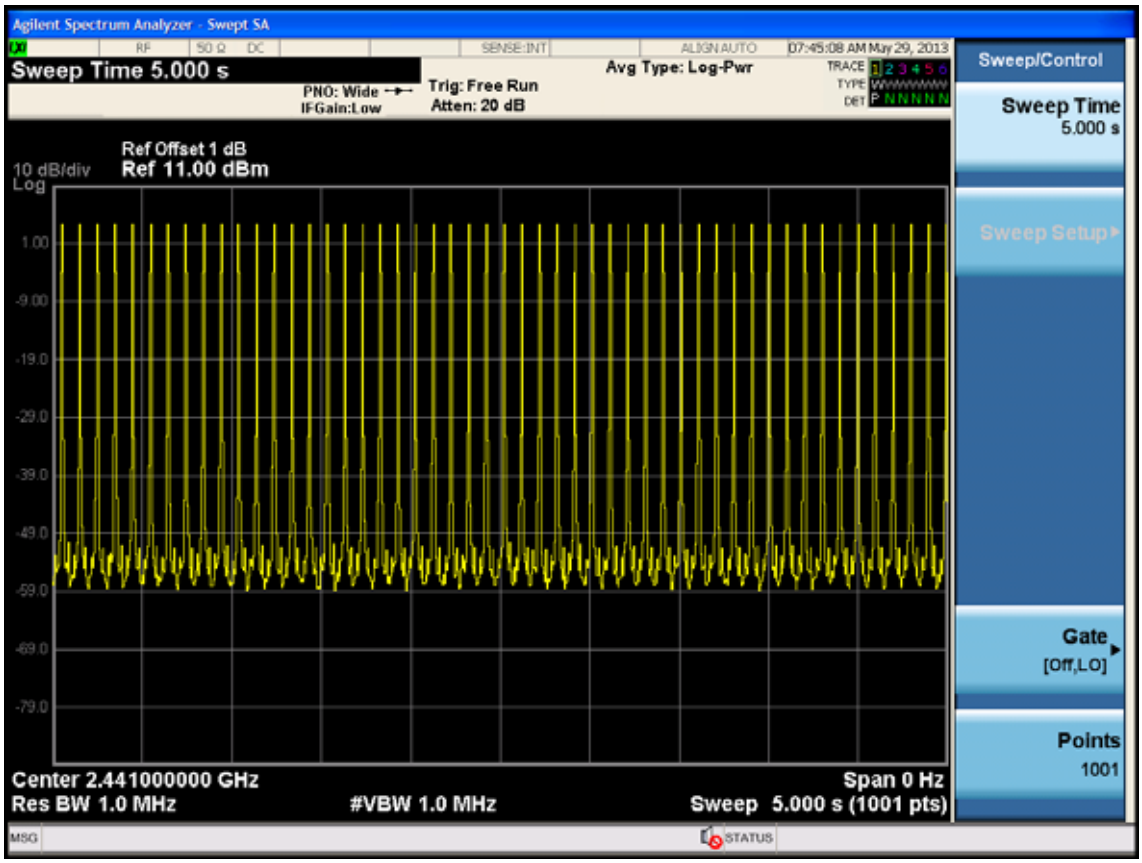
EUT: Bluetooth Mono Speaker		
M/N: MET1207		
Test date: 2013-06-28	Pressure: 101.2±1.0 kpa	Humidity: 52.3± 3.0%
Tested by: Leo-Li	Test site: RF Site	Temperature：22.6± 0.6℃

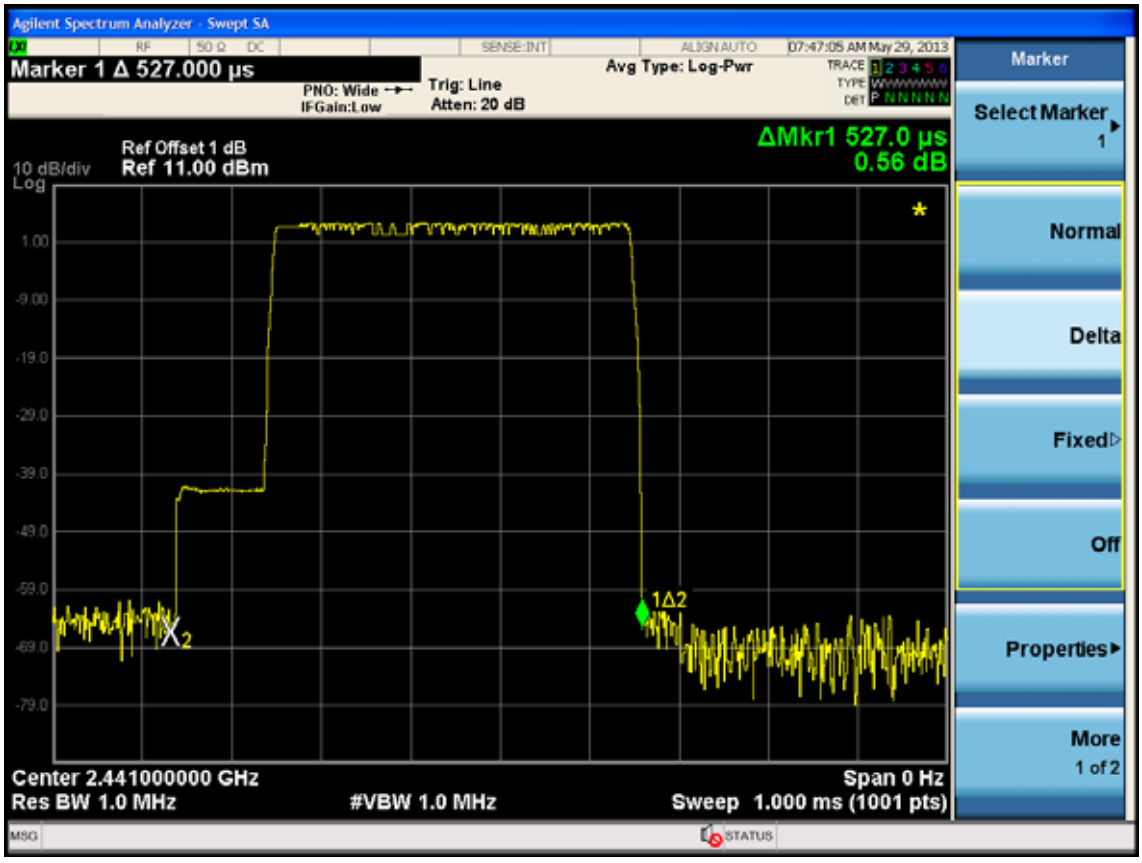
Mode		dwell time	Limit	Conclusion
GFSK	DH1	51ps/5s*0.4*79chanels*0.527 m=169.86264ms	<400ms	PASS
	DH3	26ps/5s*0.4*79chanels*1.788 ms =293.80416ms	<400ms	PASS
	DH5	17hops/5s*0.4*79chanels*3.04ms=326.6176ms	<400ms	PASS
8DPSK	DH1	51hops/5s*0.4*79chanels*0.536ms=172.76352ms	<400ms	PASS
	DH3	25hops/5s*0.4*79chanels*1.797ms =84.688ms	<400ms	PASS
	DH5	16hops/5s*0.4*79chanels*3.075ms =310.944ms	<400ms	PASS

Note: All the lower levels were signal from receiver's, and should not considered in here.

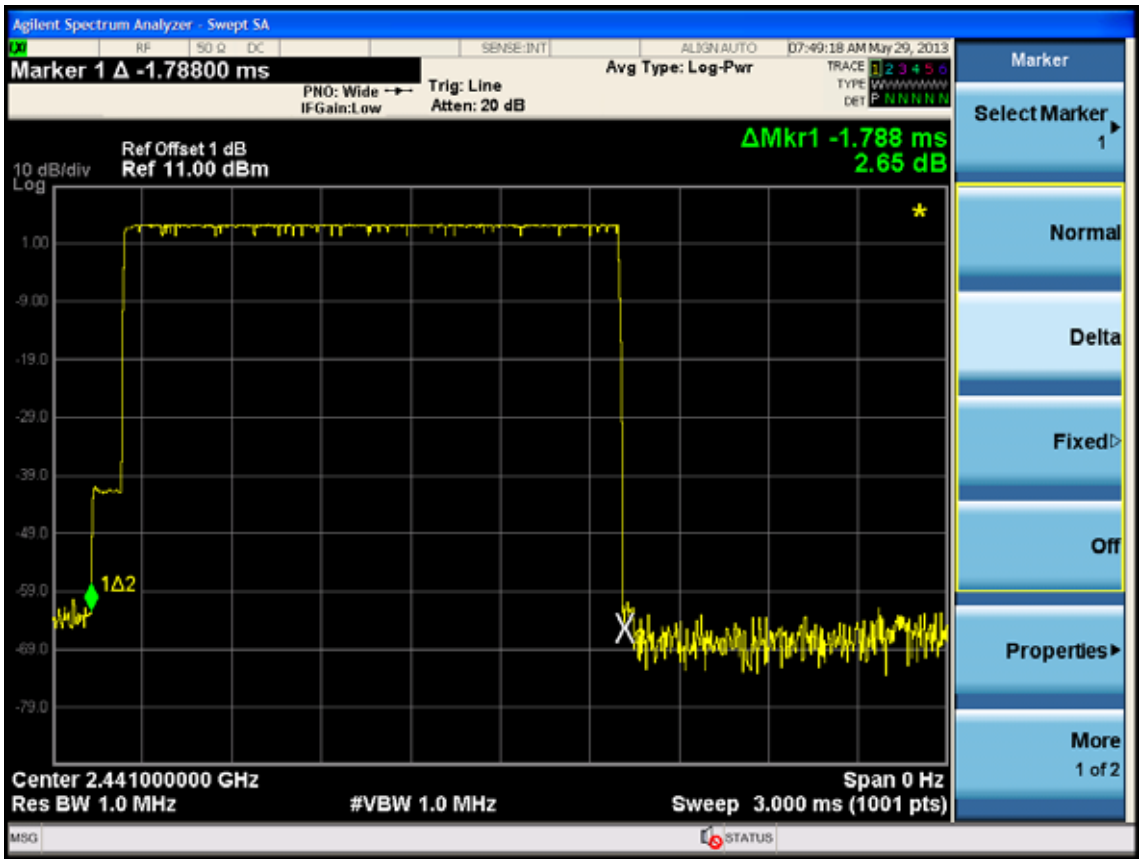
GFSK

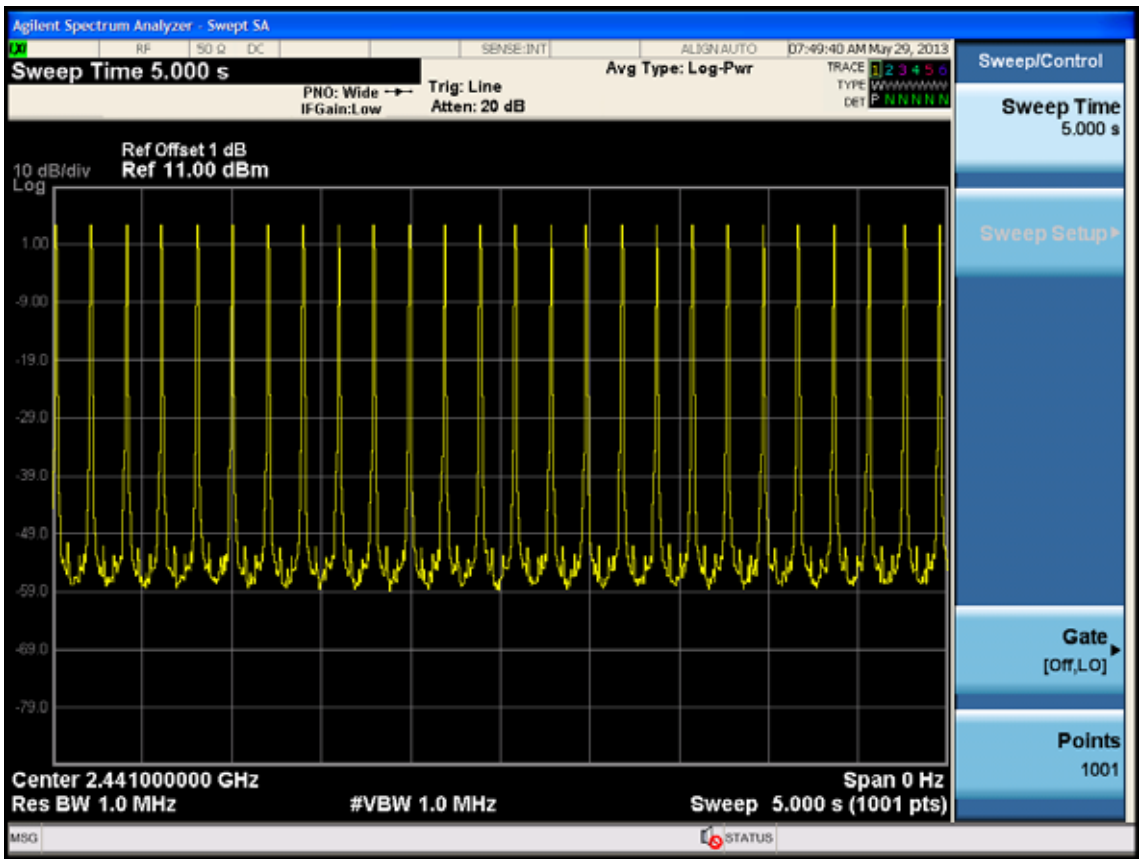
DH 1


Agilent Spectrum Analyzer - Swept SA
Sweep Time 5.000 s
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
07:45:08 AM May 29, 2013
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 5.000 s (1001 pts)
Sweep/Control
Sweep Time
5.000 s
Sweep Setup
Gate
[Off,LO]
Points
1001
MSG
STATUS

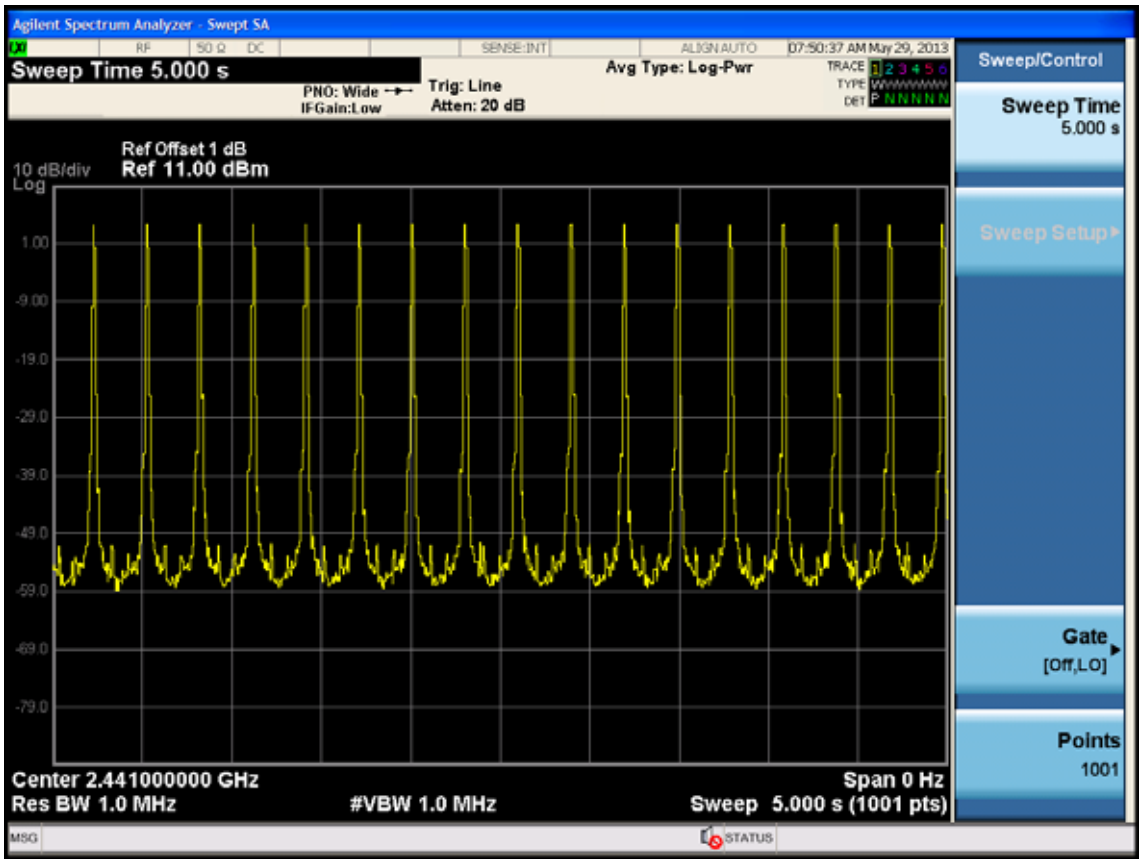

Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 527.000 µs
PNO: Wide
IFGain:Low
Trig: Line
Atten: 20 dB
Avg Type: Log-Pwr
07:47:05 AM May 29, 2013
ΔMkr1 527.0 µs
0.56 dB
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 1.000 ms (1001 pts)
Marker
Select Marker
1
Normal
Delta
Fixed
Off
Properties
More
1 of 2
MSG
STATUS

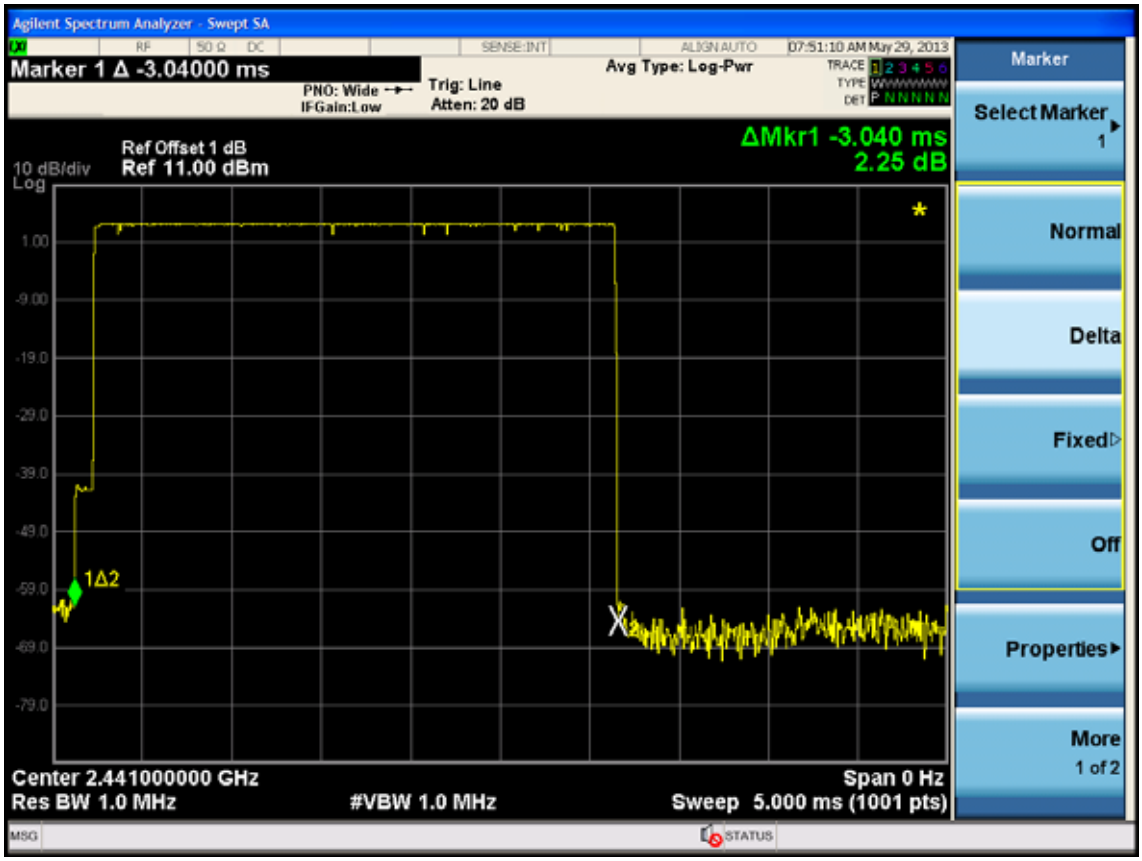
DH 3


Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ -1.78800 ms
PNO: Wide
IFGain:Low
Trig: Line
Atten: 20 dB
Avg Type: Log-Pwr
07:49:18 AM May 29, 2013
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
ΔMkr1 -1.788 ms
2.65 dB
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 3.000 ms (1001 pts)
Marker
Select Marker
1
Normal
Delta
Fixed
Off
Properties
More
1 of 2
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Sweep Time 5.000 s
PNO: Wide
IFGain:Low
Trig: Line
Atten: 20 dB
Avg Type: Log-Pwr
07:49:40 AM May 29, 2013
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 5.000 s (1001 pts)
Sweep/Control
Sweep Time
5.000 s
Sweep Setup
Gate
[Off,LO]
Points
1001
MSG
STATUS

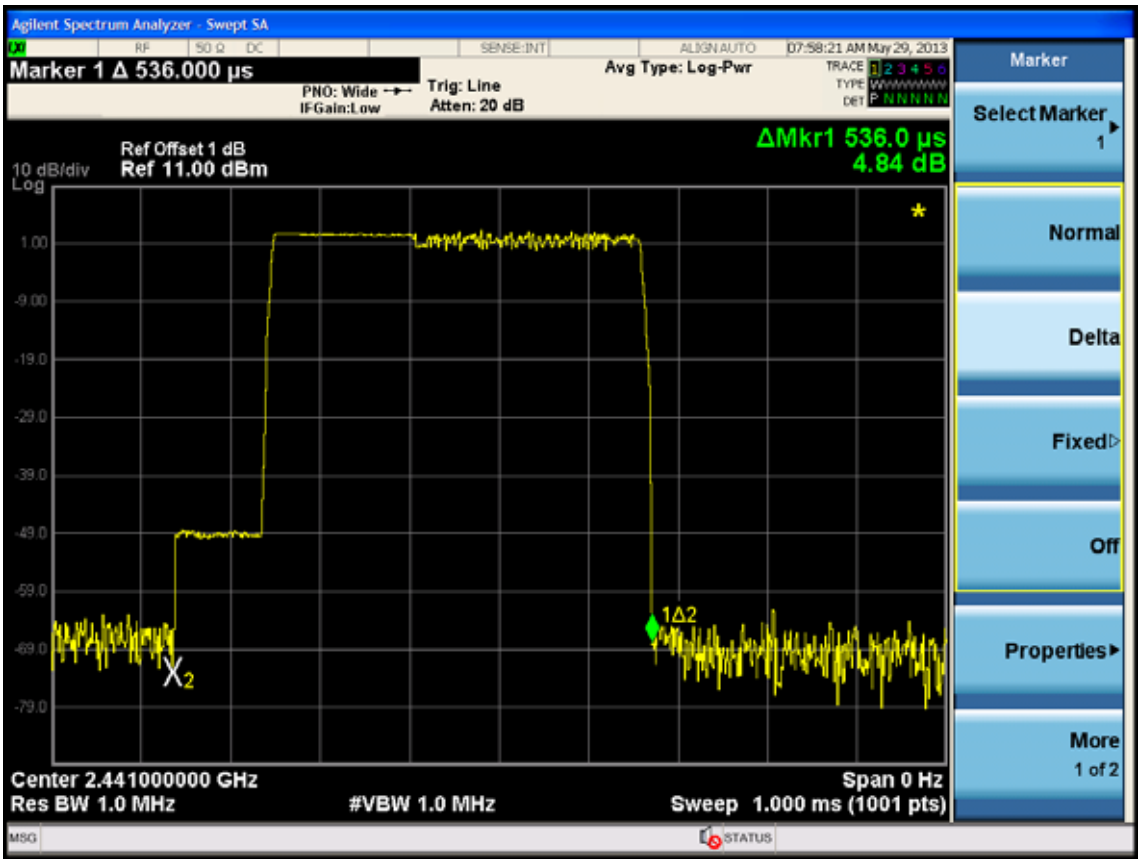
DH 5

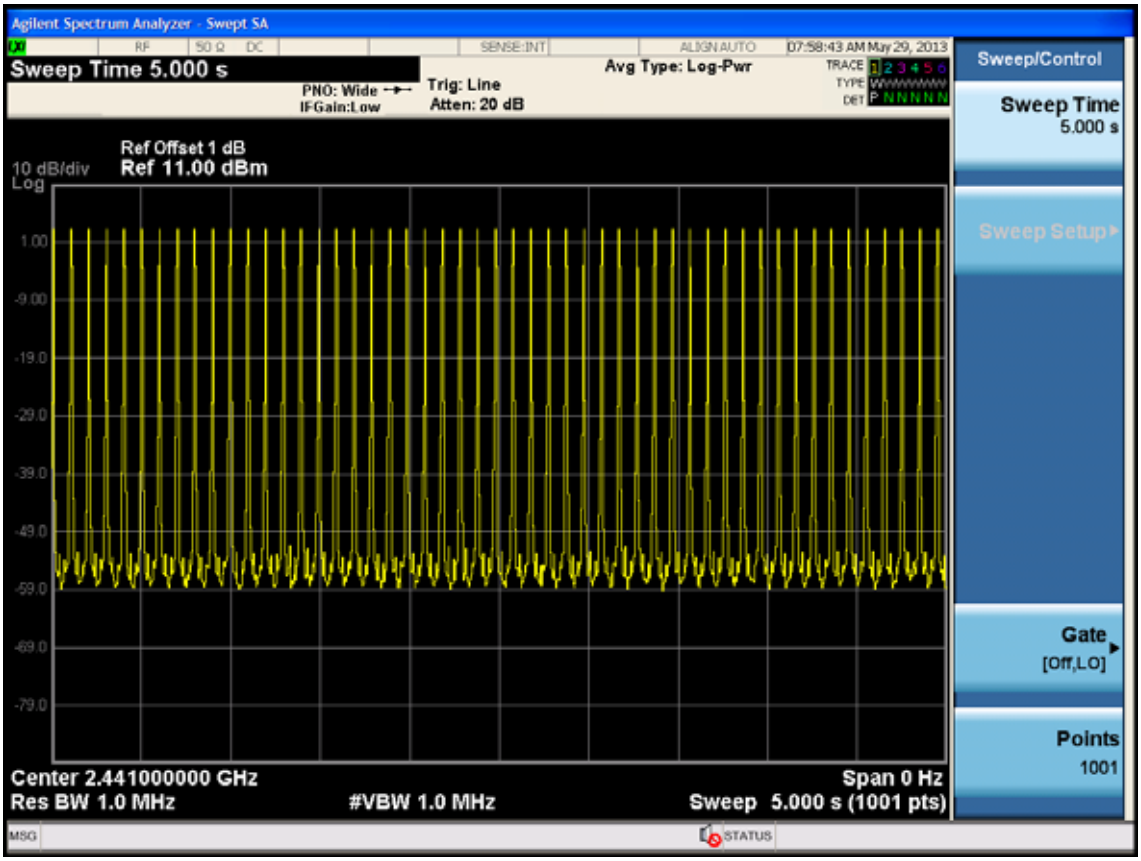

Agilent Spectrum Analyzer - Swept SA
Sweep Time 5.000 s
PNO: Wide
IFGain:Low
Trig: Line
Atten: 20 dB
Avg Type: Log-Pwr
07:50:37 AM May 29, 2013
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 5.000 s (1001 pts)
Sweep/Control
Sweep Time
5.000 s
Sweep Setup
Gate
[Off,LO]
Points
1001


Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ -3.04000 ms
PNO: Wide
IFGain:Low
Trig: Line
Atten: 20 dB
Avg Type: Log-Pwr
07:51:10 AM May 29, 2013
ΔMkr1 -3.040 ms
2.25 dB
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 5.000 ms (1001 pts)
Marker
Select Marker
1
Normal
Delta
Fixed
Off
Properties
More
1 of 2

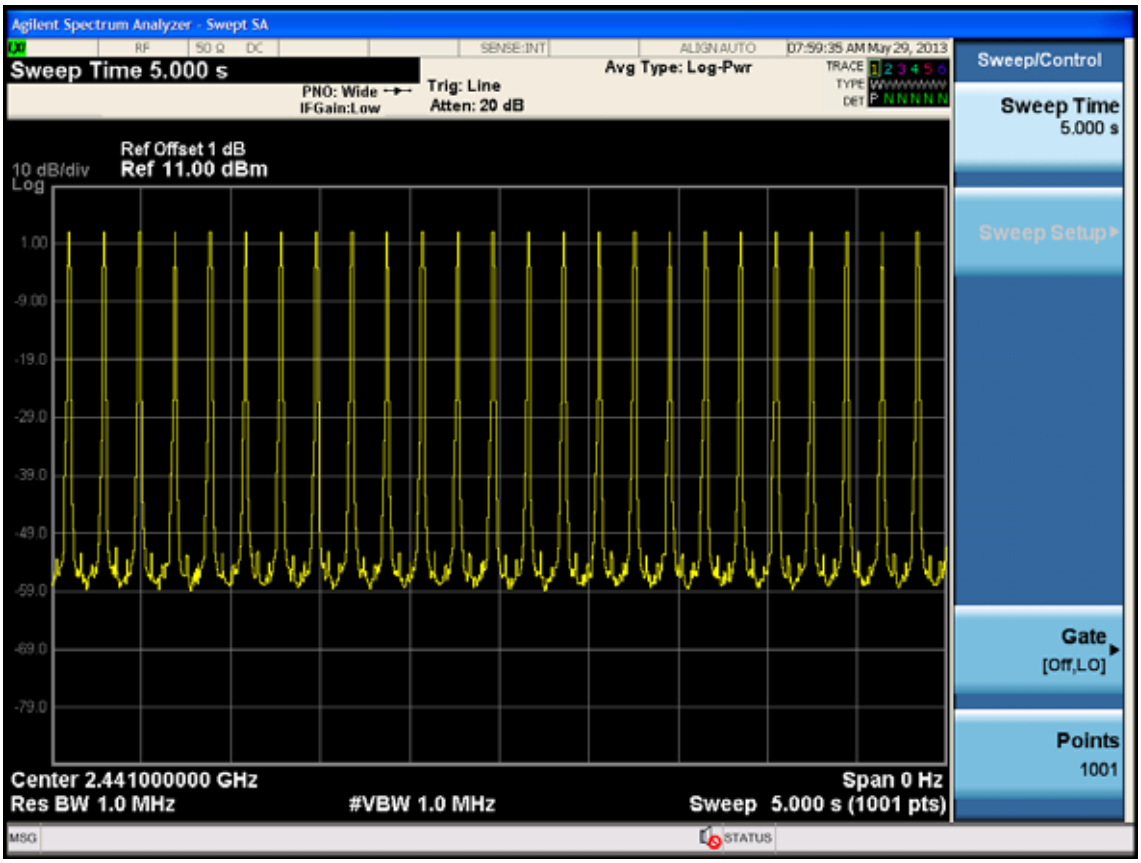
8DPSK

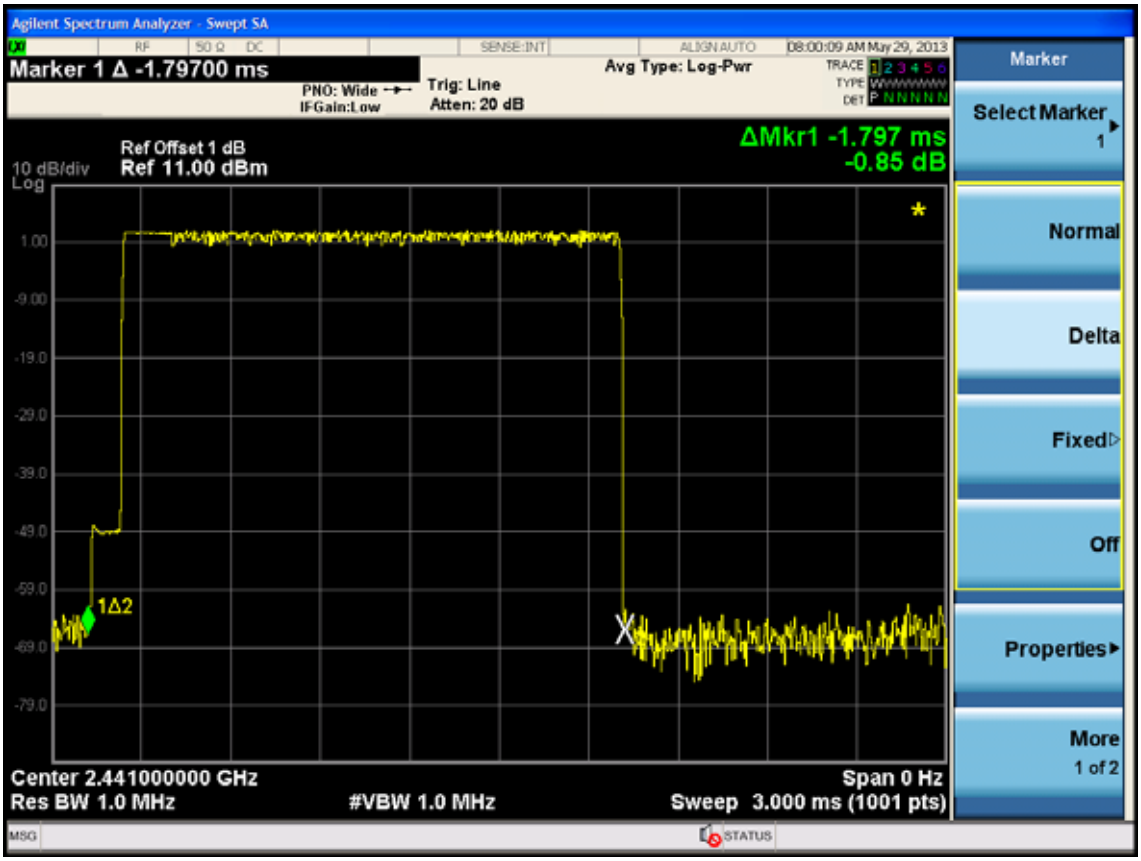
DH 1


Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 536.000 µs
PNO: Wide
IFGain:Low
Trig: Line
Atten: 20 dB
Avg Type: Log-Pwr
07:58:21 AM May 29, 2013
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
ΔMkr1 536.0 µs
4.84 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 1.000 ms (1001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2

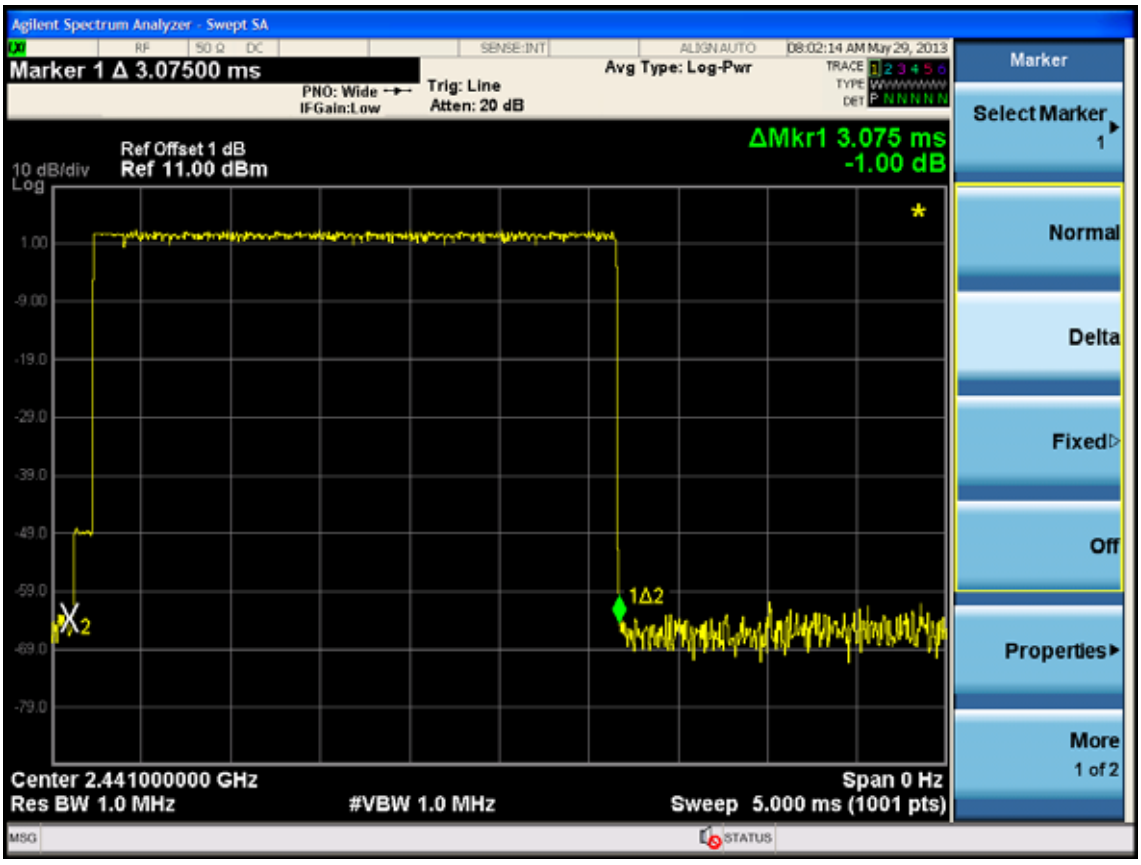

Agilent Spectrum Analyzer - Swept SA
Sweep Time 5.000 s
PNO: Wide
IFGain:Low
Trig: Line
Atten: 20 dB
Avg Type: Log-Pwr
07:58:43 AM May 29, 2013
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 5.000 s (1001 pts)
Sweep/Control
Sweep Time
5.000 s
Sweep Setup
Gate
[Off,LO]
Points
1001

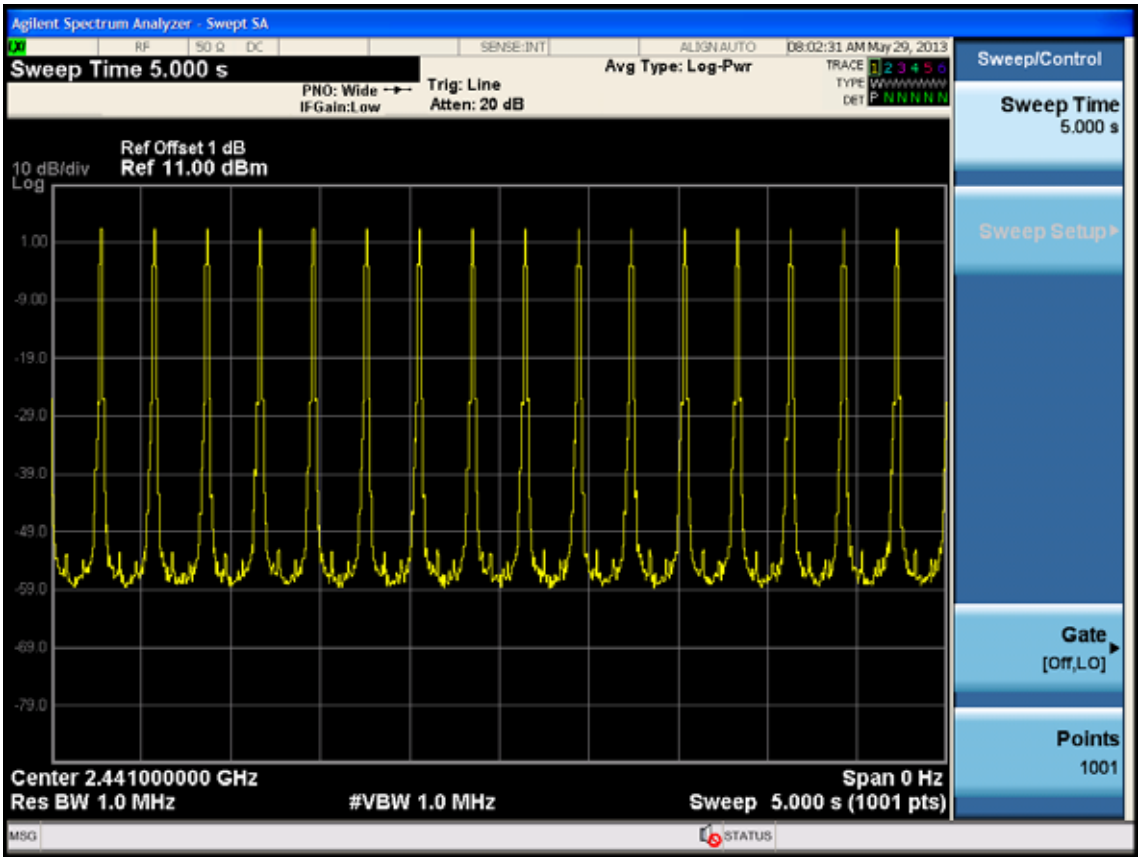
DH 3


Agilent Spectrum Analyzer - Swept SA
Sweep Time 5.000 s
PNO: Wide
IFGain:Low
Trig: Line
Atten: 20 dB
Avg Type: Log-Pwr
07:59:35 AM May 29, 2013
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 5.000 s (1001 pts)
Sweep/Control
Sweep Time
5.000 s
Sweep Setup
Gate
[Off,LO]
Points
1001


Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ -1.79700 ms
PNO: Wide
IFGain:Low
Trig: Line
Atten: 20 dB
Avg Type: Log-Pwr
08:00:09 AM May 29, 2013
ΔMkr1 -1.797 ms
-0.85 dB
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 3.000 ms (1001 pts)
Marker
Select Marker
1
Normal
Delta
Fixed
Off
Properties
More
1 of 2

DH 5


Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 3.07500 ms
PNO: Wide
IFGain:Low
Trig: Line
Atten: 20 dB
Avg Type: Log-Pwr
08:02:14 AM May 29, 2013
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
ΔMkr1 3.075 ms
-1.00 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 5.000 ms (1001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
Sweep Time 5.000 s
PNO: Wide
IFGain:Low
Trig: Line
Atten: 20 dB
Avg Type: Log-Pwr
08:02:31 AM May 29, 2013
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 5.000 s (1001 pts)
Sweep/Control
Sweep Time
5.000 s
Sweep Setup
Gate
[Off,LO]
Points
1001

10.MAXIMUM PEAK OUTPUT POWER TEST

10.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	E4446A	US44300459	May.08, 13	1 Year
2.	Horn Antenna	EMCO	3115	9607-4877	Aug.28, 12	1 Year
3.	Horn Antenna	EMCO	3116	00060089	Aug.28, 12	1 Year
4.	Signal Generator	HP	83732B	VS34490501	May.08, 13	1 Year
5.	Amplifier	Agilent	8491B	3008A02495	May.08, 13	1 Year
6.	RF Cable	Hubersuhner	SUCOFLEX 102	28620/2	May.08, 13	1 Year
7.	RF Cable	Hubersuhner	SUCOFLEX 102	28618/2	May,08, 13	1 Year
8.	RF Cable	Hubersuhner	SUCOFLEX 102	28610/2	May,08, 13	1 Year
9.	RF Cable	Hubersuhner	SUCOFLEX 102	274094/4	May,08, 13	1 Year

10.2.Limit

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

10.3.Test Procedure

1. Connected the EUT's antenna port to spectrum analyzer.
2. Set the RBW> Bandwidth of test Frequency and put the test Frequency, Set the Span large enough to capture the entire signal
3. Use a peak detector on max hold
4. Reading the value from the Spectrum analyzer

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

10.4.Test Results

EUT: Bluetooth Mono Speaker		
M/N: MET1207		
Test date: 2013-06-27	Pressure: 101.2±1.0 kpa	Humidity: 54.3±1.0%
Tested by: Leo-Li	Test site: RF site	Temperature:24.2±1.0 ℃

Test Mode	CH (MHz)	Peak output Power (dBm)	Limit (dBm)
GFSK	2402	-5.594	30
	2441	-6.236	30
	2480	-6.721	30
8DPSK	2402	-7.025	30
	2441	-7.238	30
	2480	-7.346	30

Conclusion: PASS

11.BAND EDGE COMPLIANCE TEST

11.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	E4446A	US44300459	May.08, 13	1 Year
2.	Horn Antenna	EMCO	3115	9607-4877	Aug.28, 12	1Year
3.	Amplifier	Agilent	8449B	3008A02495	May.08, 13	1 Year
4.	RF Cable	Hubersuhner	SUCOFLEX102	28620/2	May.08, 13	1 Year
5.	RF Cable	Hubersuhner	SUCOFLEX102	28618/2	May.08, 13	1 Year
6.	RF Cable	Hubersuhner	SUCOFLEX102	28610/2	May.08, 13	1 Year

11.2.Limit

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

11.3.Test Produce

For upper band emissions that are up to two bandwidths(2MHz) away (2483.5MHz to 2485.5MHz） from the band-edge use below produce:

1. Choose a spectrum analyzer span that encompasses both the peak of the fundamental emission and the band-edge emission under investigation. Set the analyzer RBW to 100KHz and with a video bandwidth 300KHz. Record the peak levels of the fundamental emission and the relevant band-edge emission, Observe the stored trace and measure the amplitude delta between the peak of the fundamental and the peak of the band-edge emission. This is not a field strength measurement, it is only a relative measurement to determine the amount by which the emission drops at the band edge relative to the highest fundamental emission level.
2. Subtract the delta measured in step (1) from the maximum field strengths measured in clause 4 .The resultant field strengths are then used to determine band-edge compliance as required by Section 15.205

For emissions above two bandwidths away from the band-edge use below produce:

1. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.
2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upperband-edges of the emission:

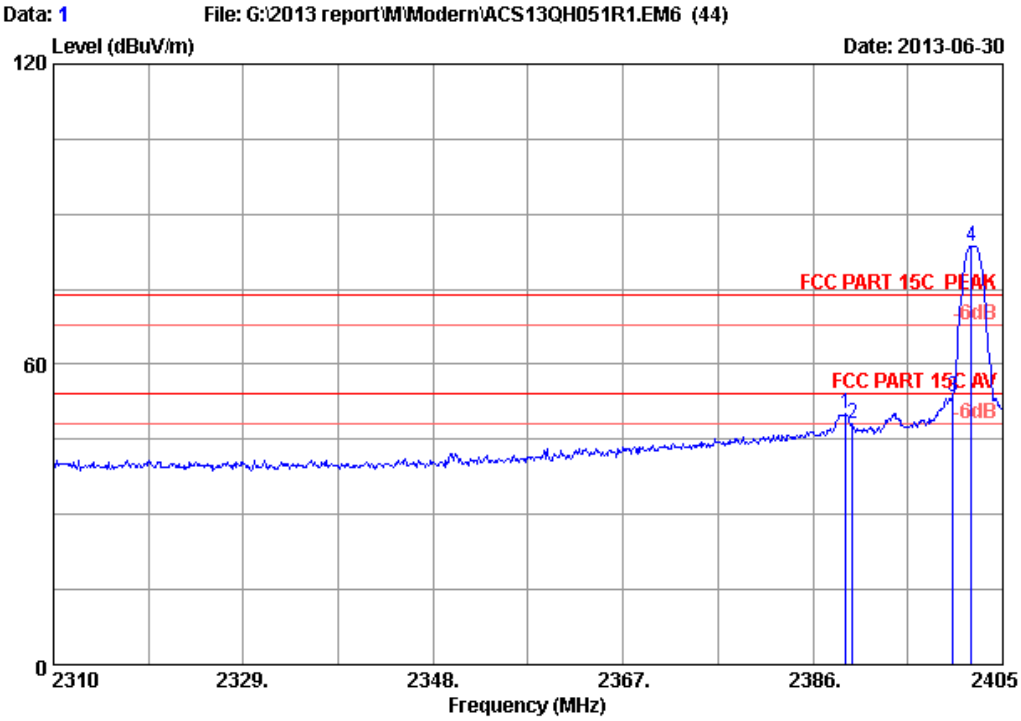
(a) PEAK: RBW=1MHz ;VBW=3MHz, PK detector, Sweep=AUTO

(b)This device is pulse modulated, a duty cycle factor was used to calculate average level based measured peak level

11.4. Test Results

Pass (The testing data was attached in the next pages.)

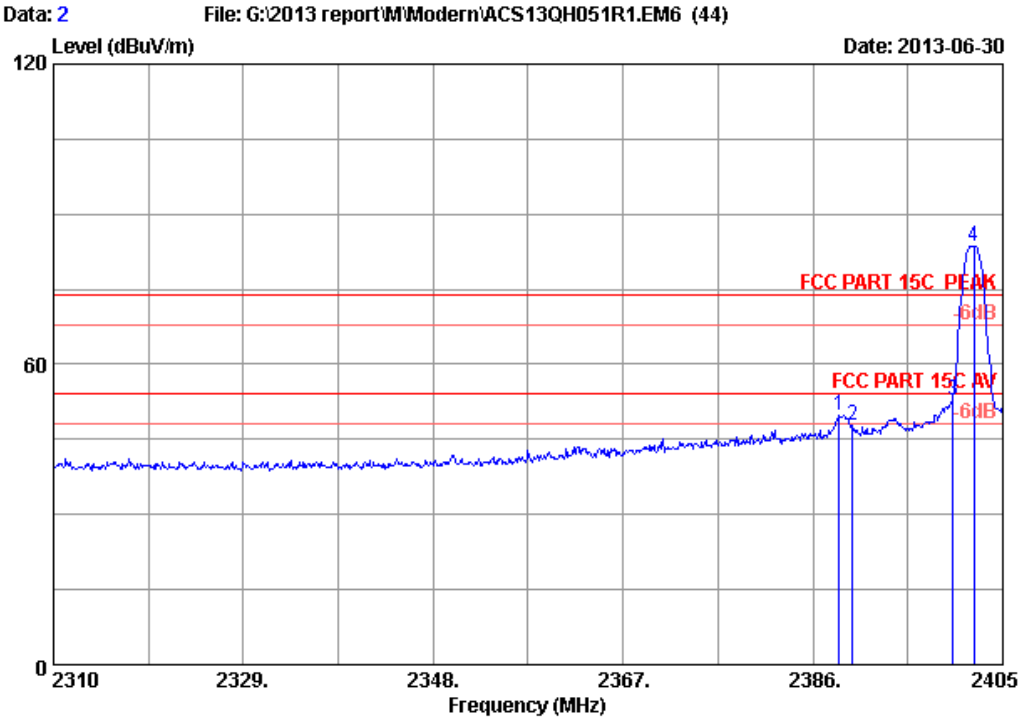
Note: If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.



Site no. : 3m Chamber Data no. : 1
Dis. / Ant. : 3m 2012 3115 (4877) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Bluetooth Mono Speaker
Power supply : DC 5V From PC Input AC 120V/60Hz
Test mode : GFSK 2402MHz Tx
M/N : MET1207
:

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2389.325	23.80	5.78	35.70	56.28	50.16	74.00	23.84	Peak
2	2390.000	23.80	5.78	35.70	54.39	48.27	74.00	25.73	Peak
3	2400.000	23.79	5.80	35.70	59.44	53.33	74.00	20.67	Peak
4	2401.865	23.79	5.80	35.70	89.80	83.69	74.00	-9.69	Peak

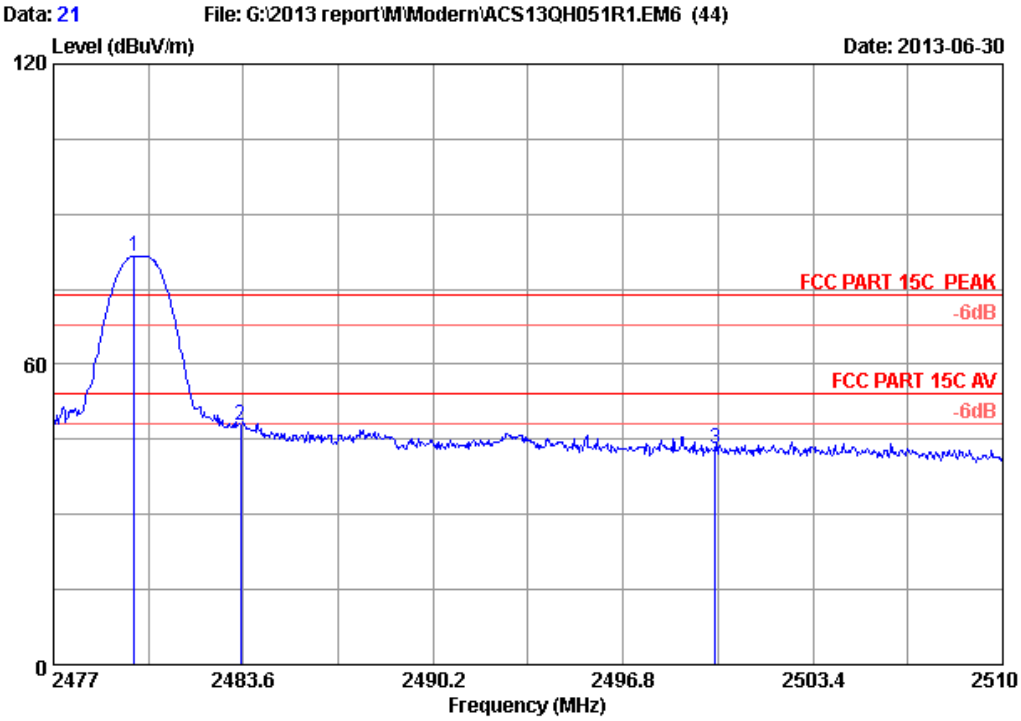
Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 2
Dis. / Ant. : 3m 2012 3115 (4877) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Bluetooth Mono Speaker
Power supply : DC 5V From PC Input AC 120V/60Hz
Test mode : GFSK 2402MHz Tx
M/N : MET1207
:

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2388.660	23.80	5.78	35.70	55.95	49.83	74.00	24.17	Peak
2	2390.000	23.80	5.78	35.70	54.09	47.97	74.00	26.03	Peak
3	2400.000	23.79	5.80	35.70	58.79	52.68	74.00	21.32	Peak
4	2402.150	23.79	5.80	35.70	89.71	83.60	74.00	-9.60	Peak

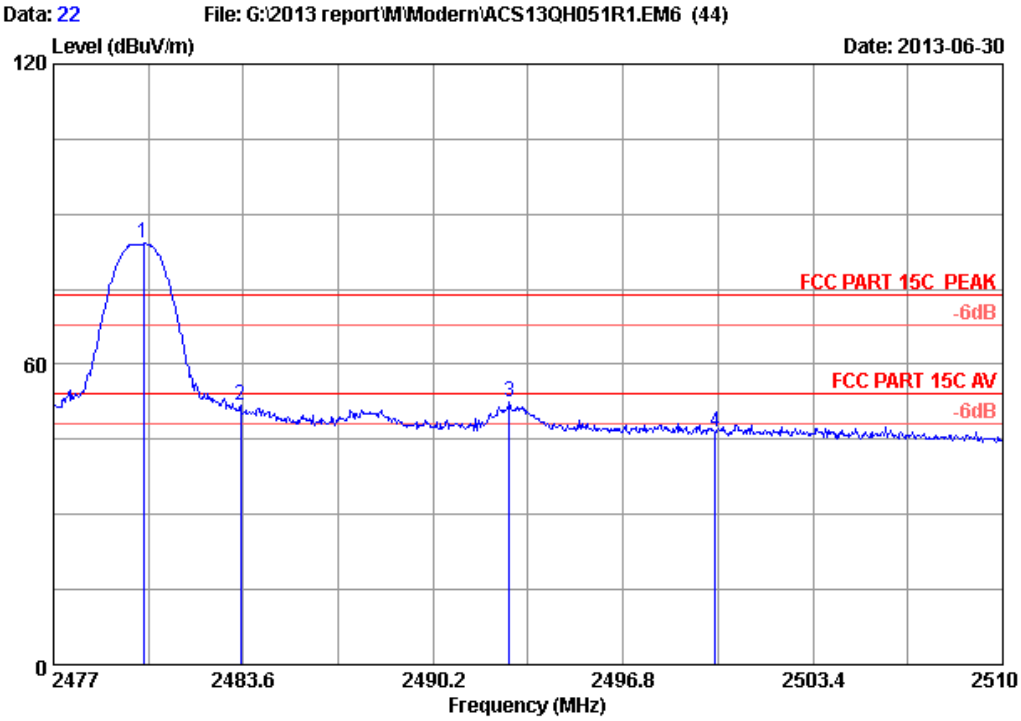
Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 21
Dis. / Ant. : 3m 2012 3115 (4877) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Bluetooth Mono Speaker
Power supply : DC 5V From PC Input AC 120V/60Hz
Test mode : GFSK 2480MHz Tx
M/N : MET1207
:

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.805	23.72	5.91	35.70	87.77	81.70	74.00	-7.70	Peak
2	2483.500	23.71	5.92	35.70	53.84	47.77	74.00	26.23	Peak
3	2500.000	23.70	5.94	35.70	49.32	43.26	74.00	30.74	Peak

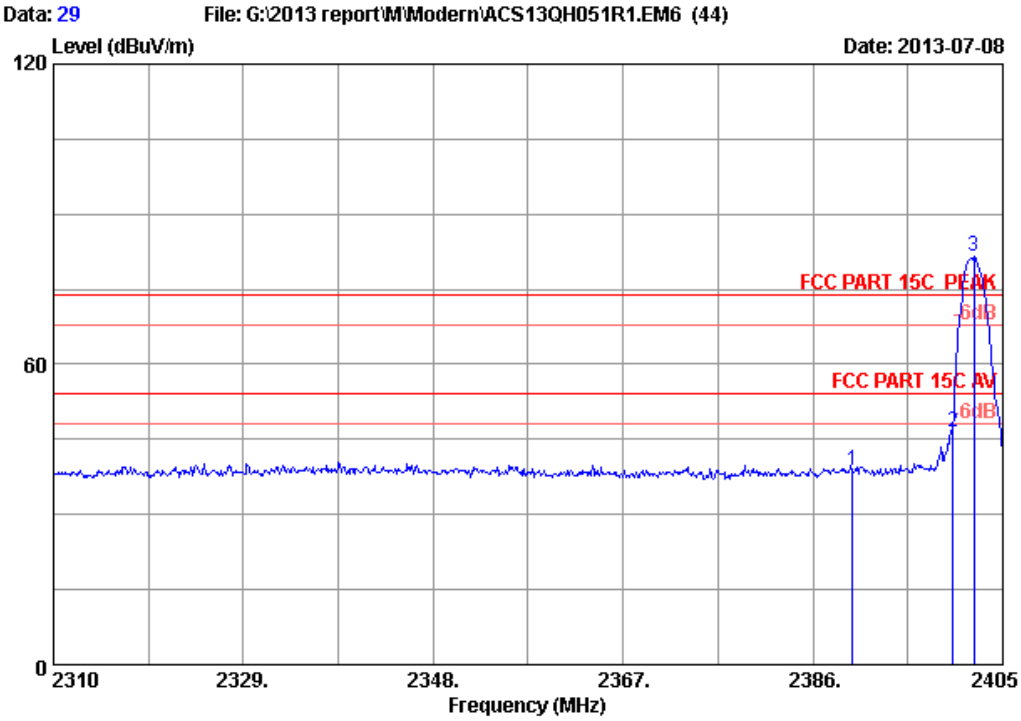
Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 22
Dis. / Ant. : 3m 2012 3115 (4877) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Bluetooth Mono Speaker
Power supply : DC 5V From PC Input AC 120V/60Hz
Test mode : GFSK 2480MHz Tx
M/N : MET1207
:

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.135	23.72	5.91	35.70	90.14	84.07	74.00	-10.07	Peak
2	2483.500	23.71	5.92	35.70	57.82	51.75	74.00	22.25	Peak
3	2492.840	23.71	5.93	35.70	58.43	52.37	74.00	21.63	Peak
4	2500.000	23.70	5.94	35.70	52.43	46.37	74.00	27.63	Peak

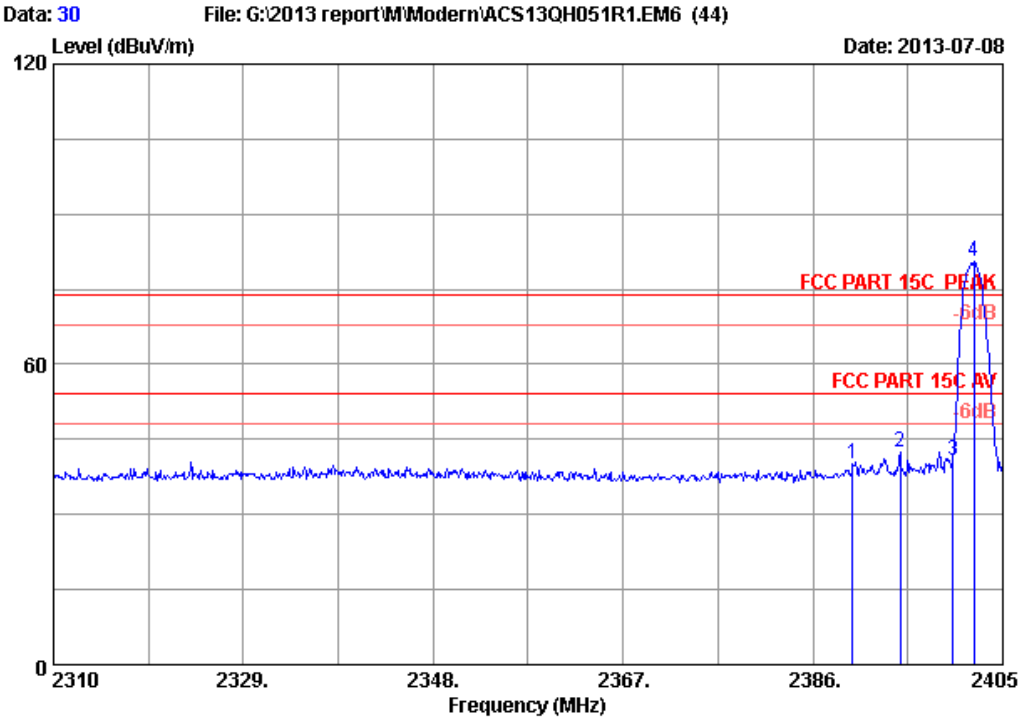
Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 29
Dis. / Ant. : 3m 2012 3115 (4877) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Bluetooth Mono Speaker
Power supply : DC 5V From PC Input AC 120V/60Hz
Test mode : 8-DPSK 2402MHz Tx
M/N : MET1207
:

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	23.80	5.78	35.70	44.89	38.77	74.00	35.23	Peak
2	2400.000	23.79	5.80	35.70	52.63	46.52	74.00	27.48	Peak
3	2402.150	23.79	5.80	35.70	87.53	81.42	74.00	-7.42	Peak

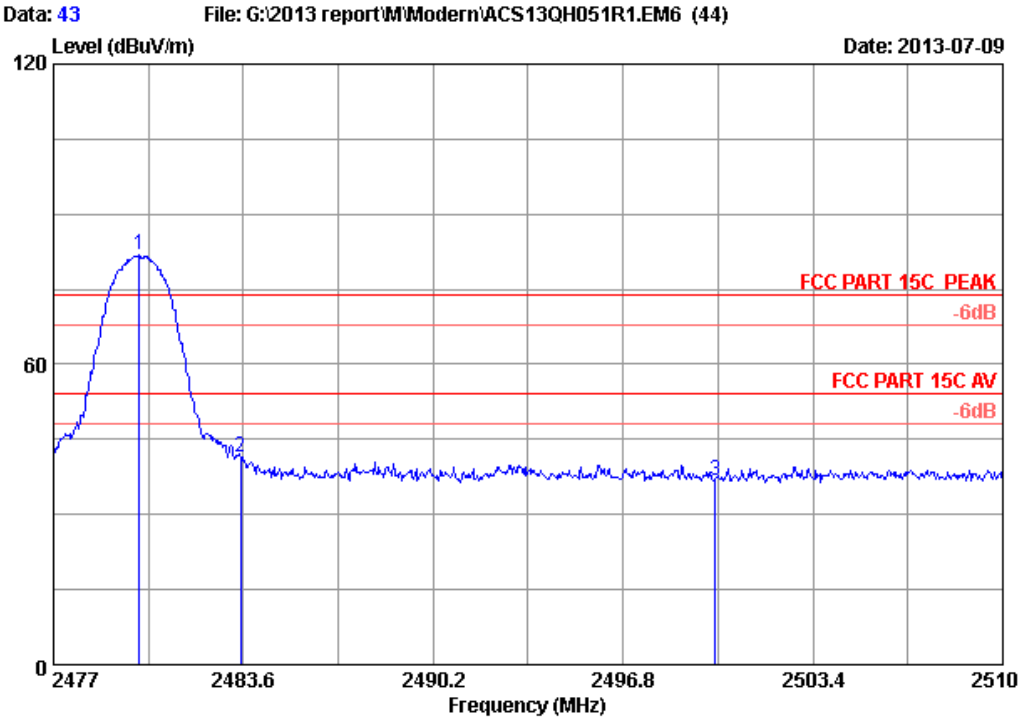
Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 30
Dis. / Ant. : 3m 2012 3115 (4877) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Bluetooth Mono Speaker
Power supply : DC 5V From PC Input AC 120V/60Hz
Test mode : 8-DPSK 2402MHz Tx
M/N : MET1207
:

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	23.80	5.78	35.70	46.27	40.15	74.00	33.85	Peak
2	2394.740	23.80	5.79	35.70	48.72	42.61	74.00	31.39	Peak
3	2400.000	23.79	5.80	35.70	46.74	40.63	74.00	33.37	Peak
4	2402.150	23.79	5.80	35.70	86.72	80.61	74.00	-6.61	Peak

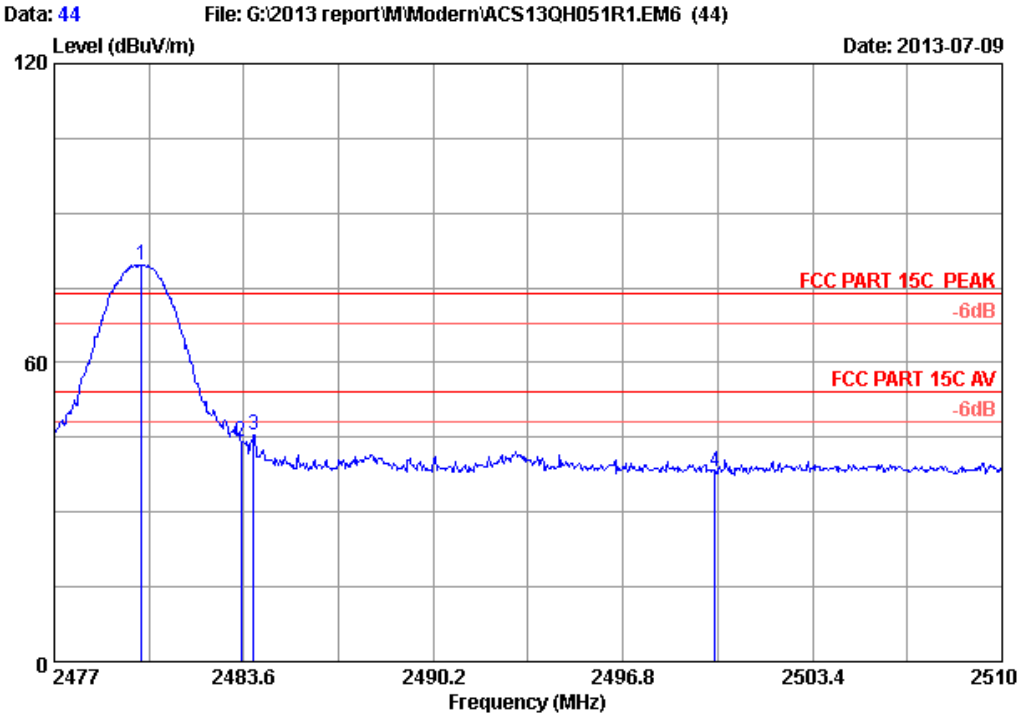
Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 43
Dis. / Ant. : 3m 2012 3115 (4877) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Bluetooth Mono Speaker
Power supply : DC 5V From PC Input AC 120V/60Hz
Test mode : 8-DPSK 2480MHz Tx
M/N : MET1207
:

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.970	23.72	5.91	35.70	87.82	81.75	74.00	-7.75	Peak
2	2483.500	23.71	5.92	35.70	47.58	41.51	74.00	32.49	Peak
3	2500.000	23.70	5.94	35.70	42.76	36.70	74.00	37.30	Peak

Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 44
Dis. / Ant. : 3m 2012 3115 (4877) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Bluetooth Mono Speaker
Power supply : DC 5V From PC Input AC 120V/60Hz
Test mode : 8-DPSK 2480MHz Tx
M/N : MET1207
:

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.036	23.72	5.91	35.70	85.77	79.70	74.00	-5.70	Peak
2	2483.500	23.71	5.92	35.70	50.21	44.14	74.00	29.86	Peak
3	2483.930	23.71	5.92	35.70	51.45	45.38	74.00	28.62	Peak
4	2500.000	23.70	5.94	35.70	44.18	38.12	74.00	35.88	Peak

Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

12. DEVIATION TO TEST SPECIFICATIONS

[NONE]