8. Carrier Frequency Separation

8.1. Test Equipment

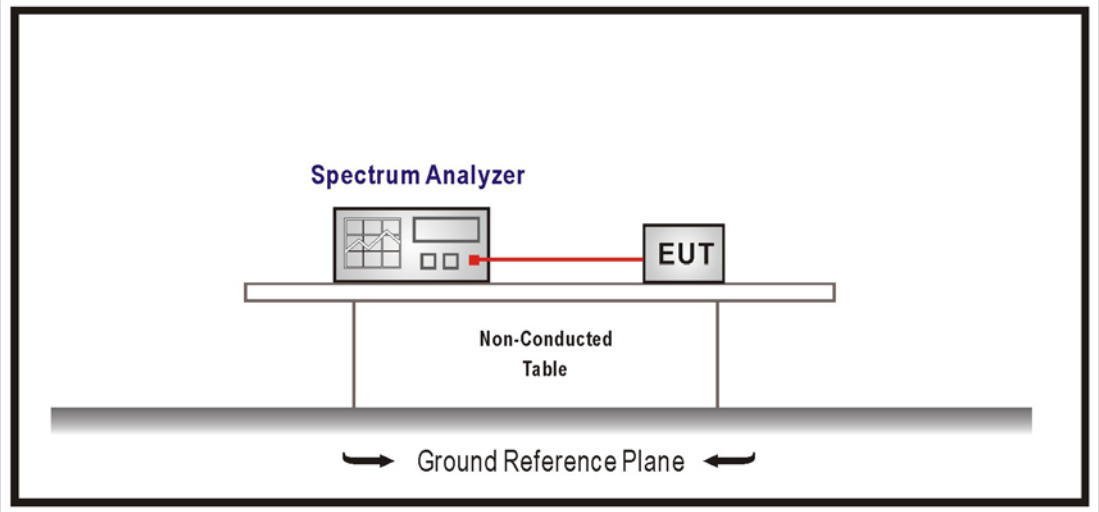
The following test equipment is used during the test:

Carrier Frequency Separation / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2013/07/31

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

8.2. Test Setup



8.3. Limits

For frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

8.4. Test Procedures

The EUT was setup according to ANSI C63.4, 2009 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

Span = wide enough to capture the peaks of two adjacent channels

Resolution Bandwidth (RBW) ≥ 1% of the span, VBW ≥ RBW

Sweep = auto, Detector function = peak, Trace = max hold

8.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2012

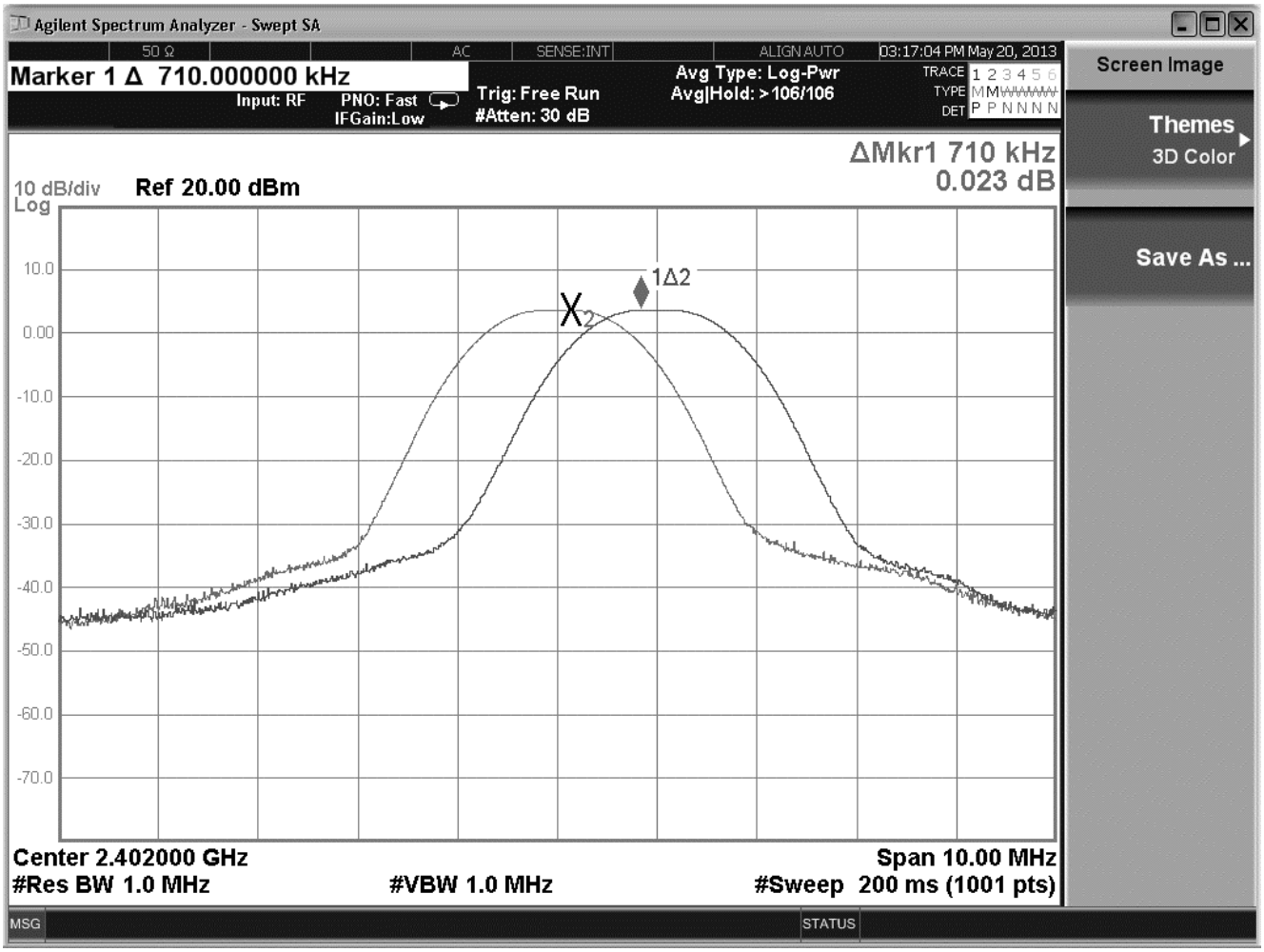
8.6. Test Result

Product	Portable Stereo Speaker		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: Transmit (GFSK)_Power Cable to adapter		
Date of Test	2013/05/20	Test Site	SR7

GFSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402	0.710	0.663	Pass

Channel 00

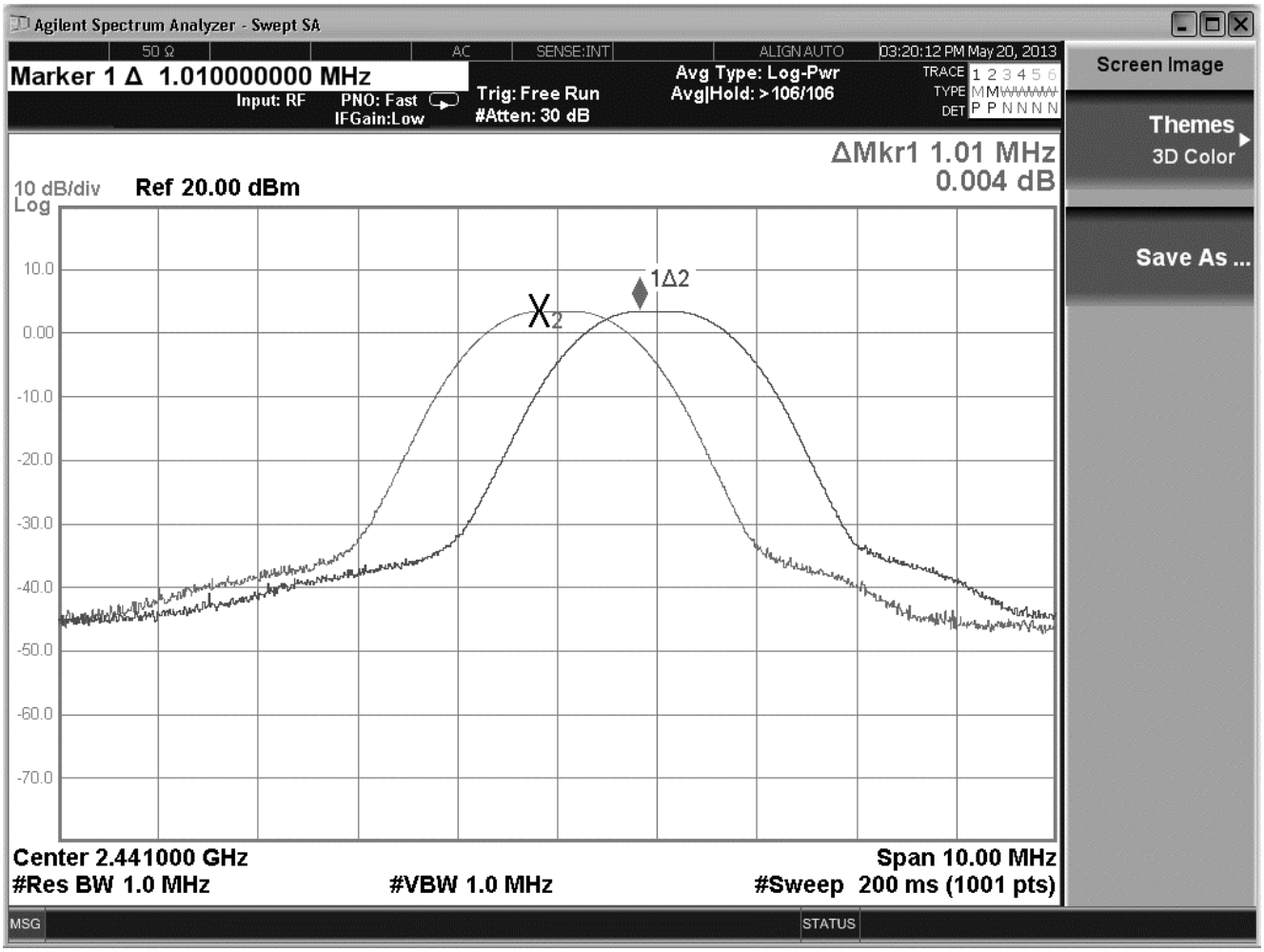


Product	Portable Stereo Speaker		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: Transmit (GFSK)_Power Cable to adapter		
Date of Test	2013/05/20	Test Site	SR7

GFSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441	1.010	0.664	Pass

Channel 39

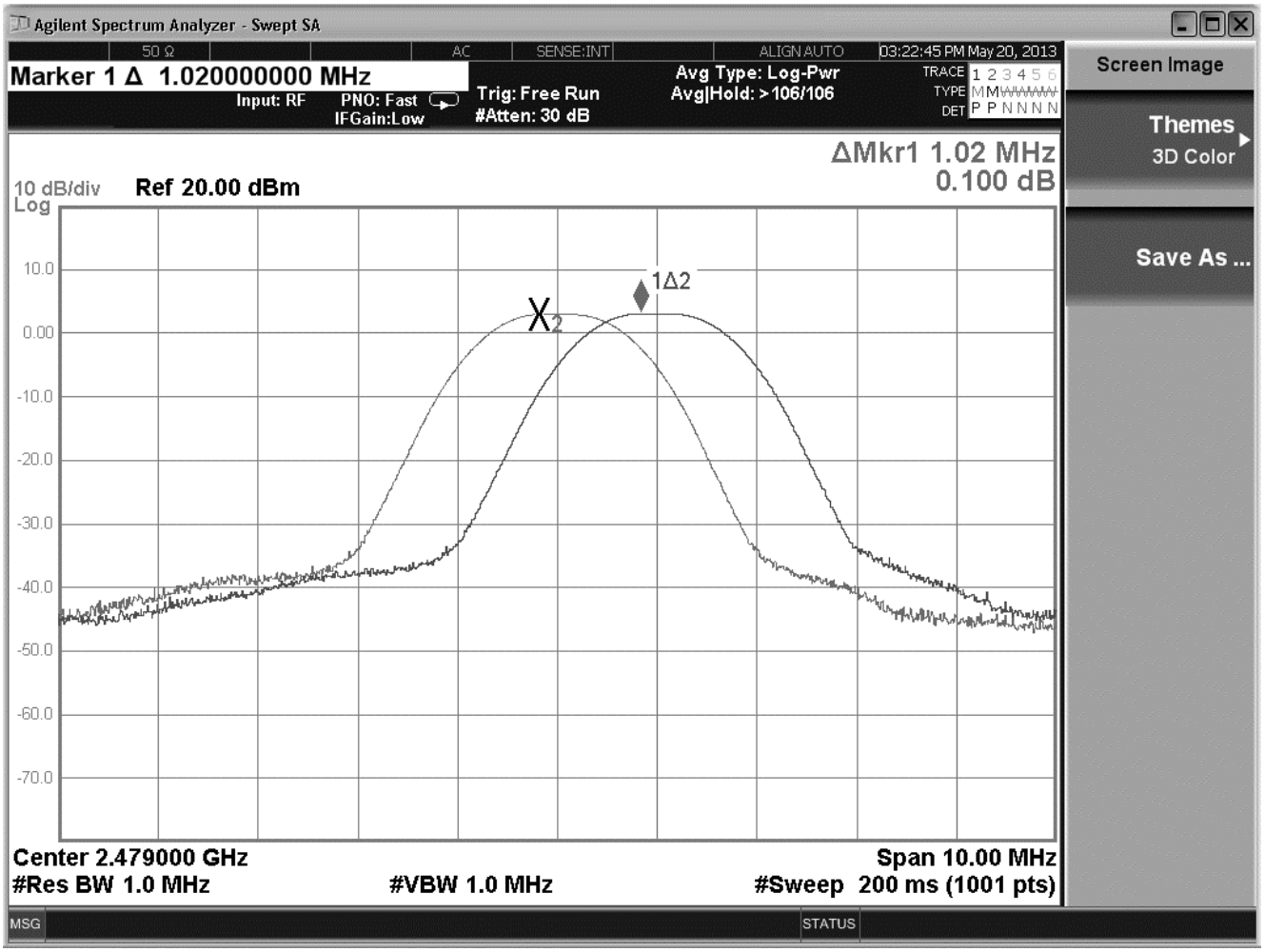


Product	Portable Stereo Speaker		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: Transmit (GFSK)_Power Cable to adapter		
Date of Test	2013/05/20	Test Site	SR7

GFSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480	1.020	0.666	Pass

Channel 78

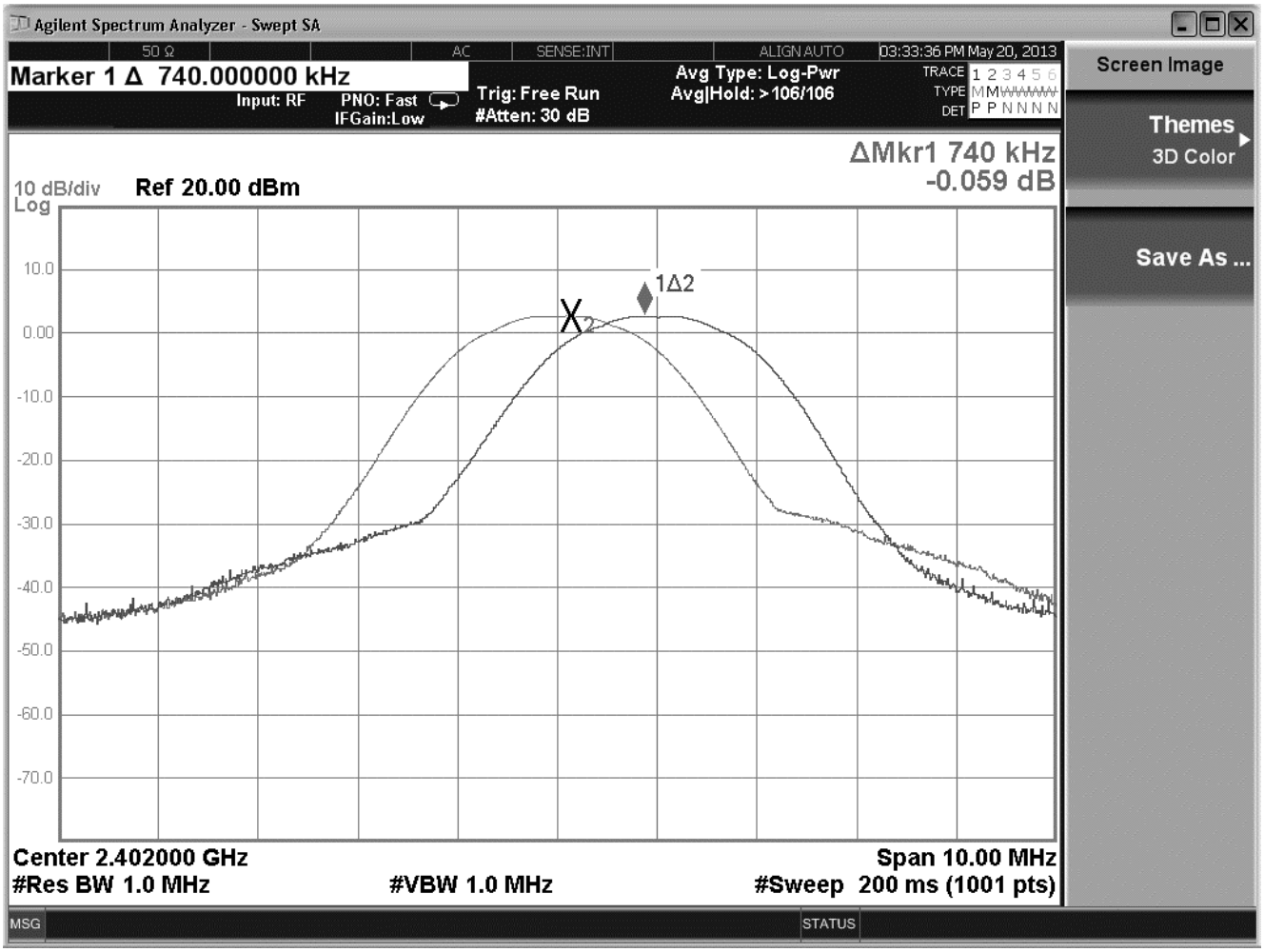


Product	Portable Stereo Speaker		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 2: Transmit (π/4DQPSK)_Power Cable to adapter		
Date of Test	2013/05/20	Test Site	SR7

π/4-DQPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402	0.740	0.720	Pass

Channel 00

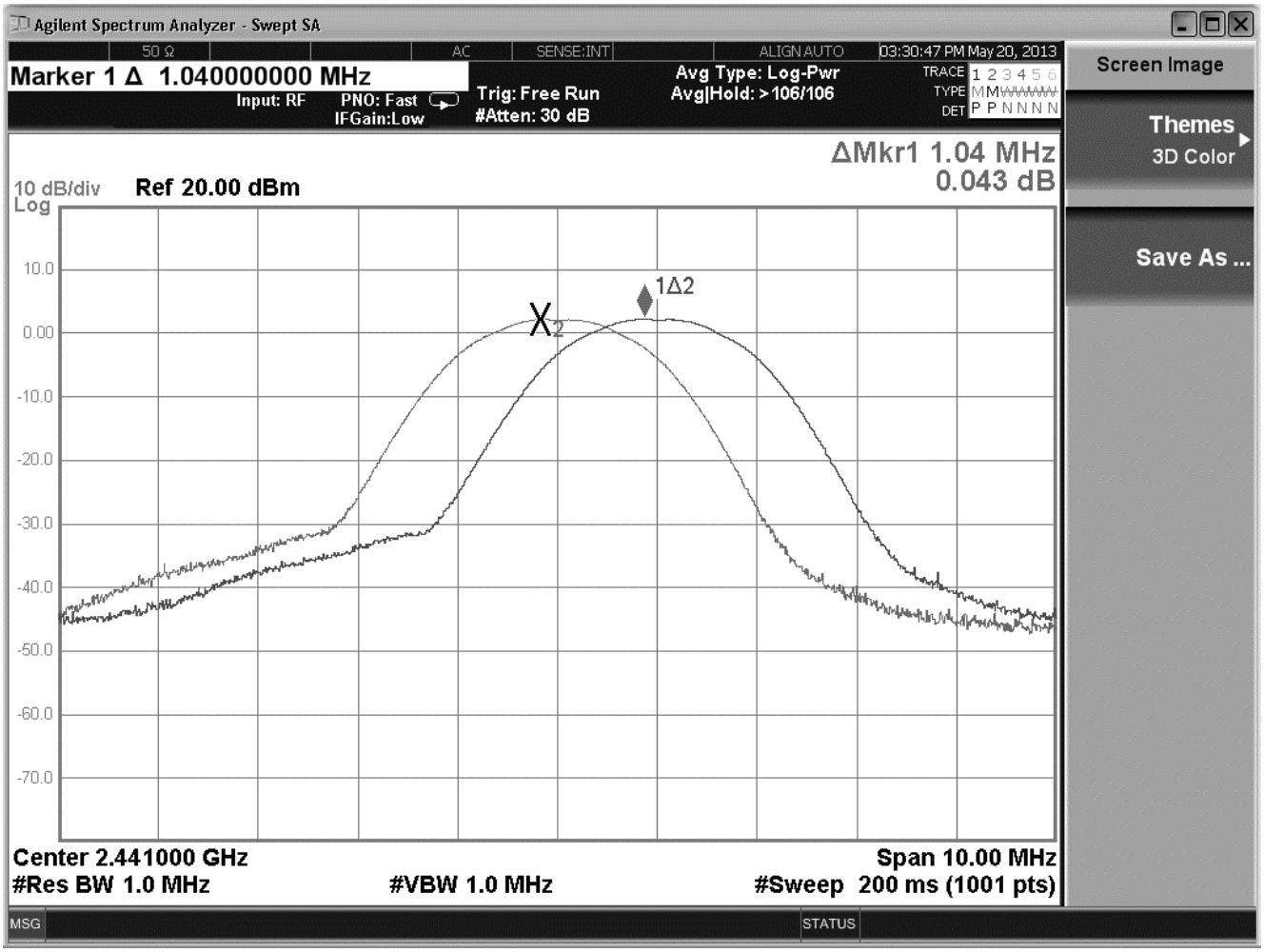


Product	Portable Stereo Speaker		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 2: Transmit (π/4DQPSK)_Power Cable to adapter		
Date of Test	2013/05/20	Test Site	SR7

π/4-DQPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441	1.040	0.720	Pass

Channel 39

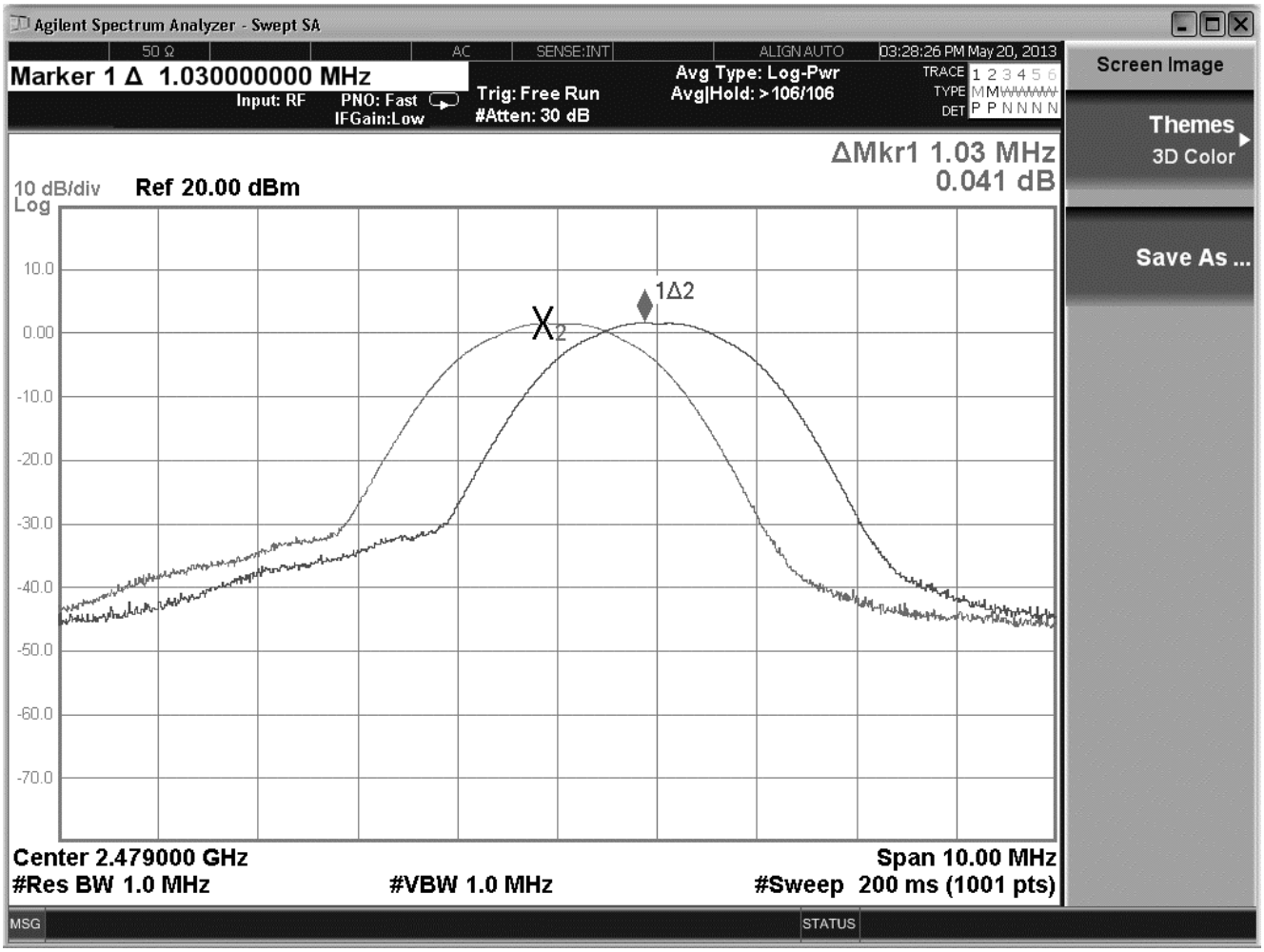


Product	Portable Stereo Speaker		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 2: Transmit (π/4DQPSK)_Power by PC		
Date of Test	2013/05/20	Test Site	SR7

π/4-DQPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480	1.030	0.723	Pass

Channel 78

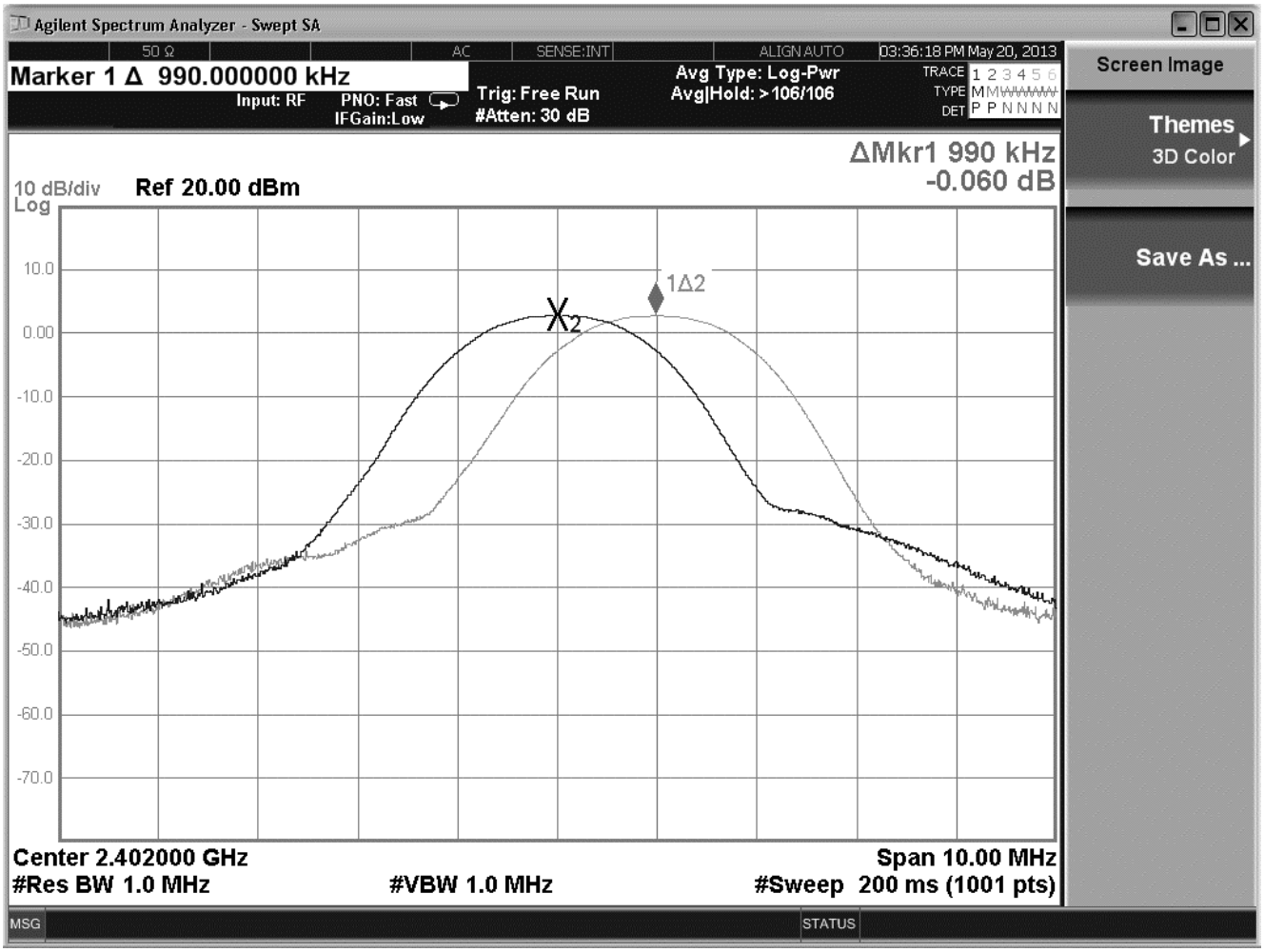


Product	Portable Stereo Speaker		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 3: Transmit (8DPSK)_Power Cable to adapter		
Date of Test	2013/05/20	Test Site	SR7

8-DPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402	0.990	0.909	Pass

Channel 00

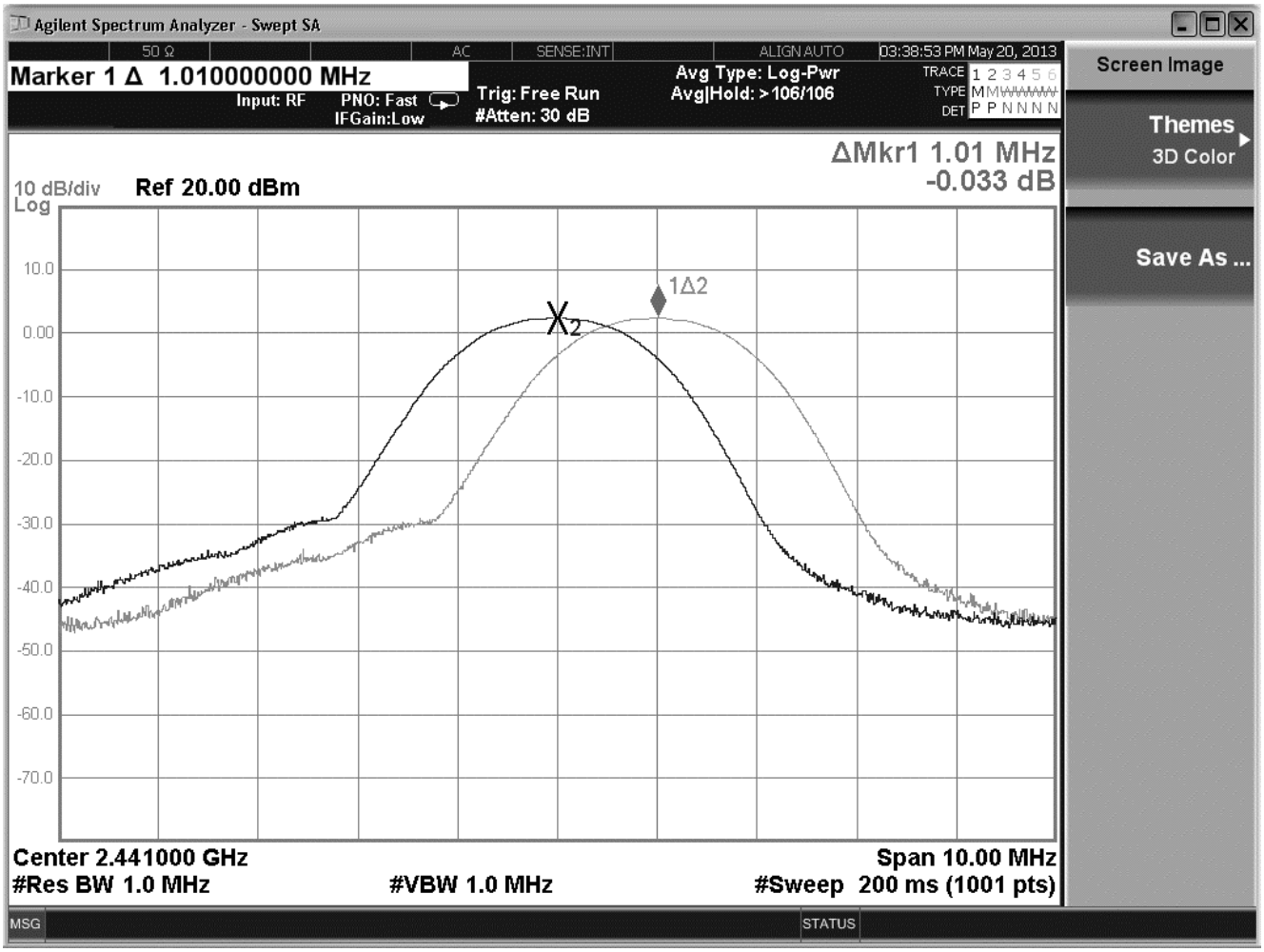


Product	Portable Stereo Speaker		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 3: Transmit (8DPSK)_Power Cable to adapter		
Date of Test	2013/05/20	Test Site	SR7

8-DPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441	1.010	0.906	Pass

Channel 39

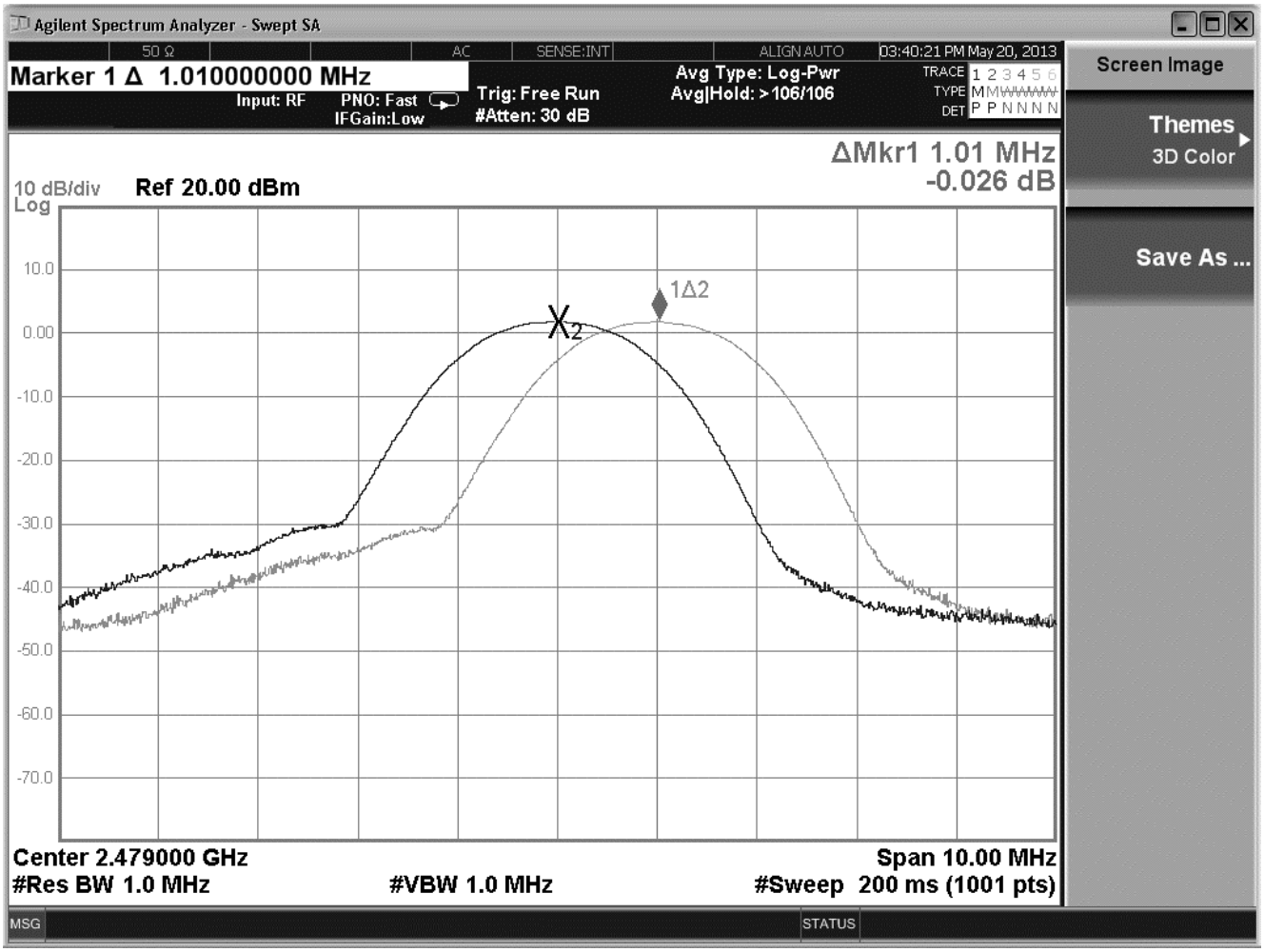


Product	Portable Stereo Speaker		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 3: Transmit (8DPSK)_Power Cable to adapter		
Date of Test	2013/05/20	Test Site	SR7

8-DPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480	1.010	0.906	Pass

Channel 78



9. Occupied Bandwidth

9.1. Test Equipment

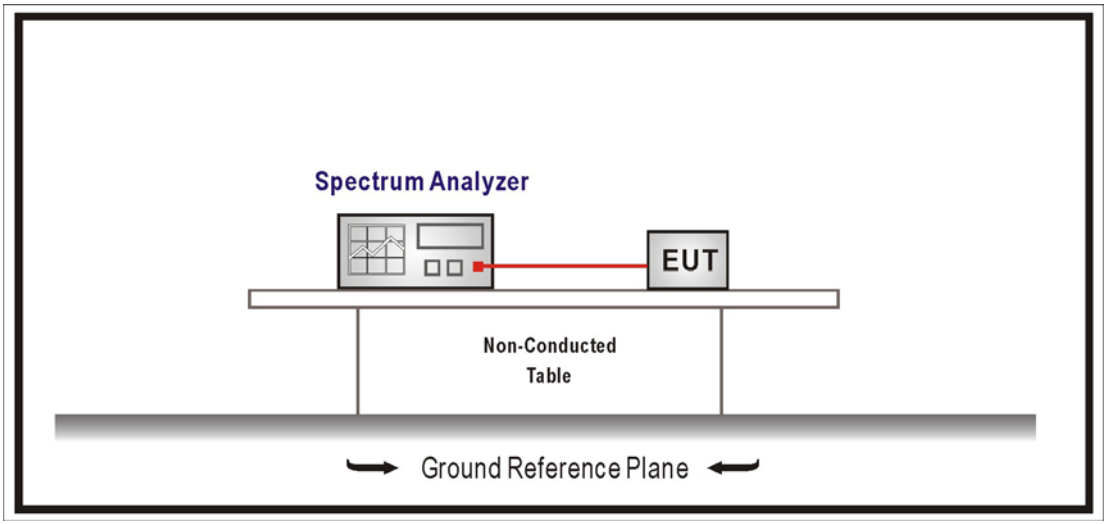
The following test equipment is used during the test:

Occupied Bandwidth / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2013/07/31

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

9.2. Test Setup



9.3. Limits

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.
For frequency hopping systems operating in the 5725-5850 MHz bands. The maximum 20 dB bandwidth of the hopping channel is 1 MHz.
For frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

9.4. Test Procedures

The EUT was setup according to ANSI C63.4, 2009 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements
Use the following spectrum analyzer settings:
Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
RBW ≥ 1% of the 20 dB bandwidth, VBW ≥ RBW
Sweep = auto, Detector function = peak, Trace = max hold
The EUT should be transmitting at its maximum data rate.

9.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2012

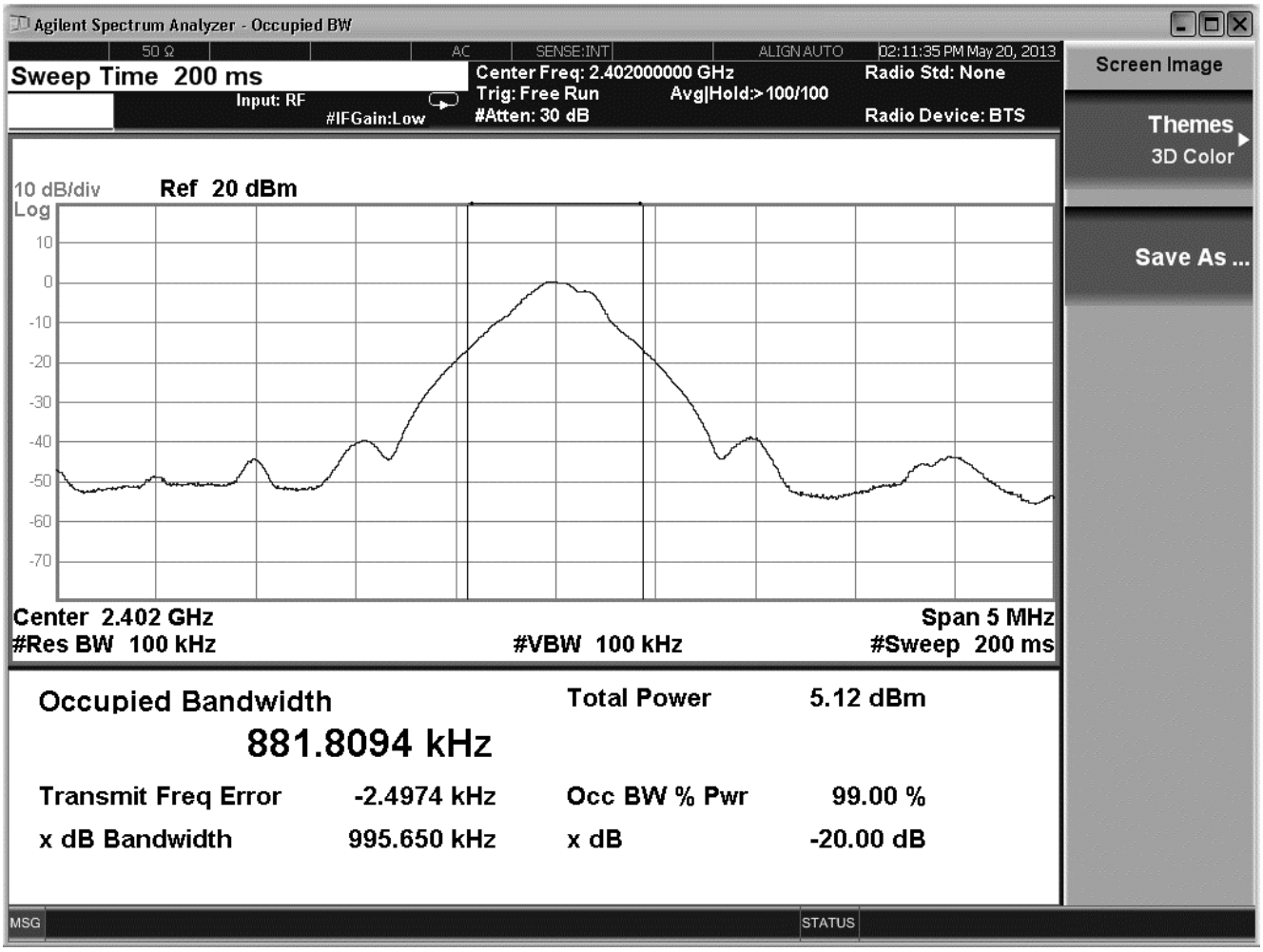
9.6. Test Result

Product	Portable Stereo Speaker		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit (GFSK)_Power Cable to adapter		
Date of Test	2013/05/20	Test Site	SR7

GFSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402	0.995	--	NA

Channel 00

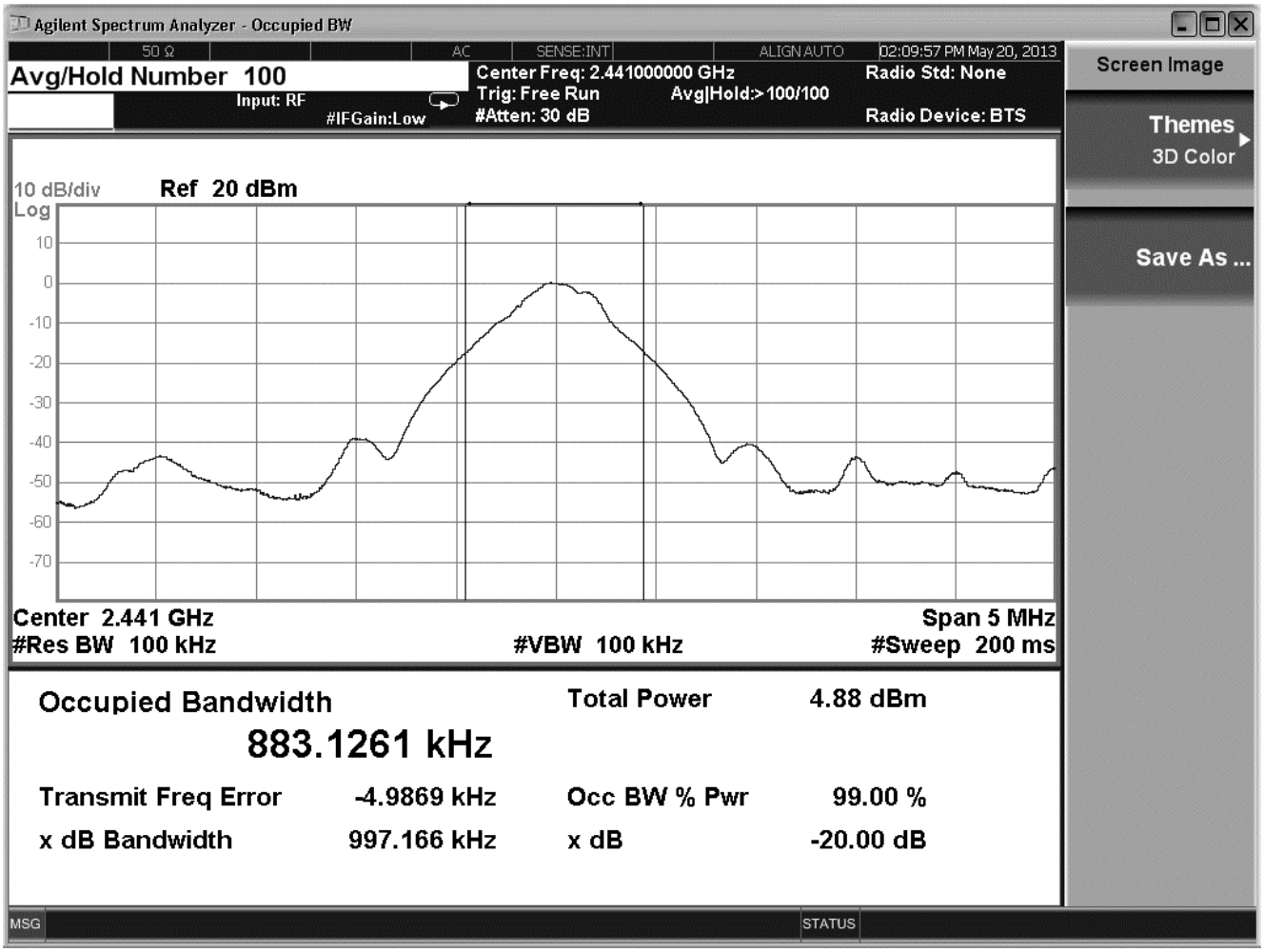


Product	Portable Stereo Speaker		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit (GFSK)_Power Cable to adapter		
Date of Test	2013/05/20	Test Site	SR7

GFSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441	0.997	--	NA

Channel 39

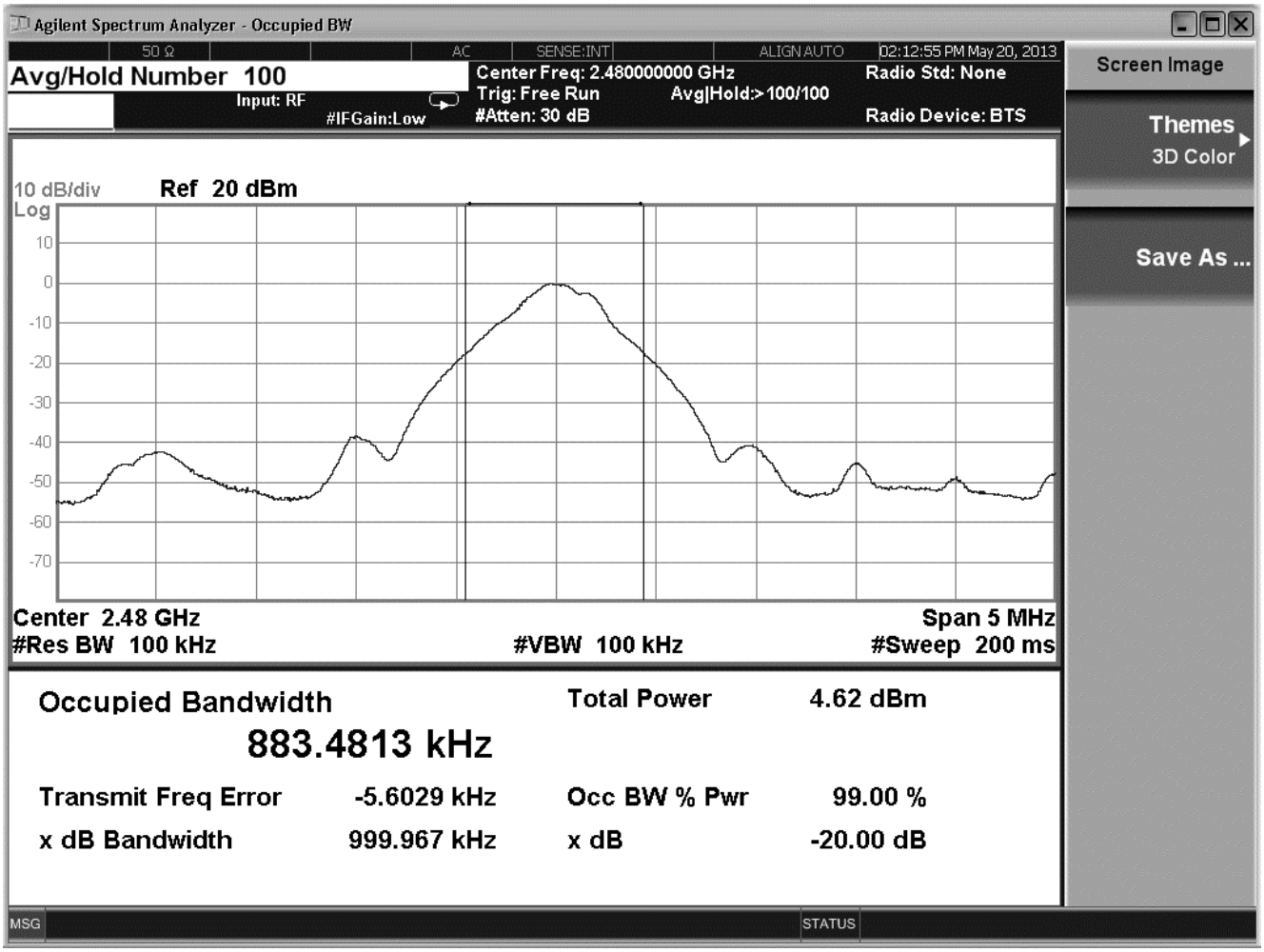


Product	Portable Stereo Speaker		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit (GFSK)_Power Cable to adapter		
Date of Test	2013/05/20	Test Site	SR7

GFSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480	0.999	--	NA

Channel 78

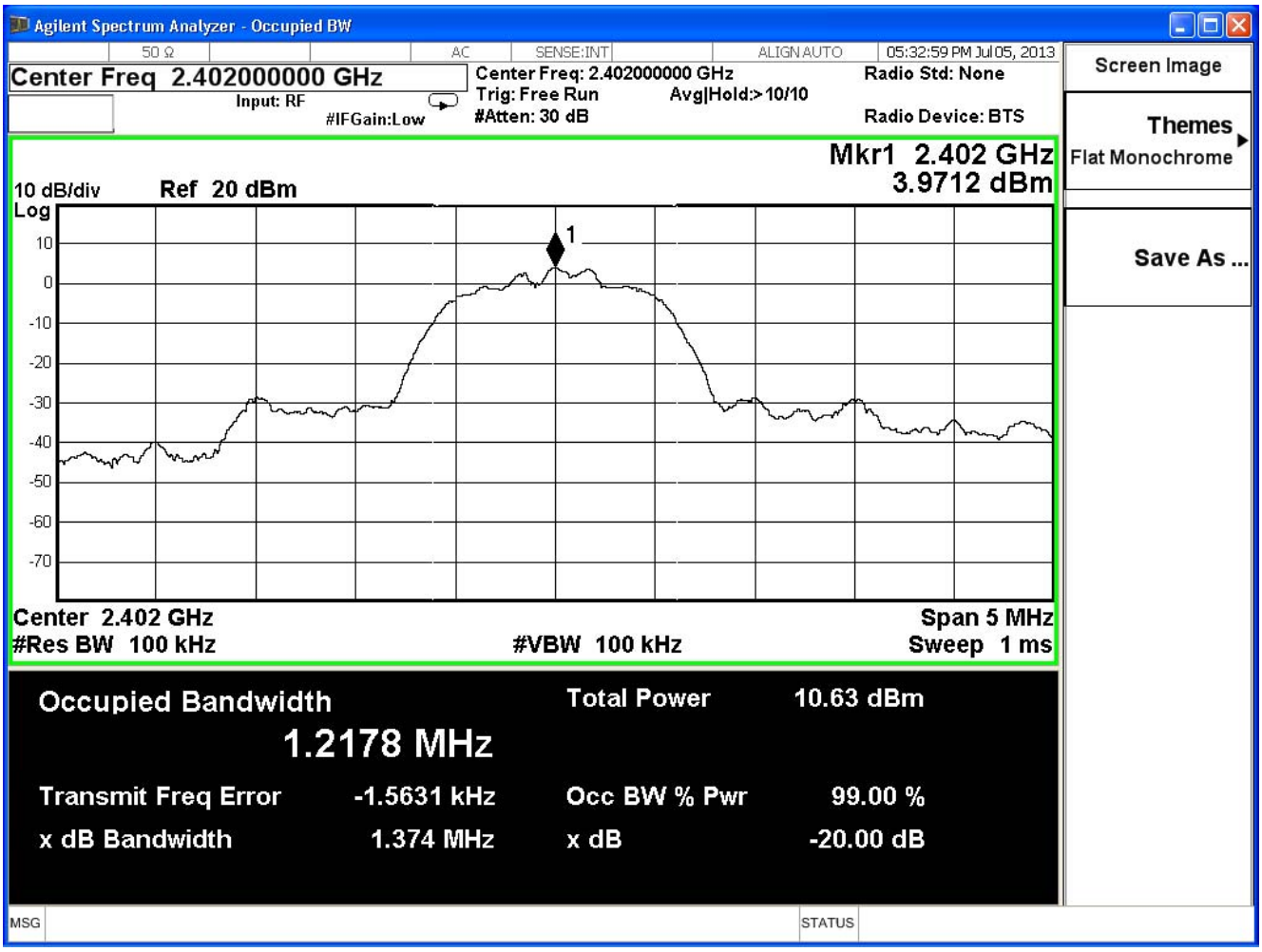


Product	Portable Stereo Speaker		
Test Item	Occupied Bandwidth		
Test Mode	Mode 2: Transmit (π/4DQPSK)_Power Cable to adapter		
Date of Test	2013/07/05	Test Site	SR7

π/4-DQPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402	1.374	--	NA

Channel 00

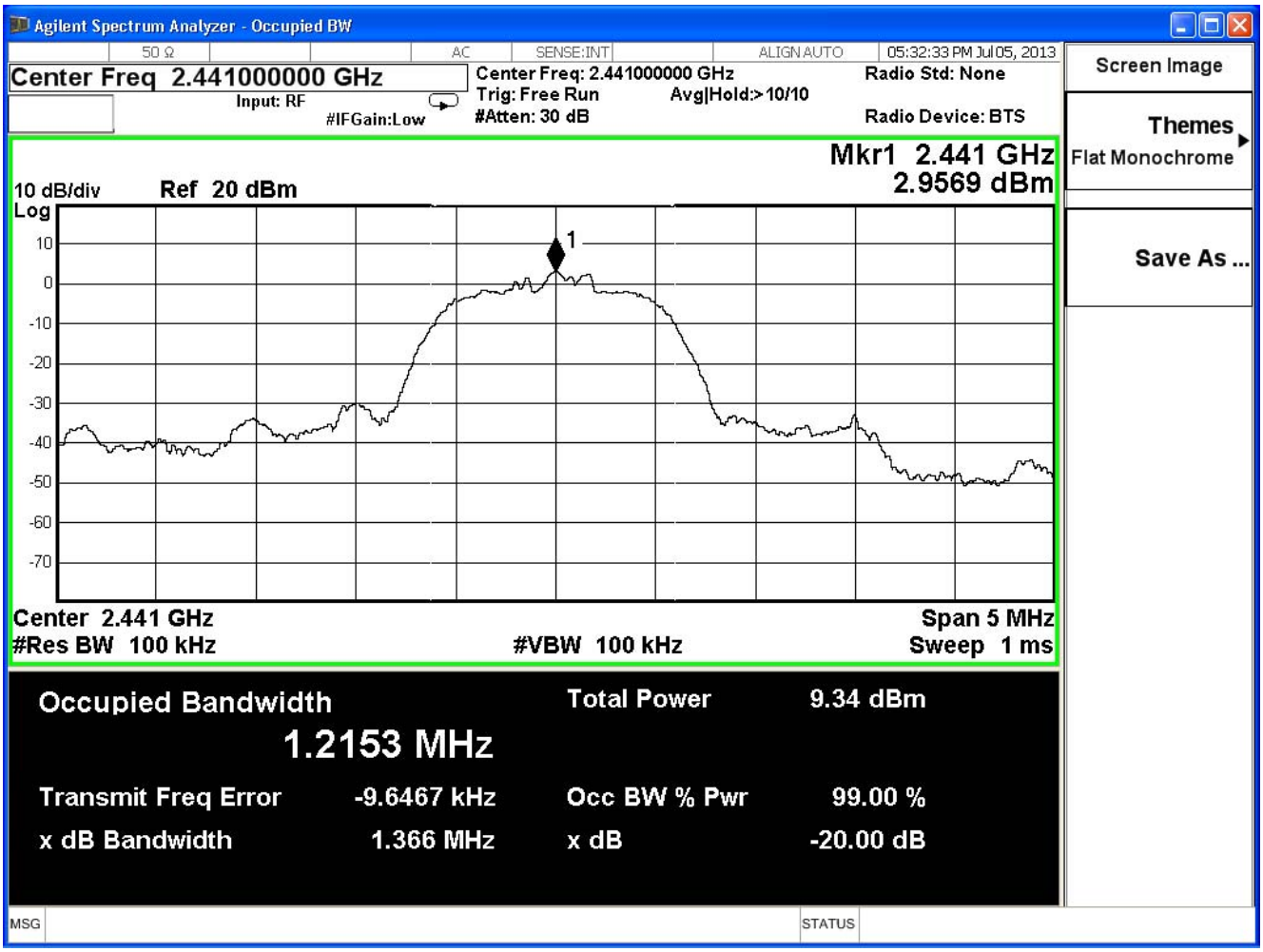


Product	Portable Stereo Speaker		
Test Item	Occupied Bandwidth		
Test Mode	Mode 2: Transmit (π/4DQPSK)_Power by PC		
Date of Test	2013/07/05	Test Site	SR7

π/4-DQPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441	1.366	--	NA

Channel 39

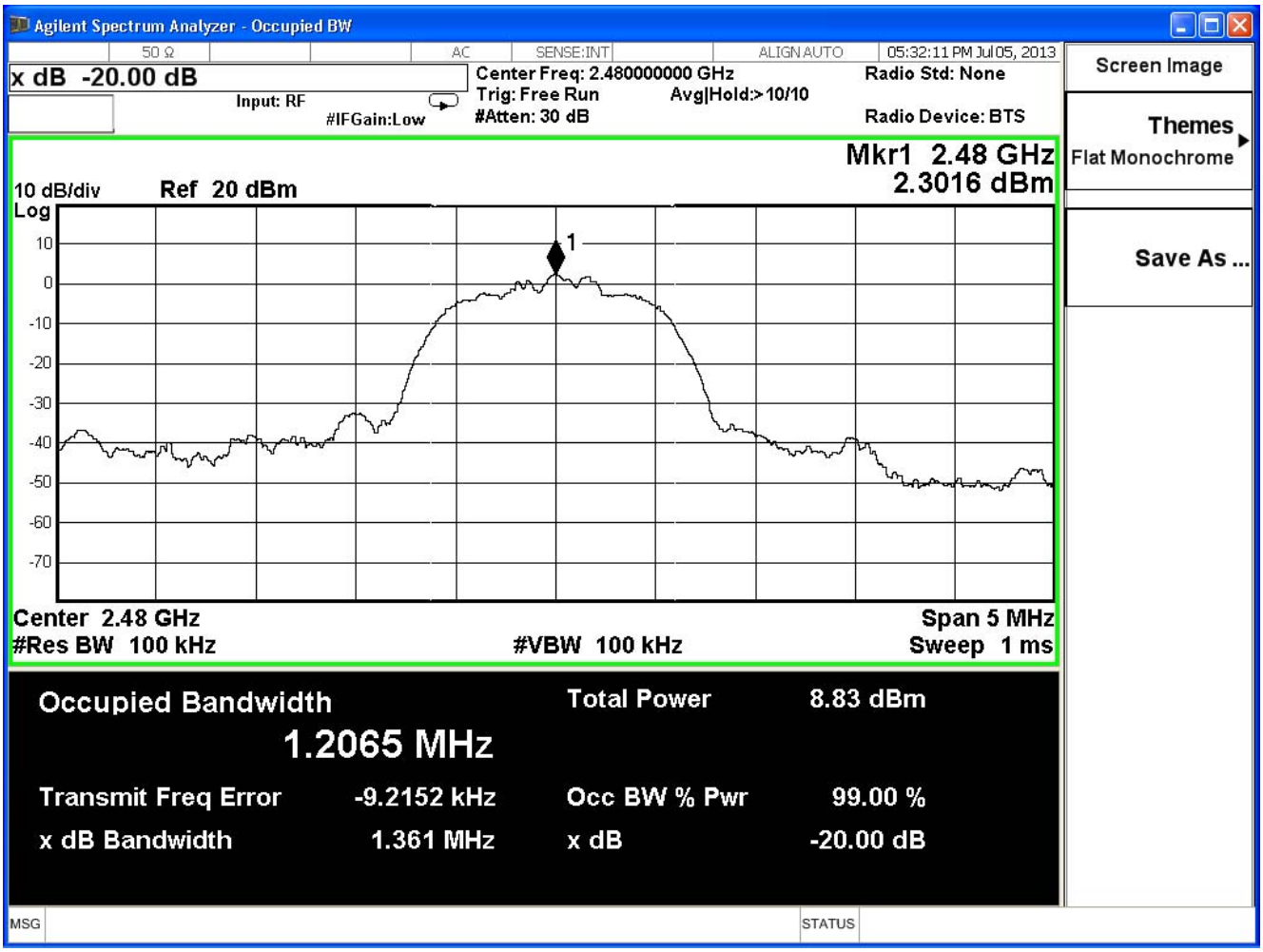


Product	Portable Stereo Speaker		
Test Item	Occupied Bandwidth		
Test Mode	Mode 2: Transmit (π/4DQPSK)_Power by PC		
Date of Test	2013/07/05	Test Site	SR7

π/4-DQPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480	1.361	--	NA

Channel 78

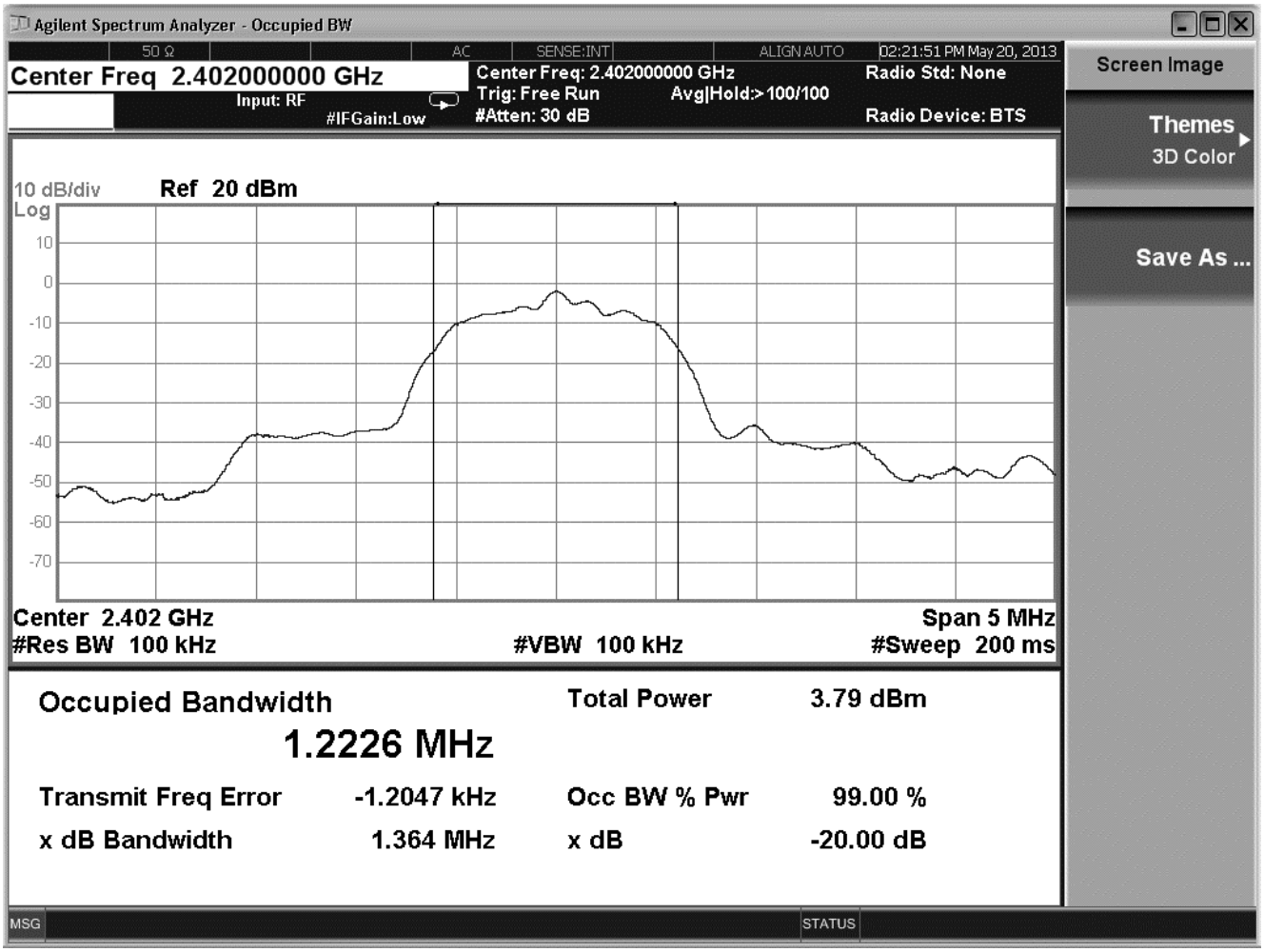


Product	Portable Stereo Speaker		
Test Item	Occupied Bandwidth		
Test Mode	Mode 3: Transmit (8DPSK)_Power Cable to adapter		
Date of Test	2013/05/20	Test Site	SR7

8-DPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402	1.364	--	NA

Channel 00

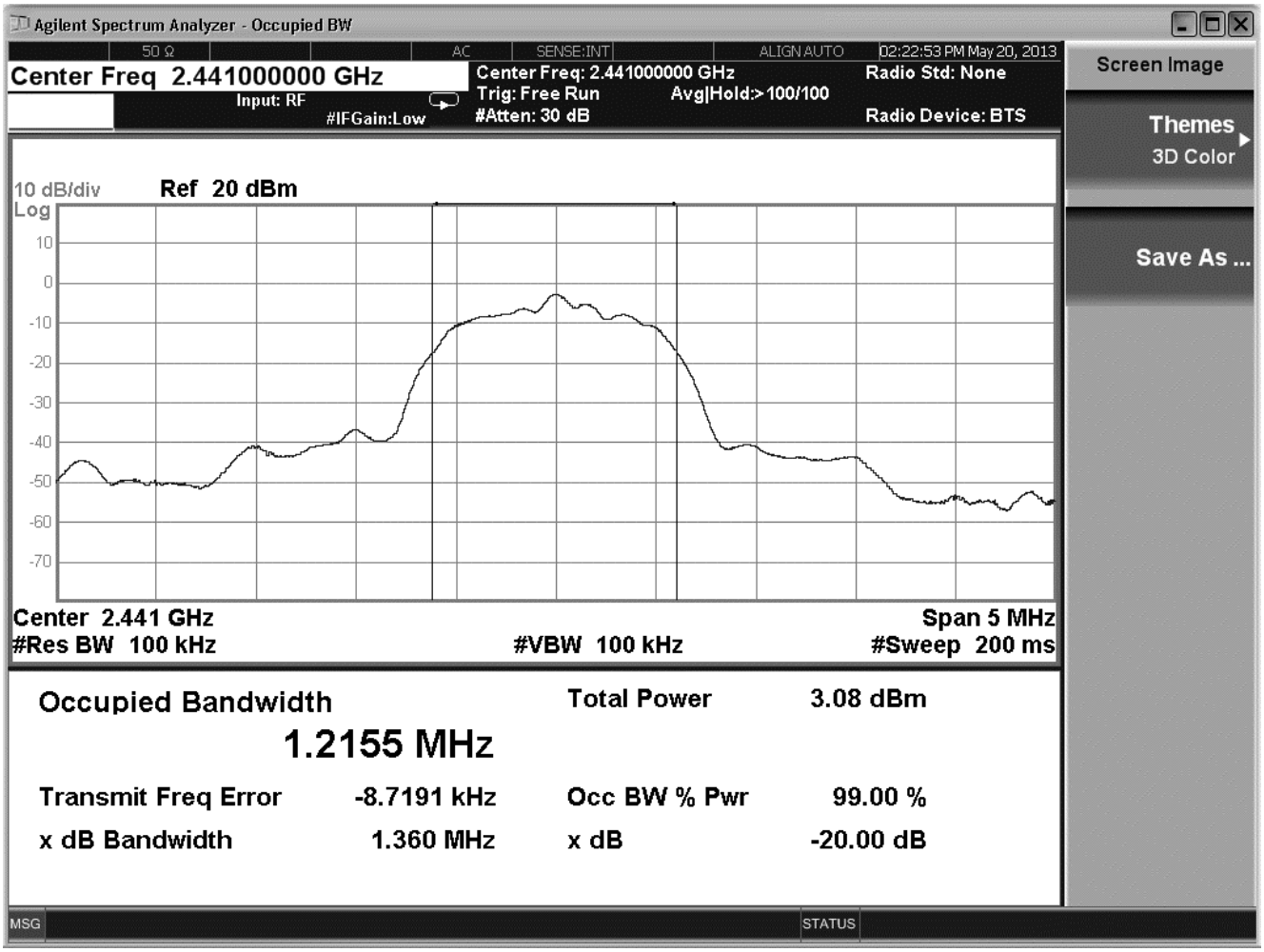


Product	Portable Stereo Speaker		
Test Item	Occupied Bandwidth		
Test Mode	Mode 3: Transmit (8DPSK)_Power Cable to adapter		
Date of Test	2013/05/20	Test Site	SR7

8-DPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441	1.360	--	NA

Channel 39

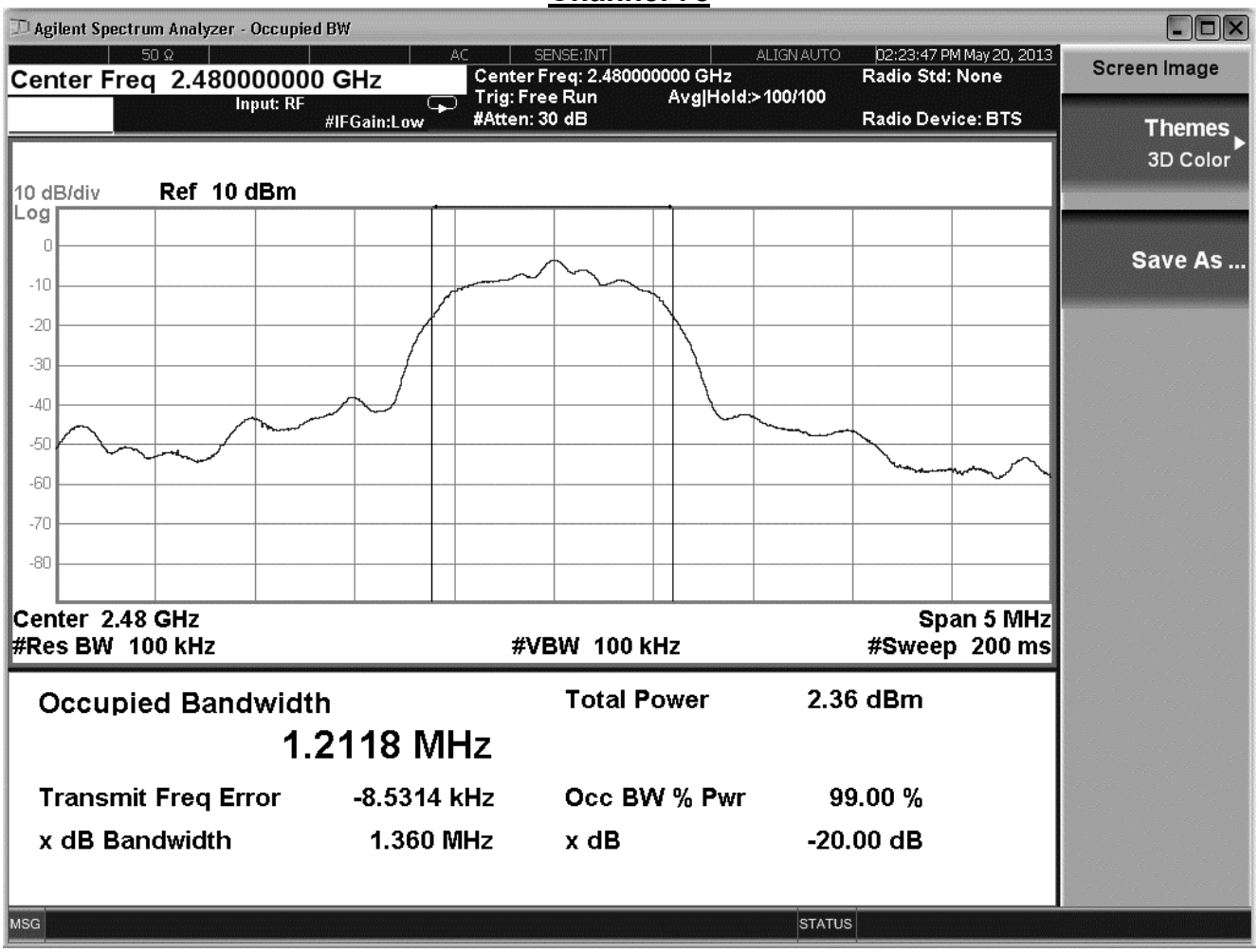


Product	Portable Stereo Speaker		
Test Item	Occupied Bandwidth		
Test Mode	Mode 3: Transmit (8DPSK)_Power Cable to adapter		
Date of Test	2013/05/20	Test Site	SR7

8-DPSK

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480	1.360	--	NA

Channel 78



10. Dwell Time

10.1. Test Equipment

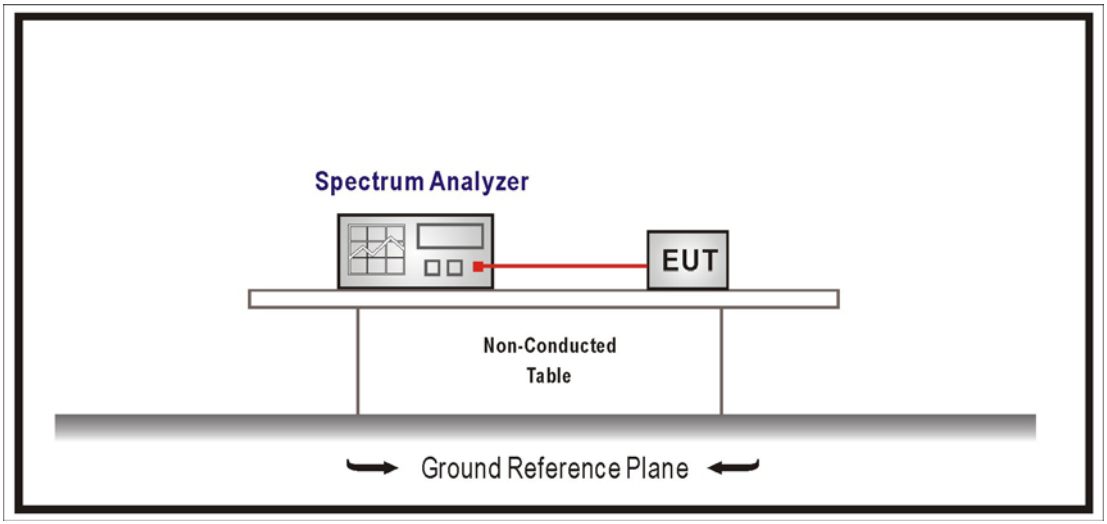
The following test equipment is used during the test:

Dwell Time / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2013/07/31

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

10.2. Test Setup



10.3. Limits

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.
For frequency hopping systems operating in the 2400-2483.5 MHz bands. 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.
For frequency hopping systems operating in the 5725-5850 MHz bands. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

10.4. Test Procedures

The EUT was setup according to ANSI C63.4, 2009 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements
Span = zero span, centered on a hopping channel
RBW = 1 MHz, VBW ≥ RBW
Sweep = as necessary to capture the entire dwell time per hopping channel
Detector function = peak, Trace = max hold

10.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2012

10.6. Test Result

Product	Portable Stereo Speaker		
Test Item	Dwell Time		
Test Mode	Mode 1: Transmit (GFSK)_Power Cable to adapter		
Date of Test	2013/05/21	Test Site	SR7

Occupancy Time of Frequency Hopping System

A) 2402MHz Test Time Period: 0.4*79=31.6sec，Time slot length : 2.90 ms = 0.0029 sec

Dwell Time : 0.0029*(266.67/79)*31.6=0.309sec。

B) 2441MHz Test Time Period: 0.4*79=31.6sec，Time slot length : 2.90 ms = 0.0029 sec

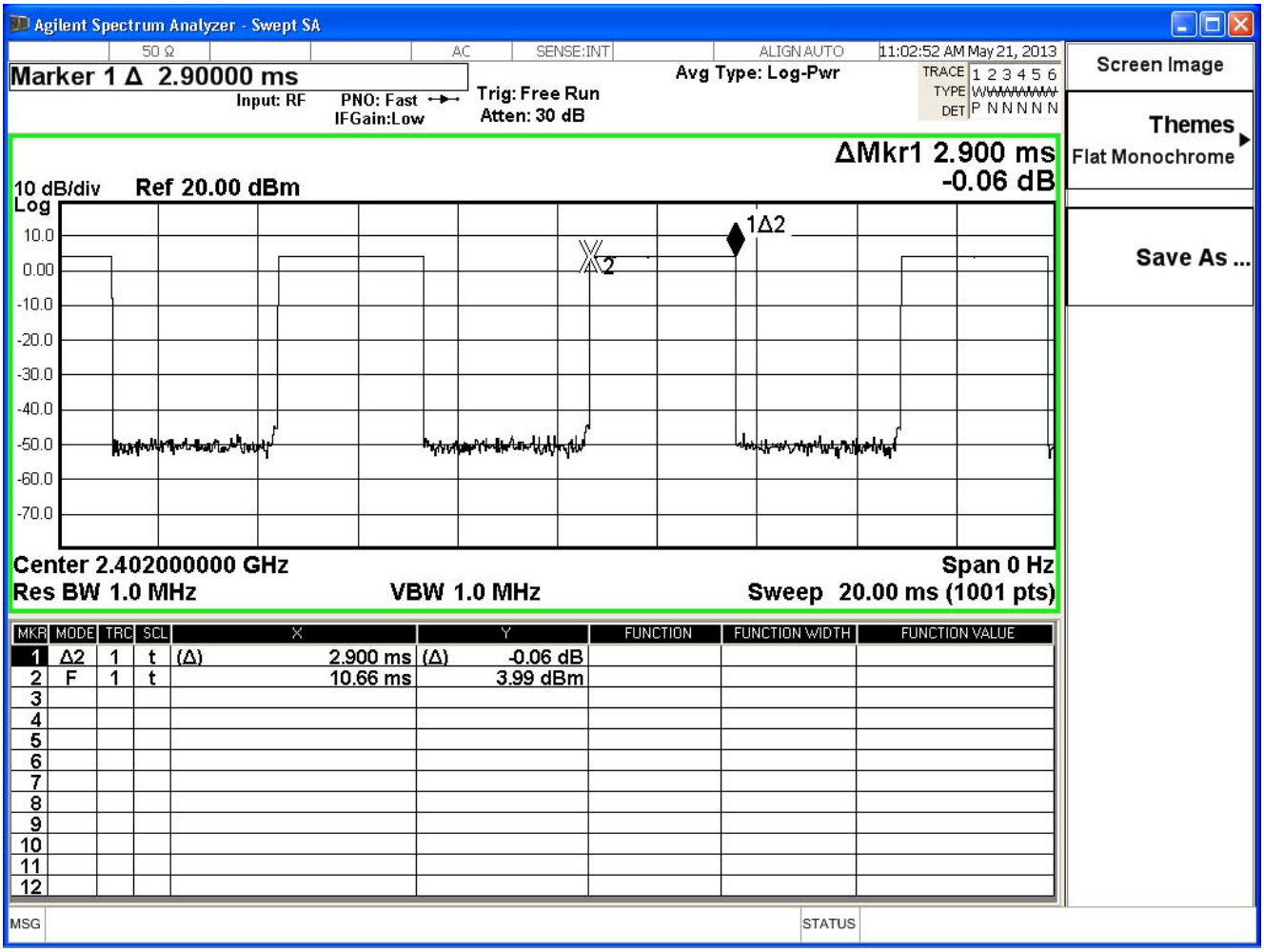
Dwell Time : 0.0029*(266.67/79)*31.6=0.309sec。

C) 2480MHz Test Time Period: 0.4*79=31.6sec，Time slot length : 2.90 ms = 0.0029 sec

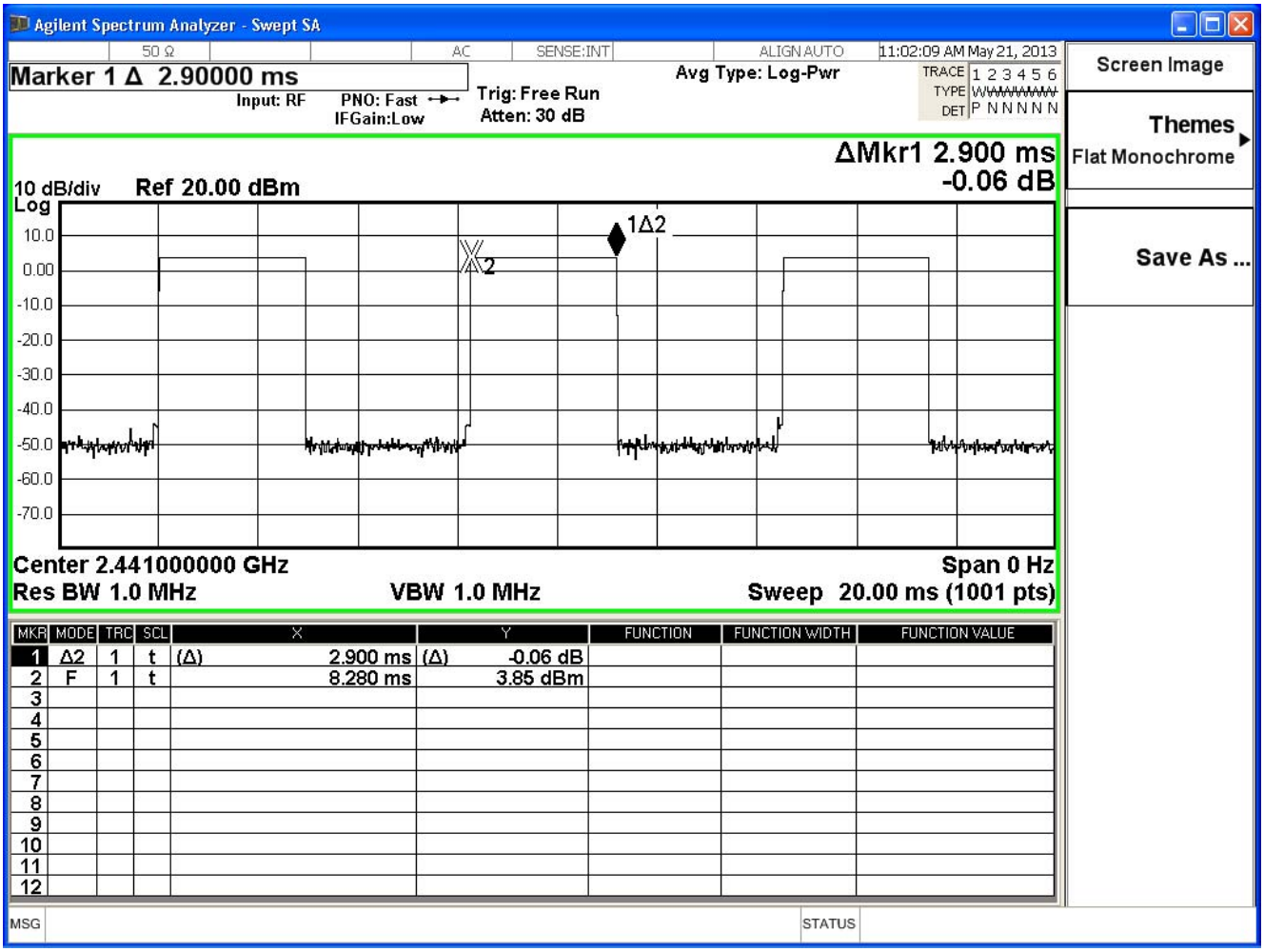
Dwell Time : 0.0029*(266.67/79)*31.6=0.309sec。

Test Result: The Average Occupancy Time of Each Highest，Middle and Lowest Channel Is Less Than 0.4sec，And Corresponds to The Standard。

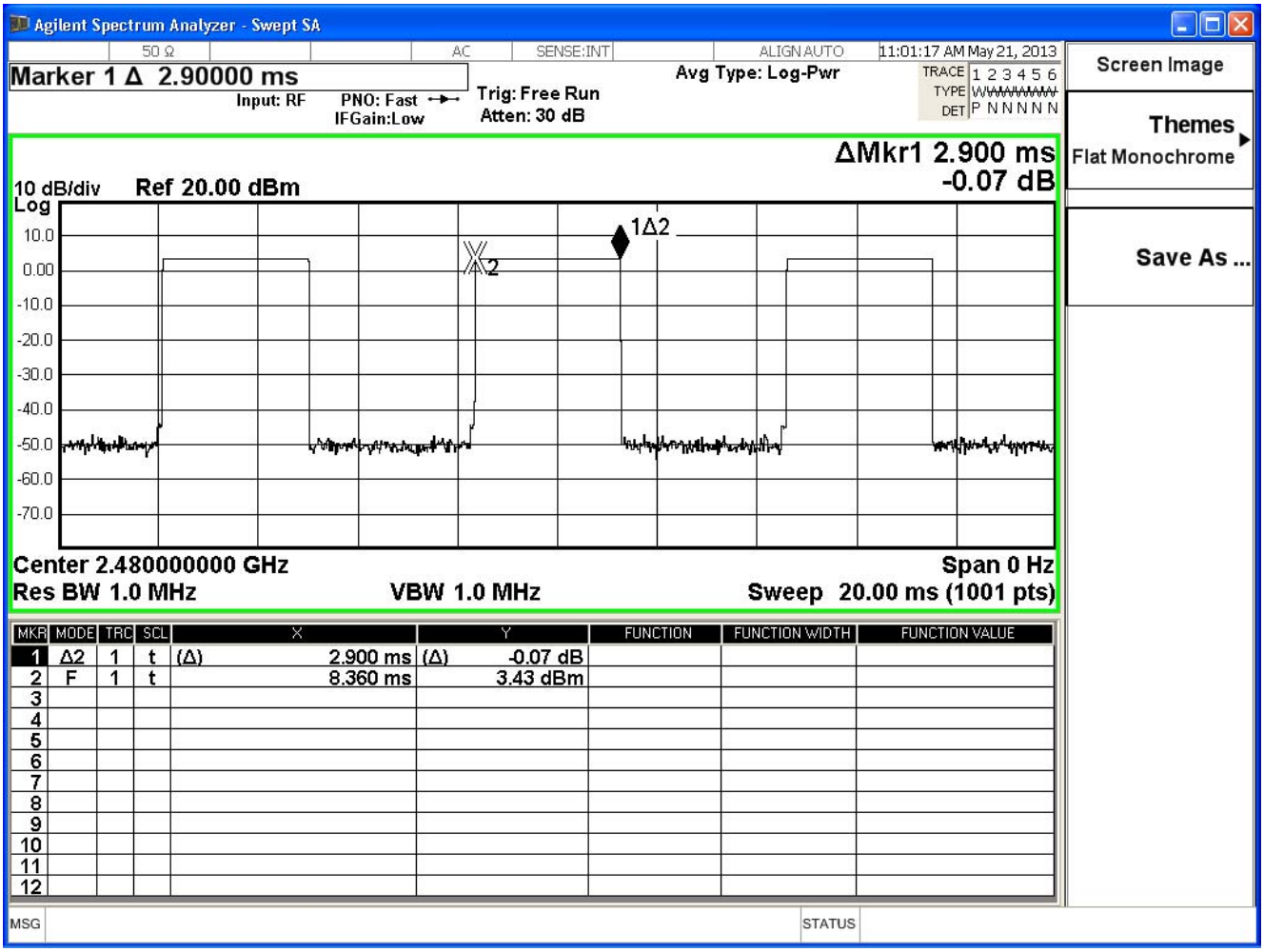
Hop rate-2402MHz



Hop rate-2441MHz



Hop rate-2480MHz



Note: Dwell time＝time slot length * hop rate / number of hopping channels * period

Product	Portable Stereo Speaker		
Test Item	Dwell Time		
Test Mode	Mode 2: Transmit (π/4DQPSK)_Power Cable to adapter		
Date of Test	2013/05/21	Test Site	SR7

Occupancy Time of Frequency Hopping System

A) 2402MHz Test Time Period: 0.4*79=31.6sec，Time slot length : 2.90 ms = 0.00290 sec

Dwell Time : 0.00290*(266.67/79)*31.6=0.309sec。

B) 2441MHz Test Time Period: 0.4*79=31.6sec，Time slot length : 2.90 ms = 0.00290 sec

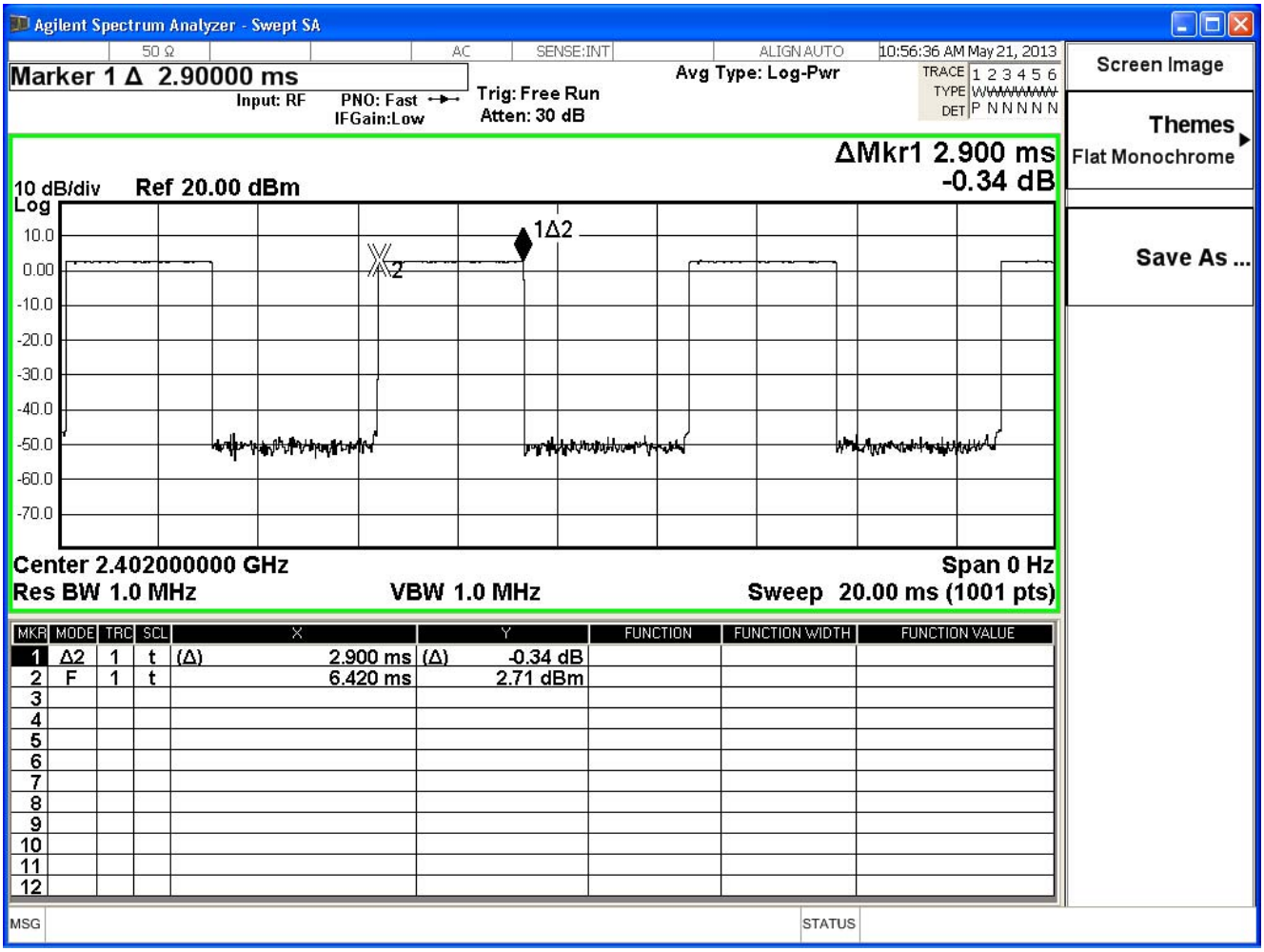
Dwell Time : 0.00290*(266.67/79)*31.6=0.309sec。

C) 2480MHz Test Time Period: 0.4*79=31.6sec，Time slot length : 2.92 ms = 0.00292 sec

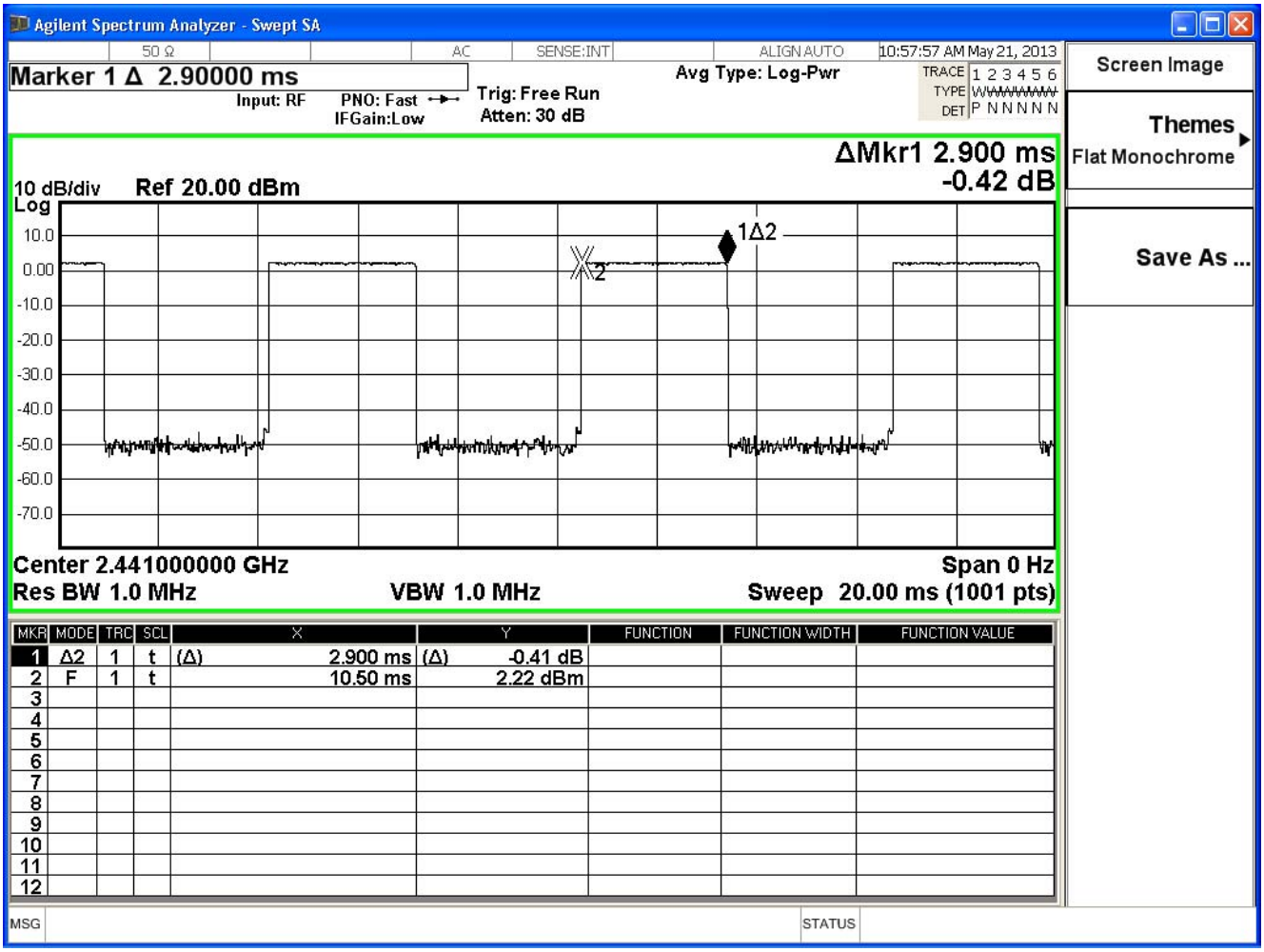
Dwell Time : 0.00292*(266.67/79)*31.6=0.311sec。

Test Result: The Average Occupancy Time of Each Highest，Middle and Lowest Channel Is Less Than 0.4sec，And Corresponds to The Standard。

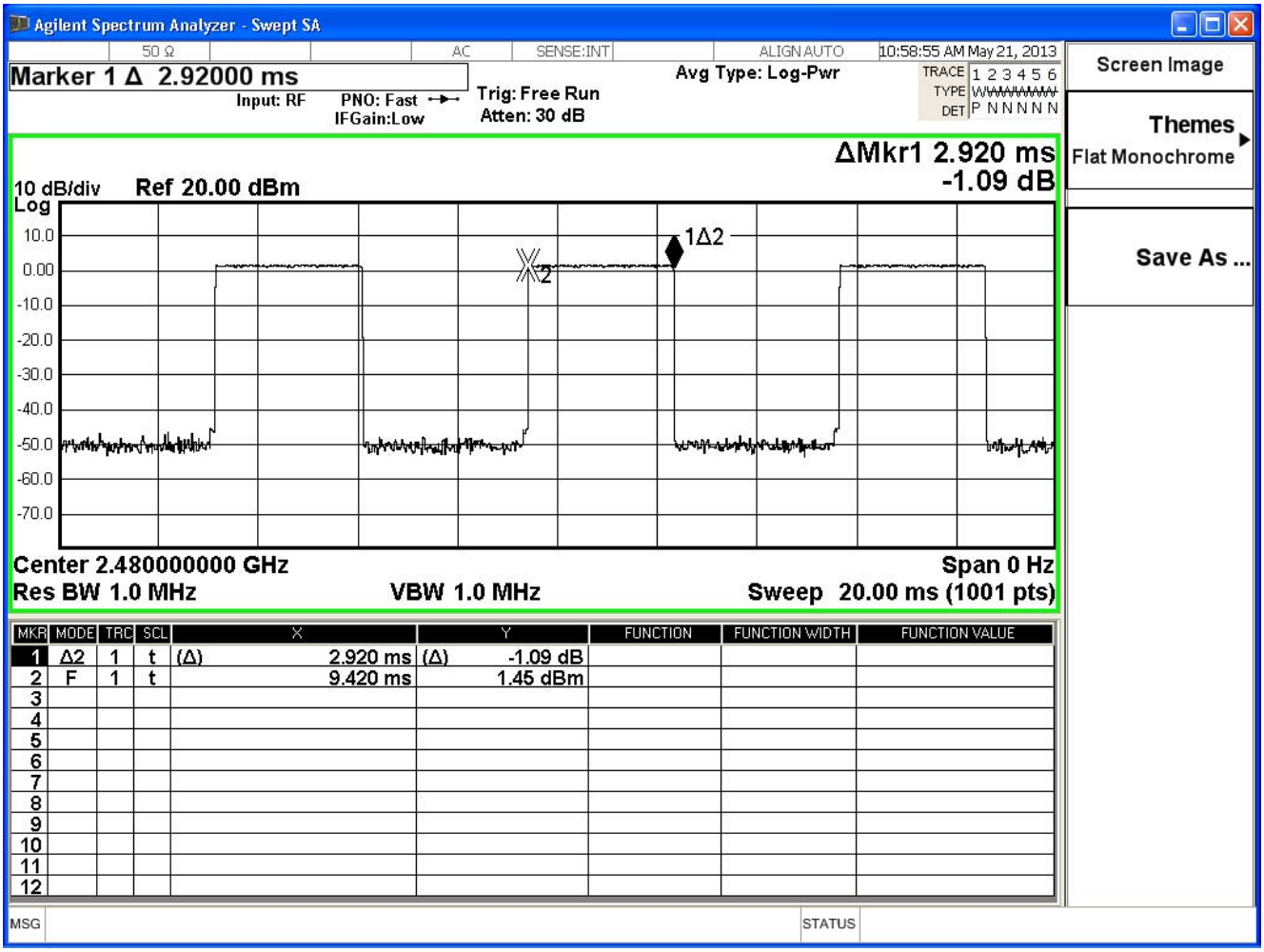
Hop rate-2402MHz



Hop rate-2441MHz



Hop rate-2480MHz



Note: Dwell time＝time slot length * hop rate / number of hopping channels * period

Product	Portable Stereo Speaker		
Test Item	Dwell Time		
Test Mode	Mode 3: Transmit (8DPSK)_Power Cable to adapter		
Date of Test	2013/05/21	Test Site	SR7

Occupancy Time of Frequency Hopping System

A) 2402MHz Test Time Period: 0.4*79=31.6sec，Time slot length : 2.92 ms = 0.00292 sec

Dwell Time : 0.00292*(266.67/79)*31.6=0.311sec。

B) 2441MHz Test Time Period: 0.4*79=31.6sec，Time slot length : 2.90 ms = 0.00290 sec

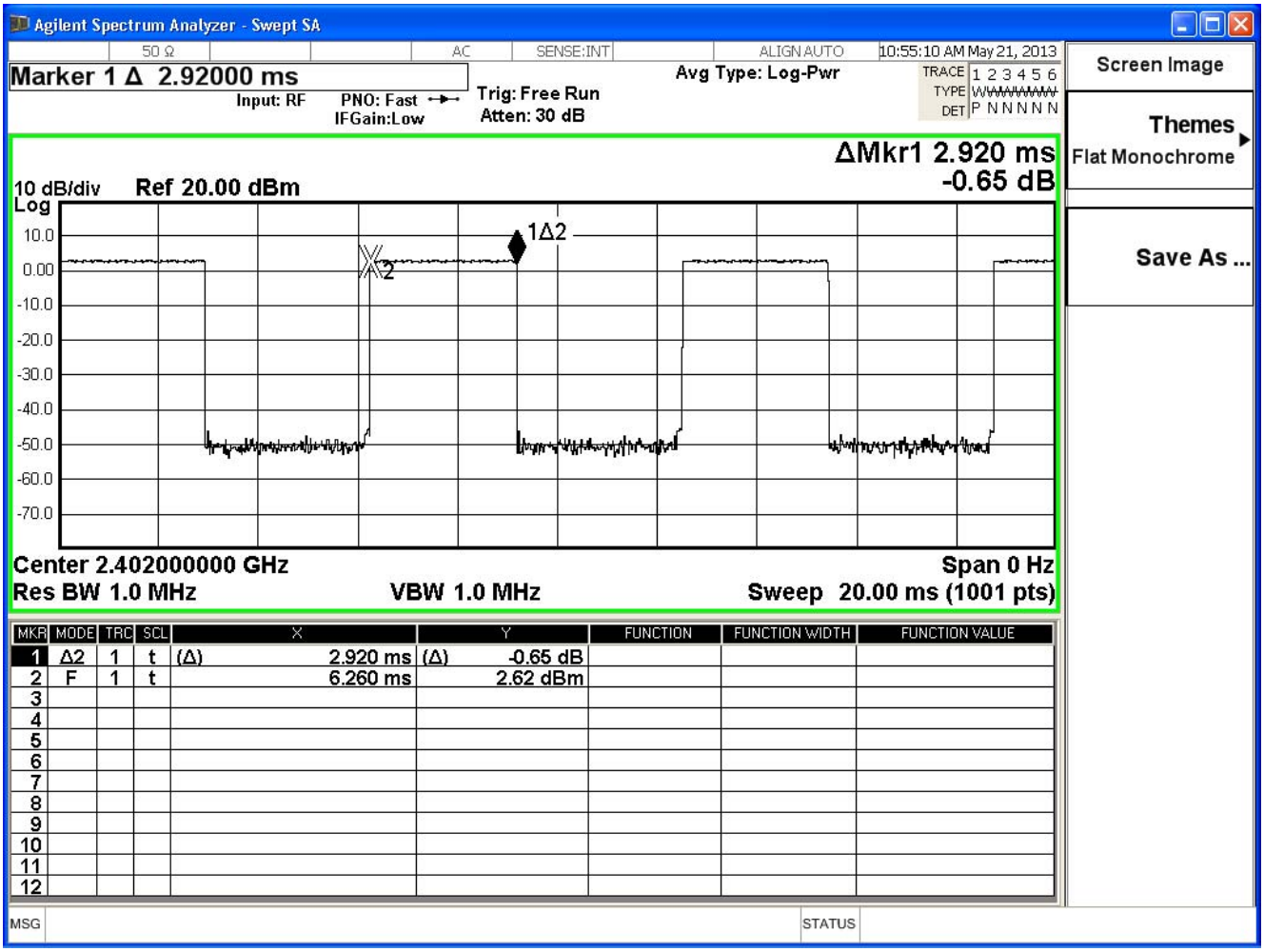
Dwell Time : 0.0029*(266.67/79)*31.6=0.309sec。

C) 2480MHz Test Time Period: 0.4*79=31.6sec，Time slot length : 2.92 ms = 0.00292 sec

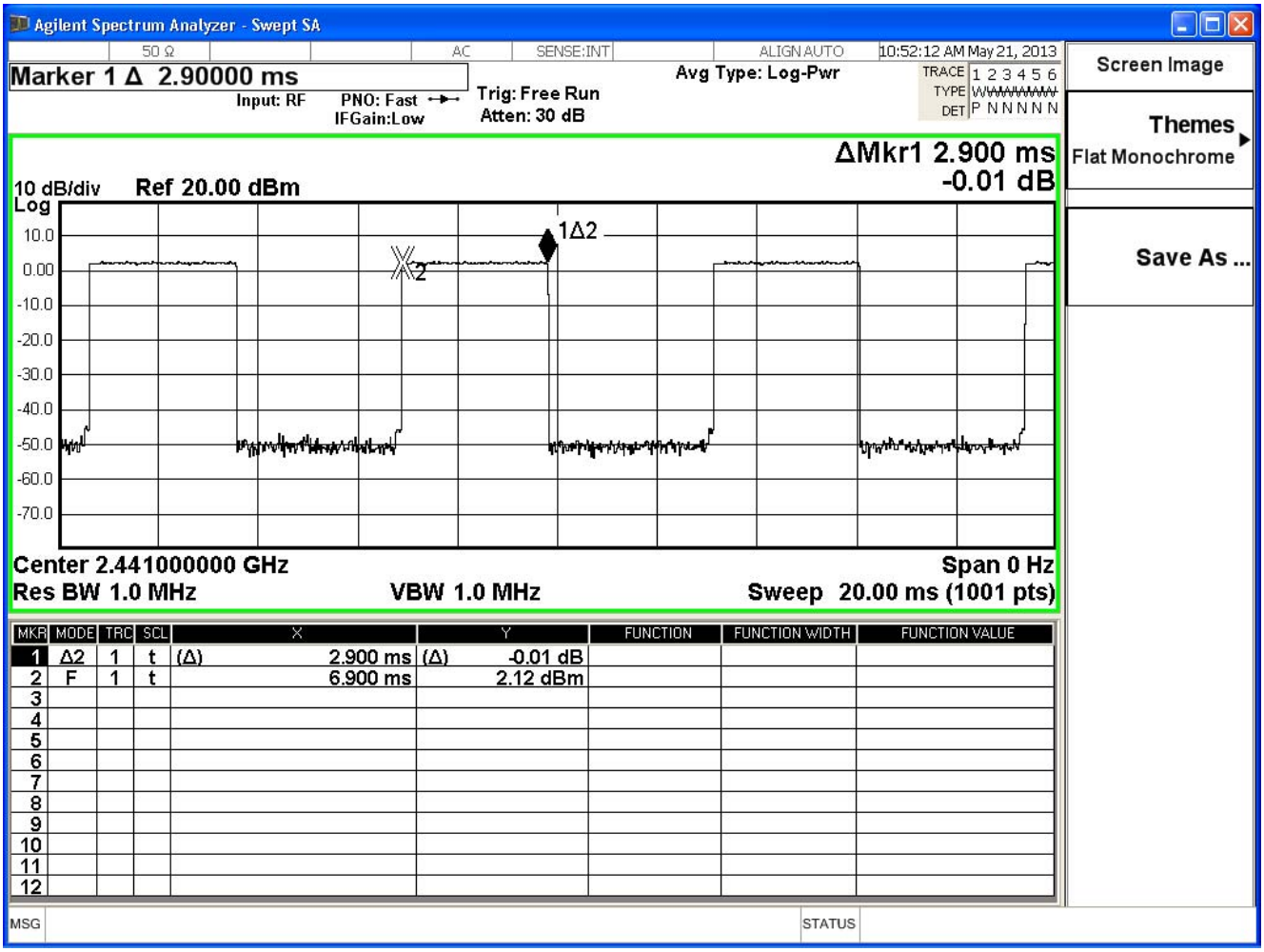
Dwell Time : 0.00292*(266.67/79)*31.6=0.311sec。

Test Result: The Average Occupancy Time of Each Highest，Middle and Lowest Channel Is Less Than 0.4sec，And Corresponds to The Standard。

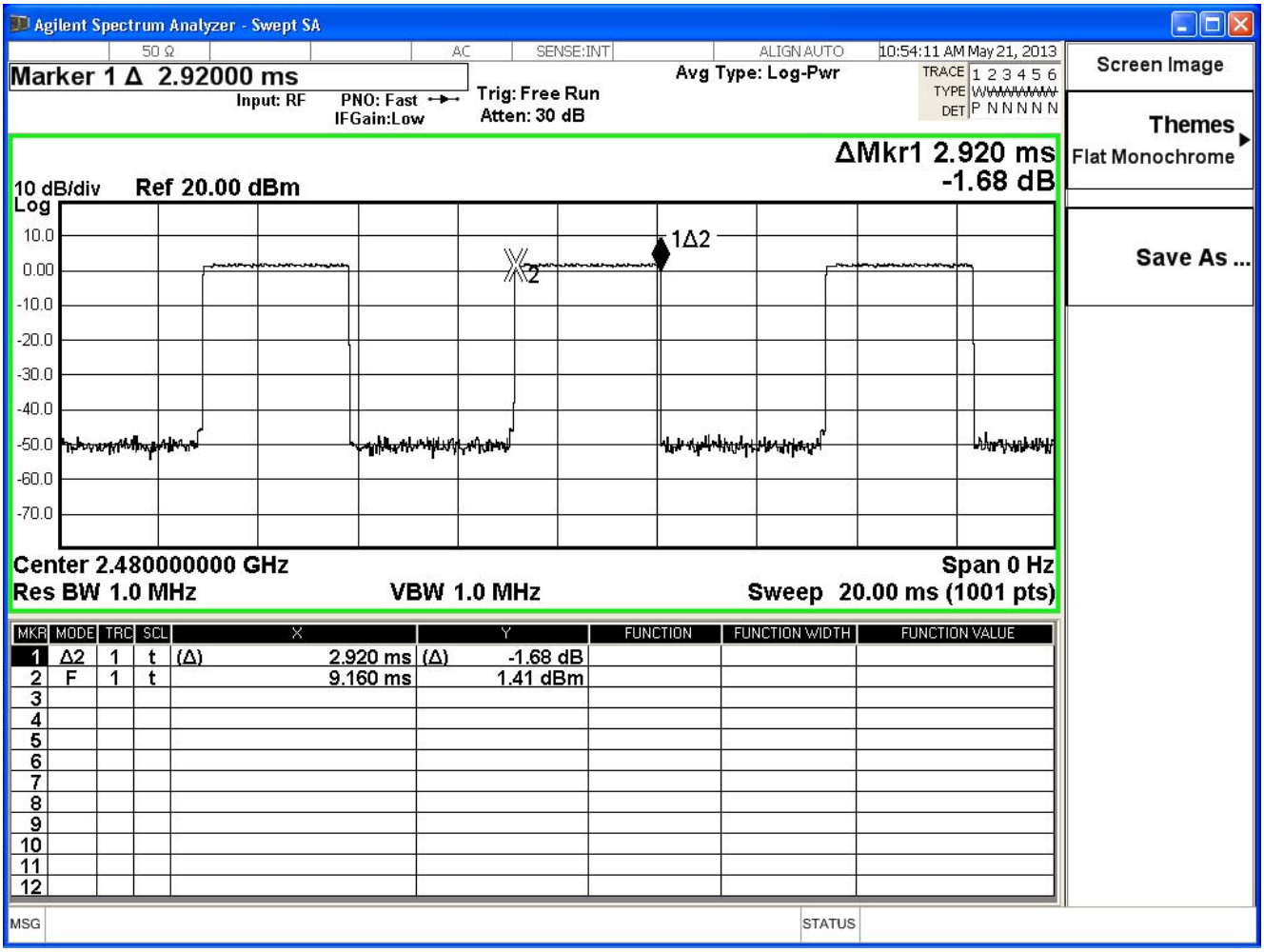
Hop rate-2402MHz



Hop rate-2441MHz



Hop rate-2480MHz



Note: Dwell time＝time slot length * hop rate / number of hopping channels * period