



FCC - TEST REPORT

Report Number : **68.850.0.010.01** Date of Issue: 3 March 2010

Model : **LEICA mojoMINI**

Product Type : GPS

Applicant : Leica Geosystems AG

Address : Heinrich-Wild-Strasse, Heerbrugg, CH-9435, Switzerland

Production Facility : Wanlida Group Co., Ltd.

Address : Wanlida Industry Zone, Nanjing, Fujian, China 363601

Test Result : **Positive** **Negative**

Total pages including Appendices : 48

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2 Details about the Test Laboratory

Details about the Test Laboratory

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Nantou, Shenzhen,
Guangdong,
China

Telephone: 86 755 2663 9496
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3 Description of the Equipment Under Test

Description of the Equipment Under Test

Product: GPS

Model no.: LEICA mojoMINI

Serial number: NIL

Options and accessories: NIL

Rating: DC 5V 2A
 Test with Car Charger:
 Input: DC 12-24V, 1.2A Max
 Output: DC 5V, 2A

Antenna: Integral antenna inside the EUT, NOT accessible by end user

RF Transmission Frequency: 2400-2483.5MHz

Description of the EUT: NIL

Auxiliary Equipment and Cable Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
Battery	BYD	---	---
PC	Lenovo	X61	L3-L3729
Serial Port Line	Lenovo	---	---
LCD monitor	Lenovo	9227-AE1	V1TDB38
Keyboard	Lenovo	SK-8825 (L)	02553778
Mouse	Lenovo	MO28UOL	4418011108
PC host	Lenovo	9439	L3BDF2K
Headphone	Ouyun	OH601	----
SD card	Kingston	SD4/4GBFE	----
VGA cable	Lenovo	Shield	140cm
AC Power cable	Lenovo	Unshield	180cm



4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators
FCC Part 15 Subpart B	PART 15 - RADIO FREQUENCY DEVICES Subpart B - Unintentional Radiators

5 Summary of Test Results

Technical Requirements				
FCC Part 15 Subpart C				
Test Condition	Pages	Test Result		
		Pass	Fail	N/A
15.107 15.207 Conducted Emission AC Power Port	8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247 (b) (1) Maximum transmit power*	12	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247(d) Band edge compliance of RF emissions	14	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247(d) Spurious RF conducted emissions*	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
15.247(d) 15.209 15.109 Spurious radiated emissions	20	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247(a)(1) 20dB bandwidth	24	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247(a)(1) Carrier frequency separation	30	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247(a)(1)(iii) Number of hopping frequencies	36	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247(a)(1)(iii) Dwell Time	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Remark: The EUT does not have an antenna connector and the Spurious RFconducted emission test can't be performed, the result of radiated test method was shown in the report.



6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: RFD-LEICAMOJOMINI filing to comply with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C Rules.

SUMMARY:

All tests according to the regulations cited on page 5 were

- Performed

- **Not** Performed

The Equipment Under Test

- **Fulfills** the general approval requirements.

- **Does not** fulfill the general approval requirements.

Sample Received Date: 3 February 2010

Testing Start Date: 8 February 2010

Testing End Date: 26 February 2010

- Jiangsu TÜV Product Service Ltd. – Shenzhen Branch -

Reviewed by:

Prepared by:

Paul Yu
EMC Project Manager

Ken Li
EMC Project Engineer

7 Technical Requirement

7.1 Conducted Emission

Test Method

- 1 The EUT was placed on a table, which is 0.8m above ground plane
- 2 The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
- 3 Maximum procedure was performed to ensure EUT compliance
- 4 A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions from both sides of AC line

Limit

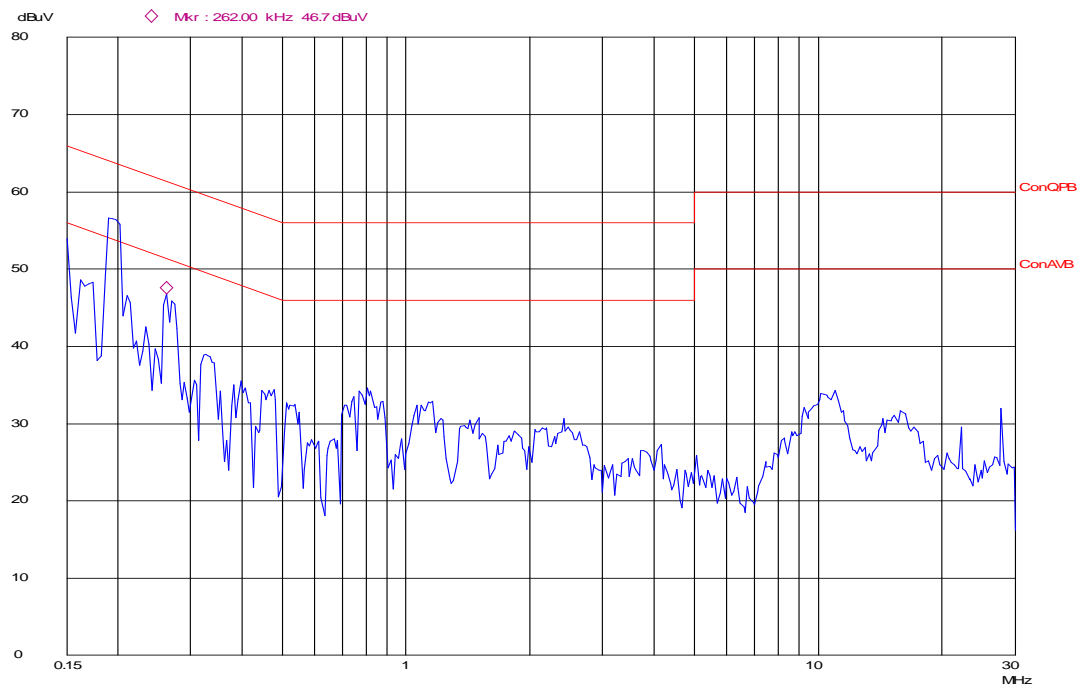
Frequency MHz	QP Limit dB μ V	AV Limit dB μ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Decreasing linearly with logarithm of the frequency

Conducted Emission

Conducted Disturbance

EUT: MNLECAMjoMINI
 Op Cond: Connect to PC
 Test Spec: L
 Comment: AC 120V/60Hz



Frequency MHz	Cable Loss dB	Reading dBµV	QP Test result dBµV	QP Limit dBµV	Margin dB
0.192	9.8	43.0	52.8	63.9	11.1
0.265	9.8	32.5	42.3	61.3	19.0

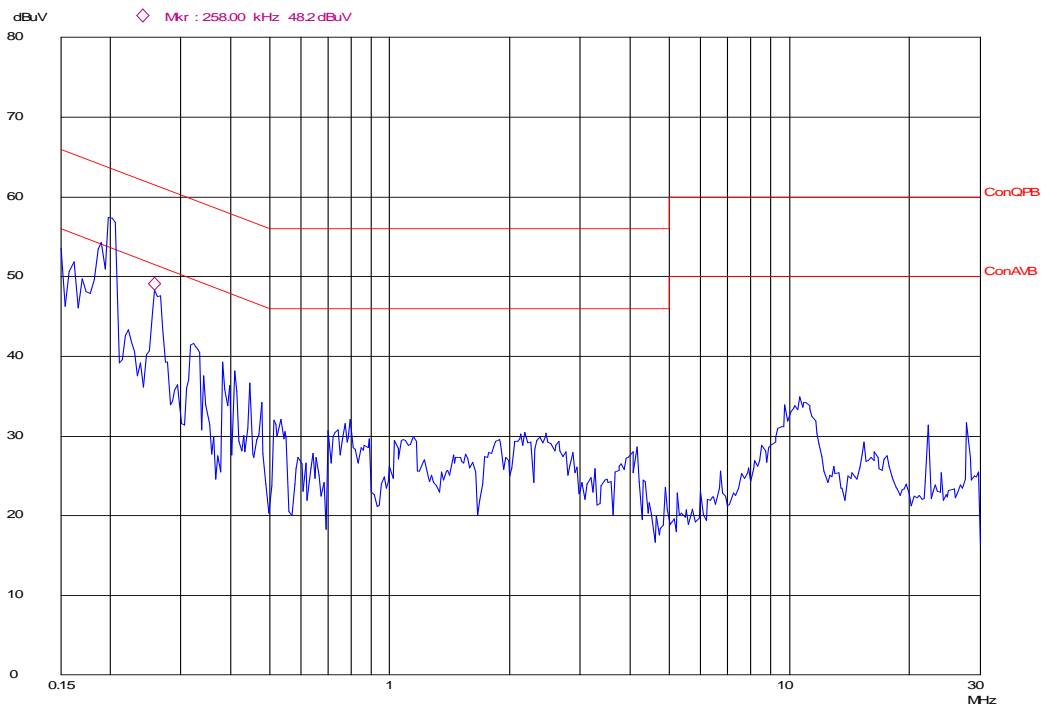
Frequency MHz	Cable Loss dB	Reading dBµV	AV Test result dBµV	AV Limit dBµV	Margin dB
0.192	9.8	25.0	34.8	53.9	19.1
0.265	9.8	16.8	26.6	51.3	24.7

Remark: Test Result= Reading + Cable Loss

Conducted Emission

Conducted Disturbance

EUT: MNLECAMojoMINI
 Op Cond: Connect to PC
 Test Spec: N
 Comment: AC 120V/60Hz



Frequency MHz	Cable Loss dB	Reading dBµV	QP Test result dBµV	QP Limit dBµV	Margin dB
0.198	9.8	44.3	54.1	63.7	9.6
0.261	9.8	34.2	44.0	61.4	17.4

Frequency MHz	Cable Loss dB	Reading dBµV	AV Test result dBµV	AV Limit dBµV	Margin dB
0.198	9.8	25.4	35.2	53.7	18.5
0.261	9.8	15.3	25.1	51.4	26.3

Remark: Test Result= Reading + Cable Loss



Test Equipment List

Conducted Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2010-12-05
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100253	2010-12-05

7.2 Maximum transmit power

Test Method

- 1 The EUT is placed on a turntable, which is 0.8m above ground plane.
- 2 The turntable shall be rotated for 360 degrees to determine the position of maximum emission level
- 3 Measured maximum fundamental field strength in V/m, utilizing a RBW \geq the 20 dB bandwidth of the emission, VBW > RBW, peak detector function.
- 4 Use the equation $P = (E \cdot d)^2 / 30 \cdot G$ to calculate the peak power of the transmitter where:
 - P= transmit power (W)
 - E= field strength (V/m)
 - d= distance from EUT to antenna (m)
 - G= transmitter's antenna gain (linear)

Limits for Maximum transmit power measurements

Frequency Range MHz	Limit W	Limit dBm
2400-2483	≤ 1	≤ 30

Maximum transmit power

GFSK Modulation Test Result

Frequency (MHz)	Maximum field strength(dB μ V/m)	Maximum peak Power(dBm)	Result
CH1 2402MHz	97.42	1.12	Pass
CH2 2441MHz	97.33	1.10	Pass
CH3 2480MHz	97.38	1.14	Pass

8DPSK Modulation Test Result

Frequency (MHz)	Maximum field strength(dB μ V/m)	Maximum peak Power(dBm)	Result
CH1 2402MHz	98.04	1.51	Pass
CH2 2441MHz	97.40	1.14	Pass
CH3 2480MHz	96.28	0.42	Pass

Test Equipment

Maximum transmit power Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	2010-05-10
Horn Antenna	EMCO	3115	9607-4877	2010-05-27
Amplifier	Agilent	8449B	3008A02495	2010-05-24
RF Cable	Hubersuhner	SUCOFLEX102	28620/2	2010-05-10
RF Cable	Hubersuhner	SUCOFLEX102	271471/4	2010-05-10
RF Cable	Hubersuhner	SUCOFLEX102	29086/2	2010-05-10

7.3 Band edge compliance of RF emissions

Test Method

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.4 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW and VBW to 1MHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength.

The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW and VBW to 100kHz, to measure the conducted peak band edge.

Limits

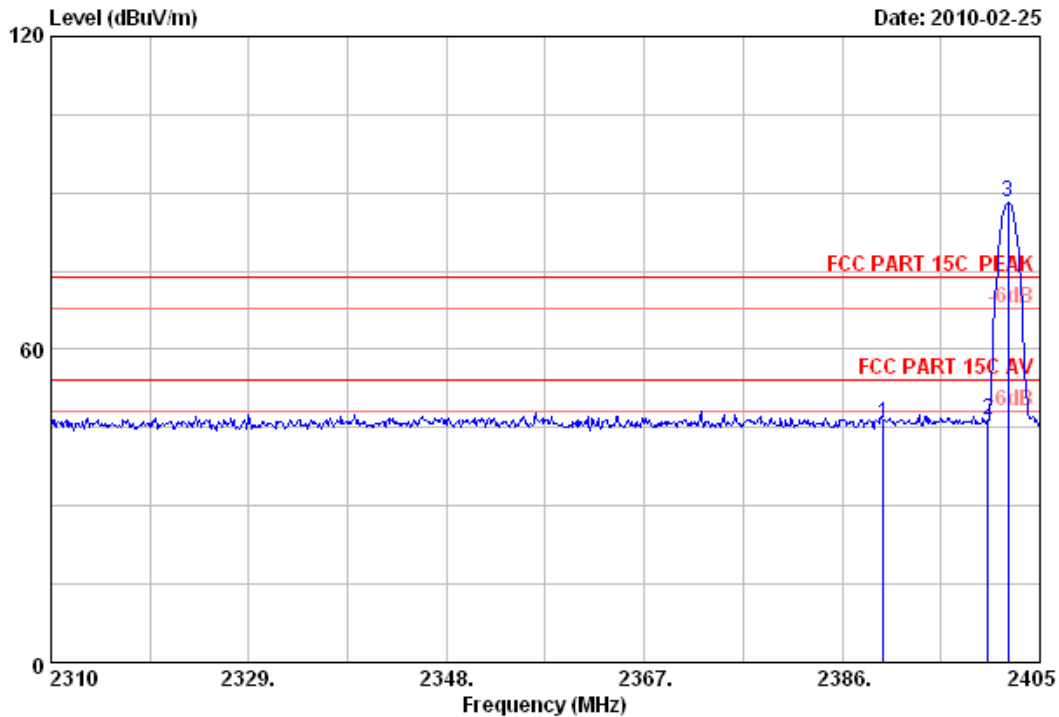
According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

Frequency MHz	Limit Average dBuV/m	Limit Peak dBuV/m
Below 2390 Above 2483.5	54	74

Band edge compliance of RF emissions

GFSK modulation Low edge peak Plot:

Data: 1 File: E:\2010 test data\TUV\2010-02-25.EM6 (40)



Site no. : 3m Chamber Data no. : 1
 Dis. / Ant. : 3m 3115(0911) Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 25°C/55% Engineer : Paul Tian
 EUT : GPS
 Power : DC 12V
 Test mode : Tx 2402MHz GFSK
 M/N : LEICA mojoMINI

	Ant. Factor	Cable loss	Amp. Factor	Reading	Emission Level	Limits	Margin	Remark
Freq. (MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1 2390.000	29.44	8.67	36.09	43.80	45.82	74.00	28.18	Peak
2 2400.000	29.44	8.72	36.09	44.29	46.36	74.00	27.64	Peak
3 2401.960	29.44	8.72	36.09	86.02	88.09	74.00	-14.09	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.

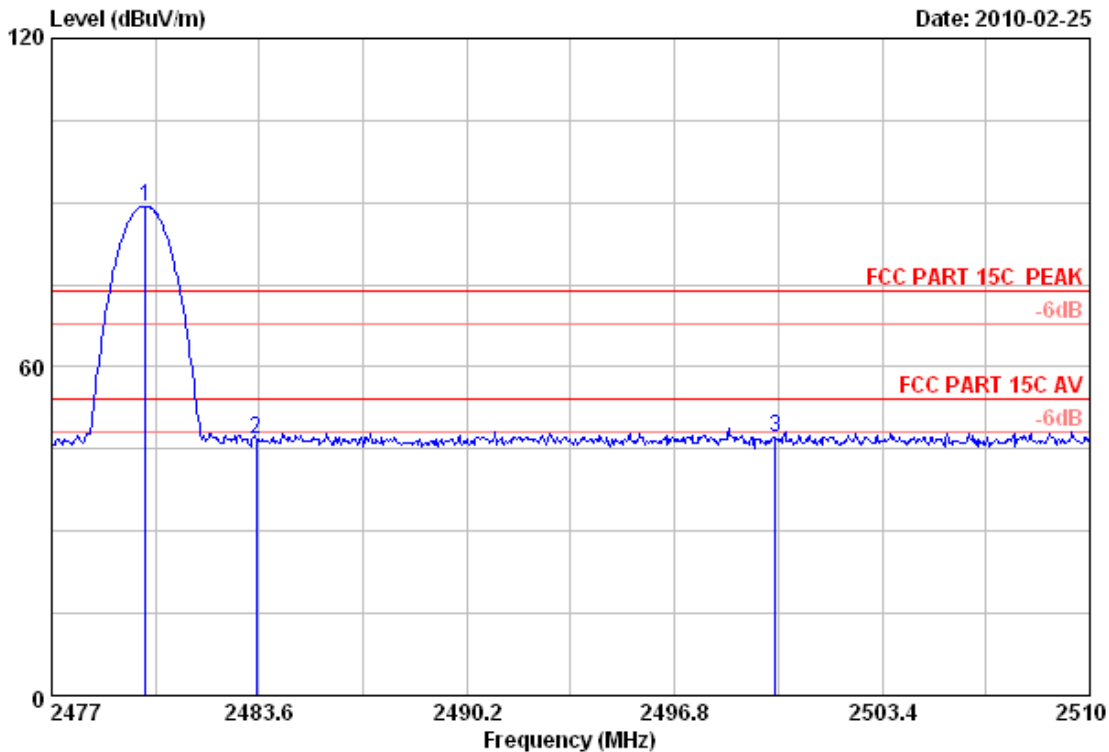
Band edge compliance of RF emissions

GFSK modulation high edge peak Plot:

Data: 3

File: E:\2010 test data\TUV\2010-02-25.EM6 (40)

Date: 2010-02-25



Site no.	: 3m Chamber	Data no.	: 3
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK	Engineer	: Paul Tian
Env. / Ins.	: 25°C/55%		
EUT	: GPS		
Power	: DC 12V		
Test mode	: Tx 2480MHz GFSK		
M/N	: LEICA mojoMINI		

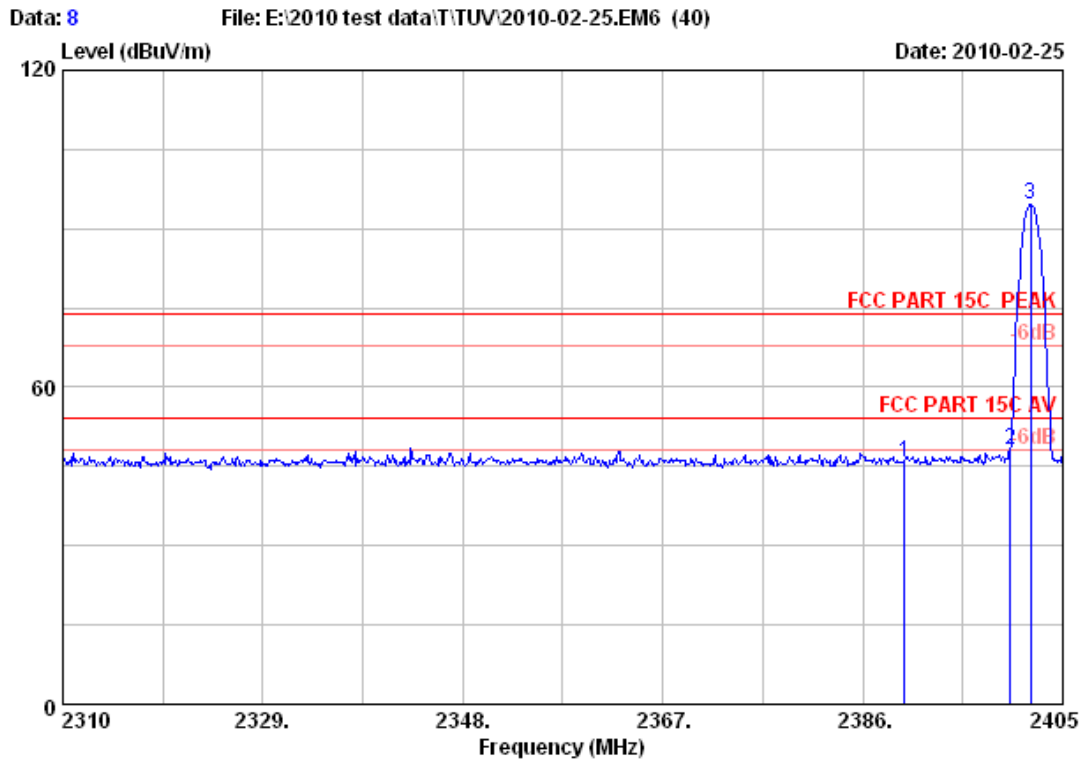
	Ant. Freq. (MHz)	Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.970	29.49	8.87	35.97	87.01	89.40	74.00	-15.40	Peak
2	2483.500	29.49	8.87	35.97	44.27	46.66	74.00	27.34	Peak
3	2500.000	29.50	8.92	36.00	44.82	47.24	74.00	26.76	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.

Band edge compliance of RF emissions

8DPSK modulation low edge peak Plot:



```

Site no.      : 3m Chamber           Data no.   : 8
Dis. / Ant.   : 3m 3115(0911)       Ant. pol.  : VERTICAL
Limit        : FCC PART 15C PEAK
Env. / Ins.   : 25°C/55%           Engineer   : Paul Tian
EUT          : GPS
Power        : DC 12V
Test mode    : Tx 2402MHz 8DPSK
M/N         : LEICA mojoMINI
  
```

	Ant.	Cable	Amp.	Emission					
Freq. (MHz)	Factor (dB/m)	loss (dB)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark	
1	2390.000	29.44	8.67	36.09	43.83	45.85	74.00	28.15	Peak
2	2400.000	29.44	8.72	36.09	46.08	48.15	74.00	25.85	Peak
3	2401.960	29.44	8.72	36.09	92.41	94.48	74.00	-20.48	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.

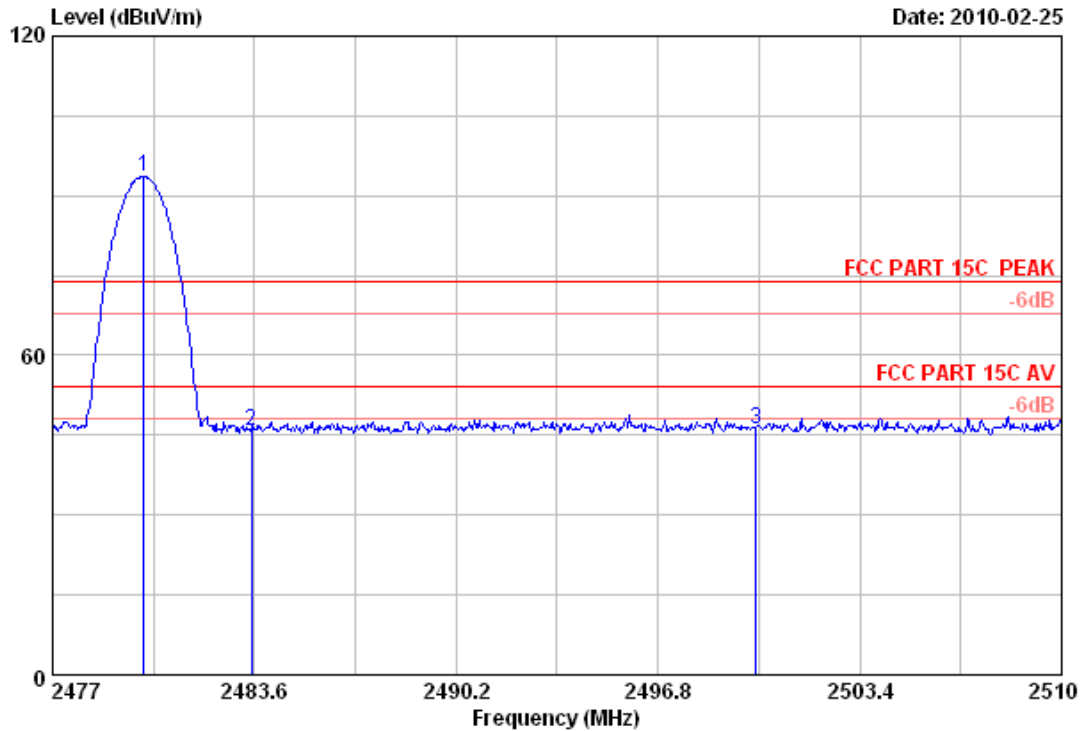
Band edge compliance of RF emissions

8DPSK modulation high edge peak Plot:

Data: 5

File: E:\2010 test data\TUV\2010-02-25.EM6 (40)

Date: 2010-02-25



Site no.	: 3m Chamber	Data no.	: 5
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK	Engineer	: Paul Tian
Env. / Ins.	: 25°C/55%		
EUT	: GPS		
Power	: DC 12V		
Test mode	: Tx 2480MHz 8DPSK		
M/N	: LEICA mojoMINI		

	Ant.	Cable	Amp.	Emission					
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)		
1	2479.970	29.49	8.87	35.97	91.15	93.54	74.00	-19.54	Peak
2	2483.500	29.49	8.87	35.97	43.28	45.67	74.00	28.33	Peak
3	2500.000	29.50	8.92	36.00	43.77	46.19	74.00	27.81	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.



Test Equipment List

Band edge compliance of RF emissions

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum	Agilent	E4446A	US44300459	2010-05-10
Amp	HP	8449B	3008A02495	2010-05-24
Antenna	EMCO	3115	9607-4877	2010-05-27
HF Cable	Hubersuhne	Sucoflex104	-	2010-05-10

7.4 Spurious radiated emissions

Test Method

- 1 The EUT is placed on a turntable, which is 0.8m above ground plane.
- 2 The turntable shall be 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 emissions.
- 4 Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5 each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

Limit

Frequency MHz	Field Strength uV/m	Field Strength dB μ V/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

Spurious radiated emissions

GFSK Modulation

test result-2402MHz

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
166.072	2.2	10.6	16.1	28.9	Horizontal	43.5	QP	Pass
263.266	2.8	13.7	14.7	31.2	Horizontal	46.0	QP	Pass
4804.000	3.8	33.3	18.1	55.2	Horizontal	74	PK	Pass
4804.000	3.8	33.3	8.6	45.7	Horizontal	54	AV	Pass
4804.000	3.8	33.3	18.8	55.9	Vertical	74	PK	Pass
4804.000	3.8	33.3	8.9	46.0	Vertical	54	AV	Pass

Test Result-2441MHz

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4882.000	3.9	33.3	20.5	57.7	Horizontal	74	PK	Pass
4882.000	3.9	33.3	9.6	46.8	Horizontal	54	AV	Pass
4882.000	3.9	33.3	21.7	58.9	Vertical	74	PK	Pass
4882.000	3.9	33.3	12.6	49.8	Vertical	54	AV	Pass

Test Result-2480MHz

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4960.000	3.9	33.3	19.5	56.7	Horizontal	74	PK	Pass
4960.000	3.9	33.3	11.1	48.3	Horizontal	54	AV	Pass
4960.000	3.9	33.3	19.4	56.6	Vertical	74	PK	Pass
4960.000	3.9	33.3	12.2	49.4	Vertical	54	AV	Pass

Remark: Emission Level= Cable Loss(include amplifier factor) + Antenna Factor + Reading

Spurious radiated emissions

8DPSK Modulation

test result-2402MHz

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
41.663	1.2	12.8	17.2	31.2	Vertical	40.0	QP	Pass
88.316	1.6	10.7	17.8	30.1	Vertical	43.5	QP	Pass
4804.000	3.8	33.3	18.6	55.7	Horizontal	74	PK	Pass
4804.000	3.8	33.3	7.8	44.9	Horizontal	54	AV	Pass
4804.000	3.8	33.3	19.5	56.6	Vertical	74	PK	Pass
4804.000	3.8	33.3	10.1	47.2	Vertical	54	AV	Pass

Test Result-2441MHz

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4882.000	3.9	33.3	18.6	55.8	Horizontal	74	PK	Pass
4882.000	3.9	33.3	11.8	49.0	Horizontal	54	AV	Pass
4882.000	3.9	33.3	18.9	56.1	Vertical	74	PK	Pass
4882.000	3.9	33.3	12.5	49.7	Vertical	54	AV	Pass

Test Result-2480MHz

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4960.000	3.9	33.3	20.5	57.7	Horizontal	74	PK	Pass
4960.000	3.9	33.3	11.2	48.4	Horizontal	54	AV	Pass
4960.000	3.9	33.3	20.6	57.8	Vertical	74	PK	Pass
4960.000	3.9	33.3	13.0	50.2	Vertical	54	AV	Pass

Remark: Emission Level= Cable Loss(include amplifier factor) + Antenna Factor + Reading



Test Equipment List

Spurious radiated emissions Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum	Agilent	E4446A	US44300459	2010-05-10
SG	HP	83723B	US34490501	2010-05-10
Amp	HP	8449B	3008A02495	2010-05-24
Antenna	EMCO	3115	9607-4877	2010-05-27



7.5 20 dB bandwidth

Test Method

- 1 Place the EUT on the table and set it in the transmitting mode.
- 2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3 Mark the peak frequency and -20dB (upper and lower) frequency.

Limit

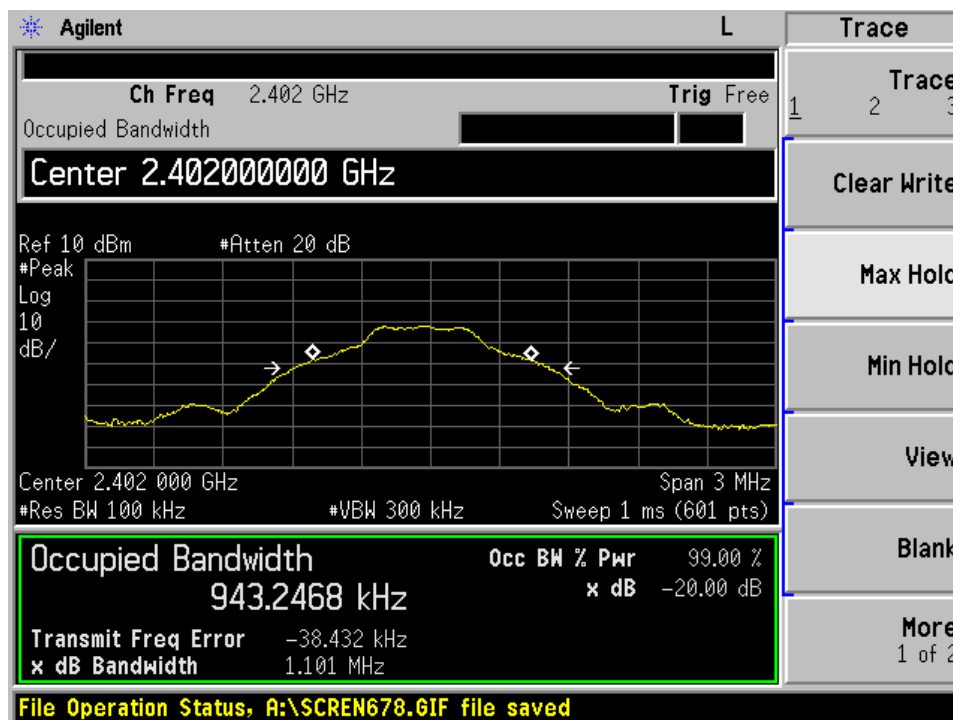
Limit [kHz]

N/A

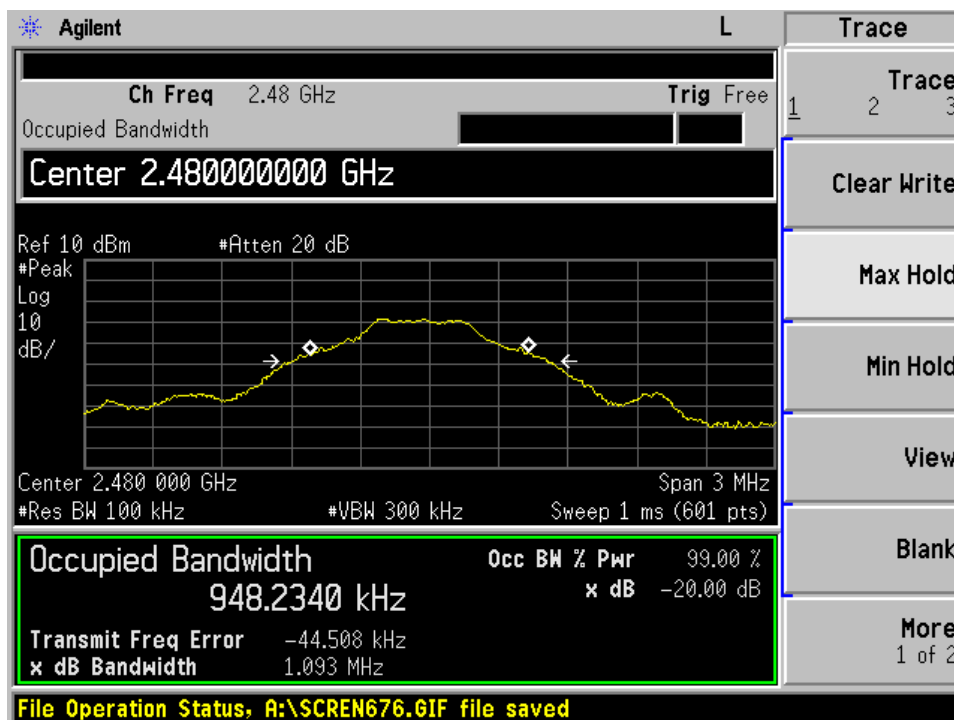
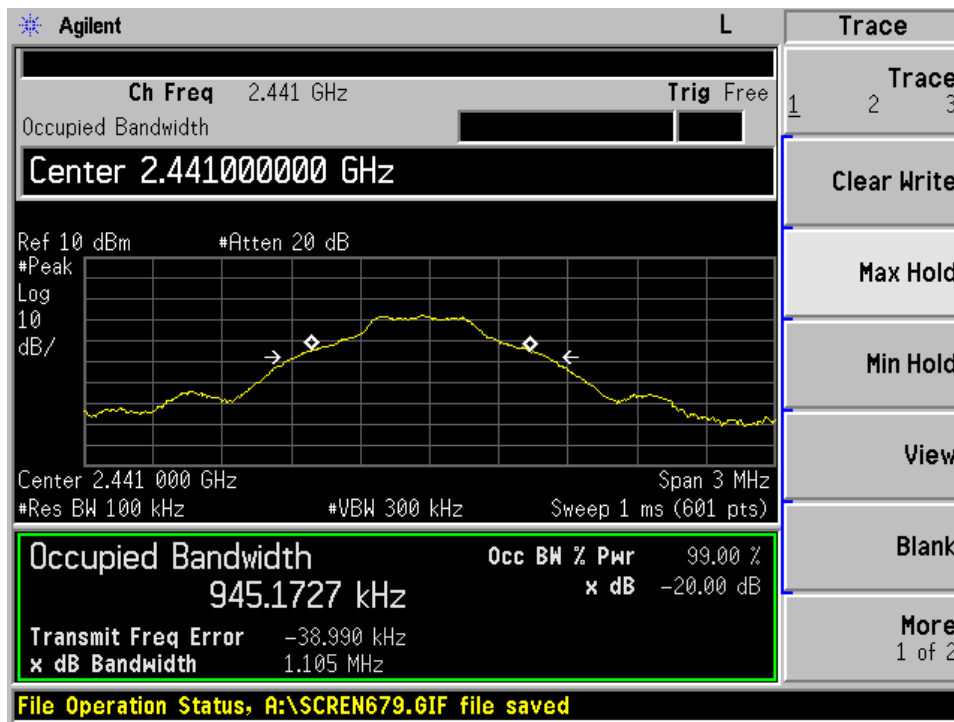
20 dB bandwidth

GFSK Modulation test result

Frequency MHz	Bandwidth kHz	Result
2402	1101	Pass
2441	1105	Pass
2480	1093	Pass



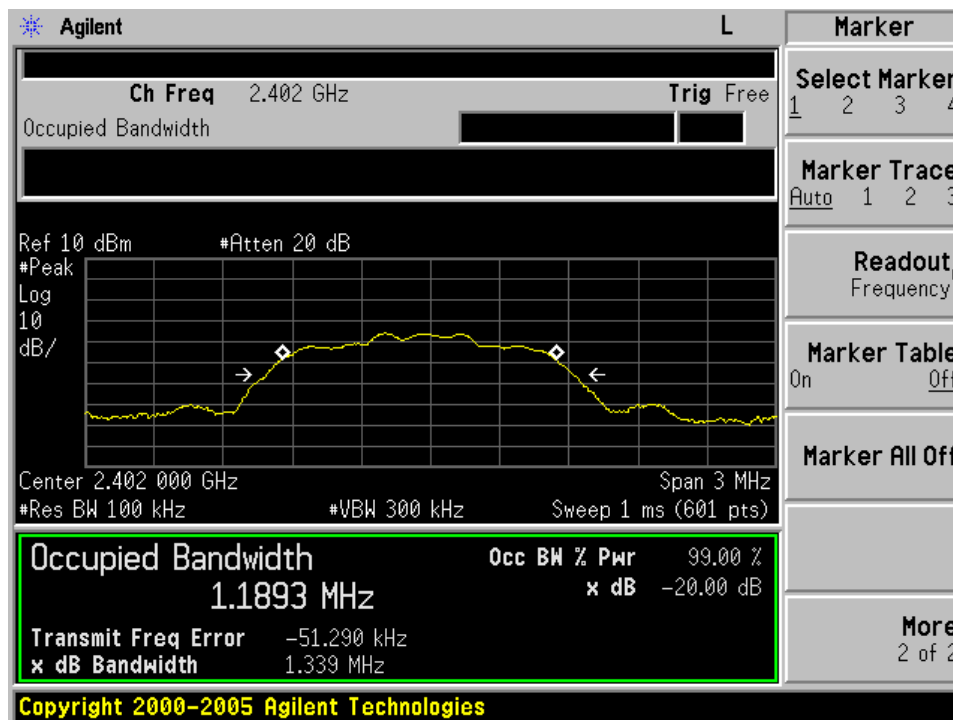
20 dB bandwidth



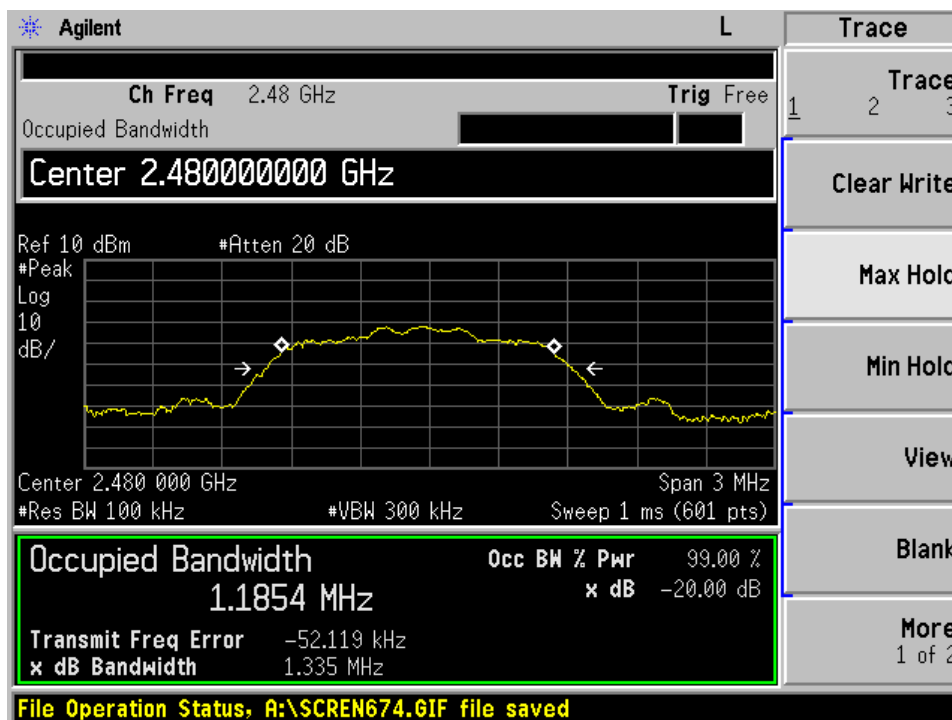
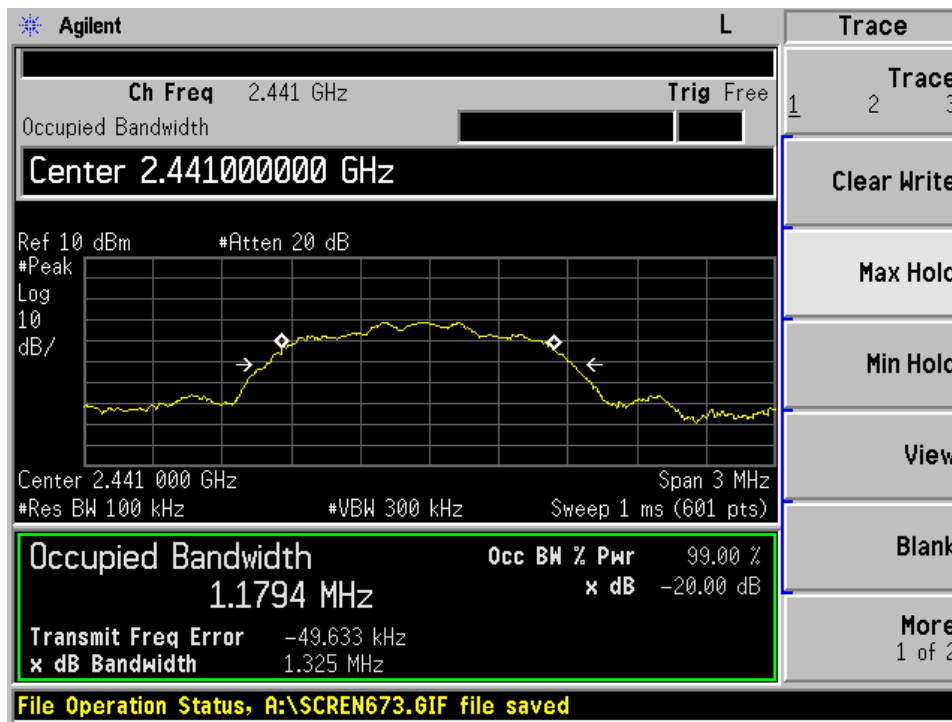
20 dB bandwidth

8DPSK Modulation test result

Frequency MHz	Bandwidth kHz	Result
2402	1189	Pass
2441	1179	Pass
2480	1185	Pass



20 dB bandwidth





Test Equipment

20 dB bandwidth Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	2010-05-10

7.6 Carrier Frequency Separation

Test Method

1. Connect EUT antenna terminal to the spectrum analyzer with a low loss cable.
Equipment mode: Spectrum analyzer
RBW: 100KHz; VBW: 300KHz; SPAN:3MHz
2. By using the Max-Hold function record the separation of two adjacent channels.
3. Measure the frequency difference of these two adjacent channels by spectrum analyzer Marker function.
4. Repeat above procedures until all frequencies measured were complete.

Limit

Limit
kHz

≥ 25 or $2/3$ of the 20 dB bandwidth which is greater

GFSK Modulation limit

Frequency MHz	2/3 of 20 dB Bandwidth kHz
2402	734
2441	737
2480	729

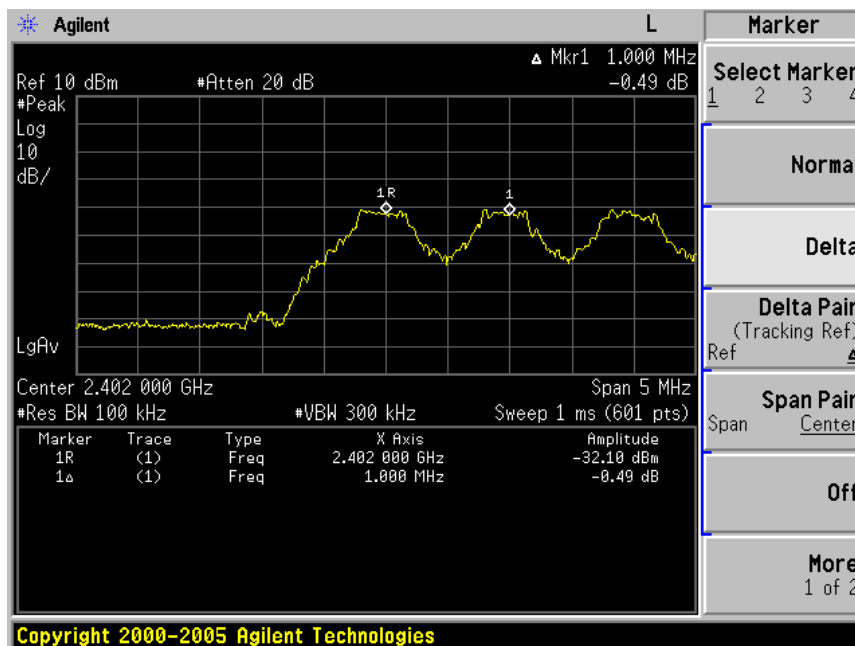
8DPSK Modulation limit

Frequency MHz	2/3 of 20 dB Bandwidth kHz
2402	793
2441	786
2480	790

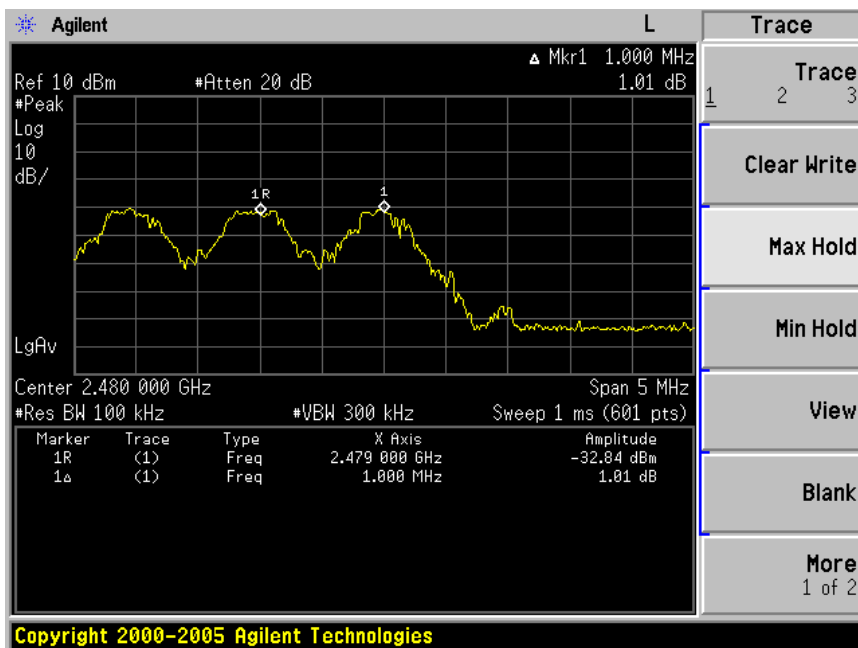
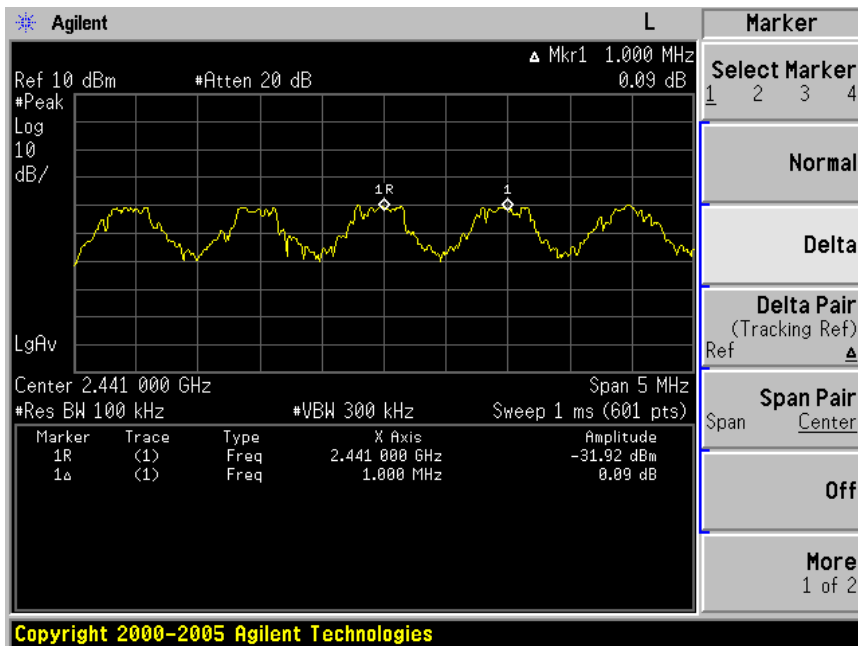
Carrier Frequency Separation

GFSK Modulation test result

Frequency MHz	Carrier Frequency Separation kHz	Result
2402	1000	Pass
2441	1000	Pass
2480	1000	Pass



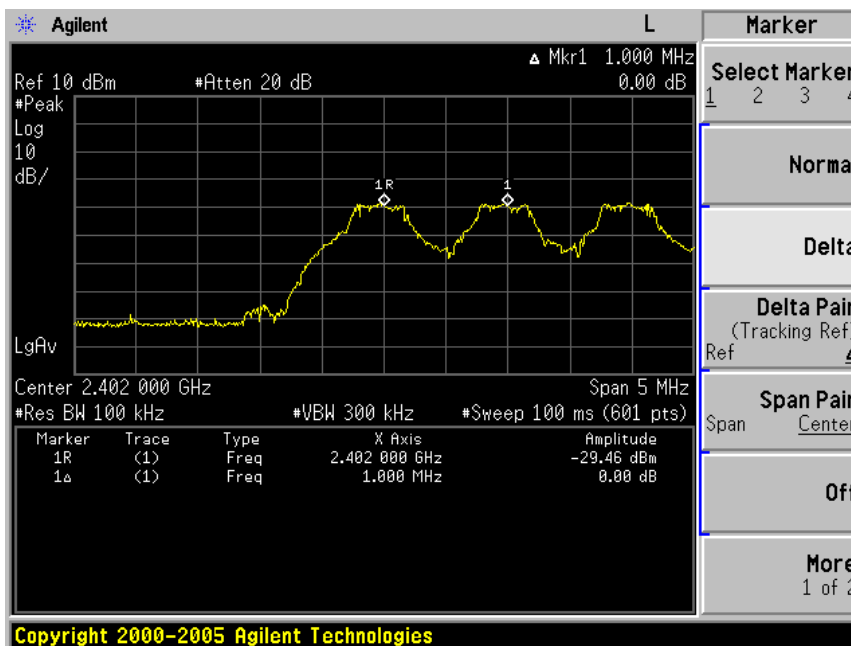
Carrier Frequency Separation



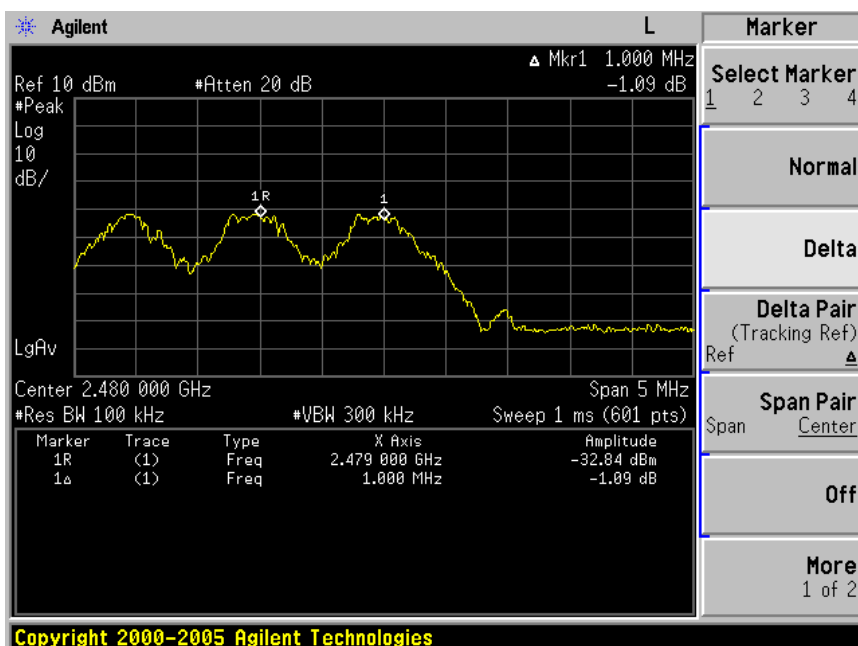
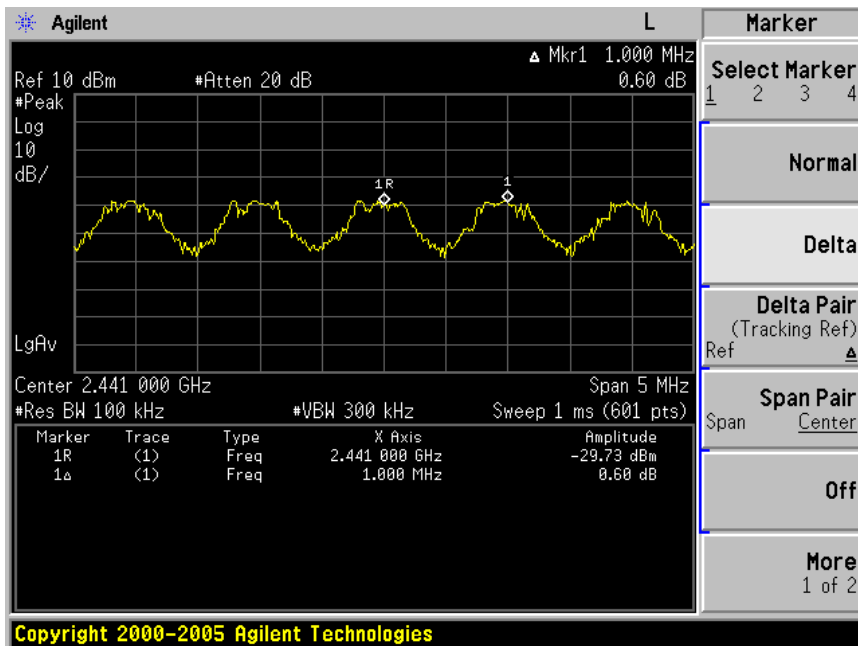
Carrier Frequency Separation

8DPSK Modulation test result

Frequency MHz	Carrier Frequency Separation kHz	Result
2402	1000	Pass
2441	1000	Pass
2480	1000	Pass



Carrier Frequency Separation





Product Service

Test Equipment

Carrier Frequency Separation Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	2010-05-10

7.7 Number of hopping frequencies

Test Method

1. Connect EUT antenna terminal to the spectrum analyzer with a low loss cable.

Equipment mode: Spectrum analyzer

RBW: 300KHz; VBW: 1MHz

2. Set the spectrum analyzer on Max-Hold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.

3. Repeat above procedures until all frequencies measured were complete.

Limit

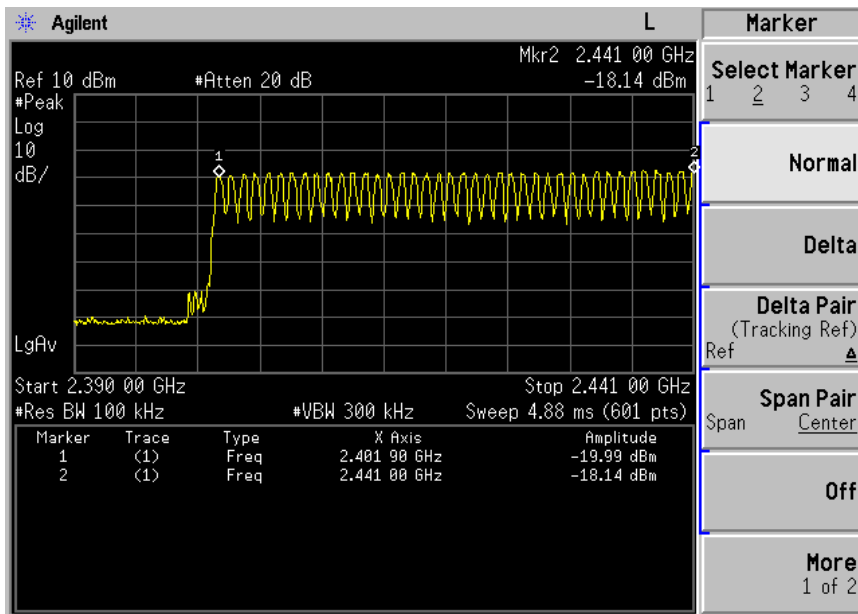
Limit
number

≥ 15

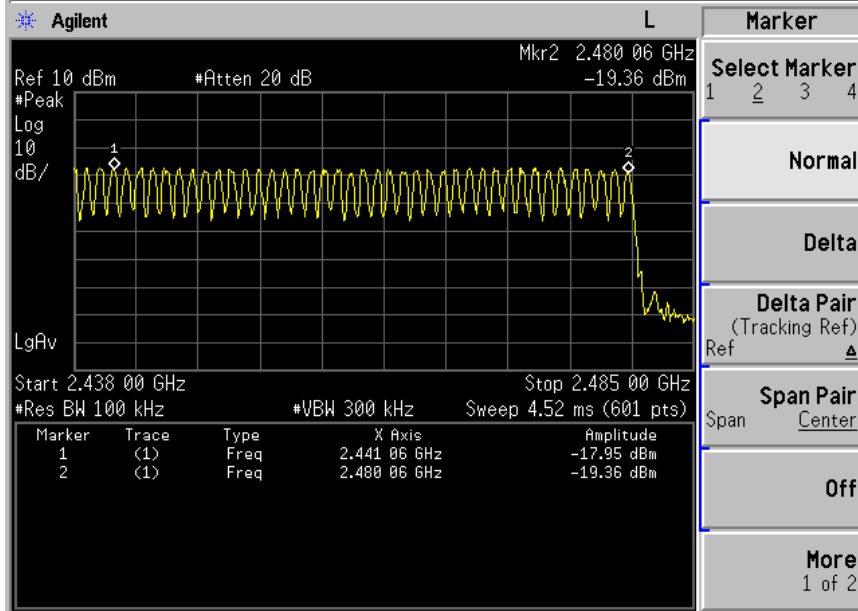
Number of hopping frequencies

GFSK Modulation test result:

Number of hopping frequencies	Result
79	Pass



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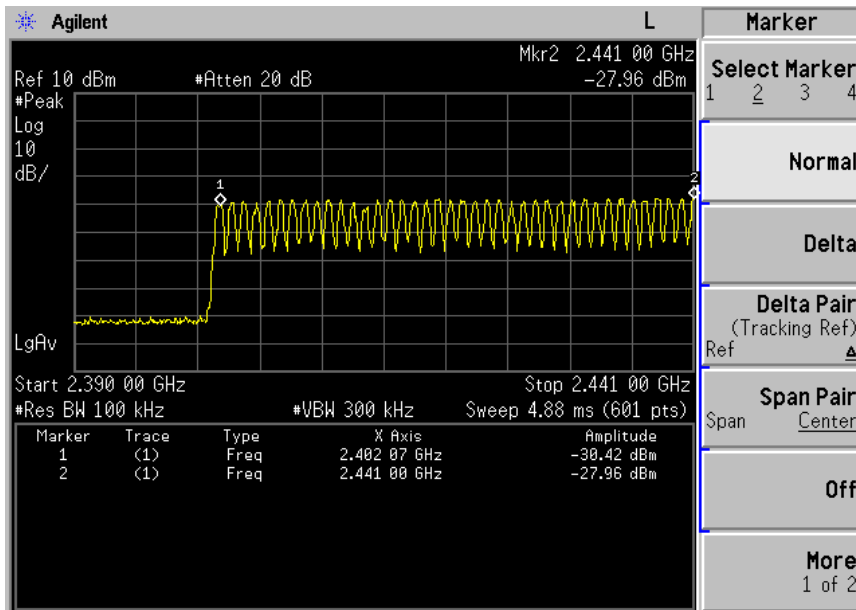


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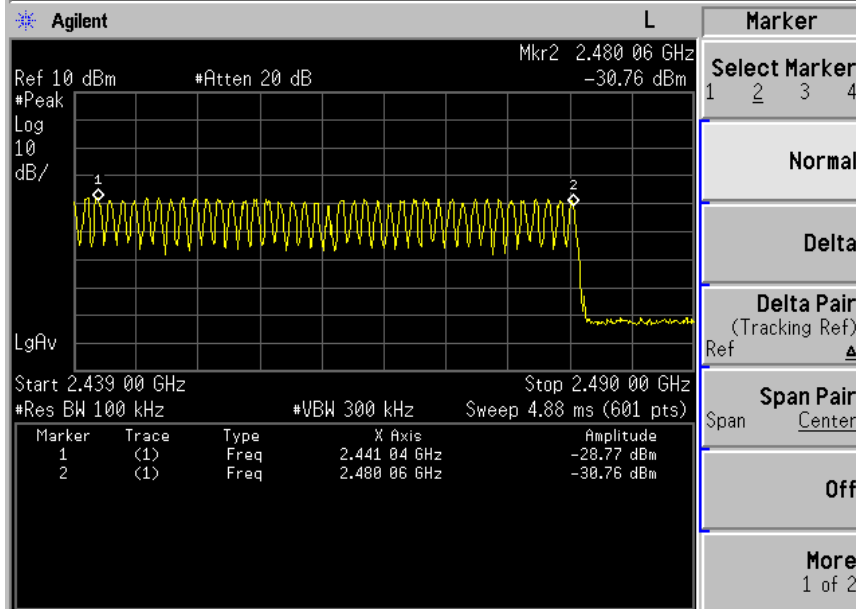
Number of hopping frequencies

8DPSK Modulation test result:

Number of hopping frequencies	Result
79	Pass



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Test Equipment

Number of hopping frequencies Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	2010-05-10

7.8 Dwell Time

Test Method

1. Connect EUT antenna terminal to the spectrum analyzer with a low loss cable.

Equipment mode: Spectrum analyzer

RBW: 1MHz; VBW: 1MHz; SPAN: Zero Span

2. Adjust the center frequency of spectrum analyzer on any frequency be measured.

3. Measure the Dwell Time by spectrum analyzer Marker function.

4. Repeat above procedures until all frequencies measured were complete.

Limit

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

Dwell Time

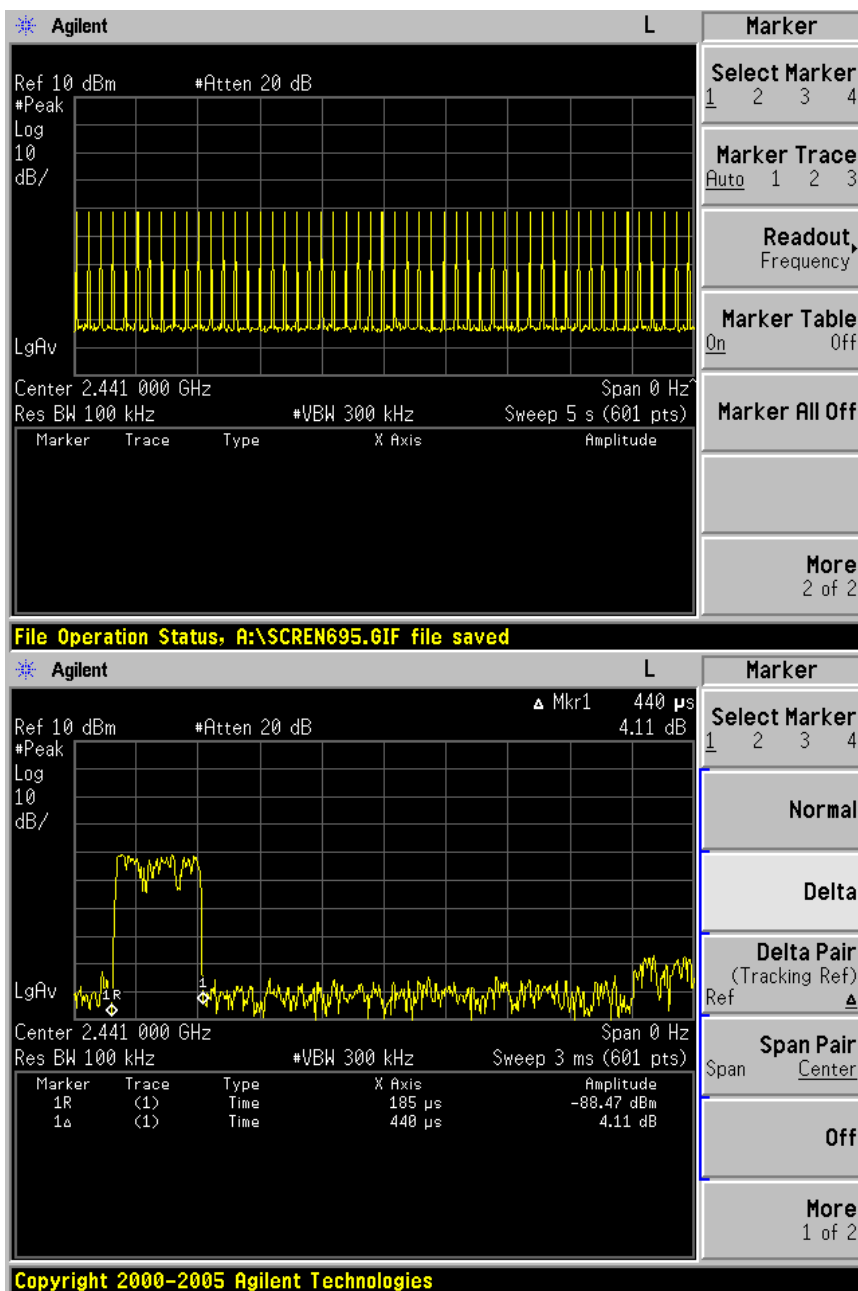
Dwell time

The maximum dwell time shall be 0,4 s.

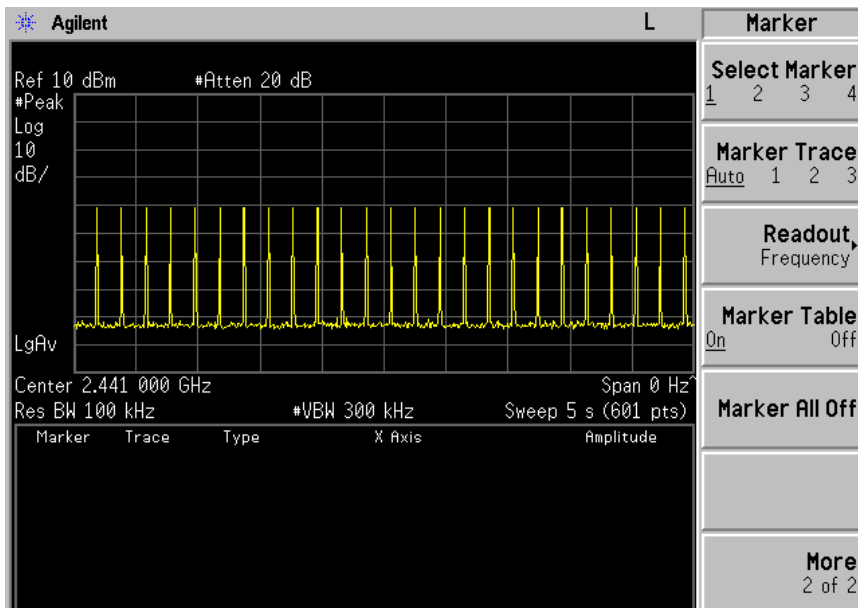
GFSK Modulation:

Test Result

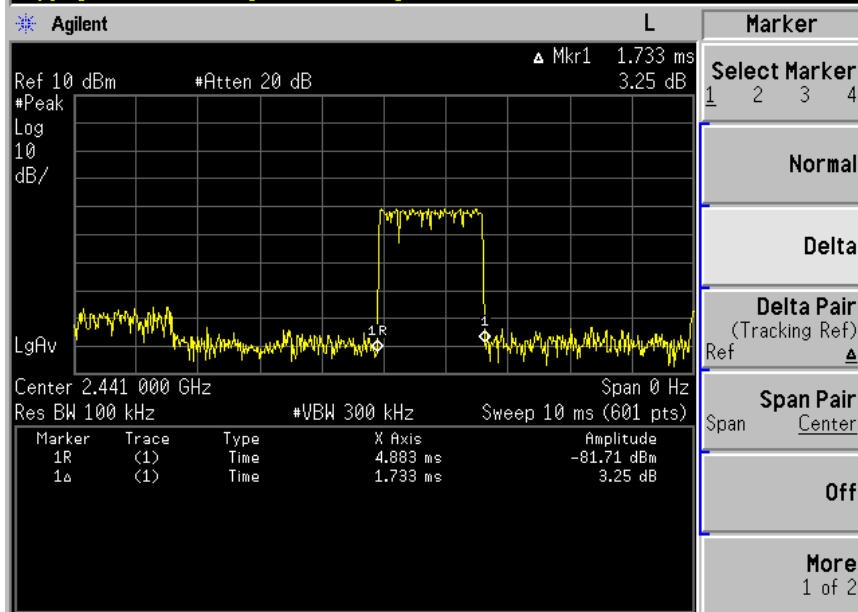
Mode	Reading (µs)	Test Result (ms)	Limit (ms)	Result
DH1	440	141.82	< 400	Pass
DH3	1733	273.81	< 400	Pass
DH5	2967	318.77	< 400	Pass



DH1

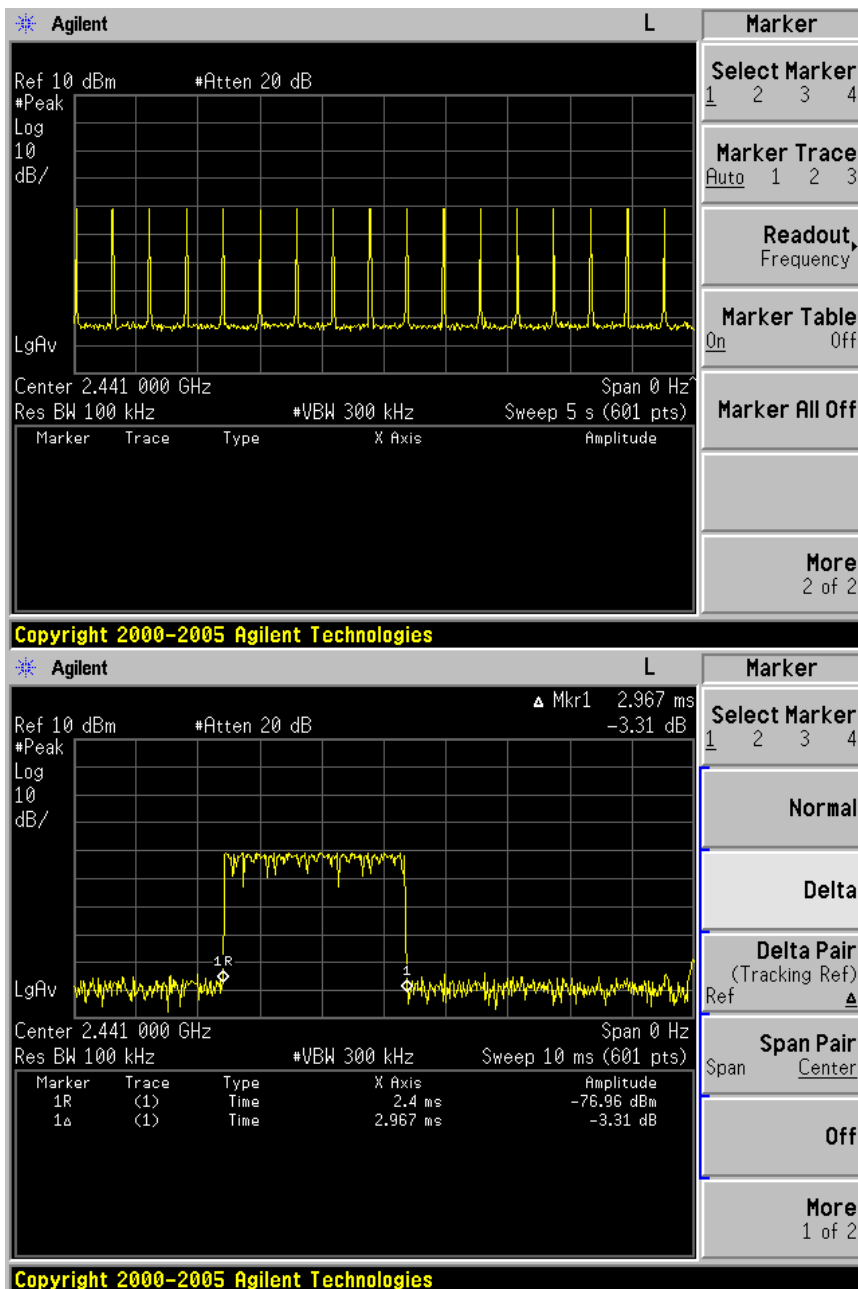


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DH3



DH5

Note:

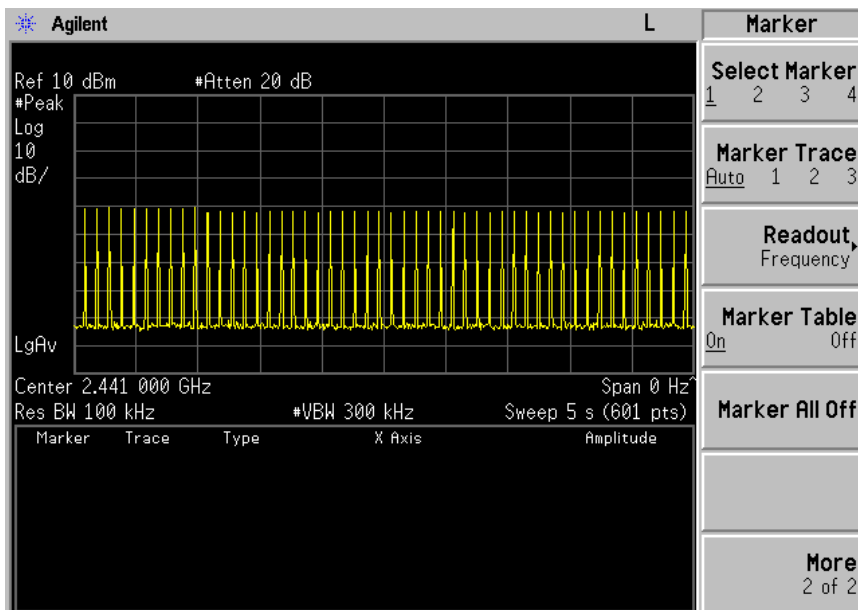
A period time=79x0.4(s)=31.6(s)

DH1 time slot= 51(times)/5(s) *440 (μs) *31.6(s)= 141.82 (ms)
 DH3 time slot= 25(times)/5(s) *1733 (μs) *31.6(s)= 273.81 (ms)
 DH5 time slot= 17(times)/5(s) *2967 (μs) *31.6(s)= 318.77 (ms)

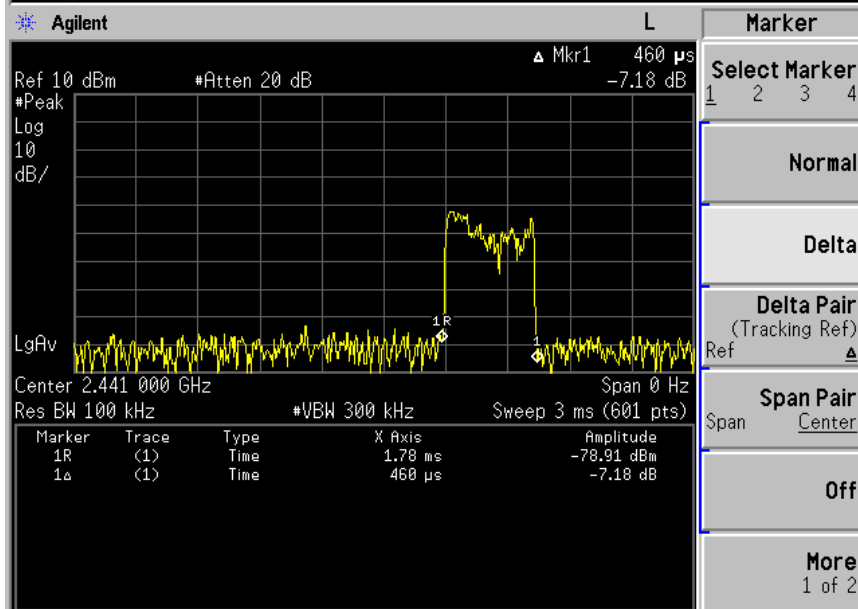
8DPSK Modulation:

Test Result

Mode	Reading (μs)	Test Result (ms)	Limit (ms)	Result
DH1	460	145.36	< 400	Pass
DH3	1733	273.81	< 400	Pass
DH5	3000	303.36	< 400	Pass

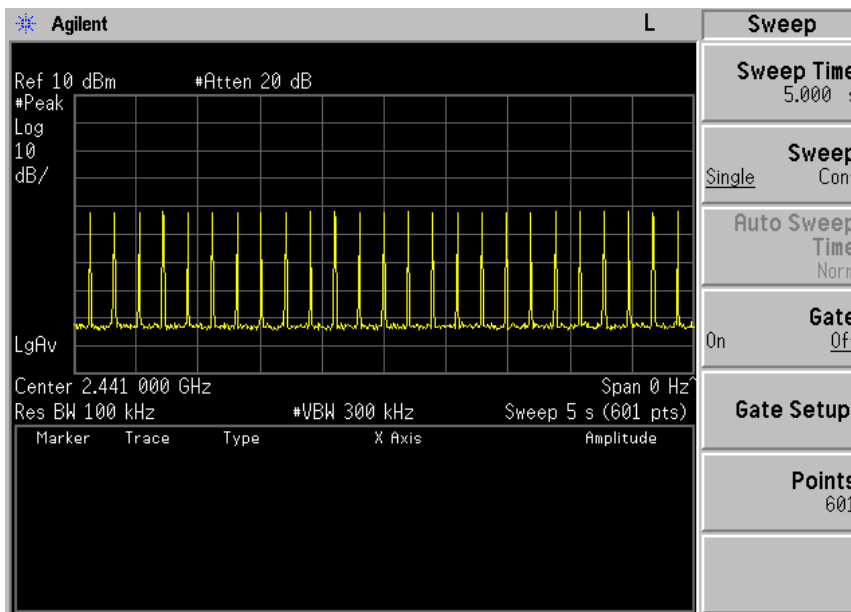


File Operation Status: A:\SCREN696.GIF file saved

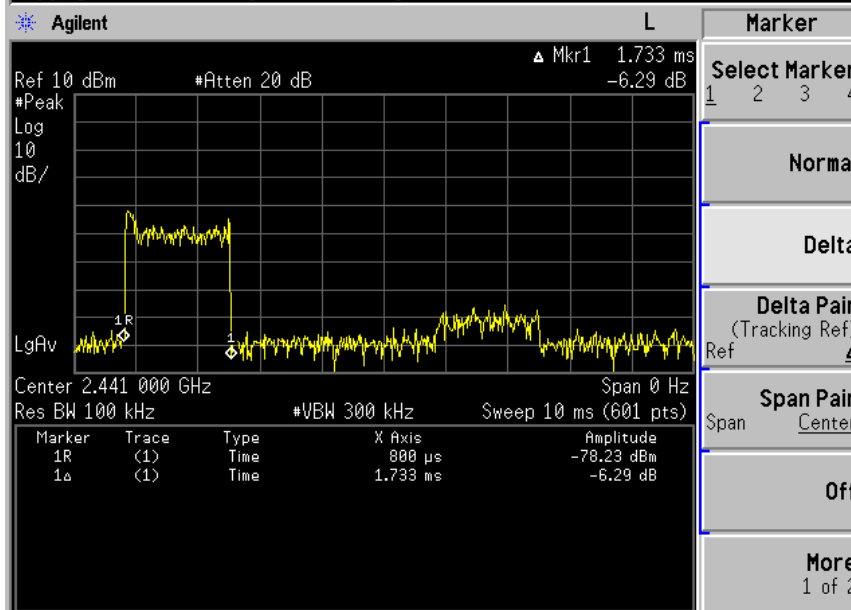


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DH1

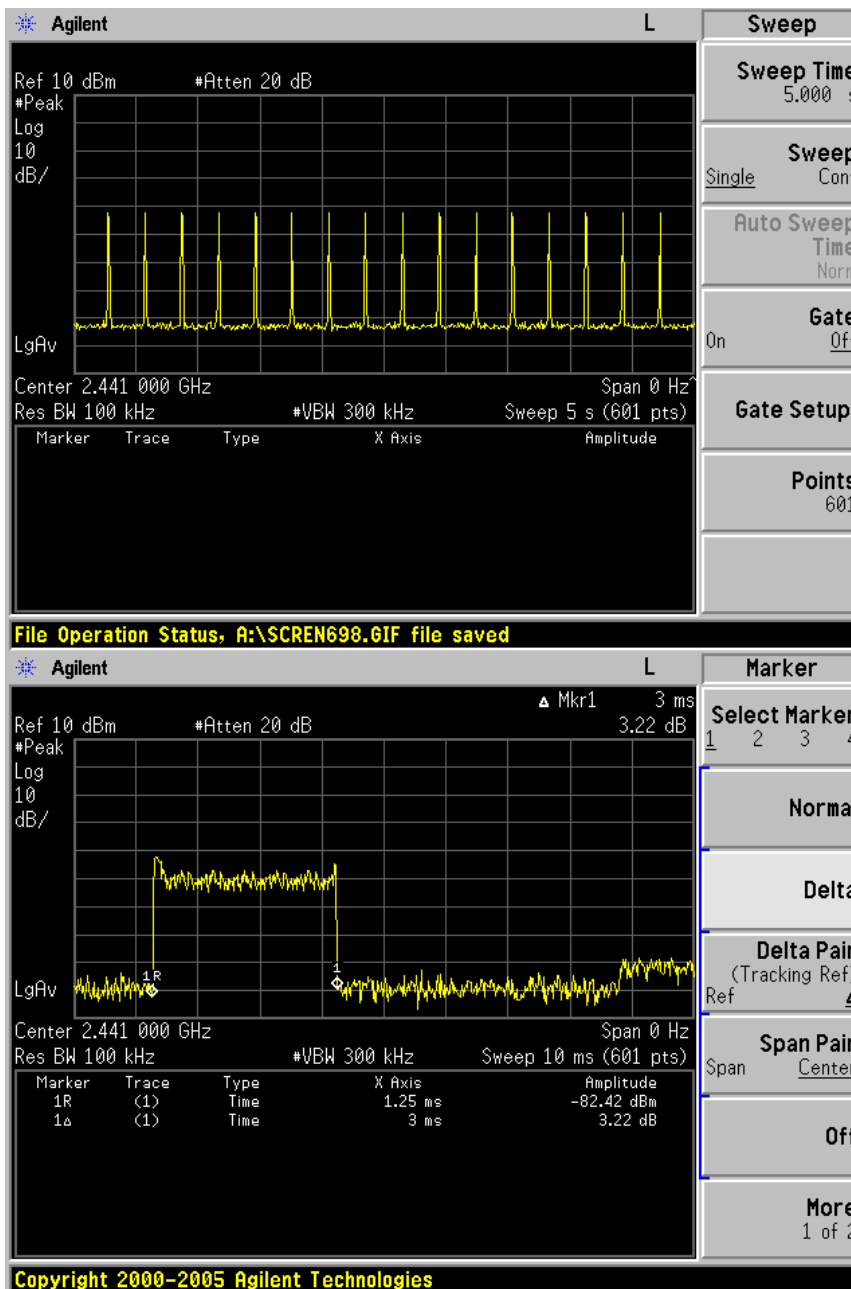


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DH3



DH5

Note:

A period time=79x0.4(s)=31.6(s)

DH1 time slot= 50(times)/5(s) *460 (μs) *31.6(s)= 145.36 (ms)
 DH3 time slot= 25(times)/5(s) *1733 (μs) *31.6(s)= 273.81 (ms)
 DH5 time slot= 16(times)/5(s) *3000 (μs) *31.6(s)= 303.36 (ms)



Test Equipment

Dwell Time Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	2010-05-10



8 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty

Items		Extended Uncertainty
RE	Field strength (dB μ V/m)	U=4.6dB; k=2(30MHz-1GHz)
CE	Disturbance Voltage (dB μ V)	U=3.3dB; k=2