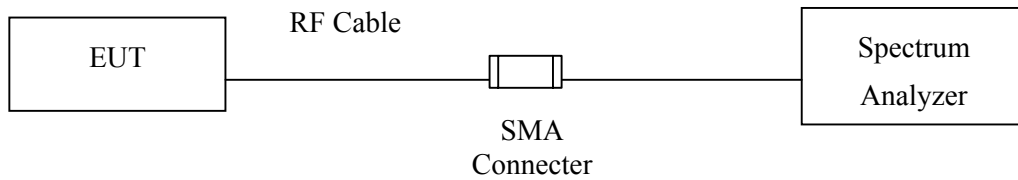## 9. Dwell Time

9.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100339	Jun, 2009
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2009
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2009

Note: 1. All equipments are calibrated every one year.

2. The test instruments marked by "X" are used to measure the final test results.

9.2. Test Setup

9.3. Limit

The dwell time shall be the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

9.4. Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

9.5. Uncertainty
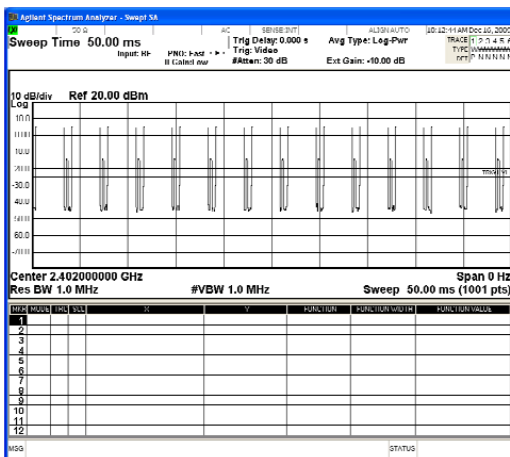
± 25msec

9.6. Test Result of Dwell Time

Product	:	Smart Handheld
Test Item	:	Dwell Time
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK) (Channel 00,39,78 –DH5)

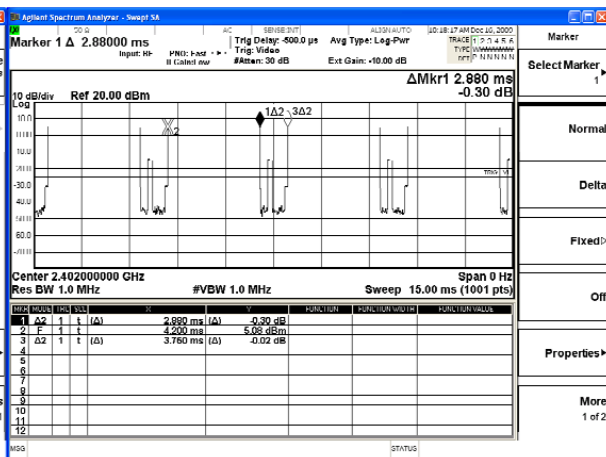| Channel No.	Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Duty cycle	Dwell Time (Sec)	Limit (Sec)	Result
00	2402	2.880	13	50	0.75	0.300	0.4	Pass
39	2441	2.880	13	50	0.75	0.300	0.4	Pass
78	2480	2.880	13	50	0.75	0.300	0.4	Pass

Note: Duty cycle =((Time slot length (ms)*Hopping of Number) / Sweep time (ms)

Dwell time = (Duty cycle /79) * (79*0.4)
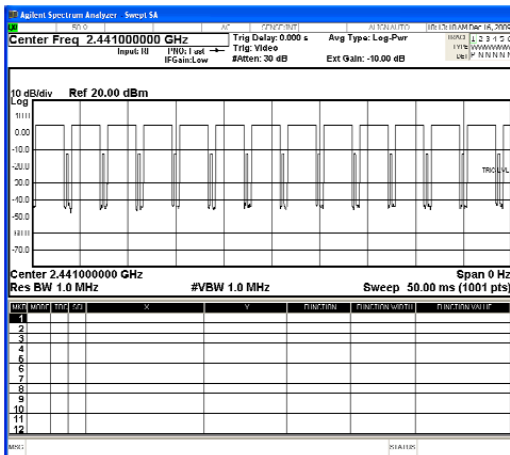
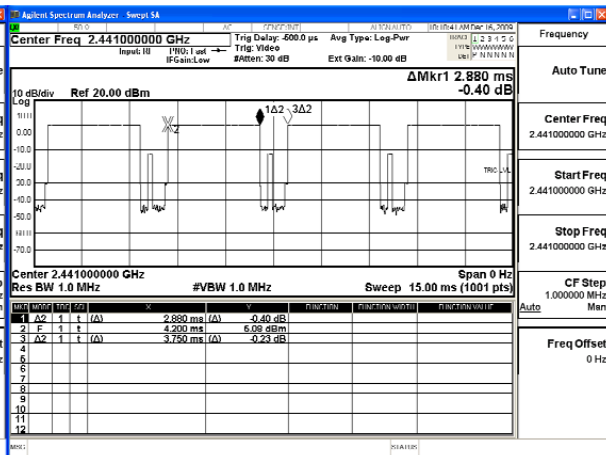CH 00 2402MHz Dwell Time   Transmission Time

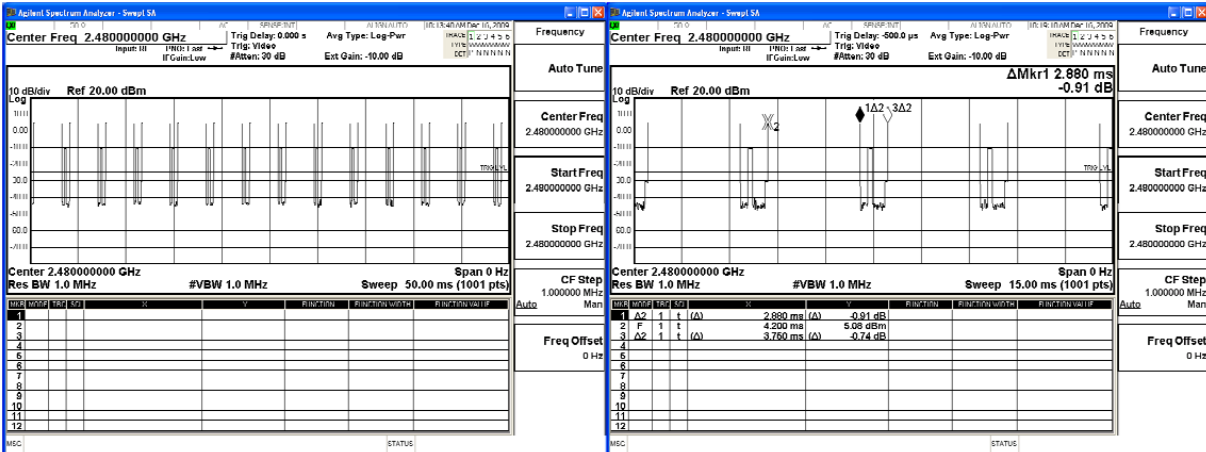CH 39 2441MHz Dwell Time   Transmission Time

CH 78 2480MHz Dwell Time   Transmission Time

Note: The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.

Product   :   Smart Handheld
Test Item   :   Dwell Time
Test Site   :   No.3 OATS
Test Mode   :   Mode 2: Transmit - 3Mbps (8DPSK) (Channel 00,39,78 –DH5)

Channel No.	Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Duty cycle	Dwell Time (Sec)	Limit (Sec)	Result
00	2402	2.895	8	50	0.46	0.185	0.4	Pass
39	2441	2.895	8	50	0.46	0.185	0.4	Pass
78	2480	2.895	8	50	0.46	0.185	0.4	Pass

Note: Duty cycle =((Time slot length(ms)*Hopping of Number) / Sweep time (ms)

Dwell time = (Duty cycle /79) * (79*0.4)

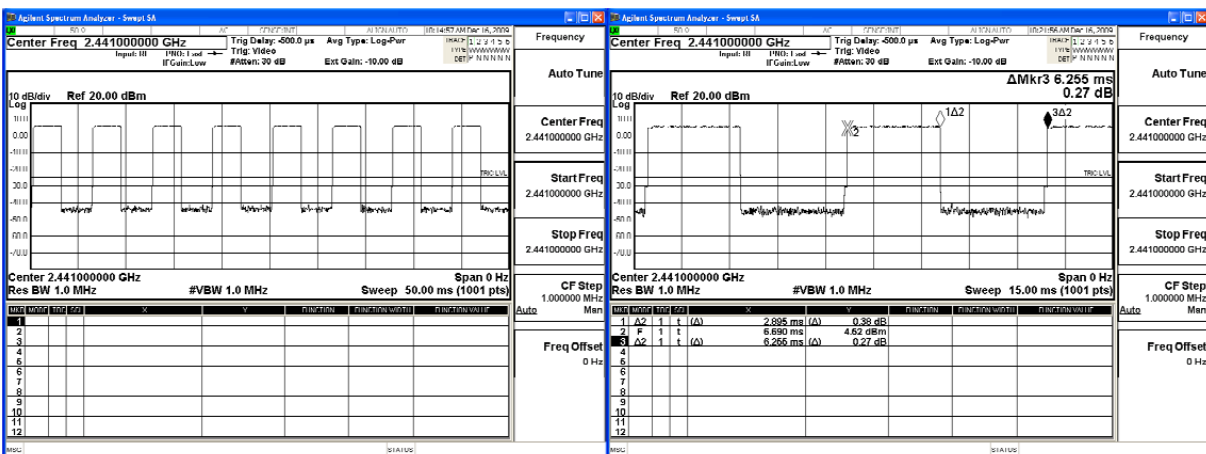CH 00 2402MHz Dwell Time   Transmission Time
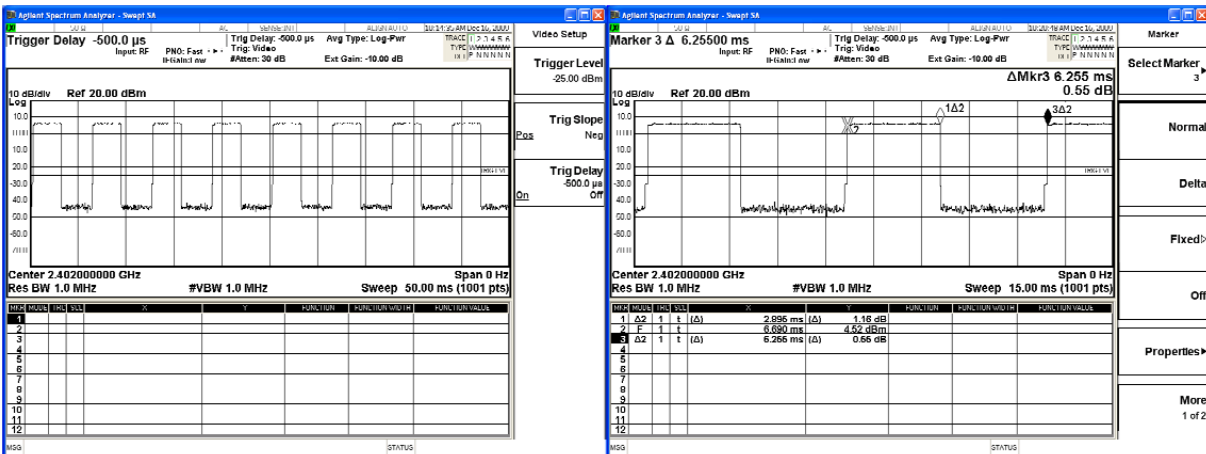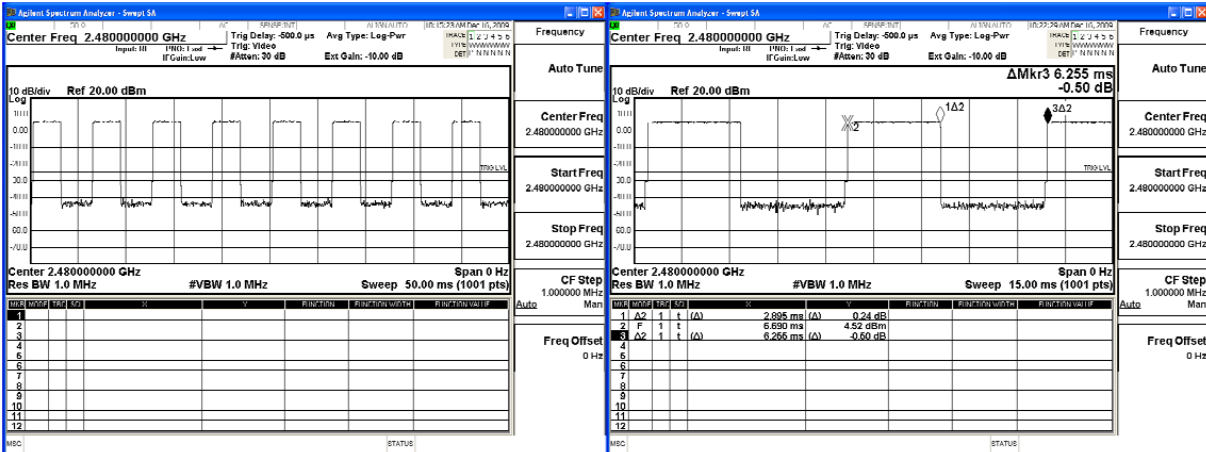

CH 39 2441MHz Dwell Time   Transmission Time

CH 78 2480MHz Dwell Time   Transmission Time

Note: The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.
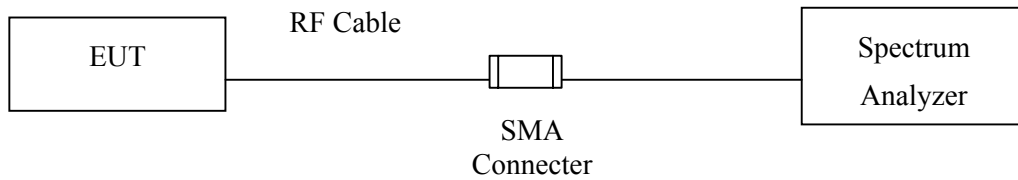
10. Occupied Bandwidth

10.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100339	Jun, 2009
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2009
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2009

Note: 1. All equipments are calibrated every one year.

2. The test instruments marked by "X" are used to measure the final test results.

10.2. Test Setup

10.3. Limits

N/A

10.4. Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.
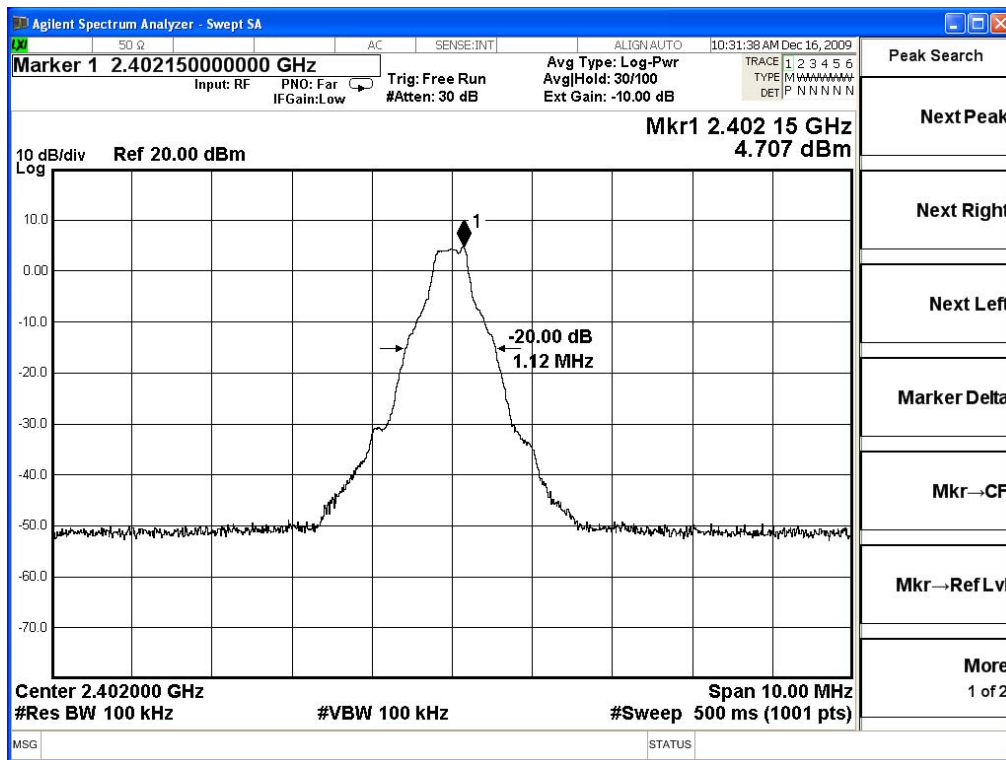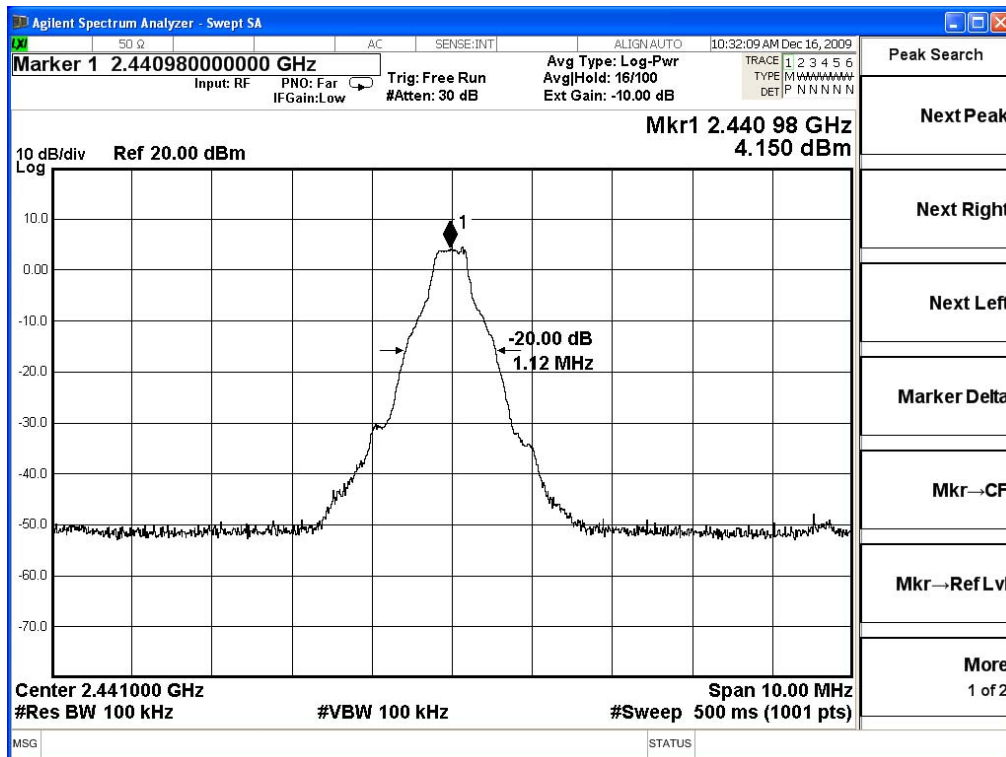
10.5. Uncertainty

± 150Hz

10.6. Test Result of Occupied Bandwidth

Product : Smart Handheld
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2402MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1120	--	NA

Figure Channel 00:

Product   :   Smart Handheld
Test Item   :   Occupied Bandwidth Data
Test Site   :   No.3 OATS
Test Mode   :   Mode 1: Transmit - 1Mbps (GFSK)(2441MHz)

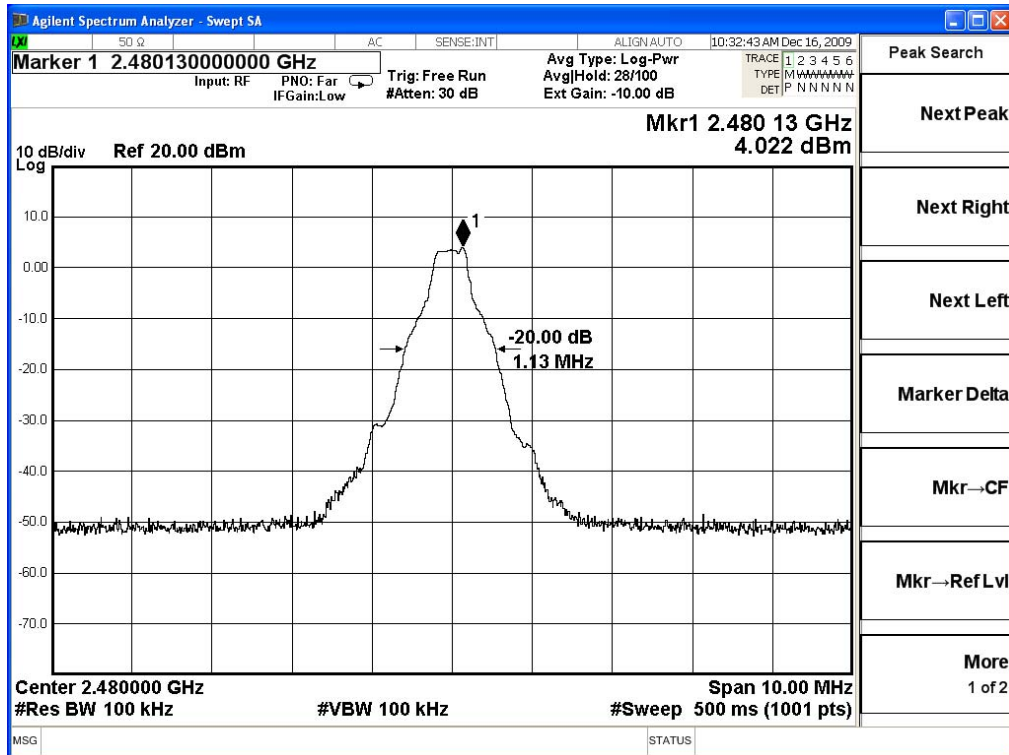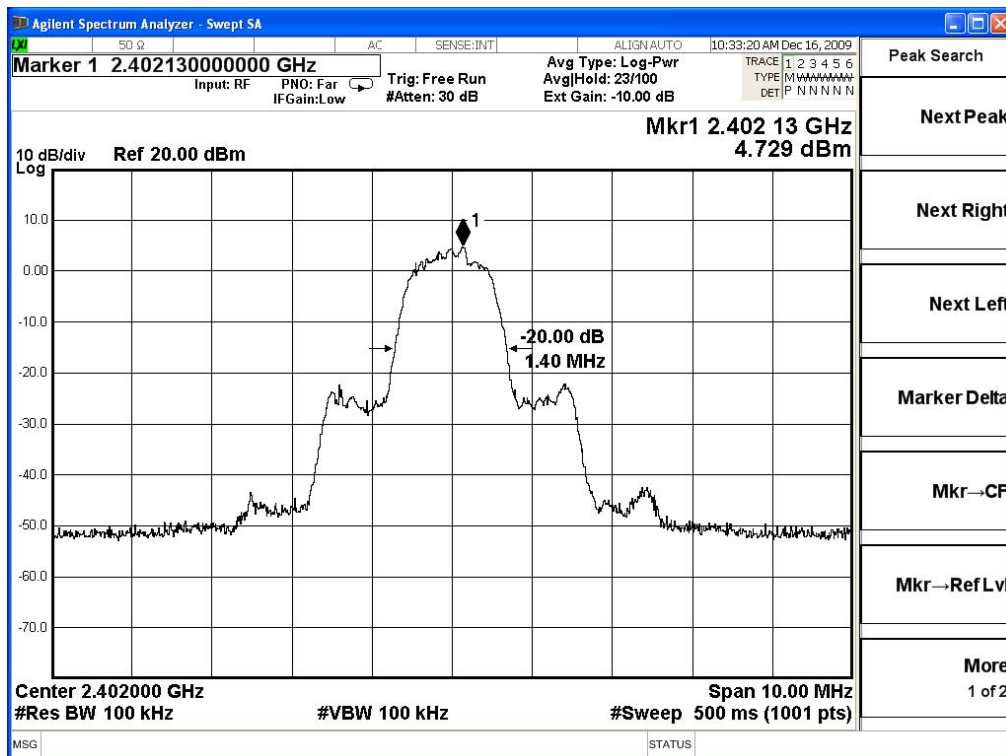| Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
39	2441	1120	--	NA

Figure Channel 39:

Product : Smart Handheld
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2480MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
78	2480	1130	--	NA

Figure Channel 78:

Product : Smart Handheld
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz)

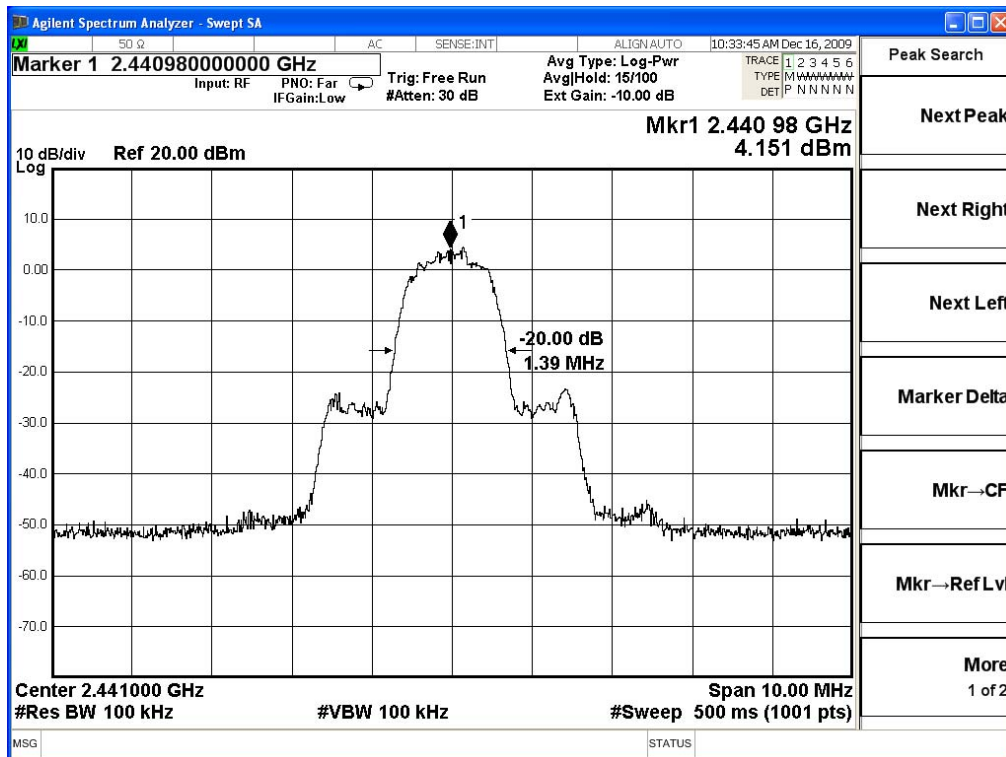| Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1400	--	NA

Figure Channel 00:

Product : Smart Handheld
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

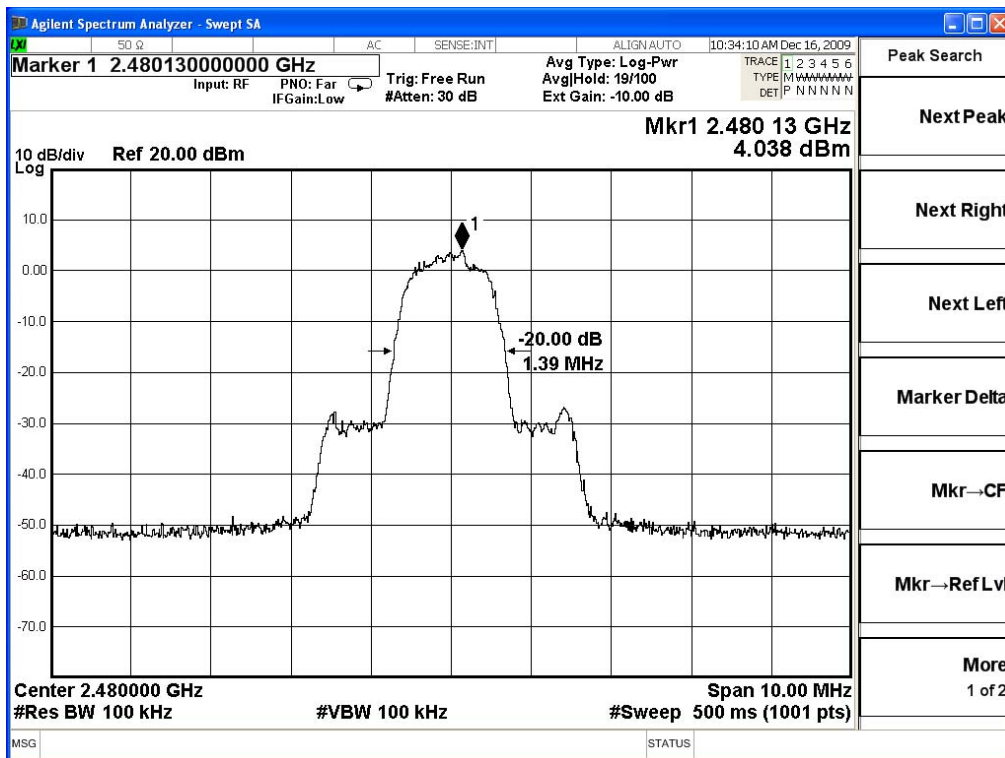| Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
39	2441	1390	--	NA

Figure Channel 39:

Product : Smart Handheld
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)(2480MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
78	2480	1390	--	NA

**Figure Channel 78:**

11.   Duty Cycle

11.1.   Test Equipment

The following test equipments are used during the band edge tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100339	Jun, 2009
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2009
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2009

Note: 1. All equipments are calibrated every one year.

2. The test equipments marked by "X" are used to measure the final test results.
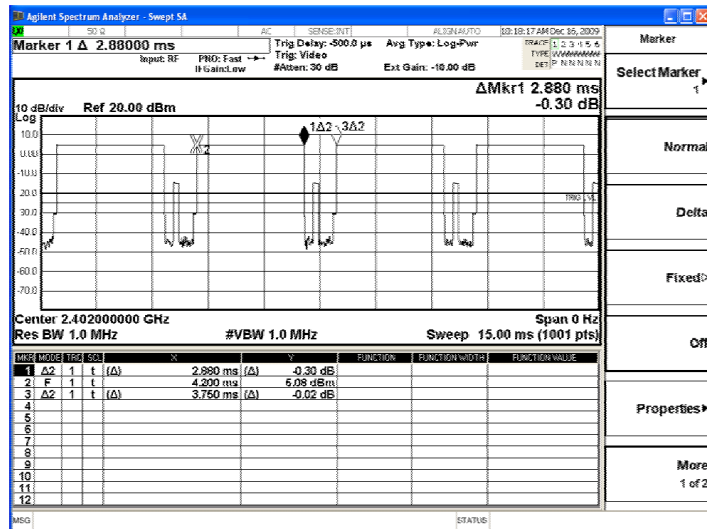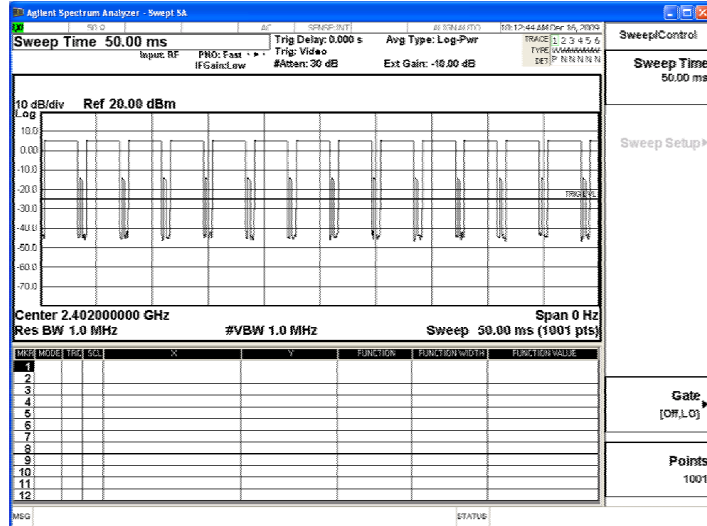
11.2.   Test Setup
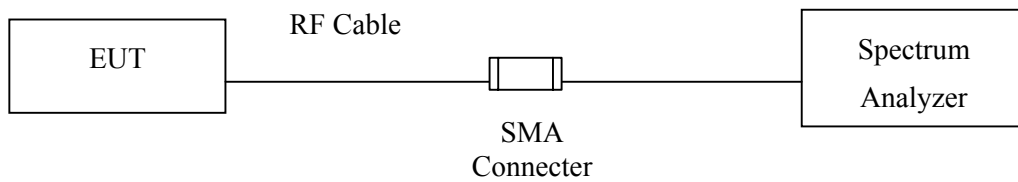
11.3.   Uncertainty

± 150Hz

11.4. Test Result of Duty Cycle

Product : Smart Handheld
Test Item : Duty Cycle Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Time on of 100ms= 2.88ms*26= 74.880ms

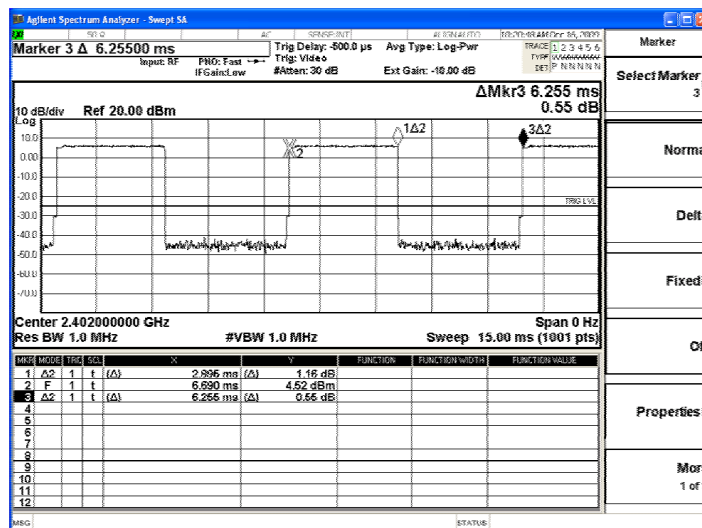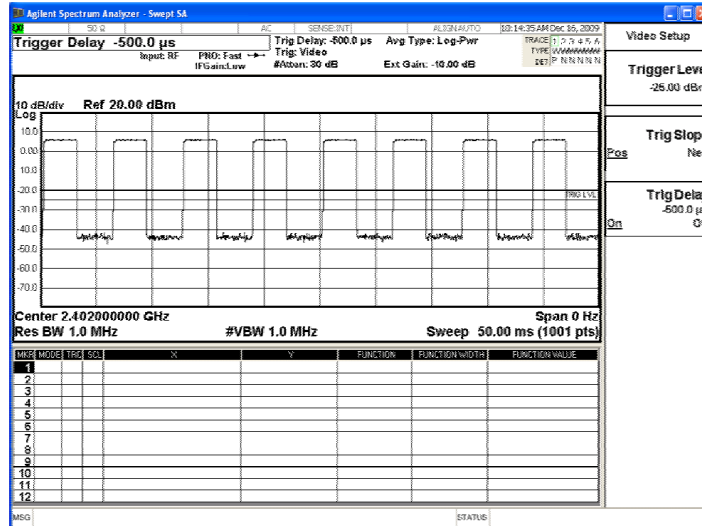Duty Cycle= 74.88ms / 100ms= 0.7488

Duty Cycle correction factor= 20 LOG 0.7488= -2.513 dB

Duty Cycle correction factor	-2.513	dB

Remark:

1. If Duty Cycle is smaller than -20dB,based on FCC part15 the duty cycle correction factor is -20dB
   for calculating average emission.

Product   :   Smart Handheld
Test Item   :   Duty Cycle Data
Test Site   :   No.3 OATS
Test Mode   :   Mode 2: Transmit - 3Mbps (8DPSK)

Time on of 100ms= 2.895ms*16== 46.320ms

Duty Cycle= 46.320ms / 100ms= 0.4632

Duty Cycle correction factor= 20 LOG 0.4632= -6.685 dB

Duty Cycle correction factor	-6.685	dB

Remark:

1. If Duty Cycle is smaller than -20dB,based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.

12.   EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs