10 NUMBER of HOPPING CHANNELS

10.1 Standard Applicable

According to 15.247(b)(1), for frequency hopping systems, operating in the 2400-2483.5MHz band employing at least 75 hopping channels

10.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. The setup of the EUT as shown in figure 4. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set EUT to hopping operating mode and set spectrum analyzer miximum to measure the number of hopping channels.

10.3 Measurement Equipment

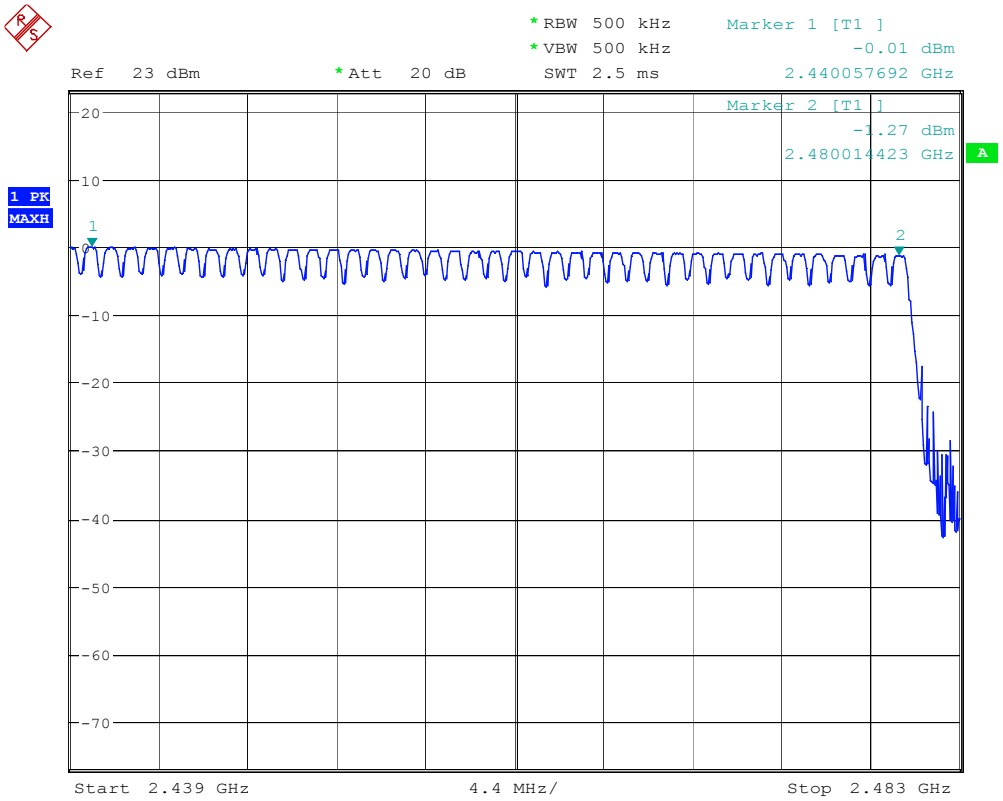
Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSU46	10/03/2005

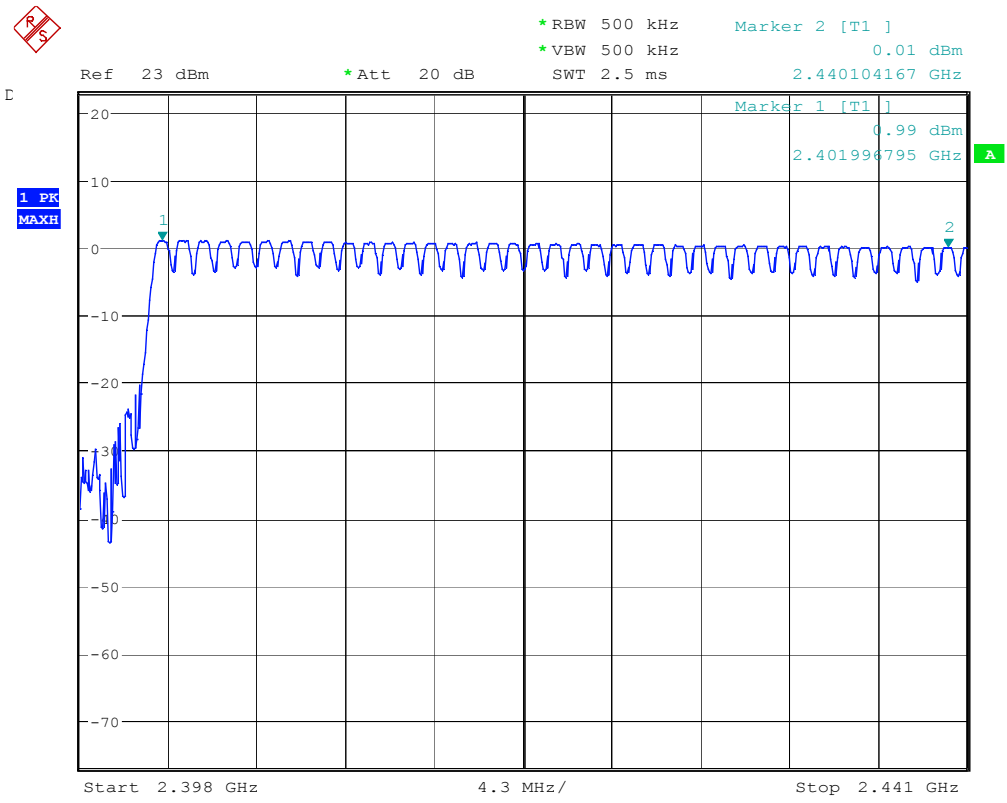
10.4 Measurement Data

Test Date : Sep. 22, 2004 Temperature : 24 ℃ Humidity: 69%

Number of hopping channels = 79 channels

Note: Please refer to page 54 for chart


*RBW 500 kHz
*VBW 500 kHz
SWT 2.5 ms
Marker 1 [T1]
-0.01 dBm
2.440057692 GHz
Ref 23 dBm
*Att 20 dB
Marker 2 [T1]
-1.27 dBm
2.480014423 GHz
A
1 PK
MAXH
20
10
0
-10
-20
-30
-40
-50
-60
-70
1
2
Start 2.439 GHz
4.4 MHz/
Stop 2.483 GHz


*RBW 500 kHz
*VBW 500 kHz
SWT 2.5 ms
Marker 2 [T1]
0.01 dBm
2.440104167 GHz
Ref 23 dBm
*Att 20 dB
Marker 1 [T1]
0.99 dBm
2.401996795 GHz
A
1 PK
MAXH
20
10
0
-10
-20
-30
-40
-50
-60
-70
1
2
Start 2.398 GHz
4.3 MHz/
Stop 2.441 GHz

11 HOPPING CHANNEL CARRIER FREQUENCY SEPARATED

11.1 Standard Applicable

According to 15.247(a)(1), the frequency hopping system shall have hopping channel carrier frequencies seperated by minimum of 25kHz or the 20dB bandwidth of hopping channel, whichever is greater.

11.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. The setup of the EUT as shown in figure 4. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any measurement frequency within its operating ragne and make sure the instrument is operated in its linear range.
3. Set spectrum analyzer maximum hold to measure channel carrier frequency , then adjust channel carrier frequency to adjacent channel.
4. Repeat above procedure until all measured frequencies were complete.

11.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Hewlett-Packard	8564EC	09/16/2005

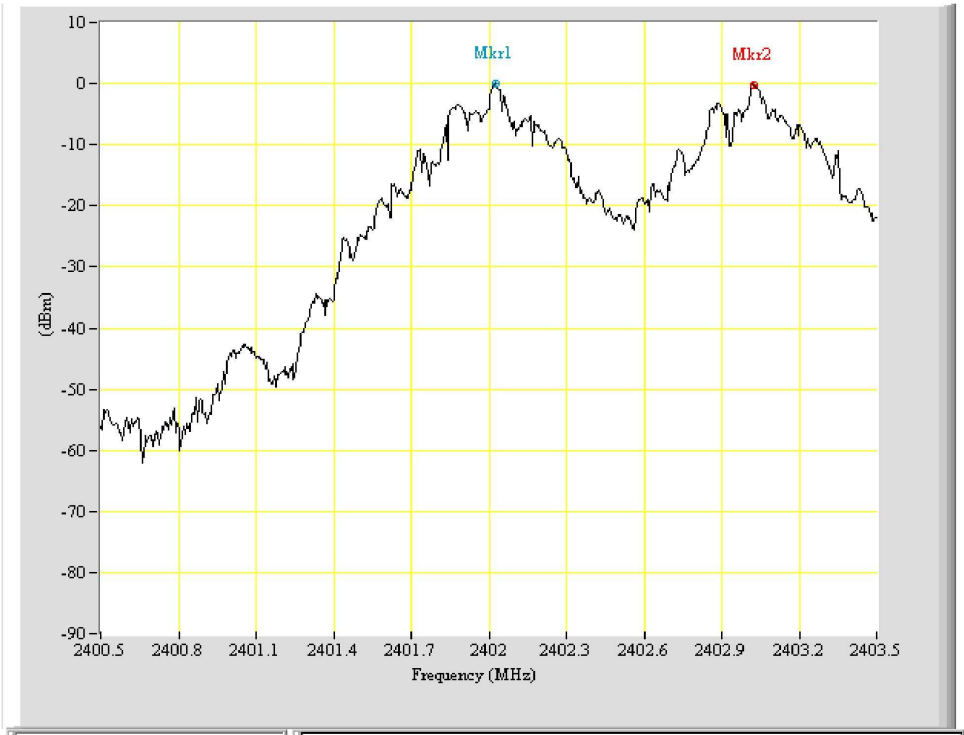
11.4 Measurement Data

Test Date : Sep. 22, 2004 Temperature : 24 ℃ Humidity: 69%

a) 2402MHz channel seperation is 1MHz
b) 2441MHz channel seperation is 1MHz
c) 2480MHz channel seperation is 1MHz

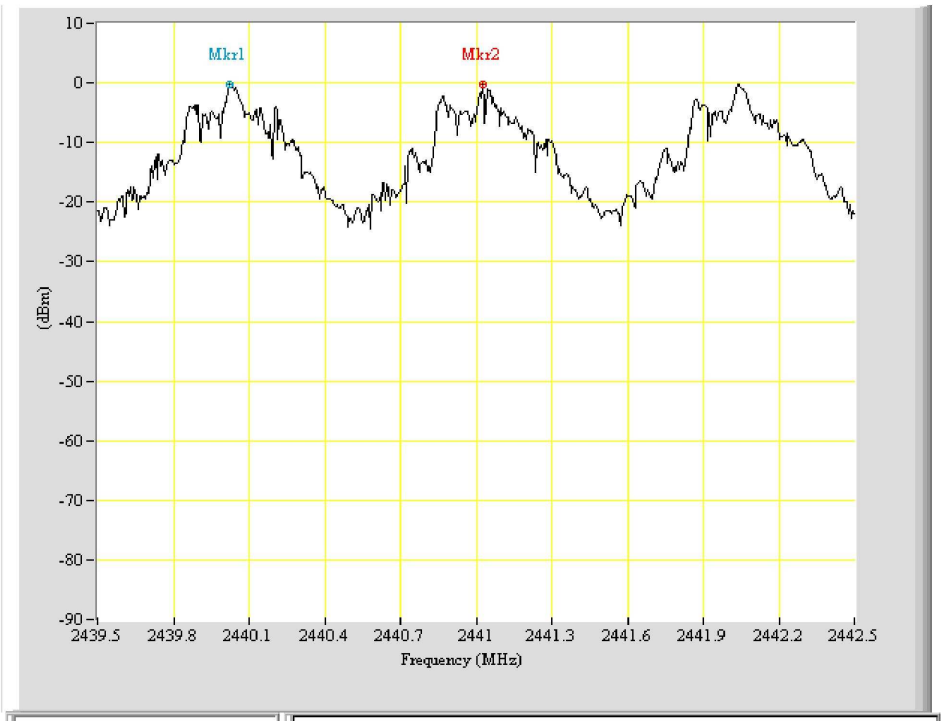
Channel	Frequency (MHz)	Hopping Channel Carrier Frequency Separated (MHz)	Chart
0	2402	1	Page 57
39	2441	1	Page 58
78	2480	1	Page 59

Note: Please refer to page 57 to page 59 for chart



*Center 2402.0000MHz	ΔMarker -1.0000MHz -0.330dB
*SPAN 3.0000MHz	Mkr1 2402.025MHz 0.000dBm
*RBW 30.00kHz	Mkr2 2403.025MHz -0.330dBm
*VBW 30.00kHz	
*SWP 50.00msec	
*ATTEN 20.00dB	
*RL 10.00dBm	

EUT:
Purpose: Channel_Seperation
Condition: CH0
Note:



*Center 2441.0000MHz	ΔMarker -1.0000MHz -0.170dB
*SPAN 3.0000MHz	Mkr1 2440.025MHz -0.160dBm
*RBW 30.00kHz	Mkr2 2441.025MHz -0.330dBm
*VBW 30.00kHz	
*SWP 50.00msec	
*ATTEN 20.00dB	
*RL 10.00dBm	

EUT:
Purpose: Channel_Seperation
Condition: CH39
Note:

*Center 2480.0000MHz	ΔMarker -1.0000MHz 0.000dB
*SPAN 3.0000MHz	Mkr1 2479.035MHz -1.330dBm
*RBW 30.00kHz	Mkr2 2480.035MHz -1.330dBm
*VBW 30.00kHz	
*SWP 50.00msec	
*ATTEN 20.00dB	
*RL 10.00dBm	

EUT:
Purpose: Channel_Seperation
Condition: CH78
Note:

12 POWER SPECTRAL DENSITY

12.1 Standard Applicable

According to 15.247(d), for bluetooth device, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater them 8dBm in any 3kHz band during any time interral of continuous transmission.

12.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. The setup of the EUT as shown in figure 4. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 3kHz, VBW to 30 kHz, sweep 300kHz and sweep time 100 sec.
4. Measure the highest amplitude appearing on spectral display and record the level to calculate result data.
5. Repeat above procedures until all frequencies measured were complete.

12.3 Measurement Equipment

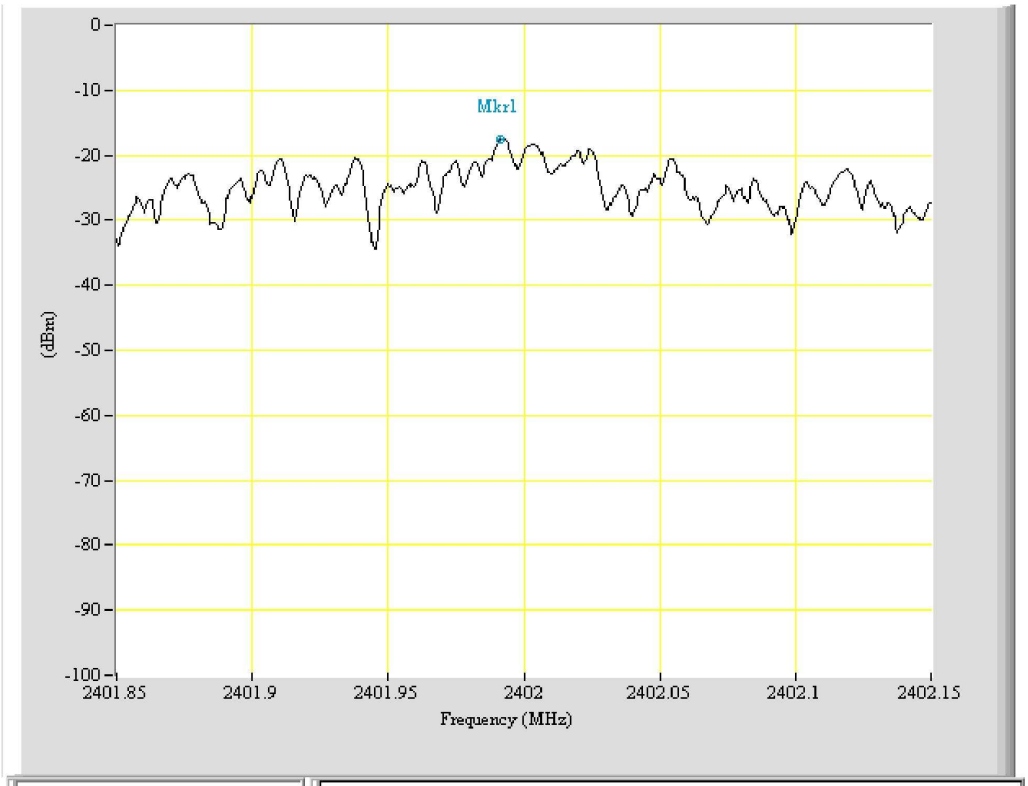
Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Hewlett-Packard	8564EC	09/16/2005

12.4 Measurement Data

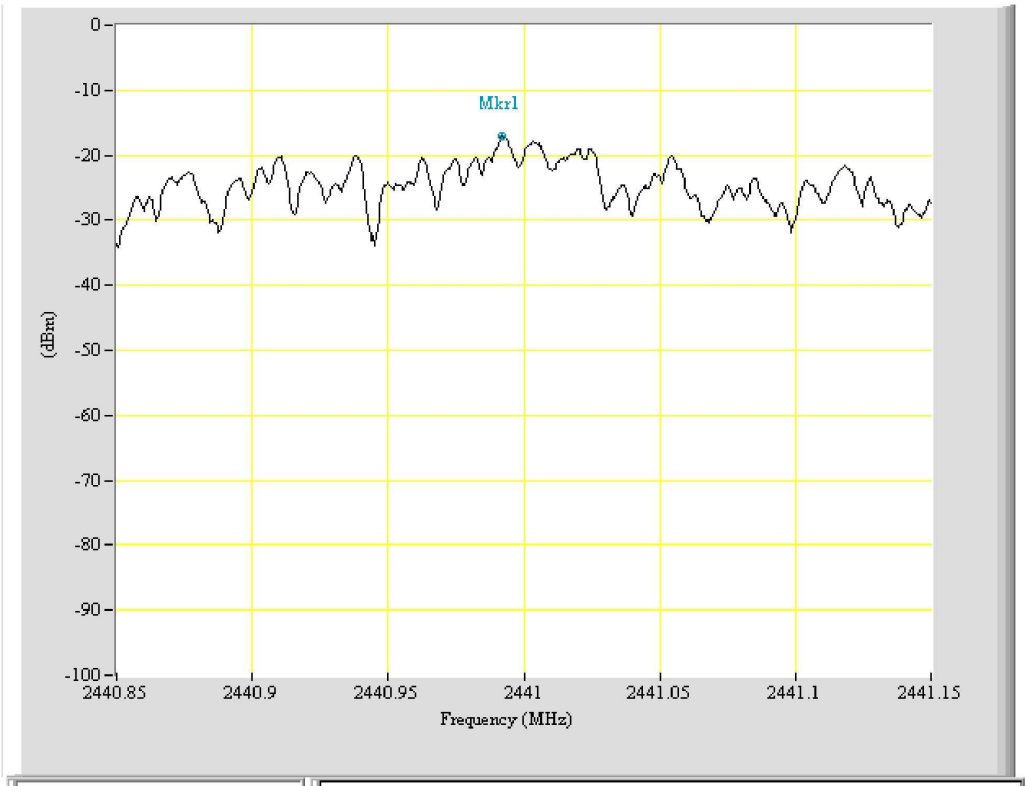
Test Date : Sep. 22, 2004 Temperature : 24 ℃ Humidity: 69%

Channel	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	Power Spectral Density (dBm)	FCC Limit (dBm)	Chart
0	2402	-17.50	1.0	-16.50	8	Page 62
39	2441	-17.16	1.0	-16.16	8	Page 63
78	2480	-17.50	1.0	-16.50	8	Page 64

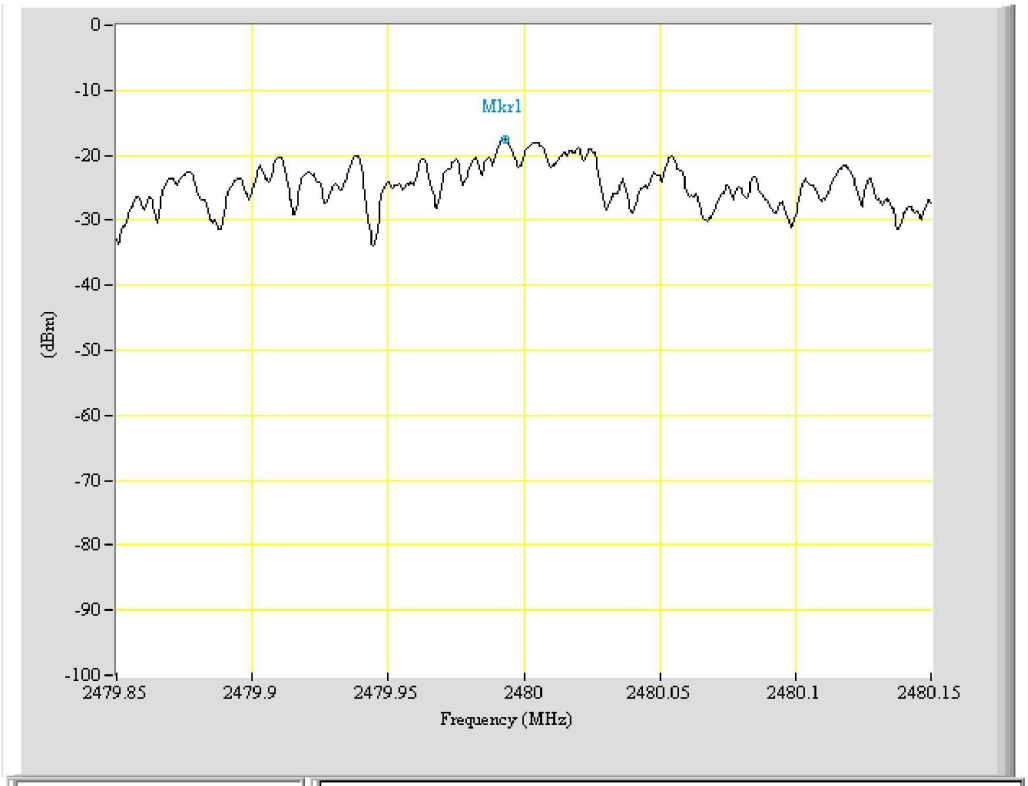
Note: Please refer to page 62 to page 64 for chart



EUT:
Purpose: PwrDensity
Condition: CH0
Note:



EUT:
Purpose: PwrDensity
Condition: CH39
Note:



EUT:
Purpose: PwrDensity
Condition: CH78
Note:

13 Dwell Time

13.1 Standard Applicable

According to 15.247(a)(1)(iii), frequency hopping system in the 2400-2483.5MHz band employing at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 second multiplied by the number of hopping channels employed.

13.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. The setup of the EUT as shown in figure 4.

13.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Hewlett-Packard	8564EC	09/16/2005

13.4 Measurement Data

Test Date : Sep. 22, 2004 Temperature : 24 ℃ Humidity: 69%

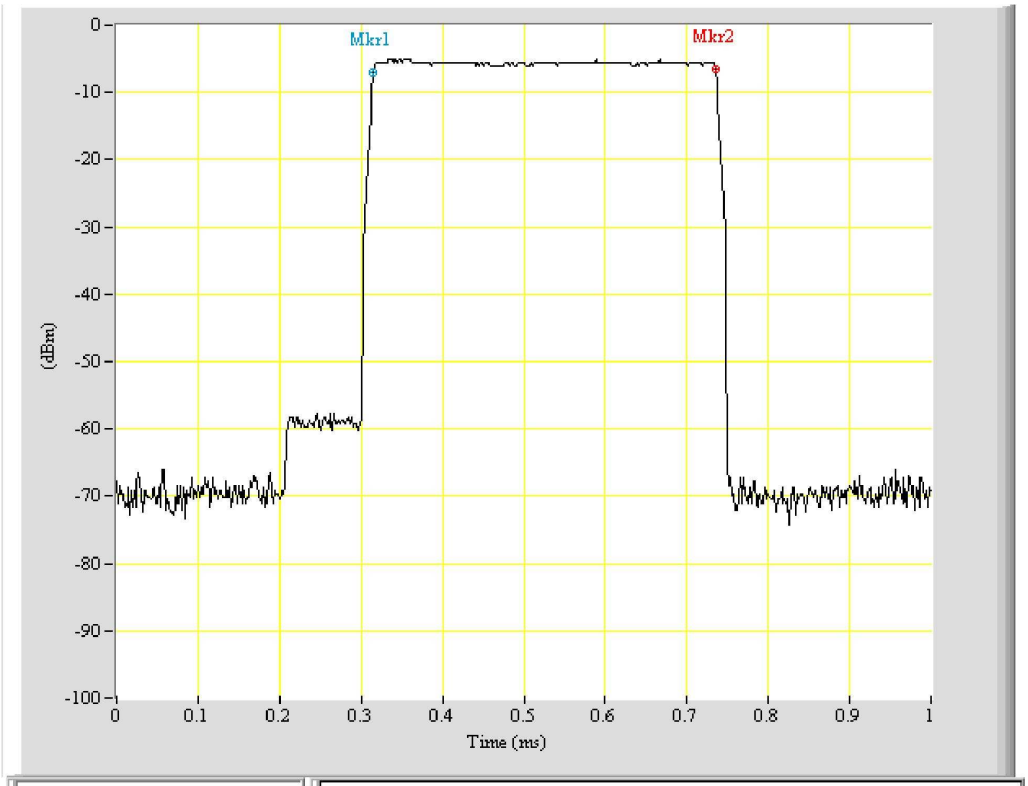
Test period=0.4(second/channel)× 79 channel=31.6sec

a) 2402MHz dwell time= $420.0\text{us} \times \frac{800}{79} \times 31.6 = 134.400$ ms

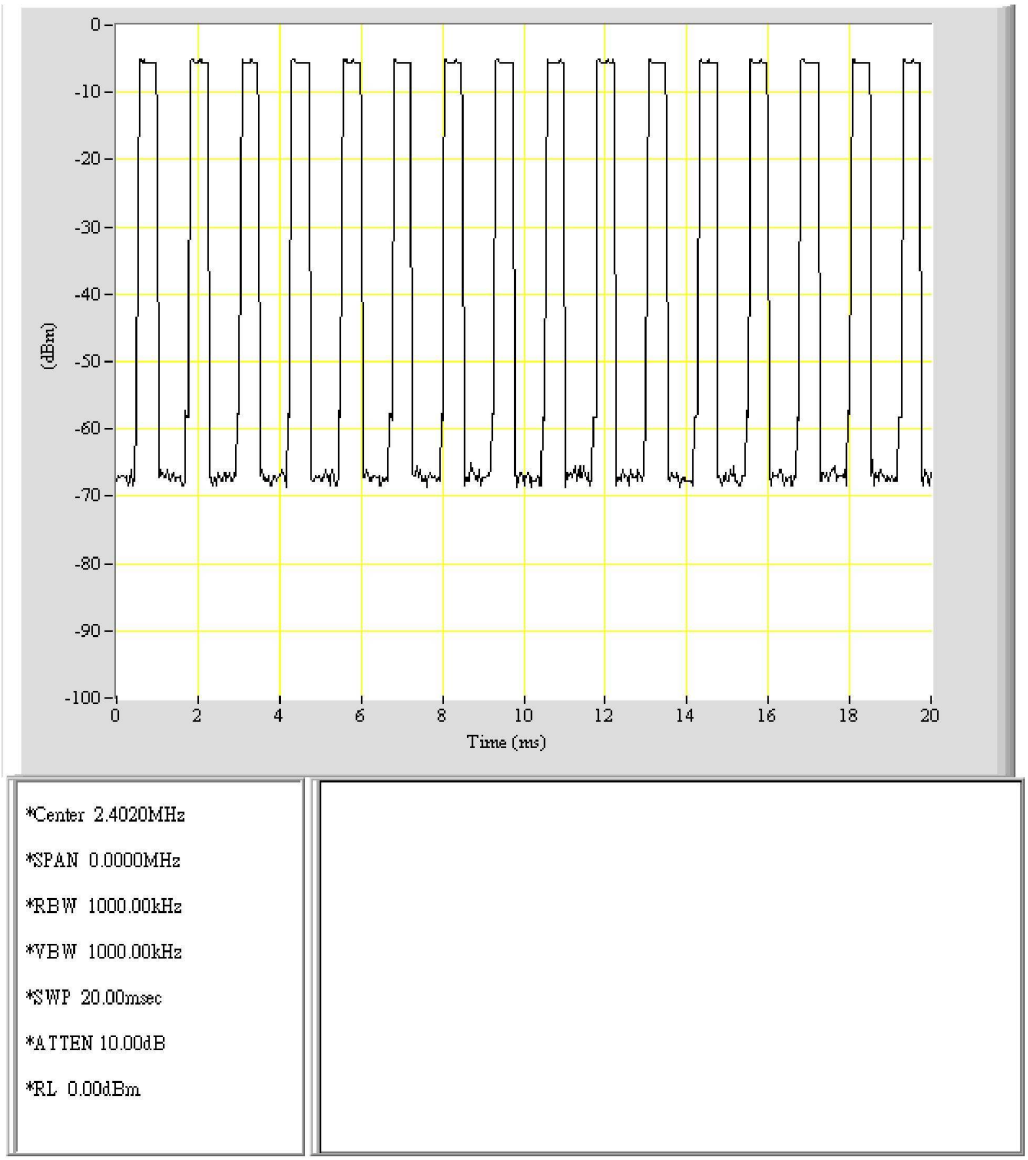
b) 2441MHz dwell time= $420.0\text{us} \times \frac{800}{79} \times 31.6 = 134.400$ ms

c) 2480MHz dwell time= $420.0\text{us} \times \frac{800}{79} \times 31.6 = 134.400$ ms

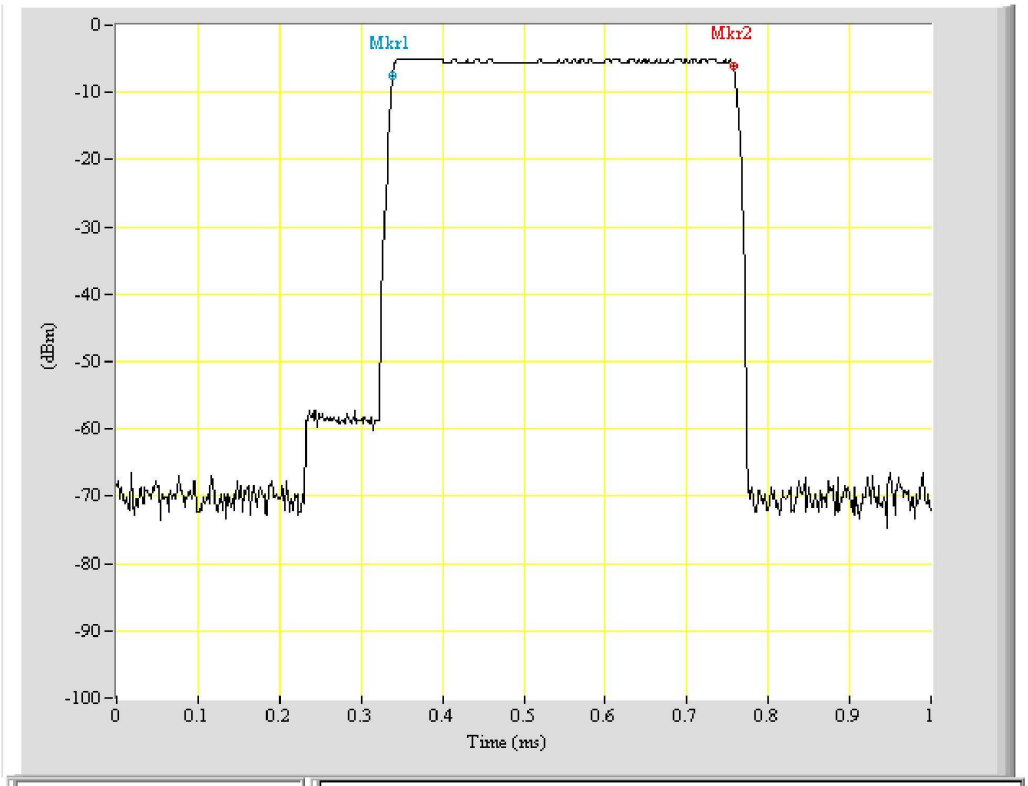
Note: Please refer to page 66 to page 71 for chart



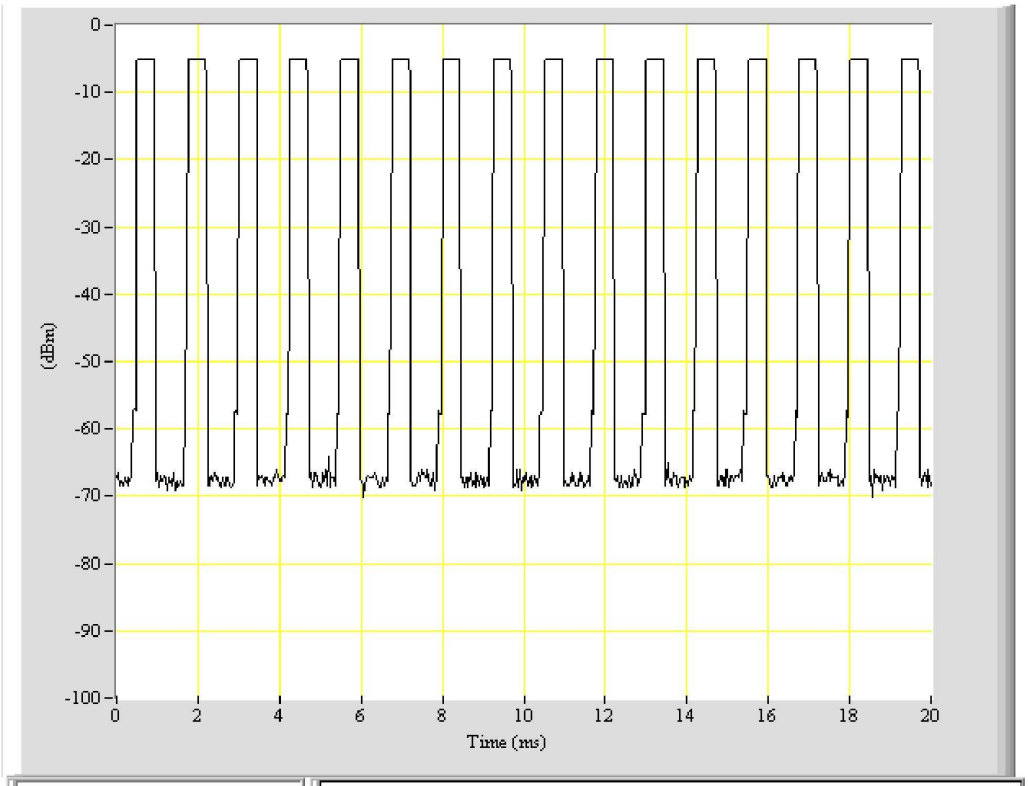
EUT:
Purpose: Dwell_Time
Condition: CH0
Note:



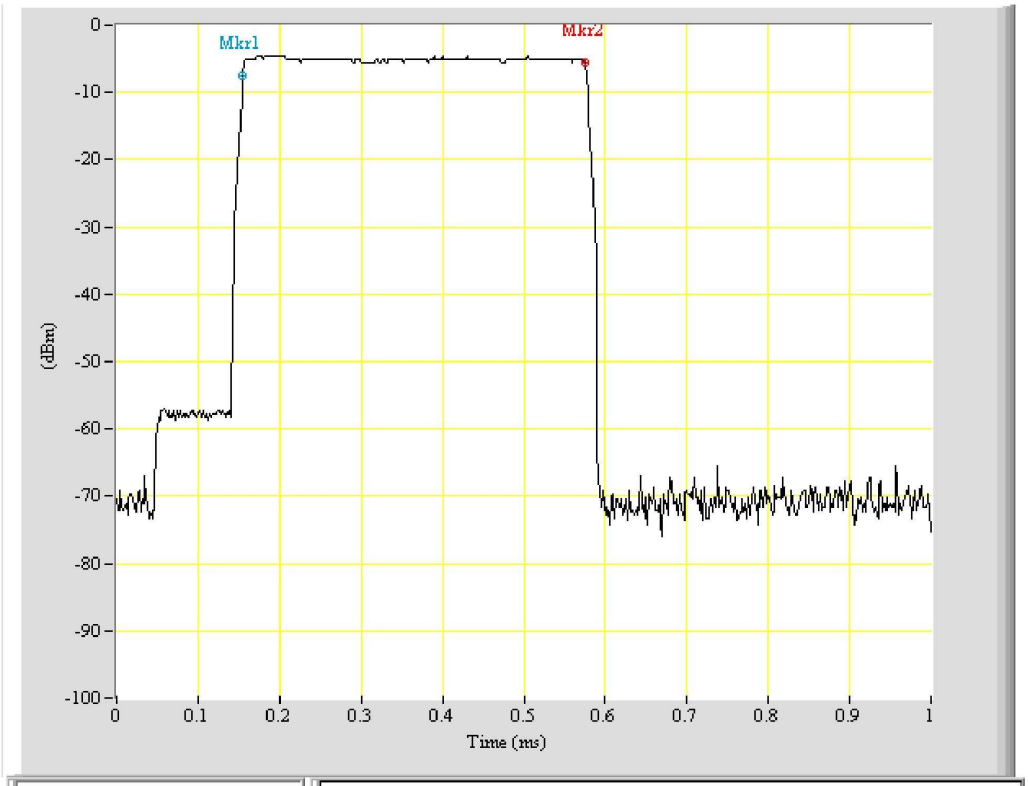
EUT:
Purpose: Dwell_Time_Peroid
Condition: CH0
Note:



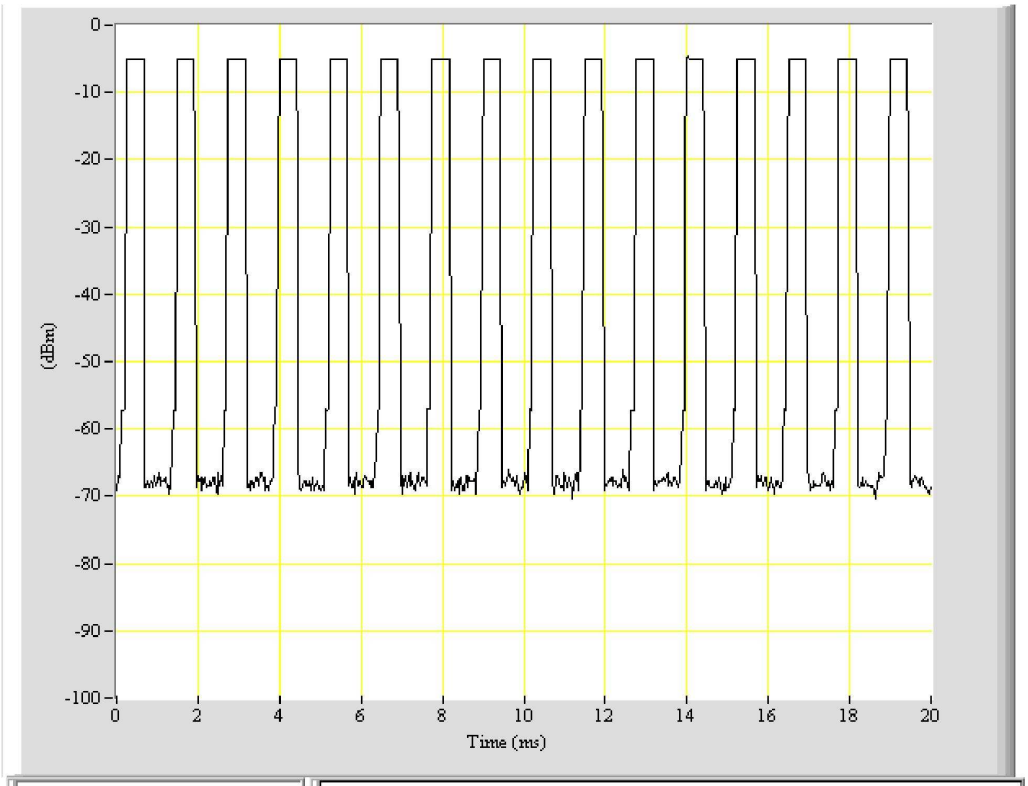
EUT:
Purpose: Dwell_Time
Condition: CH39
Note:



EUT:
Purpose: Dwell_Time_Peroid
Condition: CH39
Note:



EUT:
Purpose: Dwell_Time
Condition: CH78
Note:



EUT:
Purpose: Dwell_Time_Peroid
Condition: CH78
Note: