



Product Service

## FCC - TEST REPORT

Report Number : **68.760.11.263.01** Date of Issue: 27 September 2011

Model : **SCD610, SCD609**

Product Type : Video Baby Monitor

Applicant : Philips Consumer Lifestyle

Address : 1600 Summer Street Stamford, CT 06905, United States

Production Facility : Tranwo Technology (Suzhou) Co., Ltd.

Address : No. 128, Songshan Road, Suzhou New District,  
Jiangsu Province, China

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

Total pages including  
Appendices : 53

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## 2 Details about the Test Laboratory

### Details about the Test Laboratory

#### Test Site 1

Company name: Jiangsu TÜV Product Service Ltd. – Shenzhen Branch  
6th Floor, H Hall,  
Century Craftwork Culture Square,  
No. 4001, Fuqiang Road,  
Futian District 518048,  
Shenzhen, P.R.C.

Telephone: 86 755 8828 6998

Fax: 86 755 8828 5299

#### Test Site 2

Company name: Audix Technology (shenzhen) Co., Ltd  
Block Shenzhen, Science & Industry Park,  
Nantou, Shenzhen,  
Guangdong,  
China

Telephone: 86 755 2663 9496

Fax: 86 755 2663 2877



### 3 Description of the Equipment Under Test

#### Description of the Equipment Under Test

Product: Video Baby Monitor  
Model no.: SCD610  
Brand Name: Philips AVENT  
Options and accessories: NIL  
Rating: DC 6V  
Test with external adaptor:  
Adaptor input: 100-240VAC, 50-60Hz, 0.2A;  
Adaptor Output: 6.0VDC, 500mA

RF Transmission  
Frequency: 2400MHz-2483.5MHz  
Description of the EUT: NIL

#### Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
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## 4 Summary of Test Standards

<b>Test Standards</b>	
FCC Part 15 Subpart C	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

**5 Summary of Test Results**

Technical Requirements					
FCC Part 15 Subpart C					
Test Condition	Pages	Test Site	Test Result		
			Pass	Fail	N/A
15.207 Conducted Emission AC Power Port	8	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247 (b) (1) Conducted peak output power	12	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247(d) Band edge compliance of RF emissions	14	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247(d) Spurious RF conducted emissions	28	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247(d) 15.209 Spurious radiated emissions	35	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247(a)(1) 20dB bandwidth	39	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247(a)(1) Carrier frequency separation	43	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247(a)(1)(iii) Number of hopping frequencies	46	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247(a)(1)(iii) Dwell Time	49	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## 6 General Remarks

### Remarks

This submittal(s) (test report) is intended for FCC ID: BOUSCD610 complies with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C Rules.

All the configurations of the product were tested and only the worst test results are listed in the report.

The only difference between SCD 610 and SCD609 is their model name, so the related tests were applied on SCD610, the other model is deemed to fulfill the requirements without testing.

### 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: 10 August 2011

Testing Start Date: 10 August 2011

Testing End Date: 5 September 2011

- Jiangsu TÜV Product Service Ltd. – Shenzhen Branch -

Reviewed by:

Prepared by:

Tested by:

Paul Yu  
Assistant EMC Manager

Phoebe Hu  
Senior EMC Project Engineer

Sunny Lu  
Test 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 is used to test the emissions from both sides of AC line

#### Limit

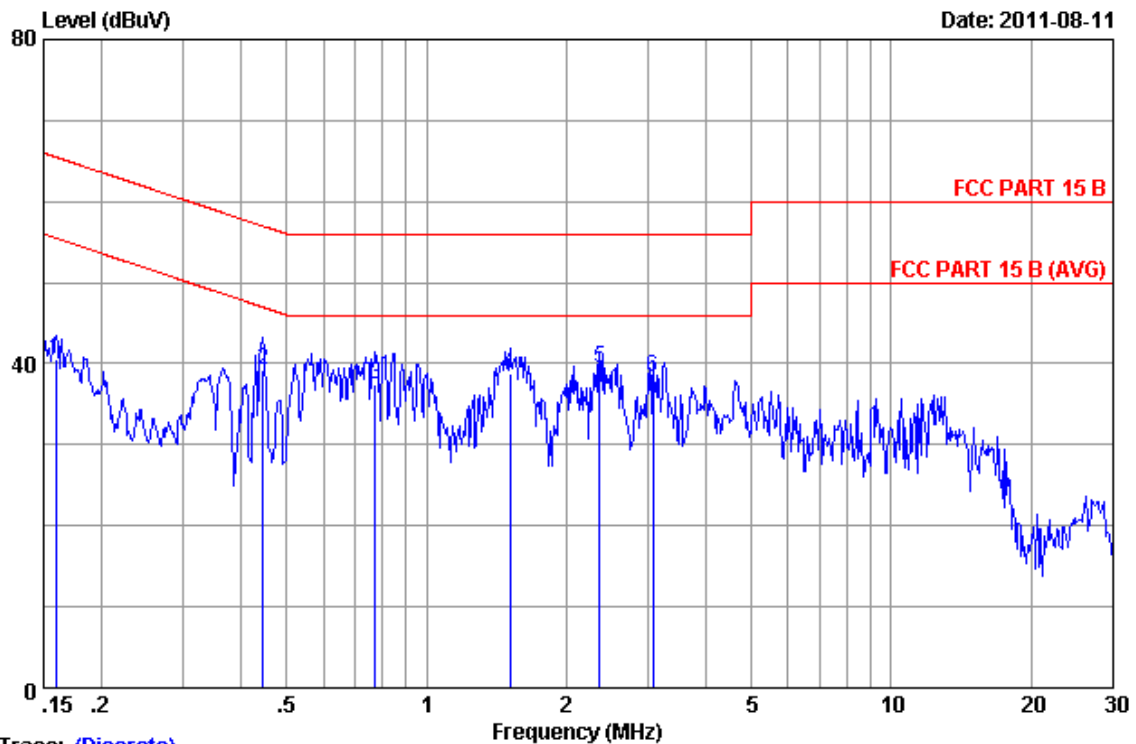
Frequency MHz	QP Limit dB $\mu$ V	AV Limit dB $\mu$ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Decreasing linearly with logarithm of the frequency

Remark: This test was carried out in all the test modes, here only the worst test result was shown.



## Conducted Emission



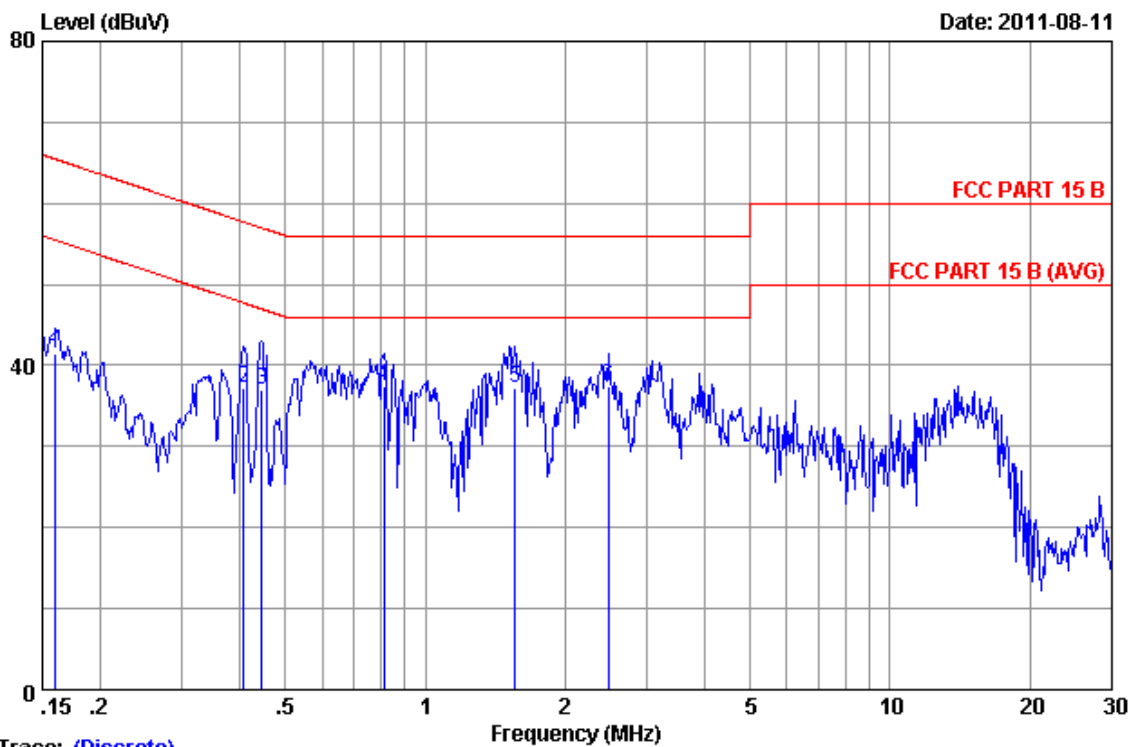
Trace: (Discrete)

Site no :1#conduction Data No :2  
 Dis./Ant. \*\*: 2011 ESH2-Z5 LINE  
 Limit :FCC PART 15 B  
 Env./Ins. :25.5°C/55% Engineer :Frank\_Li  
 EUT :Baby Monitor  
 Power Rating :DC 5V Adapter Input AC 120V/60Hz  
 Test Mode :Baby Unit  
 M/N:SCD610

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.15900	0.17	9.98	30.41	40.56	65.52	24.96	QP
2	0.44443	0.19	9.98	29.05	39.22	56.98	17.76	QP
3	0.77519	0.20	9.97	27.38	37.55	56.00	18.45	QP
4	1.511	0.27	9.97	28.63	38.87	56.00	17.13	QP
5	2.358	0.32	9.96	29.09	39.37	56.00	16.63	QP
6	3.074	0.33	9.95	27.94	38.22	56.00	17.78	QP

Remarks: 1. Emission Level=LISN Factor+Cable Loss (Include 10dB pulse limit) +Reading.  
 2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

## Conducted Emission



Trace: (Discrete)

```

Site no       :1#conduction           Data No      :1
Dis./Ant.     :** 2011 ESH2-25 NEUTRAL
Limit         :FCC PART 15 B
Env./Ins.     :25.5*C/55%           Engineer    :Frank_Li
EUT           :Baby Monitor
Power Rating  :DC 5V Adapter Input AC 120V/60Hz
Test Mode     :Baby Unit
M/N:SCD610
    
```

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.15985	0.21	9.98	31.36	41.55	65.47	23.92	QP
2	0.40615	0.22	9.98	27.07	37.27	57.73	20.46	QP
3	0.44443	0.22	9.98	26.75	36.95	56.98	20.03	QP
4	0.81305	0.23	9.97	27.16	37.36	56.00	18.64	QP
5	1.560	0.26	9.97	27.04	37.27	56.00	18.73	QP
6	2.474	0.28	9.95	27.17	37.40	56.00	18.60	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss(Include 10dB pulse limit)+Reading.  
 2.If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

**Test Equipment List**

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Test Receiver	Rohde & Schwarz	ESHS10	838693/001	Dec.18, 11
L.I.S.N.#1	Rohde & Schwarz	ESH2-Z5	834066/011	Mar.30, 12
L.I.S.N.#3	Kyoritsu	KNW-242C	8-1920-1	May.08, 12
Terminator	Hubersuhner	50Ω	No. 1	May.08, 12
Terminator	Hubersuhner	50Ω	No. 2	May.08, 12
RF Cable	Fujikura	3D-2W	LISN Cable 1#	May.08, 12
Coaxial Switch	Anritsu	MP59B	M55367	May.08, 12
Passive Probe	Rohde & Schwarz	ESH2-Z3	299.7810.52	May.08, 12
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100341	May.08, 12

## 7.2 Conducted peak output power

### Test Method

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.

### Limits for conducted peak output power measurements

Frequency Range MHz	Limit W	Limit dBm
2400-2483	≤0.125	≤21

## Conducted peak output power

Frequency MHz	Test Result	
	Conducted Peak Output Power dBm	Result
CH16 2408.625MHz	17.18	Pass
CH49 2436.75MHz	17.04	Pass
CH31 2469.375MHz	16.49	Pass



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## Test Equipment

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL DUE DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	May 08, 2012

## 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.

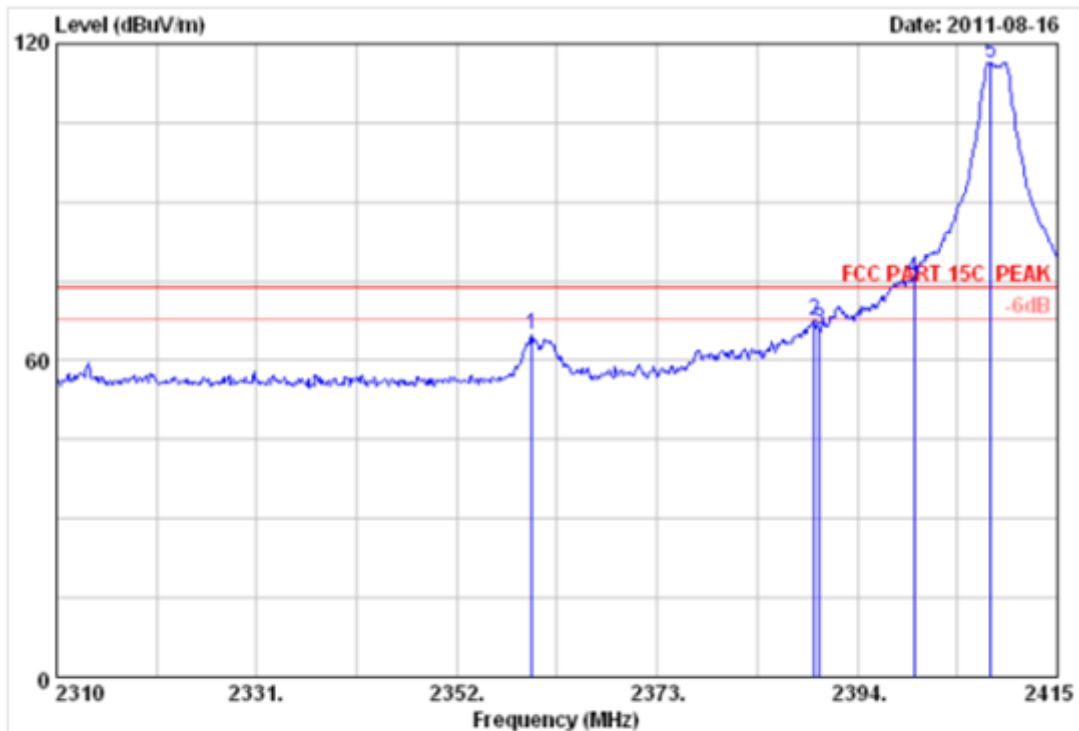
### Limits

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

Lower edge peak Plot:



Site no. : 3m Chamber                      Data no. : 3  
 Dis. / Ant. : 3m 2011 3115 4580          Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54%                      Engineer : Leo-Li  
 EUT : SCD610(Baby Unit)  
 Power : DC 6V From Adapter Input AC 120V/60Hz  
 Test mode : 2408.625 MHz Tx

Indicated		Factor			FCC Part 15.247/15.209				
Frequency (MHz)	Receiver Reading (dBμV/m)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBμV/m)	Emission Level Δ (dBμV/m)	Limit (dB)	Margin (dB)	Result
2400.000	75.35	27.96	6.75	34.44	75.62	40.86	20	20.86	Pass
2407.965	116.19	27.98	6.75	34.44	116.48				

Note1: Emission Level= Reading +Cable Loss+ Antenna Factor - Amplifier factor

Note2: Emission Level Δ=Tx Frequency Level – Band edge Frequency Level

Indicated		Factor			FCC Part 15.247/15.209			
Frequency (MHz)	Receiver Reading (dBμV/m)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2359.875	64.82	27.91	6.69	34.44	64.98	74	9.02	Pass
2389.485	67.39	27.96	6.72	34.44	67.63	74	6.37	Pass
2390.000	65.68	27.96	6.72	34.44	65.92	74	8.08	Pass

Note: Emission Level= Reading +Cable Loss+ Antenna Factor - Amplifier factor







Indicated		Factor				FCC Part 15.247/15.209			
Frequency (MHz)	Receiver Reading (dBμV/m)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Correction Factor (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2359.560	54.88	27.91	6.69	34.44	-28.57	26.47	54	27.53	Pass
2361.765	55.37	27.91	6.69	34.44	-28.57	26.96	54	27.04	Pass
2390.000	57.08	27.96	6.72	34.44	-28.57	28.75	54	25.25	Pass

Note1: Emission Level= Reading +Cable Loss+ Antenna Factor - Amplifier factor + Correction factor

Note2: According to the test procedure [DA 00-705 Public Notice-Frequency Hopper Spread Spectrum Test Procedure]:"the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from  $20 \log (dwel\ time/100\ ms)$ ", so the Duty Cycle Correction Factor is:

**Correction Factor:**

The correction factor is  $\delta$  found from the On Time divided by  $T$ :

$$\delta = (t \times n)/T$$

where

$T$  = pulse width=100ms

$t$  = pulse width of pulse=1.242ms

$n$  = number of  $t$  pulses=3

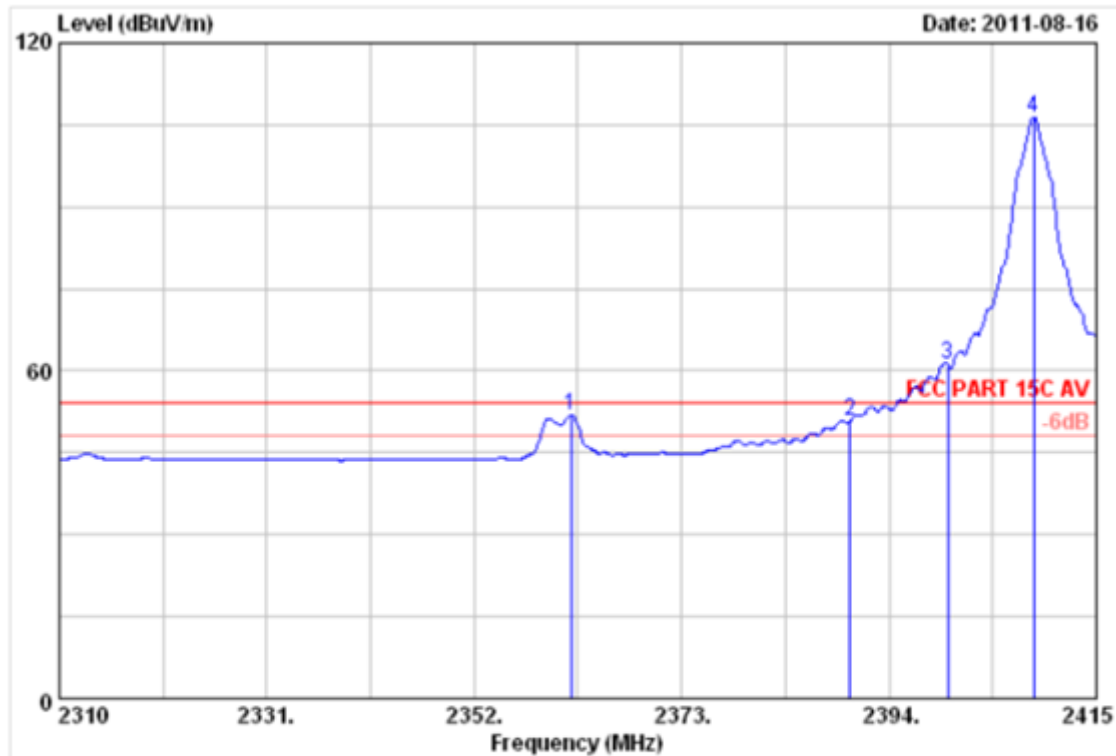
so

$$\delta = 3 \times 1.242 / 100 = 0.03726$$

$$\text{Correction factor: } \delta\ (dB) = 20 \log (0.03726) = -28.57\ dB$$

## Band edge compliance of RF emissions

Lower edge AV Plot:



Site no. : 3m Chamber Data no. : 6  
 Dis. / Ant. : 3m 2011 3115 4580 Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : SCD610 (Baby Unit)  
 Power : DC 6V From Adapter Input AC 120V/60Hz  
 Test mode : 2408.625 MHz Tx

Indicated		Factor				FCC Part 15.247/15.209				
Frequency (MHz)	Receiver Reading (dBμV/m)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Correction Factor (dB)	Emission Level (dBμV/m)	Emission Level Δ (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2400.000	61.00	27.96	6.75	34.44	-28.57	32.7	45.04	20	25.04	Pass
2408.700	106.02	27.98	6.75	34.44	-28.57	77.74				

Note1: Emission Level= Reading +Cable Loss+ Antenna Factor - Amplifier factor + Correction factor

Note2: Emission Level Δ=Tx Frequency Level – Band edge Frequency Level

Indicated		Factor				FCC Part 15.247/15.209			
Frequency (MHz)	Receiver Reading (dBμV/m)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Correction Factor (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2361.765	51.70	27.91	6.69	34.44	-28.57	23.29	54	30.71	Pass
2390.000	50.43	27.96	6.72	34.44	-28.57	22.1	54	31.9	Pass

Note1: Emission Level= Reading +Cable Loss+ Antenna Factor - Amplifier factor + Correction factor

Note2: According to the test procedure [DA 00-705 Public Notice-Frequency Hopper Spread Spectrum Test Procedure]:"the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from  $20\log(\text{dwell time}/100\text{ ms})$ ", so the Duty Cycle Correction Factor is:

### Correction Factor:

The correction factor is  $\delta$  found from the On Time divided by  $T$ :

$$\delta = (t \times n)/T$$

where

$T$  = pulse width=100ms

$t$  = pulse width of pulse=1.242ms

$n$  = number of  $t$  pulses=3

so

$$\delta = 3 \times 1.242 / 100 = 0.03726$$

Correction factor:  $\delta$  (dB) =  $20 \log(0.03726) = -28.57$  dB







Indicated		Factor				FCC Part 15.247/15.209			
Frequency (MHz)	Receiver Reading (dBμV/m)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Correction Factor (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2483.500	58.78	28.08	6.90	34.45	-28.57	30.74	54	23.26	Pass
2483.874	58.94	28.08	6.90	34.45	-28.57	30.9	54	23.1	Pass
2500.000	47.42	28.10	6.90	34.45	-28.57	19.4	54	34.6	Pass

Note1: Emission Level= Reading +Cable Loss+ Antenna Factor - Amplifier factor + Correction factor

Note2: According to the test procedure [DA 00-705 Public Notice-Frequency Hopper Spread Spectrum Test Procedure]:"the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from  $20 \log (dwel\ time/100\ ms)$ ", so the Duty Cycle Correction Factor is:

**Correction Factor:**

The correction factor is  $\delta$  found from the On Time divided by  $T$ :

$$\delta = (t \times n)/T$$

where

$T$  = pulse width=100ms

$t$  = pulse width of pulse=1.242ms

$n$  = number of  $t$  pulses=3

so

$$\delta = 3 \times 1.242 / 100 = 0.03726$$

$$\text{Correction factor: } \delta \text{ (dB)} = 20 \log (0.03726) = -28.57 \text{ dB}$$





Indicated		Factor				FCC Part 15.247/15.209			
Frequency (MHz)	Receiver Reading (dBμV/m)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Correction Factor (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2483.500	54.16	28.08	6.90	34.45	-28.57	26.12	54	27.88	Pass
2483.916	54.59	28.08	6.90	34.45	-28.57	26.55	54	27.45	Pass
2500.000	39.80	28.10	6.90	34.45	-28.57	11.78	54	42.22	Pass

Note1: Emission Level= Reading +Cable Loss+ Antenna Factor - Amplifier factor + Correction factor

Note2: According to the test procedure [DA 00-705 Public Notice-Frequency Hopper Spread Spectrum Test Procedure]:"the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from  $20\log(\text{dwell time}/100\text{ ms})$ ", so the Duty Cycle Correction Factor is:

**Correction Factor:**

The correction factor is  $\delta$  found from the On Time divided by  $T$ :

$$\delta = (t \times n)/T$$

where

$T$  = pulse width=100ms

$t$  = pulse width of pulse=1.242ms

$n$  = number of  $t$  pulses=3

so

$$\delta = 3 \times 1.242 / 100 = 0.03726$$

$$\text{Correction factor: } \delta \text{ (dB)} = 20 \log(0.03726) = -28.57 \text{ dB}$$

**Test Equipment List**

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL DUE DATE
Spectrum	Agilent	E4446A	US44300459	May 08, 2012
Amp	HP	8449B	3008A02495	May 08, 2012
Antenna	EMCO	3115	9607-4877	May 17, 2012
Bilog Antenna	Schaffner	CBL6111C	2598	Dec.14, 2011
HF Cable	Hubersuhne	Sucoflex104	---	May 08, 2012



## 7.4 Spurious RF conducted emissions

### Test Method

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The resolution bandwidth(RBW) and the video bandwidth (VBW) of the spectrum analyzer were respectively set to 100kHz and 100kHz.

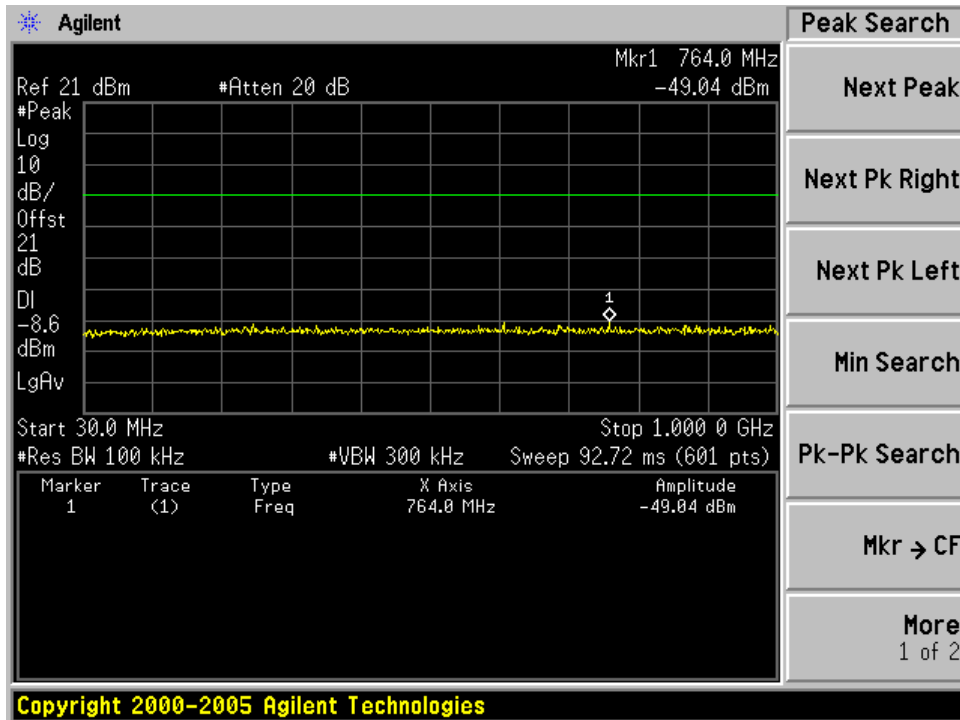
### Limit

Frequency Range MHz	Limit (dBc)
1000-25000	-20

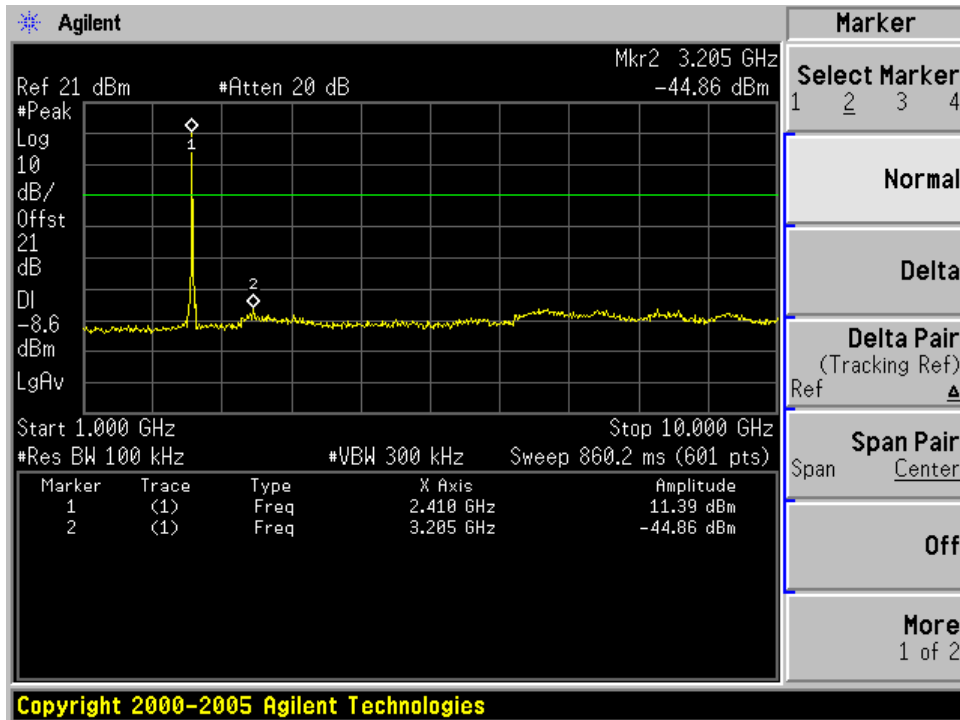
## Spurious RF conducted emissions

Test Result:

2408.625MHz

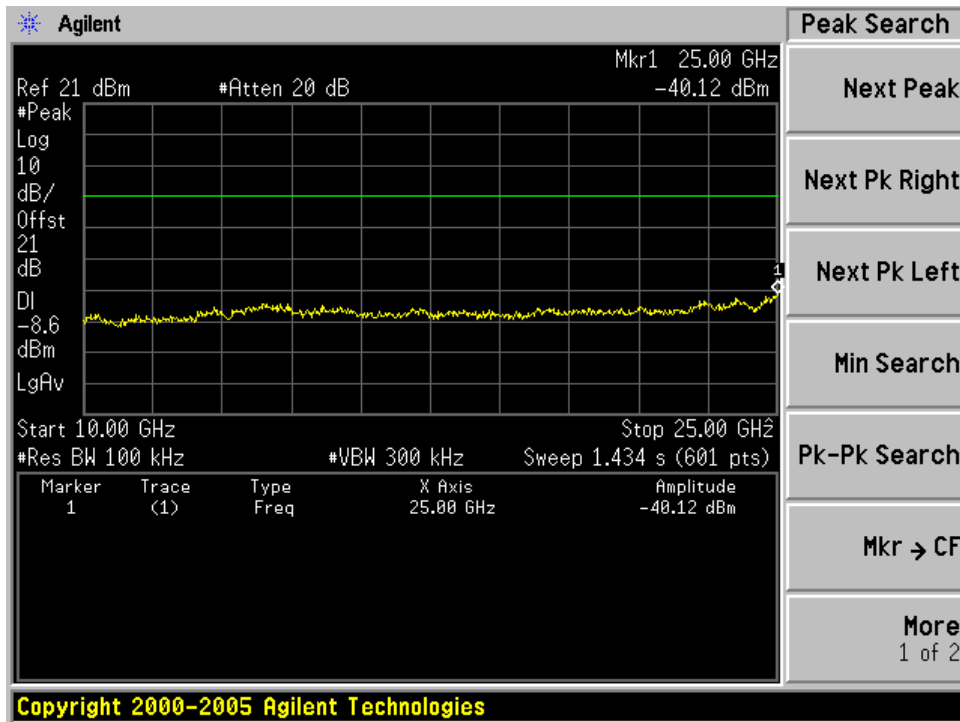


2408.625MHz

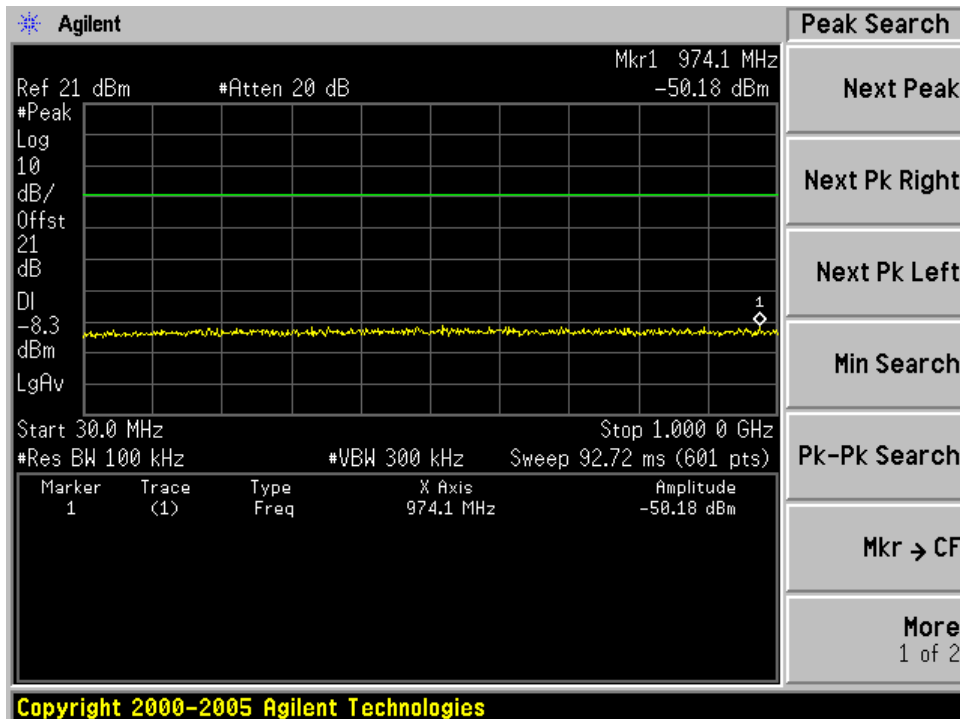


## Spurious RF conducted emissions

2408.625MHz

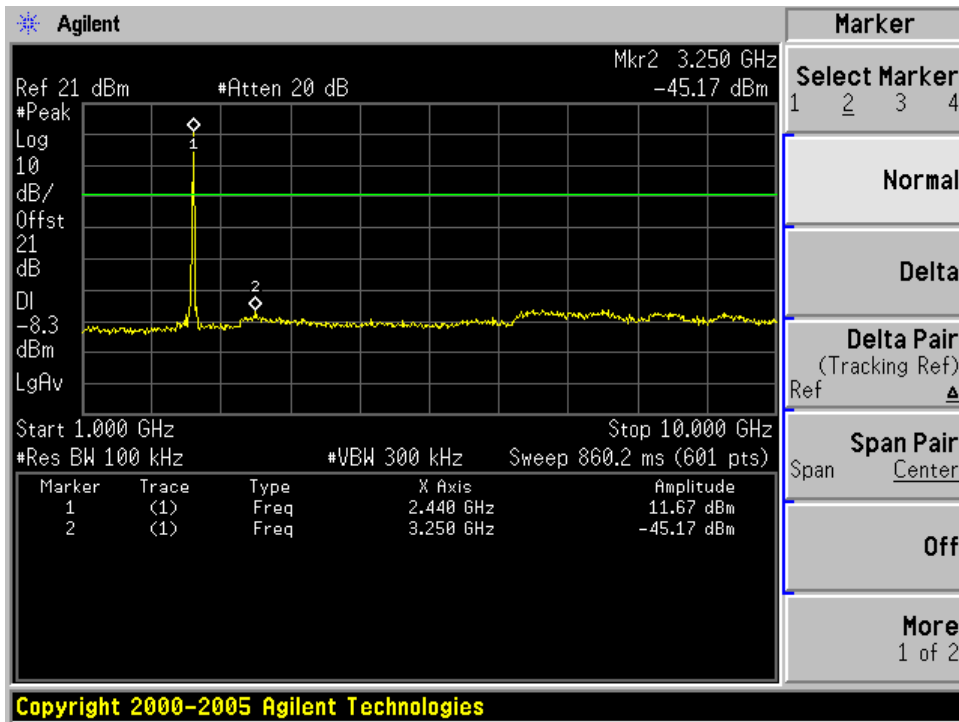


2436.75MHz

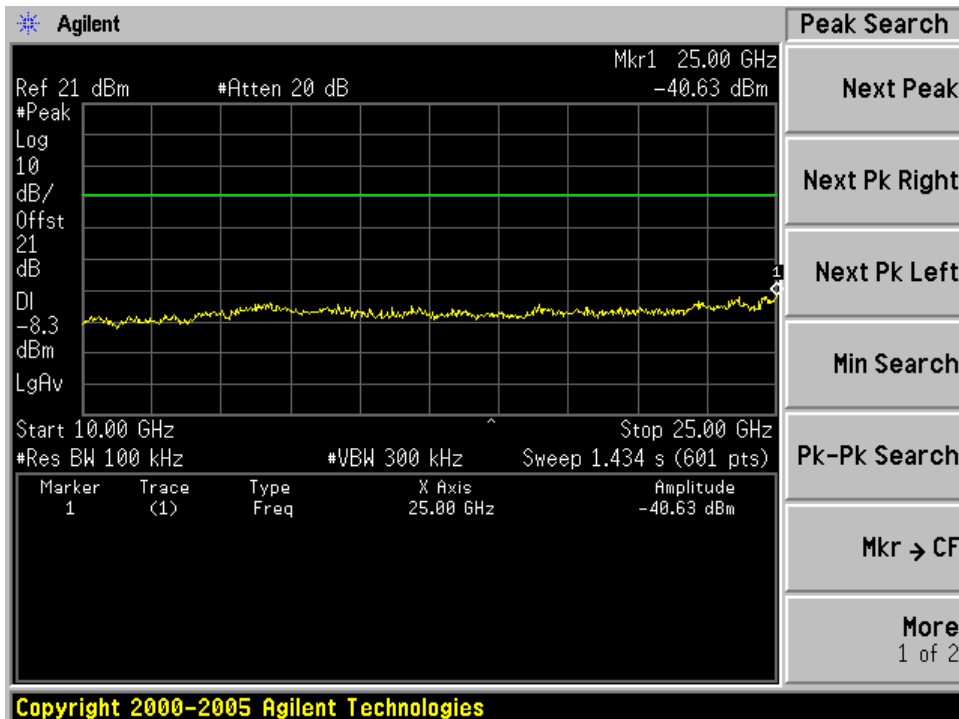


## Spurious RF conducted emissions

2436.75MHz

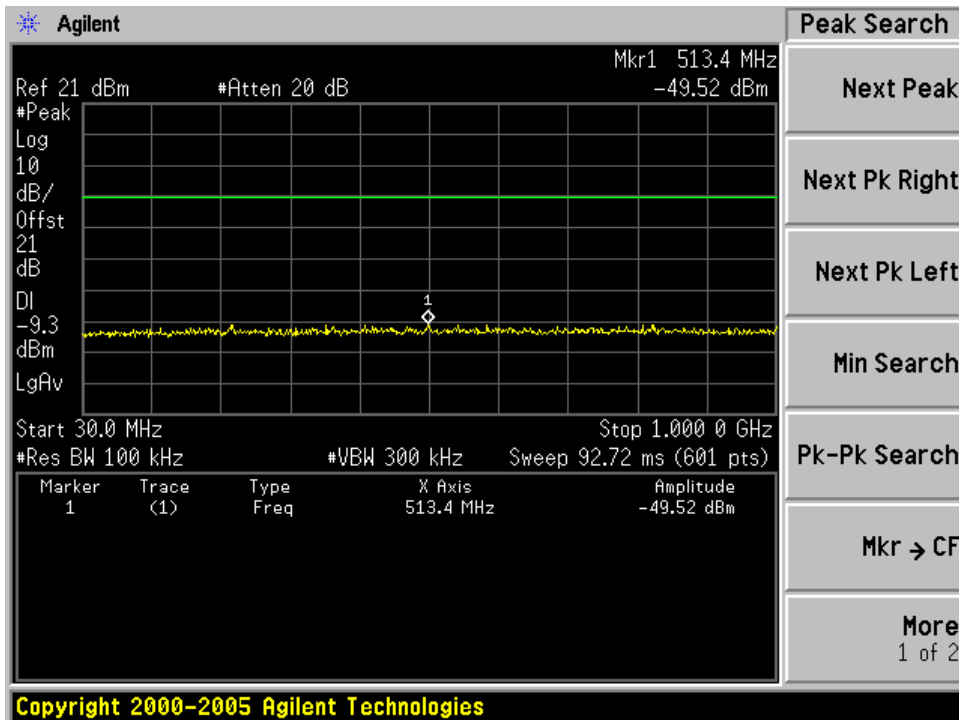


2436.75MHz

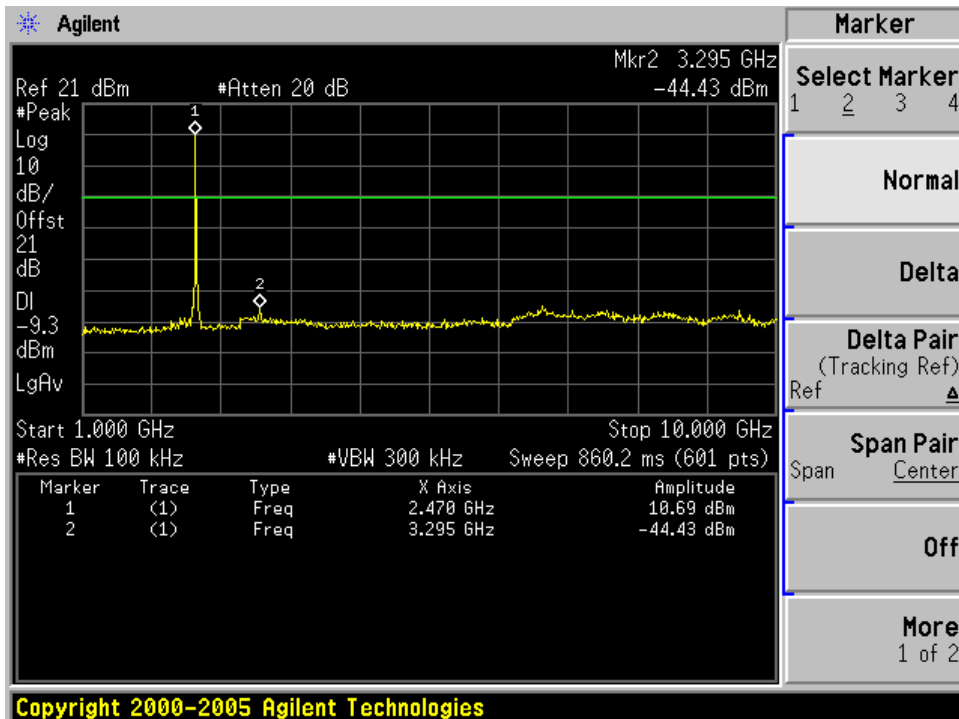


## Spurious RF conducted emissions

2469.375MHz



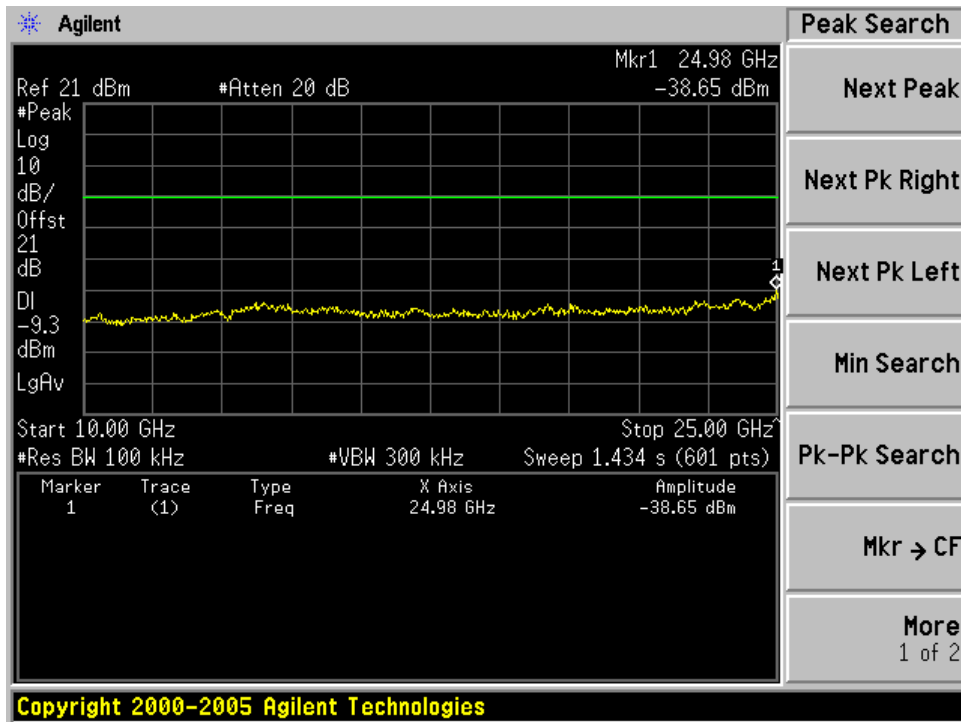
2469.375MHz





## Spurious RF conducted emissions

2469.375MHz





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## Test Equipment List

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	May 08, 2012

## 7.5 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 $\mu$ 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

**Radiated Emission**

## Test Result

Indicated		Detector (PK/QP)	Polar (H/V)	Factor			FCC Part 15.247/15.209			
Frequency (MHz)	Receiver Reading (dB $\mu$ V/m)			Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
CH16 (2408.625 MHz)										
3211.000	46.16	PK	V	30.46	7.98	34.52	50.08	74	23.92	Pass
9634.600	46.91	PK	H	37.78	13.23	34.56	63.36	74	10.64	Pass
9634.600	45.79	PK	V	37.78	13.23	34.56	62.24	74	11.76	Pass
CH49 (2436.75 MHz)										
9746.800	47.13	PK	V	37.86	13.31	34.54	63.76	74	10.24	Pass
4873.400	46.07	PK	H	32.98	9.62	34.60	54.07	74	19.93	Pass
7310.100	46.96	PK	H	36.01	11.88	34.73	60.12	74	13.88	Pass
9746.800	47.11	PK	H	37.86	13.31	34.54	63.74	74	10.26	Pass
CH31 (2469.375 MHz)										
4938.75	45.78	PK	H	33.11	9.67	34.60	53.96	74	20.04	Pass
7408.125	47.58	PK	H	36.28	11.94	34.74	61.06	74	12.94	Pass
9877.500	47.70	PK	V	37.93	13.38	34.52	64.49	74	9.51	Pass

Remark:

PK Emission Level= Reading +Cable Loss+ Antenna Factor - Amplifier factor



Indicated		Detector (AV)	Polar (H/V)	Factor				FCC Part 15.247/15.209			
Frequency (MHz)	Receiver Reading (dB $\mu$ V/m)			Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Correction factor (dB)	Emission Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
CH16 (2408.625 MHz)											
9634.600	35.04	AV	H	37.78	13.23	34.56	-28.57	22.92	54	31.08	Pass
9634.600	33.41	AV	V	37.78	13.23	34.56	--28.57	21.29	54	32.71	Pass
CH49 (2436.75 MHz)											
9746.800	35.61	AV	V	37.86	13.31	34.54	-28.57	23.67	54	30.33	Pass
4873.400	34.01	AV	H	32.98	9.62	34.60	-28.57	13.44	54	40.56	Pass
7310.100	35.64	AV	H	36.01	11.88	34.73	-28.57	20.23	54	33.77	Pass
9746.800	35.41	AV	H	37.86	13.31	34.54	-28.57	23.47	54	30.53	Pass
CH31 (2469.375 MHz)											
4938.75	34.29	AV	H	33.11	9.67	34.60	-28.57	13.9	54	40.1	Pass
7408.125	36.14	AV	H	36.28	11.94	34.74	-28.57	21.05	54	32.95	Pass
9877.500	35.53	AV	V	37.93	13.38	34.52	-28.57	23.75	54	30.25	Pass

Remark:

1: Emission Level= Reading +Cable Loss+ Antenna Factor - Amplifier factor + Correction factor

2: According to the test procedure [DA 00-705 Public Notice-Frequency Hopper Spread Spectrum Test Procedure]:"the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from  $20\log(\text{dwell time}/100 \text{ ms})$ ", so the Duty Cycle Correction Factor is:

#### Correction Factor:

The correction factor is  $\delta$  found from the On Time divided by T:

$$\delta = (t \times n)/T$$

where

T = pulse width=100ms

t = pulse width of pulse=1.242ms

n = number of t pulses=3

so

$$\delta = 3 \times 1.242 / 100 = 0.03726$$

Correction factor:  $\delta$  (dB) =  $20 \log(0.03726) = -28.57 \text{ dB}$

3. The emission levels that are 20dB below the official limits are not reported.



## Test Equipment List

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL DUE DATE
Spectrum	Agilent	E4446A	US44300459	May 08, 2012
Amp	HP	8449B	3008A02495	May 08, 2012
Antenna	EMCO	3115	9607-4877	May 17, 2012
Bilog Antenna	Schaffner	CBL6111C	2598	Dec.14, 2011
HF Cable	Hubersuhne	Sucoflex104	---	May 08, 2012

## 7.6 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  $-20\text{dB}$  (upper and lower) frequency.

### Limit

Limit [kHz]

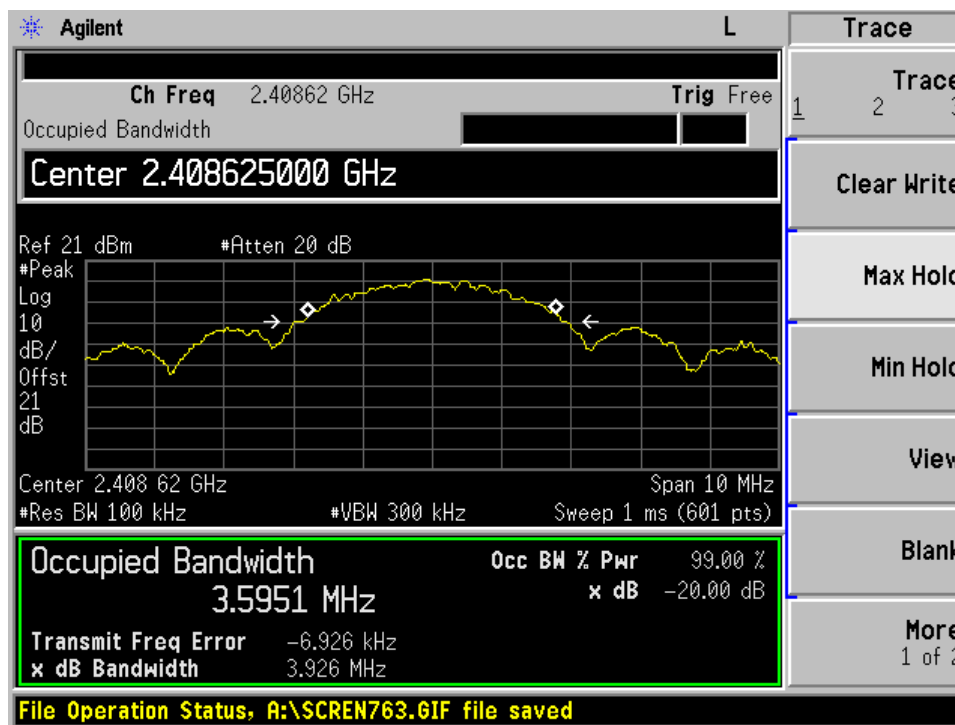
---

N/A

## 20 dB bandwidth

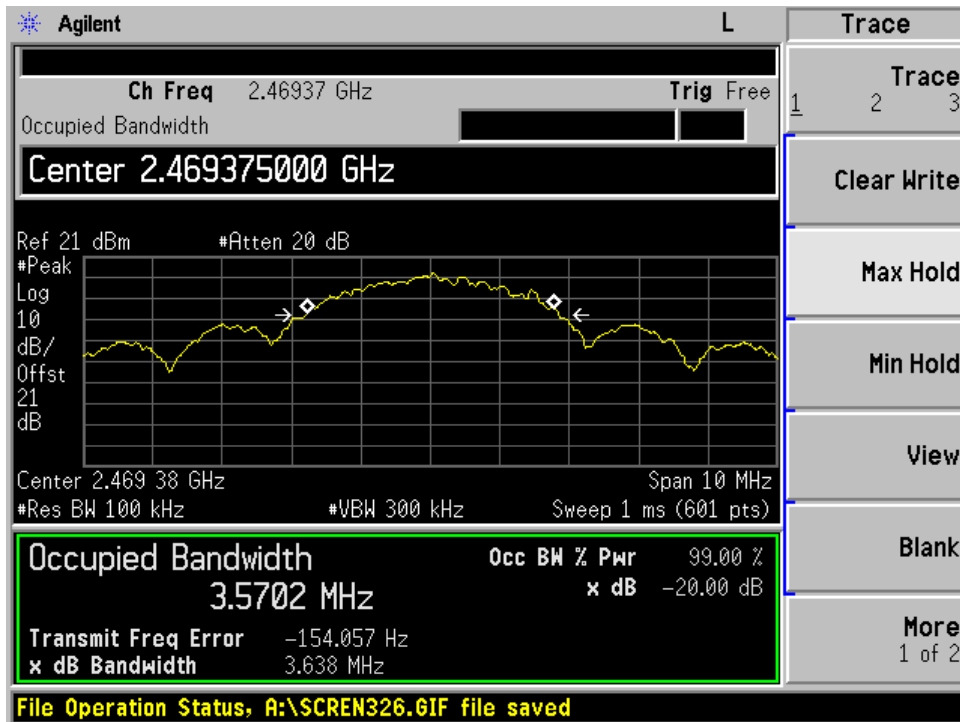
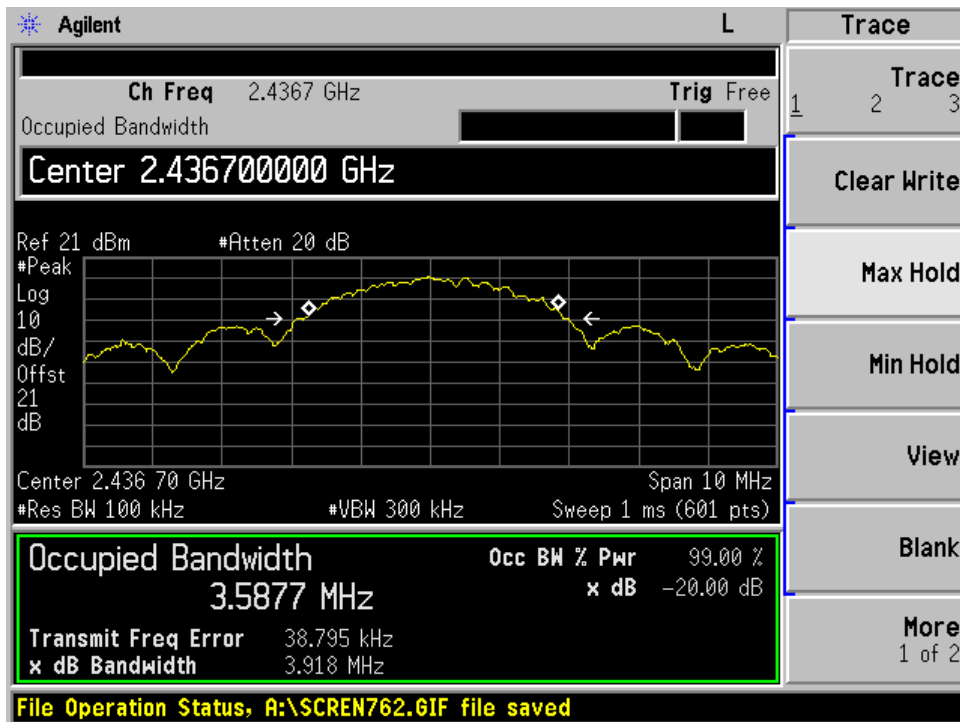
### Test result

Frequency MHz	Bandwidth MHz	Result
2408.625	3.926	Pass
2436.75	3.918	Pass
2469.375	3.638	Pass





20 dB bandwidth





## Test Equipment

### 20 dB bandwidth Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	May 08, 2012

## 7.7 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

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

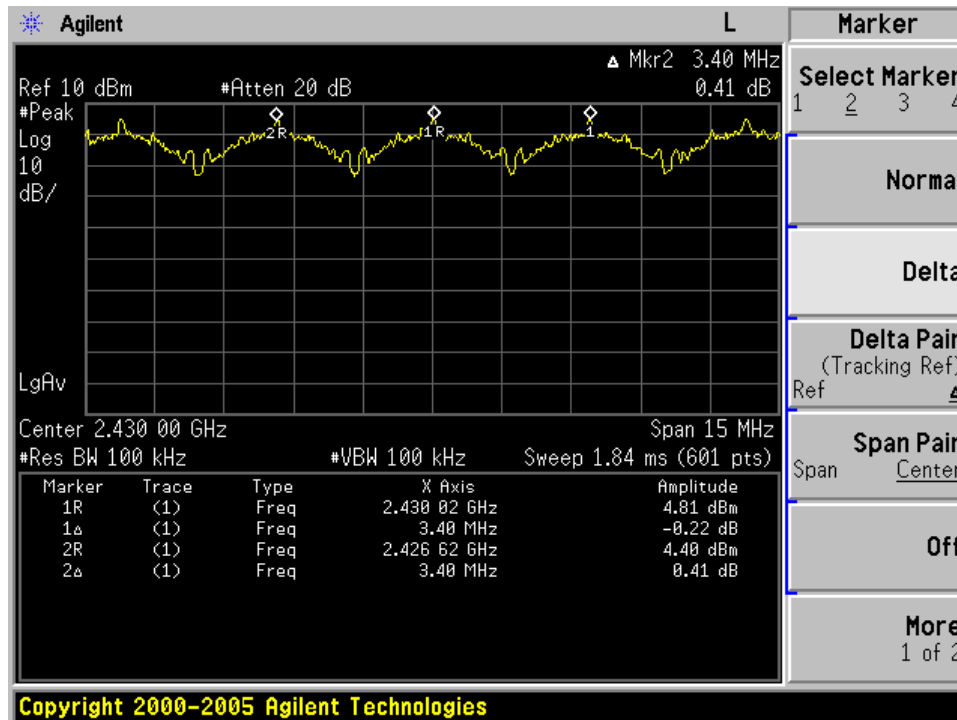
2/3 of 20 dB Bandwidth

Frequency MHz	2/3 of 20 dB Bandwidth MHz
2408.625	2.617
2436.75	2.612
2469.375	2.425

## Carrier Frequency Separation

Test result

Carrier Frequency Separation	Result
MHz	
3.40	Pass





## Test Equipment

### Carrier Frequency Separation Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	May 08, 2012

## 7.8 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**

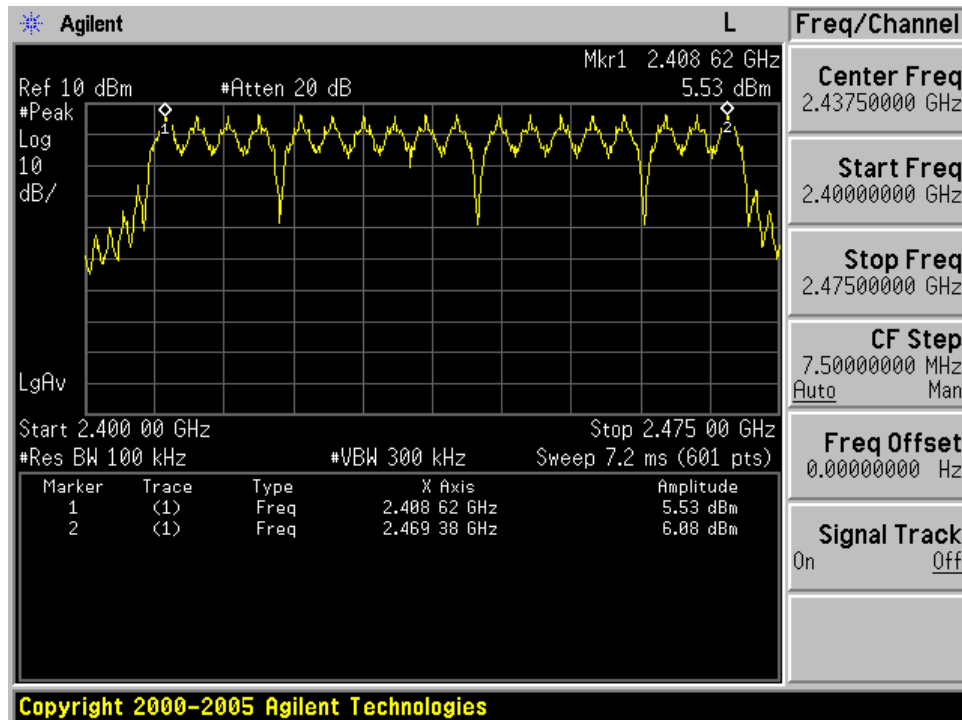
---

$\geq 15$

## Number of hopping frequencies

Test result:

Number of hopping frequencies	Result
18	Pass





Product Service

## Test Equipment

### Number of hopping frequencies Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	May 08, 2012



## 7.9 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.

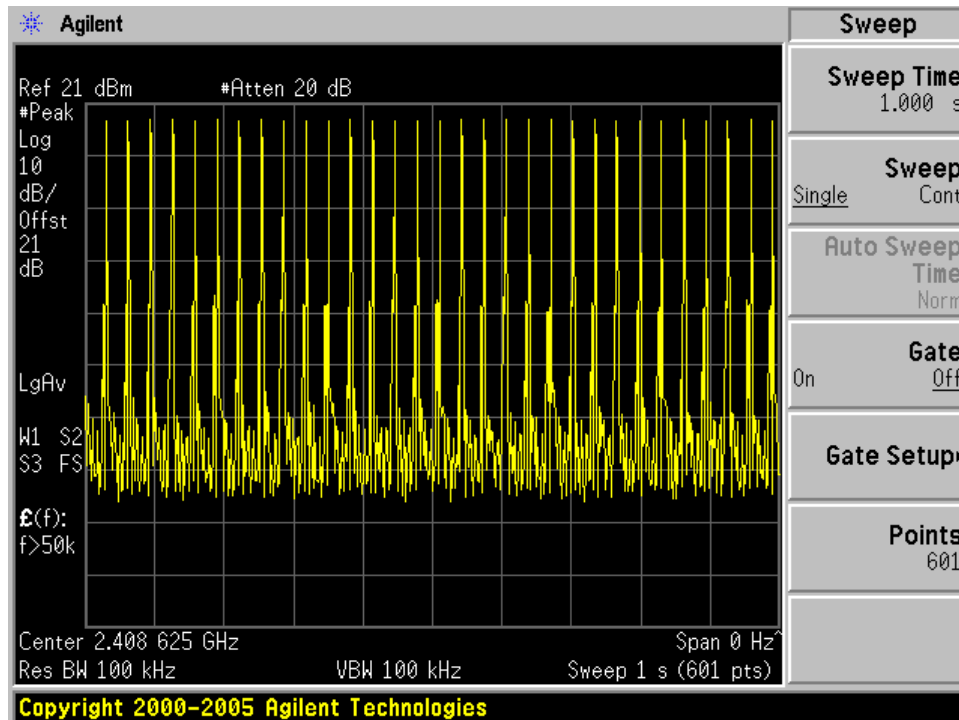
## Dwell Time

### Dwell time

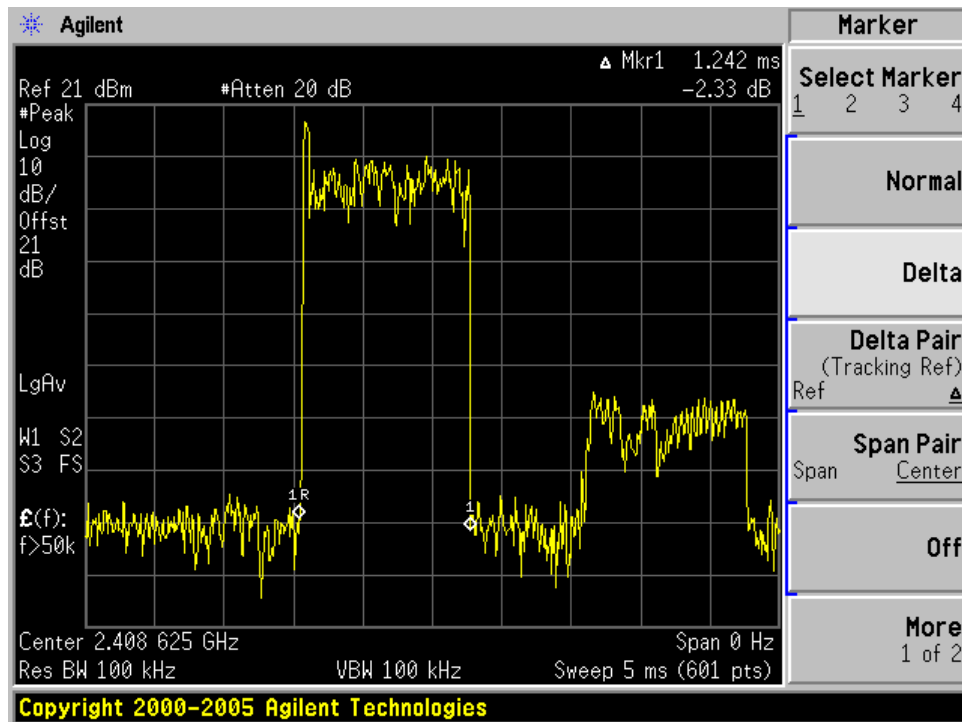
The maximum dwell time shall be 0,4 s.

#### Test Result

Mode	Reading (ms)	Test Result (ms)	Limit (ms)	Result
Hopping	1.242	277.2	< 400	Pass



## Dwell Time



Note:

A period time=18x0.4(s)=7.2(s)

time slot= 31(times)/1(s) \*1.242 (ms) \*7.2(s)= 277.2 (ms)



Product Service

## Test Equipment

### Dwell Time Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	May 08, 2012



## 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 $\mu$ V/m)	U=4.32dB (30MHz-25GHz)
CE	Disturbance Voltage (dB $\mu$ V)	U=2.4dB