

# **Intentional Radiator Test Report**

**Test Standards:  
FCC Part 15 (Subpart C – Intentional Radiators)  
Industry Canada RSS-210**

**Prepared For:  
SocketMobile, Inc.  
39700 Eureka Drive  
Newark, CA 94560**

**Equipment Under Test:  
Cordless Hand Scanner**

**Model:  
CORDLESS HAND SCANNER SERIES 7**

**M/N:  
8550-000XX**

**Prepared by:**



**44366 S. Grimmer Blvd.  
Fremont, CA 94538  
USA**

## TABLE OF CONTENTS


1. CUSTOMER INFORMATION	3
2. EUT AND ACCESSORY INFORMATION	4
3. SUMMARY OF TEST RESULTS	5
4. STANDARDS AND MEASUREMENT METHODS	6
5. TEST SETUPS	7
6. TEST RESULTS	9
7. TEST EQUIPMENT	47

## 1.0 CUSTOMER INFORMATION

<b>Test Laboratory:</b>	EMCE Engineering 44366 S. Grimmer Blvd. Fremont, CA 94538 USA  Tel: 510-490-4307 Fax: 510-490-3441 bob@universalcompliance.com
<b>FCC registration number</b>	0007-1981-20
<b>Customer:</b>	Socket Communications, Inc. 37400 Central Court Newark, CA  Tel: 510-744-2700 Fax: 510-744-2701
<b>Contact Person:</b>	Thomas Moyland
<b>Receipt of EUT:</b>	07/20/07
<b>Test plan reference:</b>	FCC Part 2, 15 (15.247) / IC RSS-210
<b>FCC ID:</b>	LUBCHS1
<b>IC #:</b>	2529A-CHS1
<b>Date of testing:</b>	07/20/07 – 08/11/07
<b>Date of Report:</b>	08/12/07

*The tests listed in this report have been completed to demonstrate compliance to the CFR 47 Section 15.247, as well as Industry Canada Radio Standard RSS-210, Issue 7.*

Contents approved:


Name: Bob Cole Title: President

## 2.0 EUT AND ACCESSORY INFORMATION

### EUT description

The EUT is a Socket Communications, Inc. **Cordless Hand Scanner, M/N: CORDLESS HAND SCANNER SERIES 7.**

### Model Numbers Represented

8550-00005, 8550-00006, 8550-00007, 8550-000014, 8550-00015, and 8550-00016

There is no difference in the electronics or Bluetooth module. Model differences denote software and enclosure differences.

### EUT and accessories

The table below lists all EUTs and accessories used in the tests. Later in this report, only numbers in the last column are used to refer to the devices in each test.

### Software

The computers were equipped with test software provided by the customer. The software was used to control the EUT in the tests.

	Name	Type	S/N	Number
<b>EUT</b>	<b>CHS</b>	<b>CORDLESS HAND SCANNER SERIES 7</b>	N/A	E0001
<b>Accessories</b>	Laptop Computer	Compaq Presario M/N: 1694	3882A744	S0001
<b>Software</b>	CRS	BlueTest	N/A	N/A

### EUT Information

Product Specification	Description
Model Name	CORDLESS HAND SCANNER SERIES 7
Type of Modulation	FHSS
Number of Channels	79
Operating Frequency Range	2480 – 2483.5 MHz
Type of Equipment	Portable
Extreme Operating Temperature Range	-20 C – 55 C
Extreme Operating Voltage Range	108 – 132 VAC
Type of Antenna	Integral
Antenna Gain (dBi)	-0.0

Transmitter Method of Frequency Generation	Synthesized
Transmitter Aggregate Data Rate	>250kbps
Transmitter Duty Type	Intermittant
Continuous Operation for Testing Purposes?	Yes
Transmit Emissions Designator	1M0G1D

### 3.0 SUMMARY OF TEST RESULTS

	Section in CFR 47	Results
15.245 (b)(1)	Peak output power (Radiated Emissions)	PASSED
R&O 97-114	Power Density	PASSED
15.247 (a)(2)	6 dB Bandwidth	PASSED
15.247, c	Band-edge compliance of RF emissions	PASSED
15.247, (4)(c)	Restricted Band	PASSED
15.247,c	Spurious radiated emissions	PASSED

PASS            The EUT passed that particular test.  
FAIL            The EUT failed that particular test.

## **4.0 STANDARDS AND MEASUREMENT METHODS**

The tests were performed in guidance of CFR 47 section 15.247, FCC Public Notice DA 00-705 (March 30, 2000), FCC Report & Order 97-114 (April 10, 1997), Industry Canada RSS-210 Issue 7, and ANSI C63.4 (2003). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under “Test method”. For the test equipment, see device list in the end of this test.

### **4.1 Selection of operation mode for tests**

Before tests, several operation modes, and modulation patterns were tried. The worst case was selected for each test and those results reported.

## 5.0 TEST SETUPS

To fulfill all requirements for the testing, total of two different test setups were used. One EUT was used, unmodified for radiated tests.

SMA connector added in place of internal antenna for Antenna Conducted measurements.

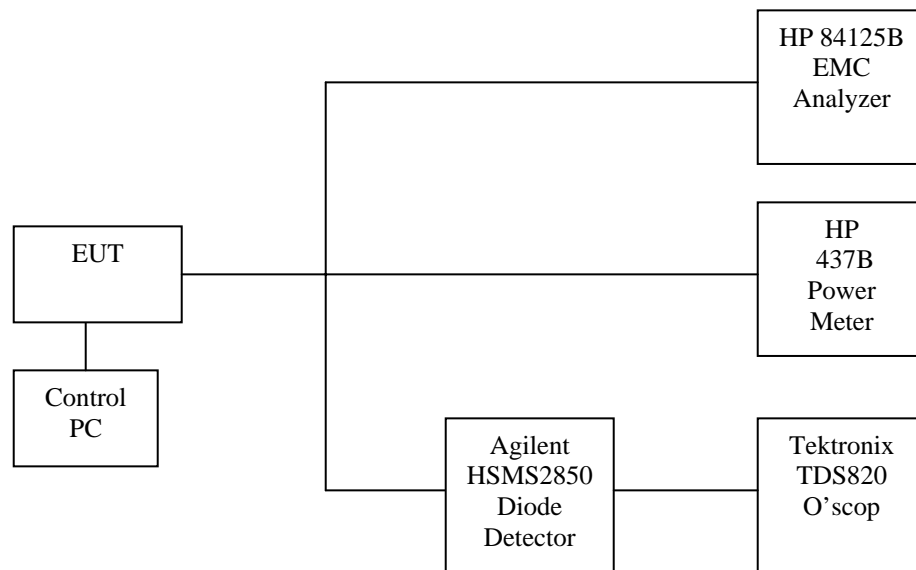
### Setup A (Antenna Conducted measurements)

#### Operational description

#### ANTENNA CONDUCTED EMISSIONS MEASUREMENTS

The EUT was connected to the Laptop Computer through the serial port (COM1), the antenna bypassed and the SMA Cable connected to the Spectrum Analyzer. This setup was used for the **PEAK POWER OUTPUT, POWER DENSITY, 6 dB BW, BAND-EDGE COMPLIANCE, and RESTRICTED BAND** measurements.

#### *Block Diagram*



The solid lines are coaxial cables and the dashed lines are either EUT insertion to the test board or control cables between test setup devices. The measurement results were adjusted with the attenuation of the coaxial cable.



## Setup B (Radiated measurements)

### Operational description

#### RADIATED EMISSIONS MEASUREMENTS

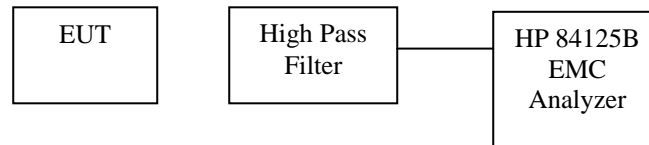
This setup was used in radiated emissions measurements.

The EUT was tested in 3 orthogonal orientations.

Worst case data is presented.

THIS SETUP USED FOR *RADIATED SPURIOUS EMISSIONS*

### *Block diagram*



Note: The high –pass filter is used for the Radiated Spurious emissions above 2.4835 GHz. A pass-thru connector is used for Radiated Spurious emissions measurements from 30 MHz – 2.4 GHz.

The solid lines are coaxial cables and the dashed lines are either EUT insertion to the test board or control cables between test setup devices.

## 6.0 TEST RESULTS

The measurement results were adjusted for the attenuation of the cable between the EUT connector and receiver.

### PEAK OUTPUT POWER

Peak Output Power [CFR 47, 15.247(b)(1) and RSS-210 6.2.2(o)]

<b>EUT</b>	<b>CORDLESS HAND SCANNER SERIES 7</b>
<b>Test setup</b>	A (conducted)
<b>Temp, Humidity, Air Pressure</b>	78° F, 31.22
<b>Date of Measurement</b>	7/23/07
<b>Measured by</b>	Bob Cole
<b>Result</b>	PASSED

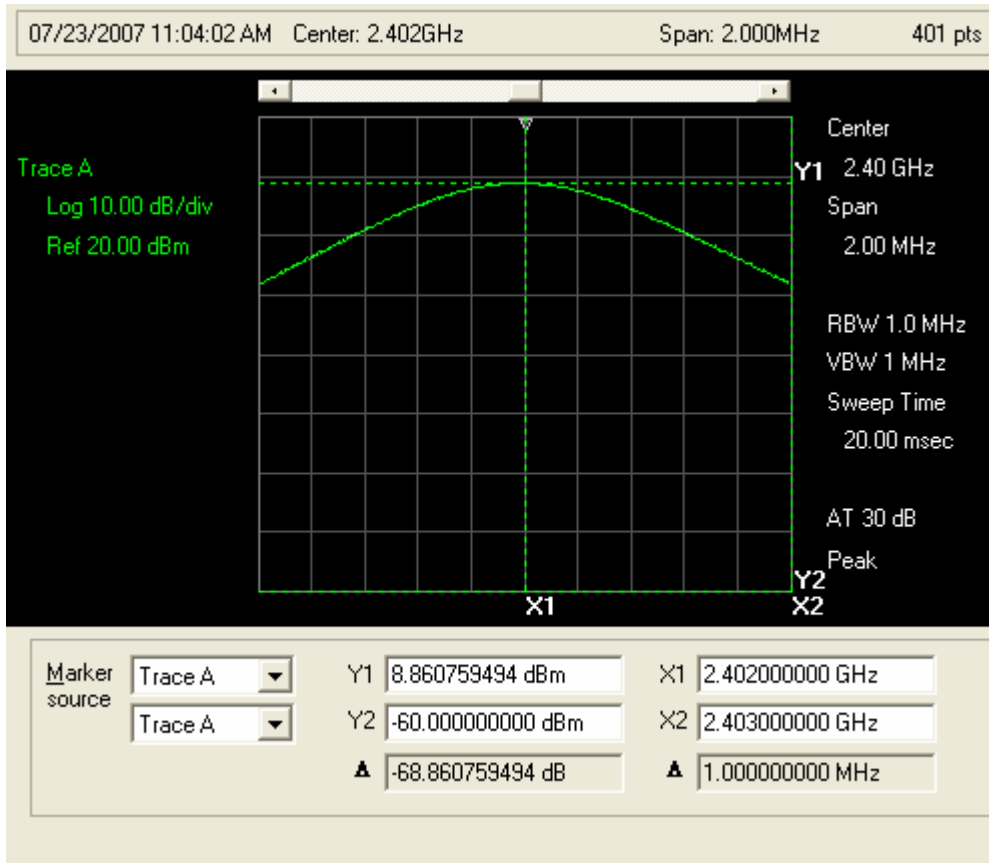
#### Limits and results

### PEAK OUTPUT POWER

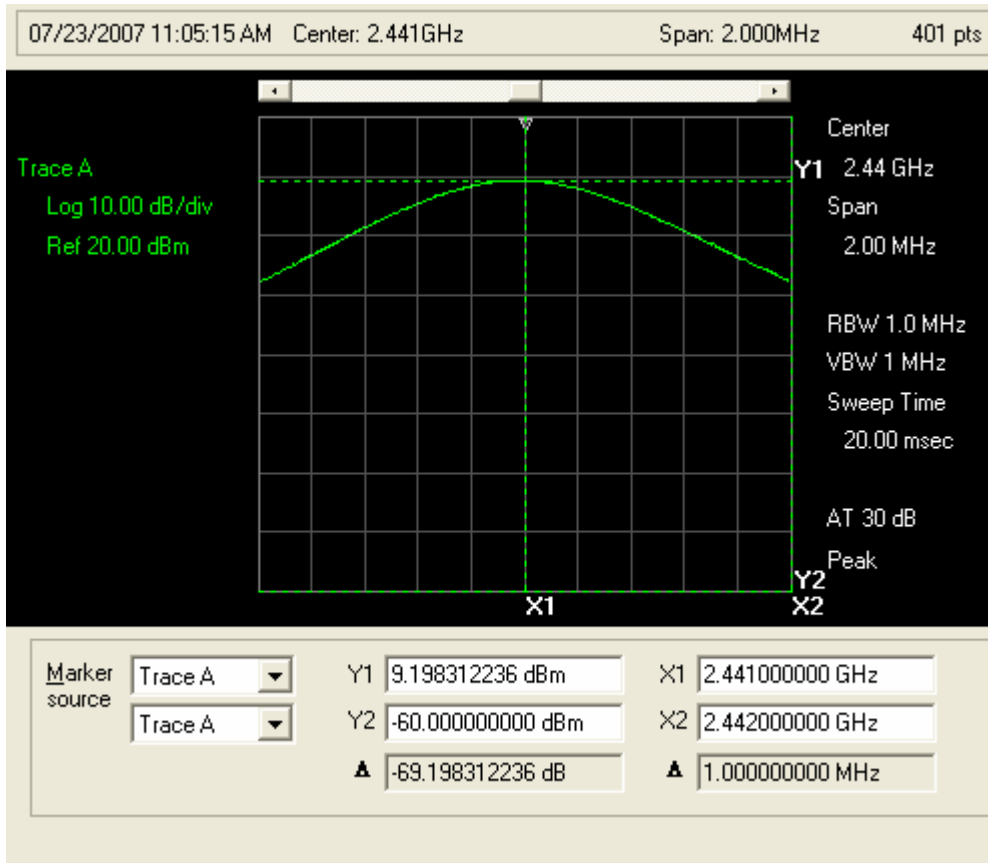
<b>EUT Channel Info</b>	<b>Limit (dBm)</b>	<b>Test results (dBm)</b>
2412 OFDM 6 MB/S	30.0	8.86
2437 OFDM 6 MB/S	30.0	9.19
2467 OFDM 6 MB/S	30.0	8.52

Screen shots

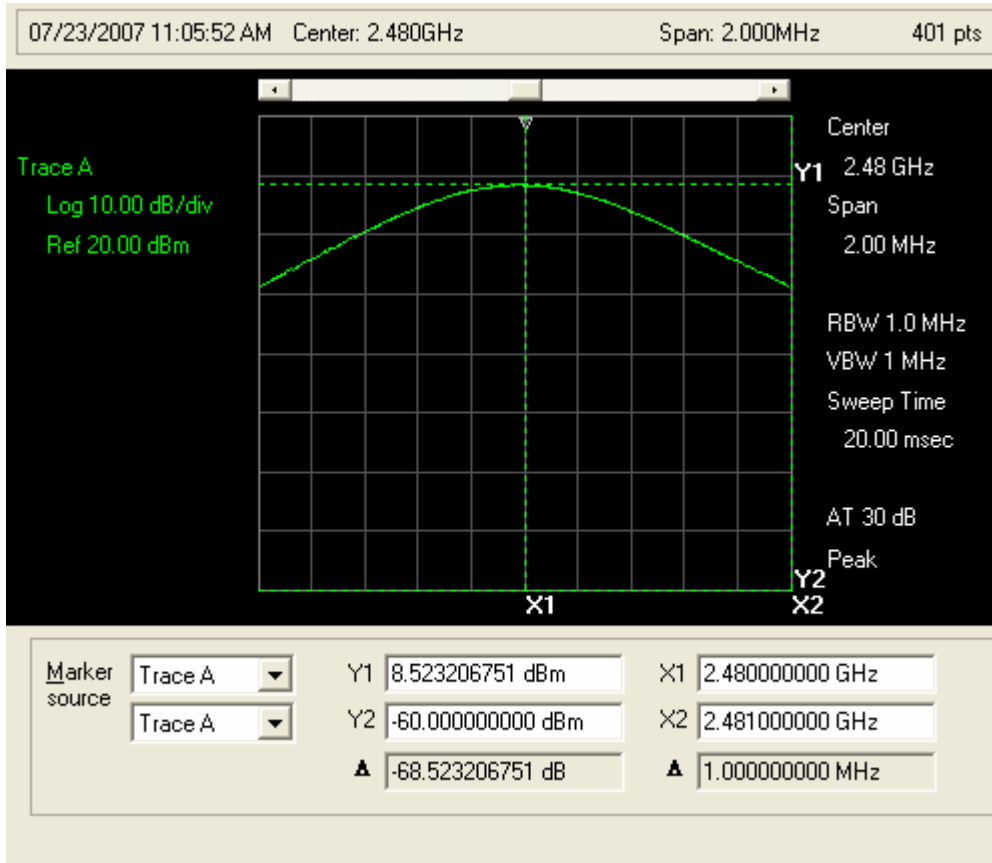
Plot 1: Peak output power, 2402 MHz



### Plot 2: Peak output power, 2441 MHz



**Plot 3: Peak output power, 2480 MHz**



## 20 dB Bandwidth

### 20 dB Bandwidth [CFR 47 15.247 (a)(1)(ii) and RSS-210 6.2.2(o)]

<b>EUT</b>	<b>CORDLESS HAND SCANNER SERIES 7</b>
<b>Test setup</b>	A (conducted)
<b>Temp, Humidity, Air Pressure</b>	78° F, 30.98
<b>Date of Measurement</b>	7/25/07
<b>Measured by</b>	Bob Cole
<b>Result</b>	PASSED

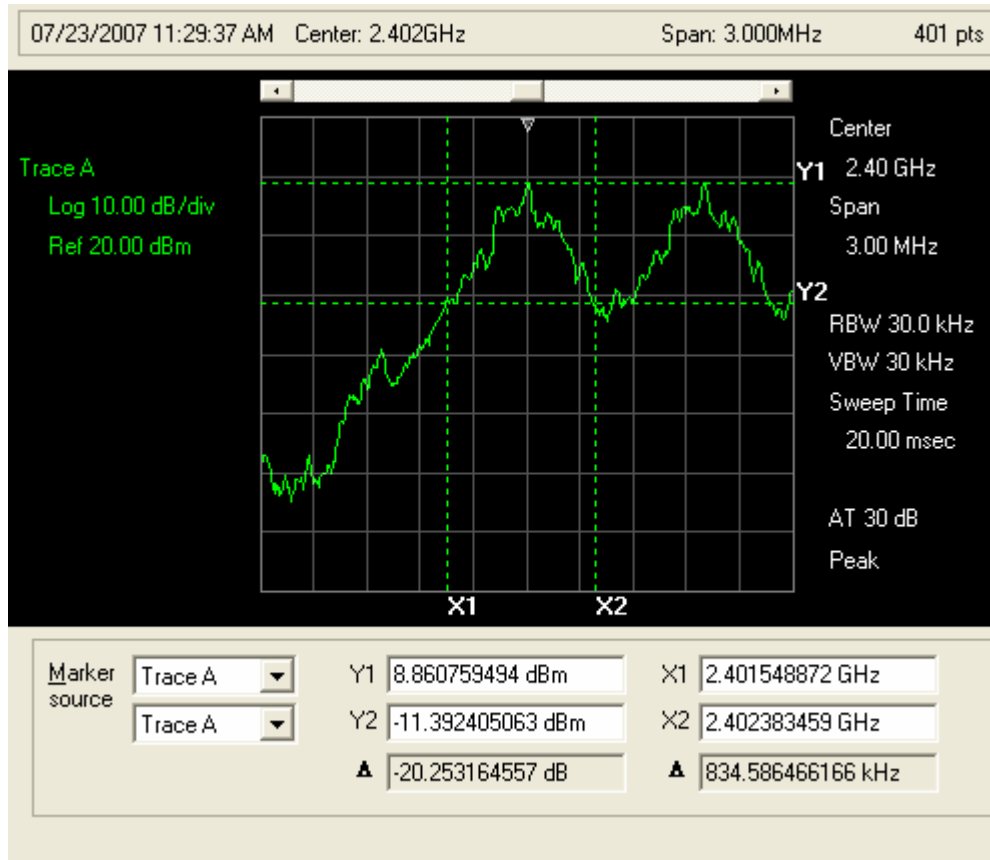
### Limits and Results

#### 20 dB BANDWIDTH

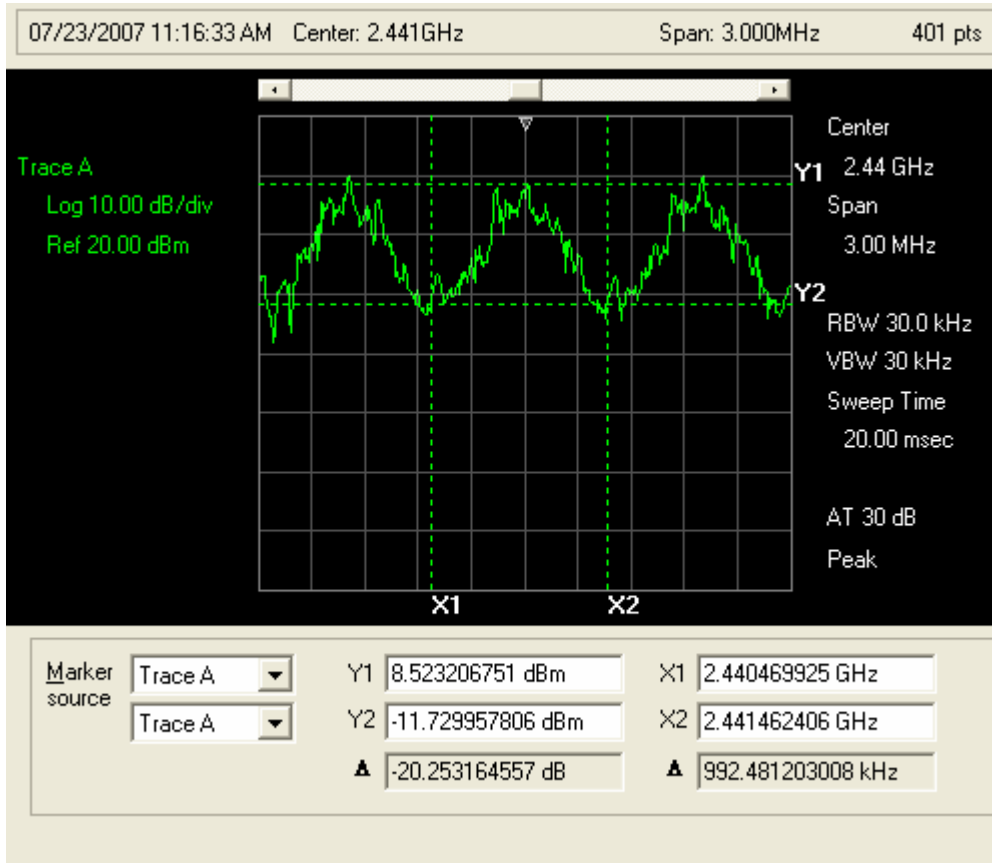
EUT Channel	Limit (MHz)	Test results (MHz)
2402	1.00	0.832
2441	1.00	0.992
2480	1.00	0.981

### Screen Shots

**Plot 4: 20 dB BW 2402 MHz**

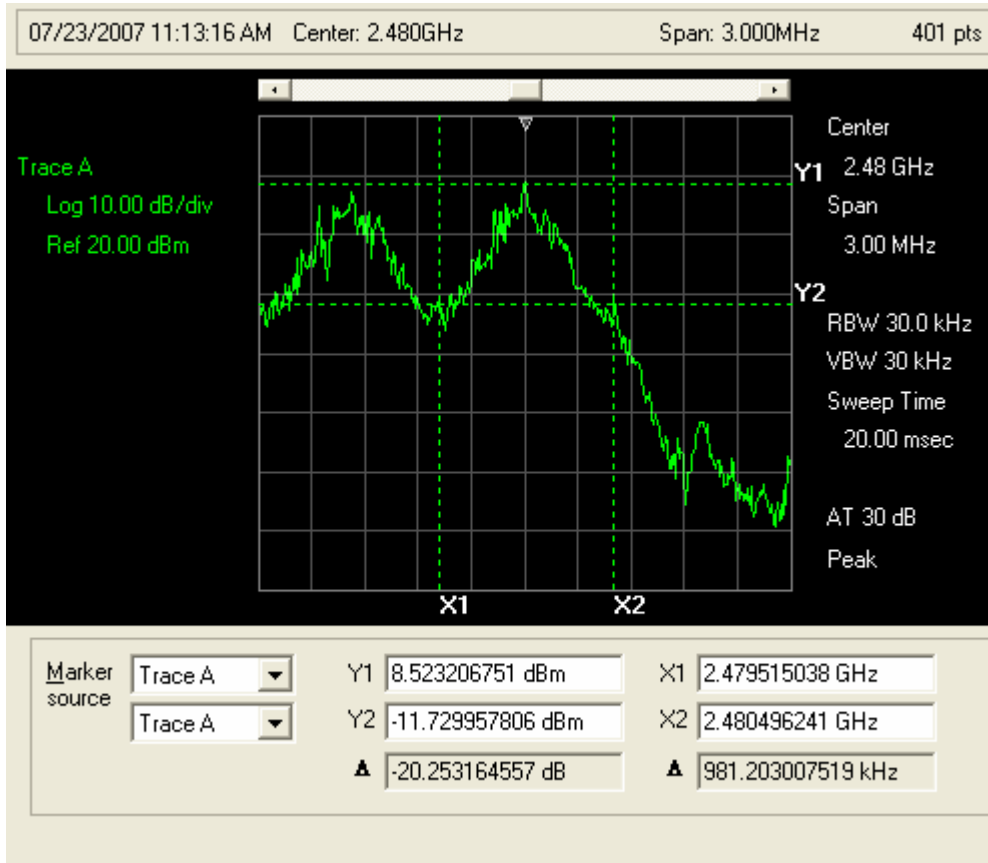


**Plot 5: 20B BW 2441Hz**





**Plot 6: 20B BW 2480 MHz**



## CENTER FREQUENCY SEPARATION

CF Separation [CFR 47, 15.247 (a)(1) and RSS-210 6.2.2(o)]

EUT	RING SCANNER
Test setup	A (conducted – hopping enabled)
Temp, Humidity, Air Pressure	77° F, 30.96
Date of Measurement	7/23/07
Measured by	Bob Cole
Result	PASSED

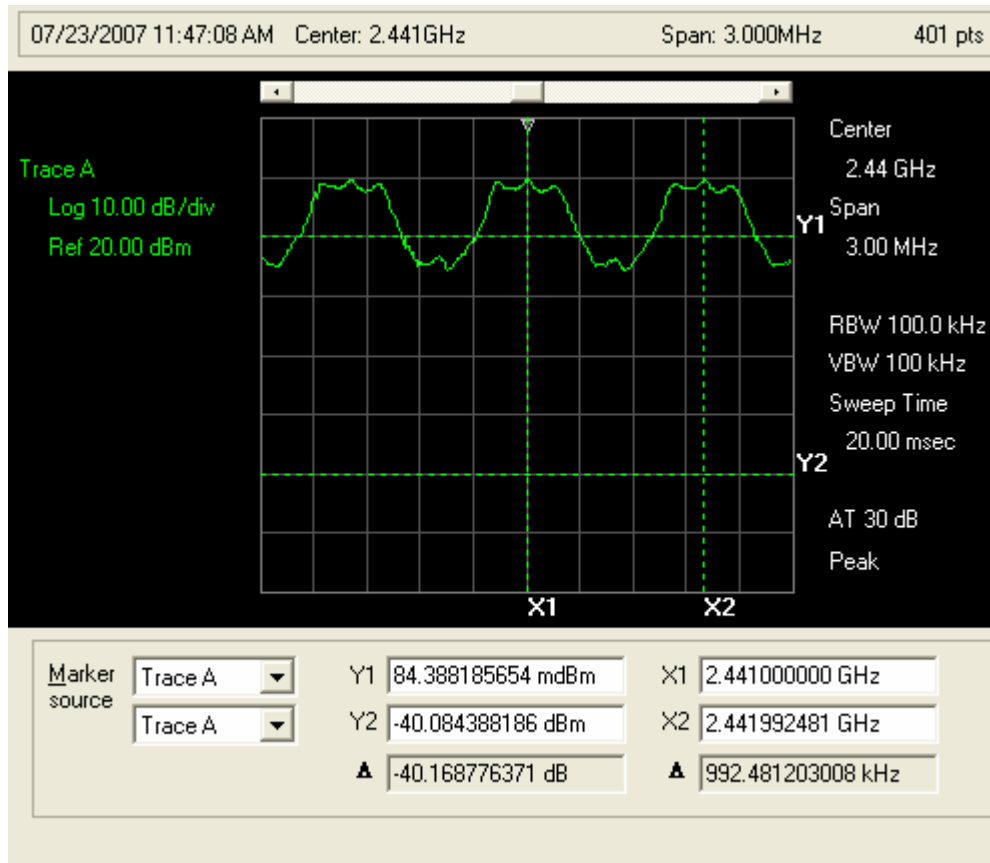
### Limits and results

#### CENTER FREQUENCY SEPARATION

EUT Channel	Limit (MHz)	Test results (MHz)
41-42	$\leq 1.0$	0.992

Screen Shot:

Plot 7: CF separation



## NUMBER OF HOPPING FREQUENCIES

Number of Hopping Frequencies [CFR 47, 15.247 (a)(1)(ii) and RSS-210 6.2.2(o)]

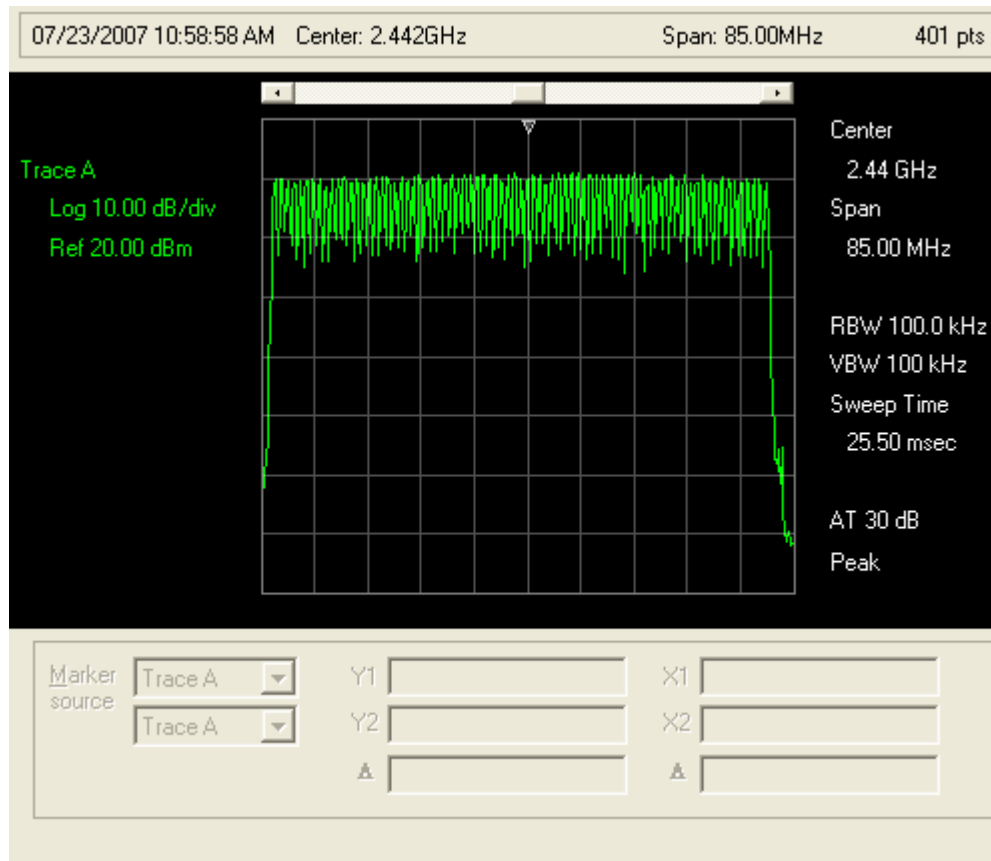
<b>EUT</b>	<b>RING SCANNER</b>
<b>Test setup</b>	A (conducted – hopping enabled)
<b>Temp, Humidity, Air Pressure</b>	80° F, 30.92
<b>Date of Measurement</b>	7/23/07
<b>Measured by</b>	Bob Cole
<b>Result</b>	PASSED

### Limits and results

#### NUMBER OF HOPPING FREQUENCIES

EUT Channel	Limit (MHz)	Test results (MHz)
2-80	≤ 75	79

**Plot 8: Number of Hopping Frequencies**



## BAND-EDGE COMPLIANCE

**Band-edge compliance of RF Radiated emissions [CFR 47, 15.247c(1) and RSS-210 6.2.2(o)]**

<b>EUT</b>	<b>RING SCANNER</b>
<b>Test setup</b>	A (conducted – hopping enabled & disabled)
<b>Temp, Humidity, Air Pressure</b>	79° F, 30.72
<b>Date of Measurement</b>	10/24/05
<b>Measured by</b>	Bob Cole
<b>Result</b>	PASSED

### EUT operation mode

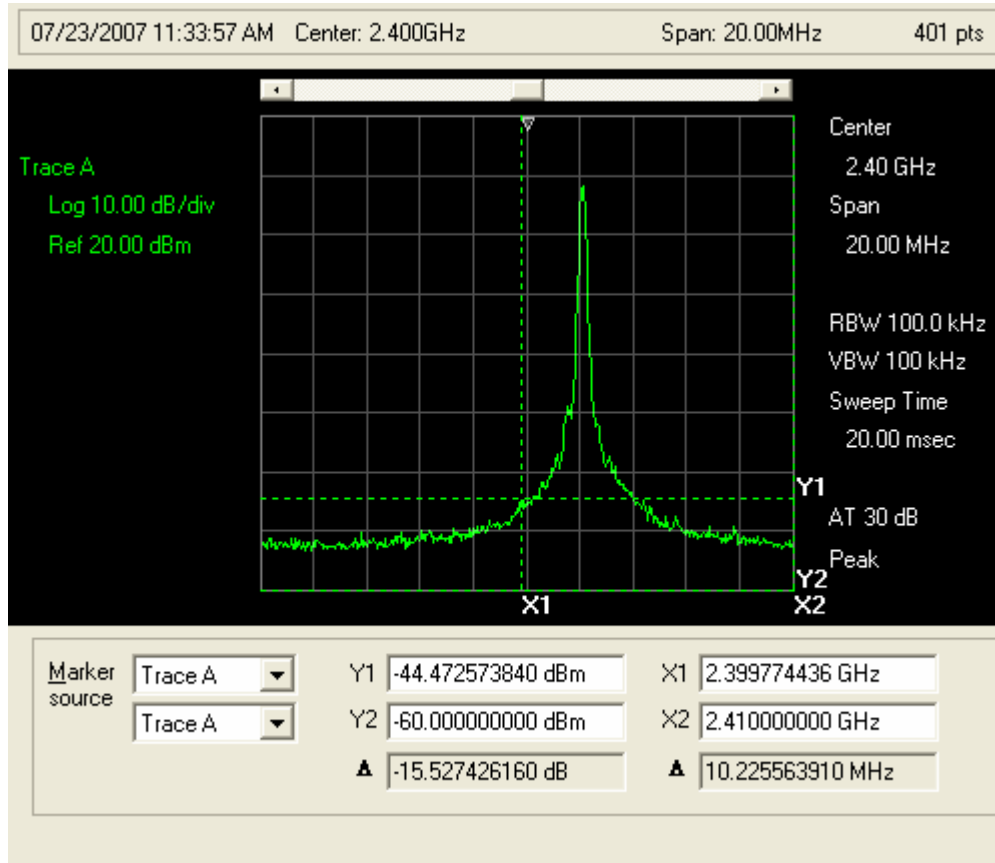
<b>EUT operation mode</b>	Hopping Enabled / Disabled
<b>EUT channel</b>	2, 80
<b>EUT TX power level</b>	Maximum

### Limits and results

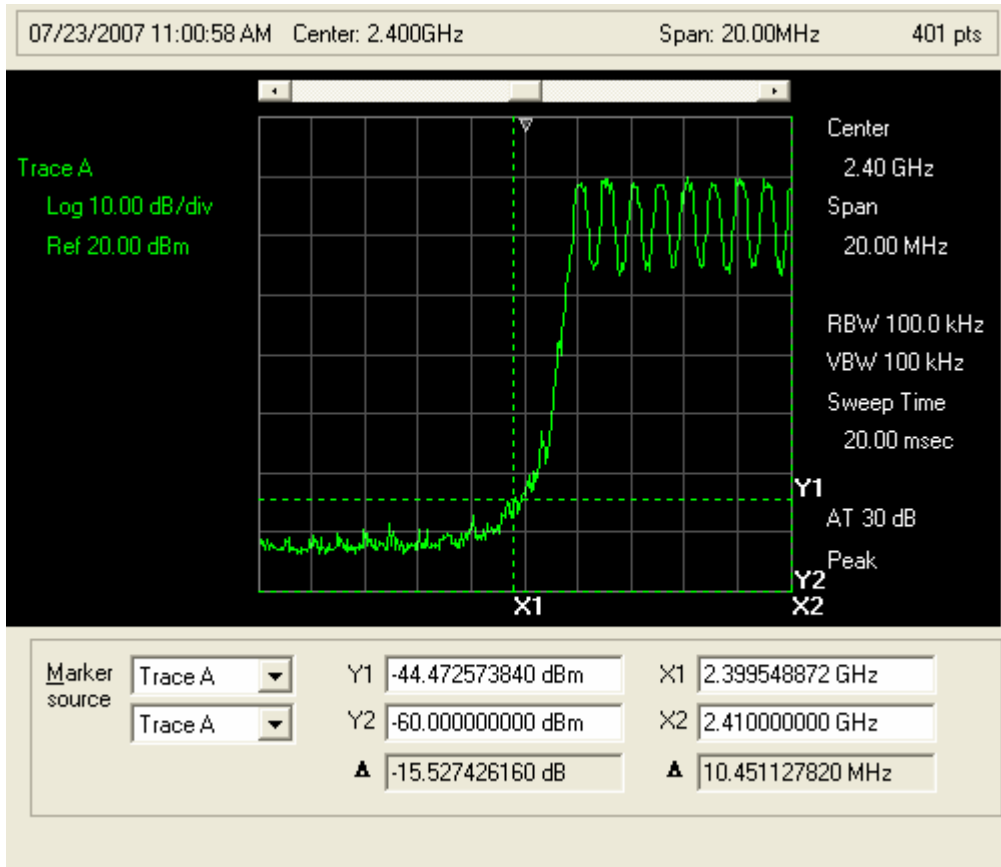
#### BAND-EDGE COMPLIANCE

Channel	Limit (dBm)	Results (dBm)
2	-53.00	-44.47
80	-53.00	-49.53

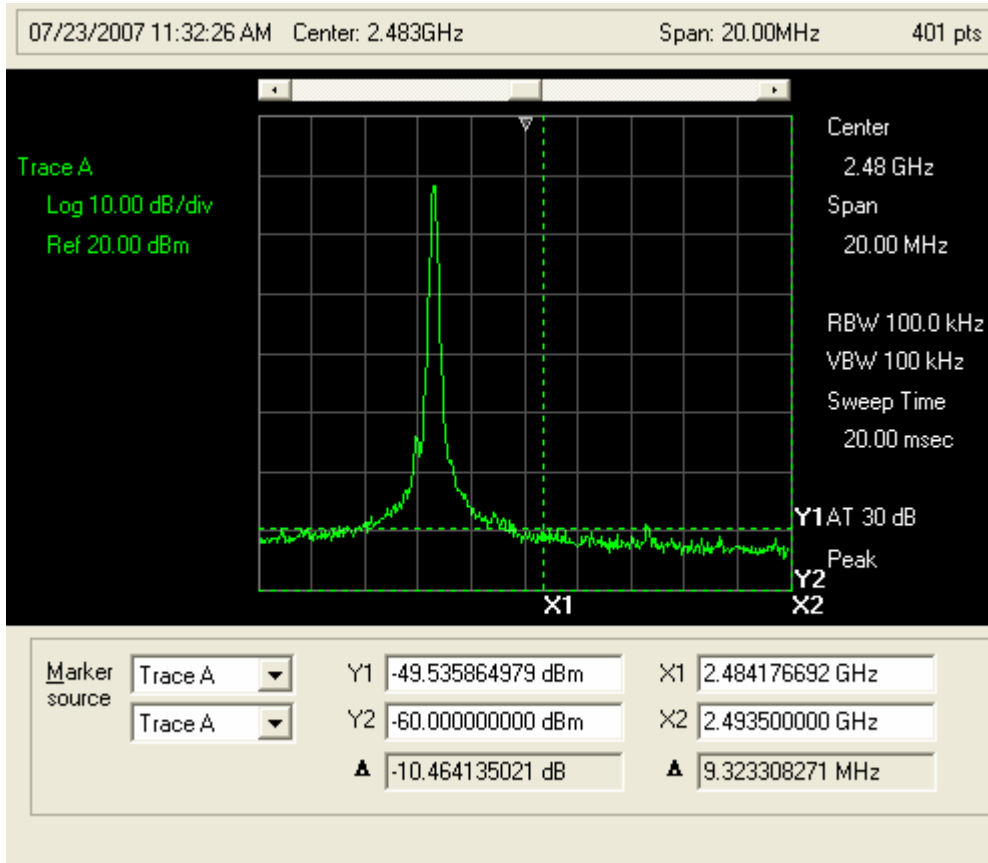
**Plot 9: Band-edge Compliance, Lower Band-edge (Hopping Disabled)**



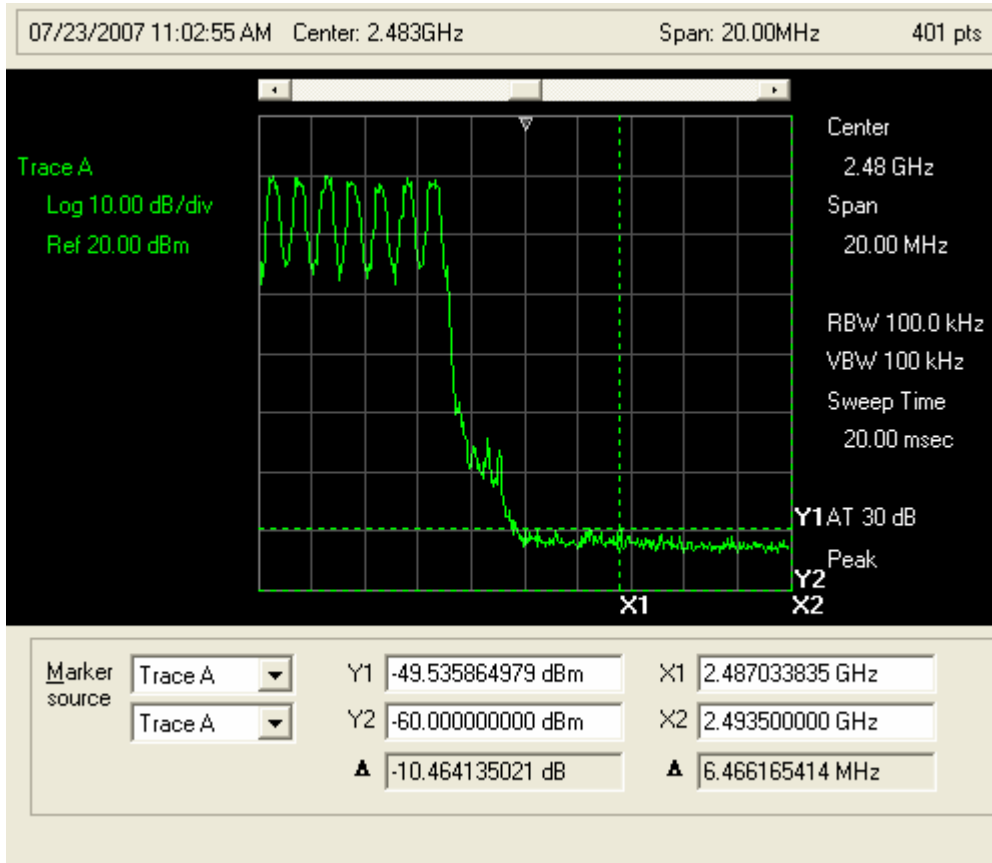
**Plot 10: Band-edge Compliance, Lower Band-edge (Hopping Enabled)**



**Plot 11: Band-edge compliance, Upper Band-edge (Hopping Disabled)**



### Plot 12: Band-edge Compliance, Upper Band-edge (Hopping Enabled)





## DWELL TIME

### Dwell Time

<b>EUT</b>	<b>RING SCANNER</b>
<b>Test setup</b>	N/A
<b>Temp, Humidity, Air Pressure</b>	N/A
<b>Date of Measurement</b>	N/A
<b>Measured by</b>	Bob Cole
<b>Result</b>	PASSED – see Bluetooth Specification below

### Limits and results

#### DWELL TIME

EUT Channel	Limit	Test results
2	400 ms per 30 second of operation	PASSED <i>See description that follows</i>

There are five hopping sequences (section 11, Bluetooth Spec. 1.1):

- 1) A **page hopping sequence** with 32 unique wake-up frequencies distributed equally over the 79 MHz, with a period length of 32; The basic slot time can be 312.5 uS or 625 uS. Min. hop repeat rate =  $32 \cdot 3125mS = 10mS$ .
- 2) A **page response sequence (page scan)** covering 32 unique response frequencies that all are in a one-to-one correspondence to the current page hopping sequence. The master and slave use different rules to obtain the same sequence. The basic slot time can be 312.5 uS or 625 uS and the period is 1.28s.
- 3) An **inquiry sequence** with 32 unique wake-up frequencies distributed equally over the 79 MHz, with a period length of 32; The basic slot time can be 312.5 uS or 625 uS. Min. hop repeat rate =  $32 \cdot 3125mS = 10mS$ .
- 4) An **inquiry response sequence (inquiry scan)** covering 32 unique response frequencies that all are in a one-to-one correspondence to the current inquiry hopping sequence. The basic slot time can be 312.5 uS or 625 uS and the period is 1.28s.
- 5) A **channel hopping sequence** which has a very long period length, which does not show repetitive patterns over a short time interval, but which distributes the hop frequencies equally over the 79 MHz during a short time interval; The basic slot time is 625 uS.

Worst case dwell times (largest dwell value) would be found with #5, the Channel Hopping (or data) sequence. The other hopping sequences may short shorter time sequences; however they are not repeated as often and hence have a lower overall dwell or duty cycle.

In normal transactions one may see occasional short periods between a chosen frequency due to inquiry and page scans possibly be interleaved during data transactions. It's my understanding that this would not create a dwell cycle result worse than the Channel hopping or data sequence.

### Channel Hopping Sequence (Data sequence) Dwell Calculation

Cycle time for complete hopping sequence of a 79 hop cycle (data transmission mode) =

$$(1.1) \text{ Time slot period} * 79 \text{ slots} = 625\mu\text{S} * 79 = 49.375 \text{ mS}$$

See page below from Bluetooth spec. Rev 1.1, section 2, for a depiction of the hopping sequence versus packet size. Figure 2.1 shows a DH1 cycle. Figure 2.2 shows a DH1, DH3 and DH5 sequence (resp.).

Every time slot has a frequency assignment, and the frequency used for a packet remains the same as the slot it started in, if the packet is longer than one time slot.

For a DH1 packet this does not have an impact. The channel selector steps thru the entire list of 79 pseudo-random channels and then start over from the beginning.

For a DH5 (5 Slot packet), the starting frequency will be used for all 5 time slots ( $f(k)$  in this example), and 4 following frequencies will not be used during that hopping cycle. Therefore instead of stepping sequential thru the 79 frequency channel list, only every 5<sup>th</sup> channel is used. Each time the 79 frequency channel list is started, is it a new randomized list of 79 channels. The probability that it will use the same frequency channel in the next list is 1/5.

Therefore even though the DH5 is at one frequency for 5 times longer than a DH1 packet, it repeats itself 1/5 as often, with the effective dwell time (averaged over a long period over a long period of time – for instance the 30 sec FCC dwell test) being the same.

For the “duty cycle correction factor”, my “read” of the FCC doc says that one should take the “worst” 100mS period found, in contrast to the average 30 sec dwell time just mentioned. As a result the DH1 and DH5 numbers for the 100 mS dwell case will be different. For a worst case DH5 packet sequence, the same frequency channel could appear in two successive 79 channel sequences.

**DH1 calculation: DH1 uses 1 time slot of 0.625 mS per hopping cycle.**

Dwell time per 100mS – since one 79 hop sequence is approx 50mS, there will be approx. two hop sequences in 100 mS (more accurately 100/49.375).

$$(1.2) \text{ DH1 dwell time} = 0.625 \text{ mS} * (100\text{ms}/49.375\text{mS}) = 1.26 \text{ mS (per 100 mS)}$$

**DH5 calculation: DH5 uses 5 time slots of 0.625 mS per hopping cycle.**

Dwell time per 100mS – since one 79 hop sequence is approx 50mS and there could be two appearances of a frequency channel in 100 mS (more accurately 100mms/49.375ms).

$$(1.3) \text{ DH5 dwell time} = 5 * 0.625 \text{ mS} * (100\text{ms}/49.375\text{mS}) = 6.3 \text{ mS (per 100 mS)}$$

**Using the FCC duty cycle correction factor:**

$$(1.4) \text{ DH1 Dwell correction} = 20 \log (\text{DH1 dwell time}/100\text{mS}) = 20 \log (0.0126) = -38 \text{ dB}$$

$$(1.5) \text{ DH5 Dwell correction} = 20 \log (\text{DH5 dwell time}/100\text{mS}) = 20 \log (0.0633) = -24 \text{ dB}$$

Therefore the worst case duty cycle adjustment condition will be for the DH5 packet.

The calculation shows us that we can subtract 24 dB from our 2<sup>nd</sup> harmonic measurement to compensate for this duty cycle adjustment.

## RESTRICTED BAND MEASUREMENTS

### Restricted Band Measurements [CFR 47, 15.247(c) and RSS-210 6.2.2(o)]

<b>EUT</b>	<b>CORDLESS HAND SCANNER SERIES 7</b>
<b>Test setup</b>	B (Radiated)
<b>Temp, Humidity, Air Pressure</b>	68° F, 30.02
<b>Date of Measurement</b>	05/23/07
<b>Measured by</b>	Bob Cole
<b>Result</b>	PASSED

### Restricted Band Spurious Radiated Emissions 30 - 1000 MHz

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **SocketMobile, Inc.**  
 Specification: **FCC-85 Restricted Band 30-2400**  
 Work Order #: \_\_\_\_\_ Date: 8/8/2007  
 Test Type: **Radiated Scan** Time: 12:33:52  
 Equipment: **Cordless Hand Scanner** Sequence#: 7  
 Manufacturer: SocketMobile, Inc. Tested By: Bob Cole  
 Model: CHS  
 S/N: \_\_\_\_\_

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
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**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
Cordless Hand Scanner*	SocketMobile, Inc.	CHS	

**Support Devices:**

Function	Manufacturer	Model #	S/N
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**Test Conditions / Notes:**

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**Transducer Legend:**

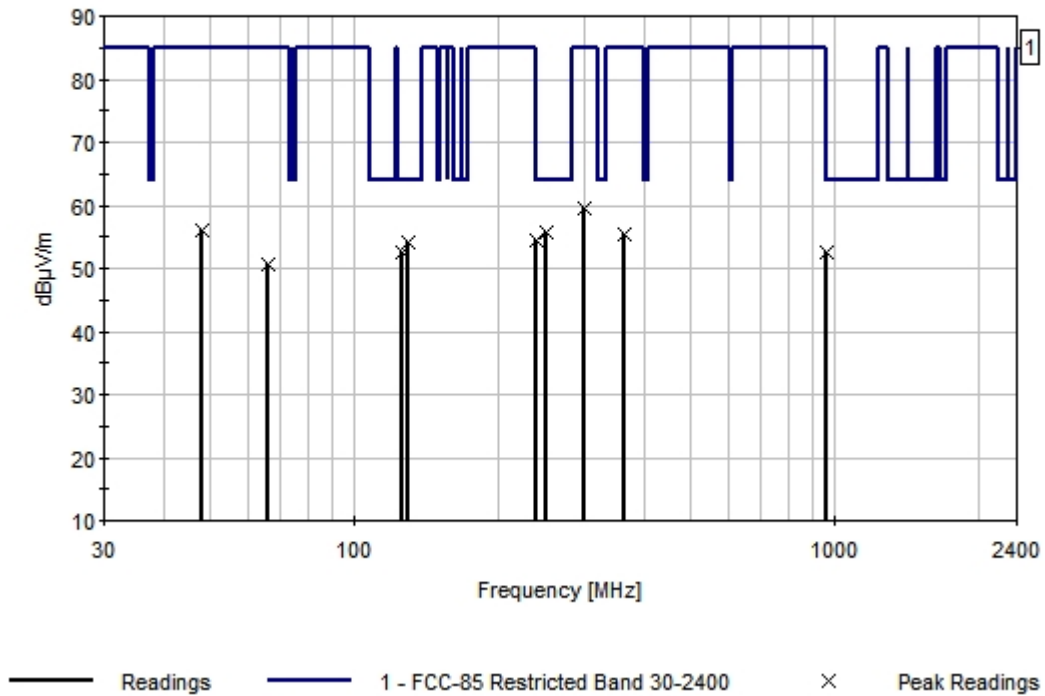
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**Measurement Data:** Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	250.070M	35.8					+20.0	55.8	64.0	-8.2	Horiz
2	240.070M	34.3					+20.0	54.3	64.0	-9.7	Vert
3	128.895M	34.0					+20.0	54.0	64.0	-10.0	Horiz
4	125.020M	32.6					+20.0	52.6	64.0	-11.4	Horiz

5	960.000M	32.4	+20.0	52.4	64.0	-11.6	Horiz
6	301.640M	39.6	+20.0	59.6	85.0	-25.4	Vert
7	47.835M	36.1	+20.0	56.1	85.0	-28.9	Vert
8	364.785M	35.5	+20.0	55.5	85.0	-29.5	Vert
9	65.760M	30.7	+20.0	50.7	85.0	-34.3	Vert

EMCE Engineering Date: 8/8/2007 Time: 12:33:52 SocketMobile, Inc. WO#: FCC-85 Restricted Band 30-2400 Test Distance: 10 Meters Sequence#: 7



## Restricted Band Spurious Radiated Emissions 1000 - 2400 MHz

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **SocketMobile, Inc.**

Specification: **FCC-85 Restricted Band 1000-2400**

Work Order #:

Date: 8/8/2007

Test Type: **Radiated Scan**

Time: 11:36:04 AM

Equipment: **Cordless Hand Scanner**

Sequence#: 6

Manufacturer: SocketMobile, Inc.

Tested By: Bob Cole

Model: CHS

S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
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**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
Cordless Hand Scanner*	SocketMobile, Inc.	CHS	

**Support Devices:**

Function	Manufacturer	Model #	S/N
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**Test Conditions / Notes:**

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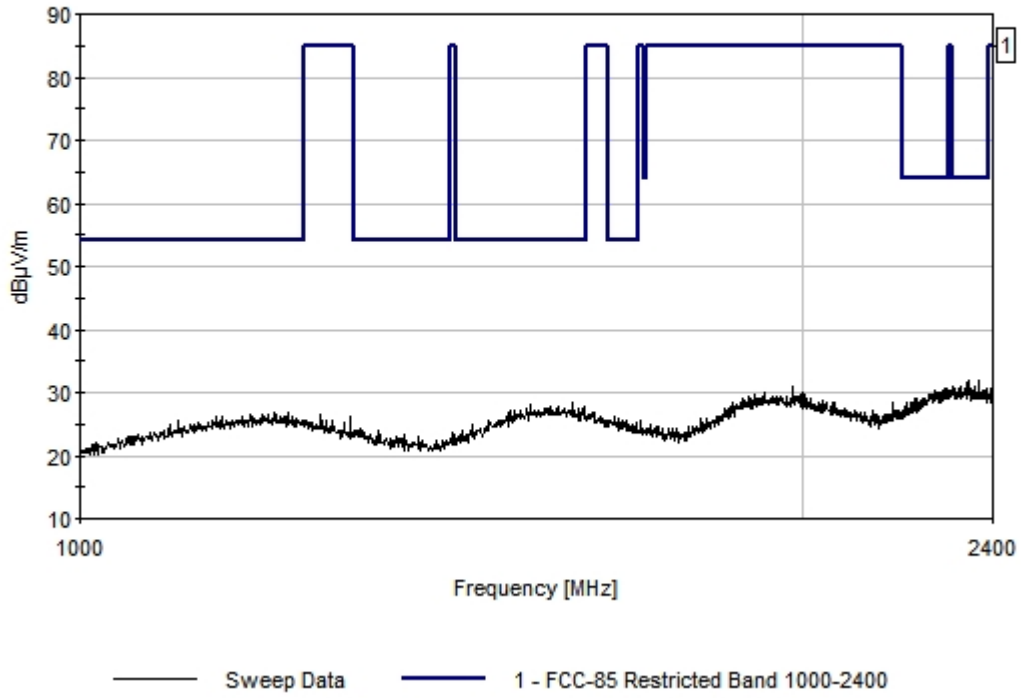
**Transducer Legend:**

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**Measurement Data:** Reading listed by margin. Test Distance: 1 Meter

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	1605.194M	38.5					-10.0	28.5	54.0	-25.5	Vert
2	1204.678M	36.9					-10.0	26.9	54.0	-27.1	Vert
3	2345.445M	42.0					-10.0	32.0	64.0	-32.0	Vert
4	1982.074M	41.0					-10.0	31.0	85.0	-54.0	Vert

EMCE Engineering Date: 8/8/2007 Time: 11:36:04 AM SocketMobile, Inc. WO#:  
FCC-85 Restricted Band 1000-2400 Test Distance: 1 Meter Sequence#: 6



## Restricted Band Spurious Radiated Emissions 2483.5 – 12750 MHz

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **SocketMobile, Inc.**  
 Specification: **FCC-85 Restricted Band 2483.5 - 18000**  
 Work Order #: \_\_\_\_\_ Date: 8/8/2007  
 Test Type: **Radiated Scan** Time: 11:17:32 AM  
 Equipment: **Cordless Hand Scanner** Sequence#: 5  
 Manufacturer: SocketMobile, Inc. Tested By: Bob Cole  
 Model: CHS  
 S/N: \_\_\_\_\_

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
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**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
Cordless Hand Scanner*	SocketMobile, Inc.	CHS	

**Support Devices:**

Function	Manufacturer	Model #	S/N
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**Test Conditions / Notes:**

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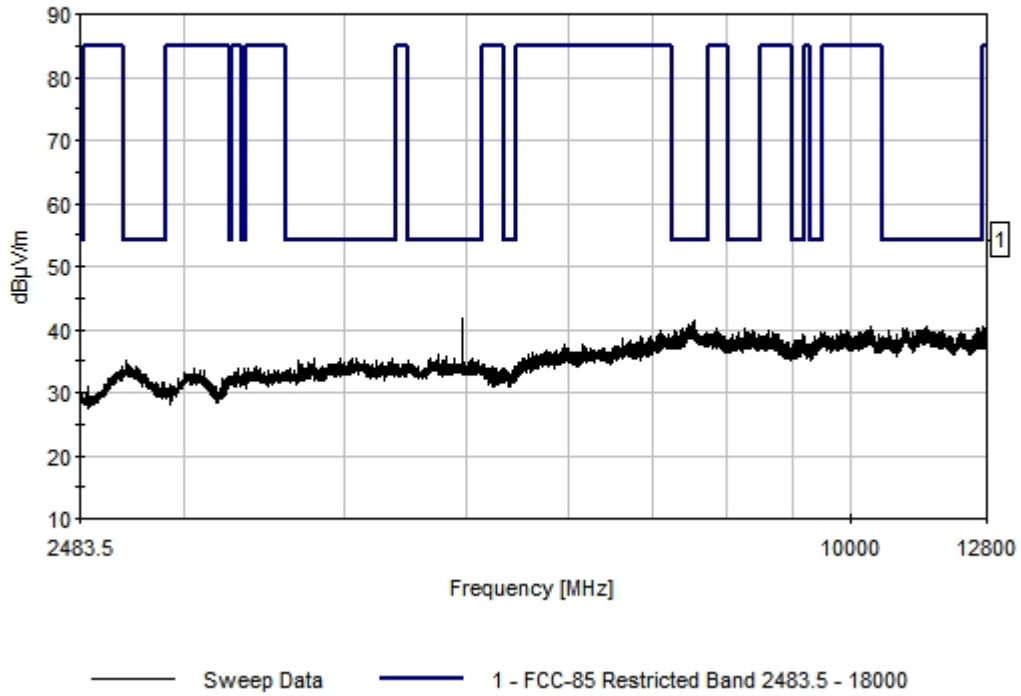
**Transducer Legend:**

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**Measurement Data:** Reading listed by margin. Test Distance: 1 Meter

#	Freq MHz	Rdng dB $\mu$ V	dB	dB	dB	dB	Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	4959.851M	51.8					-10.0	41.8	54.0	-12.2	Vert
2	7541.728M	51.5					-10.0	41.5	54.0	-12.5	Vert
3	11492.430M	50.4					-10.0	40.4	54.0	-13.6	Vert
4	8272.372M	50.3					-10.0	40.3	54.0	-13.7	Vert
5	10992.940M	50.2					-10.0	40.2	54.0	-13.8	Vert
6	12561.830M	50.2					-10.0	40.2	54.0	-13.8	Vert
7	12604.940M	50.1					-10.0	40.1	54.0	-13.9	Vert
8	8389.959M	50.0					-10.0	40.0	54.0	-14.0	Vert

EMCE Engineering Date: 8/8/2007 Time: 11:17:32 AM SocketMobile, Inc. WO#: FCC-85 Restricted Band 2483.5 - 18000 Test Distance: 1 Meter Sequence#: 5





## RECEIVE MODE RESTRICTED BAND MEASUREMENTS

### Restricted Band Measurements [CFR 47, 15.247(c) and RSS-210 6.2.2(o)]

<b>EUT</b>	<b>CORDLESS HAND SCANNER SERIES 7</b>
<b>Test setup</b>	B (Radiated)
<b>Temp, Humidity, Air Pressure</b>	74° F, 30.02
<b>Date of Measurement</b>	07/24/07
<b>Measured by</b>	Bob Cole
<b>Result</b>	PASSED

### Receive Mode Restricted Band Spurious Radiated Emissions 30 - 1000 MHz

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **SocketMobile, Inc.**  
 Specification: **FCC-85 Restricted Band 30-2400**  
 Work Order #: **2732** Date: 7/24/2007  
 Test Type: **Radiated Scan** Time: 2:34:23 PM  
 Equipment: **Cordless Hand Scanner** Sequence#: 2  
 Manufacturer: **SocketMobile, Inc.** Tested By: **Bob Cole**  
 Model: **CHS**  
 S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
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**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
Cordless Hand Scanner*	SocketMobile, Inc.	CHS	

**Support Devices:**

Function	Manufacturer	Model #	S/N
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**Test Conditions / Notes:**

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**Transducer Legend:**

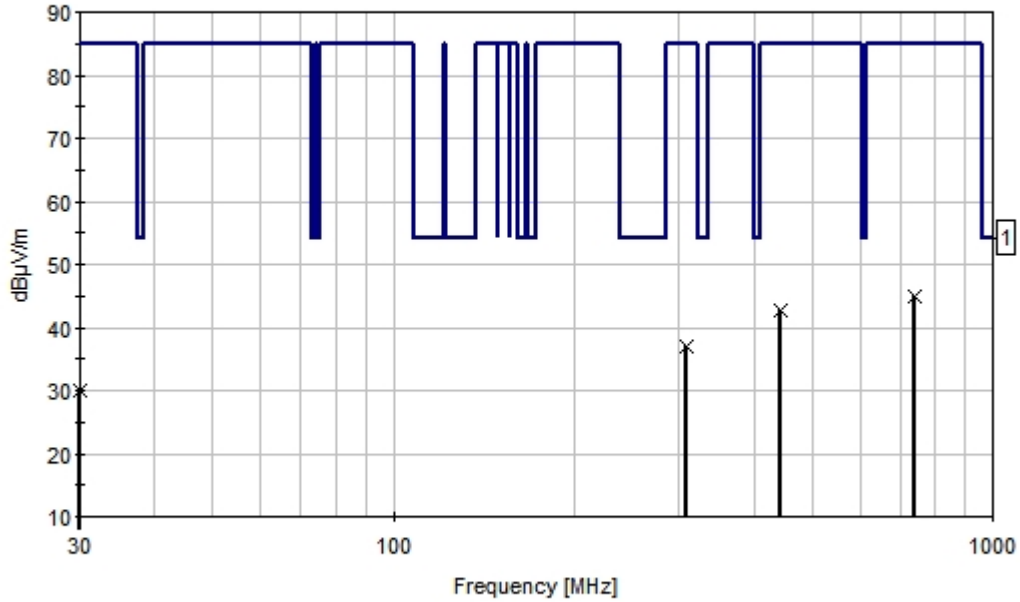
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**Measurement Data:** Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	741.346M	34.9					+10.0	44.9	85.0	-40.1	Vert
2	443.385M	32.6					+10.0	42.6	85.0	-42.4	Vert
3	308.039M	26.9					+10.0	36.9	85.0	-48.1	Vert

4	30.000M	20.0	+10.0	30.0	85.0	-55.0	Vert
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EMCE Engineering Date: 7/24/2007 Time: 2:34:23 PM SocketMobile, Inc. WO#: 2732  
FCC-85 Restricted Band 30-2400 Test Distance: 10 Meters Sequence#: 2



## Receive Mode Restricted Band Spurious Radiated Emissions 1000 - 12750 MHz

Test Location: EMCE Engineering • 44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **SocketMobile, Inc.**

Specification: **BT RX Radiated 1000-12750**

Work Order #: **2732**

Date: 7/24/2007

Test Type: **Radiated Scan**

Time: 12:06:51 PM

Equipment: **Cordless Hand Scanner**

Sequence#: 1

Manufacturer: SocketMobile, Inc.

Tested By: Bob Cole

Model: CHS

S/N:

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
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**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
Cordless Hand Scanner*	SocketMobile, Inc.	CHS	

**Support Devices:**

Function	Manufacturer	Model #	S/N
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**Test Conditions / Notes:**

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**Transducer Legend:**

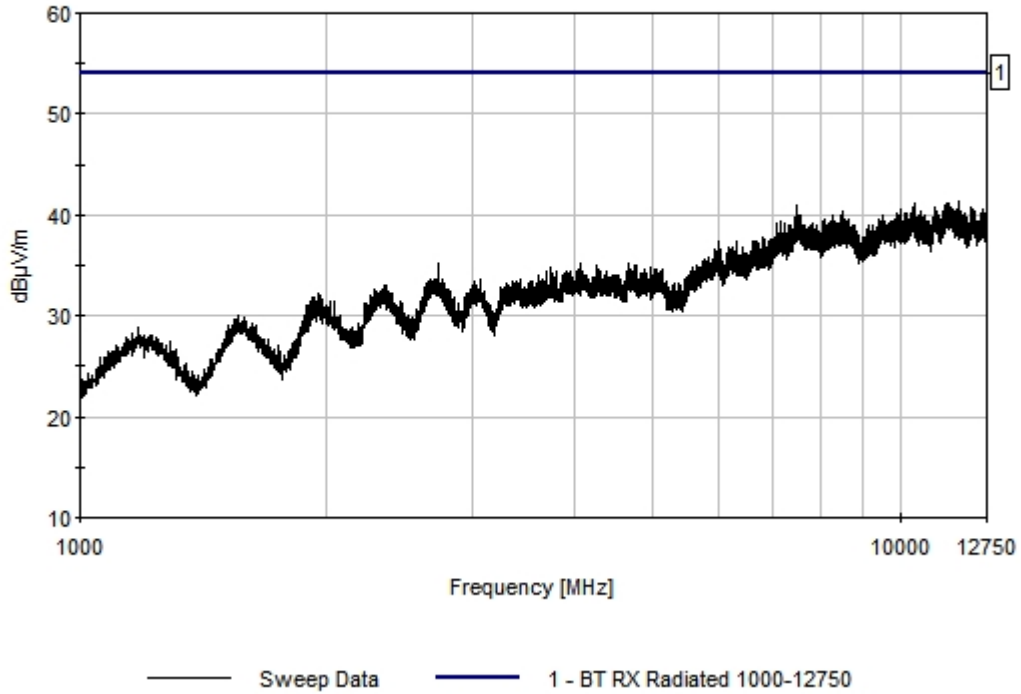
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**Measurement Data:** Reading listed by margin. Test Distance: 1 Meter

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	11764.690 M	51.4					-10.0	41.4	54.0	-12.6	Vert
2	10401.890 M	51.2					-10.0	41.2	54.0	-12.8	Vert
3	11398.860 M	51.2					-10.0	41.2	54.0	-12.8	Vert
4	7478.311M	51.0					-10.0	41.0	54.0	-13.0	Vert
5	10999.880 M	50.8					-10.0	40.8	54.0	-13.2	Vert
6	12187.800 M	50.8					-10.0	40.8	54.0	-13.2	Vert
7	12578.750 M	50.6					-10.0	40.6	54.0	-13.4	Vert

8	10033.050	50.5	-10.0	40.5	54.0	-13.5	Vert
	M						

EMCE Engineering Date: 7/24/2007 Time: 12:06:51 PM SocketMobile, Inc. WO#: 2732  
BT RX Radiated 1000-12750 Test Distance: 1 Meter Sequence#: 1



## AC LINE CONDUCTED EMISSIONS MEASUREMENT

### AC Line Conducted Emissions Measurement 150 kHz – 30 MHz

<b>EUT</b>	<b>CORDLESS HAND SCANNER SERIES 7</b>
<b>Test setup</b>	C (conducted)
<b>Temp, Humidity, Air Pressure</b>	75° F, 30.21
<b>Date of Measurement</b>	8/8/07
<b>Measured by</b>	Bob Cole
<b>Result</b>	PASSED

### CLASS B LIMIT

Frequency Band (MHz)	EN 55022 B Limit (dB $\mu$ V/m)	Detector
0.15 – 0.5	66 to 56	QP
0.5 – 5.0	56	QP
5.0 – 30.0	60	QP

### EUT operation mode

<b>EUT operation mode</b>	Hopping
<b>EUT channel</b>	
<b>EUT TX power level</b>	Maximum
<b>EUT operation voltage</b>	120 VAC

**LINE CONDUCTED EMISSIONS, .15 - 30 MHz**  
**EN 55022 Class B Limits**

**LINE 1**

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **SocketMobile, Inc.**  
Specification: **EN55022 B COND [QP]**  
Work Order #: **2733**  
Test Type: **Conducted Emissions**  
Equipment: **Cordless Hand Scanner**  
Manufacturer: **SocketMobile, Inc.**  
Model: **CHS**  
S/N:

Date: 8/8/2007  
Time: 12:54:02 PM  
Sequence#: 2  
Tested By: Bob Cole  
120V 60Hz

***Test Equipment:***

Function	S/N	Calibration Date	Cal Due Date	Asset #
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***Equipment Under Test (\* = EUT):***

Function	Manufacturer	Model #	S/N
Cordless Hand Scanner*	SocketMobile, Inc.	CHS	

***Support Devices:***

Function	Manufacturer	Model #	S/N
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***Test Conditions / Notes:***

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***Transducer Legend:***

T1=cable5 test	T2=LISN 1
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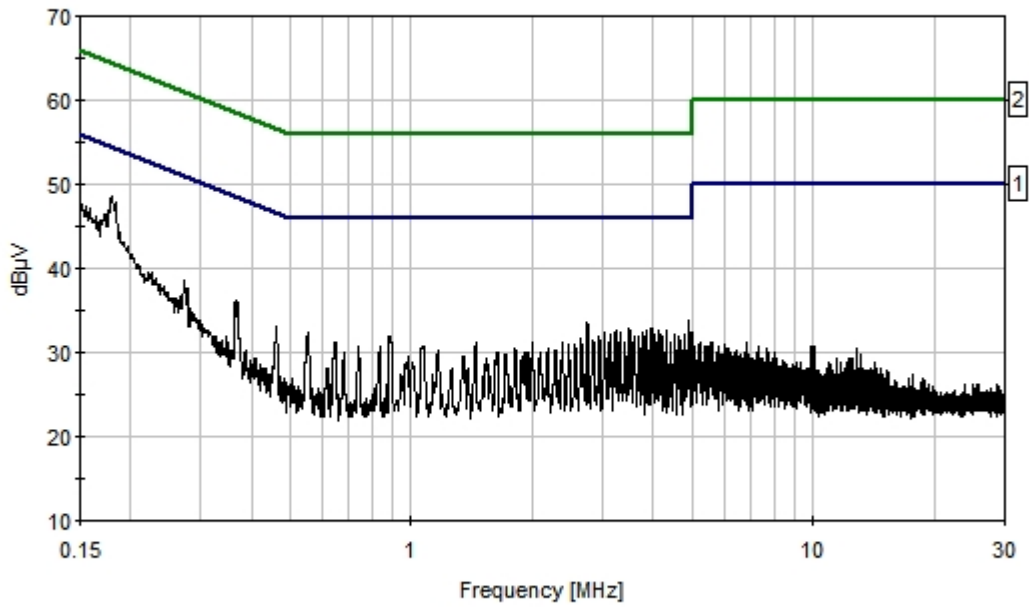
***Measurement Data:***

Reading listed by margin.

Test Lead: Line 1

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	179.815k	47.6	+0.0	+1.0			+0.0	48.6	64.5	-15.9	Black
2	150.727k	46.6	+0.0	+1.1			+0.0	47.7	66.0	-18.3	Black
3	4.892M	32.8	+0.2	+0.7			+0.0	33.7	56.0	-22.3	Black
4	365.251k	35.2	+0.1	+0.8			+0.0	36.1	58.6	-22.5	Black
5	2.740M	32.7	+0.2	+0.6			+0.0	33.5	56.0	-22.5	Black
6	3.484M	32.0	+0.2	+0.7			+0.0	32.9	56.0	-23.1	Black
7	3.960M	31.9	+0.2	+0.7			+0.0	32.8	56.0	-23.2	Black
8	4.143M	31.8	+0.2	+0.7			+0.0	32.7	56.0	-23.3	Black
9	3.867M	31.7	+0.2	+0.7			+0.0	32.6	56.0	-23.4	Black
10	4.330M	31.7	+0.2	+0.7			+0.0	32.6	56.0	-23.4	Black

EMCE Engineering Date: 8/8/2007 Time: 12:54:02 PM SocketMobile, Inc. WO#: 2733  
EN55022 B COND [QP] Test Lead: Line 1 120V 60Hz Sequence#: 2



— Sweep Data    — 1 - EN55022 B COND [AVE]    — 2 - EN55022 B COND [QP]

Test Location: EMCE Engineering •44366 S. Grimmer Blvd • Fremont, CA 94538 • 510-490-4307

Customer: **SocketMobile, Inc.**  
 Specification: **EN55022 B COND [QP]**  
 Work Order #: **2733**  
 Test Type: **Conducted Emissions**  
 Equipment: **Cordless Hand Scanner**  
 Manufacturer: SocketMobile, Inc.  
 Model: CHS  
 S/N:

Date: 8/8/2007  
 Time: 1:00:19 PM  
 Sequence#: 3  
 Tested By: Bob Cole  
 120V 60Hz

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
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**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
Cordless Hand Scanner*	SocketMobile, Inc.	CHS	

**Support Devices:**

Function	Manufacturer	Model #	S/N
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**Test Conditions / Notes:**

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**Transducer Legend:**

T1=cable5 test	T2=LISN 1
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**Measurement Data:**

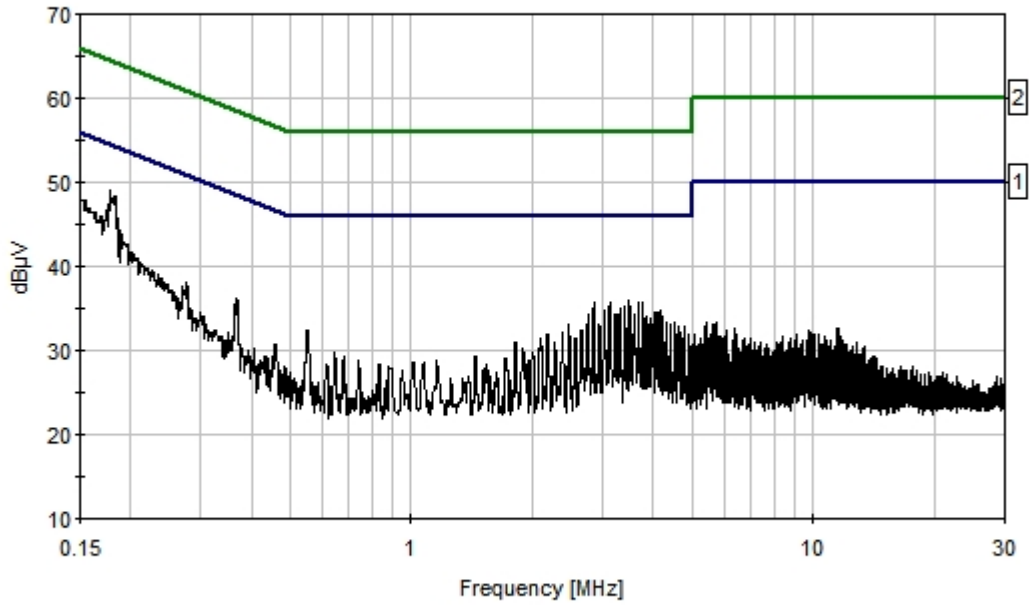
Reading listed by margin.

Test Lead: Line 2

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	178.361k	48.0	+0.0	+1.0			+0.0	49.0	64.6	-15.6	Line
2	151.454k	46.7	+0.0	+1.1			+0.0	47.8	65.9	-18.1	Line
3	186.360k	44.8	+0.0	+1.0			+0.0	45.8	64.2	-18.4	Line
4	3.484M	35.1	+0.2	+0.7			+0.0	36.0	56.0	-20.0	Line
5	190.723k	42.8	+0.0	+1.0			+0.0	43.8	64.0	-20.2	Line
6	3.127M	34.8	+0.2	+0.7			+0.0	35.7	56.0	-20.3	Line
7	3.684M	34.8	+0.2	+0.7			+0.0	35.7	56.0	-20.3	Line
8	3.765M	34.8	+0.2	+0.7			+0.0	35.7	56.0	-20.3	Line
9	2.850M	34.7	+0.2	+0.7			+0.0	35.6	56.0	-20.4	Line
10	3.403M	34.3	+0.2	+0.7			+0.0	35.2	56.0	-20.8	Line



EMCE Engineering Date: 8/8/2007 Time: 1:00:19 PM SocketMobile, Inc. WO#: 2733  
EN55022 B COND [QP] Test Lead: Line 2 120V 60Hz Sequence#: 3



— Sweep Data    — 1 - EN55022 B COND [AVE]    — 2 - EN55022 B COND [QP]

## 7.0 TEST EQUIPMENT

Antenna Conducted Measurements:

Equipment	Type	Manufacturer	Calibration Due Date
Spectrum Analyzer	8593EM	Hewlett-Packard	2/1/08
Oscilloscope	TDS820	Tektronix	2/1/08
Coaxial cable	SMA Male – Reverse SMA Male (Length = 20 cm)	Own	10/1/08

Spurious RF radiated emissions:

Equipment	Type	Manufacturer	Calibration Due Date
EMI Analyzer System	84125B	Hewlett-Packard	2/1/08
Spectrum Analyzer	8593EM	Hewlett-Packard	2/1/08
Pre-Amp	83051A	Hewlett-Packard	2/1/08
Pre-Amp	83017A	Hewlett-Packard	2/1/08
High Pass Filter	9701	CMT	2/1/08
Horn Antenna	3115	EMCO	2/1/08
Cable		Hewlett Packard	2/1/08

Note: The HP 84125B EMC Analyzer System is calibrated as a system, including the analyzer, pre-amps, filters, and cable.

EN 55022 (AC powerline conducted emissions)

Equipment	Type	Manufacturer	Calibration Due Date
Spectrum analyzer	8568B	Hewlett-Packard	2/1/08
LISN	3810/2	EMCO	10/1/08
Coaxial cable	N Type – BNC (5 Meters)	Own	10/1/08