

**FCC Part 24 Test Data**

**Occupied Bandwidth (24.238)**

**&**

**Frequency Stability (24.235)**

***Sierra Wireless Inc.***

**FCC ID: N7NACRD510**

**Model: Aircard 510**

Prepared By:  
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**April 9, 2000**

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# 1. OCCUPIED BANDWIDTH

## 1.1 Test description

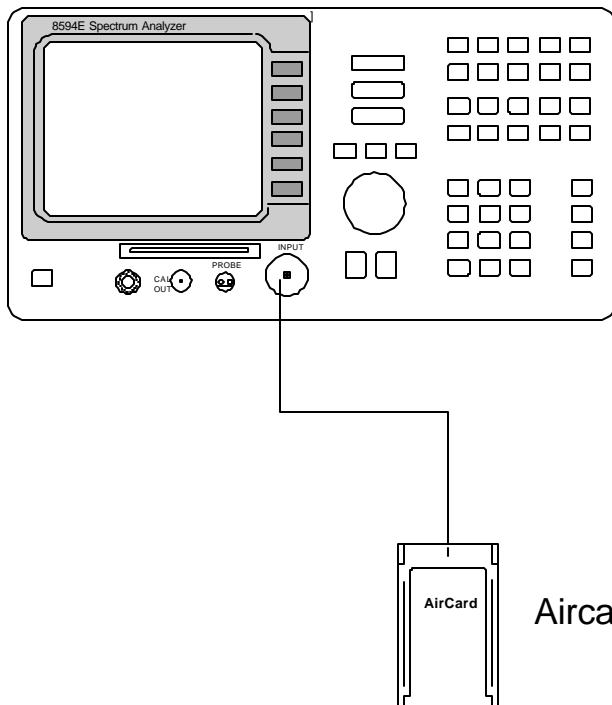
Parameter: FCC 2.1049
Requirement: FCC 24.238
Emission Bandwidth Limits: Not Applicable

## 1.2 Test Procedure

The antenna was disconnected from the transmitter and the short cable was connected to the transmitter RF output.

The RF output was connected to the input of the spectrum analyzer through sufficient attenuation. The resolution bandwidth (RBW) of the spectrum analyzer was set up to at least 1MHz inside the frequency block. In the 1MHz bands immediately outside and adjacent to the frequency block, the RBW may be reduced to at least 1% of emission bandwidth of the fundamental emission.

### 1.3 Test setup



Spectrum Analyzer 8593E  
sn: 3801A03362  
Cal Due: 14, Apr 2000

Aircard 510

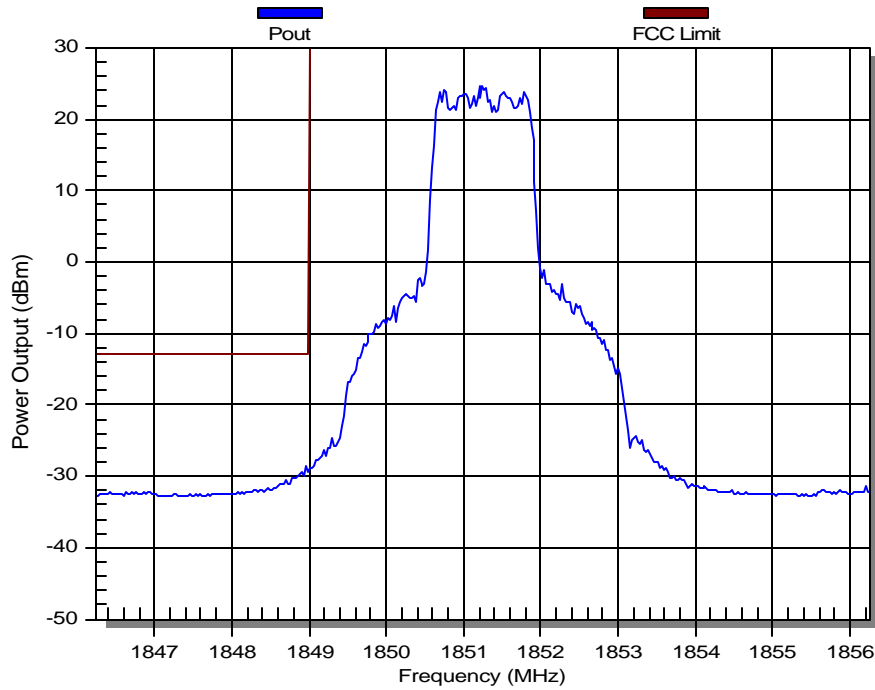
### 1.4 Test instrumentation

- a) HP 8593E Spectrum Analyzer (SN: 3801A03362, Cal Due Date: Apr 14, 2000)
- b) Aircard 510 modem (DUT)

## 1.5 Test Data

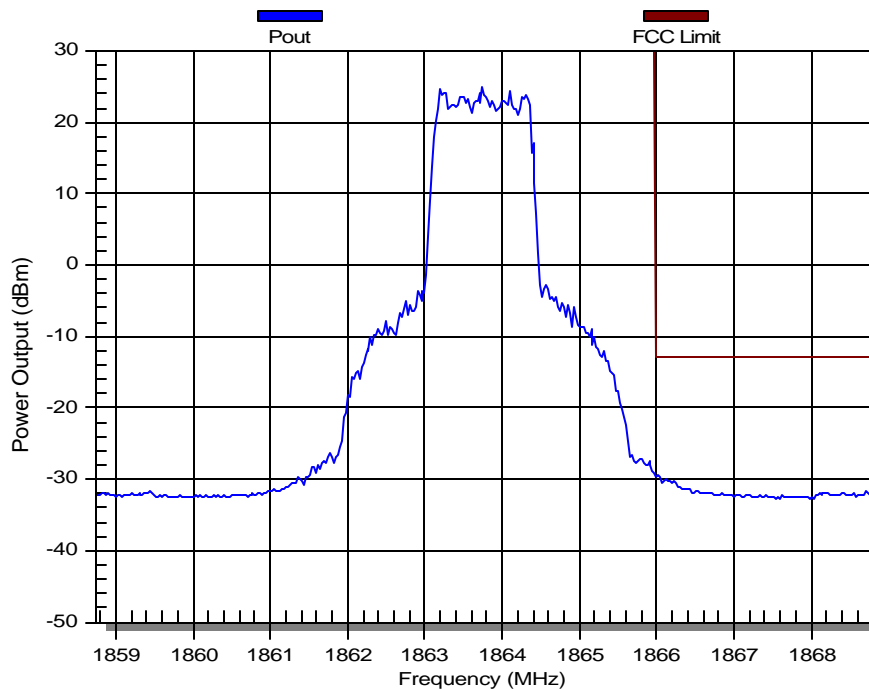
### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 25; Power Supply: 5.0 V; Temp: ; RW 1MHz



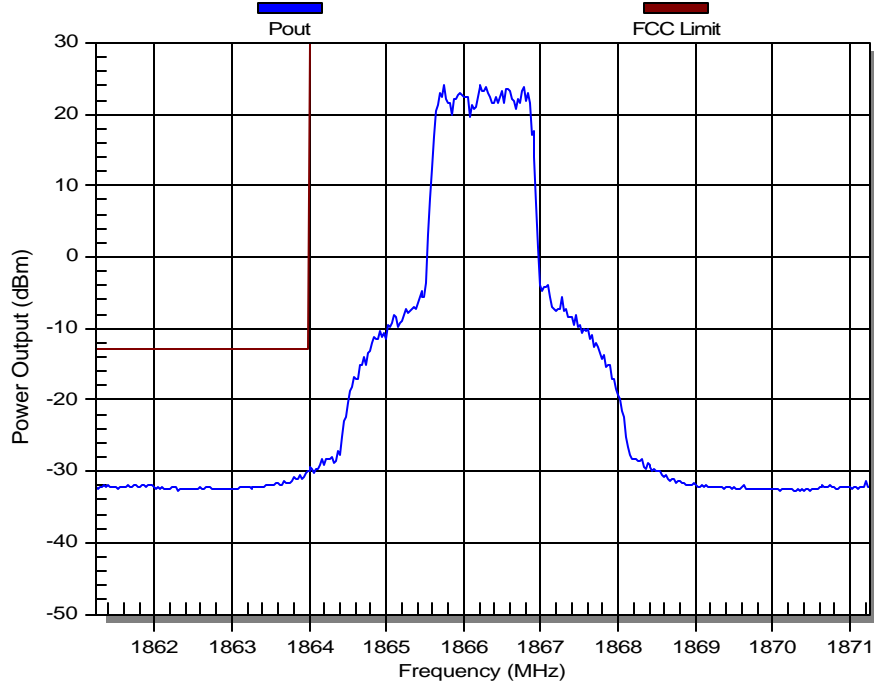
### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 275; Power Supply: 5.0 V; Temp: ; RW 1MHz



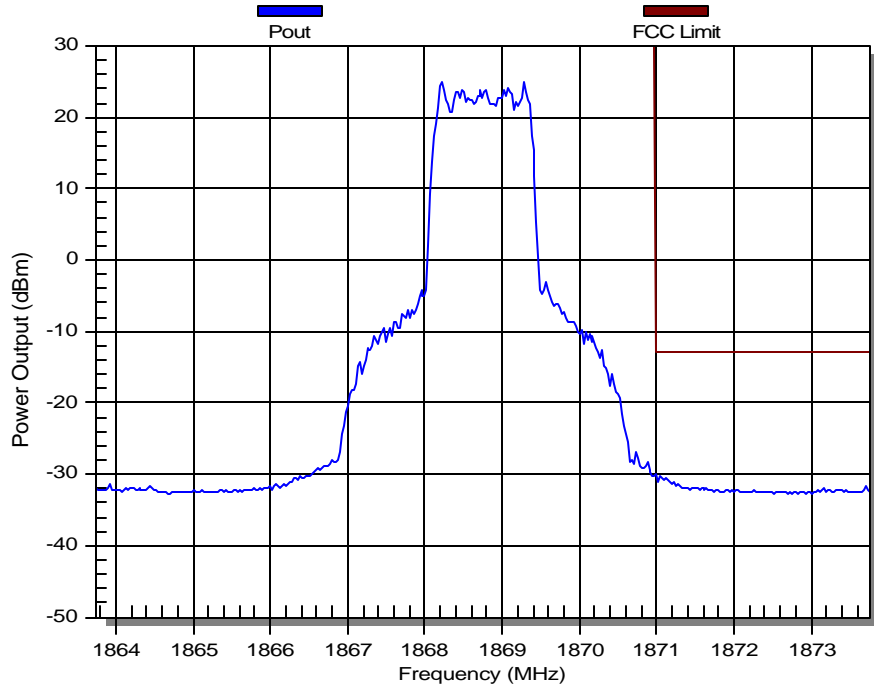
### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 325; Power Supply: 5.0 V; Temp: ; RW 1MHz



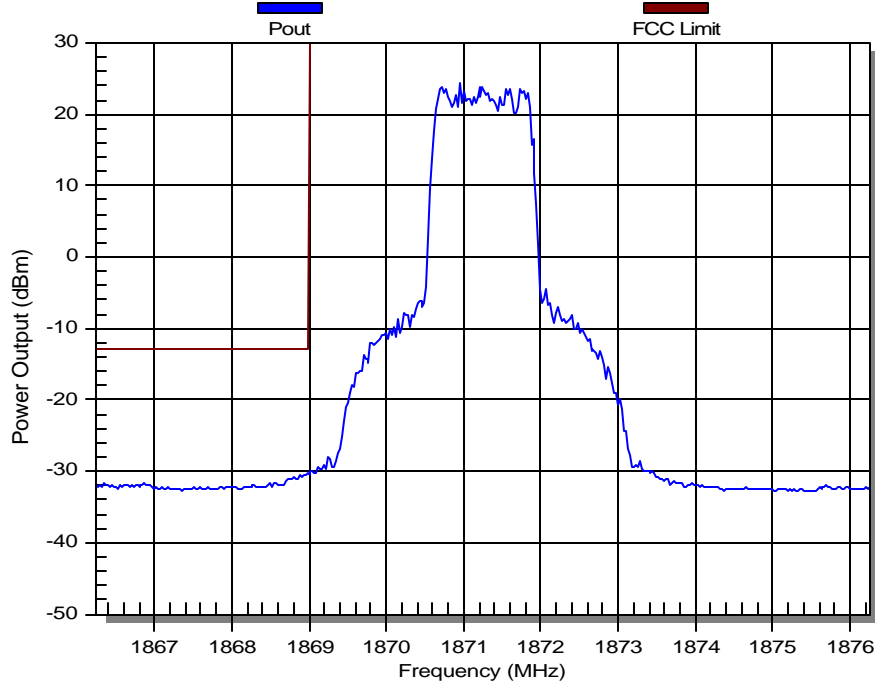
### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 375; Power Supply: 5.0 V; Temp: ; RW 1MHz



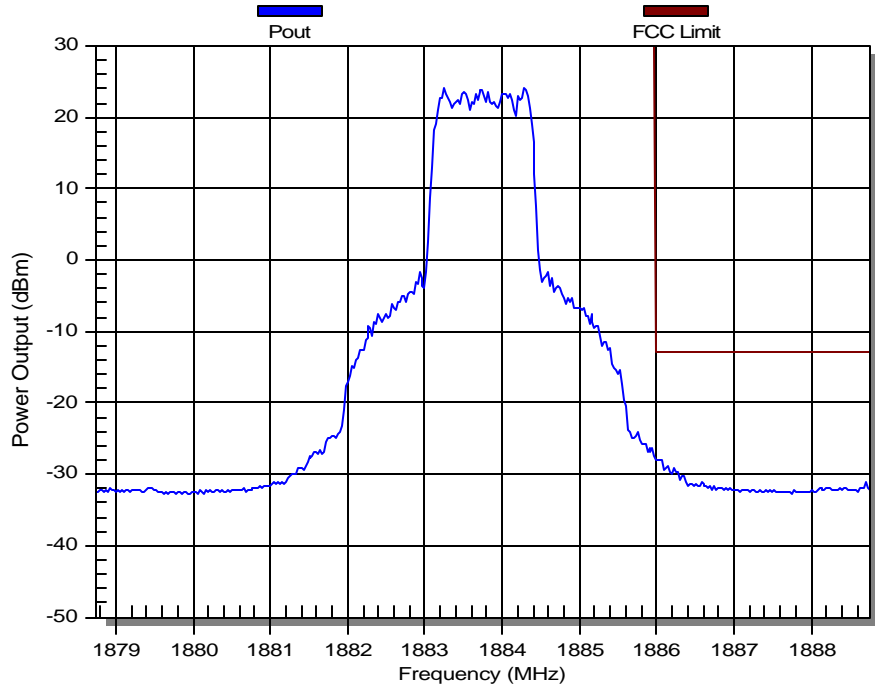
### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 425; Power Supply: 5.0 V; Temp: ; RW 1MHz



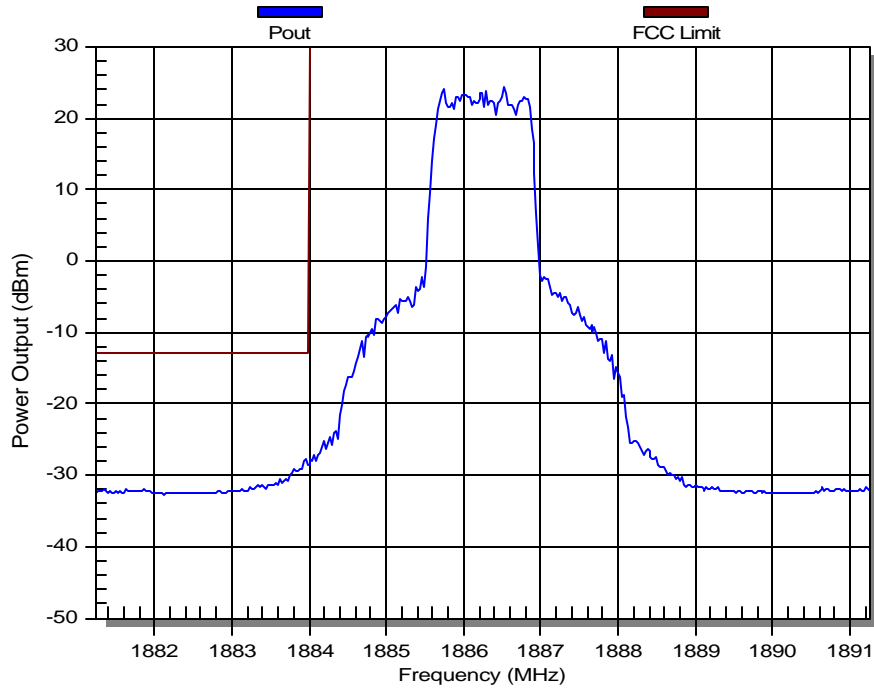
### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 675; Power Supply: 5.0 V; Temp: ; RW 1MHz



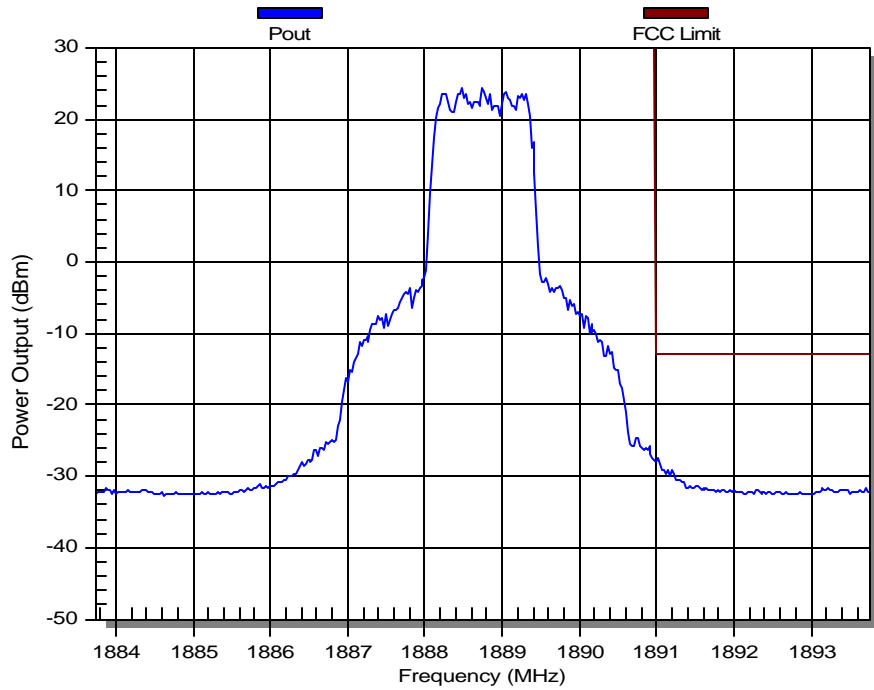
### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 725; Power Supply: 5.0 V; Temp: ; RW 1MHz



### Spur Emission Conform FCC Section 24.238

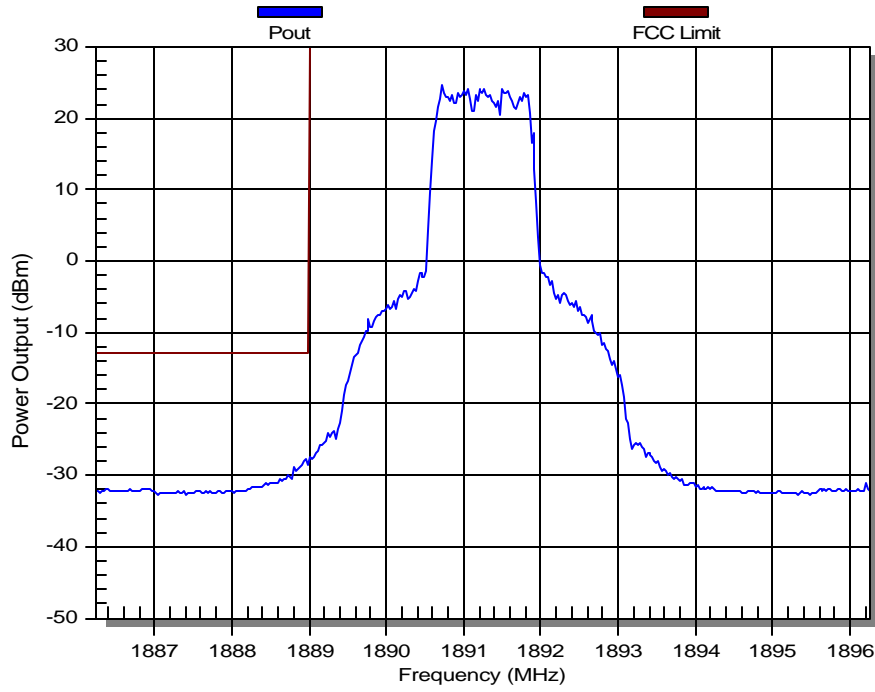
03/08/00; Channel: 775; Power Supply: 5.0 V; Temp: ; RW 1MHz





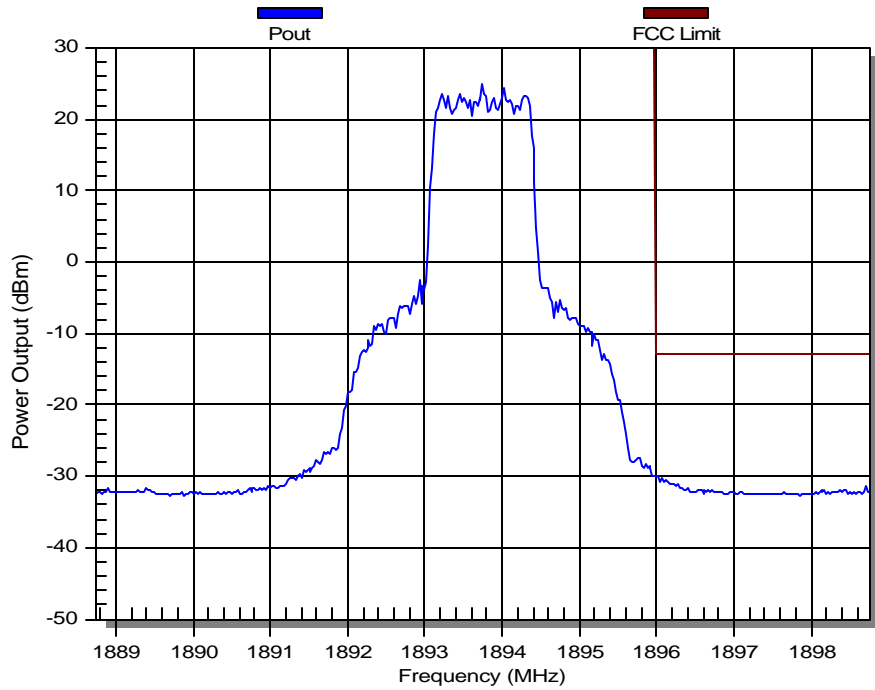
### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 825; Power Supply: 5.0 V; Temp: ; RW 1MHz



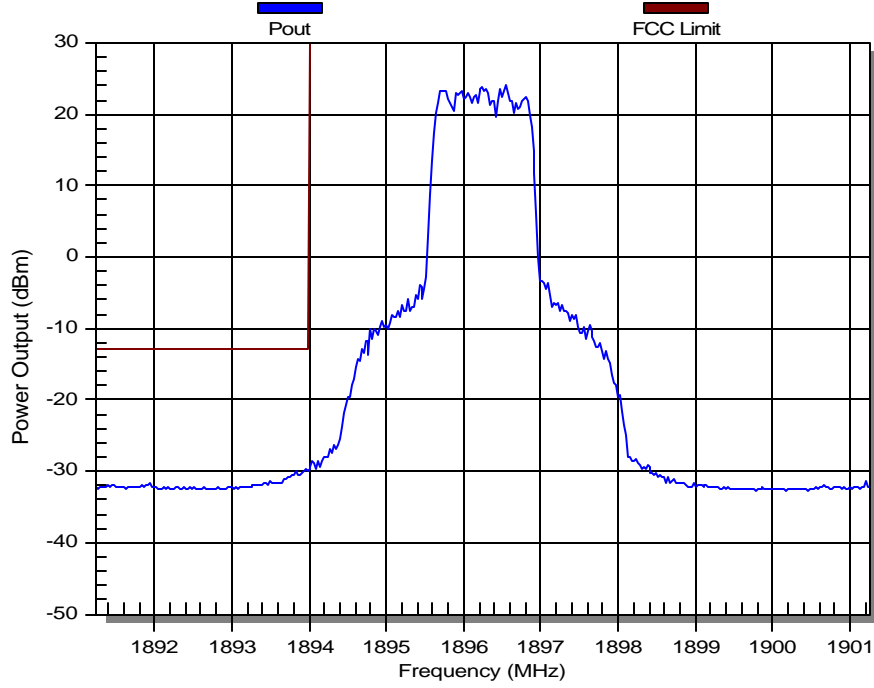
### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 875; Power Supply: 5.0 V; Temp: ; RW 1MHz



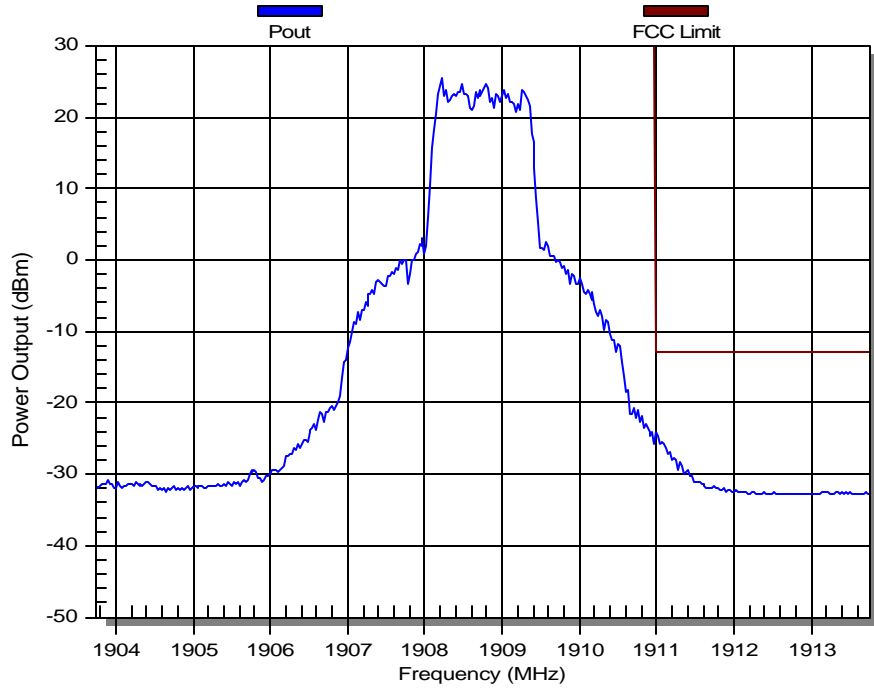
### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 925; Power Supply: 5.0 V; Temp: ; RW 1MHz



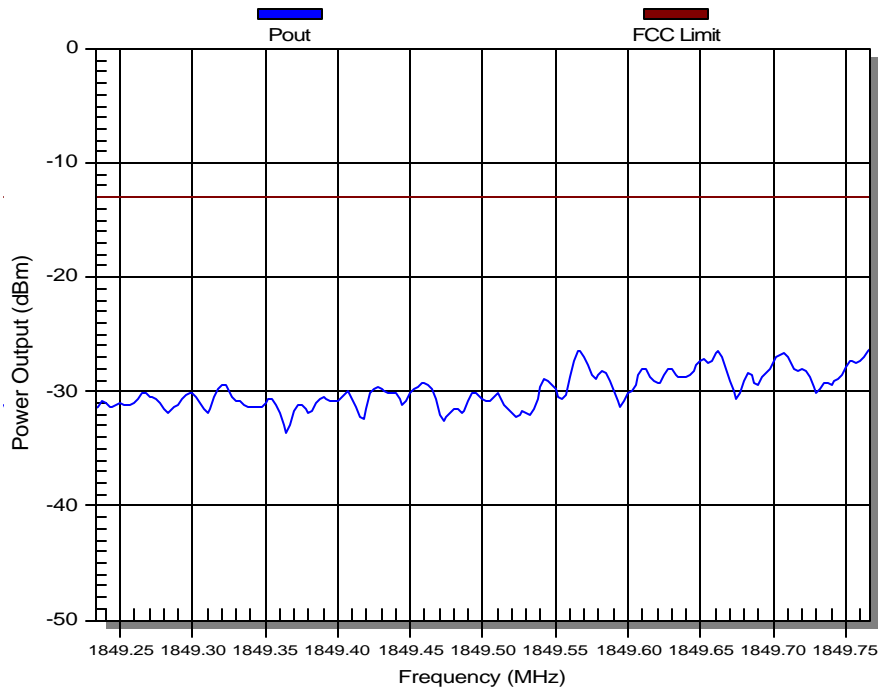
### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 1175; Power Supply: 5.0 V; Temp: ; RW 1MHz



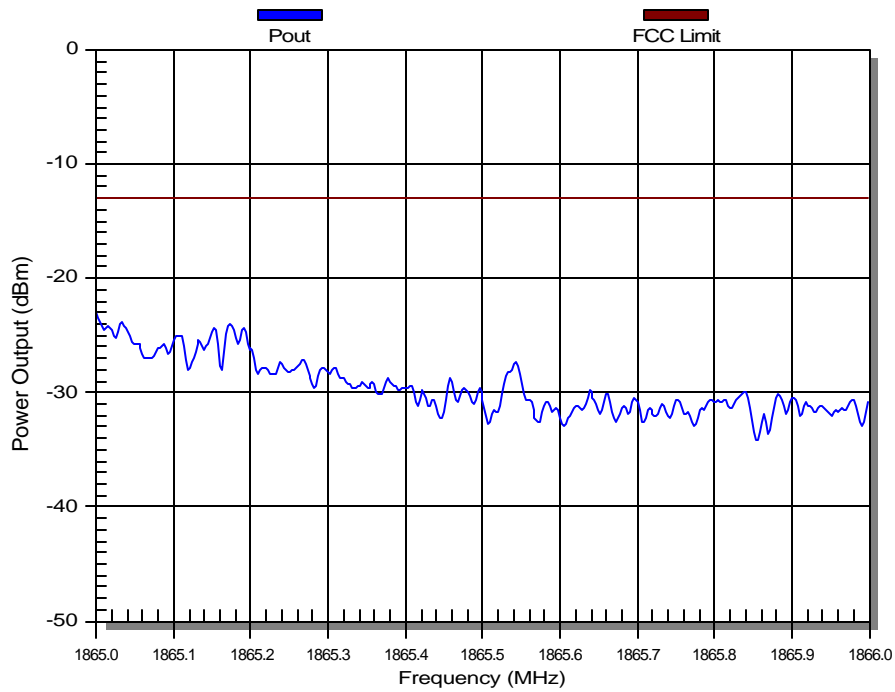
### Spur Emission Using FCC Section 24.238 Limits

03/08/00; Channel: 1; RW 12.5KHz



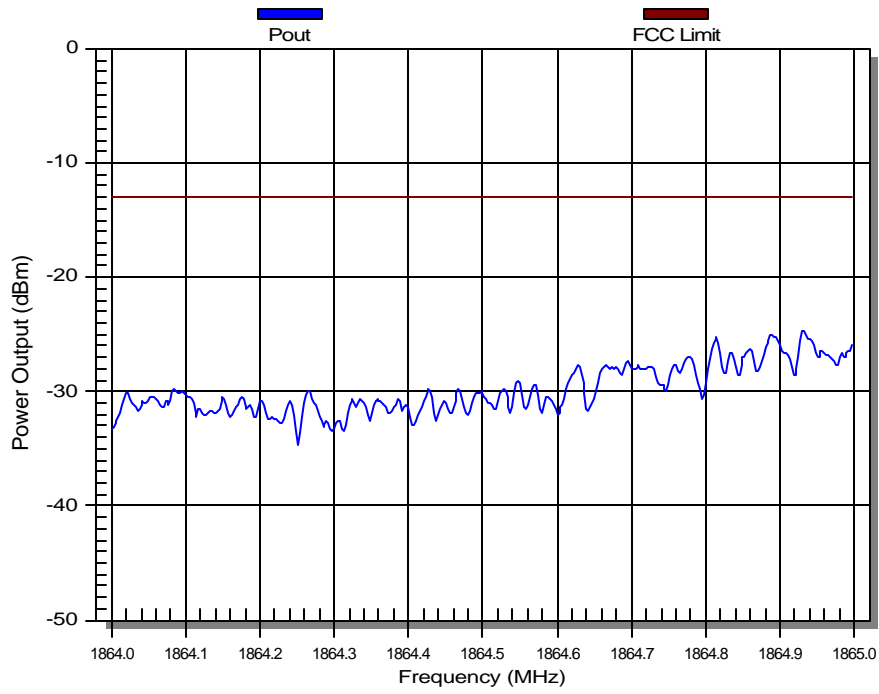
### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 11; RW 12.5KHz



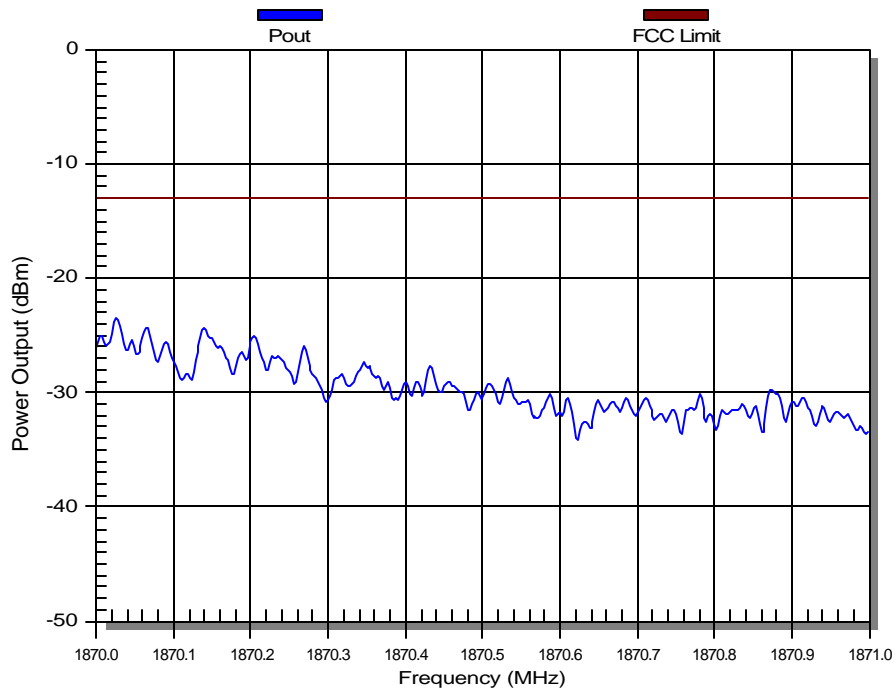
### Spur Emission Using FCC Section 24.238 Limits

03/08/00; Channel: 13; RW 12.5KHz



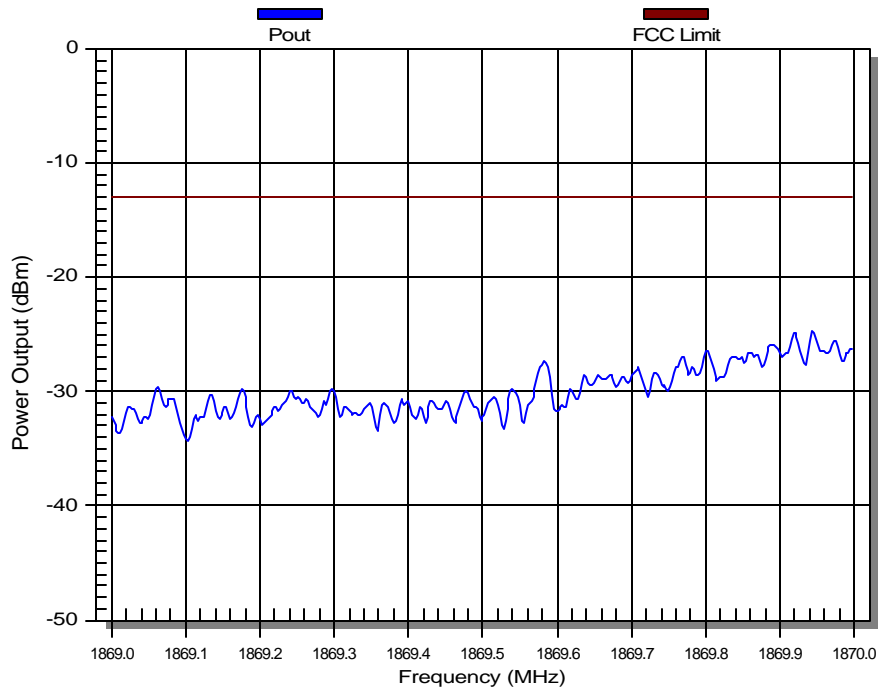
### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 15; RW 12.5KHz



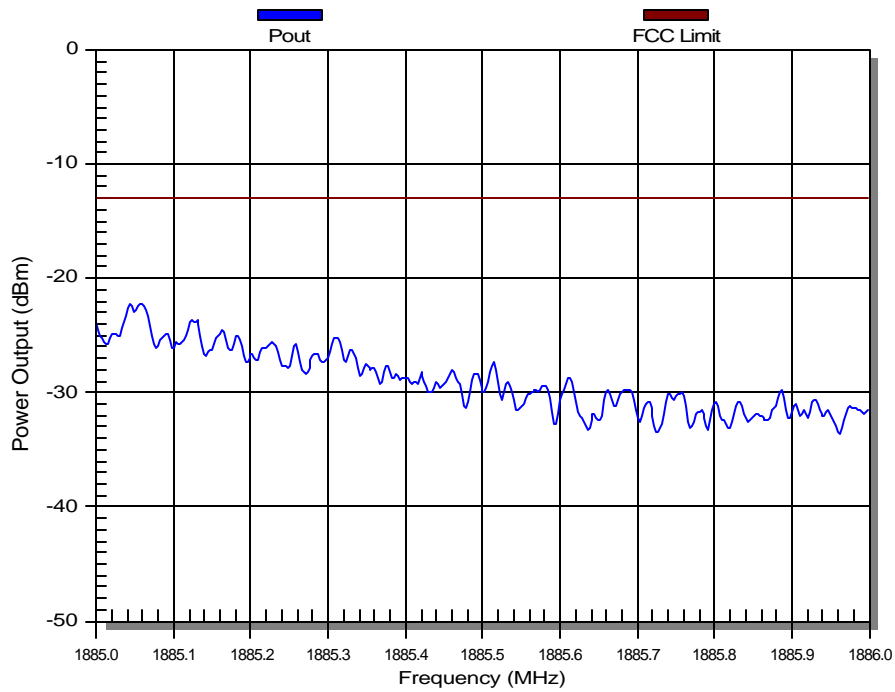
### Spur Emission Using FCC Section 24.238 Limits

03/08/00; Channel: 17; RW 12.5KHz



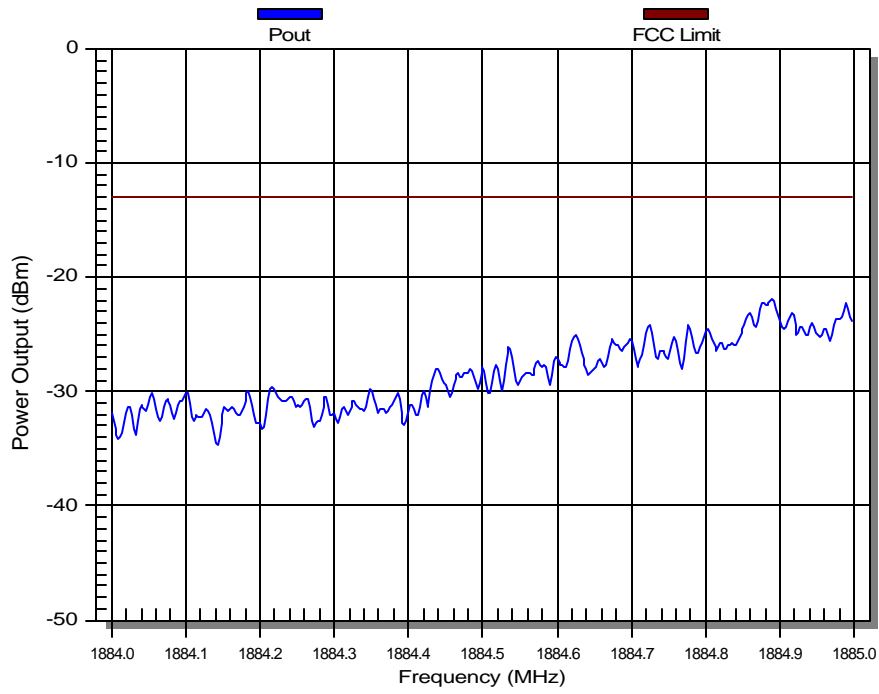
### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 27; RW 12.5KHz



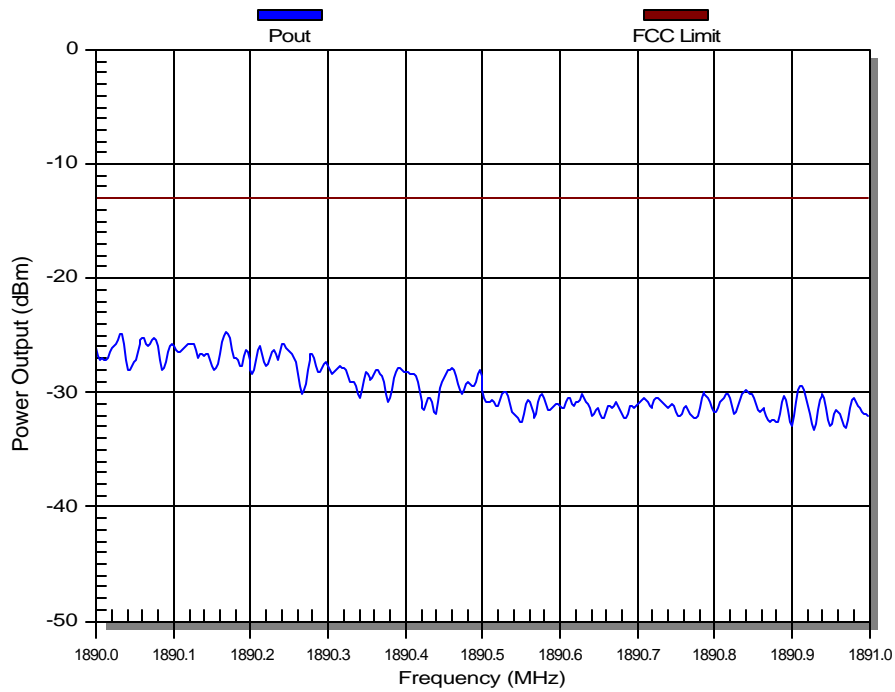
### Spur Emission Using FCC Section 24.238 Limits

03/08/00; Channel: 29; RW 12.5KHz



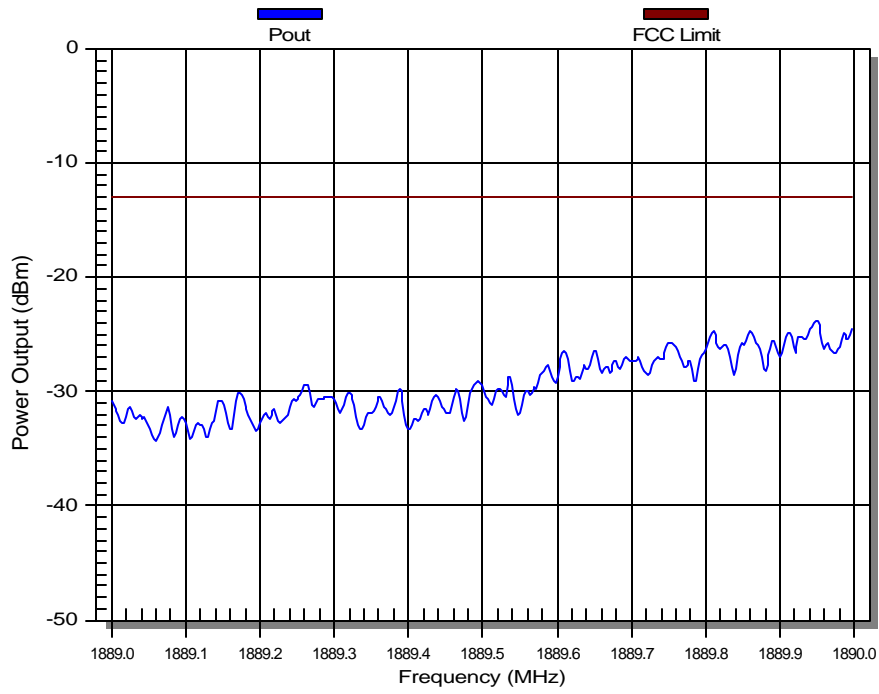
### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 31; RW 12.5KHz



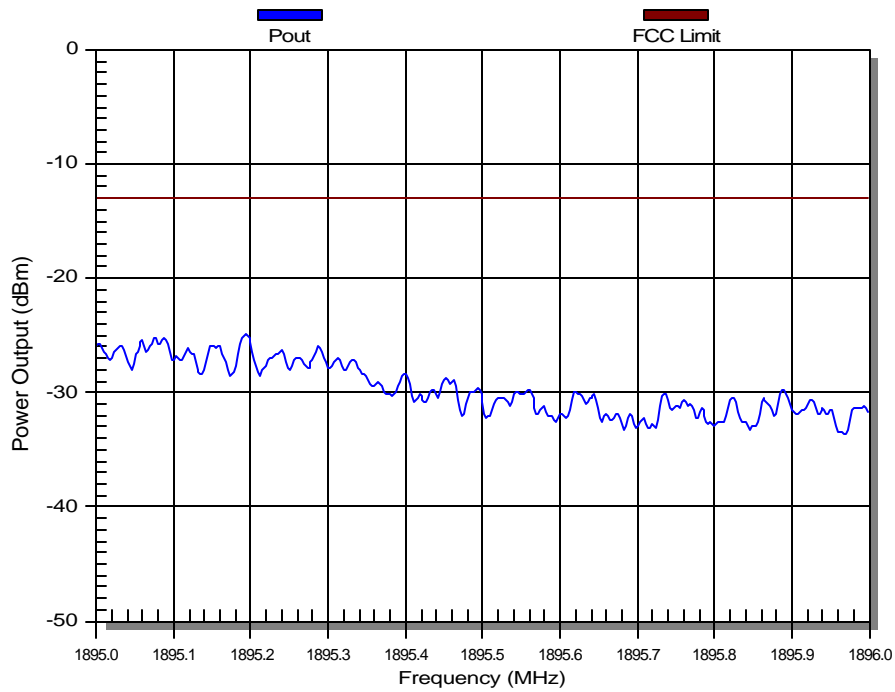
### Spur Emission Using FCC Section 24.238 Limits

03/08/00; Channel: 33; RW 12.5KHz



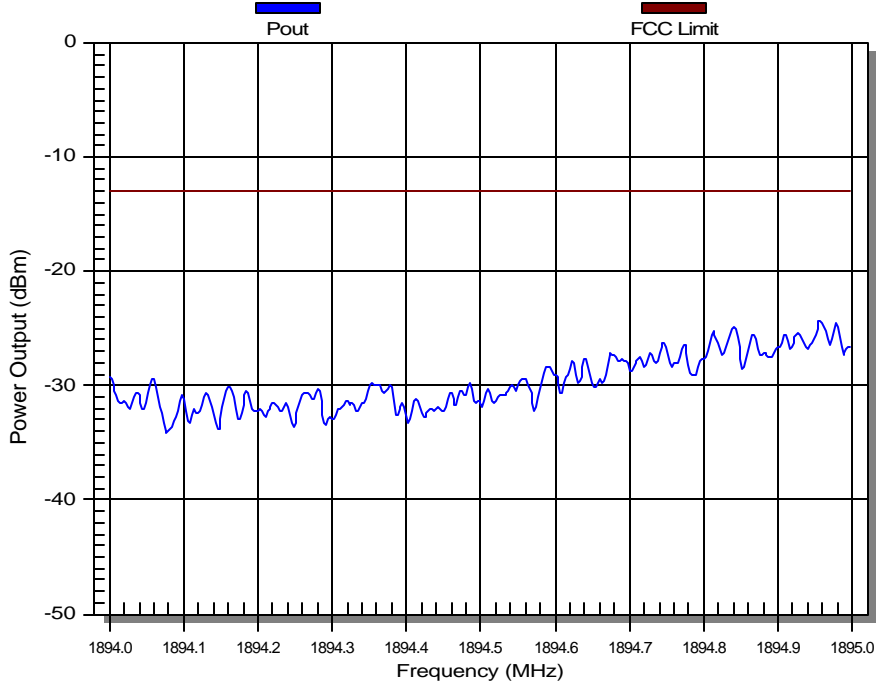
### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 35; RW 12.5KHz



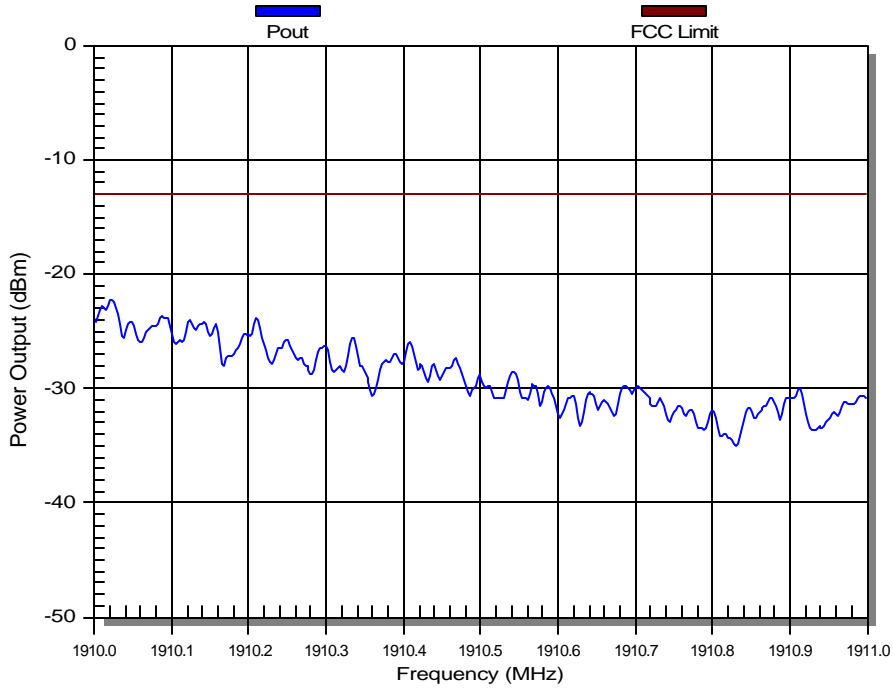
### Spur Emission Using FCC Section 24.238 Limits

03/08/00; Channel: 37; RW 12.5KHz



### Spur Emission Conform FCC Section 24.238

03/08/00; Channel: 47; RW 12.5KHz





## 2.0 Frequency Stability

### 2.1 Test description

Parameter:	FCC 2.1055
Requirement:	FCC 24.235
Frequency Tolerance	Sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### 2.2 Test Procedure

The ppm frequency error of the transmitter was calculated by:

$$Ppm\ error = (MCF/ ACF - 1) * 10^6$$

Where MCF is the Measured Carrier Frequency in MHz

ACF is the Assigned Carrier Frequency in MHz

#### 2.2.1 Frequency Stability vs. Temperature

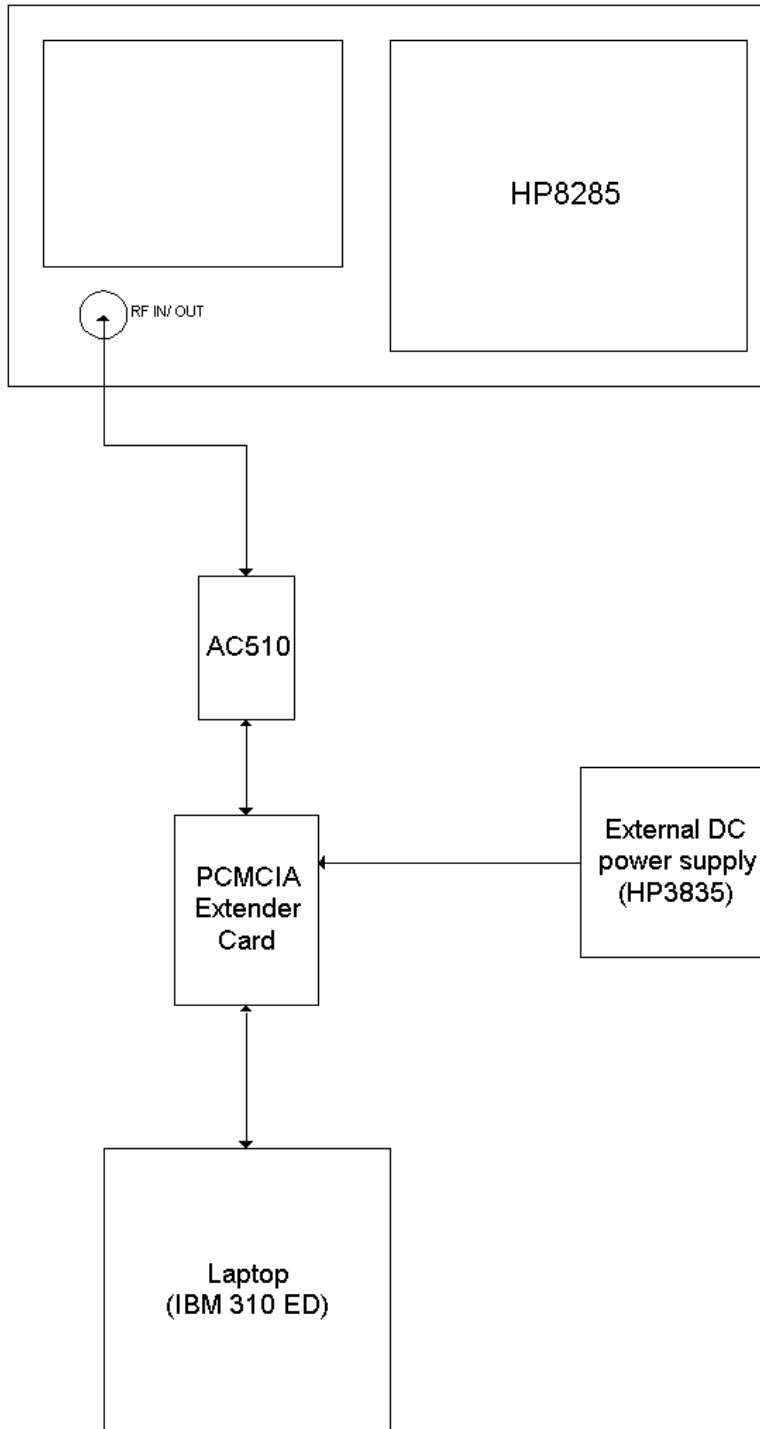
The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter (HP8285 test set). The EUT was placed inside a temperature chamber.

After the temperature stabilized for approximately 20 minutes, the frequency of the output was recorded from the counter.

#### 2.2.2 Frequency Stability vs. Voltage

At room temperature ( $25 \pm 5^\circ\text{C}$ ), an external variable DC supply was connected to the EUT. The frequency of the transmitter was measured for 115%, 100%, and 85% of the nominal operating input voltage.

## 2.3 Test Setup

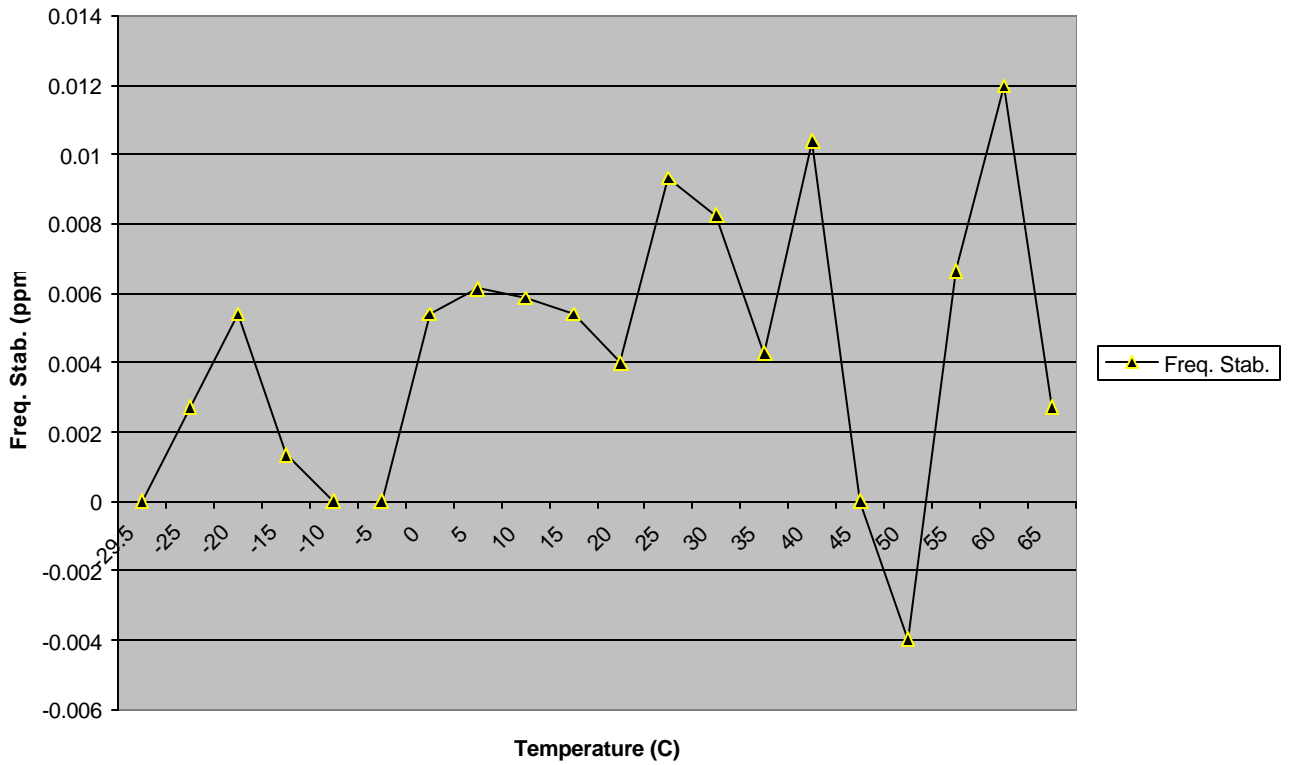


### 2.3.1 Test Instrumentation

- [X] HP8285, Cal: 1/20/2000, Due: 1/20/2002
- [X] HP3631A
- [X] Aircard 510 (EUT)
- [X] IBM 310ED Laptop computer
- [X] Sytek PCMCIA extender card

### 2.4 Test Data

Frequency Stability vs. Temperature



Frequency Stability (ppm) vs. Supply Voltage (V)

