## 7.6 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

### LIMIT

According to FCC §2.1055, FCC §24.235.

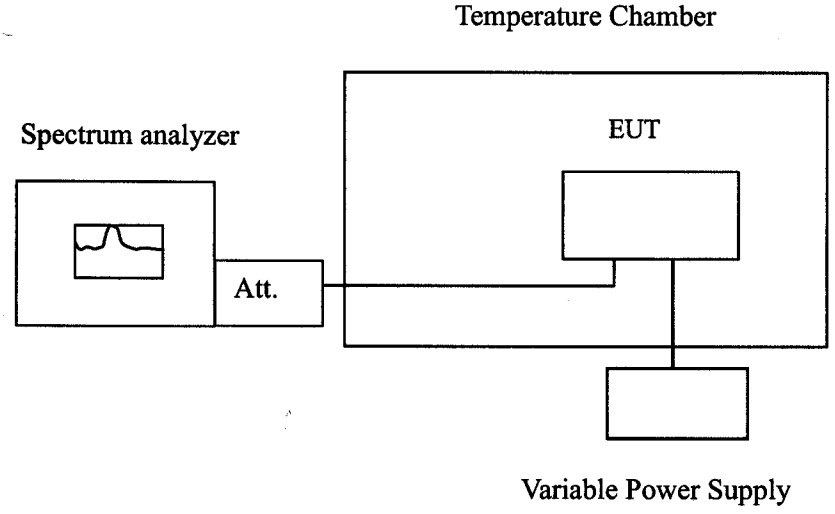
Frequency Tolerance: 2.5 ppm

### MEASUREMENT EQUIPMENT USED

| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
|---|---|---|---|---|
| DC Power Source | Agilent | E3640A | MY40001774 | 01/12/2006 |
| Temperature Chamber | K.son | THS-M1 | 242 | 03/20/2006 |
| Spectrum Analyzer | Agilent | E4446A | MY43360131 | 01/10/2006 |

***Remark:*** *Each piece of equipment is scheduled for calibration once a year.*

### Test Configuration




***Remark:*** *Measurement setup for testing on Antenna connector*

## TEST PROCEDURE

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to –30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

## TEST RESULTS

*No non-compliance noted.*

| **Reference Frequency: Mid Channel 836 MHz @ 20℃** | | | | |
|---|---|---|---|---|
| Limit: +/- 2.5 ppm = 2090 Hz | | | | |
| Power Supply Vdc | Environment Temperature (°C) | Frequency (Hz) | Delta (Hz) | Limit (Hz) |
| 3.6 | 50 | 835999997.7 | -34 | 2090 |
| | 40 | 835999996.4 | -36 | |
| | 30 | 835999996.2 | -36 | |
| | 20 | 836000032.0 | 0 | |
| | 10 | 835999995.7 | -36 | |
| | 0 | 835999994.9 | -37 | |
| | -10 | 835999996.1 | -36 | |
| | -20 | 835999994.4 | -38 | |
| | -30 | 835999995.5 | -37 | |

| **Reference Frequency: Mid Channel 1880 MHz @ 20℃** | | | | |
|---|---|---|---|---|
| Limit: +/- 2.5 ppm = 4700 Hz | | | | |
| Power Supply Vdc | Environment Temperature (°C) | Frequency (Hz) | Delta (Hz) | Limit (Hz) |
| 3.6 | 50 | 1879999993 | -41 | 4700 |
| | 40 | 1879999993 | -40 | |
| | 30 | 1879999994 | -39 | |
| | 20 | 1880000033 | 0 | |
| | 10 | 1879999991 | -42 | |
| | 0 | 1879999991 | -42 | |
| | -10 | 1879999992 | -42 | |
| | -20 | 1879999990 | -43 | |
| | -30 | 1879999988 | -45 | |

## 7.7 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

### LIMIT

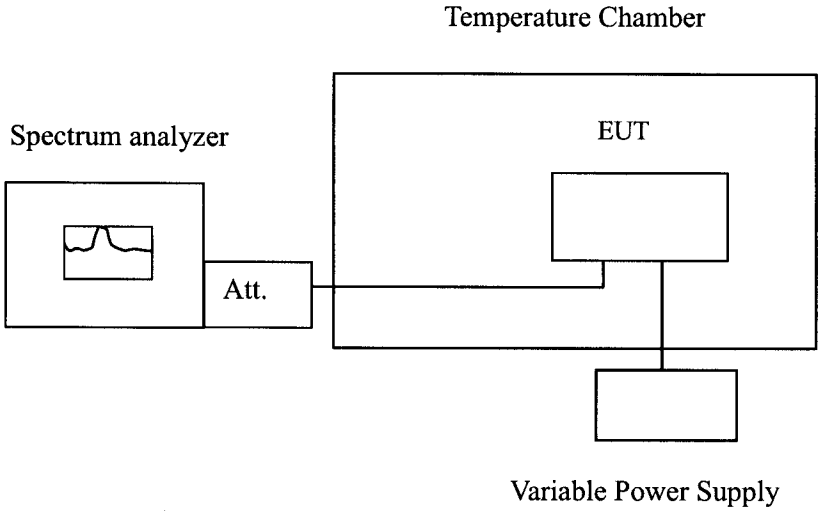
According to FCC §2.1055, FCC §24.235,
Frequency Tolerance: 2.5 ppm.

### MEASUREMENT EQUIPMENT USED

| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
|---|---|---|---|---|
| DC Power Source | Agilent | E3640A | MY40001774 | 01/12/2006 |
| Temperature Chamber | K.son | THS-M1 | 242 | 05/26/2006 |
| Spectrum Analyzer | Agilent | E4446A | MY43360131 | 01/10/2006 |

***Remark:*** *Each piece of equipment is scheduled for calibration once a year.*

### Test Configuration




***Remark:*** *Measurement setup for testing on Antenna connector.*

## TEST PROCEDURE

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.
Reduce the input voltage to specify extreme voltage variation (± 15%) and endpoint, record the maximum frequency change.

## TEST RESULTS

*No non-compliance noted.*

| **Reference Frequency: Mid Channel 836 MHz @ 20℃** | | | | |
|---|---|---|---|---|
| Limit: +/- 2.5 ppm = 2090 Hz | | | | |
| Power Supply Vdc | Environment Temperature (°C) | Frequency (Hz) | Delta (Hz) | Limit (Hz) |
| 4.2 | 20 | 836000025 | -7 | 2090 |
| 3.6 | | 836000032 | 0 | |
| 3.3(END POINT) | | 836000044 | 12 | |

| **Reference Frequency: CDMA2000 Mid Channel 1880 MHz @ 20°C** | | | | |
|---|---|---|---|---|
| Limit: ± 2.5 ppm = 4700 Hz | | | | |
| Power Supply Vdc | Environment Temperature (°C) | Frequency (Hz) | Delta (Hz) | Limit (Hz) |
| 4.2 | 20 | 1880000023 | -10 | 4700 |
| 3.6 | | 1880000033 | 0 | |
| 3.3(END POINT) | | 1880000045 | 12 | |