



# PCTEST ENGINEERING LABORATORY, INC.

6660-B Dobbin Road, Columbia, MD 21045 USA

Tel. 410.290.6652 / Fax 410.290.6554

<http://www.pctestlab.com>



## CERTIFICATE OF COMPLIANCE FCC Part 24 & 22 Certification

**Applicant Name:**

S.A. Banksys N.V.  
1442 Haachtsesteenweg, Bruxeiles 1130  
Brussle, Belgium

**Date of Testing:**

July 10 - July 12, 2006

**Test Site/Location:**

PCTEST Lab, Columbia, MD, USA

**Test Report Serial No.:**

0606200530

**FCC ID:**

SEKMC56

**APPLICANT:**

S.A. BANKSYS N.V.

**Application Type:**

Certification

**FCC Classification:**

PCS Licensed Transmitter (PCB)

**FCC Rule Part(s):**

§24(E), §22(H); §2

**EUT Type:**

Dual-Band GSM Mobile Transmitter Module

**Model(s):**

MC56 (EUT), XENTA (host 1), XENTISSIMO (host 2)

**Tx Frequency Range:**

824.20 - 848.80MHz (Cell. GSM) / 1850.20 - 1909.80MHz (PCS GSM)

**Rx Frequency Range:**

869.20 - 893.80MHz (Cell. GSM) / 1930.20 - 1989.80MHz (PCS GSM)

**Max. RF Output Power:**

1.995 W Conducted Cell. GSM (32.99 dBm) /

0.741W Conducted PCS GSM (28.70 dBm)

**Emission Designator(s):**

300KGXW (GSM)

**Test Device Serial No.:**

[S/N: AGX6226]

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

**Grant Conditions:** Power output listed is conducted.

PCTEST certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.

  
Randy Ortanez  
President



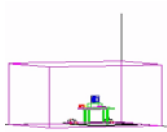
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|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| PCTEST™ PT. 22/24 GSM<br>TEST REPORT |  | FCC MEASUREMENT REPORT<br>(GSM)                      |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0606200530       | Test Dates:<br>July 10 - July 12, 2006                                              | EUT Type:<br>Dual-Band GSM Mobile Transmitter Module | FCC ID: SEKMC56                                                                       | Page 1 of 25                    |

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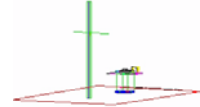
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|                                              |                                                                                     |                                                             |                                                                                       |                                        |
|----------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|
| <b>PCTEST™ PT. 22/24 GSM<br/>TEST REPORT</b> |  | <b>FCC MEASUREMENT REPORT<br/>(GSM)</b>                     |  | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>0606200530        | <b>Test Dates:</b><br>July 10 - July 12, 2006                                       | <b>EUT Type:</b><br>Dual-Band GSM Mobile Transmitter Module | <b>FCC ID:</b> SEKMC56                                                                | Page 2 of 25                           |

## 1.0 SCOPE



Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.



### §2.1033 General Information

Applicant Name: S.A. Banksys N.V.

Address: 1442 Haachtsesteenweg, Bruxeiles 1130  
Brussle, Belgium

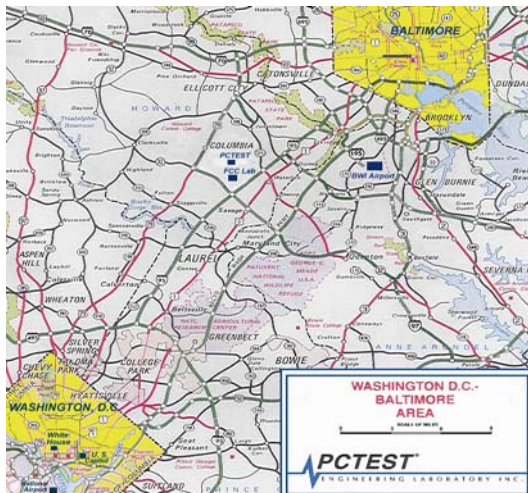
- FCC ID: SEKMC56
- Quantity: Quantity production is planned
- Emission Designators: 300KGXW (GSM)
- Tx Freq. Range: 824.20 - 848.80MHz (Cell. GSM)  
1850.20 - 1909.80MHz (PCS GSM)
- Rx Freq. Range: 869.20 - 893.80MHz (Cell. GSM)  
1930.20 - 1989.80MHz (PCS GSM)
- Max. Power Rating: 1.995 W Conducted Cell. GSM (32.99 dBm) /  
0.741W Conducted PCS GSM (28.70 dBm)
- FCC Classification(s): PCS Licensed Transmitter (PCB)
- Equipment (EUT) Type: Dual-Band GSM Mobile Transmitter Module
- Modulation(s): GMSK / 8PSK
- Frequency Tolerance:  $\pm 0.00025\%$  (2.5 ppm)
- FCC Rule Part(s): § 24(E), §22(H); §2
- Dates of Tests: July 10 - July 12, 2006
- Place of Tests: PCTEST Lab, Columbia, MD U.S.A.
- Test Report S/N: 0606200530

**Note:** *Deviation from measurement procedure - None*

|                                      |                                                                                     |                                                      |                                                                                       |                                 |
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## 2.0 INTRODUCTION

### 2.1 Testing Facility

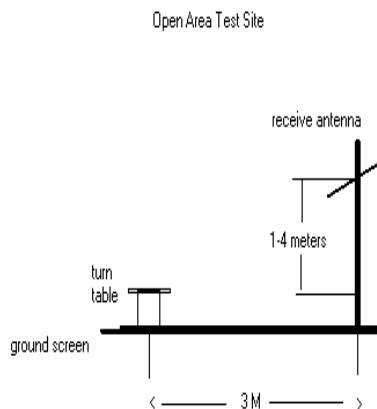


**Figure 1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area.**

These measurement tests were conducted at PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4 on January 27, 2006 and Industry Canada.

### 2.2 Measurement Procedure

The radiated spurious measurements were made outdoors at a 3-meter test range (see Figure2). The equipment under test is placed on a wooden turntable 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.



**Figure 2. Diagram of 3-meter outdoor test range**

|                                   |                                                                                     |                                                      |                                                                                       |                                 |
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### 3.0 INSERTS

Function of Active Devices (Confidential)

Block & Schematic Diagrams (Confidential)

Operating Instructions

Parts List & Tune-Up Procedure (Confidential)

Description of Freq. Stabilization Circuit (Confidential)

Description for Suppression of Spurious Radiation, for Limiting Modulation, and Harmonic Suppression Circuits (Confidential)

*Note: These exhibits are not included within this report.*

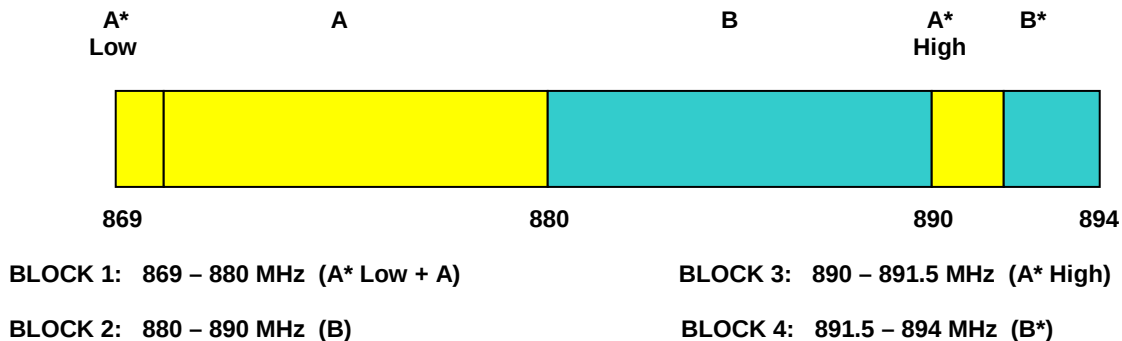
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## 4.0 DESCRIPTION OF TESTS

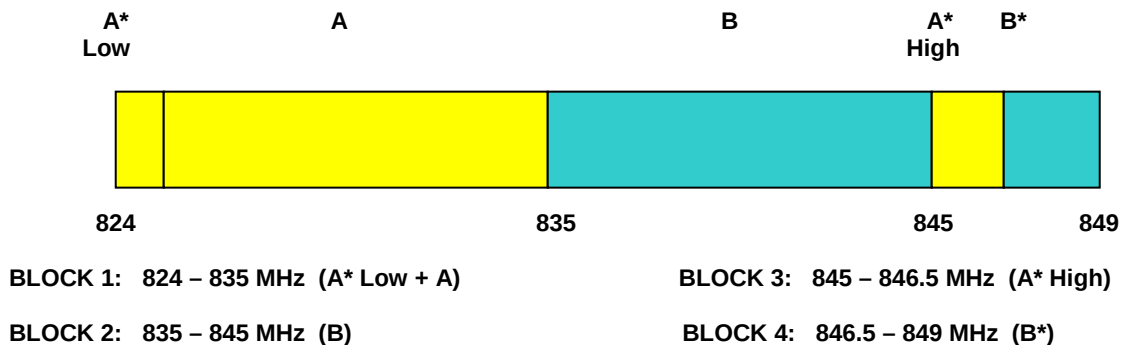
### 4.1 Occupied Bandwidth Emission Limits

- On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB.
- Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.
- When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.
- The measurement of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

### 4.2 Cellular - Base Frequency Blocks

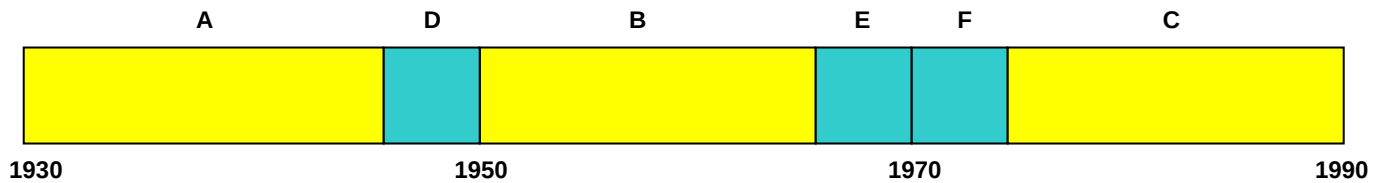


### 4.3 Cellular - Mobile Frequency Blocks



|                                   |                                                                                     |                                                      |                                                                                       |                                 |
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#### 4.4 PCS - Base Frequency Blocks



BLOCK 1: 1930 – 1945 MHz (A)

BLOCK 4: 1965 – 1970 MHz (E)

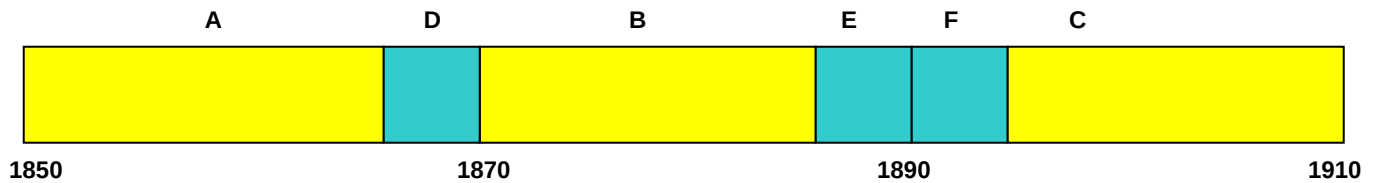
BLOCK 2: 1945 – 1950 MHz (D)

BLOCK 5: 1970 – 1975 MHz (F)

BLOCK 3: 1950 – 1965 MHz (B)

BLOCK 6: 1975 – 1990 MHz (C)

#### 4.5 PCS - Mobile Frequency Blocks



BLOCK 1: 1850 – 1865 MHz (A)

BLOCK 4: 1885 – 1890 MHz (E)

BLOCK 2: 1865 – 1870 MHz (D)

BLOCK 5: 1890 – 1895 MHz (F)

BLOCK 3: 1870 – 1885 MHz (B)

BLOCK 6: 1895 – 1910 MHz (C)

|                                   |                                                                                     |                                                      |                              |                                                                                       |                                 |
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## 4.6 Spurious and Harmonic Emissions at Antenna Terminal

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to 10 GHz. The transmitter is modulated with a 2500 Hz tone at a level of 16 dB greater than that required to provide 50% modulation.

At the input terminals of the spectrum analyzer, an isolator (RF circulator with one port terminated in 50  $\Omega$ ) and an 870 MHz to 890 MHz band-pass filter is connected between the test transceiver (for conducted tests) or the receive antenna (for radiated tests) and the analyzer. The rejection of the band-pass filter to signals in the 825 – 845 MHz range is adequate to limit the transmit energy from the test transceiver which appears to a level which will allow the analyzer to measure signals less than –90 dBm. Calibration of the test receiver is performed in the 870 – 890 MHz range to insure accuracy to allow variation in the band-pass filter insertion loss to be calibrated.

## 4.7 Frequencies

At the input terminals of the spectrum analyzer, an isolator (RF pad) and a high-pass filter are connected between the test transceiver (for conducted tests) or the receive antenna (for radiated tests) and the analyzer. The high-pass filter (signals below 1.6 GHz) is to limit the fundamental frequency from interfering with the measurement of low-level spurious and harmonic emissions and to ensure that the preamplifier is not saturated.

## 4.8 Radiated Spurious and Harmonic Emissions

Radiation and harmonic emissions are measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer reading. This level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration. This device was tested using a PCL of 0 in the PCS Band and a PCL of 5 in the Cellular Band.

|                                      |                                                                                     |                                                      |                                 |                                                                                       |                                 |
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## 4.9 Frequency Stability / Temperature Variation

The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +60°C using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

*Specification – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within  $\pm 0.00025$  ( $\pm 2.5$  ppm) of the center frequency.*

### **Time Period and Procedure:**

1. The carrier frequency of the transmitter and the individual oscillators is measured at room temperature (22°C to 25°C to provide a reference).
2. The equipment is subjected to an overnight “soak” at -30°C without any power applied.
3. After the overnight “soak” at -30°C (usually 14-16 hours), the equipment is turned on in a “standby” condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter and the individual oscillators is made within a three minute interval after applying power to the transmitter.
4. Frequency measurements are made at 10°C interval up to room temperature. At least a period of one and one half-hour is provided to allow stabilization of the equipment at each temperature level.
5. Again the transmitter carrier frequency and the individual oscillators is measured at room temperature to begin measurement of the upper temperature levels.
6. Frequency measurements are at 10 intervals starting at -30°C up to +50°C allowing at least two hours at each temperature for stabilization. In all measurements the frequency is measured within three minutes after re-applying power to the transmitter.
7. The artificial load is mounted external to the temperature chamber.

**NOTE: The EUT is tested down to the battery endpoint.**

|                                      |                                                                                     |                                                      |                                                                                       |                                 |
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## 5.0 EFFECTIVE RADIATED POWER

### 5.1 Effective Radiated Power Output Data

POWER: High (GSM Mode) Data taken with highest gain antenna

| Freq. Tuned<br>(MHz) | REF.<br>LEVEL<br>(dBm) | POL<br>(H/V) | ERP<br>(W) | ERP<br>(dBm) | BATTERY  |
|----------------------|------------------------|--------------|------------|--------------|----------|
| 824.20               | -8.300                 | V            | 1.983      | 32.973       | Standard |
| 836.60               | -8.000                 | V            | 2.204      | 33.433       | Standard |
| 848.80               | -8.400                 | V            | 2.081      | 33.183       | Standard |

Note: This unit was tested with its standard battery.

#### **NOTES:**

Effective Radiated Power Output Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

This device was tested using a PCL of 0 in the PCS Band and a PCL of 5 in the Cellular Band.

|                                      |                                                                                     |                                                      |                                                                                       |                                 |
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## 6.0 EQUIVALENT ISOTROPIC RADIATED POWER

### 6.1 Equivalent Isotropic Radiated Power Output Data

(Data taken with highest antenna gain)

Radiated measurements at 3 meters

Supply Voltage: 3.7 VDC

Modulation: PCS GSM

| FREQ.<br>(MHz) | REF.<br>LEVEL<br>(dBm) | POL<br>(H/V) | Azimuth<br>(o angle) | EIRP<br>(dBm) | EIRP<br>(W) | Battery  |
|----------------|------------------------|--------------|----------------------|---------------|-------------|----------|
| 1850.80        | -12.700                | V            | 30                   | 30.381        | 1.092       | Standard |
| 1880.00        | -12.600                | V            | 30                   | 30.651        | 1.162       | Standard |
| 1909.80        | -13.000                | V            | 30                   | 30.421        | 1.102       | Standard |

Note: This unit was tested with its standard battery.

#### **NOTES:**

Equivalent Isotropic Radiated Power Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

This device was tested using a PCL of 0 in the PCS Band and a PCL of 5 in the Cellular Band.

|                                      |                                                                                     |                                                      |                                                                                       |                                 |
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## 7.0 RADIATED MEASUREMENTS

### 7.1 Cellular GSM Radiated Measurements

#### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 824.20 MHz  
 CHANNEL: 128 (Low)  
 MEASURED OUTPUT POWER: 33.430 dBm = 2.200 W  
 MODULATION SIGNAL: GSM  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  46.42 dBc

| FREQ.<br>(MHz) | LEVEL @<br>ANTENNA<br>TERMINALS<br>(dBm) | SUBSTITUTE<br>ANTENNA<br>GAIN<br>(dBd) | CORRECT<br>GENERATOR<br>LEVEL<br>(dBm) | POL<br>(H/V) | (dBc) |
|----------------|------------------------------------------|----------------------------------------|----------------------------------------|--------------|-------|
| 1648.40        | -25.13                                   | 6.10                                   | -19.03                                 | V            | 52.5  |
| 2472.60        | -53.75                                   | 6.70                                   | -47.05                                 | V            | 80.5  |
| 3296.80        | -49.99                                   | 6.80                                   | -43.19                                 | H            | 76.6  |
| 4121.00        | -52.98                                   | 6.50                                   | -46.48                                 | V            | 79.9  |
| 4945.20        | -54.78                                   | 7.00                                   | -47.78                                 | H            | 81.2  |

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested using a PCL of 0 in the PCS Band and a PCL of 5 in the Cellular Band.

|                                      |                                                                                     |                                                      |                                                                                       |                                 |
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## 7.1 Cellular GSM Radiated Measurements (Cont'd)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 836.60 MHz  
 CHANNEL: 190 (Mid)  
 MEASURED OUTPUT POWER: 33.430 dBm = 2.200 W  
 MODULATION SIGNAL: GSM  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  46.42 dBc

| FREQ.<br>(MHz) | LEVEL @<br>ANTENNA<br>TERMINALS<br>(dBm) | SUBSTITUTE<br>ANTENNA<br>GAIN<br>(dBd) | CORRECT<br>GENERATOR<br>LEVEL<br>(dBm) | POL<br>(H/V) | (dBc) |
|----------------|------------------------------------------|----------------------------------------|----------------------------------------|--------------|-------|
| 1673.20        | -40.43                                   | 6.10                                   | -34.33                                 | H            | 67.8  |
| 2509.80        | -54.56                                   | 6.70                                   | -47.86                                 | V            | 81.3  |
| 3346.40        | -53.90                                   | 6.80                                   | -47.10                                 | V            | 80.5  |
| 4183.00        | -60.21                                   | 6.50                                   | -53.71                                 | V            | 87.1  |
| 5019.60        | -61.40                                   | 7.00                                   | -54.40                                 | H            | 87.8  |

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested using a PCL of 0 in the PCS Band and a PCL of 5 in the Cellular Band.

|                                      |                                                                                     |                                                      |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| PCTEST™ PT. 22/24 GSM<br>TEST REPORT |  | FCC MEASUREMENT REPORT<br>(GSM)                      |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0606200530       | Test Dates:<br>July 10 - July 12, 2006                                              | EUT Type:<br>Dual-Band GSM Mobile Transmitter Module | FCC ID: SEKMC56                                                                       | Page 13 of 25                   |

## 7.1 Cellular GSM Radiated Measurements (Cont'd)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 848.80 MHz  
 CHANNEL: 251 (High)  
 MEASURED OUTPUT POWER: 33.430 dBm = 2.200 W  
 MODULATION SIGNAL: FM (Internal)  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  46.42 dBc

| FREQ.<br>(MHz) | LEVEL @<br>ANTENNA<br>TERMINALS<br>(dBm) | SUBSTITUTE<br>ANTENNA<br>GAIN<br>(dBd) | CORRECT<br>GENERATOR<br>LEVEL<br>(dBm) | POL<br>(H/V) | (dBc) |
|----------------|------------------------------------------|----------------------------------------|----------------------------------------|--------------|-------|
| 1697.60        | -35.34                                   | 6.10                                   | -29.24                                 | V            | 62.7  |
| 2546.40        | -43.96                                   | 6.70                                   | -37.26                                 | V            | 70.7  |
| 3395.20        | -49.31                                   | 6.80                                   | -42.51                                 | H            | 75.9  |
| 4244.00        | -55.75                                   | 6.50                                   | -49.25                                 | V            | 82.7  |
| 5092.80        | -61.14                                   | 7.00                                   | -54.14                                 | V            | 87.6  |

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested using a PCL of 0 in the PCS Band and a PCL of 5 in the Cellular Band.

|                                      |                                                                                     |                                                      |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| PCTEST™ PT. 22/24 GSM<br>TEST REPORT |  | FCC MEASUREMENT REPORT<br>(GSM)                      |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0606200530       | Test Dates:<br>July 10 - July 12, 2006                                              | EUT Type:<br>Dual-Band GSM Mobile Transmitter Module | FCC ID: SEKMC56                                                                       | Page 14 of 25                   |

## 7.2 PCS GSM Radiated Measurements

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1850.20 MHz  
 CHANNEL: 512 (Low)  
 MEASURED OUTPUT POWER: 30.650 dBm = 1.162 W  
 MODULATION SIGNAL: GSM  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  43.65 dBc

| FREQ.<br>(MHz) | LEVEL @<br>ANTENNA<br>TERMINALS<br>(dBm) | SUBSTITUTE<br>ANTENNA<br>GAIN<br>(dBd) | CORRECT<br>GENERATOR<br>LEVEL<br>(dBm) | POL<br>(H/V) | (dBc) |
|----------------|------------------------------------------|----------------------------------------|----------------------------------------|--------------|-------|
| 3700.40        | -33.33                                   | 6.10                                   | -27.23                                 | V            | 57.9  |
| 5550.60        | -61.05                                   | 6.70                                   | -54.35                                 | H            | 85.0  |
| 7400.80        | -57.89                                   | 6.80                                   | -51.09                                 | V            | 81.7  |
| 9251.00        | -62.68                                   | 6.50                                   | -56.18                                 | V            | 86.8  |
| 11101.20       | -84.38                                   | 7.00                                   | -77.38                                 | H            | 108.0 |

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested using a PCL of 0 in the PCS Band and a PCL of 5 in the Cellular Band.

|                                      |                                                                                                                             |                                                      |                                                                                       |                                 |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| PCTEST™ PT. 22/24 GSM<br>TEST REPORT |  <b>FCC MEASUREMENT REPORT<br/>(GSM)</b> |                                                      |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0606200530       | Test Dates:<br>July 10 - July 12, 2006                                                                                      | EUT Type:<br>Dual-Band GSM Mobile Transmitter Module | FCC ID: SEKMC56                                                                       | Page 15 of 25                   |

## 7.2 PCS GSM Radiated Measurements (Cont'd)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1880.00 MHz  
 CHANNEL: 661 (Mid)  
 MEASURED OUTPUT POWER: 30.650 dBm = 1.162 W  
 MODULATION SIGNAL: GSM  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  43.65 dBc

| FREQ.<br>(MHz) | LEVEL @<br>ANTENNA<br>TERMINALS<br>(dBm) | SUBSTITUTE<br>ANTENNA<br>GAIN<br>(dBd) | CORRECT<br>GENERATOR<br>LEVEL<br>(dBm) | POL<br>(H/V) | (dBc) |
|----------------|------------------------------------------|----------------------------------------|----------------------------------------|--------------|-------|
| 3760.00        | -48.83                                   | 6.10                                   | -42.73                                 | H            | 73.4  |
| 5640.00        | -61.66                                   | 6.70                                   | -54.96                                 | V            | 85.6  |
| 7520.00        | -64.50                                   | 6.80                                   | -57.70                                 | V            | 88.3  |
| 9400.00        | -64.31                                   | 6.50                                   | -57.81                                 | V            | 88.5  |
| 11280.00       | -83.78                                   | 7.00                                   | -76.78                                 | V            | 107.4 |

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested using a PCL of 0 in the PCS Band and a PCL of 5 in the Cellular Band.

|                                      |                                                                                     |                                                      |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| PCTEST™ PT. 22/24 GSM<br>TEST REPORT |  | FCC MEASUREMENT REPORT<br>(GSM)                      |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0606200530       | Test Dates:<br>July 10 - July 12, 2006                                              | EUT Type:<br>Dual-Band GSM Mobile Transmitter Module | FCC ID: SEKMC56                                                                       | Page 16 of 25                   |

## 7.2 PCS GSM Radiated Measurements (Cont'd)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1908.80 MHz  
 CHANNEL: 810 (High)  
 MEASURED OUTPUT POWER: 30.650 dBm = 1.162 W  
 MODULATION SIGNAL: GSM  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  43.65 dBc

| FREQ.<br>(MHz) | LEVEL @<br>ANTENNA<br>TERMINALS<br>(dBm) | SUBSTITUTE<br>ANTENNA<br>GAIN<br>(dBd) | CORRECT<br>GENERATOR<br>LEVEL<br>(dBm) | POL<br>(H/V) | (dBc) |
|----------------|------------------------------------------|----------------------------------------|----------------------------------------|--------------|-------|
| 3817.60        | -38.54                                   | 6.10                                   | -32.44                                 | H            | 63.1  |
| 5726.40        | -56.26                                   | 6.70                                   | -49.56                                 | V            | 80.2  |
| 7635.20        | -57.11                                   | 6.80                                   | -50.31                                 | V            | 81.0  |
| 9544.00        | -59.95                                   | 6.50                                   | -53.45                                 | V            | 84.1  |
| 11452.80       | -83.98                                   | 7.00                                   | -76.98                                 | H            | 107.6 |

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested using a PCL of 0 in the PCS Band and a PCL of 5 in the Cellular Band.

|                                      |                                                                                     |                                                      |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| PCTEST™ PT. 22/24 GSM<br>TEST REPORT |  | FCC MEASUREMENT REPORT<br>(GSM)                      |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0606200530       | Test Dates:<br>July 10 - July 12, 2006                                              | EUT Type:<br>Dual-Band GSM Mobile Transmitter Module | FCC ID: SEKMC56                                                                       | Page 17 of 25                   |

## 8.0 FREQUENCY STABILITY

### 8.1 Frequency Stability (Cellular GSM)

OPERATING FREQUENCY: 836,600,009 Hz

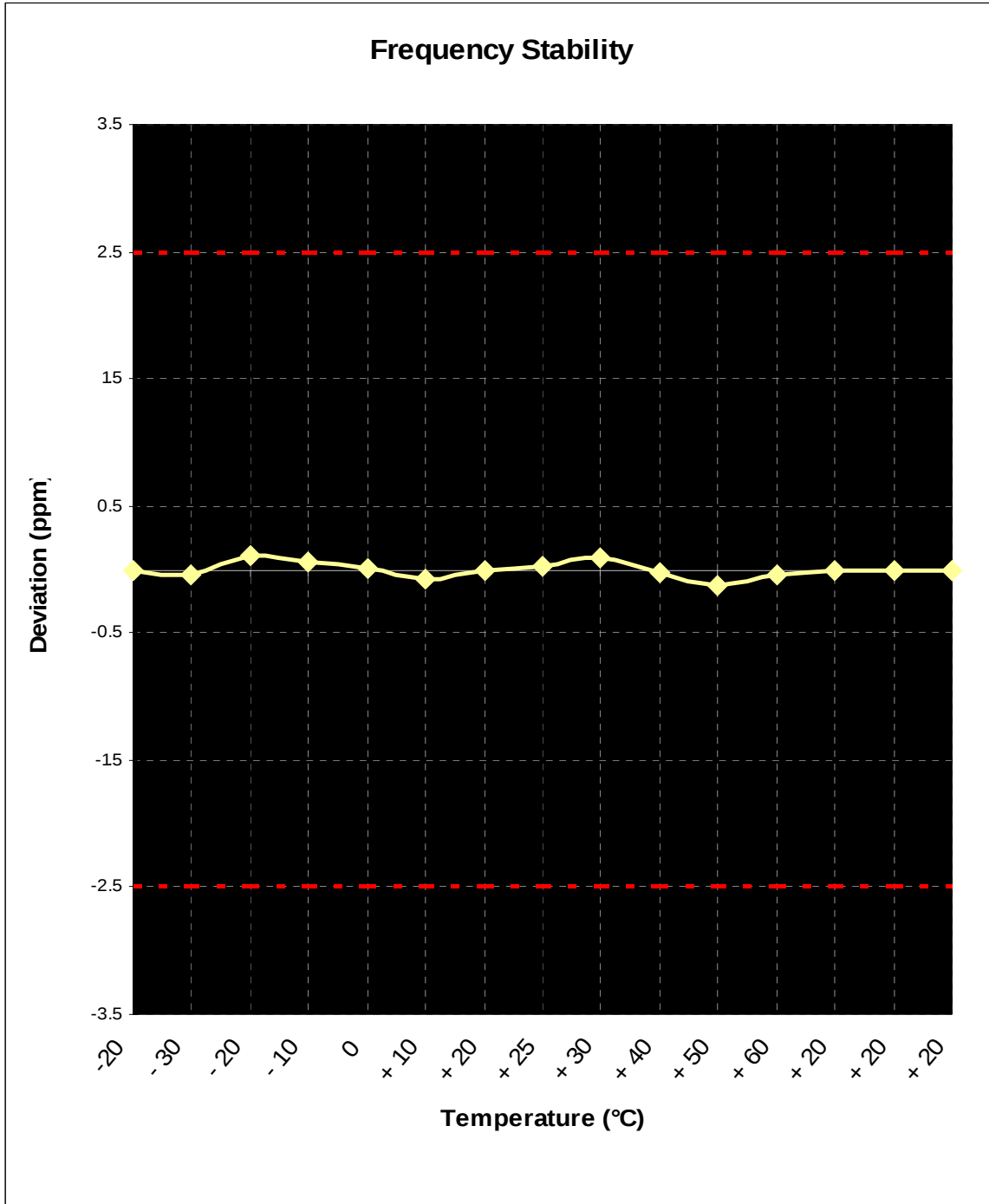
CHANNEL: 190

REFERENCE VOLTAGE: 3.7 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

| VOLTAGE<br>(%) | POWER<br>(VDC) | TEMP<br>(°C) | FREQ.<br>(Hz) | Freq. Dev.<br>(Hz) | Deviation<br>(%) |
|----------------|----------------|--------------|---------------|--------------------|------------------|
| 100 %          | 3.70           | + 20 (Ref)   | 836,600,009   | 0.00               | 0.000000         |
| 100 %          |                | - 30         | 836,600,042   | -33.46             | -0.000004        |
| 100 %          |                | - 20         | 836,599,917   | 92.03              | 0.000011         |
| 100 %          |                | - 10         | 836,599,959   | 50.20              | 0.000006         |
| 100 %          |                | 0            | 836,600,001   | 8.37               | 0.000001         |
| 100 %          |                | + 10         | 836,600,068   | -58.56             | -0.000007        |
| 100 %          |                | + 20         | 836,600,009   | 0.00               | 0.000000         |
| 100 %          |                | + 25         | 836,599,992   | 16.73              | 0.000002         |
| 100 %          |                | + 30         | 836,599,934   | 75.29              | 0.000009         |
| 100 %          |                | + 40         | 836,600,034   | -25.10             | -0.000003        |
| 100 %          |                | + 50         | 836,600,109   | -100.39            | -0.000012        |
| 100 %          |                | + 60         | 836,600,051   | -41.83             | -0.000005        |
| 85 %           | 3.17           | + 20         | 836,600,009   | 0.00               | 0.000000         |
| 115 %          | 4.26           | + 20         | 836,600,009   | 0.00               | 0.000000         |
| BATT. ENDPOINT | 3.01           | + 20         | 836,600,009   | 0.00               | 0.000000         |

## 8.1 Frequency Stability (Cellular GSM) (Cont'd)



|                                      |                                                                                                                             |                                                      |                                                                                       |                                 |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| PCTEST™ PT. 22/24 GSM<br>TEST REPORT |  <b>FCC MEASUREMENT REPORT<br/>(GSM)</b> |                                                      |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0606200530       | Test Dates:<br>July 10 - July 12, 2006                                                                                      | EUT Type:<br>Dual-Band GSM Mobile Transmitter Module | FCC ID: SEKMC56                                                                       | Page 19 of 25                   |

## 8.2 Frequency Stability (PCS GSM)

OPERATING FREQUENCY: 1,880,000,003 Hz

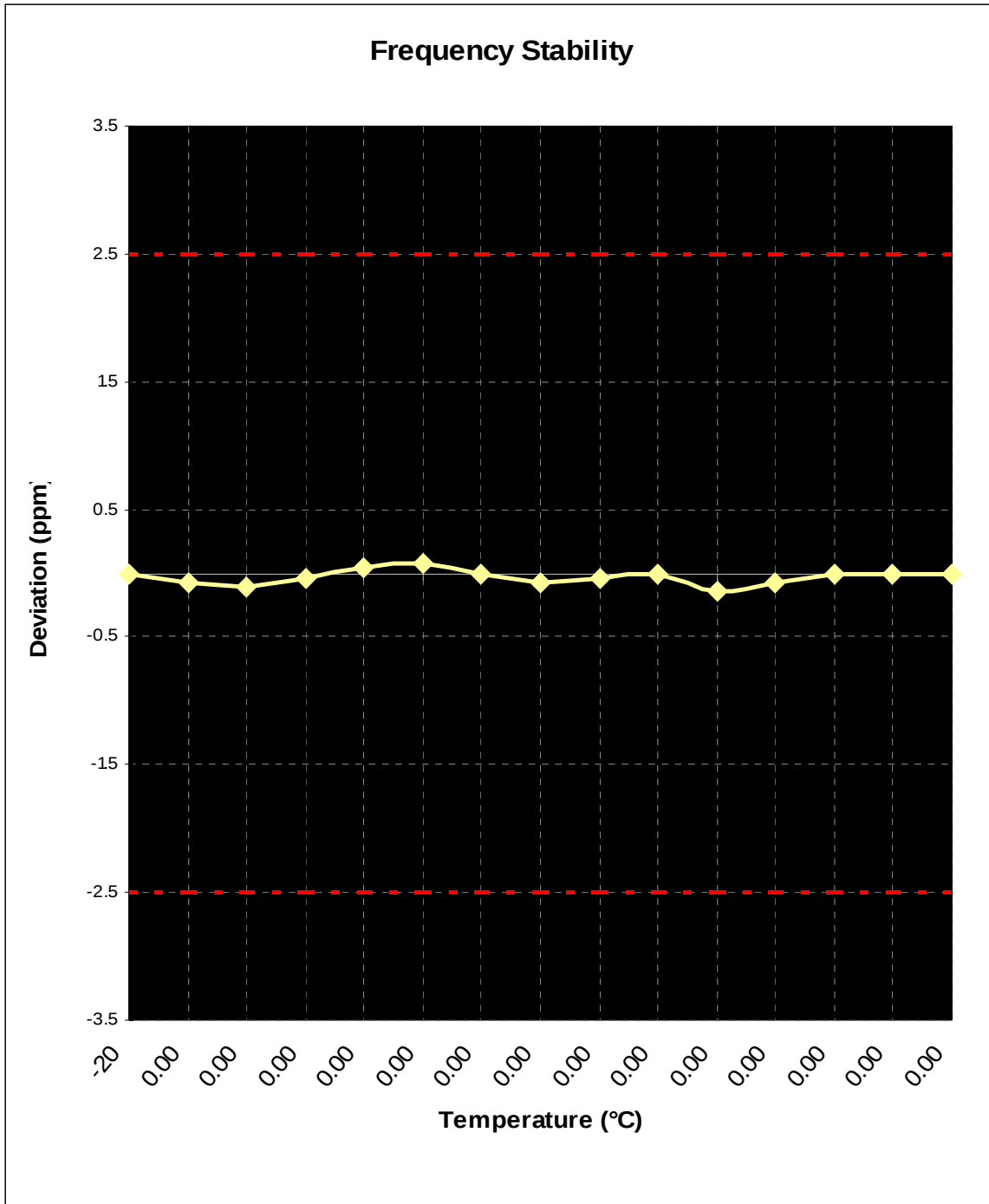
CHANNEL: 661

REFERENCE VOLTAGE: 3.7 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

| VOLTAGE<br>(%) | POWER<br>(VDC) | TEMP<br>(°C) | FREQ.<br>(Hz) | Freq. Dev.<br>(Hz) | Deviation<br>(%) |
|----------------|----------------|--------------|---------------|--------------------|------------------|
| 100 %          | 3.70           | + 20 (Ref)   | 1,880,000,003 | 0.00               | 0.000000         |
| 100 %          |                | - 30         | 1,880,000,153 | -150.40            | -0.000008        |
| 100 %          |                | -20          | 1,880,000,210 | -206.80            | -0.000011        |
| 100 %          |                | -10          | 1,880,000,097 | -94.00             | -0.000005        |
| 100 %          |                | 0            | 1,879,999,928 | 75.20              | 0.000004         |
| 100 %          |                | 10           | 1,879,999,853 | 150.40             | 0.000008         |
| 100 %          |                | 20           | 1,880,000,003 | 0.00               | 0.000000         |
| 100 %          |                | 25           | 1,880,000,135 | -131.60            | -0.000007        |
| 100 %          |                | 30           | 1,880,000,078 | -75.20             | -0.000004        |
| 100 %          |                | 40           | 1,880,000,022 | -18.80             | -0.000001        |
| 100 %          |                | 50           | 1,880,000,285 | -282.00            | -0.000015        |
| 100 %          |                | 60           | 1,880,000,153 | -150.40            | -0.000008        |
| 85 %           | 3.15           | 20           | 1,880,000,003 | 0.00               | 0.000000         |
| 115 %          | 4.26           | 20           | 1,880,000,003 | 0.00               | 0.000000         |
| BATT. ENDPOINT | 2.94           | 20           | 1,880,000,003 | 0.00               | 0.000000         |

## 8.2 Frequency Stability (PCS GSM) (Cont'd)



|                                      |                                                                                     |                                                      |                                 |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| PCTEST™ PT. 22/24 GSM<br>TEST REPORT |  |                                                      | FCC MEASUREMENT REPORT<br>(GSM) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0606200530       | Test Dates:<br>July 10 - July 12, 2006                                              | EUT Type:<br>Dual-Band GSM Mobile Transmitter Module | FCC ID: SEKMC56                 | Page 21 of 25                                                                         |                                 |

## 9.0 PLOT(S) OF EMISSIONS

(SEE ATTACHMENT A)

|                                      |                                                                                     |                                                      |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| PCTEST™ PT. 22/24 GSM<br>TEST REPORT |  | FCC MEASUREMENT REPORT<br>(GSM)                      |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0606200530       | Test Dates:<br>July 10 - July 12, 2006                                              | EUT Type:<br>Dual-Band GSM Mobile Transmitter Module | FCC ID: SEKMC56                                                                       | Page 22 of 25                   |

## 10.0 TEST EQUIPMENT

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

| TYPE                                 | MODEL                           | CAL. DUE DATE | CAL. INTERVAL | SERIAL No.             |
|--------------------------------------|---------------------------------|---------------|---------------|------------------------|
| Microwave Spectrum Analyzer          | Agilent E4448A (3Hz-50GHz)      | 09/19/06      | Annual        | US42510244             |
| Spectrum Analyzer/Tracking Generator | HP 8591A (9kHz-1.8GHz)          | 09/12/06      | Annual        | 3144A02458             |
| Spectrum Analyzer                    | HP 8566B (100Hz-2.5GHz/2-22GHz) | 12/22/06      | Annual        | 3638A08713             |
| Signal Generator                     | HP 8640D (500Hz-1GHz)           | 12/07/07      | Annual        | 3613A00315             |
| PSG Analog Signal Generator          | Agilent E8257D (250kHz-20GHz)   | 03/08/07      | Annual        | MY45470194             |
| 5 Watt Amplifier                     | 5S1G4 (800MHz-4.2GHz)           | N/A           | N/A           | 22332                  |
| Universal Radio Communication Tester | CMU200                          | 04/20/07      | Annual        | 836370/079             |
| Universal Power Meter                | Gigatronics 8651A (50MHz-18GHz) | 07/28/07      | Annual        | 1834052                |
| Power Sensor                         | Gigatronics 80701A              | 04/11/07      | Annual        | 1833460                |
| Quasi-Peak Adapter                   | HP 85650A                       | 08/09/06      | Annual        | 2043A00301             |
| Preamplifier                         | HP 8449B (1-26.5GHz)            | 12/22/06      | Annual        | 3008A00985             |
| Attenuation/Switch Driver            | HP 11713A                       | 12/22/06      | Annual        | N/A                    |
| Preselector                          | HP 85685A (20Hz-2GHz)           | 12/22/06      | Annual        | N/A                    |
| 6dB Res BW Spec. Analyzer Display    | OPT 462                         | 12/22/06      | Annual        | 3701A22204             |
| Ailtech/Eaton Adapter                | CCA-7 CISPR/ANSI QP Adapter     | 12/19/06      | Annual        | 0194-04082             |
| Ailtech/Eaton Receiver               | NM 37/57A (30MHz – 1GHz)        | 06/07/07      | Annual        | 0805-03334             |
| Broadband Amplifier (2)              | HP 8447D (0.1 – 1300MHz)        | N/A           | N/A           | 2443A01900, 1937A03348 |
| Horn Antenna                         | EMCO Model 3115 (1-18GHz)       | 08/25/07      | Annual        | 9704-5182              |
| Horn Antenna                         | EMCO Model 3116 (18-40GHz)      | 08/25/07      | Annual        | 9203-2178              |
| Roberts Dipoles                      | Compliance Design (1 set) A100  | 08/31/06      | Annual        | 5118                   |
| EMCO Dipoles (2)                     | N/A                             | 05/08/08      | Annual        | 00023951               |
| EMCO LISN (3)                        | 3816/2, 3816/2, 3725/2          | 10/26/06      | Annual        | 1077, 1079, 2099       |
| 10dB Attenuator                      | HP 8493B                        | N/A           | N/A           | N/A                    |
| Microwave Cables                     | MicroCoax (1.0-26.5GHz)         | 02/26/07      | Annual        | N/A                    |
| Shielded Screen Room                 | RF Lindgren Model 26-2/2-0      | N/A           | N/A           | 6710 (PCT270)          |
| Shielded Semi-Anechoic Chamber       | Ray Proof Model S81             | N/A           | N/A           | R2437 (PCT278)         |
| Environmental Chamber                | Associated Systems 1025         | 08/08/06      | Annual        | PCT285                 |
| OATS                                 | N/A                             | 12/31/2006    | Tri-annual    | N/A                    |

Table 10-1. Test Equipment

|                                   |                                                                                     |                                                      |                                                                                       |                                 |
|-----------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| PCTEST™ PT. 22/24 GSM TEST REPORT |  | FCC MEASUREMENT REPORT (GSM)                         |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0606200530    | Test Dates:<br>July 10 - July 12, 2006                                              | EUT Type:<br>Dual-Band GSM Mobile Transmitter Module | FCC ID: SEKMC56                                                                       | Page 23 of 25                   |

## 11.0 SAMPLE CALCULATIONS

### Emission Designator

**Emission Designator = 250KGXW**

GSM BW = 250 kHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

|                                      |                                                                                     |                                                      |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| PCTEST™ PT. 22/24 GSM<br>TEST REPORT |  | FCC MEASUREMENT REPORT<br>(GSM)                      |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0606200530       | Test Dates:<br>July 10 - July 12, 2006                                              | EUT Type:<br>Dual-Band GSM Mobile Transmitter Module | FCC ID: SEKMC56                                                                       | Page 24 of 25                   |

## 12.0 CONCLUSION

The data collected shows that the Banksys Dual-Band GSM Mobile Transmitter Module FCC ID: SEKMC56 complies with all the requirements of Parts 2, 22, and 24 of the FCC rules.

|                                      |                                                                                     |                                                      |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| PCTEST™ PT. 22/24 GSM<br>TEST REPORT |  | FCC MEASUREMENT REPORT<br>(GSM)                      |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0606200530       | Test Dates:<br>July 10 - July 12, 2006                                              | EUT Type:<br>Dual-Band GSM Mobile Transmitter Module | FCC ID: SEKMC56                                                                       | Page 25 of 25                   |