EXHIBIT 15

FREQUENCY STABILITY MEASUREMENTS

Measurements of DTSA frequency stability were performed in accordance with the requirements of §§ 24.235 and 2.1055; procedures and results are described in this exhibit.

Requirements

In general, as required by § 24.235, the frequency stability of broadband PCS equipment "shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block." However, as a GSM-compliant terminal, the stability of the DTSA carrier frequency is accurate to within 0.1 ppm of the received frequency from the base station (J-STD007, Air Interface: Volume 1, Section 7.4.1; and GSM 05.10, "Digital cellular telecommunications system (Phase 2); Radio subsystem synchronization").

Measurements of transmitter frequency stability are described in § 2.1055 and are necessary to obtain a Certification grant of equipment authorization. As required by § 2.1055, these measurements are to be made as follows:

1. Over variations of ambient temperature from -30° to +50° centigrade at intervals of 10° centigrade.
2. Over variations of primary supply voltage from 85 to 115 percent of the nominal line voltage of 120 VAC (variations from 102 VAC to 138 VAC).

In addition, because the DTSA operates from a DC input voltage over a specified +7 to +32 VDC range, measurements of transmitter frequency stability were also made as follows (as requested by Greg Czumak of the FCC OET):

3. Over variations of DC input voltage from 5.9 VDC to 37.0 VDC (approximately +/- 15% beyond the specified DC input voltage range of +7 to +32 VDC).

Measurement Procedure

Measurements of DTSA frequency stability were performed using the Rhode & Schwarz CMD 55 Digital Radio Communications Tester. Variation in ambient temperature were accomplished using a Hanse HALT/HASS environmental test chamber; variations in AC and DC input voltages made use of an AC variac powering an Artesyn AC/DC supply (co-located with the DTSA in the Hanse chamber) and a DC power supply, respectively. Specific procedures for both methods of powering the unit were as follows:

DTSA Powered by Artesyn NFN40-7612 AC/DC Power Supply (12 VDC Output)

1. Configure the DTSA:
   - Location — Hanse environmental test chamber (unit and supply)
   - Input voltage — AC input to Artesyn supply powering unit varied during test (Artesyn output = 12.0 VDC)
   - Mode — Transmit, random data pattern selected using PC controller
   - RF Output Power — Maximum level (step 0, 30 dBm nominal) selected using the PC controller
   - Frequency — Channel 661 (1880.0 MHz) selected using the PC controller

2. Set the Hanse Environmental Chamber to -30° C. Soak the DTSA and Artesyn AC/DC supply for ten minutes (powered off) to allow unit to reach a steady state temperature (as measured on the DTSA PCB itself).
3. Set AC line voltage to 102 VAC (85% of nominal 120 VAC line voltage); DC input to unit = 12.0 VDC (nominal).
4. Measure and record carrier frequency ten times in succession using the R&S CMD 55.
5. Set AC line voltage to 138 VAC (115% of nominal 120 VAC line voltage); DC input to unit = 12.0 VDC (nominal).
6. Measure and record carrier frequency ten times in succession using the R&S CMD 55.
7. Increase chamber temperature by 10° C. Soak unit for ten minutes to allow unit to reach steady state at new temperature.
8. Repeat steps 3 through 7 until final measurements made at +50 ° C.

DTSA Powered by Variable Output DC Supply

1. Configure the DTSA:
    - Location — Hanse environmental test chamber (unit only)
    - Input voltage — DC input to unit varied during test (5.9 to 37 VDC)
    - Mode — Transmit, random data pattern selected using PC controller
    - RF Output Power — Maximum level (step 0, 30 dBm nominal) selected using the PC controller
    - Frequency — Channel 661 (1880.0 MHz) selected using the PC controller

2. Set the Hanse Environmental Chamber to -30° C. Soak the DTSA for ten minutes (powered off) to allow unit to reach a steady state temperature (as measured on the DTSA PCB itself).
3. Set DC input to unit to 5.9 VDC.
4. Measure and record carrier frequency ten times in succession using the R&S CMD 55.
5. Set DC input to unit to 37.0 VDC.
6 Measure and record carrier frequency ten times in succession using the R&S CMD 55.
7. Increase chamber temperature by 10° C. Soak unit for ten minutes to allow unit to reach steady state at new temperature.
8. Repeat steps 3 through 7 until final measurements made at +50 ° C.

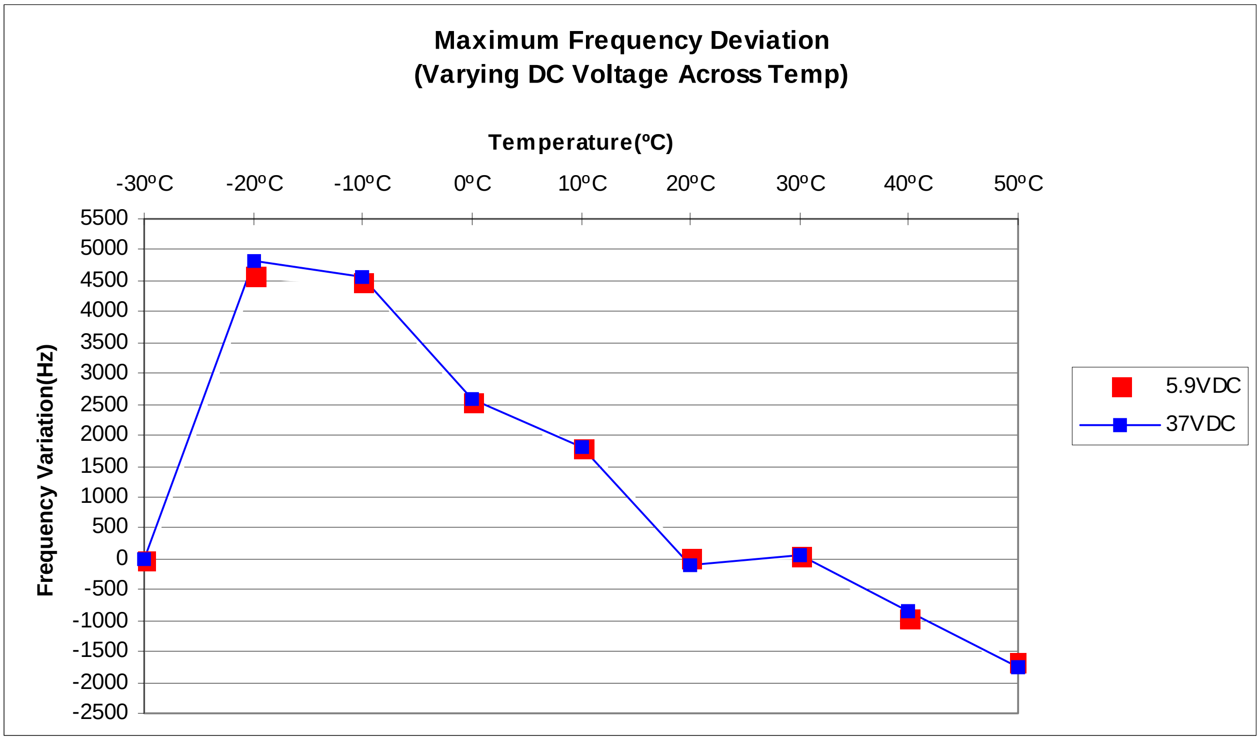
Measurement Results

Table E15.1 summarizes the DTSA frequency stability measurements taken in accordance with the preceding procedures. The Maximum Frequency Deviation columns (in Hertz and ppm) show the largest frequency deviations from the desired carrier frequency over the ten measurements made at each combination of temperature, line and DC input voltage. Plots of these results (maximum deviation from desired carrier in Hertz) are presented in Figure E15.1. In all cases, the frequency stability of the DTSA over variations in ambient temperature, and AC (to DC supply) and DC input voltages are sufficient to ensure that the fundamental emission will stay within its authorized frequency block.

No data is provided for the -30° C temperature because the DTSA will not operate at this temperature. On-board temperature sensing circuitry detects when the ambient temperature falls below -20° C and shuts the unit off. Operation is thus only possible at ambient temperatures of -20° C and higher; measurements were attempted at -30° C to ensure that the unit did indeed shut down as designed.

Table E15.1. Frequency stability measurement results.

Ambient Temperature (degrees C)	Line (AC) or DC input Voltage	Maximum Frequency Deviation (Hz)	Maximum Frequency Deviation (ppm)
50°	102 VAC	-2186	-1.16
	138 VAC	-2175	-1.16
	5.9 VDC	-1674	-0.89
	37 VDC	-1768	-0.94
40°	102 VAC	-1349	-0.72
	138 VAC	-1331	-0.71
	5.9 VDC	-931	-0.50
	37 VDC	-857	-0.46
30°	102 VAC	-429	-0.23
	138 VAC	-433	-0.23
	5.9 VDC	60	0.03
	37 VDC	40	0.02
20°	102 VAC	518	0.28
	138 VAC	521	0.28
	5.9 VDC	14	0.01
	37 VDC	-106	-0.06
10°	102 VAC	1346	0.72
	138 VAC	1332	0.71
	5.9 VDC	1817	0.97
	37 VDC	1821	0.97
0°	102 VAC	2145	1.14
	138 VAC	2127	1.13
	5.9 VDC	2554	1.36
	37 VDC	2593	1.38
-10°	102 VAC	3624	1.93
	138 VAC	3556	1.89
	5.9 VDC	4480	2.38
	37 VDC	4557	2.42
-20°	102 VAC	4853	2.58
	138 VAC	4832	2.57
	5.9 VDC	4584	2.44
	37 VDC	4819	2.56
-30°	102 VAC	EUT SHUT-DOWN	N/A
	138 VAC	EUT SHUT-DOWN	N/A
	5.9 VDC	EUT SHUT-DOWN	N/A
	37 VDC	EUT SHUT-DOWN	N/A



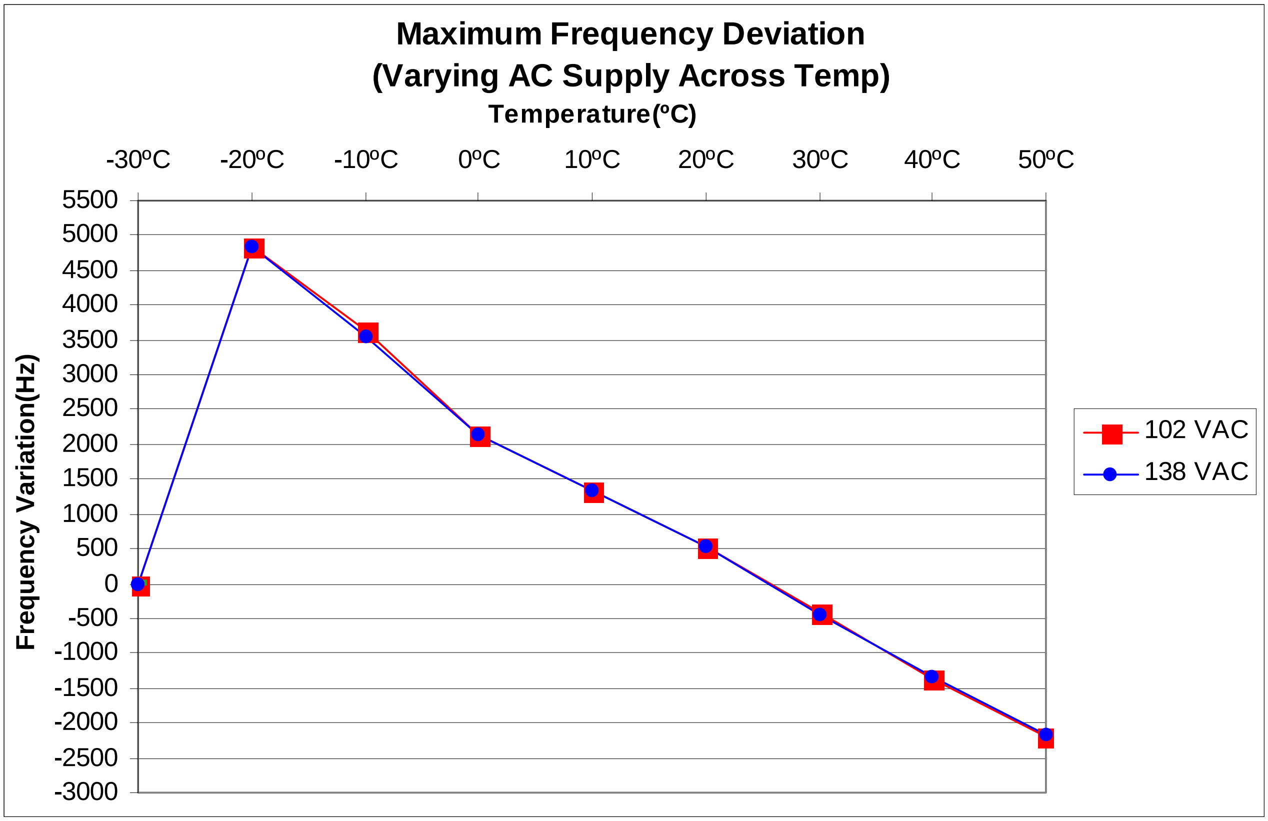


Figure E15.1. Graphical representation of Frequency Stability Results.

During normal operation, the GSM (PCS1900) network and terminal (mobile) work in conjunction to ensure an overall (long-term) frequency stability of 0.1 ppm. The base station measures the receive frequency from each terminal and, once every ten TDMA frames, commands the terminal to adjust its RF carrier frequency as required to maintain the required stability.

The measurements of frequency stability described in this Exhibit were performed with this closed-loop frequency adjustment disabled, to ensure that the frequency stability of the DTSA, by itself, is sufficient to keep the RF carrier within the authorized frequency block. As the measurement results indicate, this is indeed the case. Furthermore, during normal operation the frequency stability of the DTSA complies with the 0.1 ppm requirement specified in the GSM standards previously referenced.