

EXHIBIT 19

Section 2.1055 Measurements Required: Frequency Stability

The TDMA Oscillator Module (TOM) generates the 15 MHz reference frequency that controls both the PCS-TDMA Dual Radio Module (PDRM) and the TDMA Radio Controller (TRC). The TOM constitutes the frequency determining and stabilizing circuitry for the FLEXENT™ PCS-TDMA Microcell J41698A-1. Measurement of frequency stability for the TOM is required from -30 °C to +50 °C in 10 °C steps and for a variation of primary supply voltage from 85% to 115% nominal value. TIA/EIA/IS-138-A specifies the required minimum standard for Cellular/PCS base stations ± 1.5 ppm for the 15.00 MHz reference frequency.

RESULTS:

The TOM oscillator is manufactured under contract by three suppliers: OAK, PIEZO and CTS. The frequency stability was measured for each supplier. The Microcell was installed in an environmental chamber and the PDRMs set to transmit 10 carriers to provide the rated total composite power level at the antenna terminal of 12 Watts (40.8 dBm). The lowest frequency carrier was tuned to B-Block channel 700, and all remaining carriers were spaced at 7 channel increments. A “tee” was installed in the RF path from the TOM output to the PDRM input, such that the 15 MHz reference frequency can be monitored and recorded continuously without interrupting the Microcell operation. At each temperature and each supply voltage, the TOM was allowed to thermally stabilize for 60 minutes. The nominal supply voltage was 120 Vac, 85% = 102 Vac and 115% = 138 Vac. The supply voltage was controlled by an HP6813B AC Power Source/Analyzer, 300 Vrms, 1750 VA, 1Φ. The 15 MHz reference frequency was measured using a HP53132A Universal Counter, calibrated in compliance with ISO-9001 requirements.

The TDMA Oscillator Module (TOM) demonstrated full compliance with the requirements of TIA/EIA/IS-138-A. Based on the measurement data tabulated below, the TOM’s output signal frequency deviated from 15.0 MHz by +0.001 ppm to -0.03 ppm. This well within the required ± 1.5 ppm.

TOM Supplier: OAK

Stabilized Temp. °C	Measured Frequency at 102 Vac Hz	Deviation from 15.0 MHz at 102Vac ppm	Measured Frequency at 120 Vac Hz	Deviation from 15.0 MHz at 120Vac ppm	Measured Frequency at 138 Vac Hz	Deviation from 15.0 MHz at 138Vac ppm
- 30 °C	14999999.9525	-0.003165	14999999.9526	-0.003159	14999999.9523	-0.003159
- 20 °C	14999999.9551	-0.002992	14999999.9558	-0.002945	14999999.9561	-0.002927
- 10 °C	14999999.9529	-0.003143	14999999.9528	-0.003149	14999999.9525	-0.003165
0 °C	14999999.9530	-0.003133	14999999.9531	-0.003129	14999999.9534	-0.00311
+ 10 °C	14999999.9552	-0.002986	14999999.9557	-0.002955	14999999.9556	-0.002963
+ 20 °C	14999999.9547	-0.003023	14999999.9548	-0.003011	14999999.9550	-0.003002
+ 30 °C	14999999.9532	-0.003122	14999999.9529	-0.003143	14999999.9531	-0.003125
+ 40 °C	14999999.9500	-0.003332	14999999.9499	-0.003338	14999999.9502	-0.003319
+ 50 °C	14999999.9447	-0.003685	14999999.9449	-0.003671	14999999.9453	-0.003649

EXHIBIT 19

Section 2.1055 Measurements Required: Frequency Stability

TOM Supplier: PIEZO

Stabilized Temp. °C	Measured Frequency at 102 Vac Hz	Deviation from 15.0 MHz at 102Vac ppm	Measured Frequency at 120 Vac Hz	Deviation from 15.0 MHz at 120Vac ppm	Measured Frequency at 138 Vac Hz	Deviation from 15.0 MHz at 138Vac ppm
- 30 °C	14999999.8725	-0.008501	14999999.8722	-0.008519	14999999.8730	-0.008469
- 20 °C	14999999.8881	-0.007462	14999999.8898	-0.007346	14999999.8918	-0.007216
- 10 °C	14999999.9231	-0.00513	14999999.9214	-0.005243	14999999.9195	-0.00537
0 °C	14999999.9300	-0.004664	14999999.9338	-0.004413	14999999.9355	-0.004299
+ 10 °C	14999999.9419	-0.003876	14999999.9422	-0.003856	14999999.9419	-0.003871
+ 20 °C	14999999.9636	-0.002425	14999999.9633	-0.002447	14999999.9640	-0.002403
+ 30 °C	14999999.9823	-0.001183	14999999.9825	-0.00117	14999999.9823	-0.001178
+ 40 °C	14999999.9975	-0.000168	14999999.9977	-0.000155	14999999.9965	-0.000236
+ 50 °C	15000000.0104	+0.000693	15000000.0099	+0.000658	15000000.0107	+0.000715

TOM Supplier: CTS

Stabilized Temp. °C	Measured Frequency at 102 Vac Hz	Deviation from 15.0 MHz at 102Vac ppm	Measured Frequency at 120 Vac Hz	Deviation from 15.0 MHz at 120Vac ppm	Measured Frequency at 138 Vac Hz	Deviation from 15.0 MHz at 138Vac ppm
- 30 °C	14999999.5720	-0.028532	14999999.5721	-0.028525	14999999.5714	-0.028572
- 20 °C	14999999.5782	-0.028121	14999999.5767	-0.028223	14999999.5753	-0.028311
- 10 °C	14999999.5949	-0.027004	14999999.5949	-0.027005	14999999.5937	-0.027089
0 °C	14999999.5846	-0.027695	14999999.5853	-0.027645	14999999.5857	-0.027623
+ 10 °C	14999999.6059	-0.026277	14999999.6061	-0.026262	14999999.6067	-0.026219
+ 20 °C	14999999.6389	-0.024072	14999999.6386	-0.024095	14999999.6388	-0.024079
+ 30 °C	14999999.6709	-0.021938	14999999.6713	-0.021911	14999999.6712	-0.021921
+ 40 °C	14999999.6939	-0.020441	14999999.6945	-0.020367	14999999.6947	-0.020352
+ 50 °C	14999999.7158	-0.018949	14999999.7156	-0.018961	14999999.7154	-0.018971

A block diagram of the test set-up is attached to this exhibit.

EXHIBIT 19

Section 2.1055 Measurements Required: Frequency Stability

Test Equipment Set-Up and Configuration:

