TRUE CIRCUITS INC™

IoT PLL

Features

- Optimized for very low power, running completely from core power supply.
- Supports 32KHz reference clocks.
- Extremely wide range of operation with multiplication factors over 8,000.
- Small area, delivered as a single hard macro with guardrings and isolation.
- Flexible and highly programmable.
- Ideal for low power and cost sensitive applications such as IoT wearables and remote sensors.
- TSMC, GLOBALFOUNDRIES and UMC processes from 65nm to 28nm.

Deliverables

- GDSII and LVS Spice netlist, behavioral, synthesis and LEF models, and extensive user documentation.
- Integration support to ensure a successful tape out (included in standard design license fee).

Specifications

Part No. TCI-TN40LP-IOTPLL

– Divided reference frequency range	30KHz - 250MHz
– /1 output frequency range	30MHz - 250MHz
– Reference divider values	1 - 64
– Feedback divider values	1-8192
– Output divider values	1, 2-16 (even only)
– /1 output multiples of div. reference	1-8192
– Bandwidth adjustment div. range	1-8192
– Feedback signal delay (max))	n/a (FB internal)
– Output duty cycle (nom, tol)	50%, +/-5% (/1), +/-2% (/N)
– Static phase error (max)	n/a
– Period jitter (P-P) (max)	+/-2.5% output cycle
– Long-term jitter (RMS) (max)	n/a
– Power dissipation (nom)	45uW @ 30MHz (/1 output)
– Reset pulse width (min)	5us
– Reset /1 output frequency range	20MHz - 200MHz
– Lock time (min allowed)	500 div. reference cycles
– /1 output freq. overshoot (max)	40%/50%
– Area (including isolation) (max)	~0.063mm^2
– Number of PLL supply pkg. pins	1 VDDA, 1 VSSA (preferred)
– Low freq. supply noise est. (P-P) (max)	10% VDDA
– Low freq. sub. noise est. (P-P) (max)	10% VDDA
– Ref. input jitter (long-term, P-P) (max)	2% div. reference cycle
– Reference H/L pulse width (min)	330ps
– Process technology	TSMC CLN40LP 40nm
– Supply voltage (VDD, VDDA) (nom, tol)	1.1V, +/-10%
– Junction temperature (nom, min, max)	70C, -40C, 125C

* Jitter numbers are worst-case estimates with 10% VDDA supply and substrate noise—actual results will be better.