

IP Data Sheet

Low Power 32kHz Pierce Oscillator

The TS_XOSC_32k_X8 is a low power 32kHz Pierce oscillator that generates a VBAT-level logic square wave when a 32kHz quartz crystal is connected to its input XIN and its test input pin OSC_BYPASS is tied to ground.

If there is no quartz crystal present or the circuit is in test mode, the test input OSC_BYPASS is tied to VBAT and the internal oscillator circuit is disconnected from XIN pin and the XIN input pin is routed to oscillator output. This test feature can be used to bypass internal oscillator in case of startup

or some other type of failure.

The circuit operates with the supply voltage VBAT from 2.5V to 5.5V with a maximum current consumption less than 500nA.

The Pierce oscillator signal shaping is performed by an output stage which consists of a differential amplifier, common source amplifier and three inverters.

Technology: X-FAB XC018-0.18 μ m CMOS process

OPERATING CONDITIONS

Parameters	Values
Junction temperature range	-40°C to 60°C
Supply voltage	2.5V to 5.5V
Quartz crystal series load capacitance (C_L)	16pF
Quartz crystal equivalent series resistance (ESR)	40k Ω to 60k Ω
Quartz crystal shunt capacitance (C_0)	1pF to 1.2pF
32kHz quartz crystal drive level	11nW max

Table 1: Pierce Oscillator Operating Conditions

SPECIFICATION

Parameters	Values
VBAT average current consumption	489nA max
Duty cycle	49% to 52%
Oscillator allowance	170kΩ
Safety factor	4.25
Start-up time constant	150mS

Table 2: Pierce Oscillator Specifications**Sales & Marketing Contact****sales_dst@tes-dst.com**