

TSMC22: 1.8V 32kHz Oscillators



Libraries

Name	Process	Form Factor
RGO_TSMC22_18V18_ULL_20C_OSC_032	ULL	Staggered CUP

Summary

The 1.8V 32kHz Oscillators library provides oscillator macro cells designed to generate an asynchronous on-chip clock signal with an appropriate external oscillator crystal.

- 32 kHz Real Time Clock Oscillator

This library is available in a staggered CUP wire bond implementation with a flip chip option. The CUP cells / flip chip structures required for bonding are included with the library.

ESD Protection:

- JEDEC compliant
 - 2kV ESD Human Body Model (HBM)
 - 500V ESD Charge Device Model (CDM)

Latch-up Immunity:

- JEDEC compliant
 - Tested to I-Test criteria of $\pm 100\text{mA}$ @ 125°C

Cell Size & Form Factor

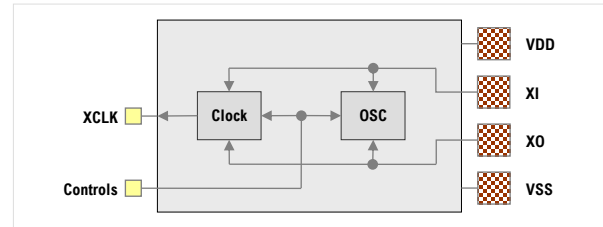
- Staggered (pad-limited) – $234.04\mu\text{m} \times 165\mu\text{m}$

Recommended Operating Conditions

Description	Min	Nom	Max	Units
V_{VDD} Core supply voltage	0.72	0.8	0.88	V
V_{DVDD} I/O supply voltage	1.62	1.8	1.98	V
T_J Junction temperature	-40	25	125	$^\circ\text{C}$
V_{PAD} Voltage at XI ^[1]	0	-	V_{VDD}	V

[1] XI can be driven by an external clock.
XO should never be driven or loaded by anything other than the crystal.

OSP_BI_032_33V



32 KHz RTC Oscillator Features

- Designed to use a 32.768 kHz external crystal
- Optimized for stability, minimum jitter & low power ($2.6\mu\text{W}$)
- Characterized with crystal loading capacitors ranging from 4 pF to 25 pF.
- Power-down mode
- Bypass mode
- Speed-up circuitry for fast startup
- Operates on core power only (VDD/VSS cells embedded)

Characterization Corners

Nom VDD	Model	LPE	VDD	DVDD ^[1]	Temp
0.8V / 0.9V	FF	Cbest	+10%	+10%	-40 $^\circ\text{C}$
	FF	Cbest	+10%	+10%	0 $^\circ\text{C}$
	FF	Cbest	+10%	+10%	125 $^\circ\text{C}$
	FFG	Ctypical	+10%	+10%	125 $^\circ\text{C}$
	TT	Ctypical	nominal	nominal	25 $^\circ\text{C}$
	TT	Ctypical	nominal	nominal	85 $^\circ\text{C}$
	SS	Cworst	-10%	-10%	-40 $^\circ\text{C}$
	SS	Cworst	-10%	-10%	0 $^\circ\text{C}$
	SS	Cworst	-10%	-10%	125 $^\circ\text{C}$

[1] DVDD = 1.8V

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Aragio Solutions
2201 K Avenue
Section B Suite 200
Plano, TX 75074-5918
Phone: (972) 516-0999
Fax: (972) 516-0998
Web: <http://www.aragio.com/>

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