

TSMC28: Oscillators



Libraries

Name	Process	Form Factor
RGO_TSMC28_18V18_HPM_20C_OSC	HPM	Staggered CUP
RGO_TSMC28_18V18_HPC_20C_OSC	HPC	Staggered CUP
RGO_TSMC28_18V18_HPC_20C_OSC	HPC+	Staggered CUP

Summary

The Oscillators library includes a programmable oscillator macro I/O cell.

- 100 MHz programmable oscillator

ESD Protection:

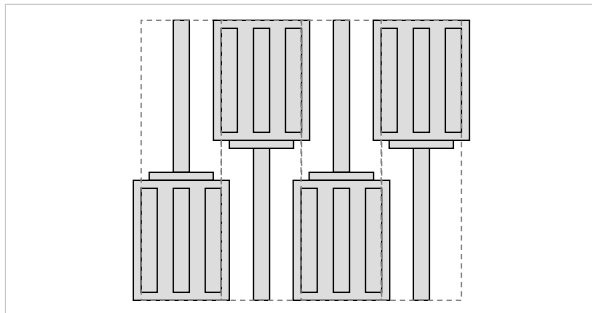
- JEDEC compliant
 - 2KV ESD Human Body Model (HBM)
 - 200 V ESD Machine Model (MM)
 - 500 V ESD Charge Device Model (CDM)

Latch-up Immunity:

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

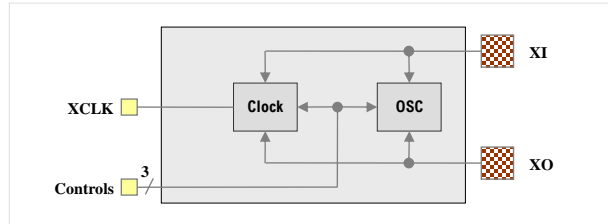
Cell Size & Form Factor

Staggered (pad-limited) – $100\mu\text{m} \times 125\mu\text{m}$



- Vertical-only and horizontal-only orientations

OSP_BI_100_18V



100 MHz Programmable Oscillator Features

- Programmable drive strength for wider frequency range – 1 MHz to $> 100\text{ MHz}$ using industry standard external crystals.
- Optimized for stability and minimum jitter
- Power-down mode
- Operates on core power only (VDD/VSS cells embedded)

Recommended operating conditions

Description	Min	Nom	Max	Units
V _{VDD} Core supply voltage	0.81	0.9	0.99	V
V _{DVDD} I/O supply voltage	1.62	1.8	1.98	V
V _{VDD} Core supply voltage	0.81	0.9	0.99	V
T _J Junction temperature	-40	25	125	°C
V _{PAD} Voltage at XI	0	-	V _{VDD}	V

TSMC28: Oscillators



Characterization Corners (HPM)

Nom VDD	Model	LPE	VDD	DVDD [1]	Temp
0.9V	FF	Cbest	+10%	+10%	-40°C
	FF	Cbest	+10%	+10%	0°C
	FF	Cbest	+10%	+10%	125°C
	FFG	Cworst	+10%	+10%	125°C
	TT	Ctypical	nominal	nominal	25°C
	TT	Ctypical	nominal	nominal	85°C
	SSG	Cworst	-10%	-10%	-40°C
	SSG	Cworst	-10%	-10%	0°C
	SSG	Cworst	-10%	-10%	125°C

[1] DVDD = 1.5V, 1.8V

Characterization Corners (HPC+)

Nom VDD	Model	LPE	VDD	DVDD [1]	Temp
0.9V	FFG	Cbest	+10%	+10%	-40°C
	FFG	Cbest	+10%	+10%	0°C
	FFG	Cbest	+10%	+10%	125°C
	TT	Ctypical	nominal	nominal	25°C
	TT	Ctypical	nominal	nominal	85°C
	SSG	Cworst	-10%	-10%	-40°C
	SSG	Cworst	-10%	-10%	0°C
	SSG	Cworst	-10%	-10%	125°C

[1] DVDD = 1.5V, 1.8V

Characterization Corners (HPC)

Nom VDD	Model	LPE	VDD	DVDD [1]	Temp
0.9V	FF	Cbest	+10%	+10%	-40°C
	FF	Cbest	+10%	+10%	0°C
	FF	Cbest	+10%	+10%	125°C
	FFG	Cworst	+10%	+10%	125°C
	TT	Ctypical	nominal	nominal	25°C
	TT	Ctypical	nominal	nominal	85°C
	SS	Cworst	-10%	-10%	-40°C
	SS	Cworst	-10%	-10%	0°C
	SS	Cworst	-10%	-10%	125°C

[1] DVDD = 1.5V, 1.8V

© 2011-2017 Aragio Solutions. All rights reserved.

Information in this document is subject to change without notice. Aragio Solutions may have patents, patent applications, trademarks, copyrights or other intellectual property rights covering subject matter in this document. Except as expressly provided in any written license agreement from Aragio, the furnishing of this document does not give you any license to the patents, trademarks, copyrights, or other intellectual property.

Published by:

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/>

While every precaution has been taken in the preparation of this book, the publisher assumes no responsibility for errors or omissions, or for damages resulting from the use of the information contained herein. This document may be reproduced and distributed in whole, in any medium, physical or electronic, under the terms of a license or nondisclosure agreement with Aragio.

Printed in the United States of America