

TSMC 07: 3.3V 100MHz Oscillator



Libraries

Name	Process	Form Factor
RGO_TSMC07_18V33_7FF_20C_OSC	7FF	Staggered

Summary

The 3.3V 100 MHz Oscillators library contains oscillator macro I/O cells.

This 7nm library is available in a staggered flip chip implementation.

To utilize these cells in the pad ring, an additional library is required – 3.3V Support: Power. That library contains the DVDD/DVSS power cells necessary for ESD protection, the POC and VREF cells, and a rail splitter to isolate the oscillator in its own power domain as recommended. It also contains an input-only buffer, isolated analog I/O, and a full complement of power cells along with corner and spacer cells to assemble a complete pad ring by abutment. The rail splitter allows multiple power domains to be isolated in the same pad ring while maintaining continuous VDD/VSS for robust ESD protection.

ESD Protection:

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

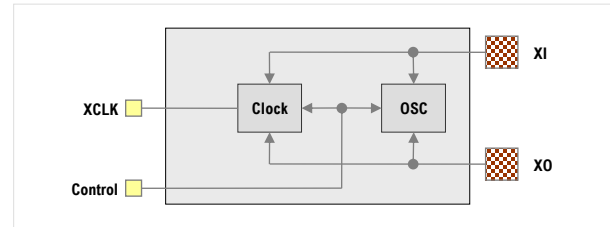
Latch-up Immunity:

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

Cell Size & Form Factor

- Staggered (pad-limited) – TBD μm x TBD μm

OSP_BI_100_1833V



100 MHz Oscillator Features

- Wide frequency range – 1 MHz to 100 MHz using industry standard external crystals.
- Optimized for stability and minimum jitter
- Power-down mode
- Operates on core power only (VDD/VSS cells embedded)

Vertical-only (_V) and horizontal-only (_H) variants provided.

Recommended operating conditions

Description	Min	Nom	Max	Units
V _{VDD} Core supply voltage	0.675	0.75	0.825	V
	0.765	0.85	0.935	V
	2.97	3.3	3.63	V
V _{DVDD} I/O supply voltage	2.25	2.5	2.75	V
	1.62	1.8	1.98	V
	1.08	1.2	1.32	V
T _J Junction temperature	-40	25	125	°C
V _{PAD} Voltage at XI ^[1]	0	-	V _{VDD}	V

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

Characterization Corners *

Model	LPE Type	VDD [1]	DVDD [2]	Temp
FF	Cbest_CCbest	+10%	+10%	-40°C
FF	Cbest_CCbest	+10%	+10%	125°C
TT	Ctypical	nominal	nominal	25°C
TT	Ctypical	nominal	nominal	85°C
SS	Cworst_CCworst	-10%	-10%	-40°C
SS	Cworst_CCworst	-10%	-10%	125°C

[1] VDD = 0.75V & 0.85V

[2] DVDD = 1.2V, 1.8V, 2.5V & 3.3V

* PRELIMINARY

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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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