SMG28: 3.3V 100MHz Oscillators

Libraries

Name	Process	Form Factor
RGO_SMG28_18V33_FDS_20C_OSC	FD-SOI	Staggered CUP

Summary

The 3.3V 100MHz Oscillators library provides a 100 MHz crystal oscillator macro I/O cell.

This 28nm library is available in a staggered CUP wire bond implementation.

To utilize this cell 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 functional 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.

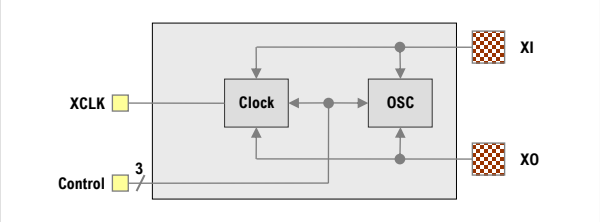
ESD Protection:

- 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 ± 100mA @ 125°C

OSP_BI_100_33V

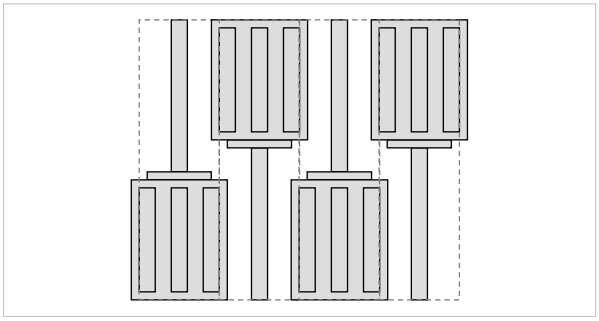


100 MHz Crystal Oscillator Features

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

Cell Size & Form Factor

Staggered (pad-limited) – 80µm x 117µm



Recommended operating conditions

	Description	Min	Nom	Max	Units
V_{VDD}	Core supply voltage	0.9	1.0	1.1	V
		0.99	1.1	1.155	V
V_{DVDD}	I/O supply voltage	2.97	3.3	3.63	V
		2.25	2.5	2.75	V
		1.62	1.8	1.98	V
T_J	Junction temperature	-40	25	125	°C
V_{PAD}	Voltage at XI / XO [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

Nominal VDD	Model	VDD	DVDD[1]	Temperature
1.0V	FF	+10%	+10%	-40°C
	FF	+10%	+10%	125°C
	FF	+10%	+10%	85°C
	FF	+10%	+10%	0°C
	TT	nominal	nominal	25°C
	SS	-10%	-10%	0°C
	SS	-10%	-10%	85°C
	SS	-10%	-10%	-40°C
	SS	-10%	-10%	125°C
1.1V Overdrive	FF	+5%	+10%	-40°C
	FF	+5%	+10%	125°C
	FF	+5%	+10%	85°C
	FF	+5%	+10%	0°C
	TT	nominal	nominal	25°C
	SS	-10%	-10%	0°C
	SS	-10%	-10%	85°C
	SS	-10%	-10%	-40°C
	SS	-10%	-10%	125°C

[1] DVDD = 1.8V, 2.5V & 3.3V

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