

# 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:

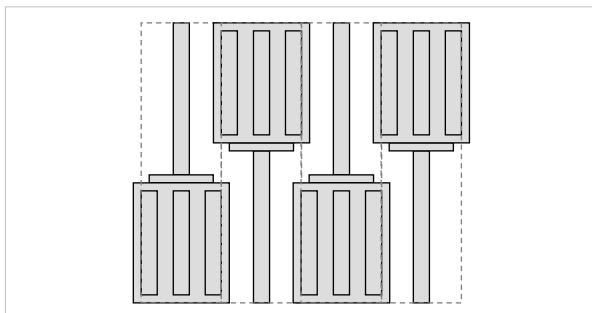
- JEDEC compliant
  - 2KV ESD Human Body Model (HBM)
  - 500 V ESD Charge Device Model (CDM)

### Latch-up Immunity:

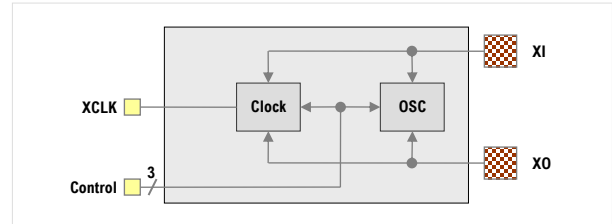
- JEDEC compliant
  - Tested to I-Test criteria of  $\pm 100\text{mA}$  @  $125^\circ\text{C}$

## Cell Size & Form Factor

Staggered (pad-limited) –  $80\mu\text{m} \times 117\mu\text{m}$



## 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)

## Recommended operating conditions

Description	Min	Nom	Max	Units
V <sub>VDD</sub> Core supply voltage	0.9	1.0	1.1	V
	0.99	1.1	1.155	V
	2.97	3.3	3.63	V
V <sub>DVDD</sub> I/O supply voltage	2.25	2.5	2.75	V
	1.62	1.8	1.98	V
	-40	25	125	°C
T <sub>J</sub> Junction temperature	-40	25	125	°C
V <sub>PAD</sub> Voltage at XI / XO <sup>[1]</sup>	0	-	V <sub>VDD</sub>	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.

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## Characterization Corners

Nominal VDD	Model	VDD	DVDD <sup>[1]</sup>	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
1.1V Overdrive	SS	-10%	-10%	125°C
	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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Published by:

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