SMIC40: Oscillators

Libraries

Name	Process	Form Factor
RGO_SMIC40_25V33_LL_20C_OSC	LL	Staggered CUP

Summary

The Oscillator library provides oscillators for on-chip asynchronous clock generation with an appropriate external crystal. This library is provided as a supplement to the 40nm GPIO libraries provided by Aragio Solutions.

- 32 kHz Real-Time-Clock Oscillator
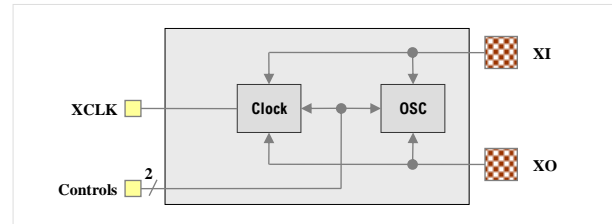- 50 MHz Low Power Oscillator
- 100 MHz Programmable Oscillator

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 ± 100mA @ 125°C

OSx_BI_032_12V

32 KHz RTC Oscillator Features

- Designed to use a 32.786 kHz external crystal for Real Time Clock applications.
- Optimized for low power, stability and minimum jitter
- Characterized with crystal loading capacitors ranging from 4 pF to 25 pF.
- Power-down and bypass modes
- Speed-up circuitry for fast startup
- Low power (2.0 µW max)
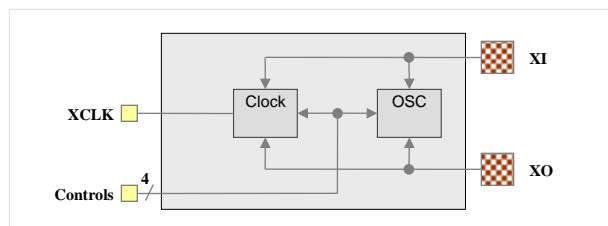- Operates on core power only (VDD/VSS cells embedded)

OSx_BI_050_12V
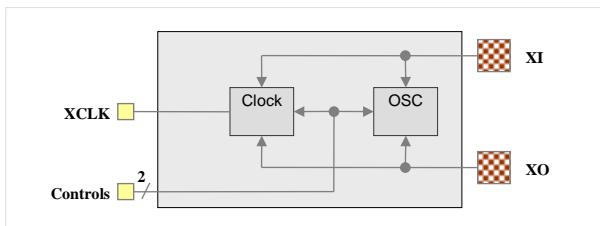
50 MHz Low Power Oscillator Features

- Frequency range – <1 MHz to 50 MHz using industry standard external crystals.
- Optimized for low power, stability and minimum jitter
- Power-down and bypass modes
- Low power design with fixed drive strength
- Operates on core power only (VDD/VSS cells embedded)

OSx_BI_10R_33V

100 MHz Programmable Oscillator Features

- Programmable drive strength for wider frequency range – 1 MHz to > 100 MHz using industry standard external crystals.
- Optimized for stability and minimum jitter
- Power-down and bypass modes
- Operates on core and I/O power (DVDD/DVSS cells embedded)

Recommended operating conditions

	Description	Min	Nom	Max	Units
V$_{VDD}$	Core supply voltage	0.99	1.1	1.21	V
V$_{DVDD}$	I/O supply voltage	2.97	3.3	3.63	V
		2.25	2.5	2.50	V
		1.62	1.8	1.98	V
T$_J$	Junction temperature	-40	25	125	°C

Characterization Corners

Nominal VDD	Model	VDD	DVDD[1]	Temperature
	FF	+10%	+10%	-40°C
	FF	+10%	+10%	125°C
1.1	TT	nominal	nominal	25°C
	SS	-10%	-10%	-40°C
	SS	-10%	-10%	125°C

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