DARE22G
100 MHz Oscillator
Product Brief

Product Overview

DARE22G OSC100M implements a current-capacitor relaxation oscillator for radiation-hardened applications in the commercial GF 22 nm FDSOI CMOS technology.

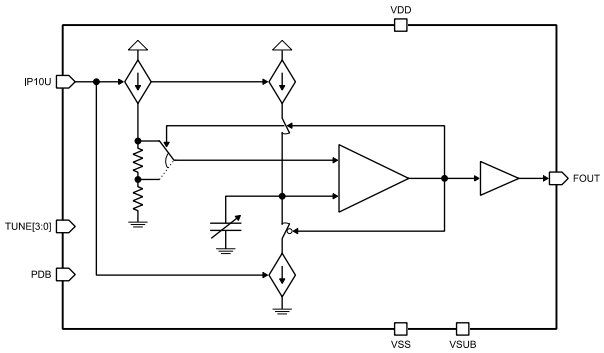
Features

DARE22G OSC100M main functionalities include:

- 100 MHz base output frequency (± 4%)
- 4-bit trimming calibration
- 92 - 112 MHz output frequency range over corners after calibration
- Maximum SET-induced jitter of 2.8 ns
- Power-down mode (< 1 µA)
- Max current consumption lower than 250 µA
- TID immunity over 100 krad (SiO_2)
- SET immunity over 60 MeV.cm^2/mg
- SEL immunity over 70 MeV.cm^2/mg

Block Diagram

The OSC100M macro cell mainly consists of a comparator and a tunable capacitor that is sequentially charged and discharged to produce an oscillating signal. Charge and discharge cycles are controlled by the comparator using voltage references generated internally through two resistors. A 10 µA sinking current signal provided via input IP10U is used as reference to voltage reference generation and charging/discharging circuits. This current can be provided by an instance of the DARE22G IVREF18 IP when it is co-integrated in the chip.



Pin Interface

Pin Name	Type	Description
VDD	Power	Power supply
VSS	Ground	Ground supply
VSUB	Ground	P-substrate bias voltage
IP10U	Analog	Reference current
PDB	Digital	Power-down enable
TUNE[3:0]	Digital	Frequency tuning bits
FOUT	Digital	Output clock

Physical Dimensions

DARE22G OSC100M is implemented as a core macro.

IP Name	Width	Height
OSC100M	68 µm	69 µm

Contact

For further information, please contact us at dare@imec.be

Operating Conditions

Performance and reliability are not guaranteed outside these recommended operating boundaries.

Parameter	Name	Minimum	Typical	Maximum	Unit
Supply voltage	VDD	0.72	0.8	0.88	V
Input reference current	I_{P10U}	9	10	11	µA
Operating temperature	T_J	-40	25	125	°C
ESD rating (HBM)	V_{HBM}	2			kV
TID immunity	TID	100			krad (SiO_2)
SET hardening	SET_{th}	60			MeV.cm^2/mg
SEL hardening	SEL_{th}	70			MeV.cm^2/mg