

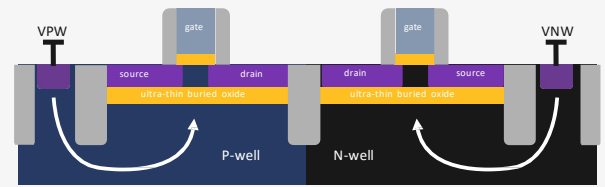
# Racyics® ABX® Adaptive Body Bias Generator

GlobalFoundries® 22FDX®



## DESCRIPTION

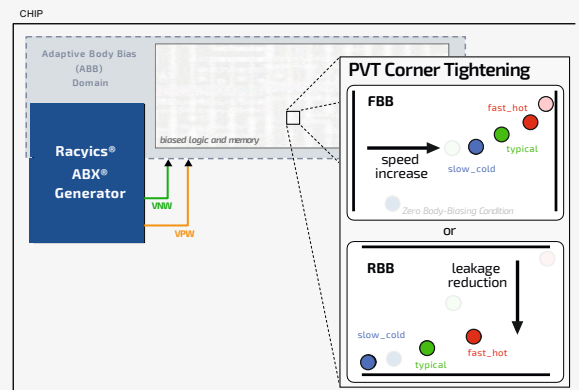
RI\_ABB\_GF22FDX is a cutting-edge adaptive body bias (ABB) generator for GlobalFoundries 22FDX technology. Featuring patented closed control loops with independent N-well and P-well body bias voltage generation, this silicon-proven IP dynamically compensates for process, voltage, and temperature (PVT) variations during operation.



## KEY FACTS

- ▶ Integrated adaptive body bias (ABB) control loop
- ▶ Charge pumps for N-Well and P-Well voltages, operated from IO supply voltage level
- ▶ Integrated PVT monitors for true independent adaptation of NMOS and PMOS performance
- ▶ Operation from typically 10 MHz, up to 50 MHz reference clock
- ▶ Available in forward (FBB) and reverse body bias (RBB) versions
- ▶ Available in multiple charge pump drive strengths supporting a wide range of active chip areas
- ▶ Delivered as hardmacro for easy and seamless integration
- ▶ Supports dynamic bias corners down to 0.40 V nominal
- ▶ Interoperable with foundation IP standard cells and SRAM

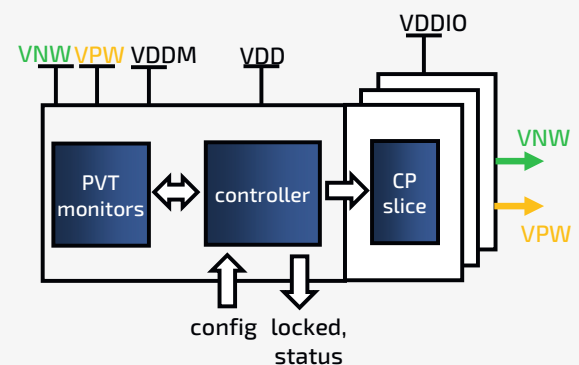
## ABX PVT CORNER TIGHTENING



## DESIGN VIEWS

- ▶ Verilog simulation models
- ▶ .lib /.db timing and power models
- ▶ .lef layout abstract views
- ▶ GDSII layout
- ▶ LVS netlist
- ▶ EMIR models
- ▶ DFT models
- ▶ Available for 22FDX PDKs

## ABX GENERATOR IP SCHEMATIC



## IP SPECIFICATION

| IP Type                     | Supplier | Specification   | Nominal Supply Voltages  |
|-----------------------------|----------|---|--|
| ABB controller IP hardmacro | Racyics  | $f_{ref} = < 10 \text{ MHz to } 50 \text{ MHz } >$<br>$P_{active} = 12 \mu\text{W (typical)}$<br>area $< 0.006 \text{ mm}^2$ (smallest pump strength)<br>$- 0.2 \text{ V} < \text{VNW} < 2.4 \text{ V}$<br>$- 2.4 \text{ V} < \text{VPW} < 0.2 \text{ V}$ | Body bias generation: 1.80 V<br>Control logic: 0.80 V<br>PVT monitors: 0.40 V / 0.45 V / 0.50 V / 0.55 V / 0.60 V / 0.65 V / 0.80 V / 0.90 V |

Compliant to PDKs 22FDX-EXT and 22FDX-PLUS



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