Racyics® ABX® Automotive Adaptive Body Bias Generator

GlobalFoundries® 22FDX®

CHALLENGE

RI_ABB_GF22FDX_AM is an adaptive body bias voltage generator for automotive applications in Globalfoundries 22FDX® technology. It contains a closed loop body bias regulation loop to generate N-well and P-well bias voltages for compensation of process, voltage and temperature (PVT) variations during operation. This results in up to 76% leakage power improvement for automotive grade-1 applications up to 150°C junction temperature.
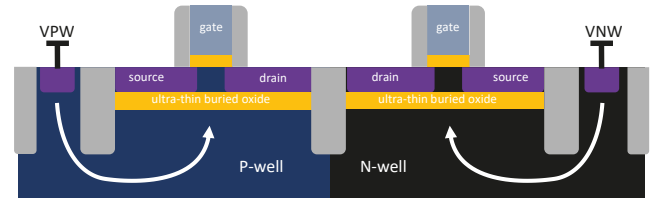

KEY FACTS

▸ 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 adaption of NMOS and PMOS performance

▸ Operation from typically 10MHz, up to 50MHz reference clock

▸ Available for forward (FBB) and reverse body bias (RBB)

▸ Available with multiple charge pump drive strengths supporting a wide range of active chip areas

▸ Delivered as hardmacro for easy and seamless integration

▸ ISO26262 Safety Element out of Context (SEooC) with ASIL D capability

▸ Interoperable with foundation IP standard cells and SRAM
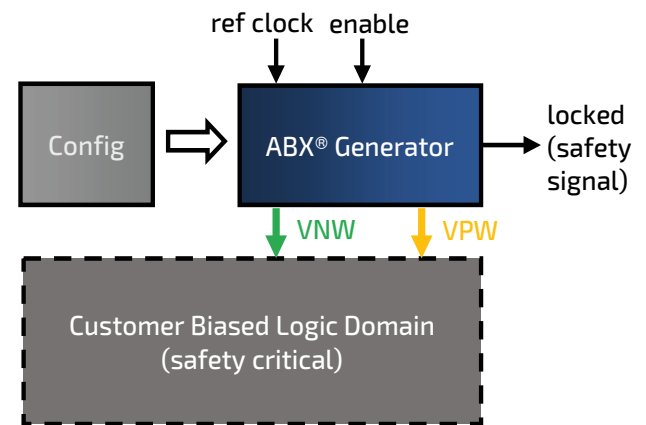
▸ Compliant to automotive grade-1 and grade-2

ABX® GENERATOR INTEGRATION SCHEME

DESIGN VIEWS

▸ Verilog simulation models

▸ .lib/.db timing and power models

▸ .lef layout abstract views

▸ NDM and Milkyway libraries

▸ GDSII layout

▸ LVS netlist

▸ EMIR models

▸ DFT models

ABX® GENERATOR IP SCHEMATIC
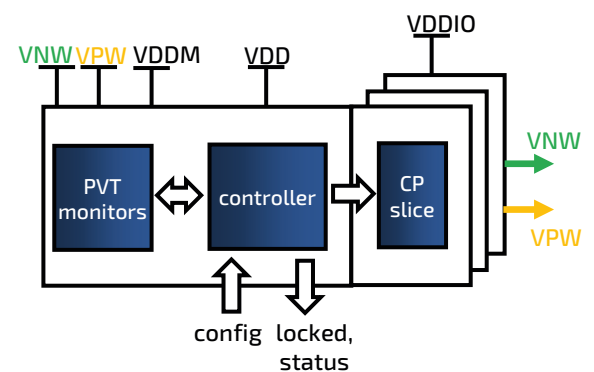

IP SPECIFICATION

IP Type	Supplier	Specification	Nominal Supply Voltages
Automotive ABB controller IP hardmacro	Racyics	f_{ref} = <10MHz to 50MHz> P_{active} < 200µW (typical) area < 0.0066mm² (smallest pump strength) -0.2V < VNW < 2.4V -2.4V < VPW < 0.2V Automotive grade-1 and grade-2 compliant ISO26262 SEooC with ASIL D capability	Body bias generation: 1.80V Control logic: 0.80V PVT monitors: 0.80V

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