

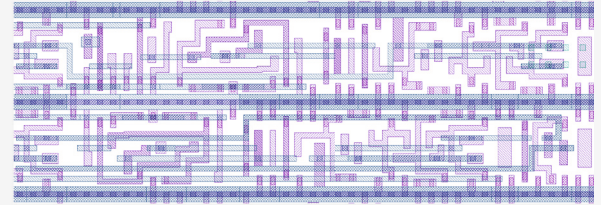
Racyics® Standard Cell Libraries

GLOBALFOUNDRIES® 22FDX®



CHALLENGE

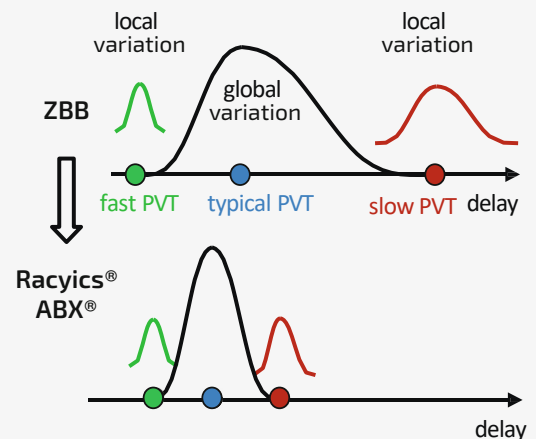
Body biasing is a disruptive **22FDX®** feature which enables the adaption of transistor threshold voltages after production during device operation. **Racyics®** dense 9T logic standard cells libraries and low power 8T standard cell libraries are fully enabled for the adaptive body biasing aware implementation and sign-off flow of the **Racyics® ABX® Platform** solution. The libraries include adaptive body bias aware characterization (CCS, CCSN, LVF) to fully leverage the benefits of **Racyics® ABX®** corner tightening at implementation and sign-off for improved PPA. Being able to operate down to 0.4 V, true minimum energy point (MEP) implementations are enabled. For automotive applications, **Racyics® ABX®** enables significant leakage reduction at 0.8 V high temperature corners.



KEY FACTS

- ▶ Contains > 300 cells, various Vt and channel length options
- ▶ Robust power supply rails on M2, optimized M1 pin access with at least two on-track M2 access points
- ▶ DFM and variability optimized layouts and variation aware placement attributes for automated place & route
- ▶ Enabled for reliable ULV operation down to 0.4 V in combination with adaptive forward body bias
- ▶ Characterization corners for -40 °C to 150 °C temperature range for **Racyics® ABX® aware timing and power sign-off**
- ▶ LVF characterization for non-gaussian random distributions
- ▶ Silicon validation for wide range of PVT conditions
- ▶ Automotive grade-1 compliant library available

RACYICS® ABX® SIGN-OFF IMPROVEMENTS



DESIGN VIEWS

- ▶ Verilog simulation models
- ▶ .lib /.db timing (NLDM, CCS, CCS noise, LVF) and power models
- ▶ .lef layout abstract views
- ▶ NDM and Milkyway libraries
- ▶ GDSII layouts
- ▶ LVS netlist

IP SPECIFICATION

IP	Supplier	Description	VT options	Gate Length	Supply Voltages [V]	ZBB (Zero Bias)	ABX	Ready for Evaluation	Ready for Testchip	Ready for Production
rilib_gf22fdx_9t	Racyics®	116CPP 9T CNRX STD-cell library with automotive grade-1 compliance	RVT, HVT	C20, C24, C28, C32, C36	0.80	yes	yes, RBB (Vt dependent)	now	now	now
rilib_gf22fdx_8t			SLVT, LVT	C20, C24, C28, C32, C36	0.40 / 0.45 / 0.50 / 0.60 / 0.80 V	yes	yes, FBB	now	now	now
rilib_gf22fdx_8t		116CPP 8T CNRX STD-cell library	RVT, HVT	C20, C24, C28, C32, C36	0.55 / 0.80 / 0.90	yes	yes, RBB (Vt dependent)	now	now	now



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