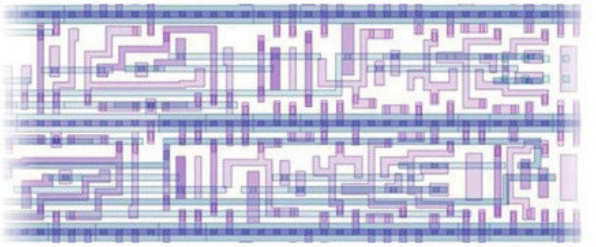
Racyics® Standard Cell Libraries

GLOBALFOUNDRIES® 22FDX®

CHALLENGE

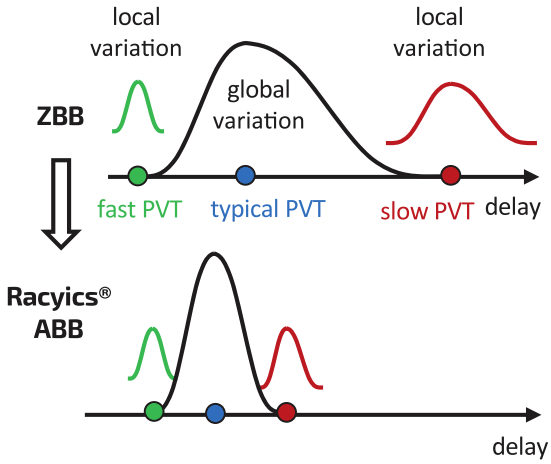
Body biasing is a disruptive 22FDX® feature which enables the adaption of transistor threshold voltages after production during device operation. Racyics® dense 9T logic standard cells libraries and low power 8T standard cell libraries are fully enabled for adaptive body biasing. The libraries include ABB aware characterization (CCS, CCSN, LVF) to fully leverage the benefits of ABB corner tightening at implementation and sign-off for improved PPA. Being able to operate down to 0.40V, true minimum energy point (MEP) implementations are enabled.



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 0.4V in combination with adaptive forward body bias
- Characterization corners for -40°C to 125°C temperature range for **Racyics® ABB aware timing and power sign-off**
- LVF characterization for non-gaussian random distributions
- Silicon validation for wide range of PVT conditions

RACYICS® ABB SIGN-OFF IMPROVEMENTS



DESIGN VIEWS

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

IP SPECIFICATION

IP	Supplier	Description	VT options	Gate Length	Supply Voltages [V]	ZBB (Zero Bias)	ABB	Ready for Evaluation	Ready for Testchip	Ready for Production
rilib_gf22fdx_9t	Racyics	104CPP 9T CNRX STD-cell library	SLVT, LVT	C20, C24, C28	0.40/0.45/ 0.50/0.60/ 0.80	yes	yes, FBB	now	now	now
			RVT, HVT, LLHVT	C20, C24, C28	0.65/0.80/0.90	yes	yes, RBB	now	now	now
rilib_gf22fdx_8t		116CPP 8T CNRX STD-cell library	SLVT, LVT	C20, C24, C28, C32, C36	0.40/0.45/ 0.50/0.60/ 0.80V	yes	yes, FBB	11/2018	11/2018	03/2019
			RVT, HVT, ULLHVT	C20, C24, C28, C32, C36	0.65/0.80/0.90	yes	yes, RBB	01/2019	02/2019	06/2019

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