



Rad-Hard Standard Cell Digital Library

FEATURES

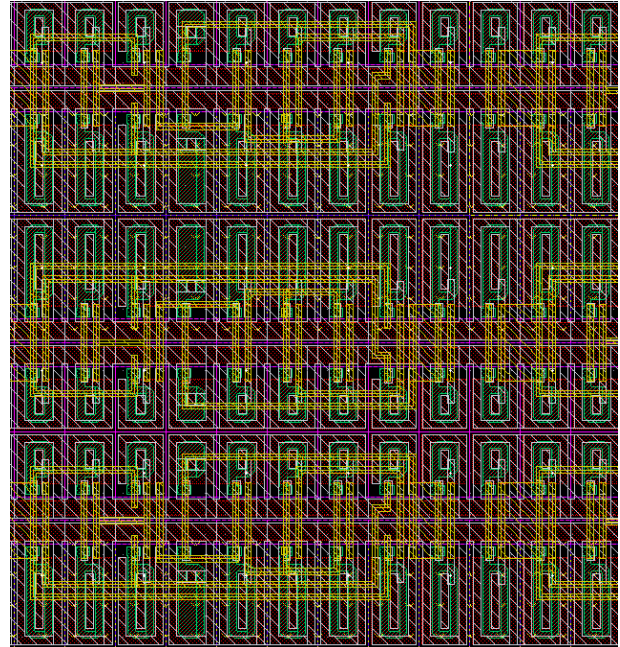
- CMOS process X-FAB 180nm (xh018)
- Operating Voltage 3.3V±10%
- Max Frequency 60MHz
- Wide Temperature Range: -55 to +125°C
- Density 25 k-gates/mm² (eq. NAND)
- More than one hundred gate cells
- TID hardened up to 1 Mrad (Si)
- SEL hardened up to 60 MeV*cm²/mg (Si)
- SEU hardened FF up to 40 MeV*cm²/mg (Si)
- Compatible with X-FAB standard cell grid
- Suitable for digital ASICs using 4, 5 or 6 metal levels

DESCRIPTION

RadLib33XF is a radiation hardened standard cell library intended for digital ASICs development (core processors, DSPs, microcontrollers) and incorporating special layout and design features allowing operation at high-level of radiation. RedCat Devices proprietary RHBD solutions guarantee immunity to SEL (Single Event Latch-up) up to 60 MeV*cm²/mg (Si) (Xe ions) and resistance to TID up to 1 Mrad (Si) (Cobalt 60) making **RadLib33XF** the best solution for both low orbit and deep space missions.

RadLib33XF is delivered with liberty description (.lib), verilog (.v), abstract (.lef) and full extracted netlist for making extended spice and verilog simulations. Closing elements, fillers, corners and enhanced guard rings are easily handled by the most common EDA tools.

RadLib33XF can be used combined with **RadLib18XF** for those digital parts requiring high-voltage blocks.



Inverter, Buffer (x1, x2, x4, x8)
AND, OR, NAND, NOR (x1, x2, x4, x8)
AND, OR, NAND, NOR with three/four inputs
XNOR, XOR (x1, x2, x4, x8)
Flip-Flop (D, Reset, Clear)
Latch (Reset, Clear)
MUX, Tristate, Switch, Voter, Antenna Diode
DECAP (x1, x2, x4, x8), TIELO, TIEHI
Closing Elements, Guard Rings, Fillers

Tab. 1 – Cell List Summary

Symbol	Parameter	Limits	Units
VDD	Supply Voltage	3.3	V
T _{OP}	Operating Temperature Range	-55 to 125	°C

Tab. 2 - Absolute Maximum Ratings

Symbol	Parameter	Limits	Units
VDD	Supply Voltage	3.3 ± 0.33	V
GND	Ground	0	V
V _{IL}	Input Low Voltage	0 ± 0.6	V
V _{IH}	Input High Voltage	VDD ± 0.6	V

Tab. 3 - Recommended Operating Conditions

Parameter	Value	Unit
Total Dose	1	Mrad (Si)
SEL LET _{th}	60	MeV*cm ² /mg (Si)
SEU LET _{th}	40	MeV*cm ² /mg (Si)

Tab. 4 - Radiation Hardness Design Specifications

