

# Your ESD / IO Design Experts

## SEVICES

ESD / IO design

Special Analog IOs, e.g. RF

ESD Consulting

## PRODUCT IO Libraries

Standard IO libraries

Template IO libraries

Fully Customized IO libraries

Design of Analog RF-IOs

## ESD/IO IP

Si-proven in CMOS  
180nm to 45nm

Product proven in 100s of ICs

Foundry proven incl. TSMC

Fully portable

Simulation verified ESD in  
product specific designs

## CONTACT

[info@certus-semi.com](mailto:info@certus-semi.com)

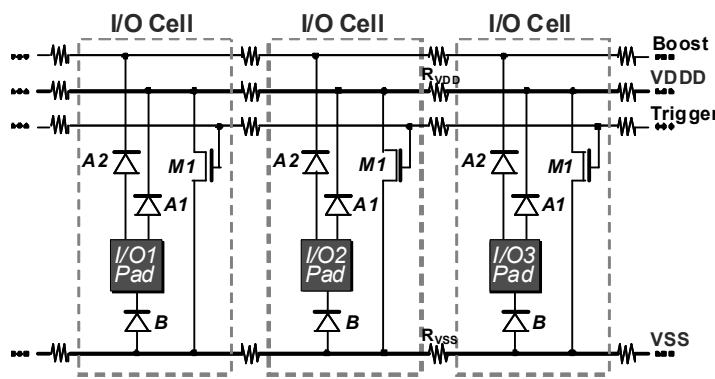
## About Certus

Certus Semiconductor is a global company, founded by a collaborating team of world renowned experts in both ESD and IO design. Certus is offering the semiconductor industry a new approach to custom IO libraries, including tailored IO designs, and ESD solutions based on simulation that leverage specialized silicon ESD models.

The technique enables fully silicided NMOS devices in output drivers thus consuming less area, capacitance, resistance – ideal for high-speed applications. The highly efficient ESD design technique includes a SPICE simulation and optimization process that guarantees a highest confidence level for IC qualification even for the highly package dependent CDM specification.

## IO Cell Library Offerings

Certus is offering their customers new options for IO design. In addition to the standard “off the shelf” IO libraries provided by many foundries and IP companies, Certus, is offering flexible IO template libraries.



*ESD protection design applying a distributed, boosted rail-clamp network*

## ESD Design Methodology

Certus has acquired rights and licenses to market and distribute ESD and IO design IP, based upon Freescale’s class leading proprietary ESD/IO technology. The unique ESD/IO design concept applies a distributed and boosted rail-clamp network for most uniform and thus efficient ESD protection along an IO bank.

An IO cell template defines the cell physical architecture and includes the cell frame, pads, power bussing, ESD circuitry, etc. – that is everything except for the functional I/O circuitry. In addition to the IO cell template, a complete I/O template library includes the full set of required power/ground cells, filler/cut cells and corner cells.

# Your ESD / IO Design Experts

**SEVICES**

- ESD / IO design
- Special Analog IOs, e.g. RF
- ESD Consulting

**IO Cell Libraries**

- Standard IO libraries
- Template IO libraries
- Customized IO libraries
- Analog RF-IOs

**ESD/IO IP**

- Si-proven in CMOS 180nm to 45nm
- Product proven in 100s of ICs
- Foundry proven incl. TSMC
- Fully portable
- Simulation verified ESD in product specific designs

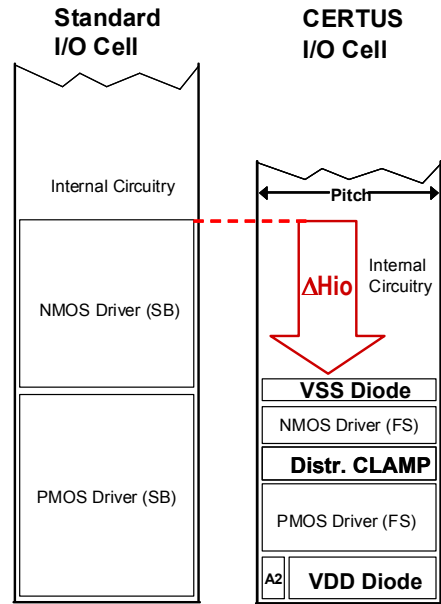
**CONTACT**

[info@certus-semi.com](mailto:info@certus-semi.com)

The IO template libraries allow our IC design customers to concentrate on what they do best - custom functional IO design - while the process technology specific challenges of robust ESD and physical architecture definition is left to Certus. With the template libraries fully custom IO libraries can be created in an amazingly short amount of time.

**Product / Foundry proven IP**

Certus has both IO template libraries and full featured IO libraries in a variety of processes including the 180nm, 130nm, 90nm, 65nm and 45nm nodes. These solutions are Si-proven in hundreds of products and in a variety of foundries world-wide including TSMC.



*Certus IO cell shrink compared to standard IO cell typically > 20%*

**Benefits summary**

- Highest confidence-level for first time-right IC ESD Design due to SPICE simulation, optimization and verification methodology including HBM, MM, CDM specifications
- Most area efficient solution allow for IO height reduction of typically more than 20% compared to standard foundry IOs
- Portable & foundry proven including TSMC
- Si product proven IP in most advanced CMOS from 180nm down to 45nm
- Uniform ESD protection levels with more effective CDM protection
- Standard, full custom libraries plus IO template library offering
- Enabling of short-time custom IO library design

