A 1.0V to 5V Analog I/O library that includes an HDMI, LVDS, and Analog/RF Low Capacitance pad set in TSMC 45/40nm HPM process.

Summary

This library is collection of analog only IO and Power/Ground pads that include ESD. The target applications are high performance analog interfaces including HDMI, RF, LVDS, basic analog and other applications. The pads include a host of specialty features including fail safe, low capacitance, high ESD protection, and IEC robustness. The IOs are designed to trigger and protect interfaces during Electrical Overstress (EOS) events during normal operation. A key feature of the library is the extremely small footpr int of the inline IO set, only 2.2um bigger than the bond pad itself. Capacitance can range from <150fF to 250fF and is scalable based on the customers needs between ESD robustness and capacitive loading.

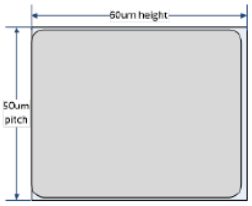
Features

- In-line low-cap analog, 50um pitch x 60um height
- Dual-row, staggered pitch of 25um 150um height
- AVDD = 1.V to 3.3V nominal, 5V tolerant HDMI option
- Capacitance 150fF to 250fF including bond pads*
- HBM >4kV*, CDM >800V*, IEC >2kV option*
- EOS Protection
- Junction temperature range: -40C to 125C
- Can integrate with TSMC standard I/O

HDMI and LVDS PAD Features

- Includes Power and Ground pads
- <250fF per I/O including bondpad
- 1.8V to 3.3V power supply (HDMI)
- 5V Tolerant (HDMI only)
- Fail-Safe I/O (HDMI only)
- Pad Macros provide ideal parasitic matching between differential signal pads

BOND PAD I/O



The entire HDMI, RF and Analog In-Line cells are only 2.2um taller than the bond pads, completely CUP (Circuit Under Pad) and providing the industries smallest footprint for RF, Analog, and HDMI Low-Cap ESD and Pad Solutions.

Models and Support Files

- GDS Layouts
- LEF Abstracts
- CDL netlist for simulation and LVS
- Functional models in behavioral Verilog with timing arcs

Front-end Devices

- 2.5V overdriven 3.3V thick-oxide NMOS and PMOS; No ESD implant layer or special masks required.
- Back-end: Metal 1 to Metal 8, AP bondpad layer for Wire-bond, using Circuit-Under-Pad construction.

0.1 Additional Products

Certus also supports I/O libraries in the following TSMC nodes: 180nm, 130nm, 110nm, 65nm, 55nm, 28nm, 22nm and 16/12nm. Additional Certus libraries are available across technologies supported by various foundries. Certus is particularly suited at providing custom variants in a cost-efficient framework. Feel free to inquire about supplementary physical or electrical features to suit your needs.

* Capacitance and ESD robustness is a sliding scale, customer opting for lower capacitance do so at a cost of ESD robustness, ad vice-versa. Nominal numbers are for 200-250fF Capacitive I/O structures.

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