

3.3V GPIO WITH 3.3V LVDS, I2C OPEN-DRAIN & ANALOG CELL IN TSMC 130NM TECHNOLOGY



A TSMC 130nm Wirebond IO library with 3.3V GPIO, 3.3V LVDS TX/RX, 3.3V I2C open-drain, 3.3V analog cell, OTP program cell and associated ESD.

SUMMARY

Key attributes of this IO library include an extended operational temperature range (-55°C to 200°C), a sleep retention mode, and a built-in power regulation PMOS device for core VDD. The GPIO cell can be configured as input, output or open-drain with an optional internal 60K ohm pull-up or pull-down resistor and a selectable Schmitt trigger. Cells for IO & core power and ground with built-in ESD are included. 3.3V LVDS transmit & receive cells, along with 3.3V programming, 3.3V I2C/SMBUS open drain and analog cells (and associated ESD) complement the GPIO offering. The library is enriched with feed-through, filler, corner and domain-break cells to allow for flexible pad ring construction. ESD design levels are 2KV HBM and 500V CDM.

OPERATING CONDITIONS

Parameter	Value
VDDIO	3.3V
Core VDD	1.5V
Tj	-55°C to 200°C
Max_Load	15pF

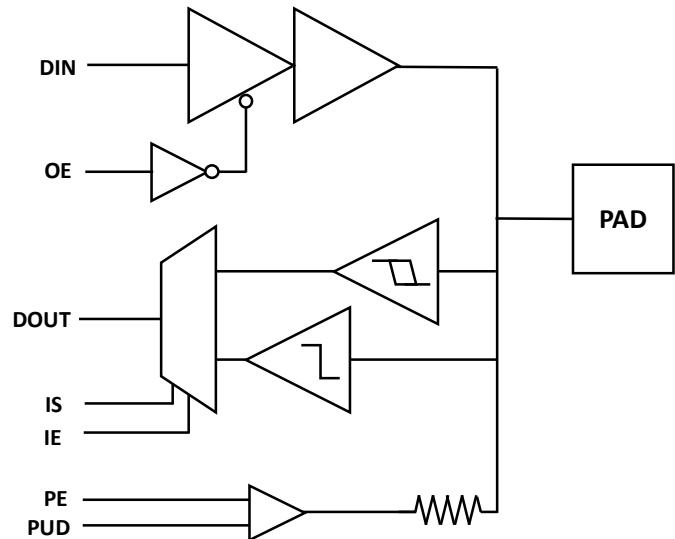
CELL SIZE & METAL STACK

Cell size	Metal Stack	WireBond Pitch
140x235um	8M_6x1z	140um single

LIBRARY CELL SUMMARY

Cell Type	Feature
Supply / ESD	3.3V; 1.5V; GND
GPIO	50MHz (@15pF)
I2C Open-drain	3.3V
LVDS	3.3V TX & RX
Analog	3.3V w/ selectable PD resistor
OTP	3.3V programming gate cell
Break cells	VDDIO, VDD
Filler cells	1um, 5um digital & analog

GPIO BLOCK DIAGRAM



GPIO FEATURES

- Extended operational temperature range (-55°C to 200°C)
- Sleep retention mode (not shown)
- Built-in regulation PMOS device
- Independent output and input enable / disable¹
- Selectable Schmitt trigger receiver
- Selectable 60KΩ pull-up or pull-down resistor
- ESD: 2KV HBM, 500V CDM²

Certus also supports IO libraries in the following TSMC nodes: 180nm, 65nm, 40nm, 28nm, 22nm, and 16/12nm. Additional Certus libraries are available across technologies supported by Global Foundries & Samsung. Certus is particularly suited at providing custom variants in a cost-efficient framework. Feel free to inquire for supplementary physical or electrical features to suit your needs.

1. HiZ when output disabled; input held low when input disabled.
2. CDM rating is a function of package size. Rating shown is for nominal packages. Certus IOs typically handle 10-20A Peak CDM currents, depending on IO type.