CUSTOM IO FOOTPRINTS, FORMATS AND PAD PLACEMENTS IN TSMC 22nm TECHNOLOGY

CERTUS semiconductor
CUSTOM IO AND ESD SOLUTIONS

With our flexible customization approach, Certus is able to offer the same IO functionality across a variety of metal stacks, footprints and Wirebond pad placements to best suit your needs.

SUMMARY

The same feature-rich Certus 22nm GPIO, with dynamically adjustable 1.8V / 3.3V supply operation, is offered across a variety of metal stacks and aspect ratios to optimally address customer needs according to metal stack, die perimeter, and package choice. Identical feature sets can be configured from a 6-metal single-row 55um pitch IO bank to a 9-metal triple-row 20um pitch IO bank, depending on requirements. Additional custom cells can be incorporated into any metal stack / aspect ratio option upon request.

CELL SIZE & METAL STACK OPTIONS

Option	*Cell size*	*Metal Stack*	*WireBond Pitch*
1	55x75um	6M_4x1z	55um single
2	25x130um	7M_5x1z	25um dual
3	25x130um	9M_6x2z	25um dual
4	20x186um	9M_6x2z	20um triple

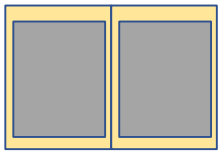
GPIO OPERATING CONDITIONS

Parameter	*Value*
VDDIO	1.8 / 3.3V selectable
Core VDD	0.9V
Tj	-40°C to 125°C
Max_Load[1]	50pF (10pF at speed)

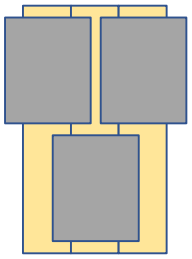
COMMON GPIO FEATURE SET

- Multi-voltage 1.8V / 3.3V switchable operation
- 25MHz, 75MHz, & 150MHz GPIO speed options[1]
- 5V I2C Open-drain IO cell
- 1.8V Analog cell
- Full-speed output enable
- Independent power sequencing
- Schmitt Trigger receiver
- 60KΩ selectable pull-up or pull-down resistor
- ESD: 2KV HBM, 500V CDM[2], 2KV IEC 61000-4-2[3]

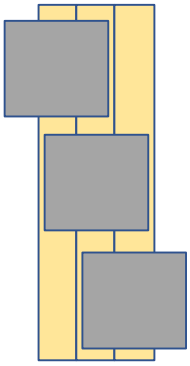
GPIO FOOTPRINTS AND PAD PLACEMENT



Option 1 – 6 metals, 55um single-row pad pitch. Advantage: reduced cost & inline area optimization



Options 2 & 3– 7 or 9 metals, 25um dual row pad pitch. Advantage: 2 cost points, 2x perimeter efficiency



Option 4 – 9 metals, 20um triple row pad pitch. Advantage: 25% additional perimeter efficiency

Certus also supports custom IO variants in the following TSMC nodes: 180nm, 130nm, 110nm, 65nm, 55nm, 45/40nm, 28nm, and 16/12nm. Certus is particularly suited at custom IO solutions in a cost-efficient framework. Feel free to inquire for supplementary physical or electrical features to suit your needs.

1. GPIO speeds are load dependent (faster for lighter loads, slower for heavier). Speeds shown are at 10pF.
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.
3. Please contact a Certus representative for IEC 62100-4-2 protection levels achievable with your design.

