

Teststructure Pad Layout Considerations for TLP

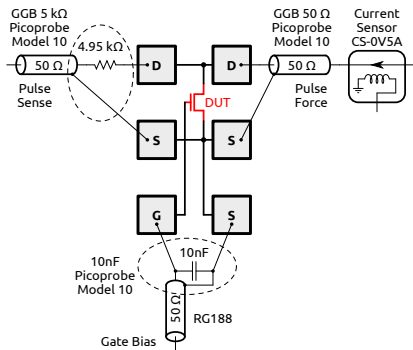


<https://www.hppi.de/>

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Type 2

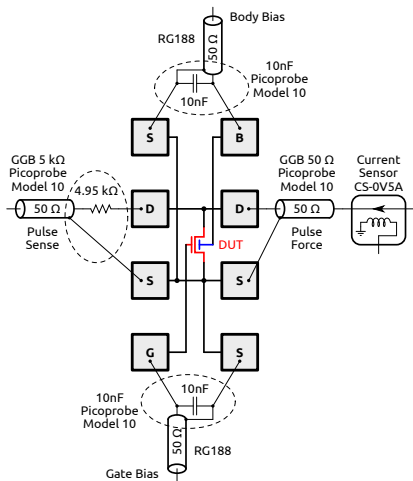
Kelvin pulse force/sense + gate bias



- ▶ better than type 1
- ▶ only 1 needle per pad
- ▶ decouple gate from drain (hot side)
- ▶ can be fixed or flex pitch

Type 3

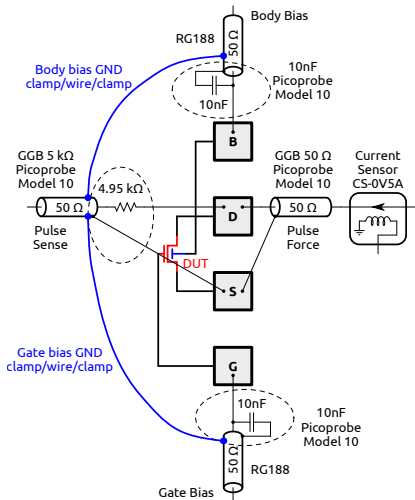
Kelvin pulse force/sense + gate bias + body bias



- ▶ gate and body bias
- ▶ can be fixed or flex pitch
- ▶ advantage: orthogonal directions of 4 micropositioners
- ▶ drawback: 8 pads and parasitic wiring

Type 4

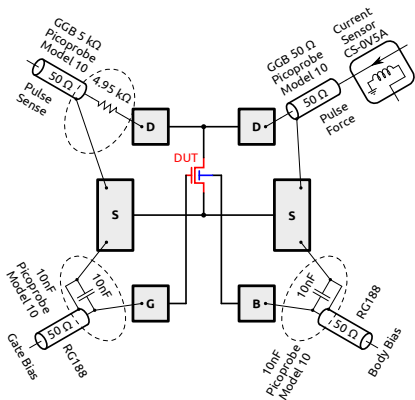
Kelvin pulse force/sense + gate bias + body bias



- ▶ gate and body bias
- ▶ gate bias GND and body bias GND are tapped to pulse sense GND
- ▶ therefore no gate or body bias GND bouncing because of no voltage drop in the pulse sense GND
- ▶ less chip area consumption

Type 5

Kelvin pulse force/sense + gate bias + body bias



- ▶ gate and body bias
- ▶ enlarged and exposed source pads
- ▶ works on all probe stations, because of only east/west and no north/south arrangement of micropositioners
- ▶ fixed pitch probes preferred

Conclusions

- ▶ type 2 and 3 are useful for convenient probing also at fixed pitch
- ▶ type 4 is most area efficient
- ▶ type 4A is better because of one needle per pad
- ▶ type 5 is universal and works on all type of probe stations and avoids additional GND clamps