

Thermal Digital Twin

Maximize hardware performance,
minimize downtime!

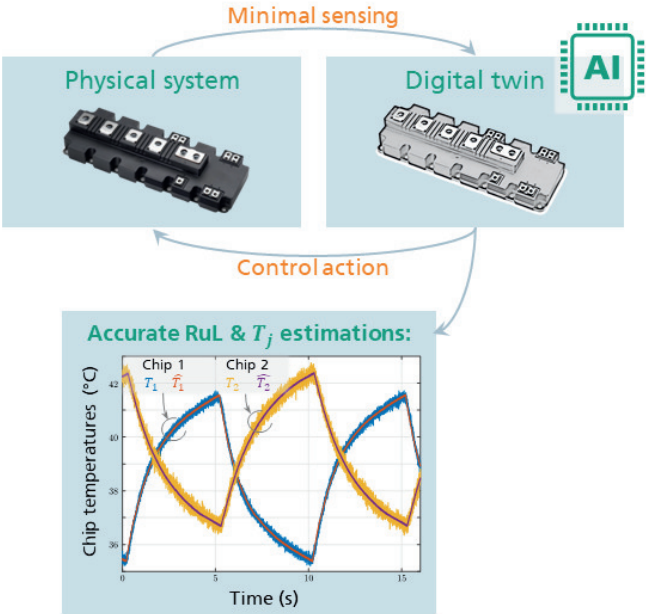
Benefits of our monitoring approach:

- **Online monitoring** of thermal system ageing
- **Optimized maintenance planning** through remaining useful lifetime estimation
- **Improve lifetime** through active thermal control and PQ-power curve extension
- Design margin reduction, owing to accurate T_j estimation

Thermal Digital Twins #WeKnowHow

Assessing power modules' health can rely on thermal impedance, but this parameter is difficult to monitor online with current methods. Our **thermal digital twins (DTs)** approach creates a realtime-capable replica of the physical thermal behavior and enables **monitoring the thermal impedance** online.

By measuring a limited number of temperatures at selected points within a power module, its comprehensive equivalent thermal model is identified. This is then used to **accurately estimate transistors' temperatures (T_j)** and assess their degradation levels.



Fraunhofer ISIT
Active Reliability

Dr. Yoann Pascal
Phone +49 152 1341 7028
yoann.pascal@isit.fraunhofer.de

Scan for further
information!

