



## Product Brief

# MIPAQ™ Pro

## A new dimension in smart protection

Based on more than twenty years of experience in the field of high-power modules and systems, we have developed the all-new MIPAQ™ Pro Intelligent Power Module (IPM).

MIPAQ™ Pro is a fully qualified and tested IPM integrating IGBTs, gate drivers, a heat sink, sensors, digital control electronics as well as digital bus communication. It comes in a half-bridge configuration with blocking voltages of 1200V and 1700V. Nominal current ratings of up to 2400A are supported. The new high power IPM is available with liquid-cooled as well as air-cooled heat sinks.

### Smart protection

The MIPAQ™ Pro provides outstanding protection technologies. All key operating parameters are monitored closely and warning signals are issued. Amongst others, output current, DC voltage and operating temperatures ( $T_{vjop}$ ) of the IGBTs and the diodes are continuously monitored. This functionality ensures that the IPM operates safely within the specified limits. A completely new product design based on smart protection significantly extends the uptime of the application.

### Customized authentication

An Infineon security microcontroller is integrated into the MIPAQ™ Pro. Individual certificates for authentication support can be stored within the IPM. This assures the high quality and reliability of the original system in the short and, more importantly, in the long run. Moreover, system manufacturers can benefit from control over the after-sales business since power stages can be authenticated. In addition, an Infineon certificate is already embedded to provide authentication of original parts.

### Design flexibility

The MIPAQ™ Pro is a ready-to-use IPM that provides monitoring and access to internal parameters like output current, DC-voltage and operation temperatures. Adaptations, e.g. of the warning levels, can be done quickly via digital bus communication and an option slot can be used to realize signal adaptations. Consequently, system manufacturers can enjoy fast and smooth design-ins.



### Key features

#### Longer application uptime

- › Monitoring of key operating parameters
- › Continuous calculation of  $T_{vjop}$
- › Early warnings

#### Fast design-in

- › Fully tested subsystem
- › Parameterization via digital bus
- › Adaptations through option slot

#### Control over after-sales business

- › Customized authentication using Infineon security microcontroller

#### Scalable up to 7 MW

- › Adjustable balancing for paralleling

#### Compact inverter

- › Power density increased by up to 35 %<sup>1)</sup>
- › Small footprint

<sup>1)</sup> Compared to ModSTACK™ C



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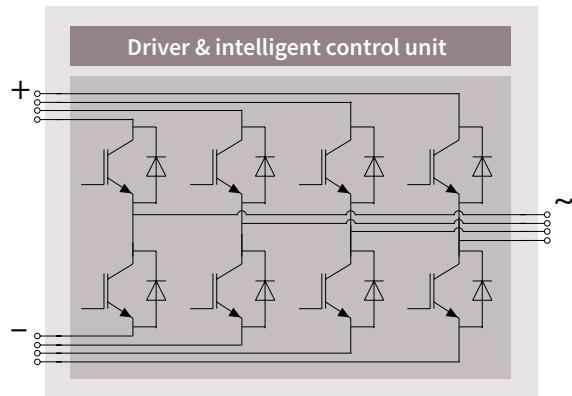
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### Modularity

As many as four MIPAQ™ Pro IPMs can be paralleled by daisy-chain to cover large power ranges up to 7 MW. Parallelizing is facilitated by adjustable delay settings that ensure a balanced set-up of the overall inverter.

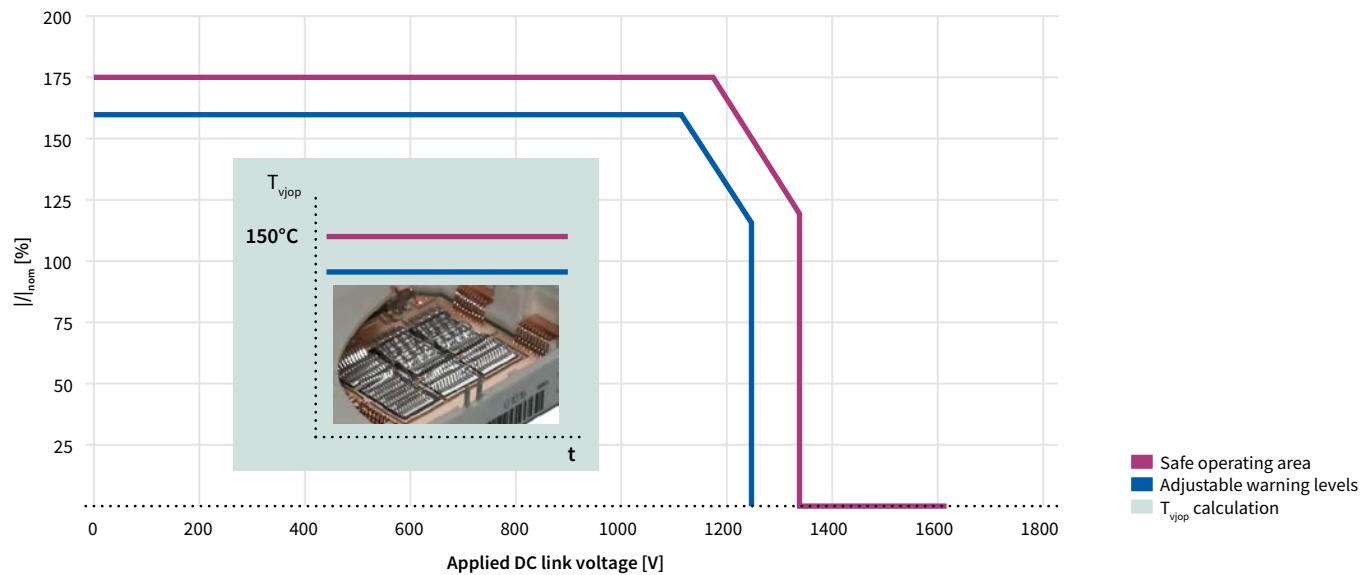
### Performance

MIPAQ™ Pro has a small footprint with a large output power; a nominal current of up to 2400 A is supported to realize compact inverters.



Block diagram of MIPAQ™ Pro with 2400 A

### Smart protection – monitoring key operating parameters with respect to specified limits



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