



We are the link
between the real and
the digital world.

Design your own GPD using Infineon's 22kW reference inverter

Infineon's virtual show 2020



Agenda

- 1 22kW GDP reference design overview
- 2 Advanced isolation concept
- 3 Feature set of current sensor TLI4971-A120T5
- 4 System enhancement through thermal performance
- 5 Summary

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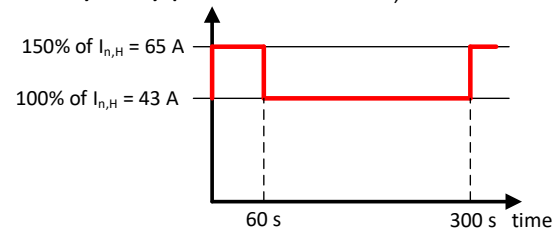
Quick facts for Infineon's new Industrial Drives reference design

Parameters	Values
Input	
Voltage	340 – 480 V _{rms}
Current	70 A _{rms}
DC bus voltage	460 V – 670 V typ.
Switching frequency	4 kHz nom 16 kHz max
Output Current per leg	60 A _{rms}
Main Infineon products	IGBT Module FP100R12W3T7 Current Sensor TLI4971 Auxiliary Power supply IMBF170R1K0M1 Microcontroller XMC4800/XMC4300

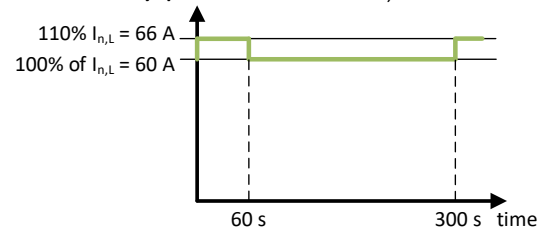


Heavy duty power 22 kW - $I_{n,H} = 43$ A

Potential Applications

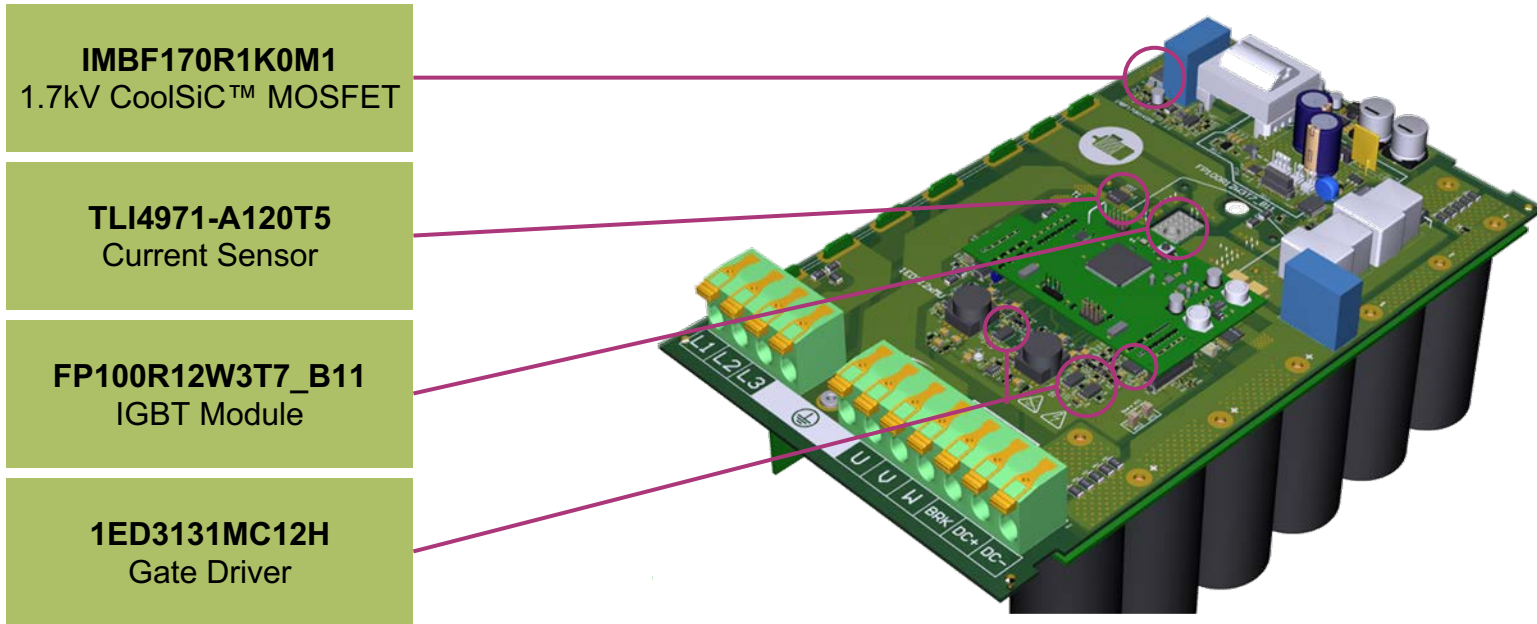


Normal duty power 30 kW - $I_{n,L} = 60$ A



Combining Infineon's newest technologies of IGBT7, gate driver, current sensor and control in one system

Reference design is built in the industry-established form factor



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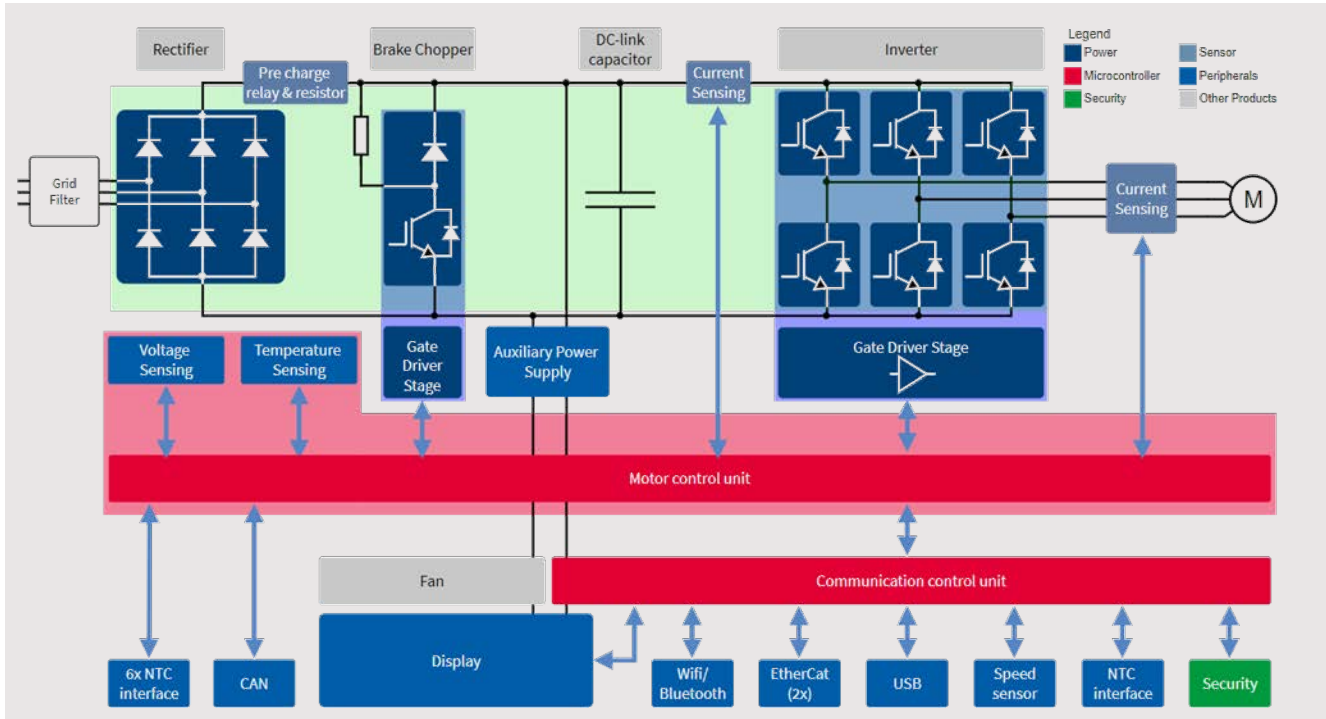
5 Summary

22kW GPD board enables testing the latest Infineon products under your operation conditions

Features

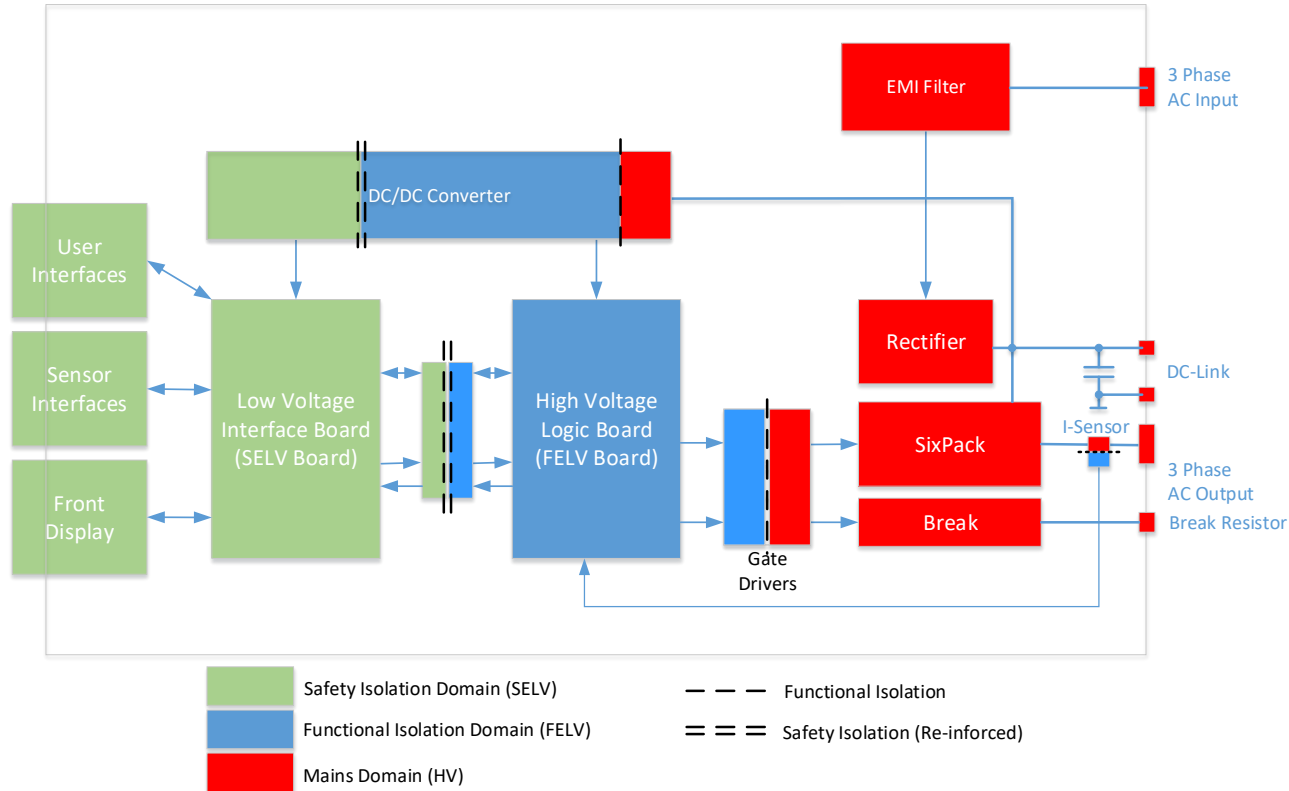
- › 3 phase AC/AC converter
- › EMI filter and DC-Link capacitors included
- › In-phase current measurement and overcurrent protection scheme with current sensor TLI4971
- › Phase voltage measurement
- › Additional spare temperature sensor inputs for evaluation

Block Diagram



22kW GPD reference design

Advanced isolation concept



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A coreless differential current sensor based on Hall technology

Featured products

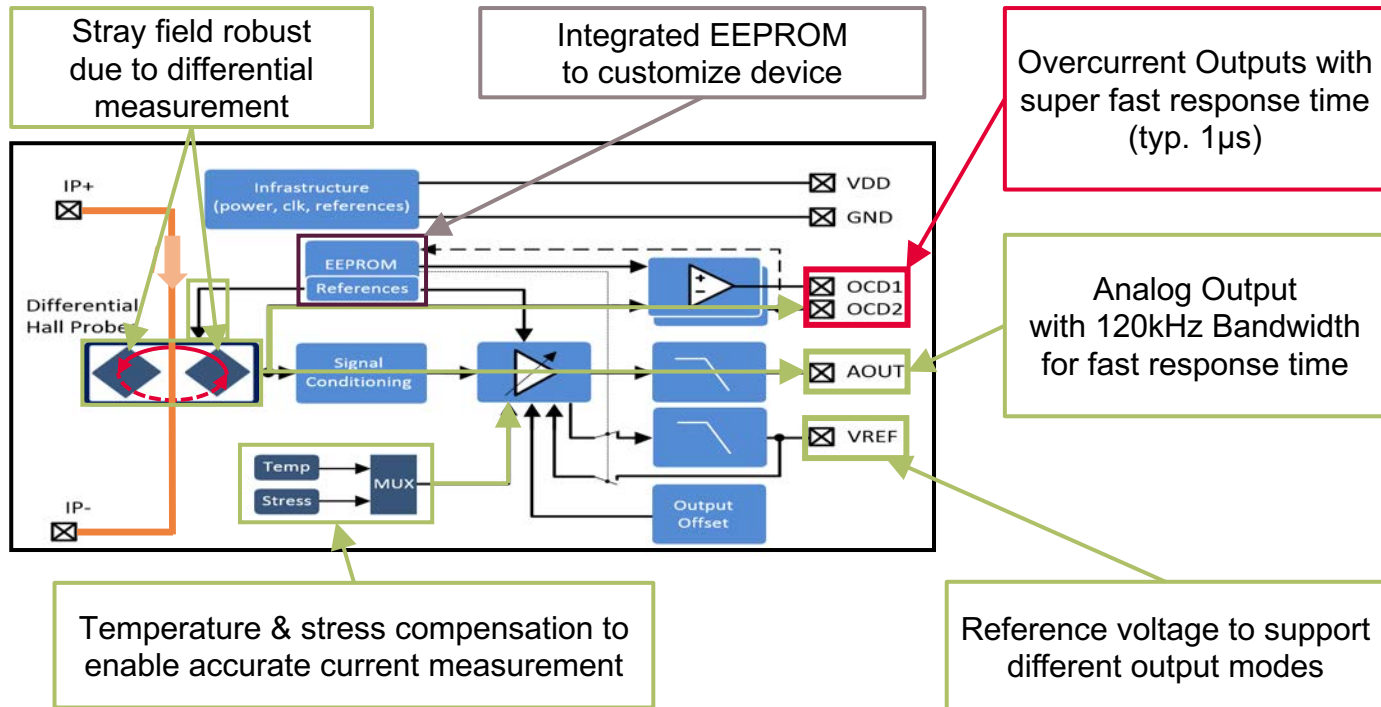
IMBF170R1K0M1
1.7kV CoolSiC™ MOSFET

TLI4971-A120T5
Current Sensor

FP100R12W3T7_B11
IGBT Module

1ED3131MC12H
Gate Driver

Simplified layout, reduced design risk



Low current rail resistance enables measurement of high currents

Featured products

Facts & Figures

IMBF170R1K0M1
1.7kV CoolSiC™ MOSFET

Ultra-low power loss due to low resistance of current rail

- › Measurement up to 70 A_{RMS} at 690 V_{RMS} within ±120 A full scale range

TLI4971-A120T5
Current Sensor

Reliable current measurement over lifetime (no re-calibration)

- › Typical error at 25°C < 2%

FP100R12W3T7_B11
IGBT Module

Functional isolation for high-voltage application

- › Current rail resistance specified at **225 μΩ** typical

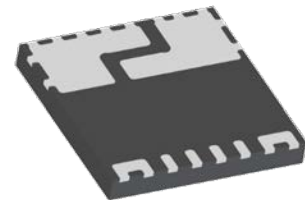
1ED3131MC12H
Gate Driver

Easy and compact design

- › Analog output signal with min. 120 kHz bandwidth
- › Programmable overcurrent detection thresholds up to 2.25 x IFSR

Measurement of high currents and protection in one device

Featured products	Features & Benefits	
IMBF170R1K0M1 1.7kV CoolSiC™ MOSFET	Magnetic coreless differential sensor	<ul style="list-style-type: none">› No hysteresis› Overload capability› Stray field immunity
TLI4971-A120T5 Current Sensor	Power Package	<ul style="list-style-type: none">› Very low power dissipation› Superior system accuracy
FP100R12W3T7_B11 IGBT Module	Best-in-class temperature and lifetime accuracy	<ul style="list-style-type: none">› Protection capability for upcoming IGBT technologies› Easy system integration
1ED3131MC12H Gate Driver	<ul style="list-style-type: none">› Improved system performance› Support of upcoming power technologies› Space and cost saving	

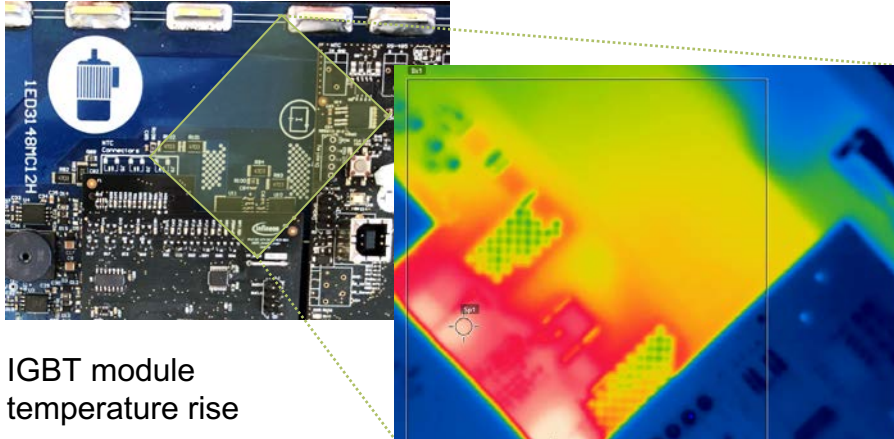


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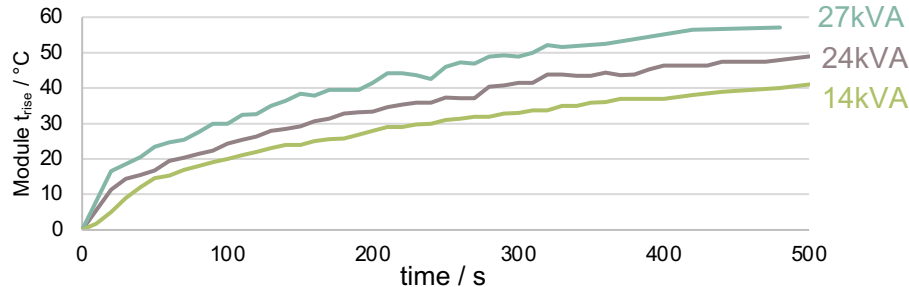
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Infiniteon's XENSIV™ TLI 4971-A120T5 – Low resistance of current rail provides enhanced thermal performance

Thermal performance

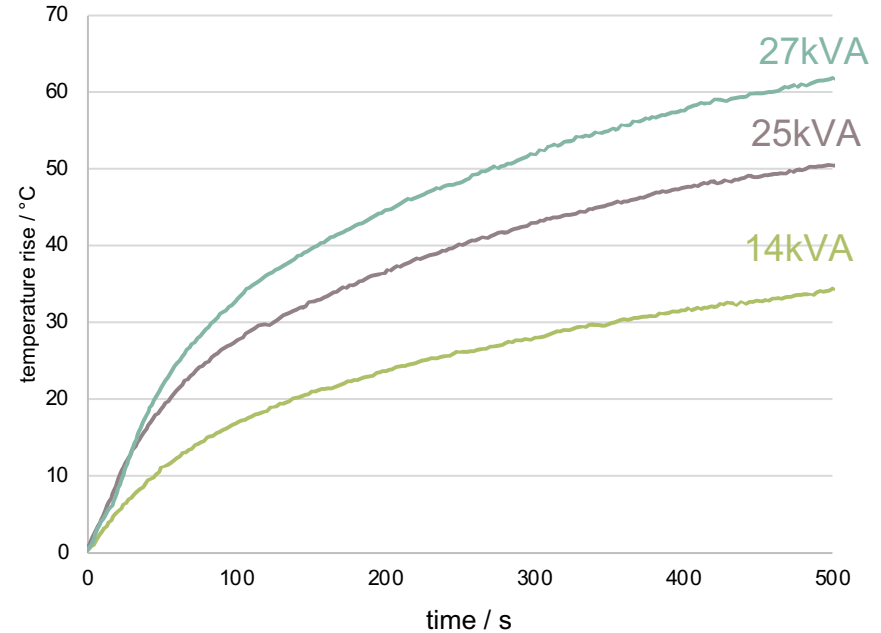


IGBT module temperature rise



TLI4971 temperature rise

Thermal performance without cooling on current sensor

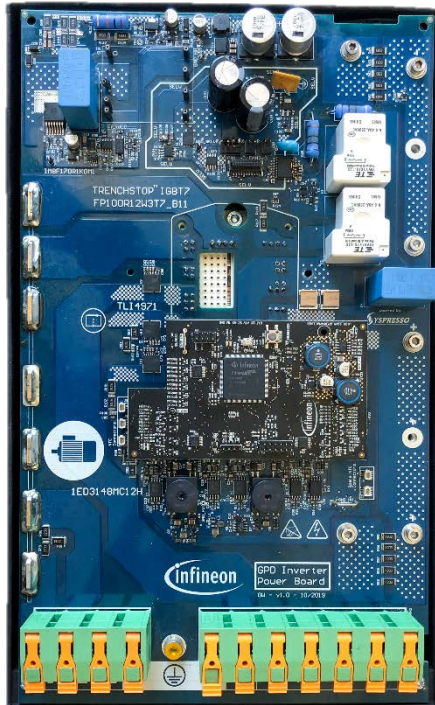


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The GPD board enables you testing the latest Infineon products under your operation conditions

Board



Main Features

- › Powerboard incl. one Easy 3B PressFIT module
- › Current measurement with short-circuit protection within 5µs
- › MCU sense & control and communication
- › DC-link capacitors, EMI input filter
- › Attached cooler with fans

Coming soon



Benefits

- | | |
|--|--|
| › "Plug-and-produce" solution for customer | → Test our devices under your operation conditions |
| › Combining Infineon's latest technologies | → One shop solution |
| › Sensor with 2 OCD pins for system protection | → Reduction of ext. components |
| › Sensor with enhanced thermal performance | → Less cooling effort |
| › Explore the new IGBT7 | → High energy efficiency |
| › Easy3B package and small current sensors | → Comparably small size |



Part of your life. Part of tomorrow.

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