



Automotive EasyPACK™ 2B
FF300R08W2P2_B11A
Customer Connector



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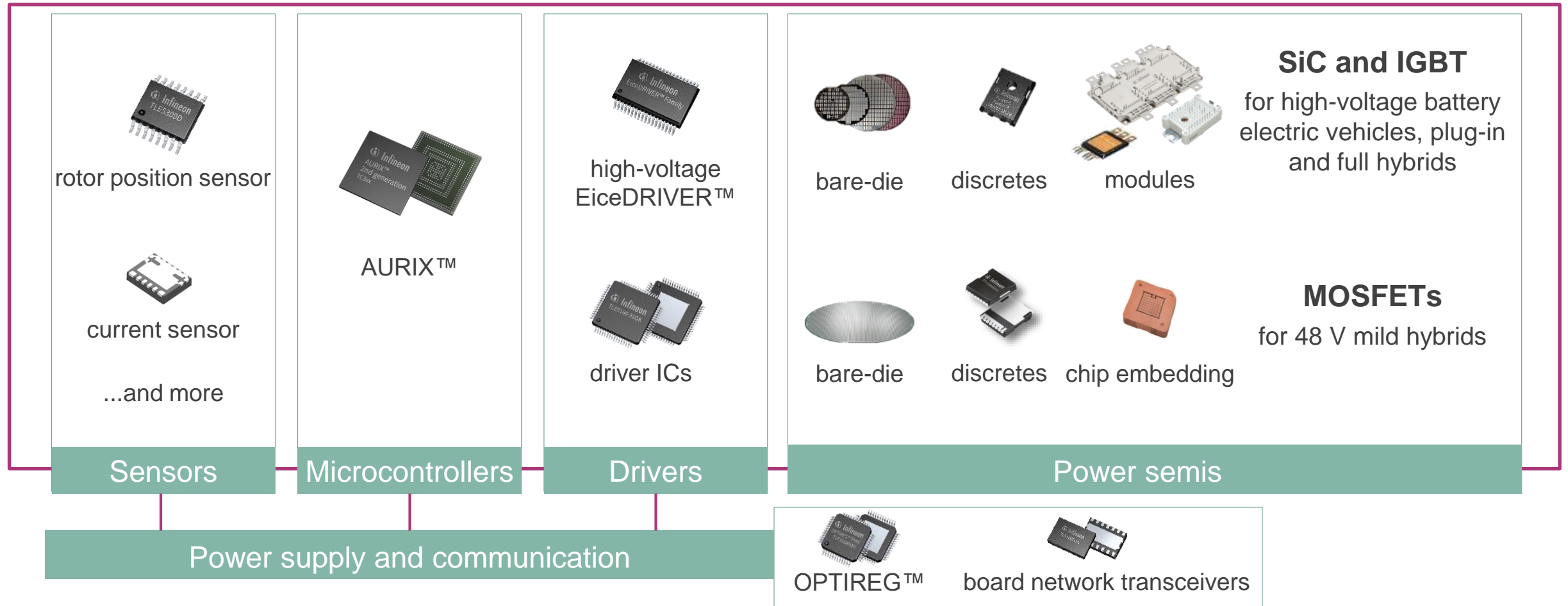
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Infiniteon offers full system solutions addressing all xEV segments: pure EV and all types of hybrid EVs



Infiniteon offers full portfolio for the control loop of an electric car



Infinite offers all components for **Traction Inverters**

The one-stop shop for competitive application solutions



Functional Safety

- › Complementing and interoperable chip set
- › ISO26262 compliance
- › Harmonized Documentation

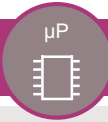
Traction Inverter

- [Overview](#)
- [Products](#)
- [Documents](#)
- [Videos](#)
- [Training](#)
- [Support](#)

Automotive Power Modules

- › [HybridPACK™](#)
- › [EasyPACK™](#)

Microcontrollers



› AURIX™

IFX product offering

- › Multi-core device
- › Safety & security
- › Scalable across xEV

Power Supply



› OPTIREG™ PMIC

IFX product offering

- › Functional Safety
- › OPTIREG™ I-PMIC specific for Traction Inverter to reduce system cost

Gate Driver



› EiceDRIVER™

IFX product offering

- › Increase system efficiency and lifetime
- › Reduction of system cost

Power Switches



› Modules, Discretes, Bare Dies

IFX product offering

- › Broad product family
- › Leading Chip technologies (Si, SiC)
- › High volume experience

Position sensors



› XENSIV™

IFX product offering

- › Integrated end-of-shaft rotor position sensing solution
- › More compact design

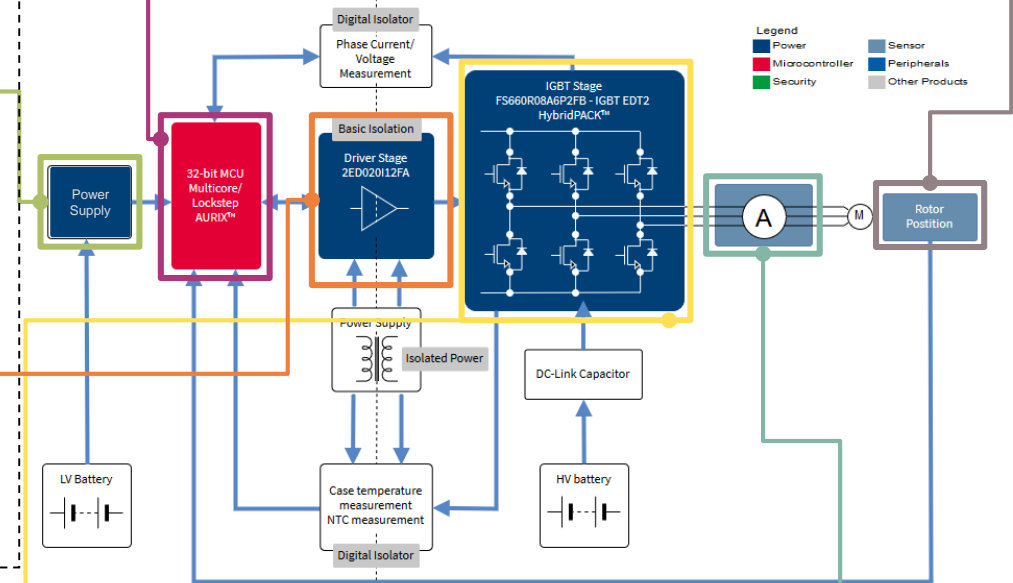
Current sensors



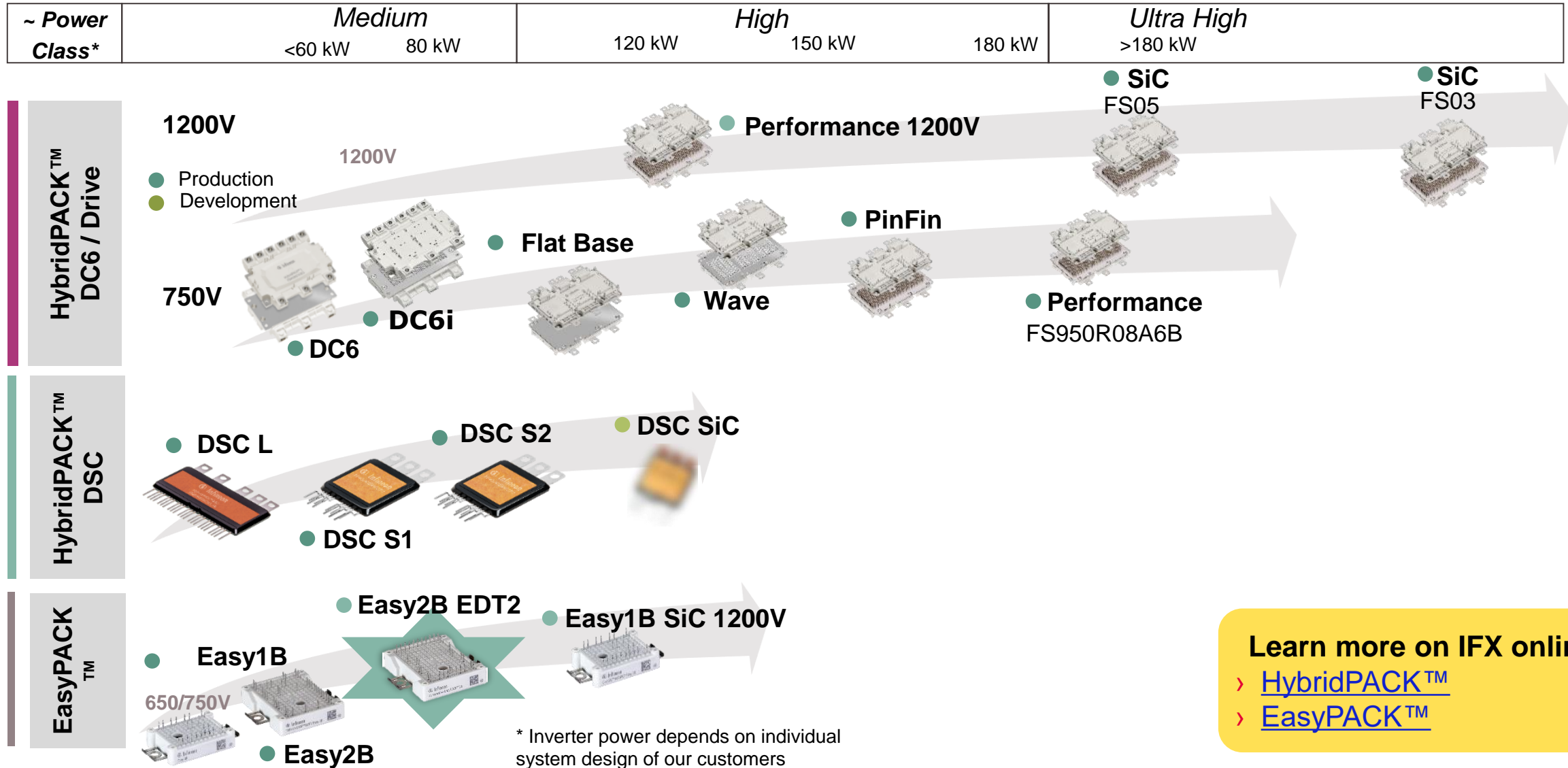
› XENSIV™

IFX product offering

- › AC current measurement
- › ADC interface
- › Standalone sensor



Scalable portfolio (Si/SiC) - HybridPACK™ and EasyPACK™



Learn more on IFX online

> [HybridPACK™](#)

> [EasyPACK™](#)

Expanding the strong footprint of Infineon automotive EiceDRIVER™ in xEV main inverter



2009

2015

2021

Automotive EiceDRIVER™ as integral part of the Infineon main inverter chipset solution

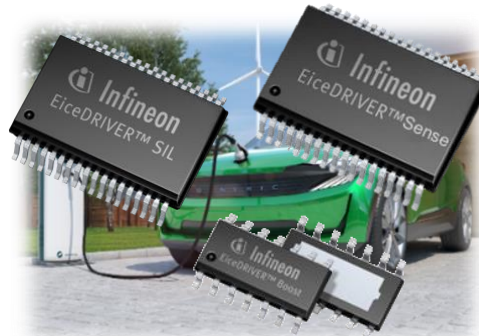
1st Generation

Early Market Entry:
Automotive HV gate drivers for xEV applications in volume production **since 2009**



2nd Generation

Field Proven:
Millions HV gate drivers shipped in numerous (PH)EV platforms worldwide



3rd Generation

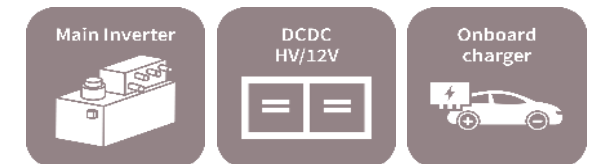
Continuous Optimization:
Expand Infineon main inverter chipset solution for further significant **system optimizations**



EiceDRIVER™ 1EDI302x/3xAS launched in 2021!

- Pin-compatible product variants for IGBT & SiC MOSFETs
- Easy to use, no programming
- ASIL-B (D) compliant with advanced safety features
- Comprehensive support material available on MyICP (i.e. Spice + Simetrix models, AppNote, Calculator,)
- Suiting various HV xEV applications:

Coreless transformer galvanic isolation technology is robust and certified.

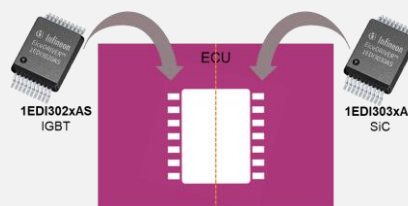


Launching soon: EiceDRIVER™ 1EDI302xAS / 1EDI303xAS

Customer benefits

Easy to use

- › Plug & play, no programming needed, diagnosis readout via PWM
- › **Leanest ISO 26262 ASIL-B(D) compliant** driver on the market
- › 6 different pin compatible variants
 - › Using **one PCB design driving IGBT or SiC MOSFETs**
 - › Using ASC & ADC variant in one



Advanced BOM reduction

- › Integrated powerful output stage
- › Integrated strong active miller clamp for unipolar switching w/o additional components
- › ADC + current source included in IC (temp. & DC-link measurements)
- › Several other features minimizing external BOM (e.g. gate monitoring w/o additional components)

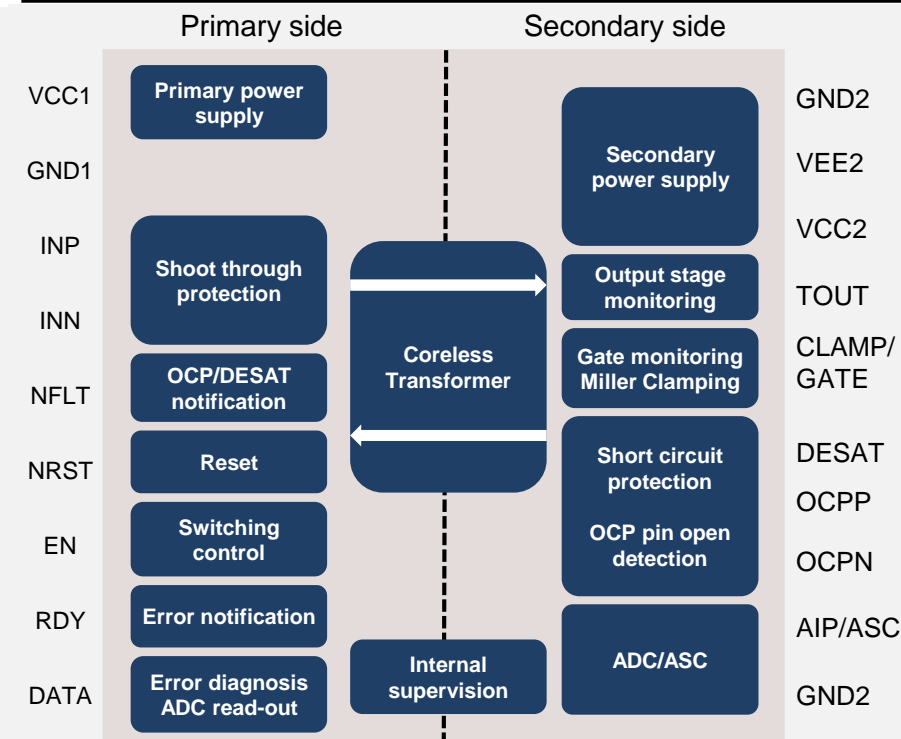


Dependability

- › Simplified ASIL C/D compliant system integration through:
 - › ISO 26262-compliant components
 - › Harmonized Infineon safety documentation and optimized chipset
- › Full compatibility with Infineon main inverter chipset saving verification and design effort
- › Proven high quality and product robustness from extensive field-experience



Block diagram



Product variant	IGBT/SiC	ADC/ASC
1EDI3020AS	IGBT	ADC for Temperature Diode
1EDI3021AS	IGBT	ASC
1EDI3023AS	IGBT	ADC for NTC & DC-Link
1EDI3030AS	SiC	ADC for Temperature Diode
1EDI3031AS	SiC	ASC
1EDI3033AS	SiC	ADC for NTC & DC-Link

All traction motor inverter topologies are addressed by AURIX™ - the MCU market leader



AURIX™ addresses all traction motor inverter topologies

48V Mild Hybrid

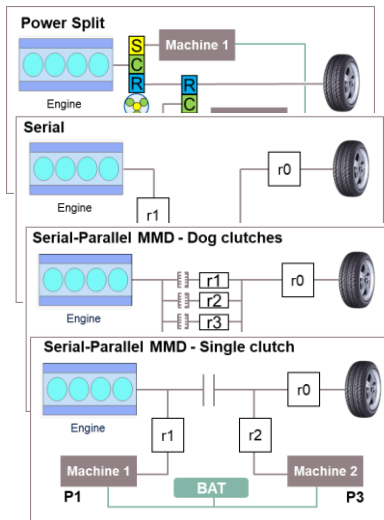


P2

P0 BSG

AURIX™ #1:
Market leader

Full Hybrid & PHEV

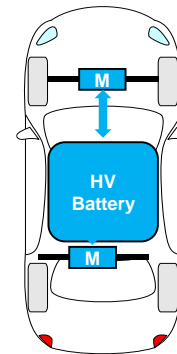


Power Split, Serial &
Serial-Parallel

AURIX™ #2:
Growing strongly

BEV & FCEV

Front
eAxe



Rear
eAxe

AURIX™ will be #1:
in next 3-5 years

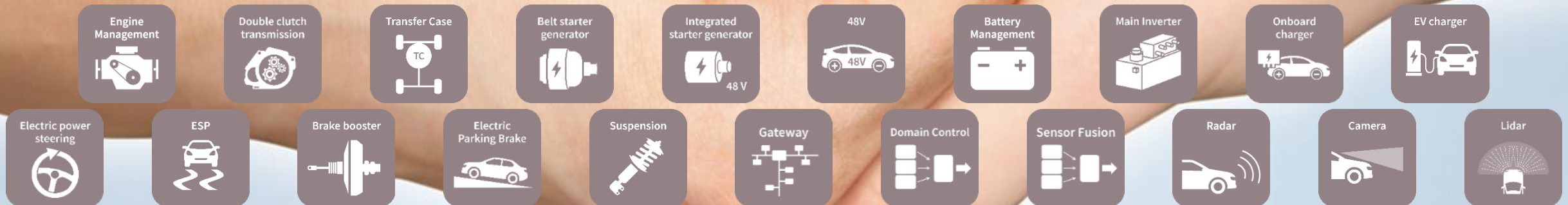
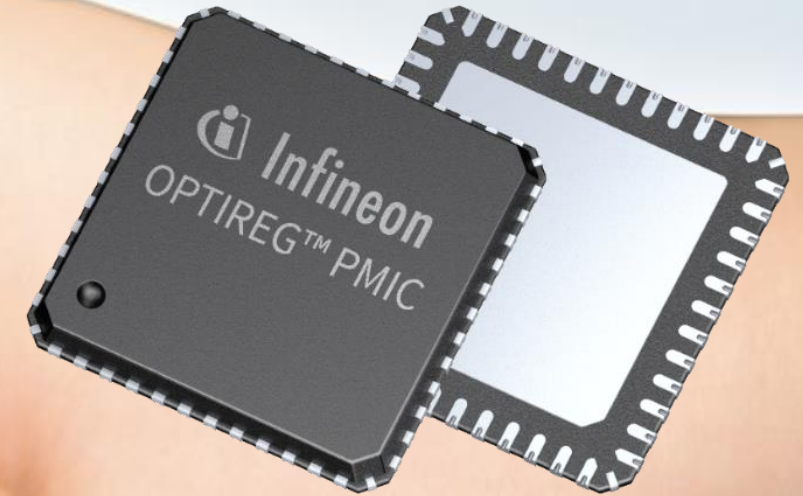
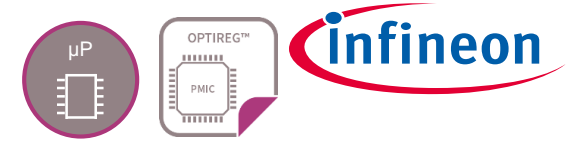
Why AURIX™?

#1

**30-40% inverter
market share by 2025**

- › **Strong position at EU & US OEMs** who increase their inverter competence
- › **Scalable family concept** enables re-use across different inverter types
- › **Strong product roadmap** provides access to innovation
- › **Proven quality & powertrain knowhow** from conventional applications

AURIX™ microcontroller & OPTIREG™ PMIC teaming up for Functional Safety



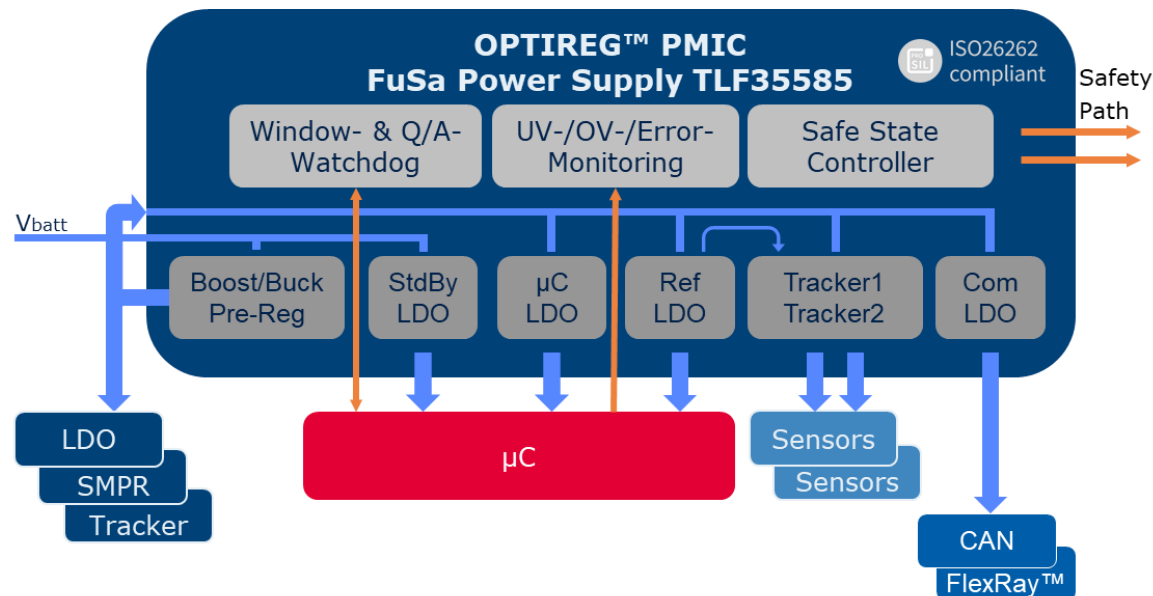
TLF35584 / TLF35585 (in development) OPTIREG™ Functional Safety PMIC



Key Features

- › Buck/Boost-Pre-Regulator
 - IQ = 1.3A (1.5A for TLF35585); f: 300kHz-2.5MHz
- › μ C-Supply: 3.3V/5V @ 600mA
- › Reference-LDO: 5V @ 150mA ($\pm 1\%$)
- › Communication-Supply: 5V @ 200mA
- › 2x Tracker: 5V @ 150mA
- › StandBy-LDO: 3.3V/5V @ 10mA

Block Diagram



- › EN/Wake (T15 and CAN/FlexRay)
- › SPI
- › TLF35585 enhancement vs. TLF35584
 - E.g. features: additional diagnostics information, extended timer functionality
 - Ultra low current consumption (<10-15 μ A)
- › Safety Features
 - Multiple bandgap (supply vs V-monitoring)
 - UV/OV-Monitoring, ERR-Monitoring
 - Functional-WD & Window-WD
 - Safe State Control / Secondary Safety Path
 - Protected safety area
 - Built In Self Test
 - Development acc. ISO26262



Package



PG-VQFN-48
(TLF35584 & TLF35585)



PG-TQFP-48
(TLF35585)



PG-LQFP-64
(TLF35584)

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Target applications

Automotive EasyPACK™ 2B Half Bridge Flexible, compact and cost efficient solution



Motivation

- › Offer an automotive qualified, flexible, integrated yet cost efficient power module for the traction inverter market of xEV and beyond, using proven technologies (EDT2 IGBT, EasyPACK™, PressFIT Pins)

Product description

- › Latest Infineon EDT2 IGBT chip technology, which allows for higher efficiency at low-load conditions. It is able to ensure significantly less losses, even outperforming Infineon's previous chip generation by 20%.
- › EasyPACK™: cost effective, reliable power module with proven high volume manufacturing experience with over 50 Million modules sold.
- › PressFIT contact technology allows in fact for reduced mounting time. That means compared to classical through-hole discrete packages as well as HybridPACK™ 1, no soldering of the pins is required anymore.
- › This half-bridge module can reach a maximum performance of up to 50 kilowatts and 230 Arms, depending on inverter conditions.

Key features and benefits of EasyPACK™ 2B EDT2 Half Bridge

● Available

FF300R08W2P2_B11A

Key features

Half-bridge module

30% smaller size
than HybridPACK™ 1
(3x Half Bridges vs. 1x B6-Bridge)

750 V EDT2 IGBT technology

Low stray inductance of 8nH
(-70% lower than HybridPACK™ 1)

Integrated isolation

Press-fit pins for the signal terminals

Key benefits

- › Enables different inverter geometries and further motor integration
- › Very compact and cost efficient inverter designs
- › High power density and low switching losses especially at light load conditions
- › Fast switching for reduced switching losses
- › No selective pin soldering and isolation foil placement → Faster and easier assembly processes

Value



Flexibility



Size and weight
reduction



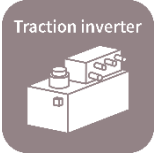
Efficiency



Optimized total costs

FF300R08W2P2_B11A: Easy-to-handle and efficient automotive qualified module for power inverters up to 50kW*

Key product features:



- > Half-bridge module
- > Allowing up to 500V_{DC-link} and up to 230Arms for power inverters up to 50kW

Infineon's EDT2 IGBT technology:

- > Benchmark efficiency and ruggedness for the Automotive electric drive train
- > Increased V_{br} of 750V



Infineon's Automotive EasyPACK™

- > Cost-effective and yet reliable module
- > High volume manufacturing experience (over 50 Million modules sold)

Key product benefits:



Flexible half-bridge module
→ enables different inverter geometries and further motor integration



Module with integrated isolation and NTC
→ Ease of design and assembly for compact inverters



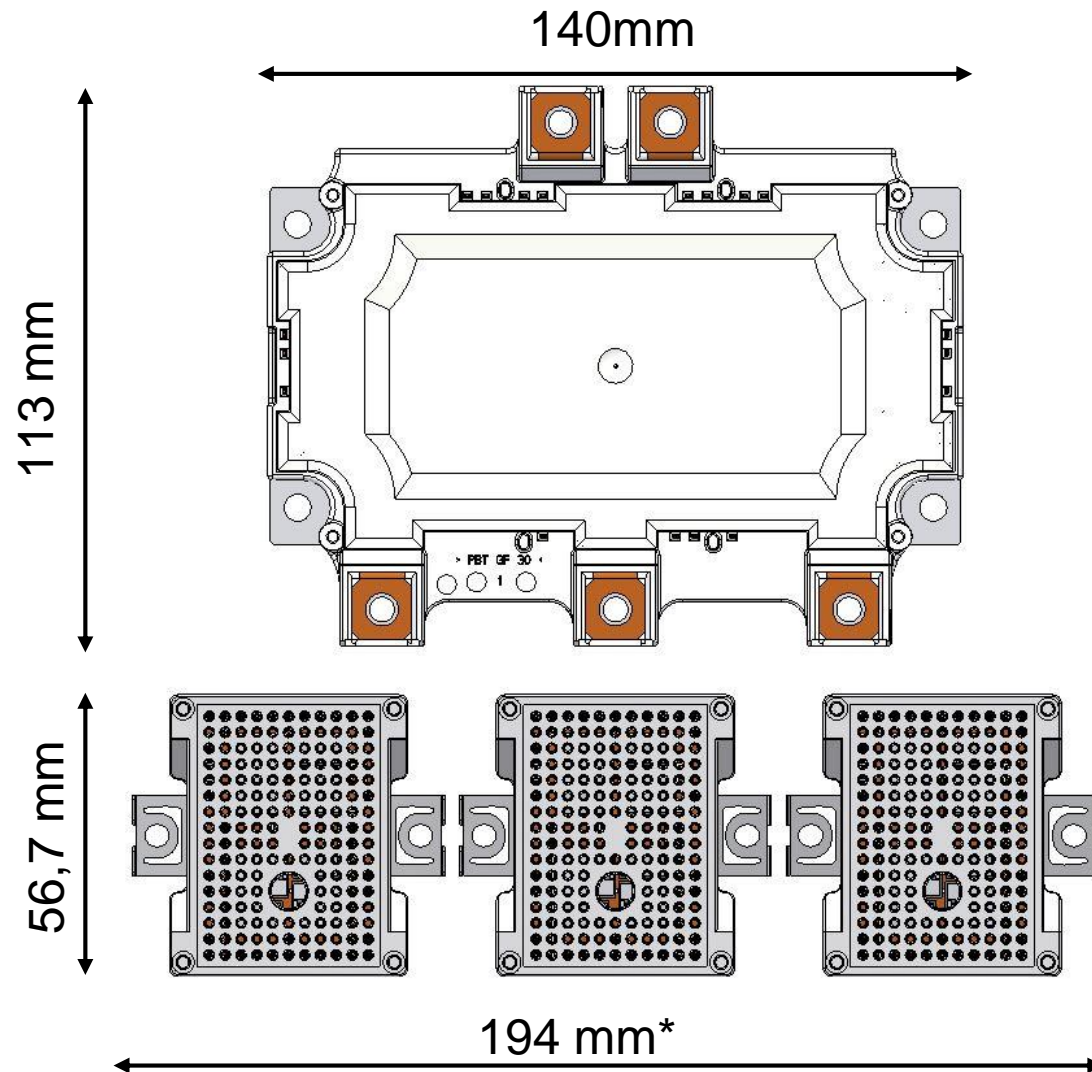
Benchmark current density combined with short circuit ruggedness and increased blocking voltage
→ Highest reliability



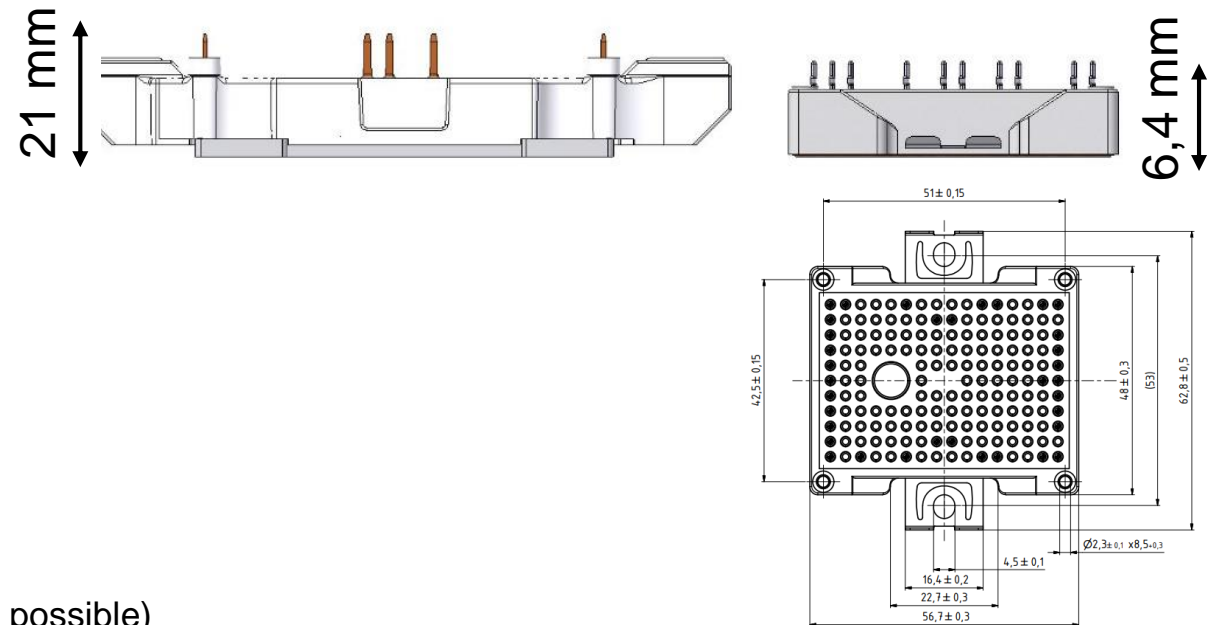
Press-Fit Pins for easy PCB assembly
→ Saving time and cost during assembly (no soldering required)

* Infineon estimation. Final result depends on customer's inverter design.

EasyPACK™ 2B enabling compact designs - Size comparison 3x EasyPACK™ 2B vs. 1xHybridPACK™ 1



- 30% smaller area foot print
- 46% smaller volume



* incl. usual spacing in between the Easy modules (optimization possible)

EasyPACK™: ATV qualified, highly integrated module solution for easy design & assembly

- › Today our Infineon EasyPACK™ modules are used in a wide range of applications (DC-DC, OBC, PTC,...) by >10 OEMs and Tier1s

Our customers chose **Easy power module** because of

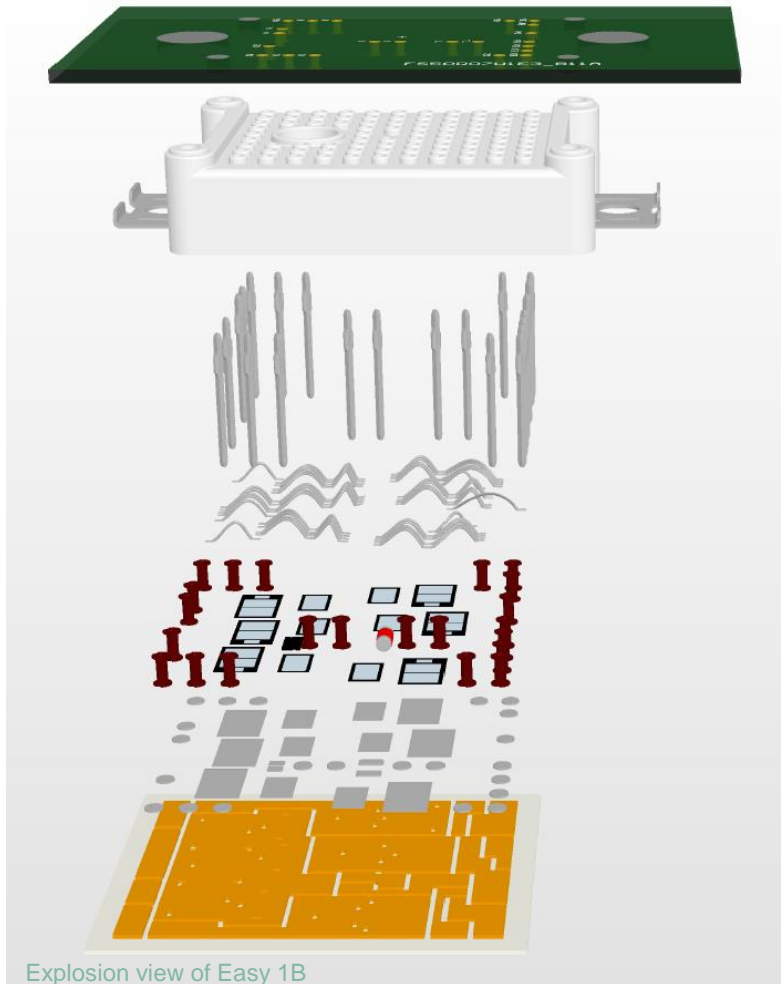
- ✓  **Cost-effective assembly**
Easy PCB mounting (PressFit)
- ✓  **Easy design**
Highly integrated “all-in-one” module solution with optimized thermal capabilities
- ✓  **Reliability**
Integrated isolation / creepage
- ✓  **Flexibility**
Platform for different technologies and topologies

Our customers chose **Infineon EasyPACK™** because of

- ✓  **High volume manufacturing experience**
Over 50 million EasyPACK™ sold
- ✓  **Seamless traceability**
Given for every individual module
- ✓  **Leader in Quality**
Field proven quality
Reuse of successful technologies
- ✓  **Technical leader**
Market innovator with extensive local technical support

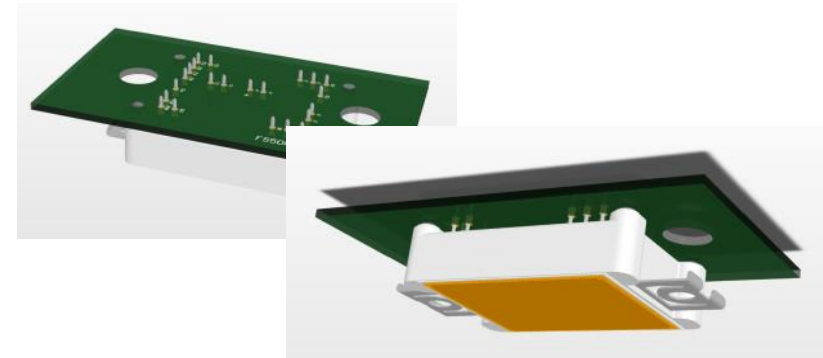
EasyPACK™ offers ease of use and flexibility at high reliability for xEV High Voltage Systems

Module Construction

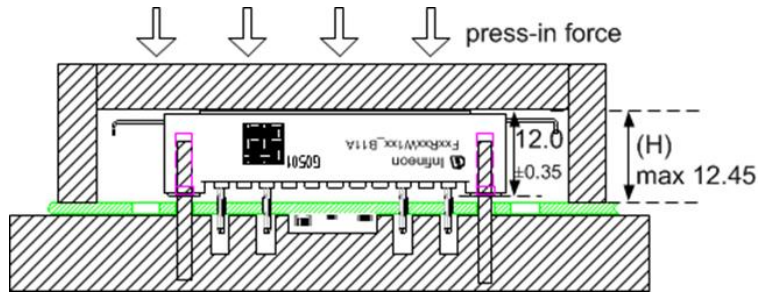


Module Benefits

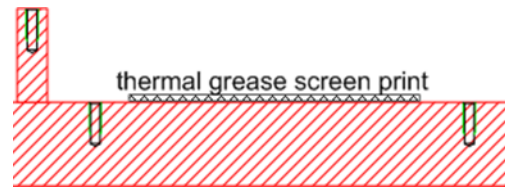
- › Easy mounting processes
- › PressFIT technology
- › Reliable isolation (creepage)
- › Automotive quality & reliability (high power cycling capability)
- › Seamless traceability
- › NTC for temperature sensing
- › Low stray inductance (module & system)
- › Platform for different topologies



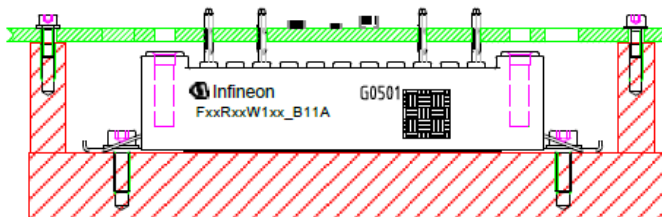
EasyPACK™ Mounting examples



1. Press the EASY module into the already pre-assembled PCB.
(No soldering, no preparation of the EASY modules)



2. Add the thermal grease. Either to the module or to the cooling device.
(No isolation foil)



3. Mount the whole PCB into the case.
(fully automated)

[See Application Note](#)

Superior Infineon Automotive quality

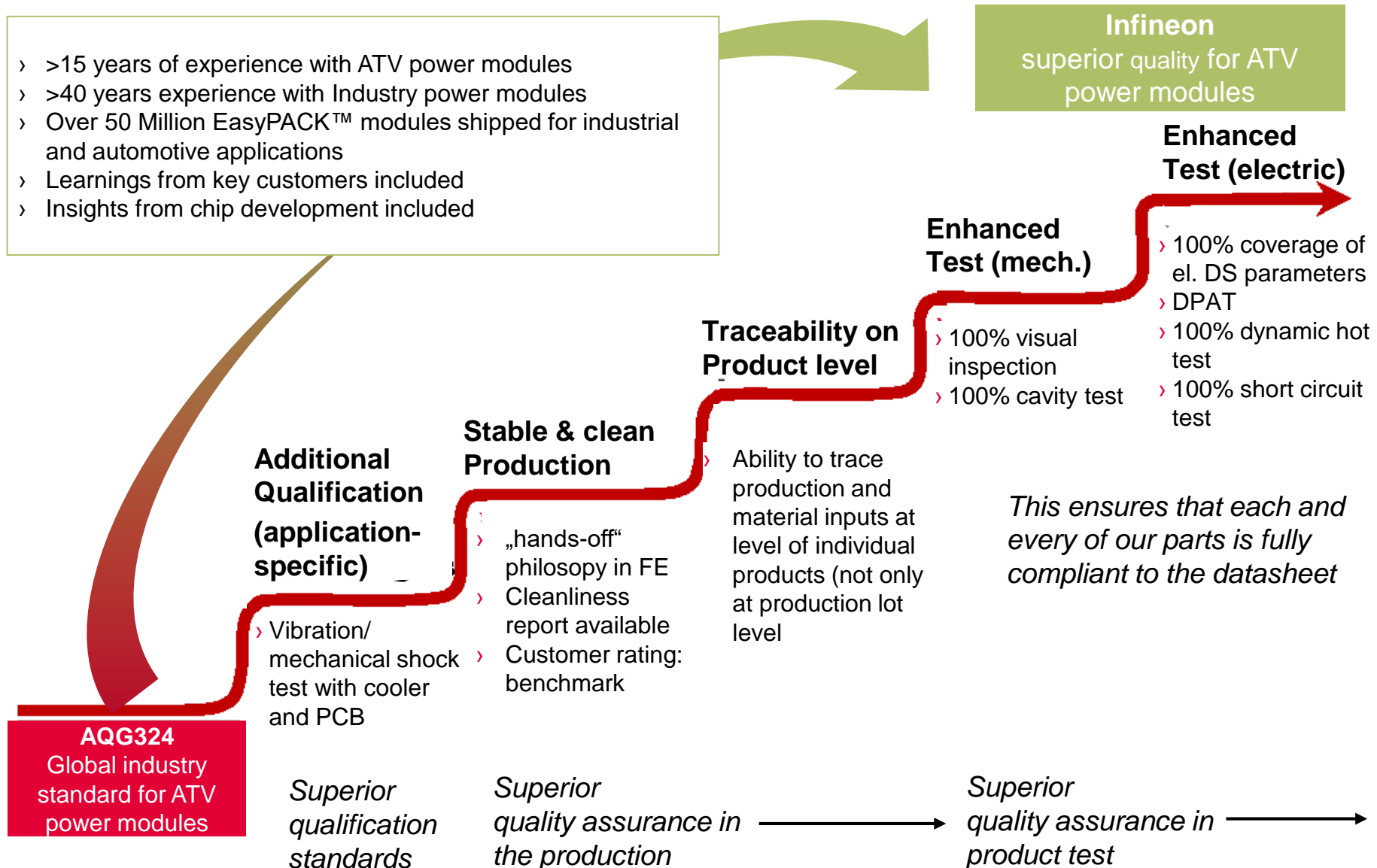


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Comprehensive support material and strong direct support facilitate R&D efforts and accelerate time2market

Collaterals

- [Product Brief](#)
- [Product picture](#)



Technical Material

- [Datasheet](#)
- [3D-Model](#)
- [Application Note](#)
- [Power simulation \(IPOSIM\)](#)



Videos / Trainings

- [Automotive EasyPACK™ Product Training](#)
- [Automotive EasyPACK™ Video for Social Media](#)
- [Automotive power module portfolio](#)



All material is available via Infineon webpage www.infineon.com/Easyinverter and links above

MyInfineon



myInfineon login

- Lorenzo, you are logged in
- My Dashboard
- My Profile
- Log out
- myInfineon (old)

Products Applications Tools About Infineon Careers

IoT Security Circle at electronica 2016

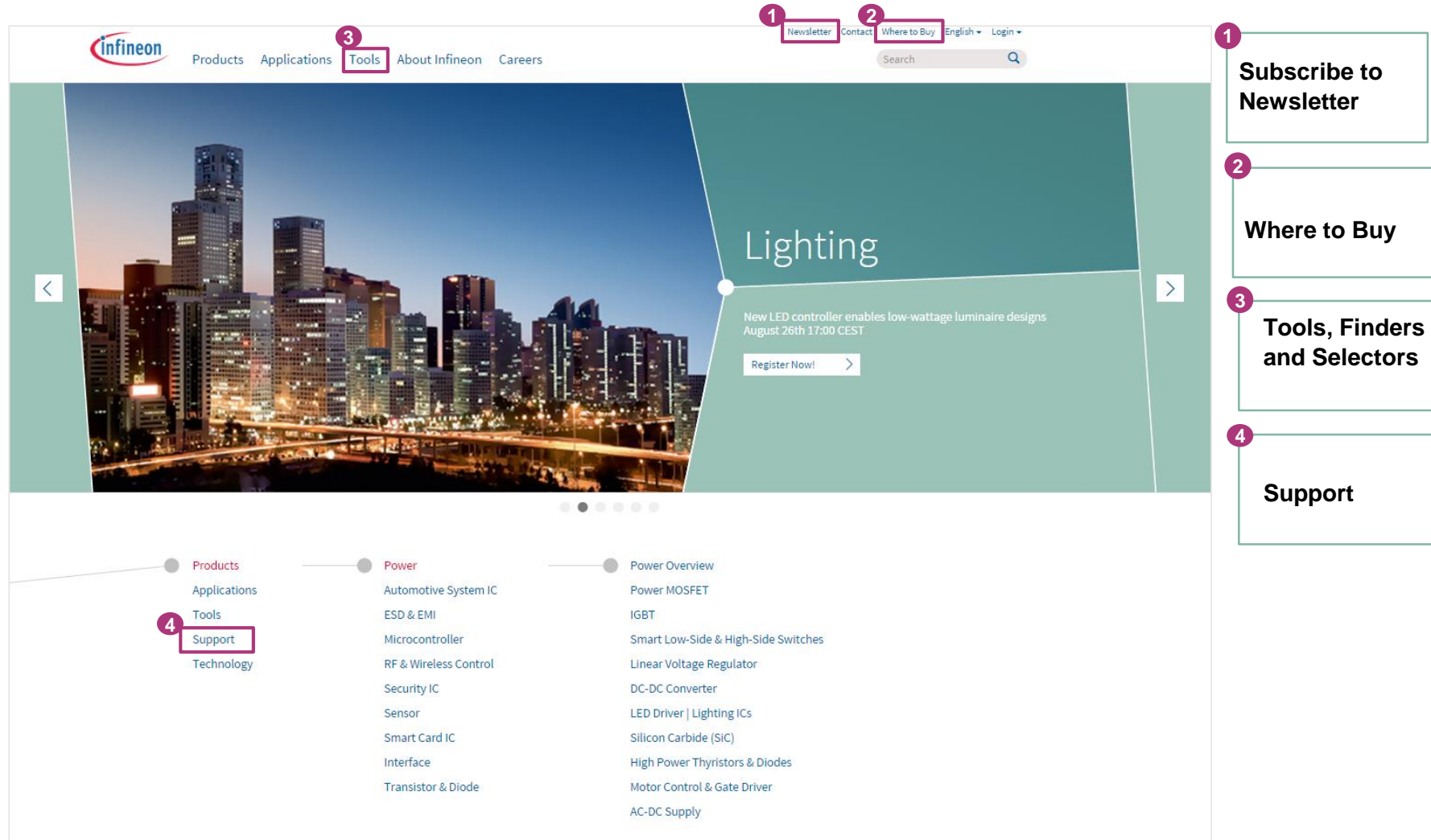
Join Infineon's IoT Security Circle (Nov. 8-9, 2016) at electronica 2016 in Munich. Experience security solutions first hand and exchange with renowned experts.

Register now for free!

- Products
 - Applications
 - Tools
 - Support
 - Technology
 - Partners
- Power
 - Automotive System IC
 - ESD, Surge and Fuse
 - HiRel
 - Microcontroller
 - RF & Wireless Control
 - Sensor
 - Security & Smart Card Solutions
- Power Overview
 - Power MOSFET
 - IGBT
 - Smart Low-Side & High-Side Switches
 - Linear Voltage Regulator
 - DC-DC Converter
 - Lighting ICs
 - Audio Driver ICs
 - GaN Power FETs

Support

Online tools and services



The screenshot shows the Infineon website with several key elements highlighted by numbered annotations:

- 1** Newsletter
- 2** Where to Buy
- 3** Tools
- 4** Support

The main navigation bar includes: [Products](#), [Applications](#), [Tools](#), [About Infineon](#), and [Careers](#). The search bar is located on the right side of the navigation bar.

The main banner features a city skyline at night with the text "Lighting" and a sub-headline: "New LED controller enables low-wattage luminaire designs August 26th 17:00 CEST". A "Register Now!" button is also present.

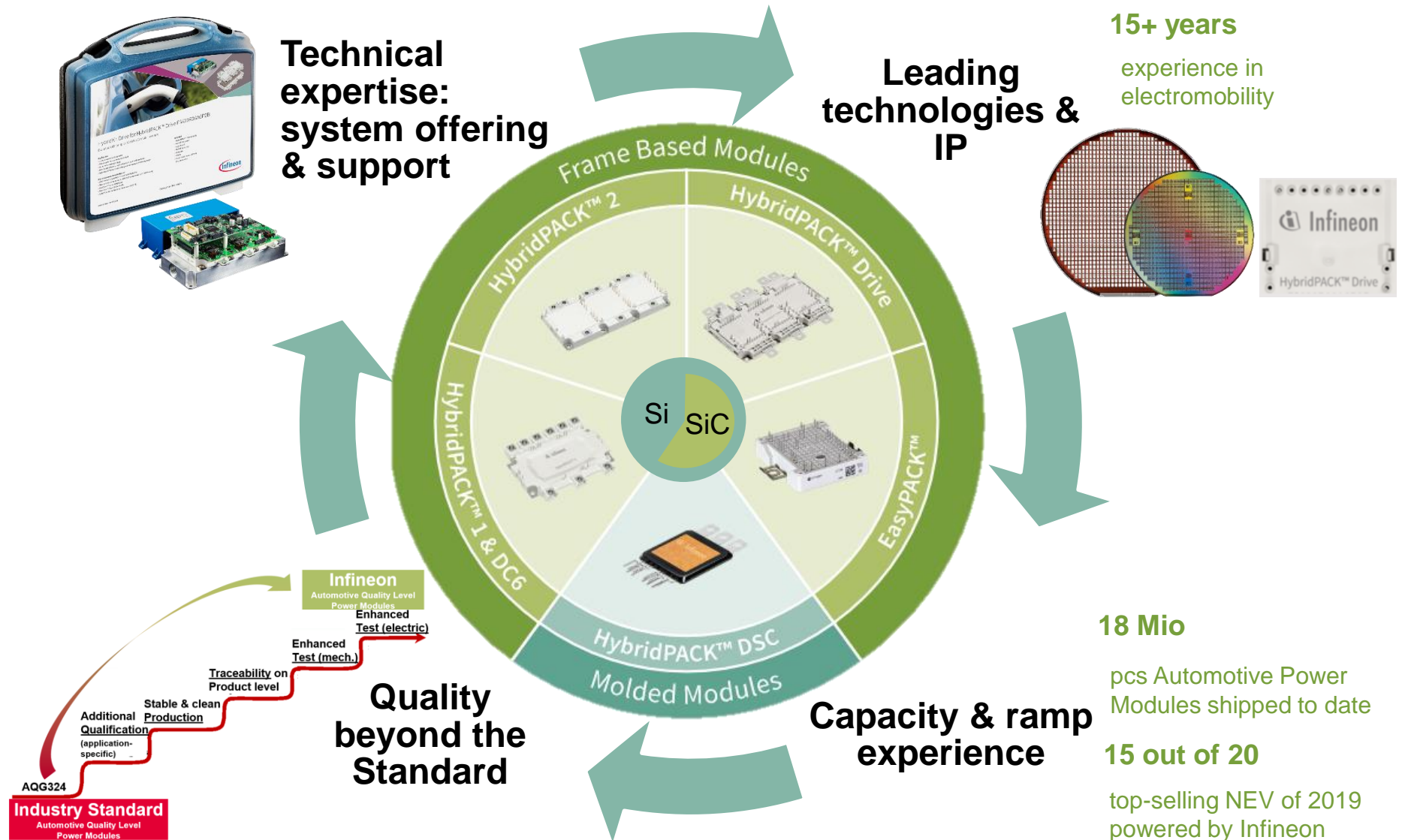
The sidebar on the right contains four main sections:

- 1 Subscribe to Newsletter
- 2 Where to Buy
- 3 Tools, Finders and Selectors
- 4 Support

The footer lists various product categories under "Products" and "Power":

- Products**
 - Applications
 - Tools
 - Support
 - Technology
- Power**
 - Automotive System IC
 - ESD & EMI
 - Microcontroller
 - RF & Wireless Control
 - Security IC
 - Sensor
 - Smart Card IC
 - Interface
 - Transistor & Diode
- Power Overview**
 - Power MOSFET
 - IGBT
 - Smart Low-Side & High-Side Switches
 - Linear Voltage Regulator
 - DC-DC Converter
 - LED Driver | Lighting ICs
 - Silicon Carbide (SiC)
 - High Power Thyristors & Diodes
 - Motor Control & Gate Driver
 - AC-DC Supply

Infineon is the dependable partner offering value that goes beyond the product





Part of your life. Part of tomorrow.