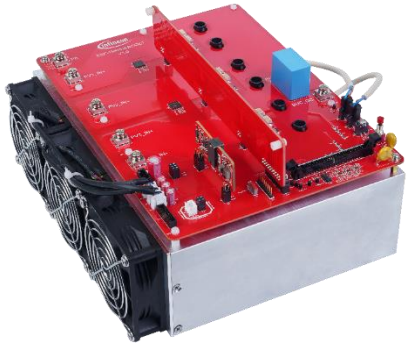


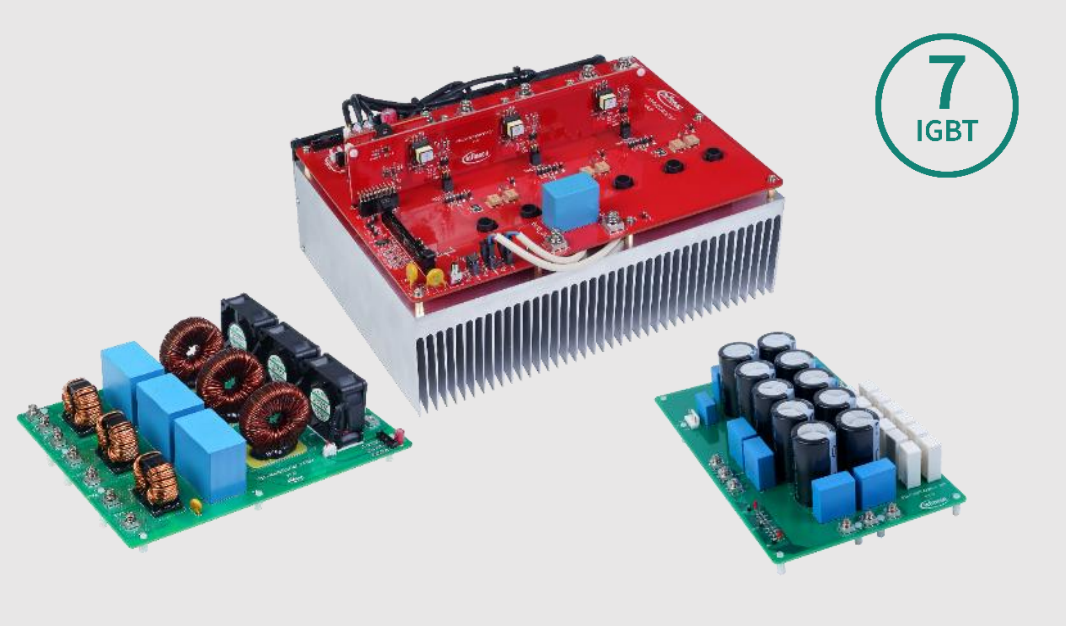
15 kW PV boost converter reference design with IGBT7 in TO-247 products

June 2026

Restricted

Modular PV boost DC-DC converter reference design with up to 15 kW and three independent DC input channels

REF-15KW2LBOOST



Target Applications

Solar

DC-DC

Ordering Information

SP Number:
SP006047580

OPN:
REF15KW2LBOOSTTOBO1

Key Technical Features and Top-Level Specification

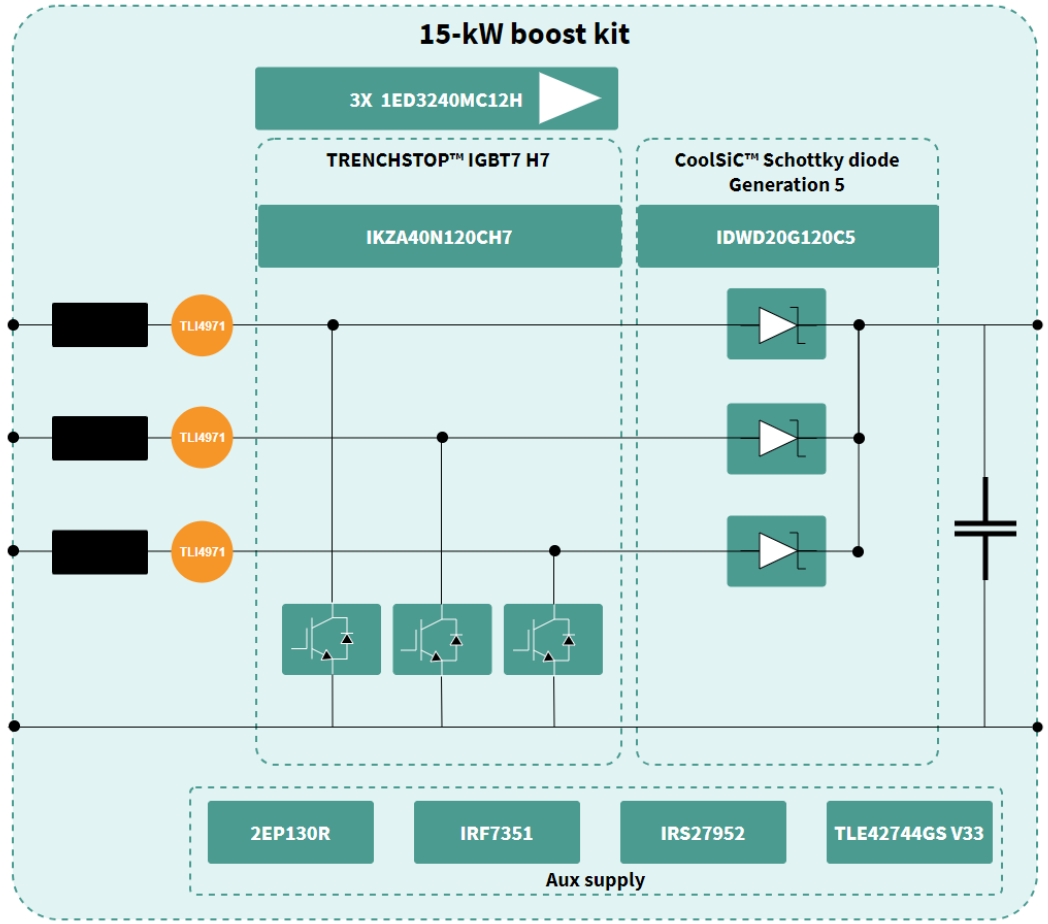
- Modular reference design kit to build a highly efficient 2-level boost converter stage with up to 15 kW
- Latest TRENCHSTOP™ IGBT7 in TO-247-4 combined with EiceDRIVER™ gate drivers
- Main power board mounted on heatsink with fans, gate driver and auxiliary power supply cards on top
- Separate EMI filter and capacitor boards to allow individual optimization of the main passive components

Target Application	Solar Hybrid Inverter
Input voltage	max 1.000 V_{DC}
Output voltage range	750 - 850 V_{DC}
No of independent DC channels	3
Max. output power per channel	5 kW
Max. output power (sum)	15 kW
Peak efficiency	98.8%
Topology	2-level boost
Additional technical parameters	OCP, OTP, OVP, soft turn off & phase-shifted interleave control

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REF-15KW2LBOOST:
Key Infineon products on the main power conversion board

Functional block diagram



Key featured Infineon products:

Power Switches
1200 V TRENCHSTOP™ IGBT 7: IKZA40N120CH7

Schottky Diodes
1200 V CoolSiC™ Schottky diode: IDW20G120C5B

Gate Drivers
EiceDRIVER™ 2L-SRC Compact single-channel isolated gate driver: 1ED3240MC12H

Current sensors
XENSIV™: TLI4971

Power Switches (Aux)
60 V Dual N-Channel HEXFET Power MOSFET: IRF7351

Gate Drivers (Aux)
Full-bridge transformer driver IC: 2EP130R

Controller IC (Aux)
600 V Half Bridge High Voltage Controller IC: IRS27952

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REF-15KW2LBOOST:
Summary of key features and customer benefits

Key Technical Features and Value Propositions

TRENCHSTOP™ IGBT7 combined with 2-level slew rate control EiceDRIVER™ gate drivers	Reduced switching losses enable higher switching frequency
High switching frequency operation (24 kHz)	Significant cost, weight and size reduction of magnetic components
High peak efficiency of 98.8 %, combined with a large heatsink design	Passive cooling possible up to 10 kW, usage of fans for higher output power
Modular design concept with separate filter and capacitor boards	Allows individual optimization of the main passive components

Top level specification

Parameter	Minimum	Typical	Maximum	Unit
Input voltage	0		1000	V_{dc}
Output voltage	0	750	850	$V_{ll\text{-}rms}$
Output power		15		kW
Switching frequency		24		kHz

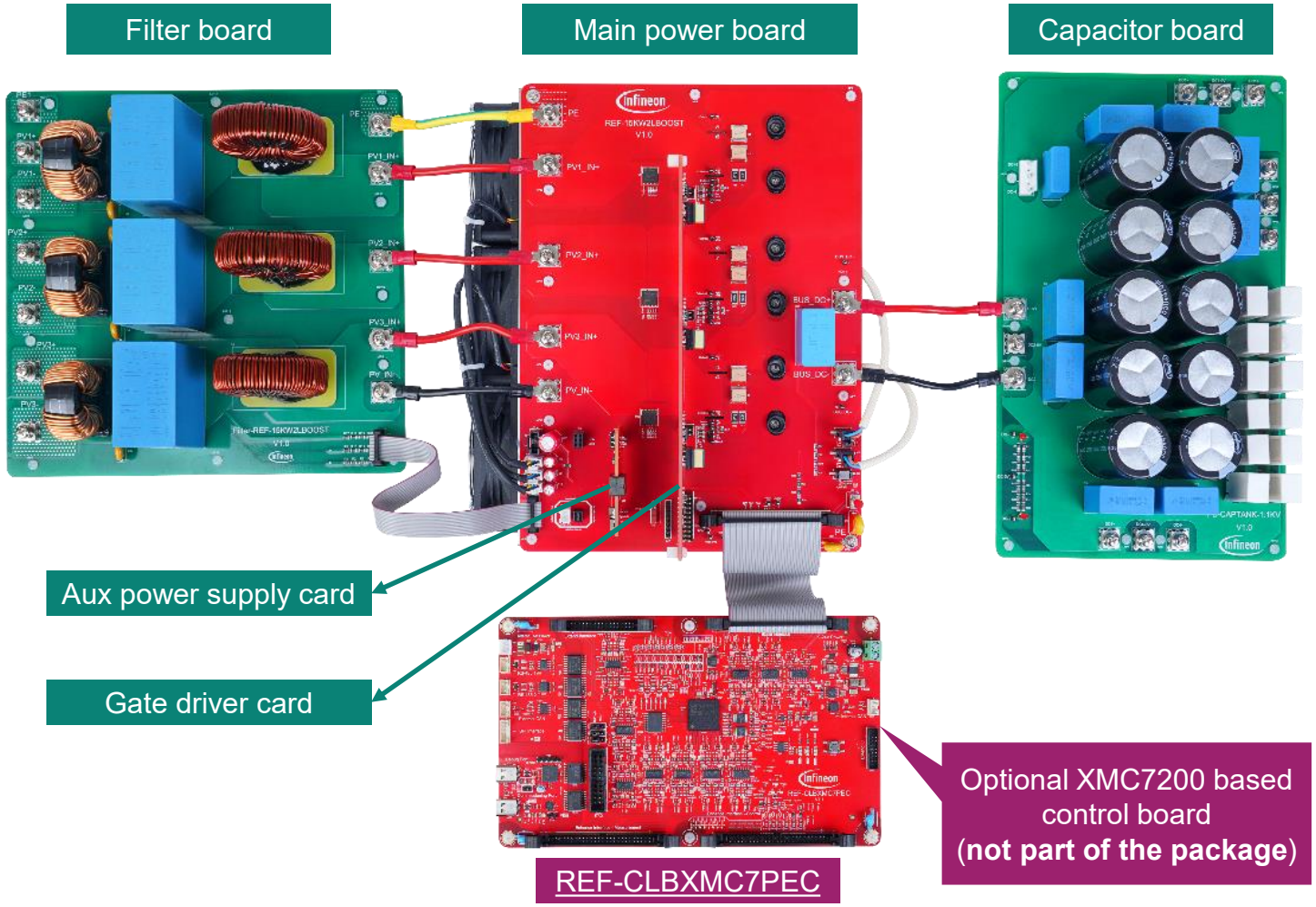
Efficiency measurements

Equipment	Zimmer LMG 670 power analyzer
Conditions	Duty cycle = 0.5, V_o = 650 V, Loading = 10, 20, 30, 50, 75 and 100% Measurements are taken after the boost inductor (power semiconductor losses) for only one channel

Loading	Efficiency
10% load	98.1%
20% load	98.4%
30% load	98.6%
50% load	98.8%
75% load	98.8%
100% load	98.7%

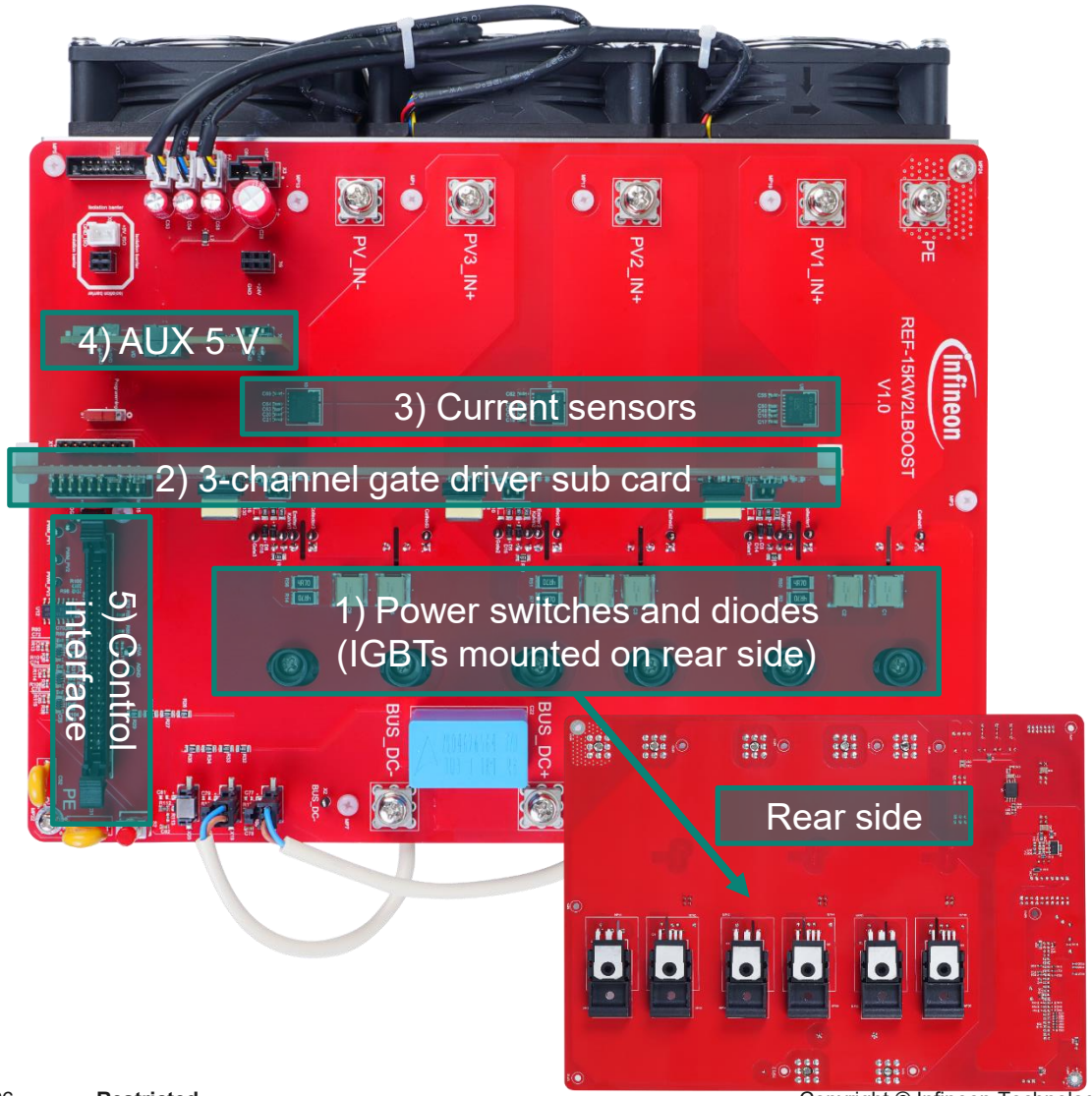
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The reference design uses a modular hardware concept to allow customers flexibility to optimize the passive components



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REF-15KW2LBOOST:
Hardware concept of the main power conversion board

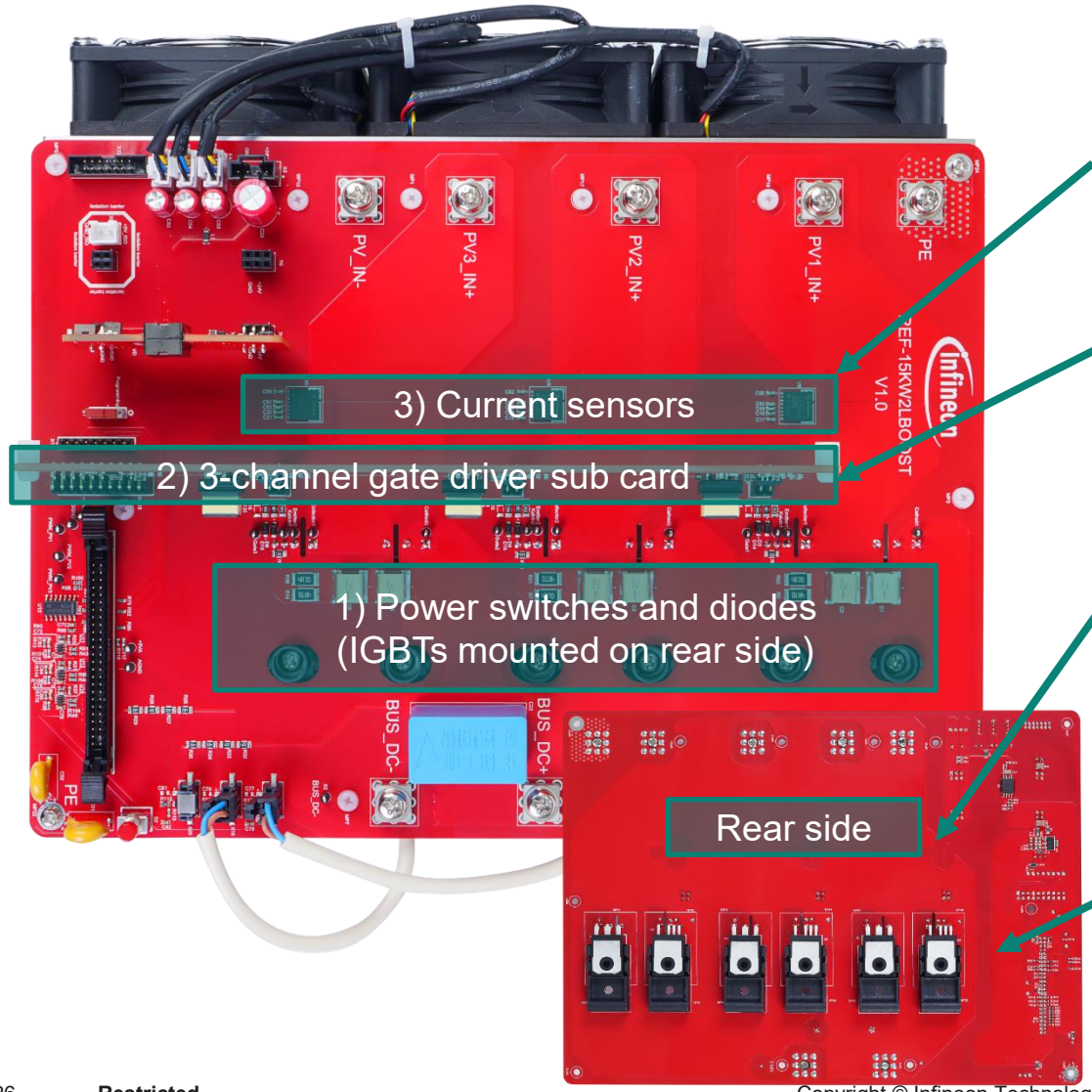


Modular design with separate auxiliary power supply and gate driver cards:

1. Power switches and diodes for all three independent MPP tracker (MPPTs)
2. Isolated gate driver card with 3 independent channel
3. Current sensors for all three independent PV inputs / MPPTs
4. Isolated Auxiliary power supply card for 5 V
5. Interface connector for power control board

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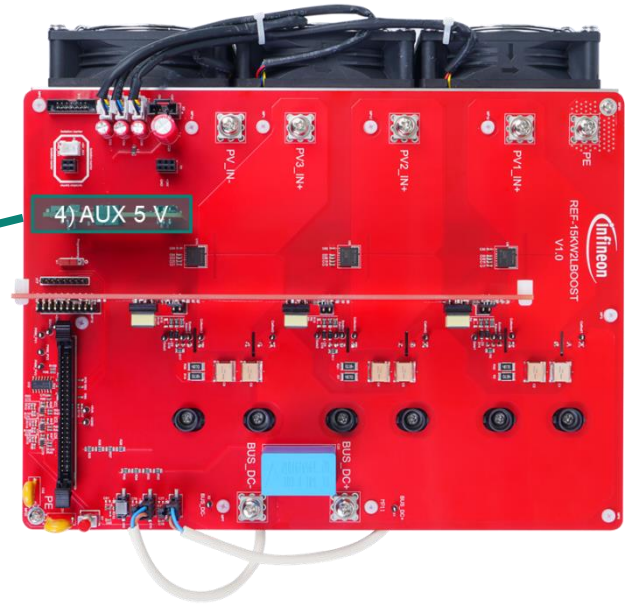
REF-15KW2LBOOST:
Key Infineon products on the main power conversion board

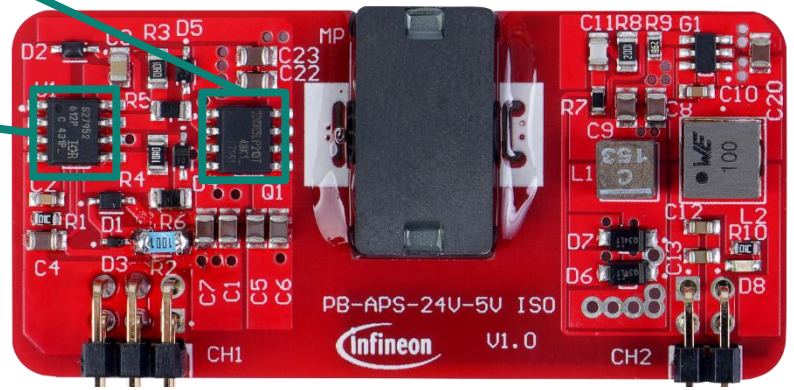


Key featured Infineon products:
Current sensors XENSIV™: TLI4971
Gate Drivers EiceDRIVER™ 2L-SRC Compact single-channel isolated gate driver: 1ED3240MC12H
Schottky Diodes 1200 V CoolSiC™ Schottky diode: IDW20G120C5B
Power Switches 1200V TRENCHSTOP™ IGBT 7: IKZA40N120CH7

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REF-15KW2LBOOST:
Key Infineon products on aux power supply card





24-5V Isolated auxiliary power supply:

Power IC
60V Dual N-Channel HEXFET Power MOSFET: IRF7351

Controller IC
600V Half Bridge High Voltage Controller IC: IRS27952

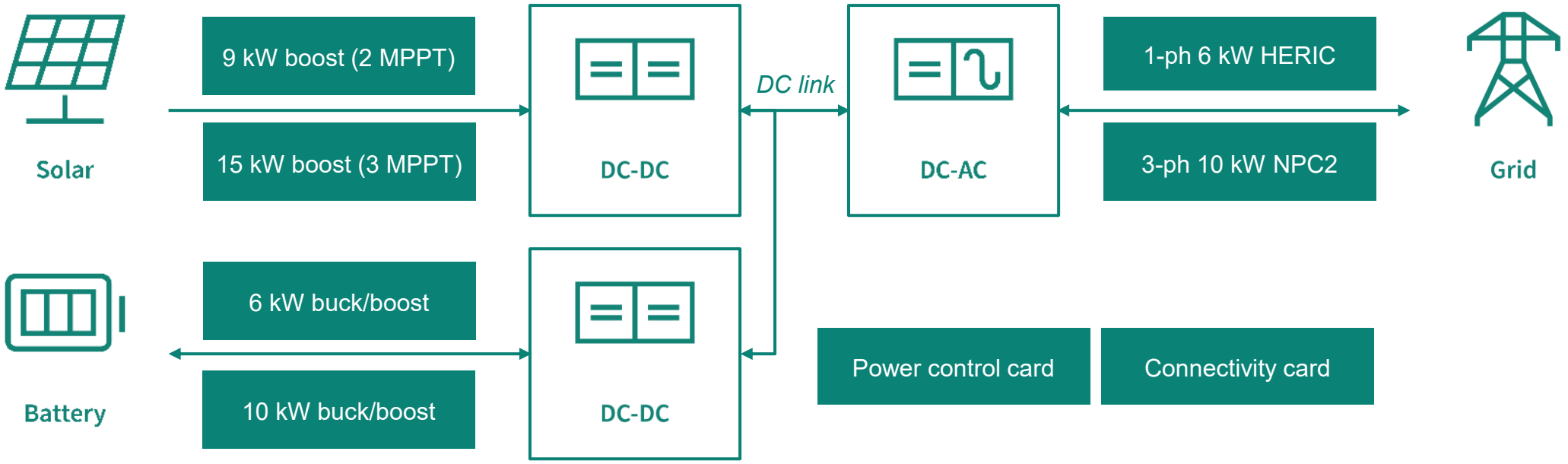
› Isolated high density DC-DC power supply with **flat transformer**

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Modular Hybrid Inverter Reference Design Platform

Modular hybrid inverter platform at a glance

Infineon is developing a modular set of power conversion, control and connectivity blocks to enable the fast prototyping of residential and small commercial hybrid inverter solutions.

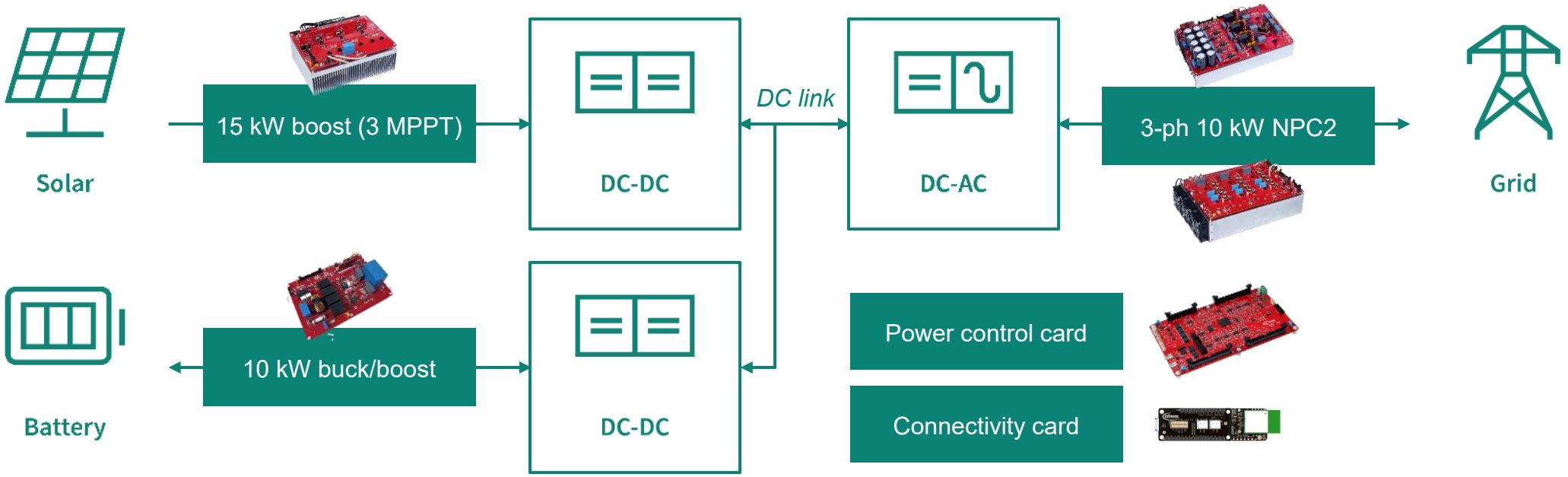


Customers will be able to choose and combine state-of-the-art technologies such as TRENCHSTOP™ IGBT H7 or CoolSiC™ MOSFETs in innovative packages like Q-DPAK and TO-247-4 to build different topologies such as HERIC or NPC2.

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Modular design kit for 3-phase 10 kW hybrid inverters

The following diagram shows the preferred building blocks to realize 3-phase hybrid inverters with up to 10 kW:

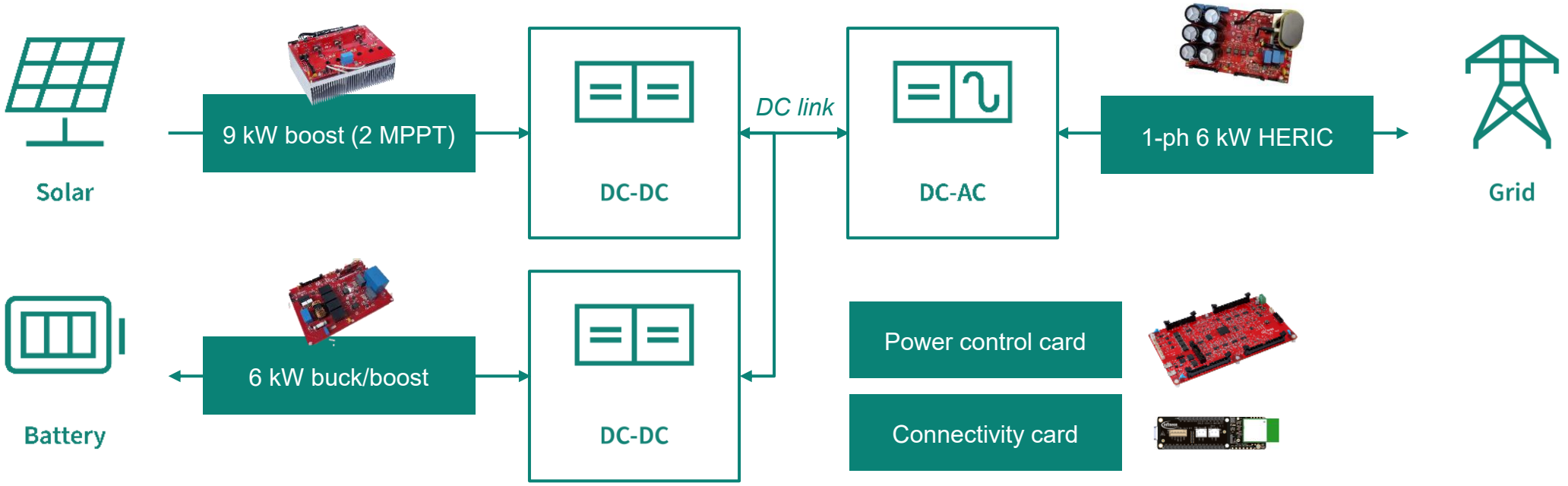


For the NPC2 inverter stage there are two options: one with IGBT7 in TO247 and one with SiC in the new top-side cooling package Q-DPAK

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Modular design kit for 1-phase 6 kW hybrid inverters

The diagram shows the preferred building blocks for 1-phase hybrid inverters with up to 6 kW, using a 1-phase HERIC inverter stage with SiC in the new top-side cooling package Q-DPAK:



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Stay tuned and contact us for support

To find more latest information, please visit the dedicated web page of this reference design:

REF-15KW2LBOOST

Home / Evaluation Boards / REF-15KW2LBOOST



Active and preferred RoHS Compliant

REF-15KW2LBOOST

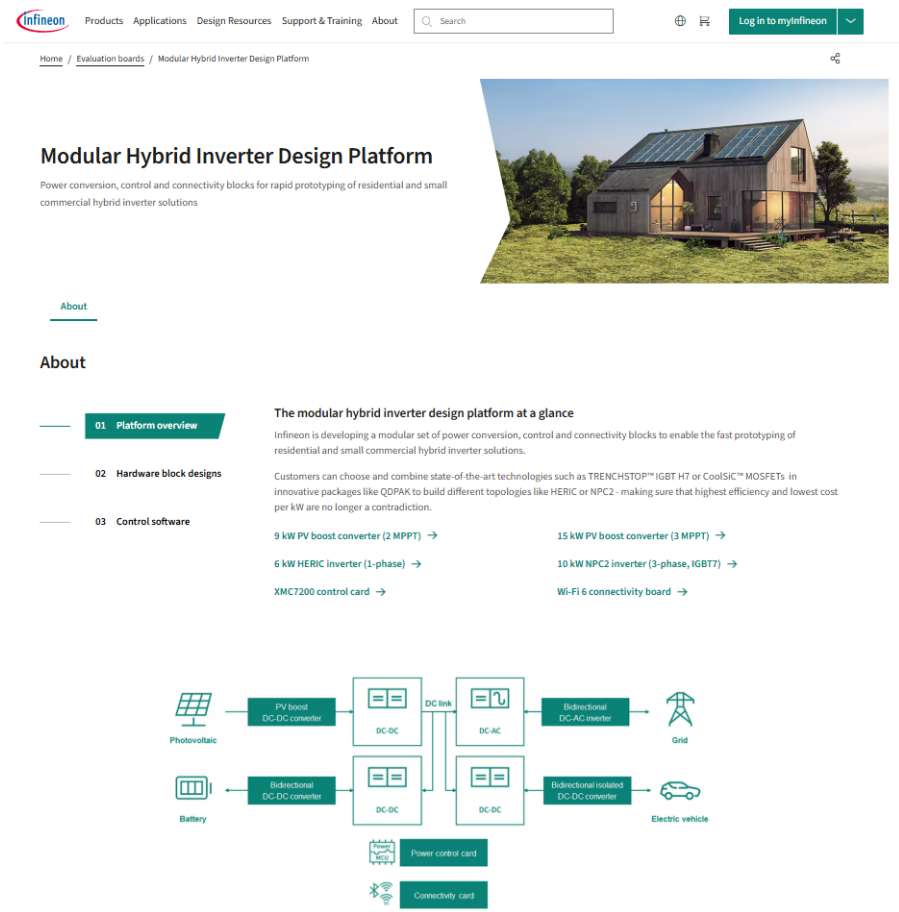
Power conversion reference design for the fast prototyping of PV boost converter stages with up to 15 kW and three independent DC input channels

User manual

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Have a look at our modular reference design platform web page

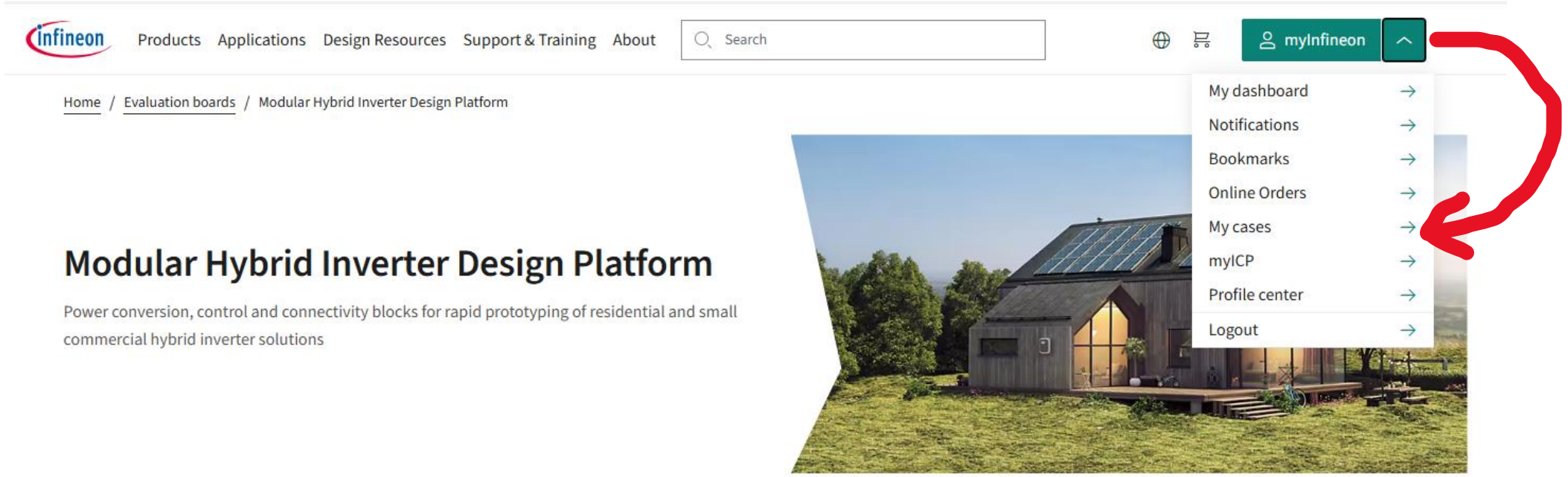
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