EVAL_2kW_ZVS_FB_CFD7

2 kW ZVS phase-shift full-bridge evaluation board

Francesco Di Domenico
Zechner Florian

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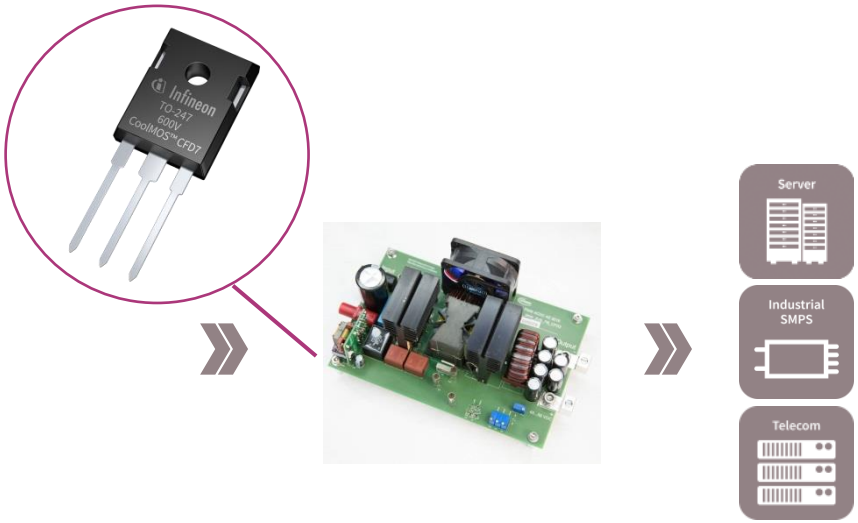
1 General description

2 Test results

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Evaluation board
600 V CoolMOS™ CFD7 SJ MOSFET

EVAL_2KW_ZVS_FB_CFD7



Technical and order details

Parameter	Value
Input voltage	350 V_{DC} - 420 V_{DC}
Output voltage	45 V_{DC} - 56 V_{DC}
Output power	2kW
Peak Efficiency @ 50% load	>96.6%

Learn more	
Sales name	EVAL_2KW_ZVS_FB_CFD7
SAP Mat number	**SP001720550**
Infineon Order Code	

Features

- External resonant inductance and dead setting optimized for 70 mΩ 600 V CoolMOS™ CFD7 technology (IPW60R070CFD7)
- Secondary synchronous rectification 200 V
- 11 mΩ OptiMOS™ 5 200 V technology with fast body diode (IPP110N20N3 G)
- Infineon 2EDN7524F dual channel 5 A, high-speed, low-side gate driver with high negative input voltage capability

Benefits

- Full ZVS achieved even in the leading leg of the bridge starting from 25 percent load onwards
- Optimized primary and secondary delay times

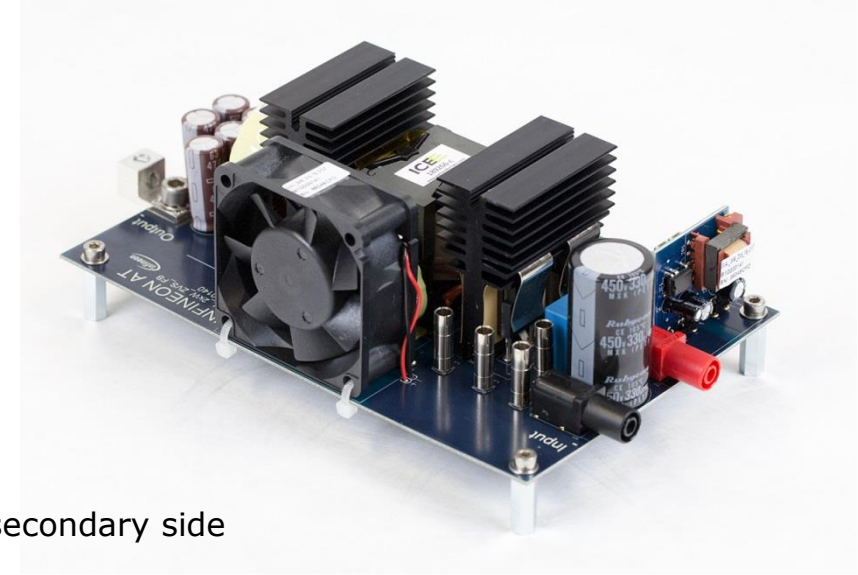
Following additional expert kits are available
- KIT_6W_12V_BIAS_ICE3 ; DC-DC Bias board
- KIT_6W_12V_BIAS_ICE5 ; DC-DC Bias board

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General

Description:

› The ZVS phase-shift full-bridge evaluation board "EVAL_2kW_ZVS_FB_CFD7" represents the newly developed ZVS DC-DC converter for telecom rectifiers with an output voltage from 45 to 56 V_{DC} and an output power of 2 kW. This converter works with an input voltage between 350 and 420 V_{DC} (typical 400V V_{DC}) and a switching frequency of 100 kHz on the primary side. This board includes the following Infineon products: full-bridge 600 V CoolMOS™ CFD7 SJ MOSFET (IPW60R070CFD7), OptiMOS™ 200 V synchronous rectification MOSFET (IPP110N20N3), auxiliary converter CoolSET™ (ICE3RBR4765JZ) and EiceDRIVER™ 2EDN non-isolated gate driver IC (2EDN7524F).

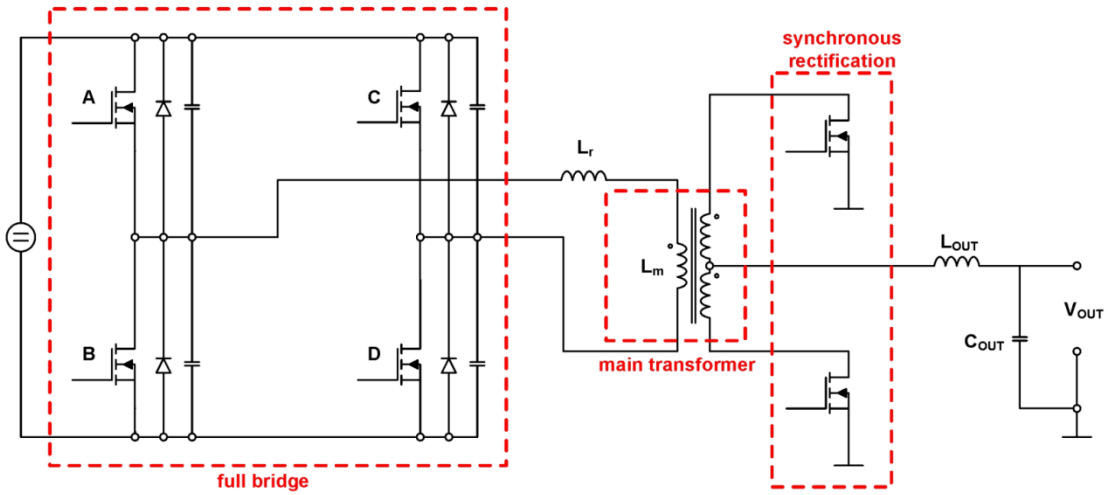


Summary of features:

› DC-DC converter with 350 - 420 V_{DC} input
› 45 – 56 V_{DC} output voltage
› Up to 2000 W output power
› 100 kHz switching frequency on primary and 200 kHz on secondary side

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ZVS phase-shift full-bridge simpilfied schematic

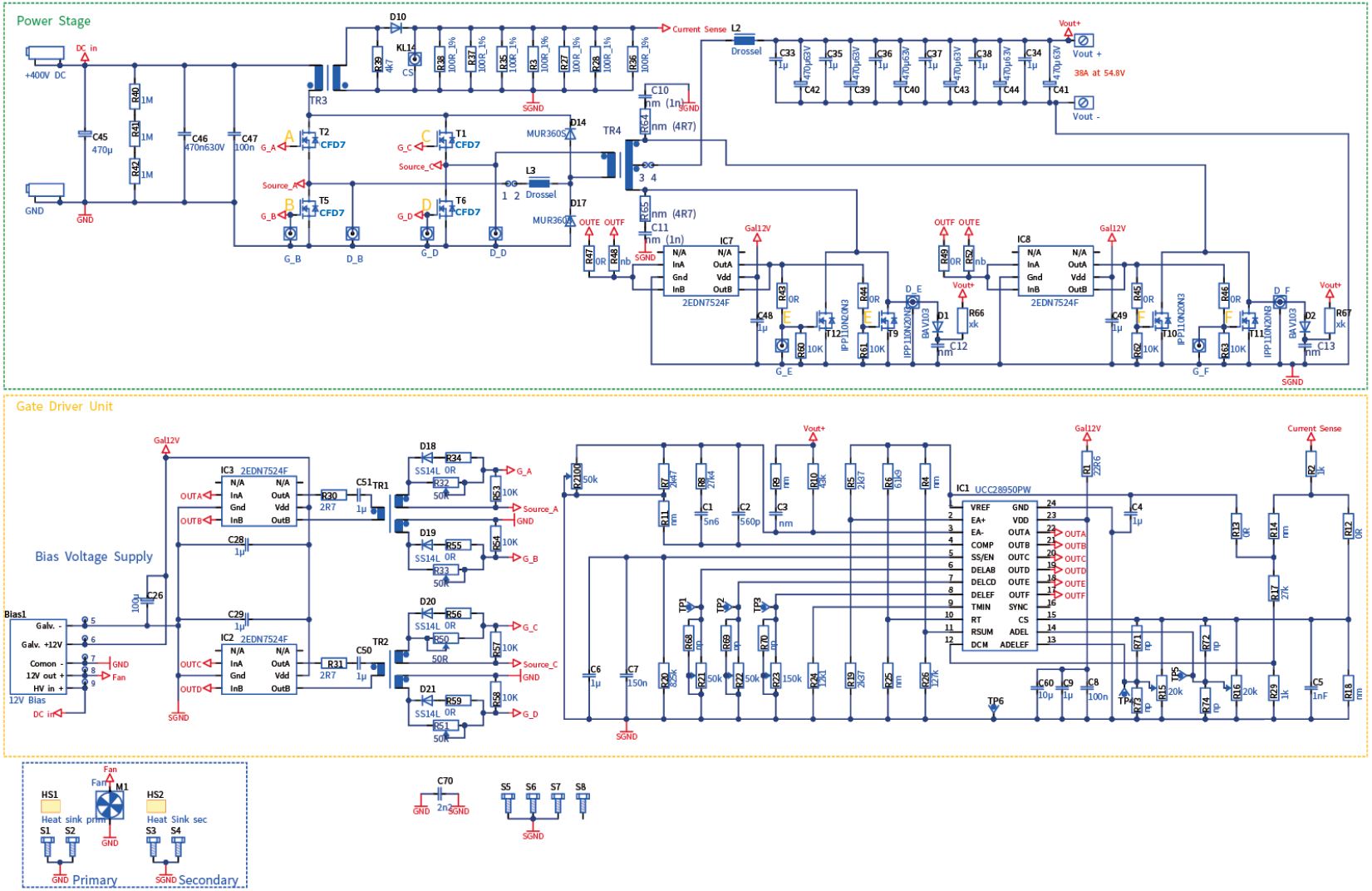


Main components:

- Full-bridge MOSFET: 600 V CoolMOS™ CFD7 (IPW60R070CFD7)
- Synchronous rectification MOSFET: OptiMOS™ 200 V (IPP110N20N3)
- Auxiliary converter: CoolSET™ (ICE3RBR4765JZ)
- Controller: Texas instruments (UCC28950)
- Gate driver: EiceDRIVER™ 2EDN (2EDN7524F)
- Main transformer: kaschke components gmbh, SP-PQ 40/40 ferrite core (center tapped)
- Resonant choke: kaschke components gmbh, SDR 9,0-0,03 kool-mμ
- Output choke: kaschke components gmbh, SDR-37-0,012 molypermalloy

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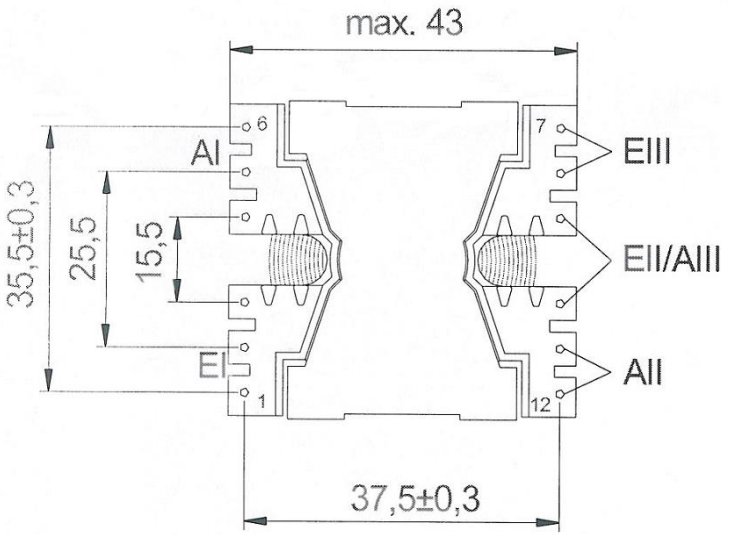
Schematic mainboard

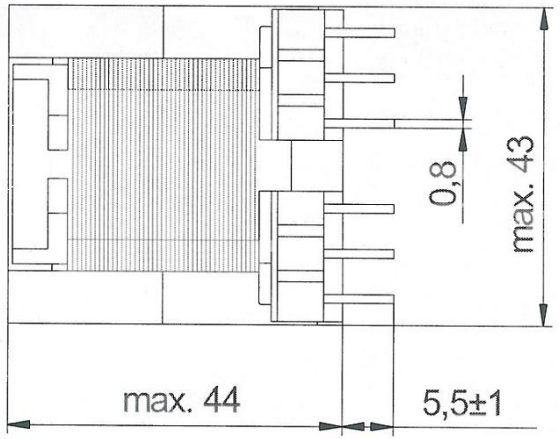


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Main transformer

- Core type: PQ40/40
- Core material: 3C96
- Nominal inductance: 1mh ±15%
- Ratio of turns: 20 : 4 : 4
- Dielectric strength (50 hz/1 s): 3 kV
- Operating temperature: -25°C to +125°C
- Storage temperature: -25°C to +85°C



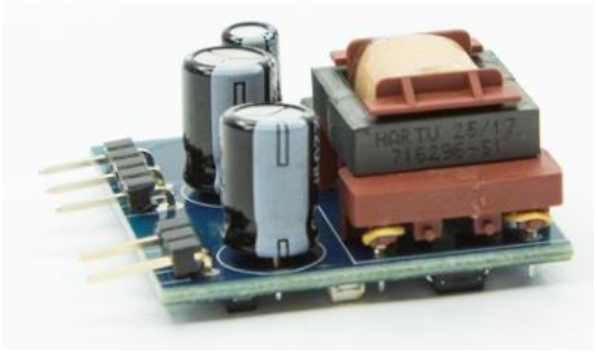


dimensions in [mm]

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BIAS KIT_6W_12V_BIAS_ICE3 (one bias board included)





Ordering code:
KIT_6W_12V_BIAS_ICE3

Board components

› CoolSET™ (ICE3RBR4765JZ)

Board specifications

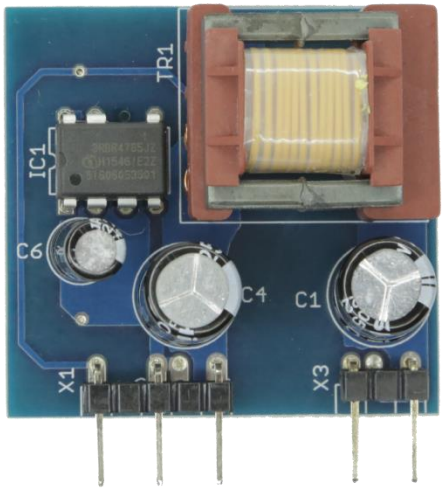
› Input voltage: 90 V_{DC} - 400 V_{DC}
› Output voltage: 12 V_{DC} (prim. and sec. side)
› Output power max.: 6 W (prim. + sec. side)

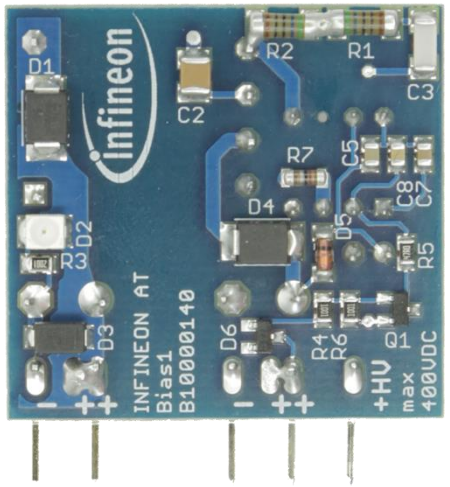
To be used with the following boards

› EVAL_800W_ZVS_FB_CFD7
› EVAL_2KW_ZVS_FB_CFD2
› EVAL_2KW_ZVS_FB_CFD7
› EVAL_2.5KW_CCM_4PIN
› EVAL_2K5W_CCM_4P

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BIAS KIT_6W_12V_BIAS_ICE3 (one bias board included)





~35 mm

~37 mm

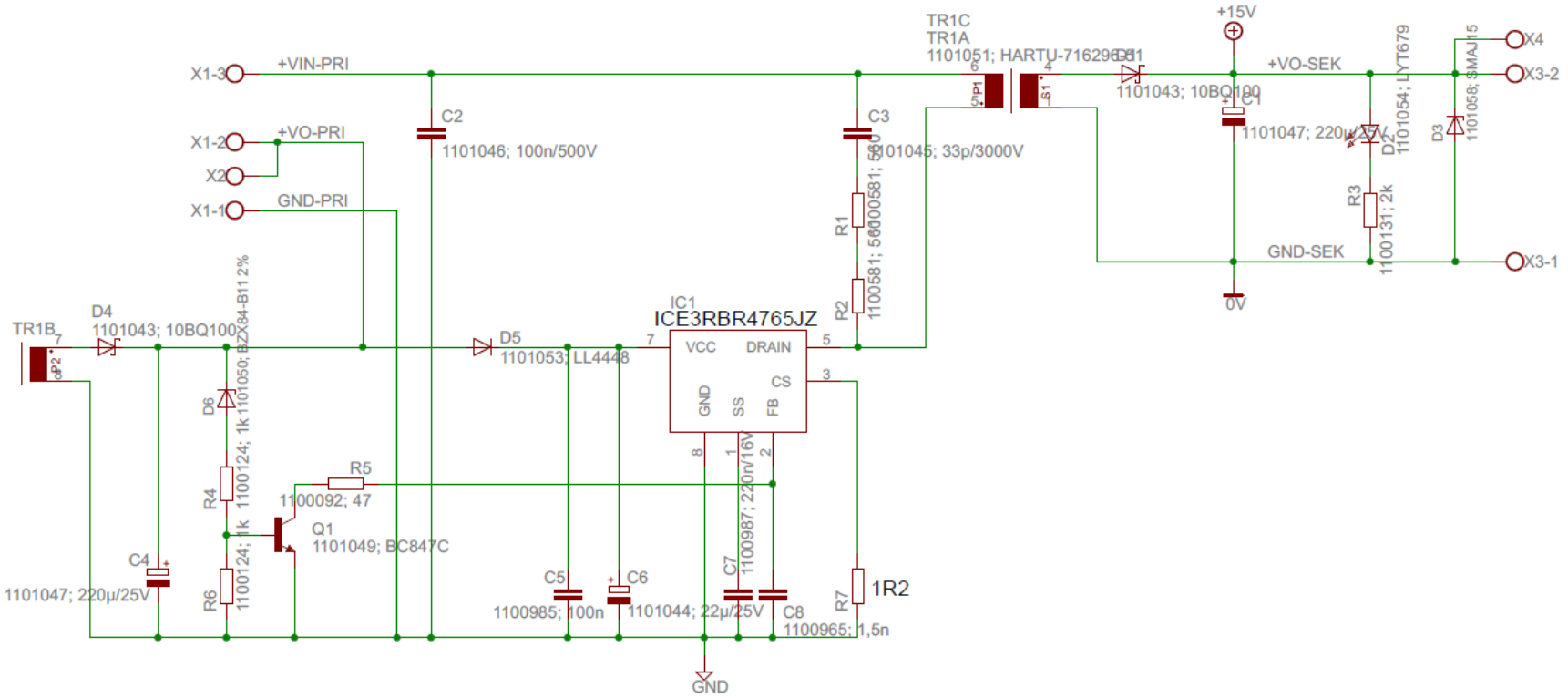
Ordering code:
KIT_6W_12V_BIAS_ICE3

Auxiliary supply solution featuring off-line SMPS current mode controller IC with integrated 650 V CoolMOS™ SJ MOSFET



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BIAS KIT_6W_12V_BIAS_ICE3 schematic



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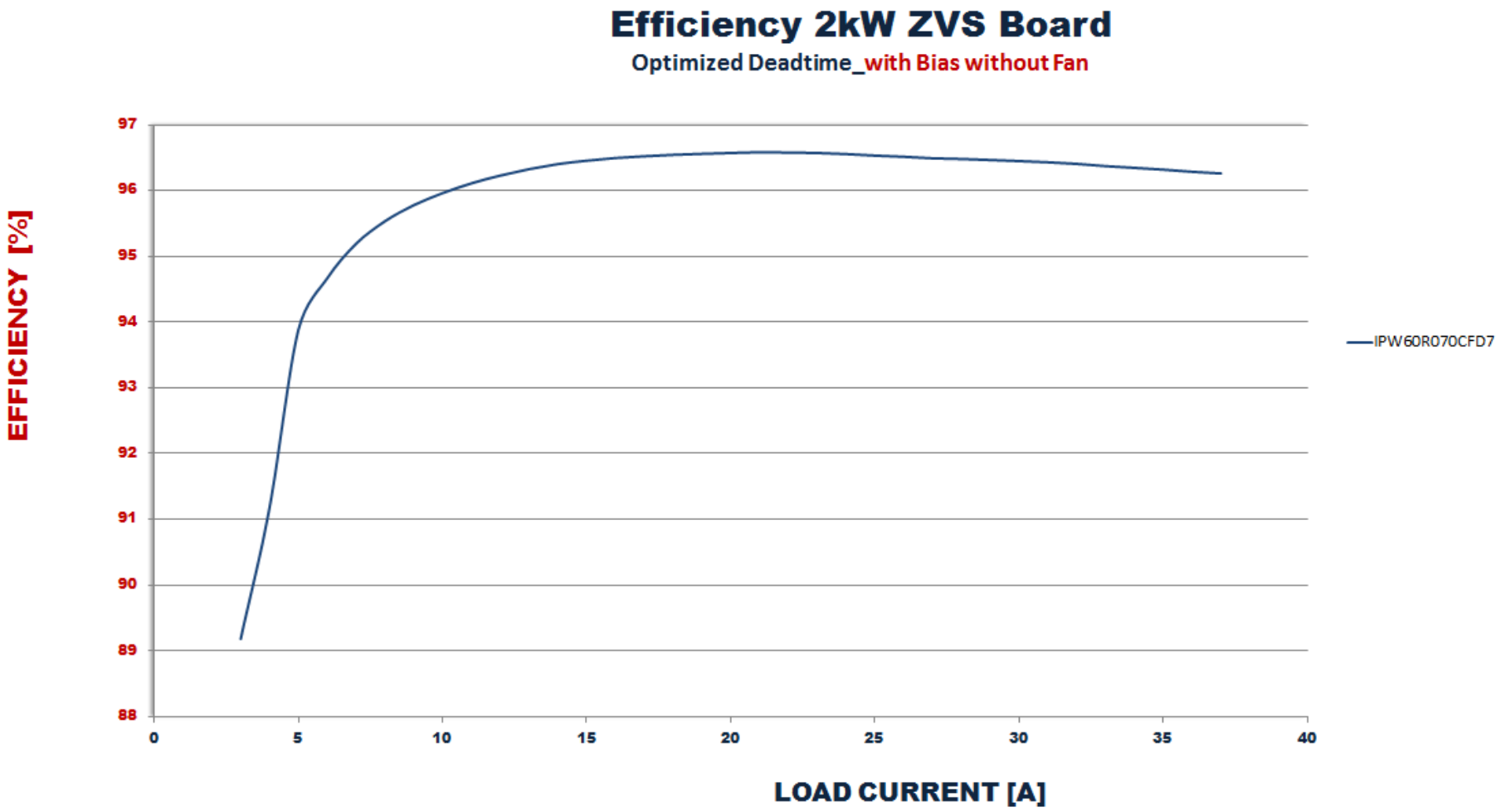
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CoolMOS™ CFD2 in ZVS board - efficiency



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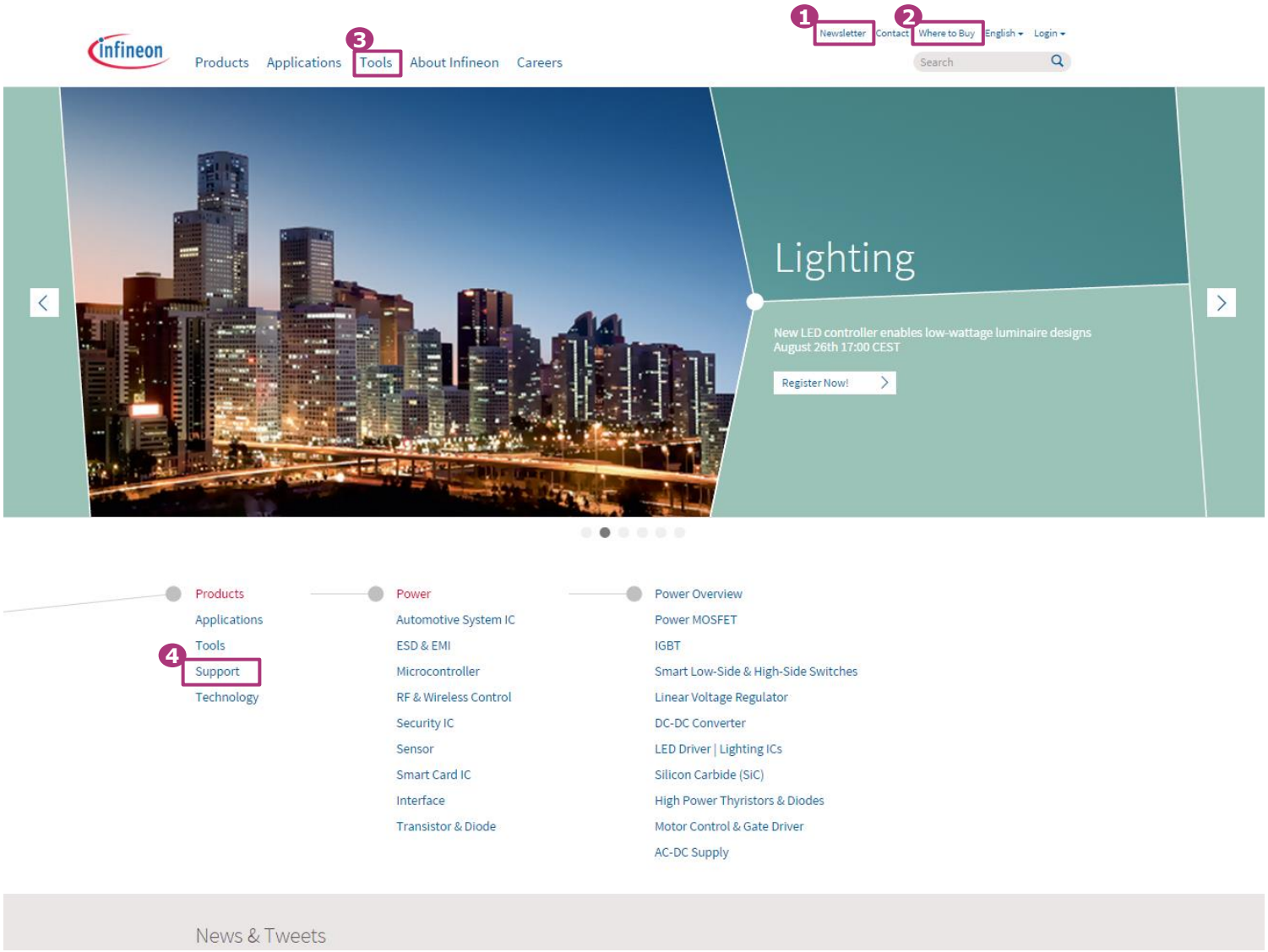
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