

# EVAL\_2kW\_ZVS\_FB\_CFD7

2 kW ZVS phase-shift full-bridge  
evaluation board

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Zechner Florian



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General description

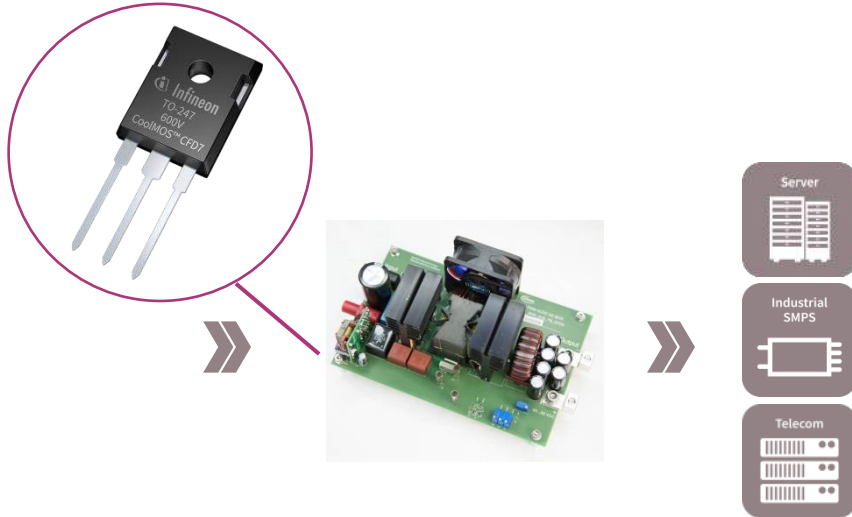
2

Test results

# Evaluation board 600 V CoolMOS™ CFD7 SJ MOSFET



EVAL\_2KW\_ZVS\_FB\_CFD7



Technical and order details

Parameter	Value
Input voltage	350 V <sub>DC</sub> - 420 V <sub>DC</sub>
Output voltage	45 V <sub>DC</sub> - 56 V <sub>DC</sub>
Output power	2kW
Peak Efficiency @ 50% load	>96.6%

Learn more	
Sales name	<u>EVAL_2KW_ZVS_FB_CFD7</u>
SAP Mat number	<b>SP001720550</b>
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

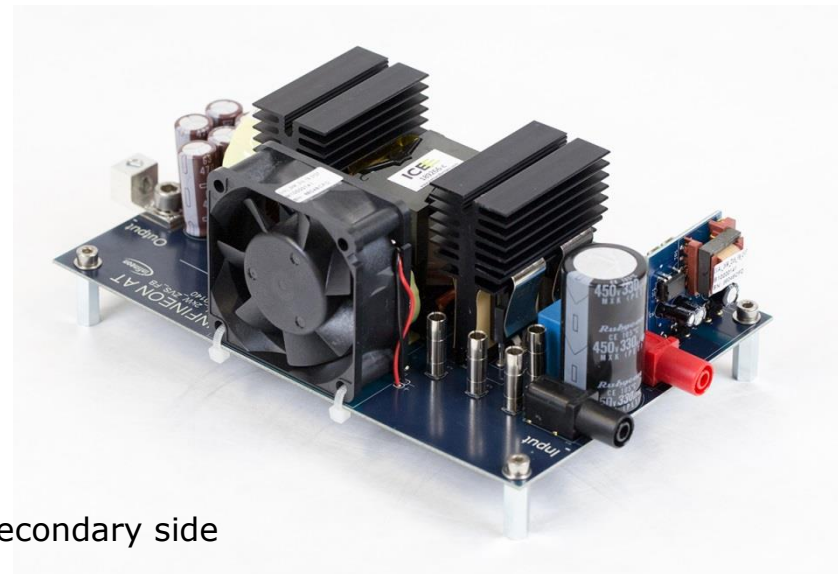
# General

## Description:

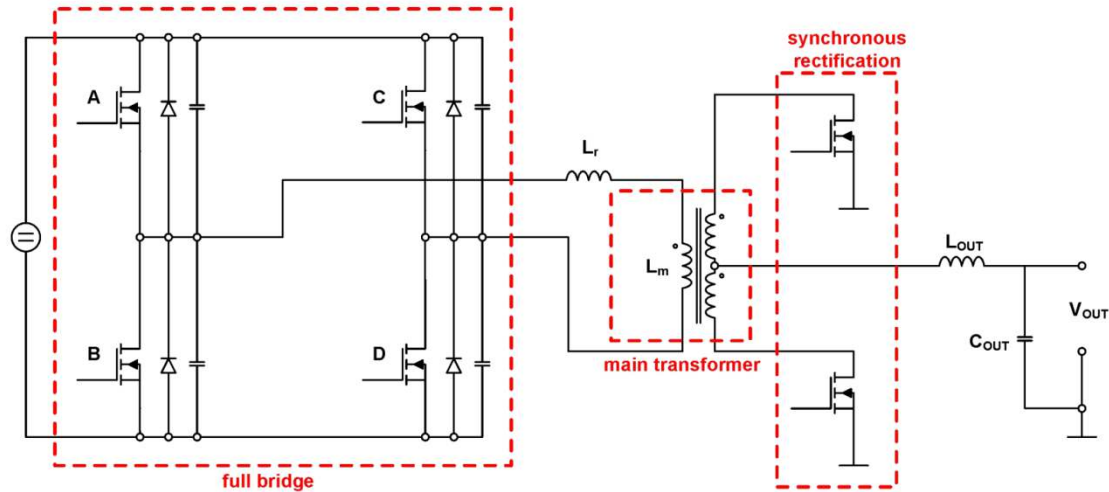
- › The ZVS phase-shift full-bridge evaluation board "[EVAL\\_2kW\\_ZVS\\_FB\\_CFD7](#)" represents the newly developed ZVS DC-DC converter for telecom rectifiers with an output voltage from 45 to 56 V<sub>DC</sub> and an output power of 2 kW. This converter works with an input voltage between 350 and 420 V<sub>DC</sub> (typical 400V V<sub>DC</sub>) 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<sub>DC</sub> input
- › 45 – 56 V<sub>DC</sub> output voltage
- › Up to 2000 W output power
- › 100 kHz switching frequency on primary and 200 kHz on secondary side



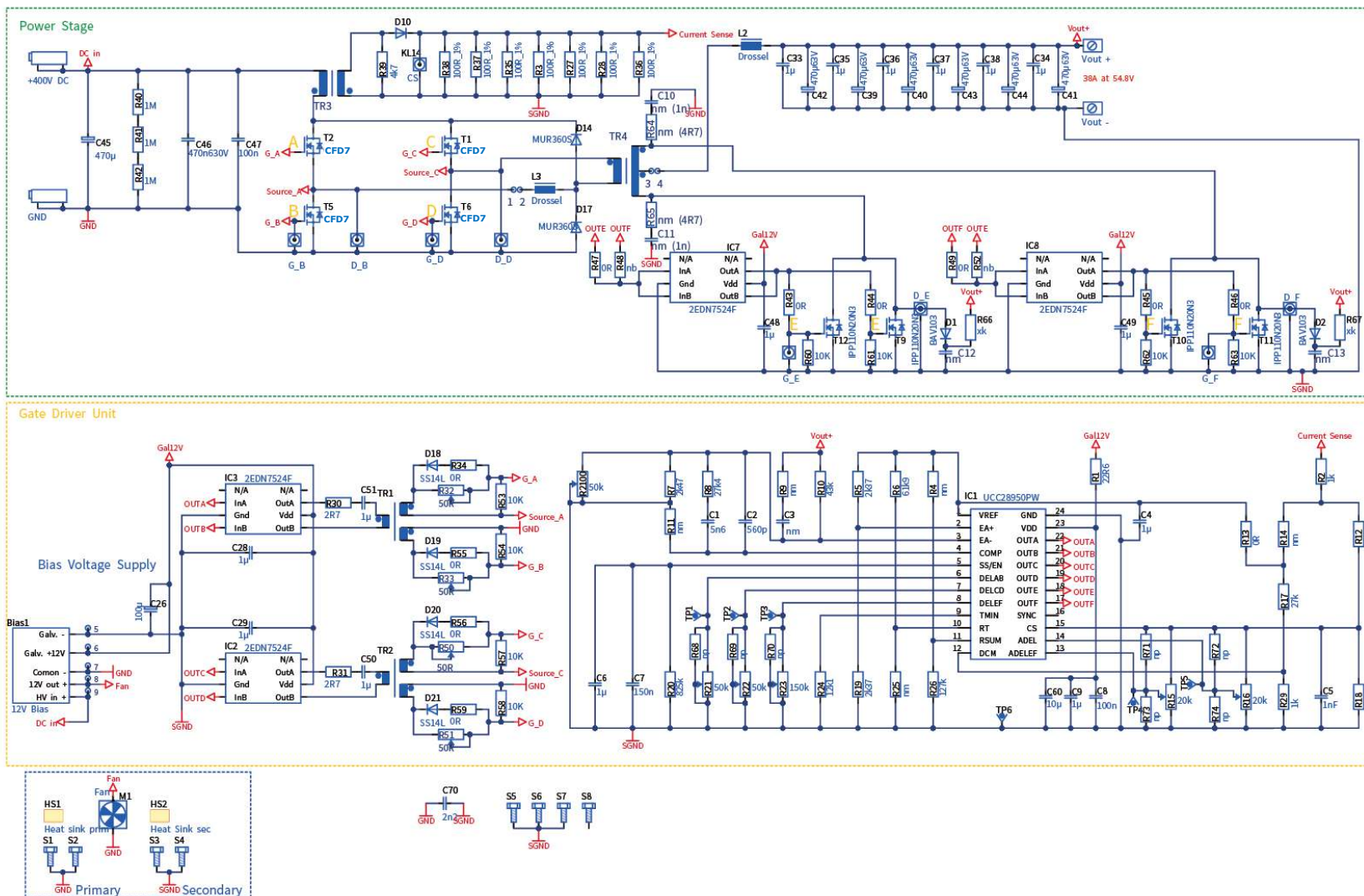
# ZVS phase-shift full-bridge simplified schematic



## Main components:

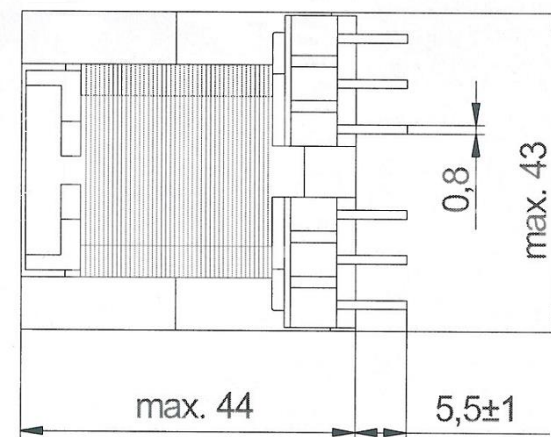
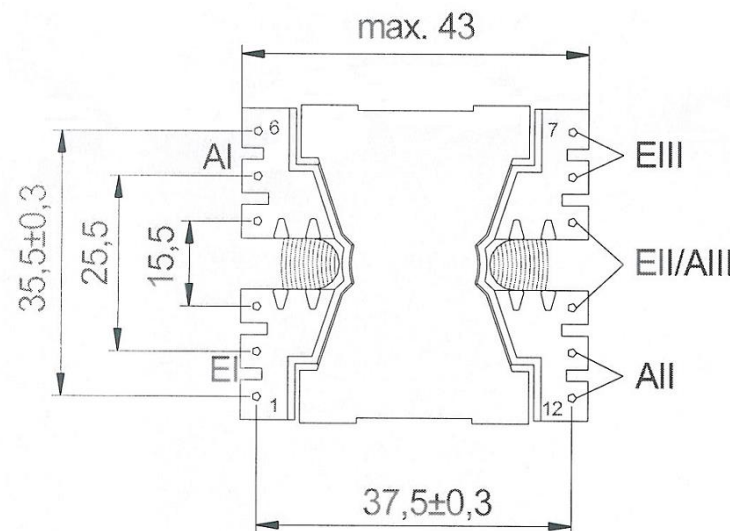
- > Full-bridge MOSFET: 600 V CoolMOS™ CFD7 (IPW60R070CFD7)
- > Synchronous rectification MOSFET: OptiMOS™ 200 V (IPP110N20N3)
- > Auxiliary converter: CoolSET™ (ICE3RBR4765JZ)
- > Controller: Texas instruments (UCC28950)
- > Gate driver: EiceDRIVER™ 2EDN (2EDN7524F)
- > Main transformer: kaschke components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

# Schematic mainboard



# Main transformer

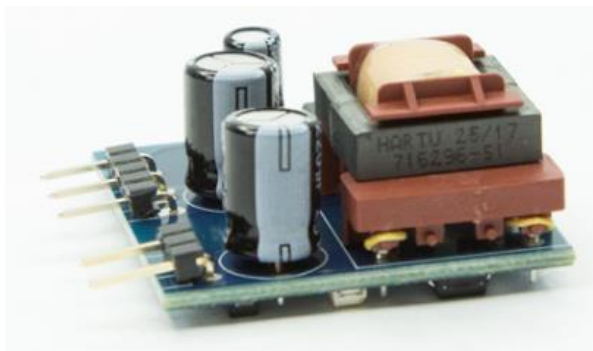
- > Core type: PQ40/40
- > Core material: 3C96
- > Nominal inductance: 1mh  $\pm$ 15%
- > Ratio of turns: 20 : 4 : 4
- > Dielectric strength (50 hz/1 s): 3 kV
- > Operating temperature: -25°C to +125°C
- > Storage temperature: -25°C to +85°C



dimensions in [mm]



# BIAS KIT\_6W\_12V\_BIAS\_ICE3 (one bias board included)



**Ordering code:**

**[KIT 6W 12V BIAS ICE3](#)**

## **Board components**

- › CoolSET™ (ICE3RBR4765JZ)

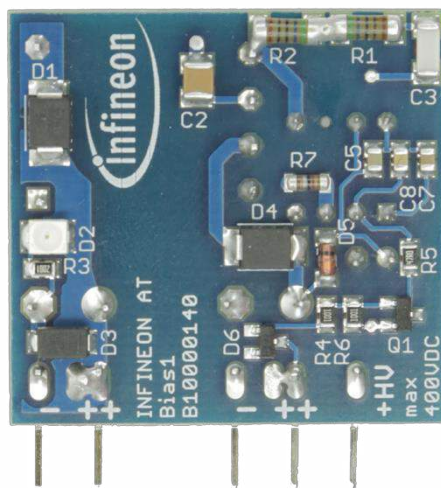
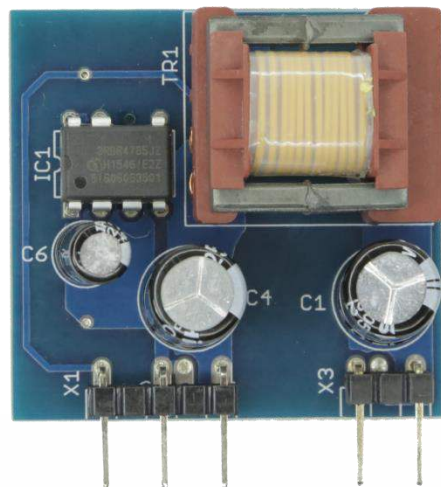
## **Board specifications**

- › Input voltage: 90 V<sub>DC</sub> - 400 V<sub>DC</sub>
- › Output voltage: 12 V<sub>DC</sub> (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

# BIAS KIT\_6W\_12V\_BIAS\_ICE3 (one bias board included)



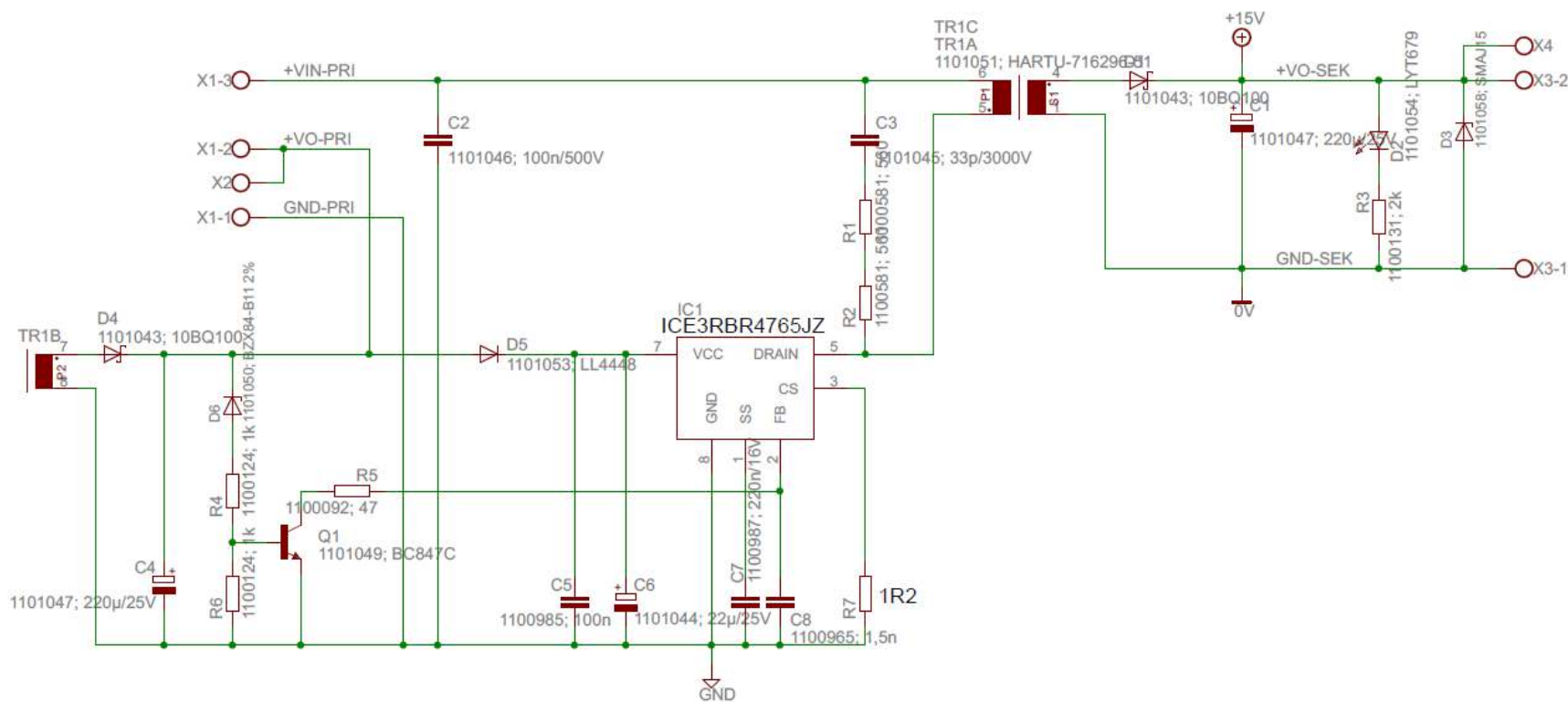
~35 mm

~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

# BIAS KIT\_6W\_12V\_BIAS\_ICE3 schematic



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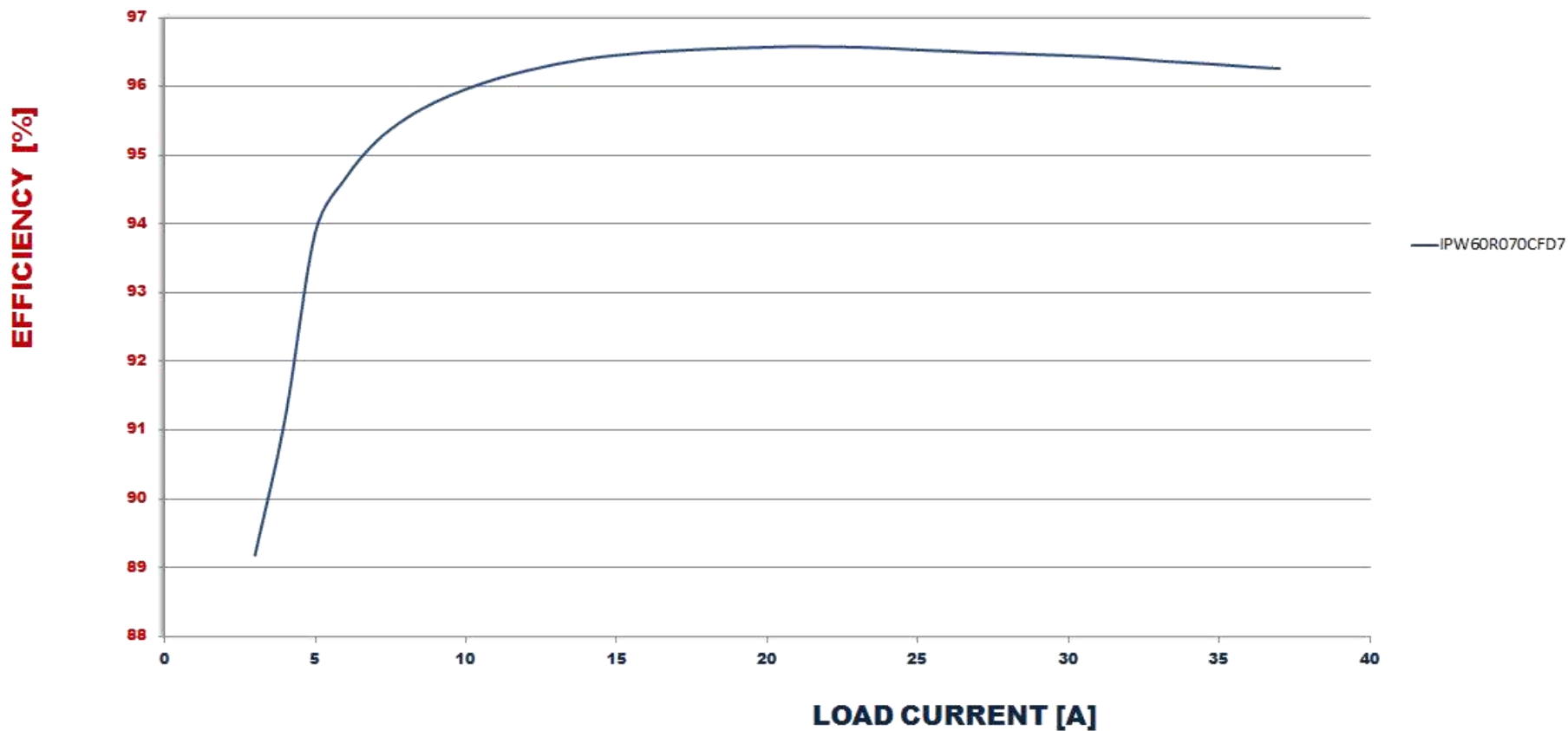
2

Test results

# CoolMOS™ CFD2 in ZVS board - efficiency

## Efficiency 2kW ZVS Board

Optimized Deadtime\_ **with Bias without Fan**





## Technical Material

- > Application Notes
- > Simulation Models
- > Datasheets
- > PCB Design Data

- > [EVAL\\_2kW\\_ZVS\\_FB\\_CFD7](#)
- > [www.infineon.com/cfd7](http://www.infineon.com/cfd7)

## Evaluation Boards

- > Evaluation Boards
- > Demoboards
- > Reference Designs

- > [www.infineon.com/evaluationboards](http://www.infineon.com/evaluationboards)

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- > Technical Videos
- > Product Information Videos

- > [www.infineon.com/mediacenter](http://www.infineon.com/mediacenter)

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- Utility links: **Newsletter** (highlighted with a red box and '1'), Contact, **Where to Buy** (highlighted with a red box and '2'), English, Login
- Search bar with a magnifying glass icon

The main content area features a large image of a city skyline at night. Overlaid on the right side of the image is a teal box with the following text:

- Lighting**
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  - Transistor & Diode
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  - IGBT
  - Smart Low-Side & High-Side Switches
  - Linear Voltage Regulator
  - DC-DC Converter
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