

Application Brief

Off-line isolated power supply 3 W 5 V reference design

Extremely low standby power consumption based on CoolSET™ current mode controller

The fast growing market around the Internet of Things (IoT) covers a wide range of applications. All of them have one thing in common, namely the ability to collect and exchange data with each other. The microcontrollers, sensors, actuators, etc. embedded in each of the devices stay connected to the network at all times. They are supplied by an efficient low-power low-standby power supply for which the Infineon CoolSET™ family of integrated off-line power supply ICs is ideally suited.

In this reference design, the Infineon CoolSET™ ICE3RBR4765JG is used as a current-mode flyback controller. It has a built-in 650 V CoolMOS™. This application operates in Discontinuous Conduction Mode (DCM), running at 65 kHz switching frequency. The output is single 5 V 600 mA. Active burst mode operation provides extremely low standby power consumption, < 13 mW over the input voltage range 180–265 V AC. Low EMI is achieved by built-in frequency jitter and soft start operation.

Target applications

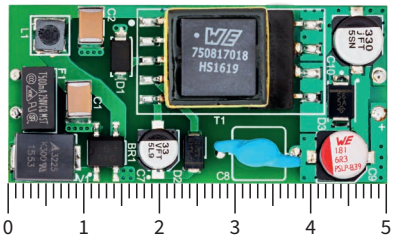
- Applications related to the Internet of Things (IoT)
  - Standby power supply
  - Power supply for microcontrollers
  - Power supply for standalone sensors operating on a wired/wireless interface bus
- USB-power supply embedded in a wall plug
- Intelligent wall plug switched by wireless (with relay)
- Metering application
- General applications with small form factor in the power range 1 W to 3 W

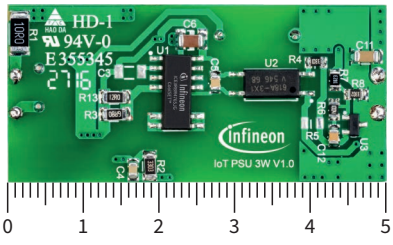
Key features

Power conversion with solid performance and more

- Input voltage range 180–265 V AC
- Efficiency > 75 percent
- Conducted EMI compliant with EN55022 class B
- Stand-by power < 13 mW
- V_{out} ripple (peak-to-peak) < 100 mV
- Small form factor (board dimension): 50 mm x 23.5 mm x 14 mm (L x W x H)
- Auto-restart protection modes
  - V_{cc} over/undervoltage
  - IC overtemperature
  - Overload
  - Open loop

Top and bottom side of the reference design



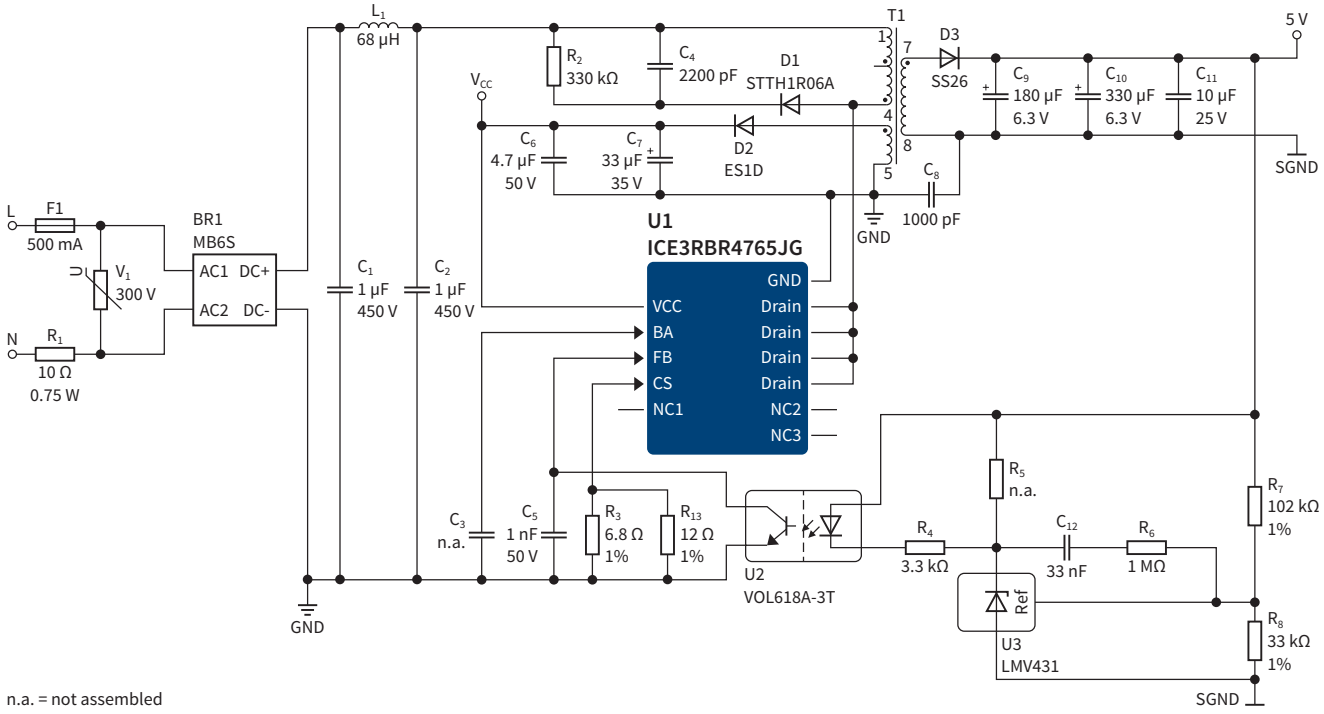


www.infineon.com/coolset

Off-line isolated power supply 3 W 5 V reference design

With CoolSET™ ICE3RBR4765JG

Reference design schematic



n.a. = not assembled

Order information

Type	Description	Ordering code
REF-3W-IOT-COOLSET	Power supply 3 W 5 V reference design	SP001642672

Published by
Infineon Technologies AG
81726 Munich, Germany

© 2016 Infineon Technologies AG.
All Rights Reserved.

Order Number: B121-I0380-V1-7600-EU-EC-P
Date: 10 / 2016

Please note!
THIS DOCUMENT IS FOR INFORMATION PURPOSES ONLY AND ANY INFORMATION GIVEN HEREIN SHALL IN NO EVENT BE REGARDED AS A WARRANTY, GUARANTEE OR DESCRIPTION OF ANY FUNCTIONALITY, CONDITIONS AND/OR QUALITY OF OUR PRODUCTS OR ANY SUITABILITY FOR A PARTICULAR PURPOSE. WITH REGARD TO THE TECHNICAL SPECIFICATIONS OF OUR PRODUCTS, WE KINDLY ASK YOU TO REFER TO THE RELEVANT PRODUCT DATA SHEETS PROVIDED BY US. OUR CUSTOMERS AND THEIR TECHNICAL DEPARTMENTS ARE REQUIRED TO EVALUATE THE SUITABILITY OF OUR PRODUCTS FOR THE INTENDED APPLICATION.

WE RESERVE THE RIGHT TO CHANGE THIS DOCUMENT AND/OR THE INFORMATION GIVEN HEREIN AT ANY TIME.

Additional information
For further information on technologies, our products, the application of our products, delivery terms and conditions and/or prices, please contact your nearest Infineon Technologies office (www.infineon.com).

Warnings
Due to technical requirements, our products may contain dangerous substances. For information on the types in question, please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by us in a written document signed by authorized representatives of Infineon Technologies, our products may not be used in any life-endangering applications, including but not limited to medical, nuclear, military, life-critical or any other applications where a failure of the product or any consequences of the use thereof can result in personal injury.