

## Product Brief

# 5<sup>th</sup> generation PWM controller

## Fixed frequency flyback controller and CoolSET™

### Rapid start-up with cascode configuration

To achieve a fast start-up performance, the 5<sup>th</sup> generation controller utilizes a high voltage superjunction MOSFET together with an internal current regulator to operate the start-up sequence in a safe and rapid manner. This is commonly known as cascode configuration, which also allows for the easy implementation of brown in protection. A high AC line input of up to 350 V<sub>AC</sub> is supported through the integration of the latest 800 V CoolMOS™ P7 SJ MOSFET and the optimization of leading edge blanking time.

### Eco mode with frequency reduction scheme

To increase the overall efficiency of the converter, the 5<sup>th</sup> generation controller enters the eco mode, whereby the switching frequency will be reduced in tandem with a reduction in load condition. This allows the system to reduce switching losses and increase efficiency, especially at mid and light load conditions.

### Integration of error amplifier for BOM savings and ease-of-design

In a multi-output or a single non-isolated output flyback design, the output regulation can be easily implemented on the primary side via a direct feedback with the 5<sup>th</sup> generation fixed frequency series. Such an approach helps to reduce external discrete components as well as simplifying the design of the power supply.

### Comprehensive suite of protection features

In addition to the typical output protection such as output short, overload and overvoltage protection, the 5<sup>th</sup> generation controller is able to detect abnormal line input conditions (except ICE5ARxxxBZS). Similarly, in-system protection has been further enhanced with the introduction of V<sub>CC</sub> and CS pin short-to-ground to prevent controller damage during abnormal start-up conditions and OTP has been enhanced with hysteresis to improve operational fault handling. To minimize interruption to system operation, all protection modes are implemented with auto resume to enhance user experience.

### Key features

- › Integrated with 700 V and 800 V superjunction MOSFETs with avalanche capability
- › Comprehensive suite of protection
- › Fixed frequency switching scheme with eco mode
- › Support both DCM and CCM current control mode
- › Direct feedback with integrated error amplifier for non-isolated topologies

### Key benefits

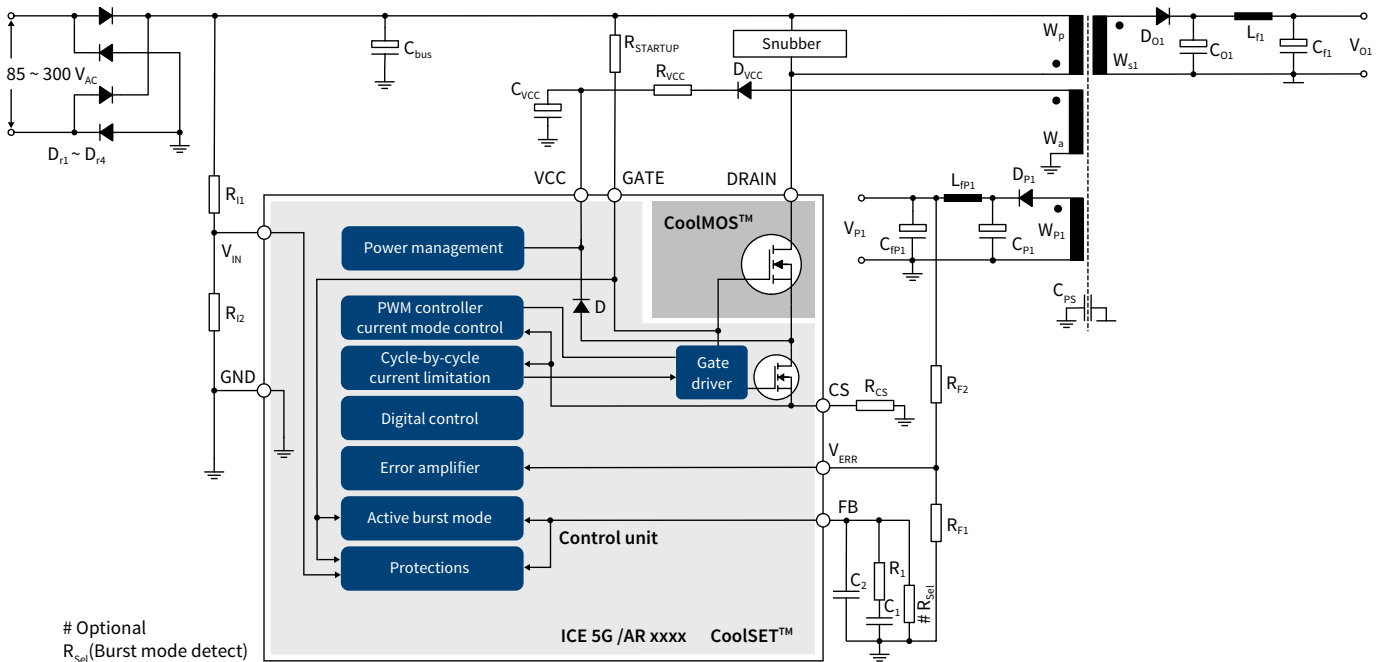
- › High efficiency with latest CoolMOS™ P7 SJ MOSFET family and fixed frequency switching scheme
- › Extensive protection coverage to increase system robustness
- › Auto-restart recovery scheme to minimize interruption to system operation
- › Single platform to support both isolated and non-isolated topologies



# 5<sup>th</sup> generation PWM controller

## Fixed frequency flyback controller and CoolSET™

Typical application schematic of primary side regulation



### Quick selection guide

Integrated MOSFET	Output power (85~350* V <sub>AC</sub> ) T <sub>a</sub> = 50°C	15 W	23 W	27 W	40 W	60 W
	Package type					
External MOSFET	DSO-8	ICE5ASAG (100 kHz) ICE5GSAG (125 kHz)				
700 V MOSFET	DIP-7	ICE5AR4770BZS				
	DSO-12	ICE5AR4770AG				
800 V MOSFET	DIP-7	ICE5AR4780BZS			ICE5AR0680BZS	
	DSO-12	ICE5GR4780AG	ICE5GR2280AG	ICE5GR1680AG	ICE5AR0680AG	

\* Up to 350 V<sub>AC</sub> input is only suitable with 800 V MOSFET devices

Published by  
Infineon Technologies Austria AG  
9500 Villach, Austria

© 2017 Infineon Technologies AG.  
All Rights Reserved.

#### 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](http://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.