

CoolSET™

The coolest couple out there



www.infineon.com/coolset



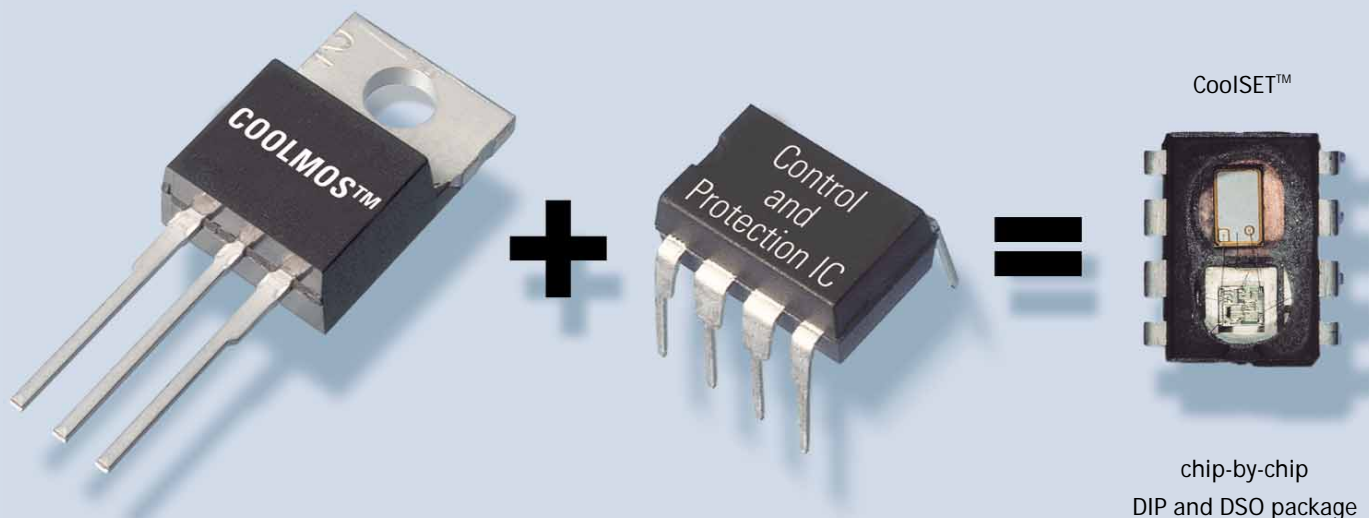
Never stop thinking.



CALL TO INNOVATE

MARKET DEMANDS continue to raise the bar in the design of switched mode power supplies (SMPS). Designers are challenged to reduce both footprint and weight to enhance operational flexibility and user mobility. At the same time, the application power consumption curve continues to sweep upwards. This places designers under even greater pressure to optimize efficiency and reliability by keeping standby power consumption and EMI levels to a minimum. These demands are reflected in the increasingly stringent legal requirements governing efficiency ratings, such as Energy Star and Blue Angel. The upcoming legislation is expected to further tighten existing rules.

THE CoolSET™ MULTICHIP solution is Infineon's response to these spiraling requirements. This 2-in-1 solution integrates a control IC and CoolMOS™ powerstage to reduce size, weight, and heat dissipation across an unprecedented application power range.



CHILLING DUO

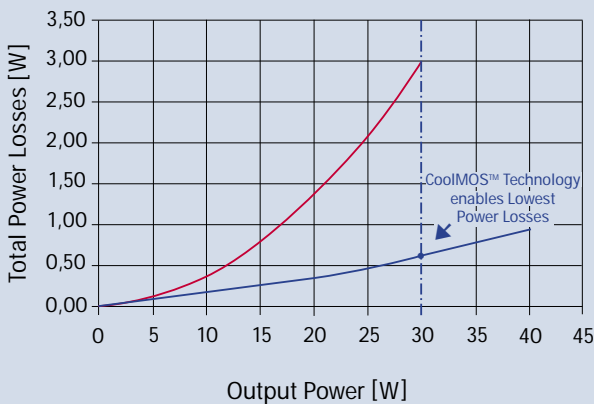
BY INTEGRATING the control IC and CoolMOS™ power MOSFET into one package, CoolSET™ marks a new dimension in design agility and miniaturization. At the same time, the CoolSET family provides the highest output power with the lowest losses available in industry, including the highest degree of flexibility by means of external current sense scaling.

LEVERAGING Infineon's market-leading MOSFET technology, the CoolMOS power MOSFET sets new standards for high-voltage transistors by dramatically curtailing conducting and switching losses. Area specific $R_{DS(on)}$ is five times lower compared to conventional power MOSFETs. Therefore it cuts power losses significantly and eliminates the need for a heatsink.

CoolSET also integrates a fixed frequent pulse width modulator (PWM) control IC. Optimized to the specific application requirements, the control IC ensures outstanding overload, open loop, overvoltage protection and provides soft start and thermal shut-down, all with automatic re-start. It also offers low standby power consumption and keeps EMI to a minimum through a modulated gate drive.

Comparison of Power Losses

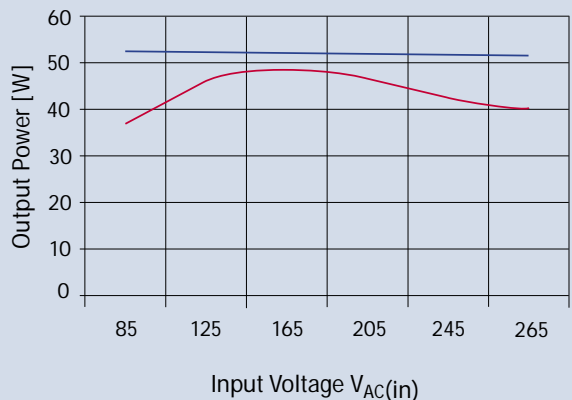
Total Power Losses versus Output Power



— Leading Competitor in 30 W Application
— CoolSET™ ICE2A365 in 40 W Application

Comparison of accurate Output Power Limit

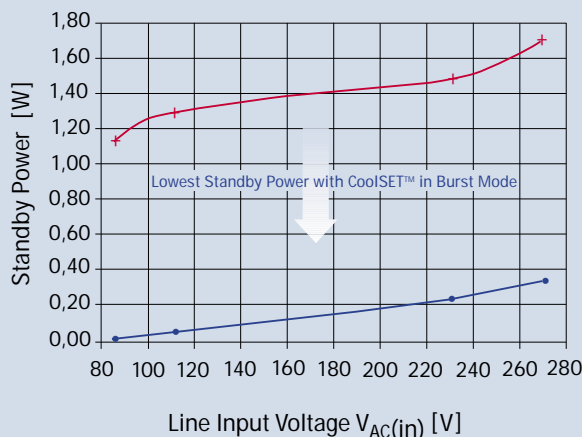
Max Output Power versus Input Voltage



— Leading Competitor in 30 W Application
— CoolSET™ ICE2A365 in 40 W Application

Comparison of Standby Power Consumption at No Load Condition

Standby Power versus Input Voltage

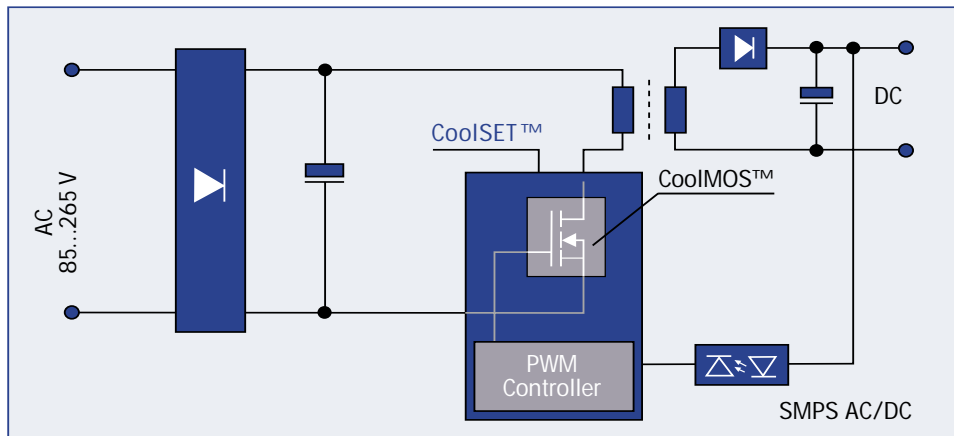


— Leading Competitor in 30 W Application
— CoolSET™ ICE2A365 in 40 W Application

WIN-WIN SITUATION

CoolSET™ OFFERS A RANGE OF features to propel you ahead of the competition. You can optimize design by reducing heat dissipation and EMI, maximize efficiency by cutting system size and weight, speed time-to-market by simplifying design-in, and – last but not least – keep a tight rein on overall system costs.

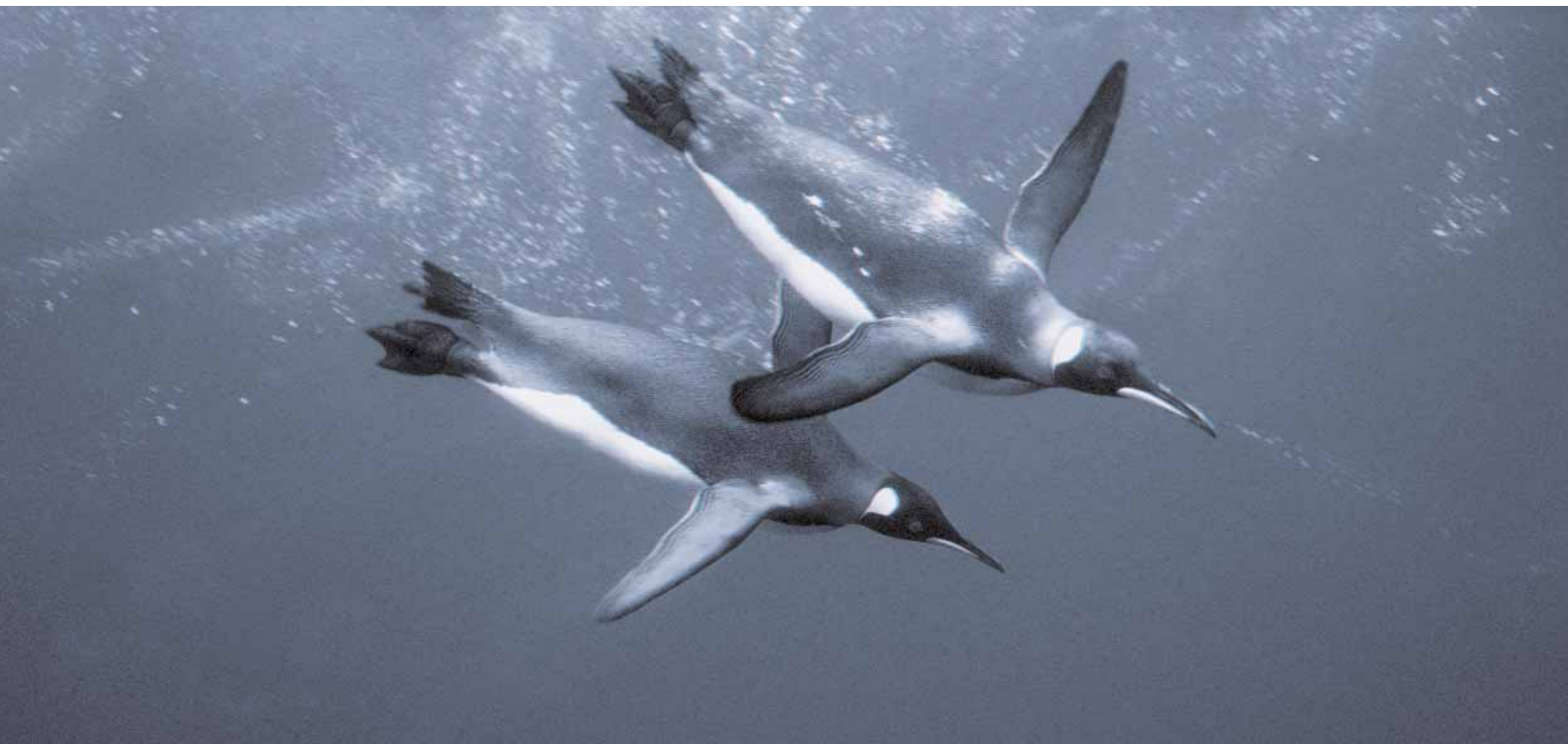
Typical SMPS schematic containing CoolSET™ with secondary regulation



CoolSET™ Features

- Lowest standby power consumption to comply with upcoming international standby requirements
- Lowest on-resistance for record efficiency levels
- Elimination (or minimization) of heatsink to shrink board weight and size resulting from reduced heat dissipation
- Integration of enhanced protection features to reduce the need for surrounding components (such as short-circuit protection)
- Modulated gate drive for lower EMI
- Special customer support from Infineon including simulation models (PSpice™*), evaluation and demo boards with documentation, calculation tools, and application notes

*PSpice is a registered Trademark of Cadence Design Systems, Inc.



APPLICATIONS

THE COOLSET™ FAMILY is suited to a broad range of SMPS applications: notebook, printer and LCD-monitor adapters; battery chargers for portable and mobile devices; and multimedia systems such as set top boxes and DVD players. Regardless of your application field, the combined benefits of CoolMOS™ technology, a sophisticated control IC feature set, and a space-efficient 2-in-1 design provide a powerful foundation on which to build your next-generation SMPS solutions.

PRODUCT OVERVIEW

Device	Maximum Output Power ($V_{AC} = 85 \dots 270 \text{ V}$)	Breakdown Voltage	Maximum Current Rating	Typical On-Resistance $R_{DS(on)}$	Package	Evaluation Boards Available
TDA 16831	10 W	650 V	1 A	3.5 Ω	DIP8	EVAL10
TDA 16831G	10 W	650 V	1 A	3.5 Ω	SO14	-
TDA 16832	20 W	650 V	1 A	3.5 Ω	DIP8	EVAL20
TDA 16832G	15 W	650 V	1 A	3.5 Ω	SO14	-
TDA 16833	30 W	650 V	2 A	1.0 Ω	DIP8	EVAL30
TDA 16833G	25 W	650 V	2 A	1.0 Ω	SO14	-
TDA 16834	40 W	650 V	3 A	0.5 Ω	DIP8	EVAL40
TDA 16822	20 W	650 V	2 A	3.0 Ω	DIP8	EVAL10/20
ICE 2A165	20 W	650 V	1 A	3.0 Ω	DIP8	-
ICE 2A180	20 W	800 V	1 A	3.0 Ω	DIP8	-
ICE 2A265	30 W	650 V	2 A	0.9 Ω	DIP8	-
ICE 2A280	35 W	800 V	2 A	0.8 Ω	DIP8	-
ICE 2A365	45 W	650 V	3 A	0.5 Ω	DIP8	EVALF240 single EVALF240 multi



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