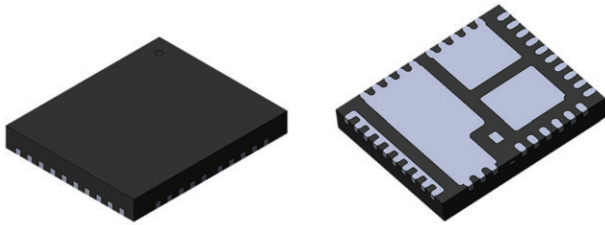


80 A VRPower[®], Automotive Grade Smart Power Stage With Current Sensing and Temperature Monitor

(Datasheet in Brief)



DESCRIPTION

The SiCQ830A is an integrated power stage solution optimized for synchronous buck applications to offer high current, high efficiency, and high power density. SiCQ830A integrates the gate driver, high-side MOSFET, and low-side MOSFET together to provide high performance in a small package. It enables simple voltage regulator design to deliver up to 80 A of peak current.

The internal power MOSFETs utilize Vishay's state-of-the-art TrenchFET[®] Gen V technology that delivers industry bench mark performance to significantly reduce switching and conduction losses.

The SiCQ830A incorporates an advanced MOSFET gate driver IC that features high current driving capability, adaptive dead-time control, integrated bootstrap switch, and a thermal monitor that alerts the system of excessive junction temperature. The driver is compatible with a wide range of PWM controllers, supporting 3.3 V PWM logic with tri-state. The device also integrates a current monitor to provide a real-time representation of the inductor current (I_{MON}). An on-board temperature monitor (T_{MON}) provides the system an indication of the power stage internal temperature which can be used to throttle the system operation down to a safer level if needed. The device also integrates fault protections and reporting such as over-current, over-temperature, and undervoltage.

FEATURES

- AEC-Q100 qualified for automotive applications
- Gen V TrenchFET technology optimized for 12 V input bus
- Integrated Schottky diode in low-side MOSFET
- 80 A peak current capability
- High frequency operation up to 1.5 MHz
- Current monitor with 5 μ A/A gain
- Temperature monitor output with 8 mV/ $^{\circ}$ C gain
- 3.3 V PWM with tri-state support
- Accurate positive and negative over-current protections
- Over-temperature protection
- V_{CC} / V_{DRV} / BOOT under voltage lockout
- Fault reporting and identification through T_{MON} and I_{MON}
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

APPLICATIONS

- Datacenter and server multiphase controller voltage regulators
- High-power SoC and FPGA
- DC/DC VR modules

EFFICIENCY

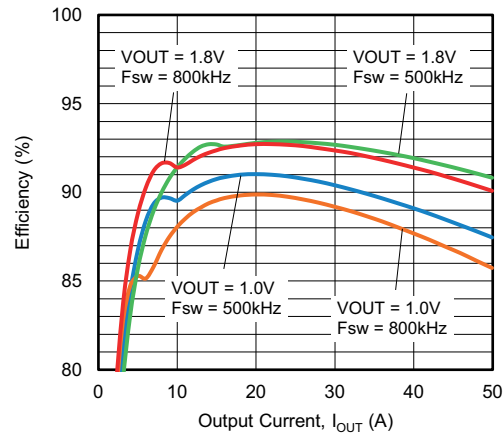


Fig. 1 - Efficiency vs. Output Current
($V_{IN} = 12$ V, $L = 100$ nH, $V_{CC} = V_{DRV} = 5$ V,
driver and inductor loss included)



PRODUCT SUMMARY	
Part number	SiCQ830A
Description	80 A smart power stage with current sensing and temperature monitor, 3.3 V PWM
Input voltage min. (V)	4.5
Input voltage max. (V)	16
Current rating (A)	80
Switch frequency max. (kHz)	1500
Enable (yes / no)	Yes
Monitoring features	I _{MON} , T _{MON}
Protection	UVLO, OTP, OCP
Light load mode	None
Pulse-width modulation (V)	3.3
Package type	MLP39-65
Package size (W, L, H) (mm)	5 x 6 x 0.75
Status code	1
Product type	VRPower
Applications	Multiphase voltage regulators

To request the full version of the datasheet, please contact: ICmarketing@vishay.com

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package / tape drawings, part marking, and reliability data, see www.vishay.com/ppg?61747.



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.