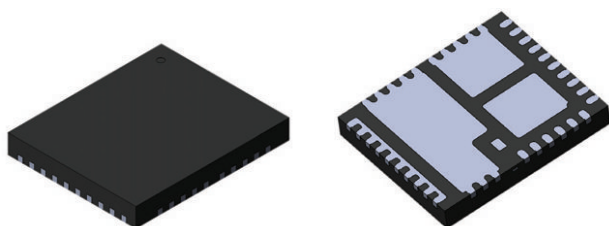


SiC825, 80 A VRPower[®], Smart Power Stage With Current Sensing and Temperature Monitor

(Datasheet in Brief)



DESCRIPTION

The SiC825 is an integrated power stage solution optimized for synchronous buck applications to offer high current, high efficiency, and high power density performance. Packaged in Vishay's 5 mm x 6 mm MLP package, SiC825 enables voltage regulator design to deliver in excess of 80 A per phase current.

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

The SiC825 incorporates an advanced MOSFET gate driver IC that features high current driving capability, adaptive dead-time control, and integrated bootstrap switch, a thermal monitor that alerts the system of excessive junction temperature. This driver is also compatible with wide range of PWM controllers with the support of both 3.3 V and 5 V PWM logic with tri-state. Diode emulation mode can be enabled at light loads through the use of PWM tri-state signal. The device also integrates a current monitor to provide a real time scale down of inductor current (I_{MON}). A temperature monitor provides the system an indication of the power stage internal temperature ($T_{MON/FLT}$) and can be used to throttle the system operation down to a safer level if needed. The device also integrates fault alerts such as HS FET overcurrent, over temperature and HS MOSFET short failures.

FEATURES

- Thermally enhanced PowerPAK[®] MLP56-39L package
- Optimize MOSFET switching performance with integrated Schottky diode in LS MOSFET
- Up to 80 A continuous current
- High frequency operation up to 2 MHz
- Power MOSFETs optimized for 12 V input stage and 10 % to 15 % duty cycle operation
- 3.3 V / 5 V PWM logic with tri-state and hold-off
- PWM minimum controllable on time of 30 ns
- Diode emulation mode at light loads for high efficiency over the full load range using PWM tri-state signal
- Low PWM propagation delay (< 20 ns)
- Current sense monitor (I_{MON})
- Temperature monitor (T_{MON})
- Over temperature alert
- HS MOSFET over-current and short alert
- Under voltage lockout for V_{DRV} and $BOOT$
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

APPLICATIONS

- Synchronous buck converters
- Multi-phase VRDs for CPU, GPU, and memory
- DC/DC VR modules

EFFICIENCY

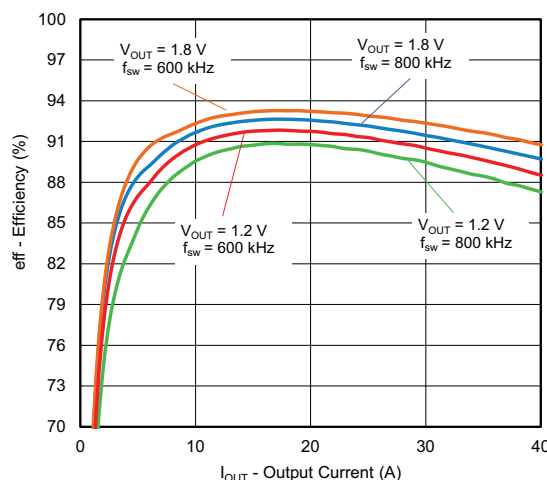


Fig. 1 - Efficiency vs. Output Current
($V_{IN} = 12V$, $L = 150nH$, $V_{CC} = V_{DRV} = 5V$)



PRODUCT SUMMARY		
Part number	SiC825	SiC825A
Description	80 A smart power stage, 4.5 V _{IN} to 16 V _{IN} , 5 V P _{WM} with diode emulation mode	80 A smart power stage, 4.5 V _{IN} to 16 V _{IN} , 3.3 V P _{WM} with diode emulation mode
Input voltage min. (V)	3	3
Input voltage max. (V)	16	16
Current rating (A)	80	80
Switch frequency max. (kHz)	2000	2000
Enable (yes / no)	yes	yes
Monitoring features	T _{MON} , I _{MON}	T _{MON} , I _{MON}
Protection	UVLO, OTP, OC flag, OCP, HS-short	UVLO, OTP, OC flag, OCP, HS-short
Light load mode	SMOD	SMOD
Pulse-width modulation (V)	5	3.3
Package type	PowerPAK® MLP39-65	PowerPAK® MLP39-65
Package size (W, L, H) (mm)	5.0 x 6.0 x 0.75	5.0 x 6.0 x 0.75
Status code	1	1
Product type	VRPower (DrMOS)	VRPower (DrMOS)
Applications	Computer, industrial, networking	Computer, industrial, networking

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?63016.



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.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. 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.