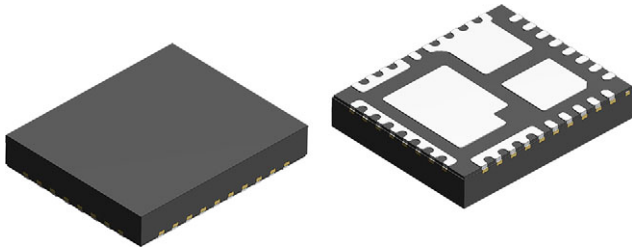


# 80 A VRPower<sup>®</sup>, Automotive Grade Smart Power Stage With Current Sensing and Temperature Monitor

(Datasheet in Brief)



## DESCRIPTION

The SiCQ850A is an integrated power stage solution optimized for synchronous buck applications to offer high current, high efficiency, and high power density. SiCQ850A 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<sup>®</sup> Gen V technology that delivers industry bench mark performance to significantly reduce switching and conduction losses.

The SiCQ850A 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

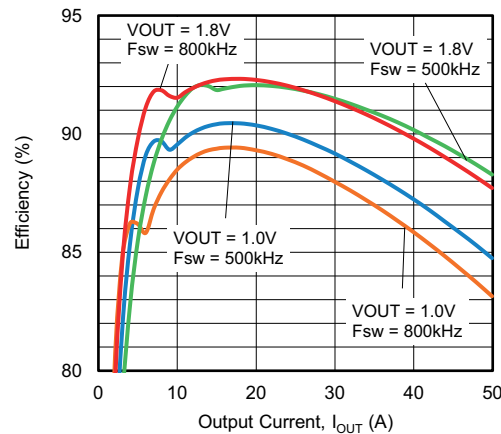
- AEC-Q100 qualified for automotive applications
- Gen V TrenchFET technology optimized for 12 V to 20 V input bus
- 80 A peak current capability
- High frequency operation up to 1.5 MHz
- Current monitor with 5  $\mu$ A/A gain
- Temperature monitor output with 8 mV/ $^{\circ}$ C gain
- 3.3 V PWM with 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](http://www.vishay.com/doc?99912)

## APPLICATIONS

Multiphase DC/DC converter for high-power SoC and FPGA used in:

- Autonomous driving module
- ADAS module
- Artificial intelligence acceleration module
- Cloud computing
- Machine Learning
- Graphic acceleration card (GPU)

## 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                 | SiCQ850A   |
| 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)      | 21   |
| Current rating (A)          | 80   |
| Switch frequency max. (kHz) | 1500   |
| Enable (yes / no)           | Yes  |
| Monitoring features         | I <sub>MON</sub> , T <sub>MON</sub>  |
| Protection                  | UVLO, OTP, OCP   |
| Light load mode             | None   |
| Pulse-width modulation (V)  | 3.3  |
| Package type                | MLP36-56   |
| Package size (W, L, H) (mm) | 5 x 6 x 1.0  |
| Status code                 | 1  |
| Product type                | VRPower  |
| Applications                | Multiphase voltage regulators  |

To request the full version of the datasheet, please contact: [ICmarketing@vishay.com](mailto:ICmarketing@vishay.com)

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