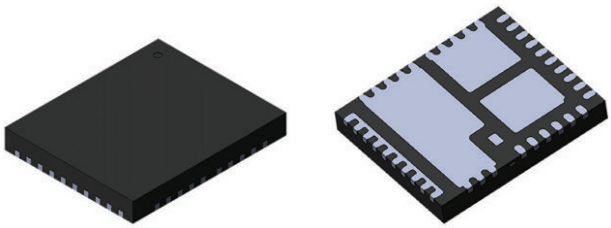
# SiC825, 80 A VRPower®, Smart Power Stage With Current Sensing and Temperature Monitor

(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

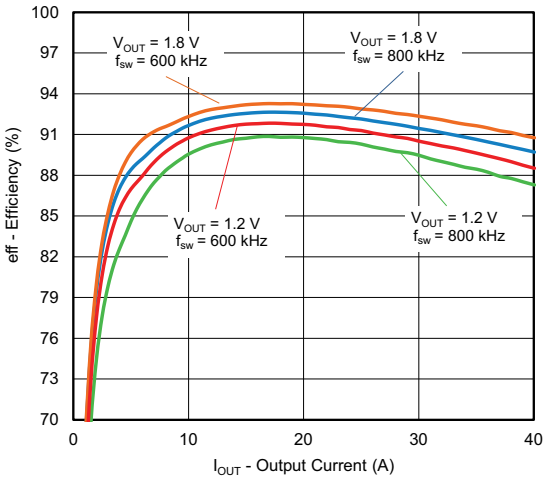



**Fig. 1 - Efficiency vs. Output Current ($V_{IN}$ = 12 V, L = 150 nH, $V_{CC}$ = $V_{DRV}$ = 5 V)**

| 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**

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