

# 50 A VRPower® Integrated Power Stage

(Datasheet in Brief)

## DESCRIPTION

The SiC642 and SiC642A are high frequency integrated power stage optimized for synchronous buck applications to offer high current, high efficiency, and high power density performance with very low shutdown current. Packaged in Vishay's proprietary 5 mm x 5 mm MLP package, SiC642 enables voltage regulator designs to deliver up to 50 A continuous current per phase.

The internal power MOSFETs utilize Vishay's latest TrenchFET® technology that delivers industry benchmark performance to significantly reduce switching and conduction losses.

The SiC642 and SiC642A incorporates an advanced MOSFET gate driver IC that features high current driving capability, adaptive dead-time control, an integrated bootstrap switch, and user selectable zero current detection to improve light load efficiency. The driver is also compatible with a wide range of PWM controllers, supports tri-state PWM, and 5 V and 3.3 V PWM logic.

The device also supports PS4 mode to reduce power consumption when the system is in standby state.

The SiC642 and SiC642A offer operating temperature monitoring, protection features, and warning flags that improve system monitoring and reliability.

## APPLICATIONS

- Multi-phase VRDs for computing, graphics card and memory
- Intel core processor power delivery
  - $V_{CORE}$ ,  $V_{GRAPHICS}$ ,  $V_{SYSTEM\ AGENT}$
  - $V_{CCGI}$
- Up to 16 V rail input DC/DC VR modules

## FEATURES

- Highly efficient
  - Thermally enhanced PowerPAK® MLP55-31L package
  - Vishay's latest TrenchFET technology and low side MOSFET with integrated Schottky diode
  - Integrated, low impedance, bootstrap switch
  - Power MOSFETs optimized for 12 V input stage
  - Supports PS4 mode light load requirement with low shutdown supply current (5 V, 3  $\mu$ A)
  - Zero current detection for improved light load efficiency
- Highly versatile
  - 5 V and 3.3 V PWM logic with tri-state and hold-off timer
  - 5 V DSBL#, ZCD\_EN# logic with PS4 state support
  - High frequency operation up to 2 MHz
- Robust and reliable
  - Delivers in excess of 50 A continuous current, 70 A, peak (10 ms) and 100 A, peak (10  $\mu$ s)
  - Over current protection
  - Over temperature flag
  - Over temperature protection
  - Undervoltage lockout protection
  - High side MOSFET short detection
- Effective monitoring and reporting
  - Accurate temperature reporting
  - Warnings and faults reporting flag
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## TYPICAL APPLICATION DIAGRAM

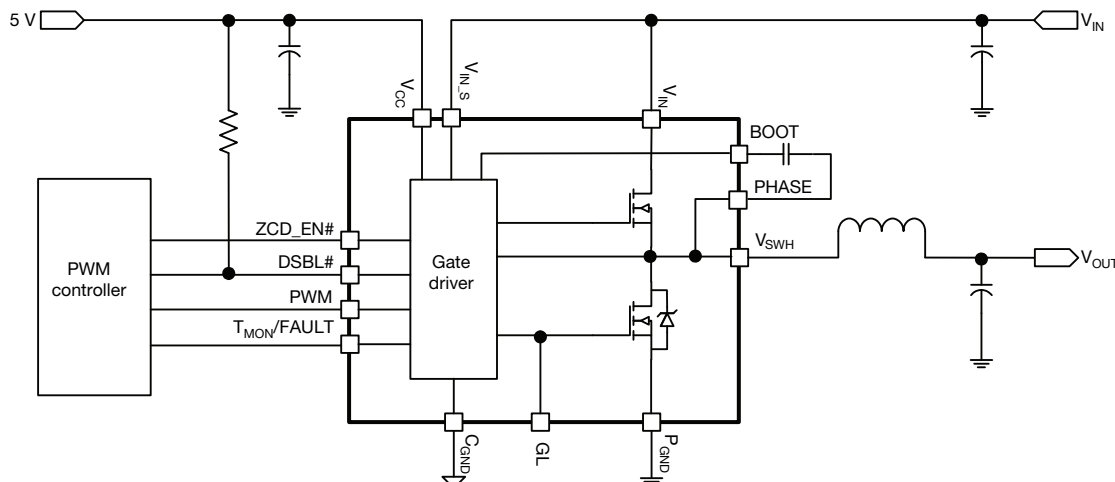


Fig. 1 - Typical Application Diagram



PRODUCT SUMMARY		
Part number	SiC642	SiC642A
Description	50 A power stage plus, 2.5 V <sub>IN</sub> to 16 V <sub>IN</sub> , 5 V PWM with ZCD, PS4 mode	50 A power stage plus, 2.5 V <sub>IN</sub> to 16 V <sub>IN</sub> , 3.3 V PWM with ZCD, PS4 mode
Input voltage min. (V)	2.5	2.5
Input voltage max. (V)	16	16
Continuous current rating max. (A)	50	50
Switch frequency max. (kHz)	2000	2000
Enable (yes / no)	Yes	Yes
Monitoring features	T <sub>MON</sub>	T <sub>MON</sub>
Protection	UVLO, OCP, OTP, HS-short	UVLO, OCP, OTP, HS-short
Light load mode	ZCD, PS4	ZCD, PS4
Pulse-width modulation (V)	5	3.3
Package type	PowerPAK MLP55-31L	PowerPAK MLP55-31L
Package size (W, L, H) (mm)	5.0 x 5.0 x 0.75	5.0 x 5.0 x 0.75
Status code	1	1
Product type	VRPower (DrMOS)	VRPower (DrMOS)
Applications	Computers	Computers

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

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