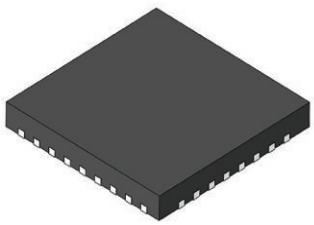
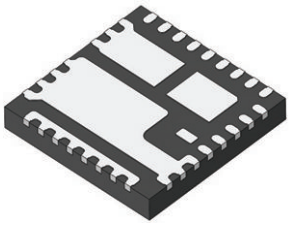
60 A VRPower® Smart Power Stage (SPS) Module With Integrated High Accuracy Current and Temperature Monitors

(Datasheet in Brief)



Top view



Bottom view

DESCRIPTION

The SiC648 is a smart VRPower® device that integrates a high side and low side MOSFET, a high performance driver with integrated bootstrap FET. The SiC648 offers high accuracy current and temperature monitors that can be fed back to the controller and doubler to complete a multiphase DC/DC system. They simplify design and increase performance by eliminating the DCR sensing network and associated thermal compensation. Light-load efficiency is supported via a dedicated LGCTRL control pin. Packaged in Vishay's 5 mm x 5 mm MLP package.

The devices feature a 3.3 V (SiC648A) or 5 V (SiC648) compatible tri-state PWM input that, working together with multiphase PWM controllers, will provide a robust solution in the event of abnormal operating conditions. The SiC648 also improves system performance and reliability with integrated fault protection of UVLO, over-temperature and over-current. An open-drain fault reporting pin simplifies the handshake between the smart VRPower device and multiphase controllers and can be used to disable the controller during start-up and fault conditions.

FEATURES

RoHS COMPLIANT
HALOGEN FREE

- Input range: 4.5 V to 18 V
- Supports 60 A DC current
- Compatible with 3.3 V (SiC648A) and 5 V (SiC648) tri-state PWM
- Down slope current sensing
- ± 3 % accuracy current monitor (I_{MON}) with REF_{IN} input
- 8 mV/°C temperature monitor with OT flag
- Dedicated low side FET control input
- Fault protection
  - High side FET short and over-current protection
  - Over-temperature protection
  - V_{CC} and V_{IN} under voltage lockout (UVLO)
- Open drain fault reporting output
- Up to 2 MHz switching frequency
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

APPLICATIONS

- High frequency and high efficiency VRM and VRD
- Core, graphic, and memory regulators for microprocessors
- High density VR for server, networking, and cloud computing
- POL DC/DC converters and video gaming consoles

TYPICAL APPLICATION DIAGRAM

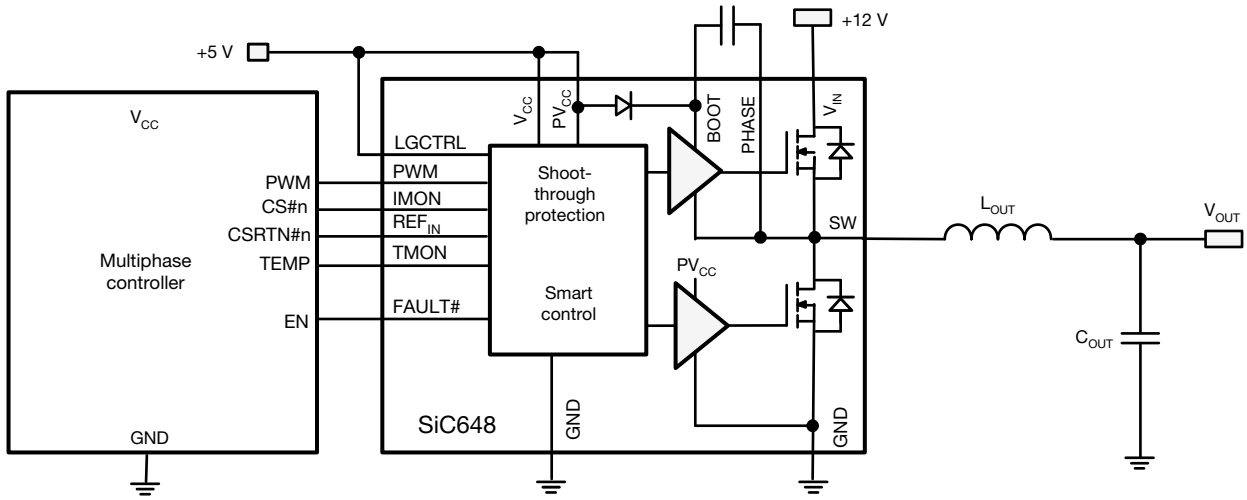


Fig. 1 - Typical Application Block Diagram

For technical questions, contact: powerictechsupport@vishay.com

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PRODUCT SUMMARY		
Part number	SiC648	SiC648A
Description	60 A smart power stage, 4.5 V_{IN} to 18 V_{IN}, 5 V PWM	60 A smart ower stage, 4.5 V_{IN} to 18 V_{IN}, 3.3 V PWM
Input voltage min. (V)	4.5	4.5
Input voltage max. (V)	18	18
Continuous current rating max. (A)	60	60
Switch frequency max. (kHz)	2000	2000
Enable (yes / no)	no	no
Monitoring features	T_{MON}, I_{MON}	T_{MON}, I_{MON}
Protection	UVLO, OCP, OTP, HS-short	UVLO, OCP, OTP, HS-short
Light load mode	yes	yes
Pulse-width modulation (V)	5	3.3
Package type	PowerPAK MLP55-32L	PowerPAK MLP55-32L
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	Computer, networking	Computer, networking

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

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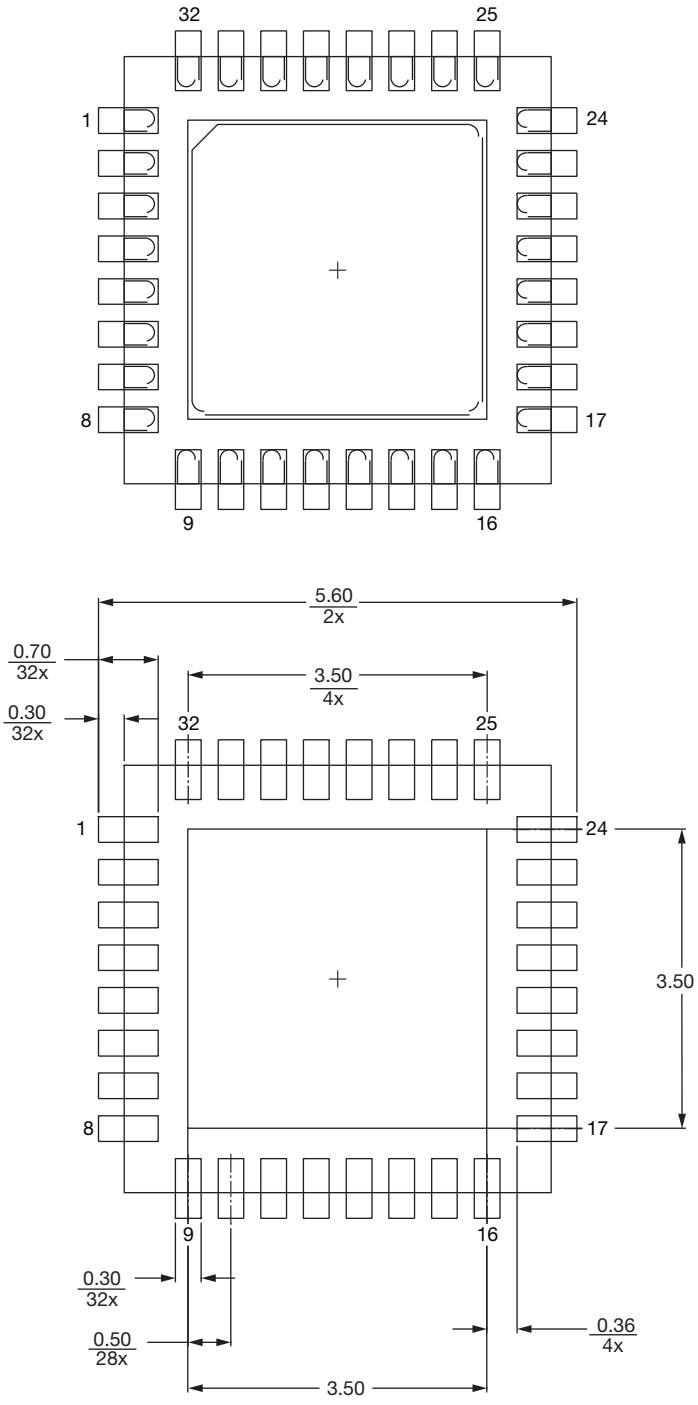
Recommended Land Pattern PowerPAK® MLP32S-55



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DWG: 3033

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