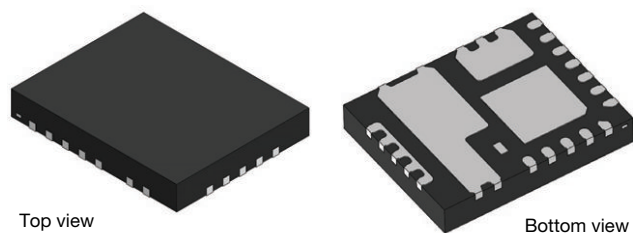


# 40 A VRPower® Smart Power Stage (SPS) Module With Integrated High Accuracy Current and Temperature Monitors

(Datasheet in Brief)



## DESCRIPTION

The SiC550 is a smart VRPower® device that integrates a high side and low side MOSFET, a high performance driver with integrated bootstrap FET. The SiC550 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 left control pin. An industry leading thermally enhanced, 4 mm x 5 mm PowerPAK® MLP package allows minimal overall PCB real estate and low profile construction.

The devices feature a 3.3 V (SiC550A) or 5 V (SiC550) 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 SiC550 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

- Input range: 4.5 V to 18 V
- Supports 40 A<sub>DC</sub> current
- Compatible with 3.3 V (SiC550A) and 5 V (SiC550) tri-state PWM
- Down slope current sensing
- ± 3 % accuracy current monitor (I<sub>MON</sub>) with REF<sub>IN</sub> 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<sub>CC</sub> and V<sub>IN</sub> 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](http://www.vishay.com/doc?99912)



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

## 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

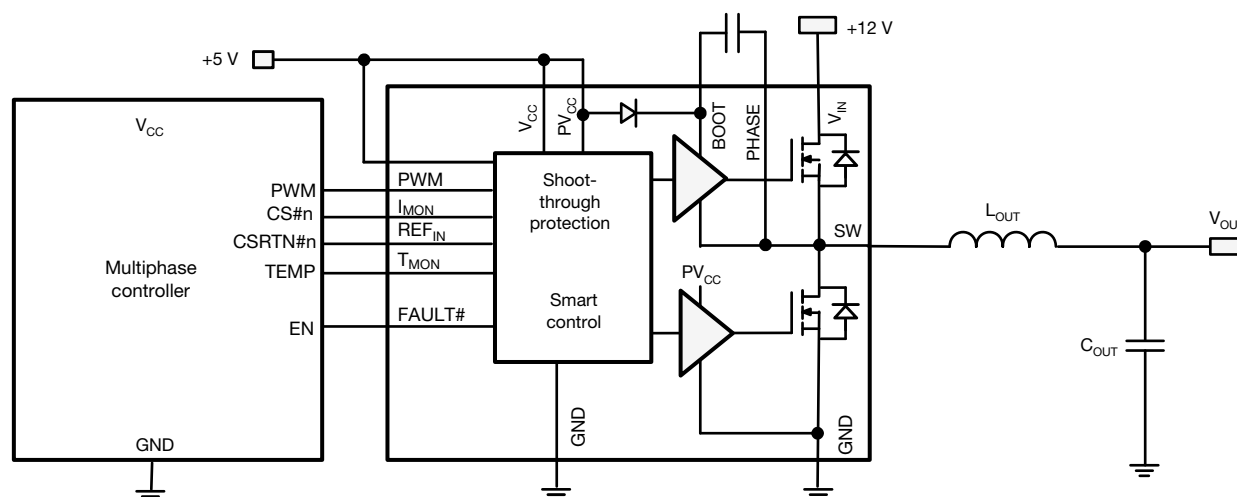


Fig. 1 - Typical Application Block Diagram



| PRODUCT SUMMARY                    |                                                                                |                                                                                  |
|------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Part number                        | SiC550                                                                         | SiC550A                                                                          |
| Description                        | 40 A smart power stage, 4.5 V <sub>IN</sub> to 18 V <sub>IN</sub> ,<br>5 V PWM | 40 A smart power stage, 4.5 V <sub>IN</sub> to 18 V <sub>IN</sub> ,<br>3.3 V PWM |
| Input voltage min. (V)             | 4.5                                                                            | 4.5                                                                              |
| Input voltage max. (V)             | 18                                                                             | 18                                                                               |
| Continuous current rating max. (A) | 40                                                                             | 40                                                                               |
| Switch frequency max. (kHz)        | 2000                                                                           | 2000                                                                             |
| Enable (yes / no)                  | No                                                                             | No                                                                               |
| Monitoring features                | I <sub>MON</sub> , T <sub>MON</sub>                                            | I <sub>MON</sub> , T <sub>MON</sub>                                              |
| Protection                         | UVLO, OTP, THDN, OCP, HSSC                                                     | UVLO, OTP, THDN, OCP, HSSC                                                       |
| Light load mode                    | No                                                                             | No                                                                               |
| Pulse-width modulation (V)         | 5                                                                              | 3.3                                                                              |
| Package type                       | PowerPAK MLP24-54                                                              | PowerPAK MLP24-54                                                                |
| Package size (W, L, H) (mm)        | 4.0 x 5.0 x 0.75                                                               | 4.0 x 5.0 x 0.75                                                                 |
| Status code                        | 1                                                                              | 1                                                                                |
| Product type                       | VRPower (DrMOS)                                                                | VRPower (DrMOS)                                                                  |
| Applications                       | Computer, networking, game consoles                                            | Computer, networking, game consoles                                              |

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

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