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

(Datasheet in Brief)

DESCRIPTION

The SiC675 is a smart VRPower® device that integrates a high side and low side MOSFET, a high performance driver with integrated bootstrap FET. The SiC675 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, 5 mm x 5 mm PowerPAK® MLP package allows minimal overall PCB real estate and low profile construction.

The devices feature a 3.3 V (SiC675A) 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 SiC675 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

• Highly efficient
  - Thermally enhanced PowerPAK® MLP55-30L
  - Vishay latest TrenchFET technology
  - Low side MOSFET with integrated Schottky diode
  - Low impedance bootstrap switch
  - Low shutdown supply current (10 μA)

• Highly versatile
  - Wide input range support: 4.5 V to 25 V
  - Compatible with 3.3 V PWM logic tri-state / middle voltage
  - Up to 2 MHz switching frequency

• Robust and reliable
  - Delivers in excess of 60 A continuous current
  - 90 A at 10 ms, peak current
  - Down slope current sensing
  - Fault protection
    • Over-temperature protection
    • VCC (3.3 V) / PVCC (5 V) undervoltage lockout (UVLO)

• Effective monitoring / reporting
  - ± 3 % accuracy current monitor (I_MON)
  - 8 mV/°C temperature monitor with OT flag

• 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
## PRODUCT SUMMARY

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<tr>
<th>Part number</th>
<th>SIC675A</th>
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<tr>
<td>Description</td>
<td>60 A smart power stage, 4.5 V&lt;sub&gt;IN&lt;/sub&gt; to 18 V&lt;sub&gt;IN&lt;/sub&gt;, 3.3 V PWM with diode emulation mode</td>
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<tr>
<td>Input voltage min. (V)</td>
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<td>Input voltage max. (V)</td>
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<td>Continuous current rating max. (A)</td>
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<td>Switch frequency max. (kHz)</td>
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To request the full version of the datasheet, please contact: ICmarketing@vishay.com
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