

RAA221320

20A Smart Power Stage (SPS) with Integrated High Accuracy Current and Temperature Monitors

The [RAA221320](https://www.renesas.com/en/products/power-management/raa221320) is a Smart Power Stage (SPS) compatible with the ISL68xxx/69xxx Digital Multiphase (DMP) controllers. The SPS has integrated high-accuracy current and temperature monitors that are fed back to the controller to complete a multiphase DC/DC system. These monitors simplify design and increase performance by eliminating the DCR sensing network and associated thermal compensation. An industry-leading thermally enhanced 4x5 PQFN package allows minimal overall PCB real estate.

The SPS features a 3.3V compatible tri-state PWM input that works together with the Renesas multiphase PWM controllers to provide a robust solution in abnormal operating conditions. The SPS also improves system performance and reliability with integrated fault protection of UVLO, shorted HFET, over-temperature, and overcurrent. An open-drain fault reporting pin simplifies the handshake between the SPS and controllers and can disable the controller during startup and fault conditions.

Features

- Input range: +3.0V to +16V
- Supports 20A DC current
- 3.3V compatible tri-state PWM input
- Downslope current sensing
- $\pm 3\%$ accuracy current monitor (IMON) with REFIN input
- 8mV/°C temperature monitor with OT flag
- Comprehensive fault protection for high system reliability
 - Shorted HFET and overcurrent protection
 - Over-temperature protection
 - V_{CC} Undervoltage Lockout (UVLO)
- Fault reporting outputs (TMON, Fault#, and IMON)
- Up to 1.5MHz switching frequency
- Pb-free (RoHS compliant), 25 Ld 4x5 PQFN

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

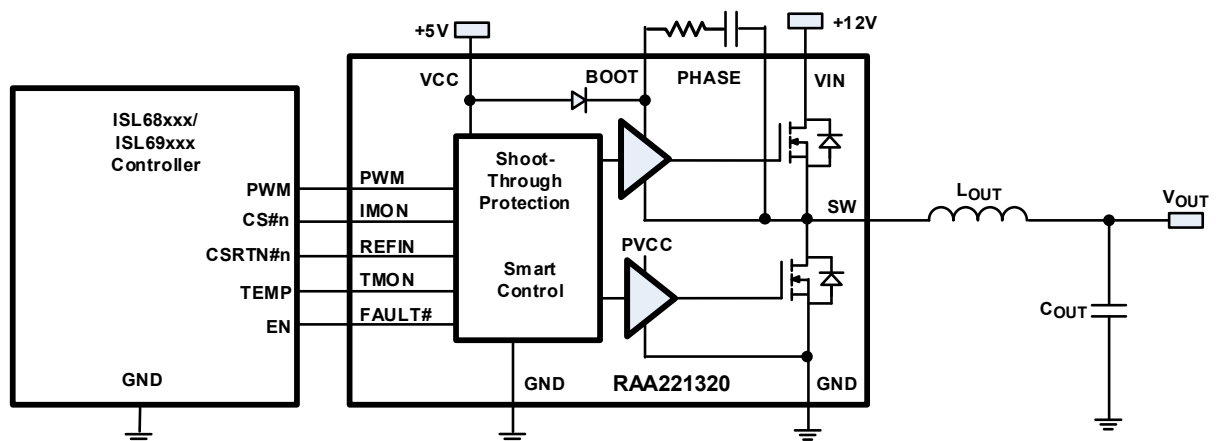


Figure 1. RAA221320 Simplified Application Block Diagram

1. Revision History

| Rev. | Date | Description |
|------|-------------|---|
| 1.1 | Apr 2, 2021 | Added Revision History and updated file number with Short-Form Datasheet file numbering scheme. |
| 1.0 | Oct 6, 2020 | Initial release |

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