

DA9211 and DA9212

Multi-phase DC-DC for core and GPU rails up to 12 A

DA9211 and DA9212 are small size DC-DC buck converters optimized for the supply of CPUs, GPUs, and DDR memory rails in smartphones, tablets, FPGAs, and other portable applications. The fast transient response (10 A/ μ s) and load regulation are optimized for the latest generation of multi-core application processors.

DA9212 integrates two dual-phase buck converters, each phase using a small external 0.47μ H inductor. Each buck is capable of delivering up to 6 A continuous output current at an output voltage in the range 0.3 V to 1.57 V. Its input voltage range of 2.8 V to 5.5 V is suitable for a wide variety of low voltage systems, including all Li-Ion battery supplied applications. DA9211 operates as a single four-phase buck converter delivering up to 12 A continuous output current.

To guarantee the highest accuracy and support multiple PCB routing scenarios without loss of performance, a remote sensing capability is implemented in DA9211/12. The pass devices are fully integrated, so no external FETs or Schottky diodes are needed.

A programmable soft-start can be enabled, which limits the inrush current from the input node and secures a slope controlled activation of the rail.

Dynamic Voltage Scaling (DVS) supports adapting the supply voltage to the processor load, either via direct register write through the communication interface (I²C or SPI compatible) or via an input pin.

A voltage track functionality is implemented, allowing the buck output voltage to be controlled by an analog input signal. Together with a digital clock input, both features allow complete control of the buck converter from external signals in the platform.

DA9211/12 features integrated over-temperature and -current protection for increased system reliability, without the need for external sensing components. The safety feature set is complete with a VDDIO undervoltage lockout.

The configurable I2C address selection via GPI allows multiple instances of DA9211/12 to be placed in one application sharing the same communication interface with different addresses.



www.dialog-semiconductor.com

DA9211 block diagram



DA9212 block diagram



www.dialog-semiconductor.com





Key features

- 2.8 V to 5.5 V input voltage
- 0.3 V to 1.57 V output voltage
- 12 A output current (DA9211)
- Two 6 A output current (DA9212)
- 3 MHz nominal switching frequency
- Maximum inductor height 1.0 mm
- ± 1% Accuracy (static)
- ±3% Accuracy (dynamic)
- Dynamic Voltage Scaling (DVS)
- PFM mode for optimized light load efficiency
- Automatic phase shedding
- Integrated power switches

- Remote sensing at point of load
- I²C/SPI compatible interface
- Output voltage tracking capability
- Adjustable soft-start
- ►-40 °C to +85 °C temperature range
- Package 42 WLCSP, 0.4 mm pitch, 2.8 mm x 2.5 mm

Typical Applications

- Smartphones
- Tablet PCs
- Cordless phones
- Infotainment
- Core supply of multi-core application processor, GPUs, and DDR memory
- Portable navigation devices
- Portable media players
- TV dongle

Dialog Semiconductor Worldwide Sales Offices - www.dialog-semiconductor.com

United Kingdom Phone: +44 1793 757700

Phone: +49 7021 805-0

Germany

The Netherlands Phone: +31 73 640 88 22

North America

Japan Phone: +81 3 5425 4567 Taiwan Phone: +1 408 845 8500 Phone: +886 281 786 222

Singapore Phone: +65 648 499 29

> Hong Kong Phone: +852 3769 5200

email: info@diasemi.com

Korea Phone: +82 2 3469 8200 China (Shenzhen) Phone: +86 755 2981 3669 China (Shanghai) Phone: +86 21 5424 9058

This publication provides outline information only, which unless agreed by Dialog Semiconductor may not be used, applied or reproduced for any purpose, or be regarded as a representation relating to products. Please refer to Dialog standard supply terms on the company website (www.dialog-semiconductor.com).

© Dialog Semiconductor 2015. All rights reserved. DA9211_2 PB 2v1