

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 0.47 μ 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.

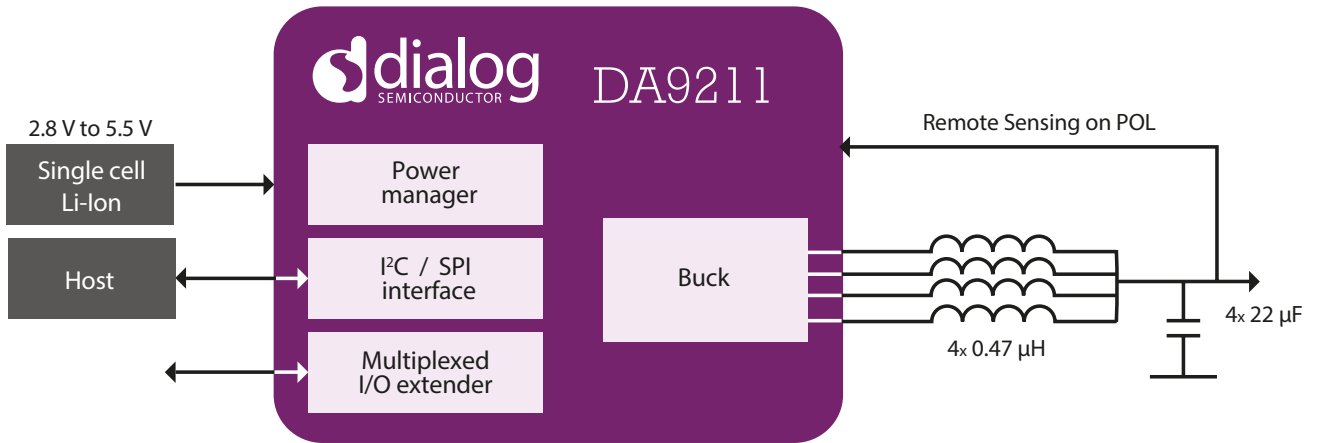
A voltage track functionality is implemented, allowing the buck output voltage to be controlled by an analog input signal. Together with a digital clock input, both features allow complete control of the buck converter from external signals in the platform.

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.

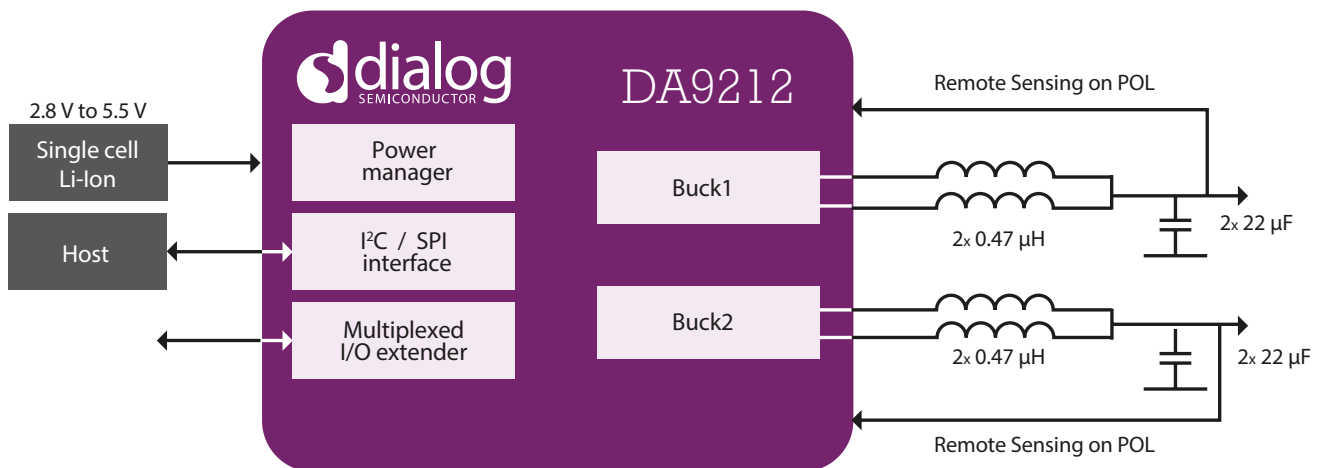
The configurable I²C address selection via GPI allows multiple instances of DA9211/12 to be placed in one application sharing the same communication interface with different addresses.



DA9211 block diagram



DA9212 block diagram



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

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