

## DA9223-A and DA9224-A

### Auto Grade 0.8 mm Pitch Multi-Phase Buck Converter

**DA9223-A and DA9224-A are PMICs optimized for the supply of CPUs, GPUs, and DDR memory rails in automotive in-vehicle infotainment systems, Advanced Driver Assistance Systems (ADAS), navigation and telematics applications. The fast transient response (10 A/ $\mu$ s) and load regulation are optimized for the latest generation of multi core application processors.**

DA9223-A operates as a single four-phase buck converter delivering up to 16 A output current. DA9224-A integrates two dual-phase buck converters, capable of delivering 2 x 8 A output current.

Each buck regulates a programmable output voltage in the range 0.3 - 1.57 V. With an external resistor divider the output voltage can be set to any voltage between 1.57 V and 4.3 V. The input voltage range of 2.8 – 5.5 V makes it suited for a wide variety of low voltage systems, including all Li Ion battery powered applications.

To guarantee the highest accuracy and to support multiple PCB routing scenarios without loss of performance, a remote sensing capability is implemented in both the DA9223-A and DA9224-A.

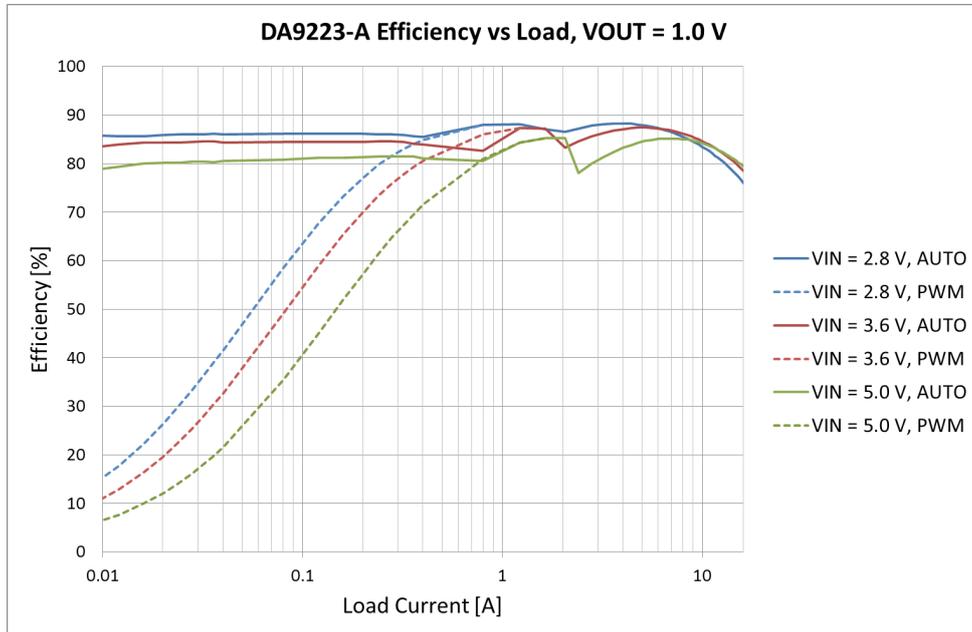
The power devices are fully integrated, so no external FETs or Schottky diodes are needed.

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

The Dynamic Voltage Control (DVC) supports adaptive adjustment of the supply voltage depending on the processor load, either via direct register writes through the communication interface (I2C or SPI compatible) or via an input pin.

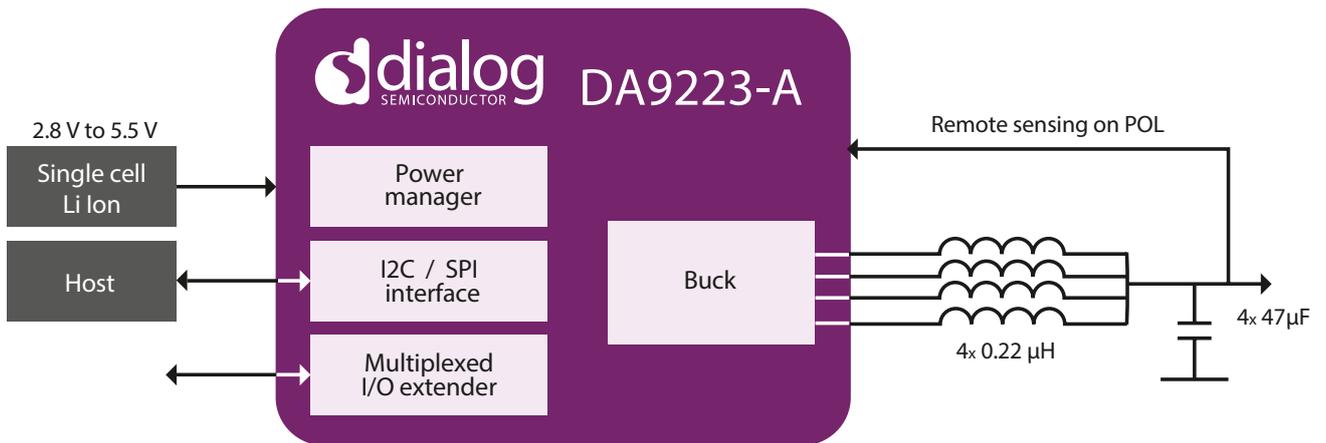
DA9223-A and DA9224-A feature integrated over-temperature and over-current protection for increased system reliability without the need for external sensing components. The safety feature set is completed by a VDDIO under voltage lockout.

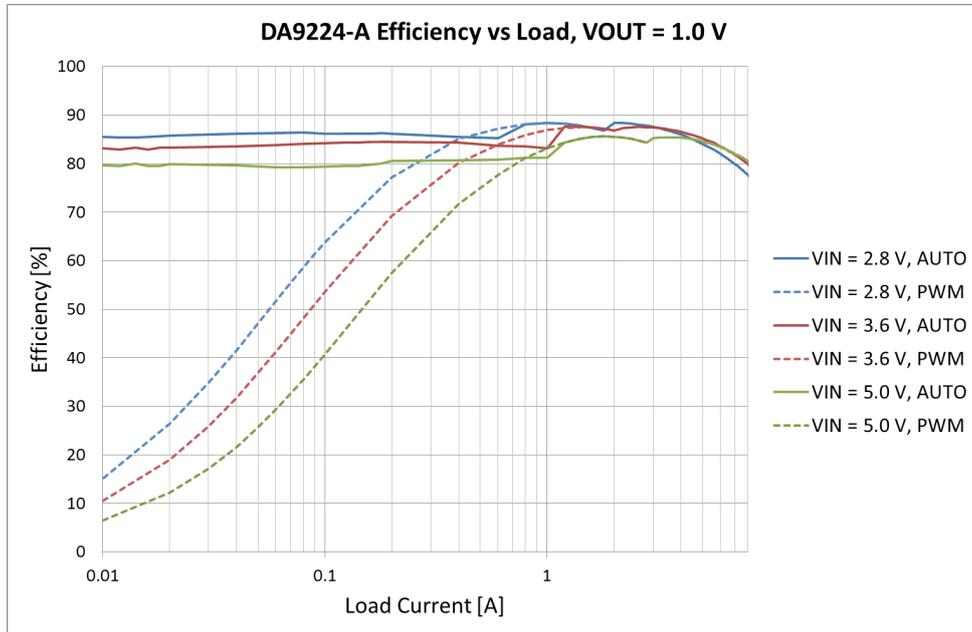
The configurable I2C address selection via GPI allows multiple instances of DA9223-A and DA9224-A to be placed in an application sharing the same communication interface with different addresses.



Efficiency Diagram DA9223-A, measured using 2520 size inductor with Typ. 8 mOhm DCR

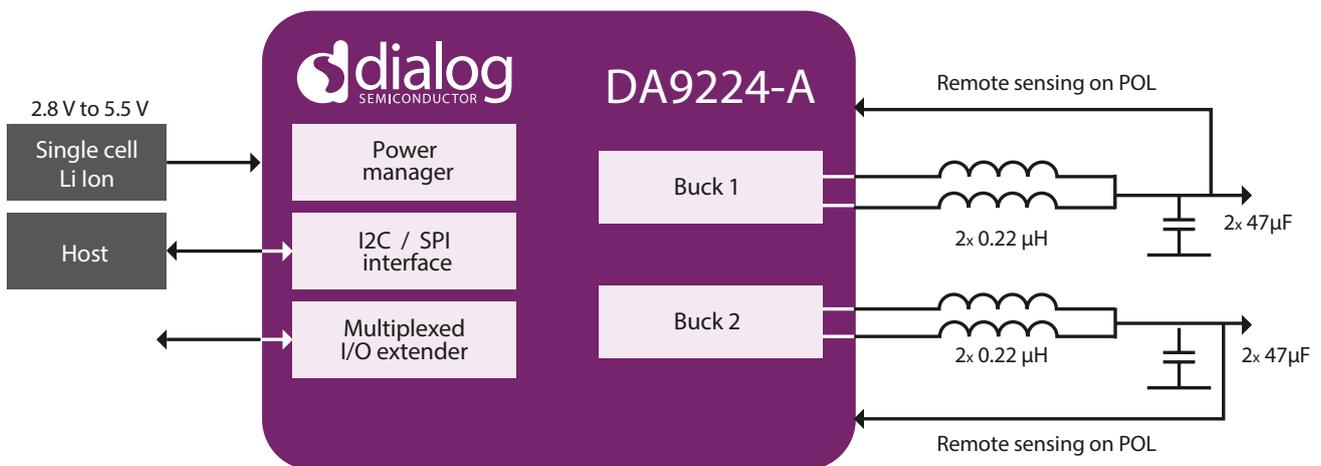
### DA9223-A block diagram





Efficiency Diagram DA9224-A, measured using 2520 size inductor with Typ. 8 mOhm DCR

### DA9224-A block diagram



## Key features

- ▶ 2.8 V to 5.5 V input voltage
- ▶ 1x 16 A DA9223-A
- ▶ 2x 8 A DA9224-A
- ▶ 3 MHz nominal switching frequency (allows use of low profile [1 mm] inductors)
- ▶  $\pm 1$  % accuracy (static)
- ▶  $\pm 3$  % accuracy (dynamic)
- ▶ 0.3 V to 1.57 V output voltage  
1.57 to 4.3 V with resistor divider
- ▶ Dynamic Voltage Control (DVC)
- ▶ Automatic phase shedding
- ▶ Integrated power switches
- ▶ Remote sensing at point of load
- ▶ I2C/SPI compatible interface
- ▶ Adjustable soft start
- ▶ -40 to +105 °C temperature range
- ▶ AEC-Q100 grade 2 qualified
- ▶ 66 TFBGA 0.8 mm pitch

## Typical applications

- ▶ In-car infotainment
- ▶ Automotive display clusters
- ▶ Advanced Driver Assistance Systems (ADAS)
- ▶ Navigation and telematics
- ▶ Mobile computing
- ▶ Industrial embedded systems

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