

## DA9213, DA9314 and DA9215

### Multiphase DC-DC for Core and GPU rails up to 20 A

**DA9213, DA9214 and DA9215 are DC-DC buck converter optimised for the supply of CPUs, GPUs, and DDR memory rails in smartphones, tablets, FPGAs and other portable applications. The fast transient response (10 A/ $\mu$ s) and load regulation are optimised for the latest generation of multi core application processors.**

DA9213 operates as a single four-phase buck converter delivering up to 20A output current.

DA9214 integrates two dual-phase buck converters, capable of delivering 2x 10A output current.

DA9215 integrates a three-phase buck converter capable of delivering 15A and a single-phase buck converter delivering 5A output current.

The output voltage is programmable in the range 0.3 - 1.57 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 DA9213, DA9214 and DA9215.

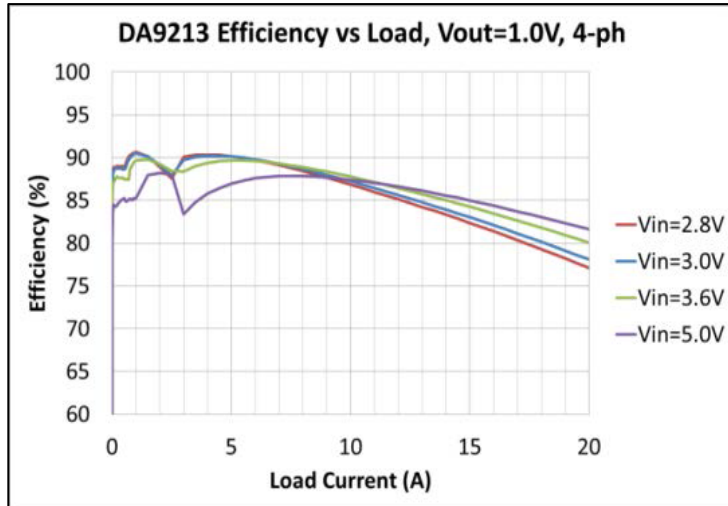
A programmable soft start-up limits the inrush current from the input node and secures a slope controlled activation of the rail.

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.

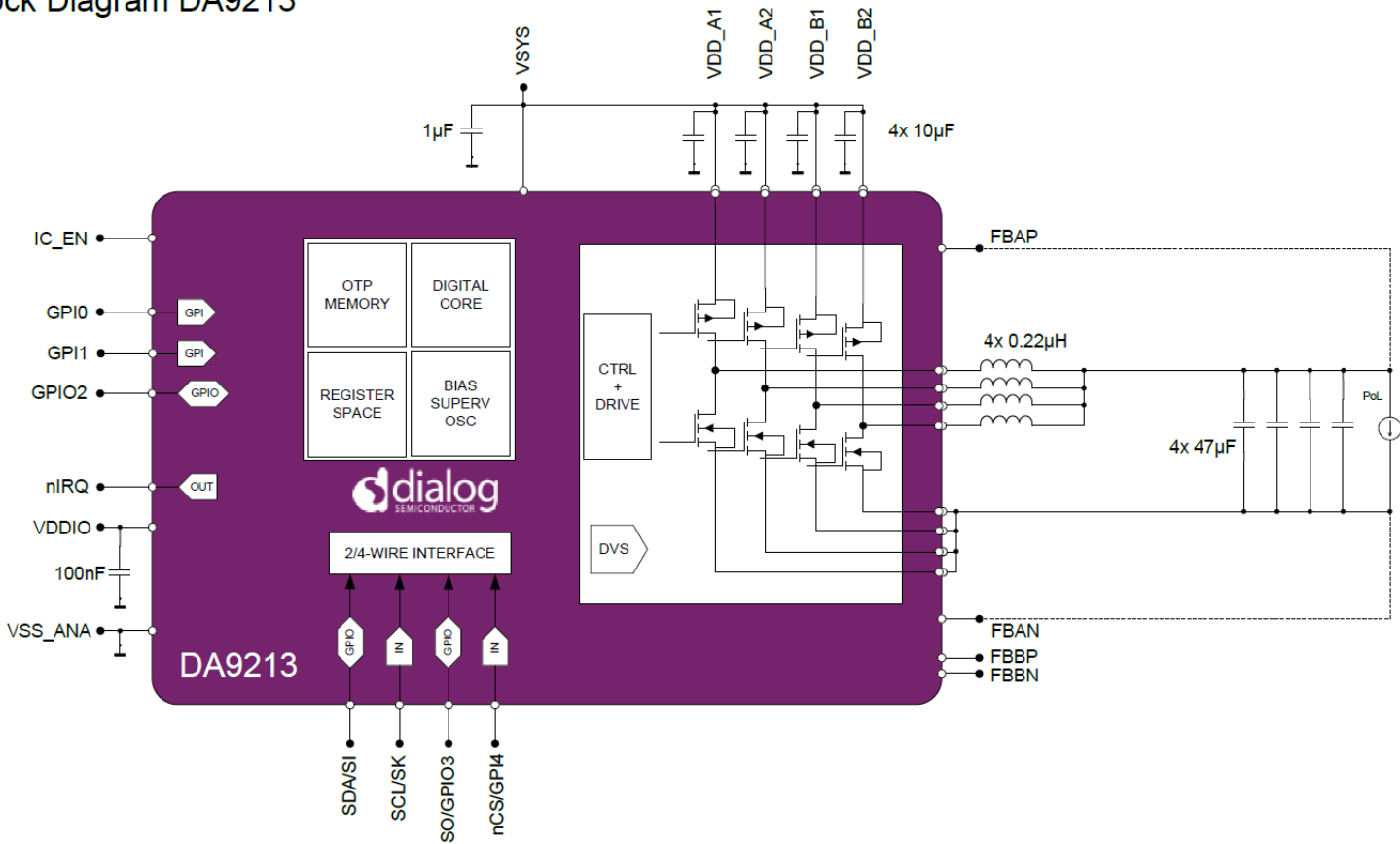
DA9213, DA9214 and DA9215 feature integrated over-temperature and over-current protection for increased system reliability without the need for external sensing components. The safety feature set is completed by a VDDIO under voltage lockout.

The configurable I2C address selected via GPI allows multiple instances of DA9213, DA9214 and DA9215 to be placed in the application sharing the same interface with different addresses.

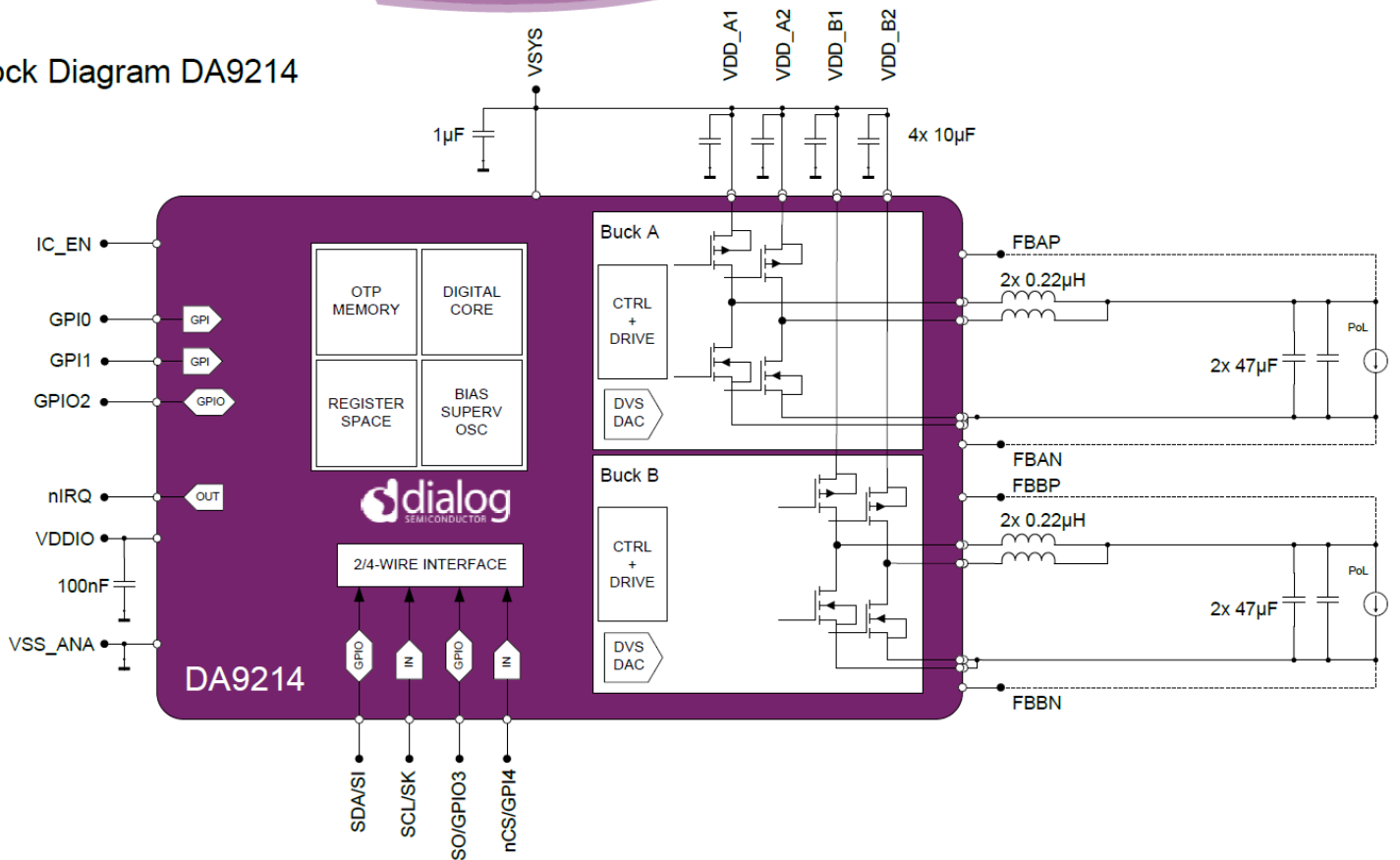
## Efficiency Diagram DA9213



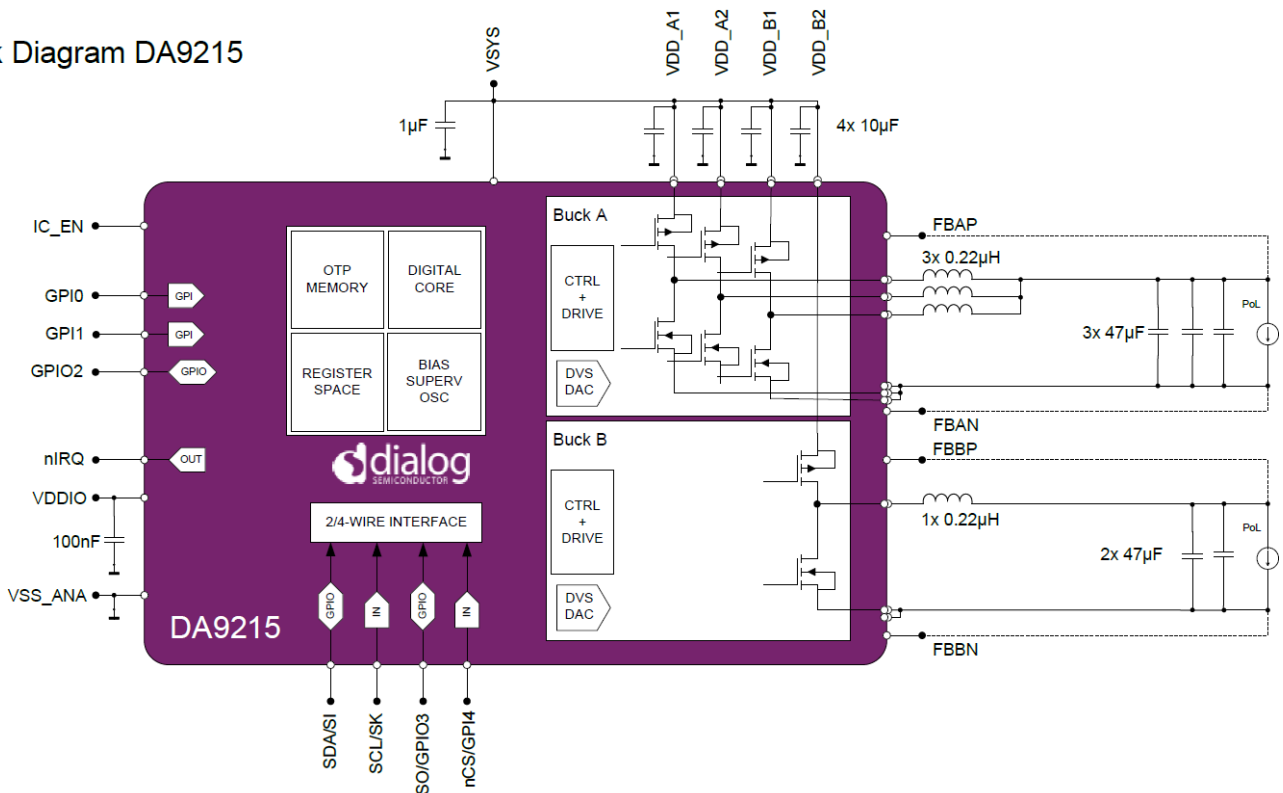
## Block Diagram DA9213



## Block Diagram DA9214



## Block Diagram DA9215





## Features

- 2.8 V to 5.5 V Input voltage
- 0.3 V to 1.57 V Output voltage
- 20A DA9213
- 2x 10A DA9214
- 1x 15A + 1x 5A DA9215
- $\pm 1$  % Accuracy (static)
- $\pm 3$  % Accuracy (dynamic)
- Automatic Phase Shedding
- 3 MHz nominal Switching Frequency
- I2C/SPI compatible Interface
- Adjustable Soft Start
- -40 to +85 °C Temperature Range
- Package 66 WL-CSP 0.4 mm pitch

## Benefits

- Integrated power switches
- Dynamic Voltage Control (DVC)
- Remote sensing at point of load
- High efficiency over a wide output range
- Low output ripple
- Small <1mm height components

## Applications

- Smartphones
- Tablet PCs
- Cordless Phones
- Infotainment
- Ultrabooks™
- Portable Navigation Devices
- Portable Media Players
- TVs

---

**Dialog Semiconductor Worldwide Sales Offices** - [www.dialog-semiconductor.com](http://www.dialog-semiconductor.com) email: [info@diasemi.com](mailto:info@diasemi.com)

**United Kingdom**  
Phone: +44 1793 757700

**The Netherlands**  
Phone: +31 73 640 88 22

**Japan**  
Phone: +81 3 5425 4567

**Singapore**  
Phone: +65 648 499 29

**Korea**  
Phone: +82 2 3469 8200

**Germany**  
Phone: +49 7021 805-0

**North America**  
Phone: +1 408 845 8500

**Taiwan**  
Phone: +886 281 786 222

**Hong Kong**  
Phone: +852 3769 5200

**China (Shenzhen)**  
Phone: +86 755 2981 3669

**China (Shanghai)**  
Phone: +86 21 5424 9058