

DA9021/22

System Core PMIC with High-Efficiency USB Power Manager

The DA9021/22 family is a highly integrated PMIC subsystem with supply domains to support a wide range of application processors, associated peripherals, and user interface functions. Combining a switched-mode USB compatible charger, full power-path management, three bucks, five linear regulators and support for multiple sleep modes, the DA9021 offers an energy-optimised solution suitable for portable handheld, wireless and, infotainment applications.

DA9021/22 comes in a 4 x 4 mm, 64-bump, WLCSP package making it ideal for space constrained applications.

The high-efficiency Li-Ion/Polymer switching charger supports precise current/voltage charging as well as pre-charge and USB modes without processor interaction. During charging, the die temperature is thermally regulated enabling high-capacity batteries to be rapidly charged at currents up to 1.26 A with minimum thermal impact to space-constrained PCBs.

DA9021 offers a merged buck configuration for a combined 1.6 A or DA9022 offers a higher voltage capability on one DC-DC buck converter which is ideal for peripherals and memory running up to 3.6 V. USB suspend mode operation is supported and, for robustness, the USB power inputs are protected against overvoltage conditions.

The internally-generated system power rail supports power scenarios such as instant-on with a fully discharged battery.

Controlled by a programmable digital power manager, the eight user-programmable switched/linear regulators may be configured to meet the start-up sequence, voltage, and timing requirements for most applications. The power manager includes supply-rail qualification and system reset management. For optimal processor energy-per-task performance, Dynamic Voltage Scaling (DVS) is available on up to four supply domains. Dialog's patented **SmartMirror™** dynamic biasing is implemented on all linear regulators.

An integrated 7-channel general purpose ADC includes support for programmable high/low thresholds, an integrated current source for resistive measurements and system voltage monitoring with a programmable low voltage warning. The ADC has 8-bit resolution in auto mode and 10-bit resolution in manual conversion mode.



*Available in a 64 WLCSP 4 x 4 mm,
0.5 mm pitch, package*

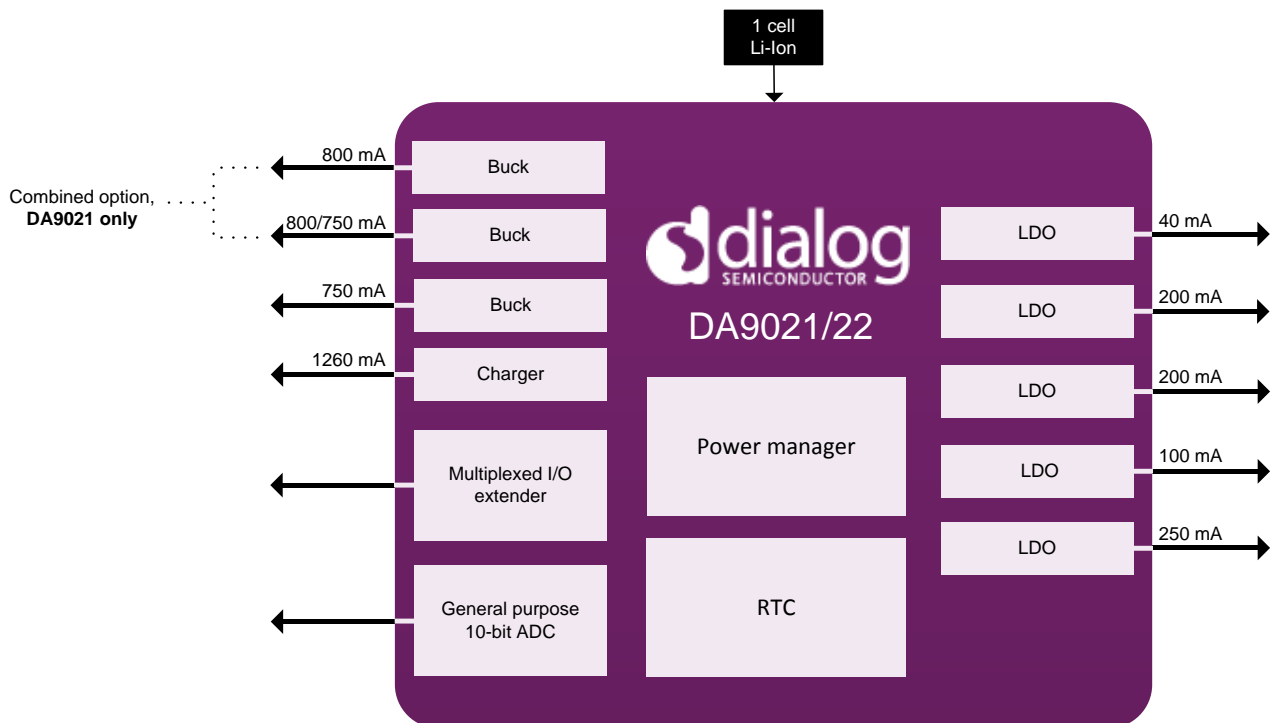
Features

- ▶ Single-input USB charger
- ▶ Three buck converters, 0.5 V to 3.6 V up to 800 mA
- ▶ DVS support
- ▶ Five programmable LDOs
- ▶ 32 kHz RTC oscillator
- ▶ Nine flexible GPIO pins for enhanced wakeup and peripheral control
- ▶ 2-wire and 4-wire control interfaces

Applications

- ▶ Personal media players
- ▶ Smartphone headsets
- ▶ Personal navigation devices
- ▶ Consumer infotainment devices
- ▶ IoT

Block Diagram



Generated Supply Domains

Block	Supplied Voltage (V)	Supplied Max. Current (mA)	External Components	Notes
BUCKCORE	0.5 to 2.075 ± 3 % accuracy	800	2.2 to 4.7 µH	DVS, 2 MHz, 25 mV steps, DVS ramp with controlled slew rate; pull-down resistor
BUCKPRO DA9021 only	0.5 to 2.075 ± 3 % accuracy	800	2.2 to 4.7 µH	DVS, 2 MHz, 25 mV steps, DVS ramp with controlled slew rate; pull-down resistor
BUCKPERI DA9022 only	1.8 to 3.6 ± 3 % accuracy	750	2.2 to 4.7 µH	2 MHz, 50/100 mV steps
BUCKMEM	0.925 to 2.5 ± 3 % accuracy	750	2.2 to 4.7 µH	DVS, 2 MHz, 25 mV steps, DVS ramp with controlled slew rate; pull-down resistor
LDO1	0.6 to 1.8 ± 3 % accuracy	40	1.0 µF	High PSRR, low noise LDO, 50 mV steps, pull-down resistor
LDO3	1.725 to 3.3 ± 3 % accuracy	200	2.2 µF	DVS, digital LDO, 25 mV steps, DVS with controlled slew rate
LDO7	1.2 to 3.6 ± 3 % accuracy	200	2.2 µF	High PSRR, low noise, 50 mV steps
LDO9	1.25 to 3.6 ± 1 % accuracy	100	1.0 µF	High PSRR, low noise, 50 mV steps, optional hardware control, common supply with LDO10
LDO10	1.2 to 3.6 ± 3 % accuracy	250	2.2 µF	High PSRR, low noise, 50 mV steps, common supply with LDO9

Dialog Semiconductor Worldwide Sales Offices - www.dialog-semiconductor.com email: info@diasemi.com

United Kingdom
Phone: +44 1793 757700

The Netherlands
Phone: +31 73 640 88 22

Japan
Phone: +81 3 5425 4567

Singapore
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Korea
Phone: +82 2 3469 8200

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Phone: +49 7021 805-0

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China (Shenzhen)
Phone: +86 755 2981 3669

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