DA9068

System Power Management IC (PMIC) for Multi-Core Application Processors

DA9068 is a power management unit (PMU) optimized for supplying systems with multi-core CPUs, I/O, DDR memory, and peripherals.

The PMIC features dual-phase, single-phase, and RF buck converters. High efficiency is achieved over a wide load range. All power switches are integrated and a high switching frequency allows low-profile inductors to be used.

DA9068 also includes additional modules such as real time clock (RTC), general purpose 12-bit ADC (GPADC) and general purpose I/O pins (GPIO). These support different functions such as battery voltage supervision and device over-temperature protection. All DA9068 features can be accessed by software via the host processor, allowing high flexibility of applications.

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

Dynamic voltage control (DVC) allows supply voltages of DA9068 to be controlled dynamically according to the operating point of the system. The control can be realized via direct register writes through the I^2C interface or via GPIOs.

Available in WLCSP,
4 mm x 6 mm, 0.4 mm pitch

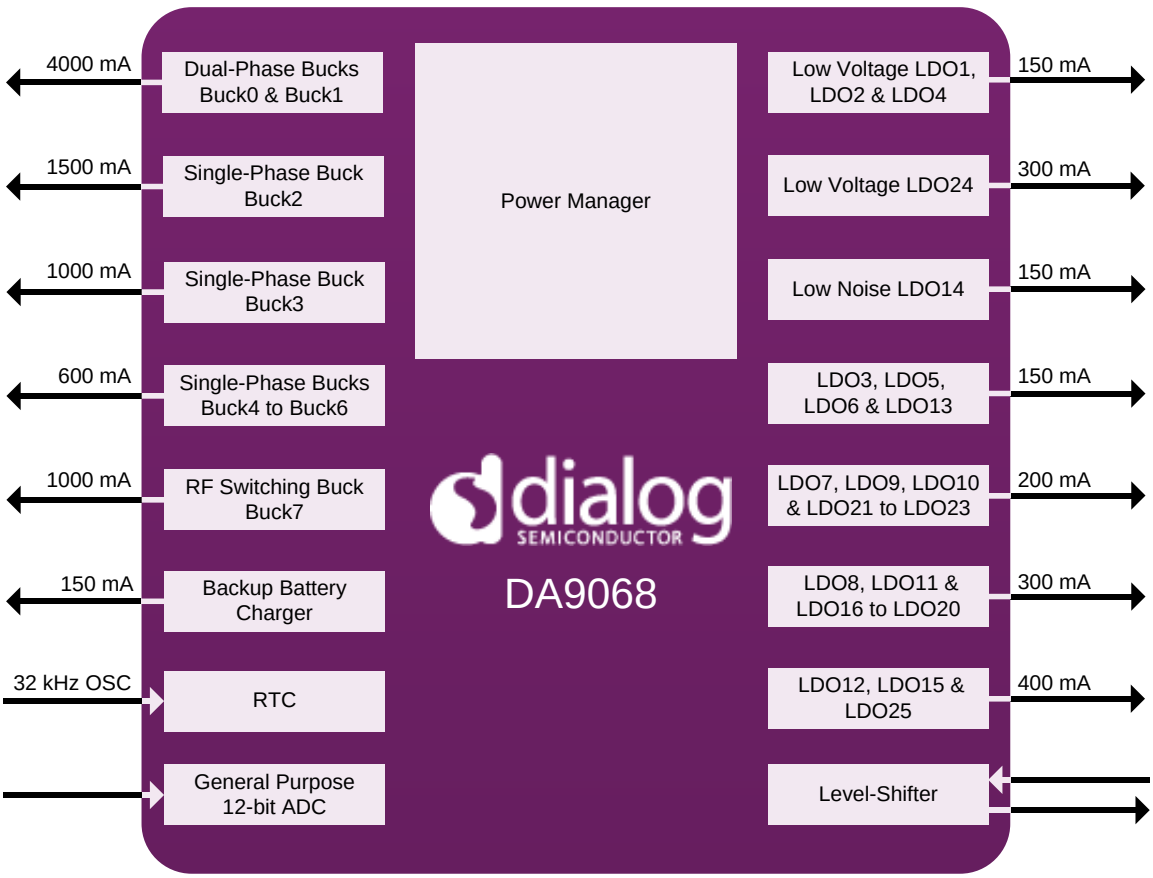
Features

- Input voltage 2.8 V to 4.5 V
- Eight buck converters with dynamic voltage control
  - 2 x 4000 mA Dual-phase
  - 1 x 1500 mA
  - 1 x 1000 mA
  - 3 x 600 mA
  - 1 x 1000 mA
- 25 LDO regulators
  - 8 x 150 mA
  - 6 x 200 mA
  - 8 x 300 mA
  - 3 x 400 mA
- Programmable power-mode sequencer
- System supply and junction temperature monitoring
- 12-bit general purpose ADC
- Coin cell/super-capacitor charger
- Ultra-low-power real-time clock with alarm
- 32 kHz oscillator with an external crystal
- -30 °C to +85 °C temperature range
- WLCSP, 4 mm x 6 mm, 0.4 mm pitch

Applications

- Supply for multi-core application processors
- Smartphones and tablets

Block Diagram



Generated Supply Domains

Block	Supplied Voltage (V)	Supplied Max. Current (A)	External Components	Notes
Buck0 Dual-Phase	0.6 to 1.4	4.0	L = 1.0 µH, C_{OUT} = 22 µF	3 MHz, 6.25 mV steps
Buck1 Dual-Phase	0.6 to 1.4	4.0	L = 1.0 µH, C_{OUT} = 22 µF	3 MHz, 6.25 mV steps
Buck2	0.6 to 1.4	1.5	L = 2.2 µH, C_{OUT} = 10 µF	2 MHz, 6.25 mV steps
Buck3	0.6 to 1.4	1.0	L = 2.2 µH, C_{OUT} = 10 µF	2 MHz, 6.25 mV steps
Buck4	1.4 to 2.2	0.6	L = 2.2 µH, C_{OUT} = 10 µF	2 MHz, 6.25 mV steps
Buck5	1.4 to 2.2	0.6	L = 2.2 µH, C_{OUT} = 10 µF	2 MHz, 6.25 mV steps
Buck6	1.4 to 2.2	0.6	L = 2.2 µH, C_{OUT} = 10 µF	2 MHz, 6.25 mV steps
Buck7 RF Buck	0.9	1.0	L = 1.0 µH, C_{OUT} = 10 µF	Fast voltage transient response
LDO1	0.65 to 2.25	0.15	C_{OUT} = 1 µF	Low Voltage, 25 mV steps
LDO2	0.65 to 2.25	0.15	C_{OUT} = 1 µF	Low Voltage, 25 mV steps
LDO3	1.2 to 3.3	0.15	C_{OUT} = 1 µF	50 mV steps
LDO4	0.65 to 1.7	0.15	C_{OUT} = 1 µF	Low Voltage, 25 mV steps
LDO5	1.2 to 3.3	0.15	C_{OUT} = 1 µF	50 mV steps
LDO6	1.2 to 3.3	0.15	C_{OUT} = 1 µF	50 mV steps
LDO7	1.2 to 3.3	0.2	C_{OUT} = 1 µF	50 mV steps
LDO8	1.2 to 3.3	0.3	C_{OUT} = 2.2 µF	50 mV steps
LDO9	1.2 to 3.3	0.2	C_{OUT} = 1 µF	50 mV steps
LDO10	1.2 to 3.3	0.2	C_{OUT} = 1 µF	50 mV steps

Block	Supplied Voltage (V)	Supplied Max. Current (A)	External Components	Notes
LDO11	1.2 to 3.3	0.3	C_{OUT} = 2.2 µF	50 mV steps
LDO12	1.2 to 3.3	0.4	C_{OUT} = 2.2 µF	50 mV steps
LDO13	1.2 to 3.3	0.15	C_{OUT} = 1 µF	50 mV steps
LDO14	1.2 to 3.3	0.15	C_{OUT} = 2.2 µF	Low Noise, 50 mV steps
LDO15	1.2 to 3.3	0.4	C_{OUT} = 2.2 µF	50 mV steps
LDO16	1.2 to 3.3	0.3	C_{OUT} = 2.2 µF	50 mV steps
LDO17	1.2 to 3.3	0.3	C_{OUT} = 2.2 µF	50 mV steps
LDO18	1.2 to 3.3	0.3	C_{OUT} = 2.2 µF	50 mV steps
LDO19	1.2 to 3.3	0.3	C_{OUT} = 2.2 µF	50 mV steps
LDO20	1.2 to 3.3	0.3	C_{OUT} = 2.2 µF	50 mV steps
LDO21	1.2 to 3.3	0.2	C_{OUT} = 1 µF	50 mV steps
LDO22	1.2 to 3.3	0.2	C_{OUT} = 1 µF	50 mV steps
LDO23	1.2 to 3.3	0.2	C_{OUT} = 1 µF	50 mV steps
LDO24	1.0 to 3.1	0.3	C_{OUT} = 2.2 µF	Low Voltage, 50 mV steps
LDO25	1.2 to 3.3	0.4	C_{OUT} = 2.2 µF	50 mV steps

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