

# ABRIDGED DATA SHEET

## MAX14690

## Wearable Charge-Management Solution

### General Description

The MAX14690 is a battery-charge-management solution ideal for low-power wearable applications. The device includes a linear battery charger with a smart power selector and several power-optimized peripherals. The MAX14690 features two ultra-low-power buck regulators with a typical quiescent current of 900nA. In addition, three ultra-low power low-dropout (LDO) linear regulators, with a typical quiescent current of 600nA are included. In total, the MAX14690 can provide up to five regulated voltages, each with an ultra-low quiescent current, critical to battery life for the unique power profile in 24/7 operation devices, such as those in the wearable market.

The battery charger features a smart power selector that allows operation on a dead battery when connected to a power source. To avoid overloading a power adapter, the input current to the smart power selector is limited based on an I<sup>2</sup>C register setting. If the charger power source is unable to supply the entire system load, the smart power control circuit supplements the system load with current from the battery.

The two synchronous, high-efficiency step-down buck regulators feature a fixed-frequency PWM mode for tighter regulation and a burst mode for increased efficiency during light-load operation. The output voltage of these regulators can be programmed through I<sup>2</sup>C with the default preconfigured.

The three configurable LDOs each have a dedicated input pin. Each LDO regulator output voltage can be programmed through I<sup>2</sup>C with the default preconfigured. The linear regulators can also be configured to operate as power switches that may be used to disconnect the quiescent load of the system peripherals.

The MAX14690 features a programmable power controller that allows the device to be configured for applications that require the device be in a true-off, or always-on, state. The controller also provides a delayed reset signal and voltage sequencing.

The MAX14690 is available in a 36-bump, 0.4mm pitch, 2.72mm x 2.47mm wafer-level package (WLP).

**Ordering Information** appears at end of data sheet.

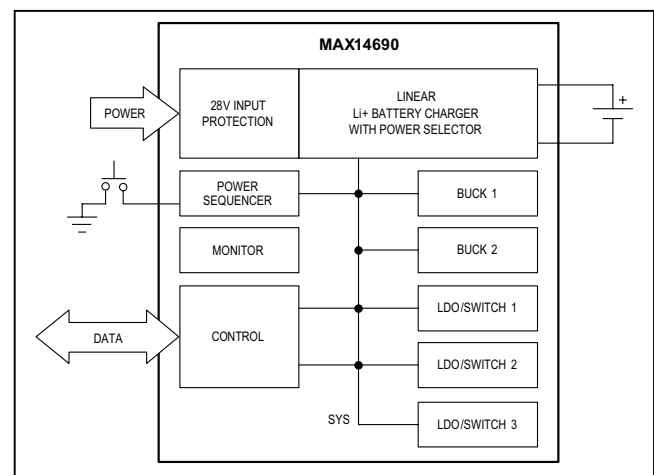
### Benefits and Features

- Extend System Use Time Between Battery Charging
  - Dual Ultra-Low-I<sub>Q</sub> 200mA Buck Regulators
    - Output Programmable from 0.8V to 1.8V and 1.5V to 3.3V
    - 0.9μA (typ) Quiescent Current
    - Automatic Burst or Forced-PWM Modes
  - Three Ultra-Low-I<sub>Q</sub> 100mA LDOs
    - Output Programmable from 0.8V to 3.6V
    - 0.6μA (typ) Quiescent Current
    - 2.7V to 5.5V Input with Dedicated Pin
- Easy-to-Implement Li+ Battery Charging
  - Smart Power Selector
  - 28V/-5.5V Tolerant Input
  - Thermistor Monitor
- Minimize Solution Footprint Through High Integration
  - Provides Five Regulated Voltage Rails
  - Switch Mode Option on Each LDO
- Optimize System Control
  - Monitors Pushbutton for Ultra-Low Power Mode
  - Power-On Reset Delay and Voltage Sequencing
  - On-Chip Voltage Monitor Multiplexer

### Applications

- Wearable Electronics
- Fitness Monitors
- Portable Medical Devices

### Block Diagram

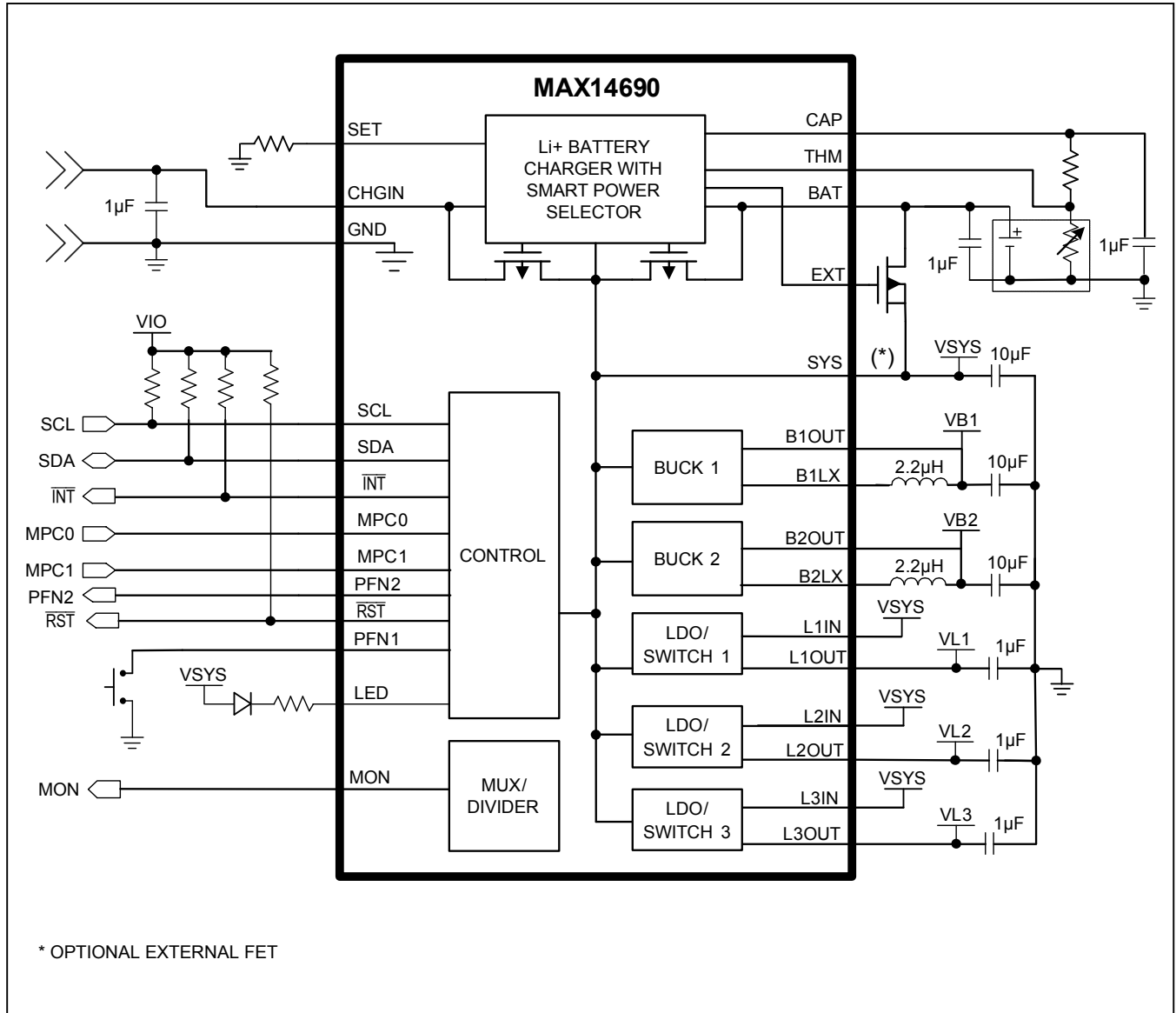


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## Typical Application Circuit



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## Ordering Information

PART	TEMP RANGE	PIN-PACKAGE
MAX14690AEWX+	-40°C to +85°C	36 WLP
MAX14690AEWX+T	-40°C to +85°C	36 WLP
MAX14690BEWX+	-40°C to +85°C	36 WLP
MAX14690BEWX+T	-40°C to +85°C	36 WLP
MAX14690CEWX+	-40°C to +85°C	36 WLP
MAX14690CEWX+T	-40°C to +85°C	36 WLP
MAX14690DEWX+	-40°C to +85°C	36 WLP
MAX14690DEWX+T	-40°C to +85°C	36 WLP
MAX14690EEWX+*	-40°C to +85°C	36 WLP
MAX14690EEWX+T*	-40°C to +85°C	36 WLP
MAX14690HEWX+	-40°C to +85°C	36 WLP
MAX14690HEWX+T	-40°C to +85°C	36 WLP
MAX14690IEWX+	-40°C to +85°C	36 WLP
MAX14690IEWX+T	-40°C to +85°C	36 WLP
MAX14690JEWX+	-40°C to +85°C	36 WLP
MAX14690JEWX+T	-40°C to +85°C	36 WLP
MAX14690KEWX+*	-40°C to +85°C	36 WLP
MAX14690KEWX+T*	-40°C to +85°C	36 WLP
MAX14690NEWX+	-40°C to +85°C	36 WLP
MAX14690NEWX+T	-40°C to +85°C	36 WLP

+Denotes a lead(Pb)-free package/RoHS-compliant package.

T = Tape and reel.

\*Future Product—contact marketing for availability.

See [Table 35](#) and [Table 36](#) for the device differences.

## Chip Information

PROCESS: BiCMOS

## Package Information

For the latest package outline information and land patterns (footprints), go to [www.maximintegrated.com/packages](http://www.maximintegrated.com/packages). Note that a "+", "#", or "-" in the package code indicates RoHS status only. Package drawings may show a different suffix character, but the drawing pertains to the package regardless of RoHS status.

PACKAGE TYPE	PACKAGE CODE	OUTLINE NO.	LAND PATTERN NO.
36 WLP	W362D2+1	<a href="#">21-0897</a>	Refer to <a href="#">Application Note 1891</a>



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