

MAX14676/MAX14676A

Wearable Charge Management Solution

General Description

The MAX14676/MAX14676A are battery-charge-management solutions ideal for low-power wearable applications. These devices include a linear battery-charger with a Smart Power Selector™, ModelGauge™ fuel gauge, and several power-optimized peripherals. They feature an ultra-low-power buck regulator with a quiescent current of 900nA (typical) and 74% efficiency with 10μA output.

The battery charger features Smart Power Selector operation, allowing operation with dead battery. It limits input current based on a register setting. If the charger power source is unable to supply the entire system load, the smart power control circuit will supplement the system load with current from the battery.

The MAX14676/MAX14676A embed a Maxim proprietary ModelGauge fuel gauge to provide an accurate estimate of the available capacity for rechargeable lithium batteries.

The MAX14676/MAX14676A include a synchronous high-efficiency step-down converter. The device features a fixed-frequency PWM mode for tighter regulation, and a burst mode for increased efficiency during light-load operation.

The MAX14676/MAX14676A have a boost regulator and three programmable current sinks that can be used to drive a variety of LED configurations. The boost converter is controlled independently from the current sinks, and they can be also used separately.

The MAX14676/MAX14676A feature a power switch controller that allows the device to be turned on and off by a pushbutton. This controller also provides a delayed reset signal and voltage sequencing.

These devices are available in a 42-bump, 0.5mm pitch, 3.497mm x 3.118mm wafer-level package (WLP).

Features and Benefits

- Extend System Use Time Between Battery Charging
 - 1.8V Low-I_Q 200mA Buck Regulator
 - 0.9μA (typ) Quiescent Current
 - Automatic Burst or Forced-PWM Modes
 - ModelGauge with Accurate State-of-Charge
- Easy-to-Implement Li+ Battery Charging
 - Smart Power Selector
 - 28V Tolerant Input
 - Thermistor Monitor
- Minimize Power-Management Footprint through High Integration
 - 3.2V Low-I_Q 100mA LDO
 - 2.0V Always-On 50μA LDO
 - +5V Safe Output LDO
 - 6.6V Low-I_Q 120μA Charge Pump
- Support a Wide Variety of Display Options
 - 5V to 17V Output Boost Converter
 - 3-Channel Adjustable High-Voltage Current Sinks
- Optimize System Control
 - Pushbutton to Enable Ultra-Low-Power Mode and Power-On Voltage Sequencing
 - I²C Control

Applications

- Wearable Electronics
- GPS Watches
- Fitness Monitors
- Portable Medical Devices

[Ordering Information/Selector Guide](#) appears at end of data sheet.

Smart Power Selector and ModelGauge are trademarks of Maxim Integrated Products, Inc.

The schematic diagram illustrates the MAX14676/MAX14676A integrated circuit and its associated external components. The IC is divided into several functional blocks: FUEL GAUGE, POWER SWITCH, Li+ BATTERY CHARGER WITH SMART POWER SELECTOR, CONTROL, and CURRENT SINKS. Key pins and their connections include:

- Power and Ground:** VIO, +2.0V, +5V, +12V, GND, and various ground connections for capacitors and inductors.
- Control and Status:** ALRT, CTG, QSTRT, CELL, RST, KOUT, KIN, AOLD, CAP, THM, BAT, GND, SYS, BOUT, BLX, LOUT, CPOUT, CPP, CPN, HVLX, HVOUT, HVCAP.
- Communication:** SCL, SDA, INT, MPC0, MPC1.
- Outputs:** LED0, LED1, LED2, LED3, LED4, LED5, LED6, LED7, LED8, LED9, LED10, LED11, LED12, LED13, LED14, LED15, LED16, LED17, LED18, LED19, LED20, LED21, LED22, LED23, LED24, LED25, LED26, LED27, LED28, LED29, LED30, LED31, LED32, LED33, LED34, LED35, LED36, LED37, LED38, LED39, LED40, LED41, LED42, LED43, LED44, LED45, LED46, LED47, LED48, LED49, LED50, LED51, LED52, LED53, LED54, LED55, LED56, LED57, LED58, LED59, LED60, LED61, LED62, LED63, LED64, LED65, LED66, LED67, LED68, LED69, LED70, LED71, LED72, LED73, LED74, LED75, LED76, LED77, LED78, LED79, LED80, LED81, LED82, LED83, LED84, LED85, LED86, LED87, LED88, LED89, LED90, LED91, LED92, LED93, LED94, LED95, LED96, LED97, LED98, LED99, LED100, LED101, LED102, LED103, LED104, LED105, LED106, LED107, LED108, LED109, LED110, LED111, LED112, LED113, LED114, LED115, LED116, LED117, LED118, LED119, LED120, LED121, LED122, LED123, LED124, LED125, LED126, LED127, LED128, LED129, LED130, LED131, LED132, LED133, LED134, LED135, LED136, LED137, LED138, LED139, LED140, LED141, LED142, LED143, LED144, LED145, LED146, LED147, LED148, LED149, LED150, LED151, LED152, LED153, LED154, LED155, LED156, LED157, LED158, LED159, LED160, LED161, LED162, LED163, LED164, LED165, LED166, LED167, LED168, LED169, LED170, LED171, LED172, LED173, LED174, LED175, LED176, LED177, LED178, LED179, LED180, LED181, LED182, LED183, LED184, LED185, LED186, LED187, LED188, LED189, LED190, LED191, LED192, LED193, LED194, LED195, LED196, LED197, LED198, LED199, LED200, LED201, LED202, LED203, LED204, LED205, LED206, LED207, LED208, LED209, LED210, LED211, LED212, LED213, LED214, LED215, LED216, LED217, LED218, LED219, LED220, LED221, LED222, LED223, LED224, LED225, LED226, LED227, LED228, LED229, LED230, LED231, LED232, LED233, LED234, LED235, LED236, LED237, LED238, LED239, LED240, LED241, LED242, LED243, LED244, LED245, LED246, LED247, LED248, LED249, LED250, LED251, LED252, LED253, LED254, LED255, LED256, LED257, LED258, LED259, LED260, LED261, 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LED637, LED638, LED639, LED640, LED641, LED642, LED643, LED644, LED645, LED646, LED647, LED648, LED649, LED650, LED651, LED652, LED653, LED654, LED655, LED656, LED657, LED658, LED659, LED660, LED661, LED662, LED663, LED664, LED665, LED666, LED667, LED668, LED669, LED670, LED671, LED672, LED673, LED674, LED675, LED676, LED677, LED678, LED679, LED680, LED681, LED682, LED683, LED684, LED685, LED686, LED687, LED688, LED689, LED690, LED691, LED692, LED693, LED694, LED695, LED696, LED697, LED698, LED699, LED700, LED701, LED702, LED703, LED704, LED705, LED706, LED707, LED708, LED709, LED710, LED711, LED712, LED713, LED714, LED715, LED716, LED717, LED718, LED719, LED720, LED721, LED722, LED723, LED724, LED725, LED726, LED727, LED728, LED729, LED730, LED731, LED732, LED733, LED734, LED735, LED736, LED737, LED738, LED739, LED740, LED741, LED742, LED743, LED744, LED745, LED746, LED747, LED748, LED749, LED750, LED751, LED752, LED753, LED754, LED755, LED756, LED757, LED758, LED759, LED760, LED761, LED762, LED763, LED764, LED765, LED766, LED767, LED768, LED769, LED770, LED771, LED772, LED773, LED774, LED775, LED776, LED777, LED778, LED779, LED780, LED78

Ordering Information/Selector Guide

PART	BUCK	3.2V LDO	STAY ON BIT DEFAULT*	BUMP-PACKAGE
MAX14676EWO+T	Forced On	Forced On	0	42 WLP
MAX14676AEWO+T	Forced On	Off (default)	1	42 WLP

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

T = Tape and reel.

Chip Information

PROCESS: BiCMOS

Package Information

For the latest package outline information and land patterns (footprints), go to 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.
42 WLP	W423F3+1	21-0209	Refer to Application Note 1891

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С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

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- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
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- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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