Battery Management

Gas gauges and battery monitors for accurate capacity monitoring

Lithium-Ion protectors integrate MOSFETs for industry’s smallest solution

Read Sine On online at www.ti.com/sc/sineon
Li-Ion charger with integrated FET for PDA and internet appliances

**bq24007/8**

Get samples, EVMs, and datasheets at:
- [www.ti.com/sc/device/bq24007](http://www.ti.com/sc/device/bq24007)
- [www.ti.com/sc/device/bq24008](http://www.ti.com/sc/device/bq24008)

➤ Highly integrated solution with FET pass transistor, reverse-blocking Schottky diode and thermal protection
➤ Up to 1.2-A continuous charge current with low dropout voltage
➤ Safety charge timer during preconditioning and fast charge
➤ Timer-enable function that allows host to disable charge timer and minimum current termination when charge current is shared with a load or when battery is absent
➤ Integrated voltage and current regulation with programmable charge current
➤ High-accuracy voltage regulation (<1%)
➤ Integrated cell conditioning for reviving deeply discharged cells
➤ Two charge-status output options: single or bicolor LED
➤ 1-µA low-power sleep mode
➤ Packaging: available in 20-pin TSSOP PowerPAD™
➤ Suggested resale price starts at $1.75 each in quantities of 1,000

1-A single-cell charger with safety timer disabled

The bq24007 requires few external components to implement a fully featured single-cell Li-Ion charger, minimizing overall board space and solution cost.

**Multi-chemistry notebook charger for Li-Ion, NiMH and NiCd**

**bq24700/1**

Get samples, EVMs and datasheets at:
- [www.ti.com/sc/device/bq24700](http://www.ti.com/sc/device/bq24700)
- [www.ti.com/sc/device/bq24701](http://www.ti.com/sc/device/bq24701)

➤ DPM™ (Dynamic Power Management) minimizes battery charge time and reduces cost for the external wall adapter
➤ Integrated selector supports battery conditioning and smart battery learn cycle
➤ Selector feedback circuit ensures break-before-make transition from AC to battery power
➤ 0.5% charge voltage accuracy, suitable for charging Li-Ion cells
➤ 1.2% charge current accuracy
➤ 300-kHz integrated PWM controller for high-efficiency buck regulation
➤ Depleted battery detection and indicator to protect battery from over discharge
➤ 15-µA sleep mode current for low battery drain
➤ Packaging: available in 24-pin TSSOP
➤ Suggested resale price starts at $1.89 each in quantities of 1,000

### Dynamic power management

The dynamic power management of the bq2470x optimizes the use of available power from the external wall adapter and reduces charge time.

**Applications include:**
- Notebook computers
- Sub-notebook personal computers
- Product scheduled to release 2Q01
Nicd/NiMH gas gauge IC for high discharge rates

*bq2016*

Get samples, EVMs and datasheets at:
www.ti.com/sc/device/bq2016

- Accurately measures available capacity in Nicd or NiMH batteries
- Supports pack capacities of 1 Ah to 5 Ah in high-discharge applications such as power tools or power assist applications
- Measures charge flow with an auto-calibrating low-offset V-to-F converter
- Automatically compensates measurements for rate and temperature conditions
- Requires <1 square inch of PCB space for easy pack integration
- Supports five LED outputs for remaining capacity indication
- Provides a one-wire HDQ communication interface for testing or to communicate critical battery data such as remaining capacity, temperature and voltage
- Packaging: available in 28-pin, 150-mil SSOP
- Suggested resale price starts at $3.13 each in quantities of 1,000

*bq2016* block diagram

Designed for battery pack integration, the bq2016 calculates remaining battery capacity in Nicd or NiMH batteries and communicates it to the user.

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SBS v1.1 Li-Ion gas gauge IC with protector interface

*bq2063*

Get samples, EVMs and datasheets at:
www.ti.com/sc/device/bq2063

- Accurately measures available capacity in Li-Ion batteries
- Supports SBS Smart Battery Data Specification v1.1
- Directly interfaces with the Seiko S-8243 protector IC for maximum safety and minimal component count
- Signals protector on out-of-tolerance battery conditions including over-voltage, under-voltage, over-current, over-temperature
- Provides independent safety output signal for optional pack shutdown
- EEPROM programming similar to bq2060 for easy upgrade
- Measures charge flow using a V-to-F converter with offset less than 16 µV after calibration
- Low operating current (180 µA typ)
- Packaging: 28-pin, 150-mil SSOP
- Suggested resale price starts at $3.80 in quantities of 1,000

Typical smart battery application

The bq2063 Smart Battery IC monitors critical battery pack perimeters and interfaces the pack protector to maximize safety.

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Applications include:
- Notebook PCs
- Medical/test equipment
- Portable instruments
- Handheld devices

Read Sine On online at www.ti.com/sc/sineon
Battery Monitoring

Flash-based precision battery monitoring IC

bq2023

Get samples, EVMs and datasheets at:
www.ti.com/sc/device/bq2023

- Allows host to accurately track remaining capacity of battery packs
- SDQ™ communication interface compatible with the Dallas Semiconductor 1-Wire® interface
- 224 bytes of flash memory for battery parameters
- 8 bytes of ID ROM provide system identification code
- Automatic offset calibration and compensation for maximum measurement accuracy
- Resolves signal less than 3.05 µV
- Internal temperature sensor with 0.25º C resolution
- Programmable output port
- Low power: Operating current <60 µA, sleep current <2.5 µA
- Packaging: available in 8-pin TSSOP
- Suggested resale price starts at $1.85 each in quantities of 1,000

Portable system interface

The bq2023 monitors critical battery parameters and communicates the information to the portable device.

Applications include:
- Cellular telephones
- PDAs
- Handheld or portable computers

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SLUM001B
Which analog and mixed-signal products are you currently designing with or considering?

16  ❑ Advanced Bus (1394, PCI, USB)
17  ❑ Amplifiers
18  ❑ Comparators
19  ❑ Data Transmission
20  ❑ Data Converters
21  ❑ Multimedia
22  ❑ Power Drivers
23  ❑ Low Dropout Regulators
24  ❑ Supervisory Circuits
25  ❑ Power Distribution Switches
26  ❑ Power Supply Control
27  ❑ Battery Management
28  ❑ DC-DC Converters/Charge Pumps
29  ❑ Hot Swap Power Managers
30  ❑ Plug-In Power Solutions
31  ❑ SCSI Terminators
32  ❑ Speech
33  ❑ Wireless & Telecom
34  ❑ Transmitters & Receivers
35  ❑ Other (please specify)
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