

NEW PRODUCT BULLETIN

INTRODUCING THE NEW:

bq2060A

Smart Battery System Gas Gauge IC

New Version of Popular bq2060

+

KEY FEATURES / SPECIFICATIONS

- Accurately measures available capacity in battery packs of *ANY* chemistry
- Smart Battery System v1.1 Compliant
- Battery state of charge accessible over a communication port
 - Allows the host system to precisely manage battery power and extend run time
- Low offset ($<16\mu\text{V}$) voltage-to-frequency converter
 - Provides for accurate charge and discharge measurement with a low value sense resistor
- Programmable cell modeling automatically adjusts for cell inefficiencies
 - Maximizes battery fuel gauge accuracy
- 15-bit analog-to-digital converter for voltage, temperature, and current measurement
- Low operating current of $180\mu\text{A}$ (typical)
- Small package: 28-pin SSOP

DEVICE DESCRIPTION

The bq2060A is a battery fuel gauge IC. The IC resides in a battery pack and measures critical parameters about the battery, including remaining capacity, voltage, temperature, and charge/discharge current. The bq2060A can communicate remaining battery capacity by driving up to 5 indicator LEDs. The host system micro-controller can also read the bq2060A registers to acquire all the critical parameters about the battery. The host system can then use this information to manage the battery power and extend the run-time of the system as much as possible.

The bq2060A is a new version of the popular bq2060 battery gas gauge IC. The main enhancements of the

bq2060A relate to the advance feature of battery modeling and secondary safety control for Li-Ion. The bq2060A has the ability to model battery pack characteristics over a wider temperature range than the bq2060. In addition, the bq2060A has additional flexibility with the charge FET control (CFC) and discharge FET control (DFC) outputs to provide a secondary level of safety protection for Li-Ion. For most battery fuel gauge applications, either device should be well suited. The precise differences between the bq2060 and the bq2060A are listed on the next page.

TYPICAL APPLICATIONS

The bq2060A works with any battery chemistry, so any battery-powered equipment is a potential application. Most of the time, the battery fuel gauge is integrated into the battery pack. Target applications include:

- Notebook Computers
- Medical and Test Equipment
- Handheld Terminals
- Data Logging Equipment

DEVICE OPTIONS

Order Number	Package	Transport Media	1KU+
BQ2060A-E619DBQ	28-pin SSOP	Rails	\$3.69
BQ2060A-E619DBQR	28-pin SSOP	Tape & Reel	\$3.69

Notes:

- 1) The E619 designates the revision level of the bq2060A.

KEY CONTACTS

Product Marketing
Peter Fundaro +1 214 480 6078

KEY DIFFERENCES BETWEEN BQ2060A AND BQ2060

Feature	bq2060A-E619	bq2060-E411	Comments
Cold temperature capacity compensation	The bq2060A adds the EEPROM parameter EDV TC Factor to the compensation algorithm.	No EDV TC factor.	This extends the cold temperature modeling capabilities.
Maximum temperature thresholds	Bit 5 (HIT) of the Miscellaneous Options EEPROM register can be set to increase the threshold for the maximum temperature alarm/charging thresholds.	The maximum temperature threshold is limited to 69C.	
Output control to activate a fuse based on temperature	The bq2060A adds the EEPROM parameter Safety Overtemperature to set the activation threshold for the CFC pin so that the pin can be used to activate a safety fuse in the battery pack.	The CFC pin is not well suited for use to blow a safety fuse.	bq2060A: Bit 6 of Miscellaneous Options can be set so that CFC is only activated by the Safety Overtemperature threshold.
Safety control for Li-Ion	The DFC pin will be high (turn on discharge FET) if the bq2060A detects charging. The CFC output will be high (turn on charge FET) if the bq2060A does not detect charging (Discharging bit=0).	No CFC or DFC override.	This improves the CFC/DFC functionality for use as a second level of protection for Li-Ion battery packs.
Current taper termination	The charge current must be below the programmed value for 80s and above 0.5625/Rs for a termination condition to occur.	The charge current must be below the programmed value for 40s for a termination condition to occur.	This refines the termination detection for Li-Ion packs to reduce the possibility of a false termination alarm.
Capacity calibration notification with the RELEARN_FLAG	The bq2060A sets the RELEARN_FLAG flag if mid-range capacity correction is performed.	The bq2060 does not specifically set the RELEARN_FLAG based on mid-range correction.	This provides additional notification that a relearn cycle should be performed for capacity calibration.
Partial reset	The bq2060A preserves RemainingCapacity(), the RELEARN_FLAG, and MaxError() and loads all other values from EEPROM with a partial reset condition.	No data reload from EEPROM with a partial reset condition.	This provides for a higher level of protection against data corruption after the battery recovers from a deep discharge condition.
Low capacity synchronization	RemainingCapacity() is not held for capacity synchronization if Vdq=0. The capacity synchronization can be disabled at the EDV1 level by setting bit 7 (NE1) in the Miscellaneous Options EEPROM register.	RemainingCapacity() is held. The capacity synchronization cannot be disabled.	This can improve RemainingCapacity() accuracy on a partial discharge.
Mid-range voltage correction	Requires two consecutive measurements to trigger correction to RemainingCapacity() based on programmable voltage levels	Requires only one measurement to trigger correction.	Refines the conditions to invoke the correction algorithm.
Terminate discharge alarm	The TERMINATE_DISCHARGE_ALARM is set when RemainingCapacity()=0.	The TERMINATE_DISCHARGE_ALARM is set when the EDV0 threshold is reached.	This provides for an additional low battery alarm level.
Fully discharge notification	The bq2060A sets the Fully_Discharged bit if RemainingCapacity() drops below the programmable Battery Low% threshold.	The bq2060 sets the Fully_Discharged bit at the EDV2 level.	This provides for an additional low battery alarm level.

