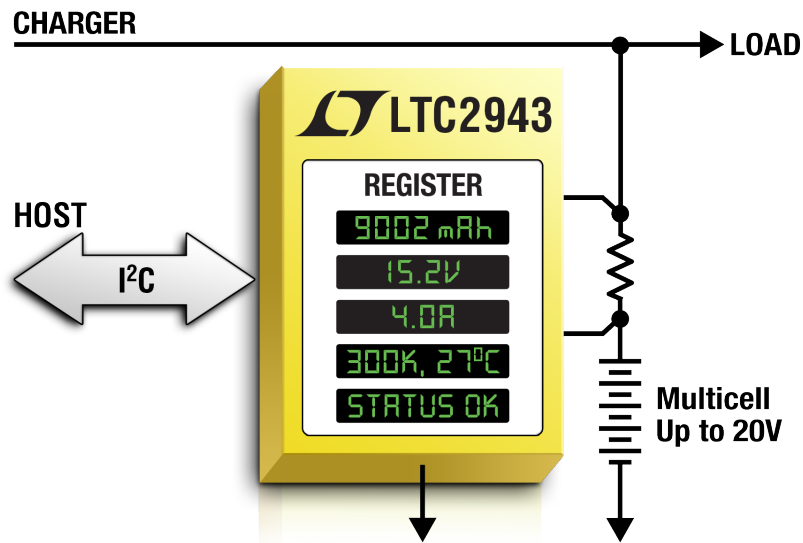


20V Battery Gas Gauge

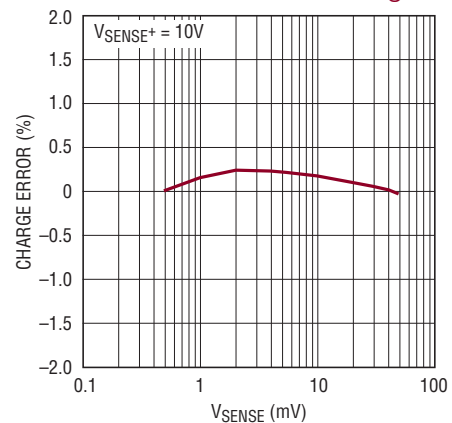


The LTC[®]2943 multicell battery gas gauge makes direct measurements of 3.6V to 20V battery stacks. Absolutely no level shifting circuitry is required to interface with multicell voltages, minimizing current consumption and preserving measurement accuracy. The LTC2943 is a true high voltage gas gauge that measures charge, voltage, current and temperature to within 1% accuracy — all of the essential parameters required to accurately assess battery state of charge (SOC).

Features

- Measures Accumulated Battery Charge and Discharge
- 3.6V to 20V Operating Range for Multicell Applications
- 14-Bit ADC Measures Voltage, Current and Temperature
- 1% Charge, Voltage, Current and Temperature Accuracy
- I²C/SMBus Interface
- Configurable Alert Output/Charge Complete Input
- Quiescent Current <120µA
- Small 8-Pin 3mm × 3mm DFN Package

Total Charge Error vs Differential Sense Voltage



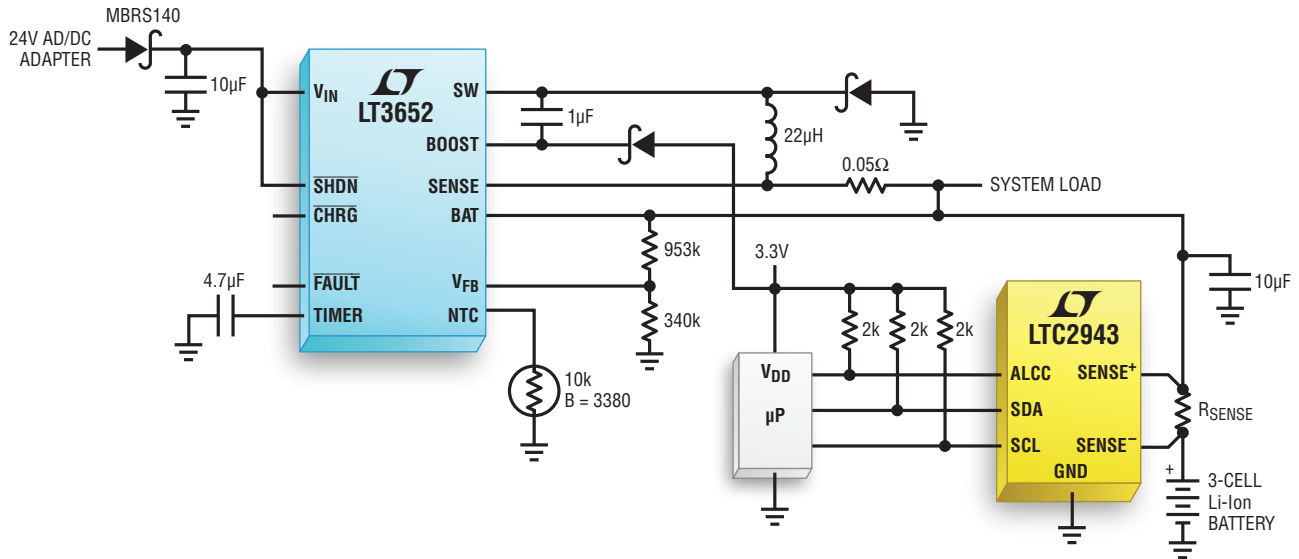
I²C Battery Gas Gauges

Part Number	Operating Range (V)	Interface	Integrated Sense Resistor	Measures				Package (mm)
				Charge	Voltage	Current	Temperature	
LTC2941	2.7 to 5.5	I ² C		•				2 × 3 DFN-6
LTC2941-1	2.7 to 5.5	I ² C	•	•				2 × 3 DFN-6
LTC2942	2.7 to 5.5	I ² C		•	•		•	2 × 3 DFN-6
LTC2942-1	2.7 to 5.5	I ² C	•	•	•		•	2 × 3 DFN-6
LTC2943	3.6 to 20	I ² C		•	•	•	•	3 × 3 DFN-8
LTC4150	2.7 to 8.5	Interrupt		•				MSOP-10



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Power Management Multicell Battery Chargers



The LT[®]3652 is a complete monolithic step-down battery charger that operates over a 4.95V to 32V input voltage range. The LT3652 provides a constant-current/constant-voltage charge characteristic, with maximum charge current externally programmable up to 2A. The charger employs a 3.3V float voltage feedback reference, so any desired battery float voltage up to 14.4V can be programmed with a resistor divider. The LT3652HV increases this range to 18V.

The LT3652 employs an input voltage regulation loop, which reduces charge current if the input voltage falls below a programmed level, set with a resistor divider. When the LT3652 is powered by a solar panel, the input voltage regulation loop is used to maintain the panel at peak output power.

Battery Chargers for Multicell Applications

Part Number	Maximum Charge Current (A)	V _{BAT} Range (V)	Battery Chemistry	Number of Battery Cells (Series)	Input Voltage (V)	Integrated Power Transistor	Synchronous	Charge Termination	Package (mm x mm)
Switch Mode Multichemistry Buck (Step-Down) Battery Chargers									
LT3652	2	3.3 to 14.4	SLA LiFePO ₄ Li-Ion	SLA 1-4 LiFePO ₄ 1-3 Li-Ion	4.9 to 32 [†]	✓	-	Timer or C/10	3x3 DFN-12, MSOP-12E
LT3652HV	2	3.3 to 18	SLA LiFePO ₄ Li-Ion	SLA 1-5 LiFePO ₄ 1-4 Li-Ion	4.9 to 34 [†]	✓	-	Timer or C/10	3x3 DFN-12, MSOP-12E
LTC4009/LTC4009-1 [‡] / LTC4009-2 [‡]	4	2 to 28	NiMH NiCd SLA Li-Ion	2-18 Ni, 1-6 Li-Ion	6 to 28	-	✓	External µC	4x4 QFN-20
LTC4012/LTC4012-1 [‡] / LTC4012-2 [‡] /LTC4012-3	4	2 to 28	NiMH NiCd SLA Li-Ion	2-18 Ni, 1-6 Li-Ion	6 to 28	-	✓	External µC	4x4 QFN-20
LTC4000 [#] /LTC4000-1 [#] \$	50 [§]	3 to 60	SLA LiFePO ₄ Li-Ion	SLA 1-16 LiFePO ₄ 1-14 Li-Ion	3 to 60 [®]	-	-	Timer + C/X	4x5 QFN-28 SSOP-28
Switch Mode Li-Ion Buck (Step-Down) Battery Chargers									
LTC4001/LTC4001-1 [*]	2	4.2	Li-Ion	1	4 to 5.5	✓	✓	Timer	3x3 QFN-16
LT3650-4.1/LT3650-4.2	2	4.1, 4.2	Li-Ion	1	4.75 to 32 [†] (40 Max)	✓	-	Timer + C/10	3x3 DFN-12 MSOP-12E
LT3650-8.2/LT3650-8.4	2	8.2, 8.4	Li-Ion	2	9 to 32 [†] (40 Max)	✓	-	Timer + C/10	3x3 DFN-12 MSOP-12E
LT3651-4.1/LT3651-4.2	4	4.1, 4.2	Li-Ion	1	6.5 to 32	✓	✓	Timer + C/10	5x6 QFN-36
LT3651-8.2/LT3651-8.4	4	8.2, 8.4	Li-Ion	2	9 to 32	✓	✓	Timer + C/10	5x6 QFN-36

[†] Minimum start-up voltage is +3.3V above V_{BATMAX} [‡] -1 and -2 versions are fixed voltage options for 1-4 Li-Ion cells [§] -1 option has MPPC (Maximum Power Point Control) ^{*} 4.1V cell voltage
[#] Charging controller requires externally compensated switching regulator [®] Greater than 60V is possible without the input current regulation/measurement function