19-3205; Rev 1; 1/09

EVALUATION KIT AVAILABLE

Single-Input 1-Cell Li+ Charger with OVP Protection and Programmable Charge Timer

General Description

The MAX8600A single-input linear battery charger safely charges single-cell Li+ batteries. Charging is optimized for Li+ cells using a control algorithm that includes low-battery precharging, voltage and current-limited fast-charging, and top-off charging, while continuously monitoring the battery for overvoltage, over/under temperature, and charging time. Charger timeout protection is programmable, and the status is indicated by three open-drain outputs.

The MAX8600A linear charger optimizes charging time by adjusting the charge rate to accommodate the thermal characteristics of a given application. There is no need to reduce the maximum charge current to accommodate worst-case charger power dissipation.

The MAX8600A is a variation of the MAX8600 with improved dropout and other spec changes. See Maxim's website for an outline of MAX8600/MAX8600A differences.

The MAX8600A is available in a 3mm x 3mm power-enhanced TDFN package.

Applications

- Cell Phones
- Digital Cameras
- PDAs
- GPS
- Portable Media Players
- MP3 Players
- Wireless Appliances

Features

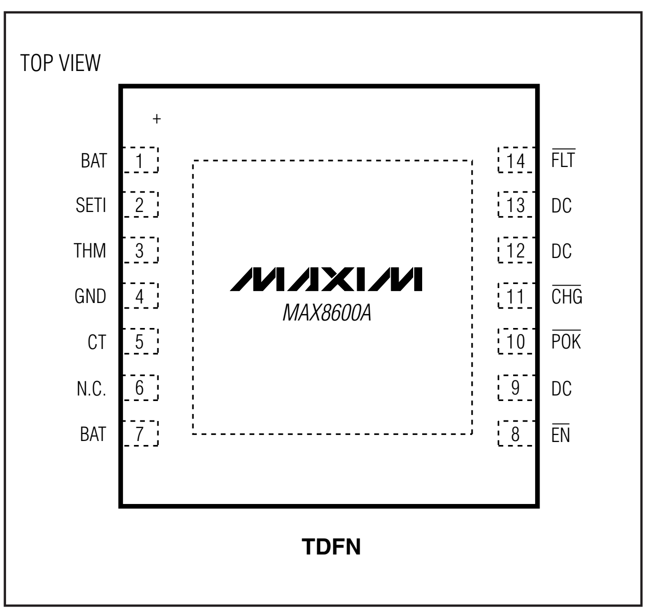
- ♦ Low Dropout -0.188V at 0.75A
- ♦ Up to 1A Programmable Fast-Charge
- ♦ 5% Charge-Current Accuracy
- ♦ Logic-Low Enable Input
- ♦ 14V Input Overvoltage Protection
- ♦ Programmable On-Chip Charge Timer
- ♦ Battery Thermistor Input
- ♦ Three Charger-Status Outputs
- ♦ Thermally Optimized Charge Rate
- ♦ 14-Pin, 3mm x 3mm TDFN Package

Ordering Information

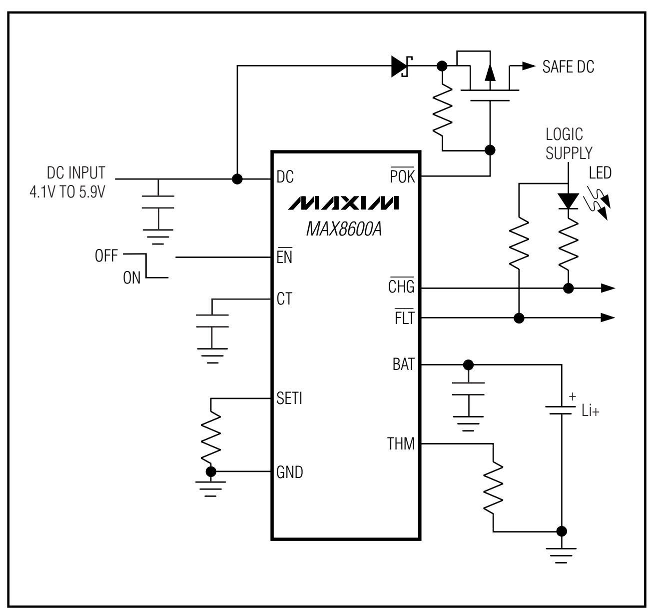
PART	TEMP RANGE	PIN-PACKAGE	TOP MARK
MAX8600AETD+	-40°C to +85°C	14 TDFN-EP* (3mm x 3mm) (T1433-2)	AEF

*EP = Exposed pad.
+Denotes a lead(Pb)-free/RoHS-compliant package.

Pin Configuration



Typical Operating Circuit



Single-Input 1-Cell Li+ Charger with OVP Protection and Programmable Charge Timer

ABSOLUTE MAXIMUM RATINGS

$\overline{POK}$ to GND..-0.3V to (DC + 0.3V)
DC to GND ....-0.3V to +16V
BAT, CT, $\overline{CHG}$, $\overline{EN}$, $\overline{FLT}$, SETI,
THM to GND..-0.3V to +5.5V
Continuous Power Dissipation (T_A = +70°C)
14-Pin TDFN 3mm x 3mm Multilayer PCB (derate 24.4mW/°C above +70°C).. 1951.2mW

Operating Temperature Range ....-40°C to +85°C
Junction Temperature Range ....-40°C to +150°C
Storage Temperature Range ....-65°C to +150°C
Lead Temperature (soldering, 10s) ....+300°C

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

(V_{DC} = 5V, V_{BAT} = 3.6V, $V_{\overline{EN}}$ = 0V, R_{SETI} = 2kΩ, C_{CT} = 0.068µF, T_A = -40°C to +85°C, unless otherwise noted. Typical values are at T_A = +25°C.) (Note 1)

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
DC						
Input Voltage Range			0		14	V
Input Operating Range	(Note 2)		4.1		6.0	V
Input Undervoltage Threshold	When $\overline{POK}$ goes low, DC rising, 500mV hysteresis		3.89	4.0	4.10	V
Input Overvoltage Threshold	When $\overline{POK}$ goes high, DC rising, 200mV hysteresis		6.2	6.5	6.8	V
Input Supply Current	I_{BAT} = 0mA, R_{THM} = 10kΩ			980	2000	µA
Shutdown Input Current	V_{EN} = 5V			275	435	µA
Input to BAT On-Resistance	V_{DC} = 3.7V, V_{BAT} = 3.6V			0.25	0.5	Ω
Input to BAT Dropout Voltage	DC falling, 200mV hysteresis		5	75	150	mV
BAT						
BAT Regulation Voltage	I_{BAT} = 0mA	T_A = +25°C	4.179	4.2	4.221	V
		T_A = -40°C to +85°C	4.166	4.2	4.234	
BAT Restart Fast-Charge Threshold	From BAT regulation voltage		-180	-150	-120	mV
DC Charging Current	R_{SETI} = 1.5kΩ		950	1000	1050	mA
	R_{SETI} = 2kΩ		675	750	825	
	R_{SETI} = 5kΩ		275	300	325	
	R_{SETI} = 2kΩ, V_{BAT} = 2.0V		67.5	75	82.5	
Soft-Start Time	Ramp time to fast-charge current			1.2		ms
BAT Prequal Threshold	When charging current changes, BAT rising, 170mV hysteresis		2.30	2.50	2.54	V
BAT Leakage Current	V_{DC} = 0V, V_{BAT} = 4.2V			0.001	5	µA
CONTROL INPUTS AND OUTPUTS						
SETI						
R_{SETI} Resistance Range	Guaranteed by charging current		1.5		5.0	kΩ

ELECTRICAL CHARACTERISTICS (continued)

(V_{DC} = 5V, V_{BAT} = 3.6V, $V_{\overline{EN}}$ = 0V, R_{SETI} = 2kΩ, C_{CT} = 0.068µF, T_A = -40°C to +85°C, unless otherwise noted. Typical values are at T_A = +25°C.) (Note 1)

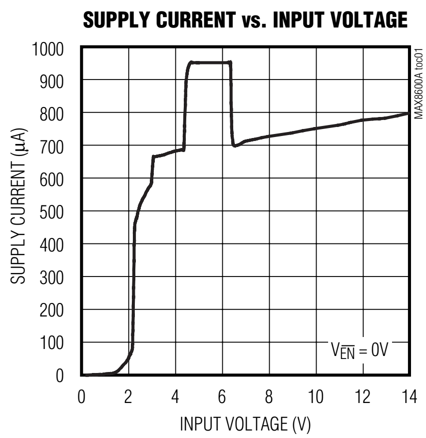
PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
$\overline{EN}$						
Logic Input Thresholds	Rising				1.6	V
	Falling		0.4			
Logic Input Resistance to GND			250	485	1000	kΩ
$\overline{POK}$						
Logic Output Voltage, Low	$I_{\overline{POK}}$ = 100µA			29	100	mV
Logic Output Leakage Current, High	$V_{\overline{POK}}$ = V_{DC} = 16V	T_A = +25°C		0.001	1	µA
		T_A = +85°C		0.01		
$\overline{CHG}$, $\overline{FLT}$						
Logic Output Voltage, Low	$I_{\overline{CHG}}$ = $I_{\overline{FLT}}$ = 1mA			12	100	mV
Logic Output Leakage Current, High	$V_{\overline{CHG}}$ = $V_{\overline{FLT}}$ = 5.5V, V_{DC} = 0V	T_A = +25°C		0.001	1	µA
		T_A = +85°C		0.01		
$\overline{CHG}$						
$\overline{CHG}$/Top-Off Current Threshold	I_{BAT} falling, battery is charged	R_{SETI} = 1.5kΩ		60		mA
		R_{SETI} = 2kΩ	30	45	60	
		R_{SETI} = 5kΩ		18		
THM						
THM Pullup Resistance	Match to thermistor resistance at T_A = +25°C		-1%	10	+1%	kΩ
THM Resistance, Hot	R_{THM} falling, 420Ω hysteresis		3.72	3.94	4.13	kΩ
THM Resistance, Cold	R_{THM} rising, 2.7kΩ hysteresis		26.7	28.3	29.7	kΩ
THM Resistance, Disabled	R_{THM} falling, 230Ω hysteresis		240	309	370	Ω
TIMERS, CT						
Timer Accuracy	C_{CT} = 0.068µF		-20		+20	%
Prequal Time Limit	From $\overline{POK}$ low and $\overline{EN}$ low to end of prequal charge, BAT < 2.4V, C_{CT} = 0.068µF			34.8		min
Charge Time Limit	From $\overline{POK}$ low and $\overline{EN}$ low to end of charge, C_{CT} = 0.068µF			334		min
Top-Off Time Limit	From $\overline{CHG}$ high to done, C_{CT} = 0.068µF			69.6		min
THERMAL LOOP						
Thermal-Limit Temperature	Junction temperature when the charge current is reduced, T_J rising			+100		°C
Thermal-Limit Gain	Reduction of I_{BAT} for increase of T_J, I_{BAT}/T_J (over +100°C)			5		%/°C

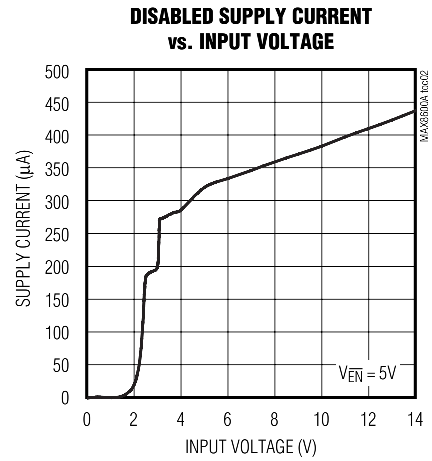
Note 1: Limits are 100% production tested at T_A = +25°C. Limits over the operating temperature range are guaranteed by design and characterization.

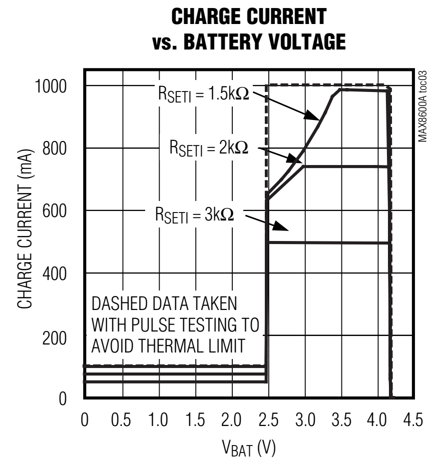
Note 2: Guaranteed by undervoltage- and overvoltage-threshold testing. For complete charging, the input voltage must be greater than 4.35V.

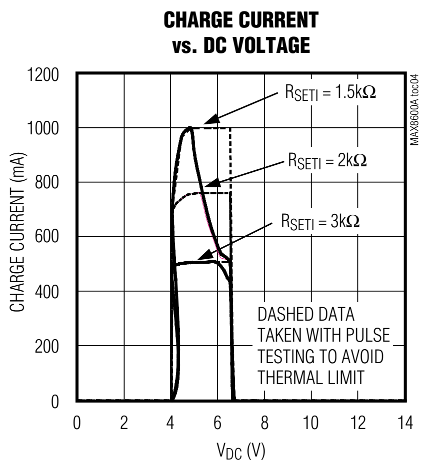
Typical Operating Characteristics

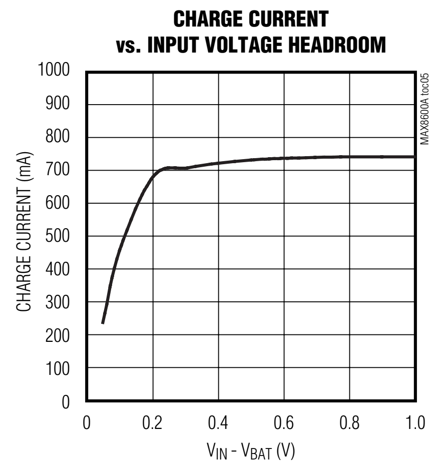
(V_{DC} = 5V, R_{SETI} = 2kΩ, V_{BAT} = 3.6V, MAX8601 Evaluation Kit with thermal resistance of 50°C/W. T_A = +25°C, unless otherwise noted.)

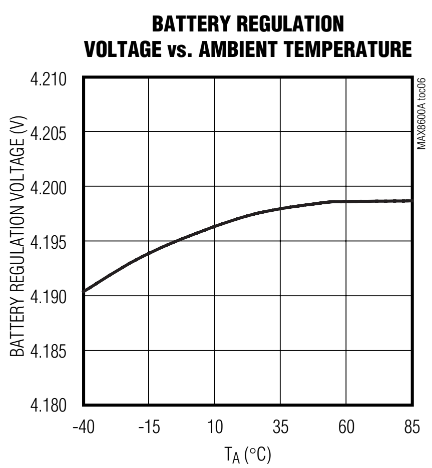


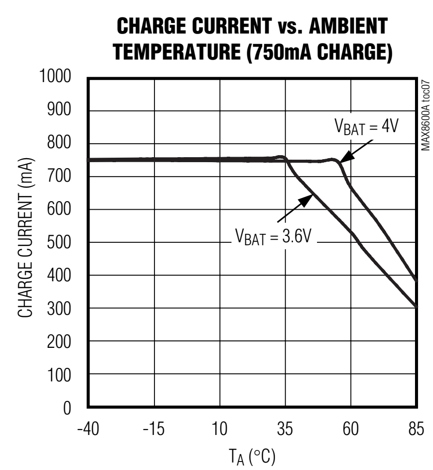








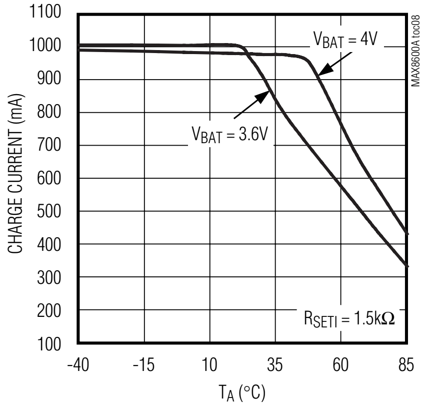


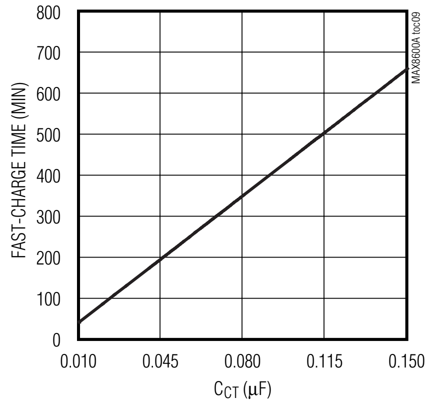


Single-Input 1-Cell Li+ Charger with OVP Protection and Programmable Charge Timer

Typical Operating Characteristics (continued)

(V_{DC} = 5V, R_{SETI} = 2kΩ, V_{BAT} = 3.6V, MAX8601 Evaluation Kit with thermal resistance of 50°C/W. T_A = +25°C, unless otherwise noted.)





Pin Description

PIN	NAME	FUNCTION
1, 7	BAT	Battery Connection. The IC delivers charging current and monitors battery voltage using BAT. Bypass BAT to GND with a 2.2µF or larger ceramic capacitor. Connect both BAT inputs together externally. BAT is high impedance when the IC is disabled. Ensure that all BAT pins are connected together.
2	SETI	DC Charge-Current Programming Pin. Connect a resistor from SETI to GND to set the maximum charging current (I_{BAT} = 1500V/R_{SETI}), the prequal current, and the CHG done threshold. Monitor charging current by measuring this pin voltage. SETI is high-impedance when $\overline{EN}$ is high, or DC is at GND.
3	THM	Thermistor Input. Connect a 10kΩ NTC thermistor, in close proximity to the battery, from THM to ground to monitor the battery temperature. The IC suspends charging when R_{THM} is outside the hot and cold limits. Disable thermistor functionality by connecting THM to GND. THM is high impedance when $\overline{EN}$ is high or DC is at GND.
4	GND	Ground
5	CT	Timing Capacitor Input. Connect a capacitor from CT to GND to set the precharge timeout, top-off time, and fast-charge timeout. Connect CT to GND to disable the timers. CT is high impedance when $\overline{EN}$ is high or DC is at GND.
6	N.C.	No Connection. Make no external circuit connection.
8	$\overline{EN}$	Active-Low Enable Input. Drive low or connect $\overline{EN}$ to GND to enable the charger. Drive $\overline{EN}$ high to disable the charger. $\overline{EN}$ has an internal 470kΩ pulldown resistance to GND.
10	$\overline{POK}$	Power-OK Monitor. $\overline{POK}$ is an open-drain output that pulls low when a valid charging source is detected. $\overline{POK}$ is high impedance when DC voltage is outside valid range. $\overline{POK}$ remains active monitoring DC with the charger enabled or disabled.

Single-Input 1-Cell Li+ Charger with OVP Protection and Programmable Charge Timer

Pin Description (continued)

PIN	NAME	FUNCTION
11	$\overline{CHG}$	Charging-Status Output. $\overline{CHG}$ pulls low when the battery is above 2.5V and being charged with a current greater than 6% of the current programmed with R_{SETI}. $\overline{CHG}$ is high impedance when the charger is in prequal, top-off, or disabled.
9, 12, 13	DC	DC Input Source. Connect directly to a 4.5V to 6.0V charging source. Bypass DC to GND with 1µF or greater. DC is overvoltage protected to 14V. Ensure that all DC pins are connected together.
14	$\overline{FLT}$	Fault Status Output. $\overline{FLT}$ pin pulls low when the fast-charge or prequal timers expire and the battery voltage is not above the required threshold. Clear the fault by raising $\overline{EN}$ or dropping DC to GND (remove input power).
—	EP	Exposed Pad. Connect EP to the GND plane for optimum thermal dissipation.

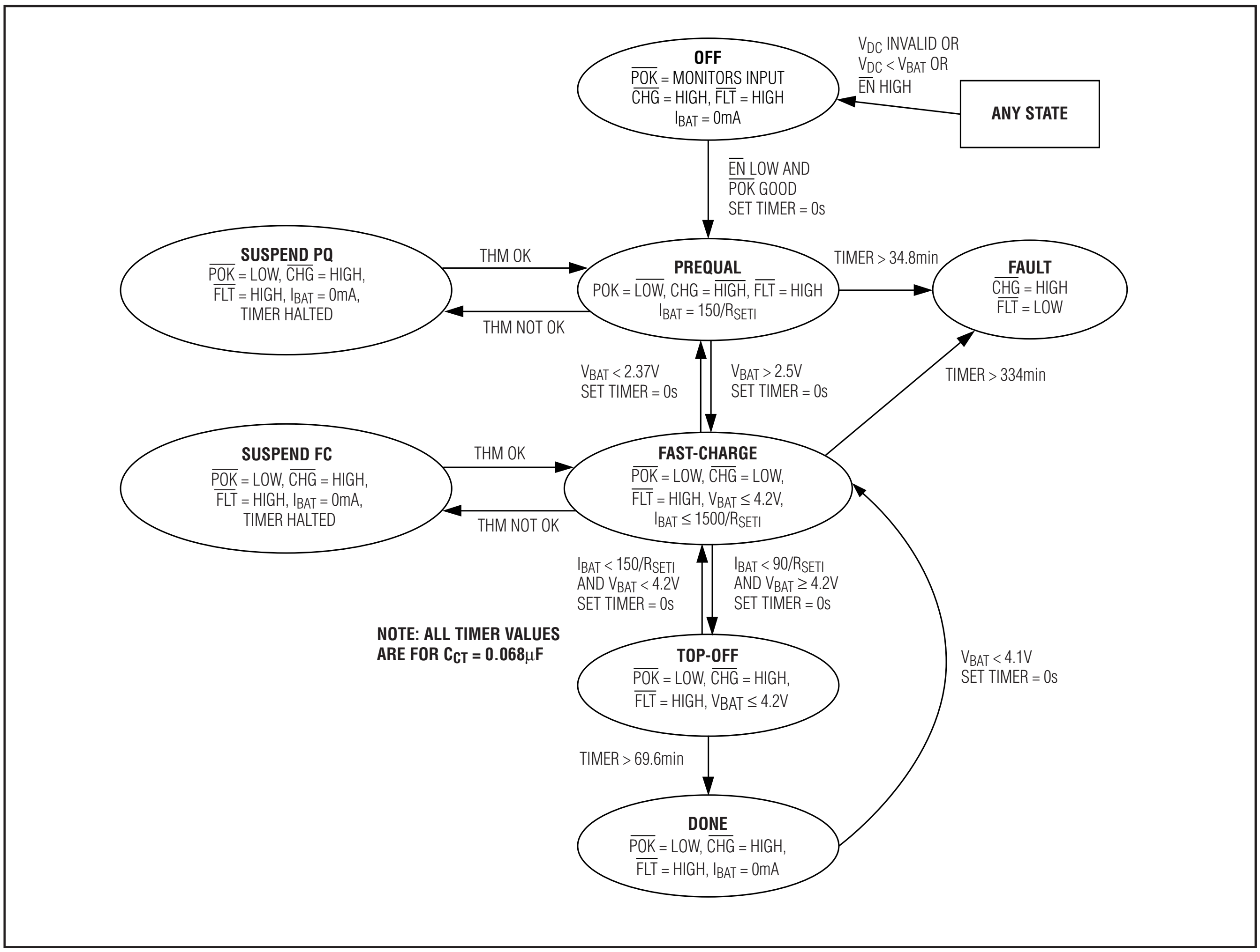


Figure 1. Charger State Diagram

Detailed Description

The MAX8600A is a single-cell Li+ battery charger. Charging is optimized for Li+ cells using a control algorithm that includes low-battery precharging, charging with simultaneous voltage and current compliance, and top-off charging. The battery is continuously monitored for over/under temperature, and charging is suspended if the temperature is out of range. Charging is also terminated when the input source voltage is greater than 6.5V, or after excess charging time (fault). Charger timeout protection is programmable. Charger status is indicated by three-open drain outputs: $\overline{POK}$, $\overline{CHG}$, and $\overline{FLT}$. An input overvoltage protection circuit prevents charging from improper input sources.

The MAX8600A reduces charging time by continuously adjusting the charge rate to accommodate the thermal characteristics of a given application. There is no need to reduce the maximum charge current based on worst-case supply voltage, temperature, and thermal resistance.

DC Charging

The MAX8600A is designed to charge a single-cell Li+ battery from a DC source voltage between 4.1V and 6.0V. The precharge current, charge current, and top-off threshold are programmable with R_{SETI}.

$\overline{EN}$ Charger-Enable Input

$\overline{EN}$ is a logic input (active low) that enables the charger. Drive $\overline{EN}$ high to disable the charger-control circuitry. Drive $\overline{EN}$ low or connect to GND for normal operation.

Soft-Start

To prevent input transients, the rate of change of charging current is limited. When the charger is turned on or when the input source is changed, charge current is ramped from 0 to the set current value in typically 1.2ms. This is done to ensure that the DC source is not subjected to a severe load current step.

Charge-current ramp-up is also limited when transitioning from prequal to fast-charge. There is no dI/dt limiting, however, if I_{SET} is changed suddenly using a switch at R_{SETI}.

Thermal-Limit Control

The MAX8600A features a thermal limit that reduces the charge current when the die temperature exceeds +100°C. As the temperature increases above +100°C, the IC lowers the fast-charge current compliance by 5%/°C.

$\overline{CHG}$ Charge-Indicator Output

$\overline{CHG}$ is an open-drain output that indicates charger status. $\overline{CHG}$ goes low during charge cycles where V_{BAT} is greater than 2.5V and I_{BAT} is greater than 6% of the maximum charge current set by R_{SETI}. When the MAX8600A is used in conjunction with a microprocessor (µP), connect a pullup resistor between $\overline{CHG}$ and the logic I/O voltage to indicate charge status to the µP. Alternatively, $\overline{CHG}$ can sink up to 20mA for an LED charge indicator.

Fault Indicator ($\overline{FLT}$)

The MAX8600A contains an open-drain $\overline{FLT}$ output to signal the user when a fault occurs. $\overline{FLT}$ goes low if the charger is in prequal and the prequal timer expires, or if the charger is in fast-charge and the fast-charge time expires. $\overline{FLT}$ does not go low if the THM thermistor temperature is out of range. Toggle $\overline{EN}$ or the input power to reset the $\overline{FLT}$ indicator.

Power-OK Indicator ($\overline{POK}$)

The MAX8600A contains an open-drain $\overline{POK}$ output that goes low when a valid input source is detected at DC. A valid input source is one whose voltage is between 4.1V and 6.0V and exceeds the battery voltage by 350mV. After a valid input has been established, charging is sustained with inputs as low as 3.5V as long as the input voltage remains above the battery voltage by at least 75mV (typ). Figure 2 shows $\overline{POK}$ being used to drive an external p-channel MOSFET to create a node called SAFE DC. SAFE DC is an overvoltage-protected version of DC.

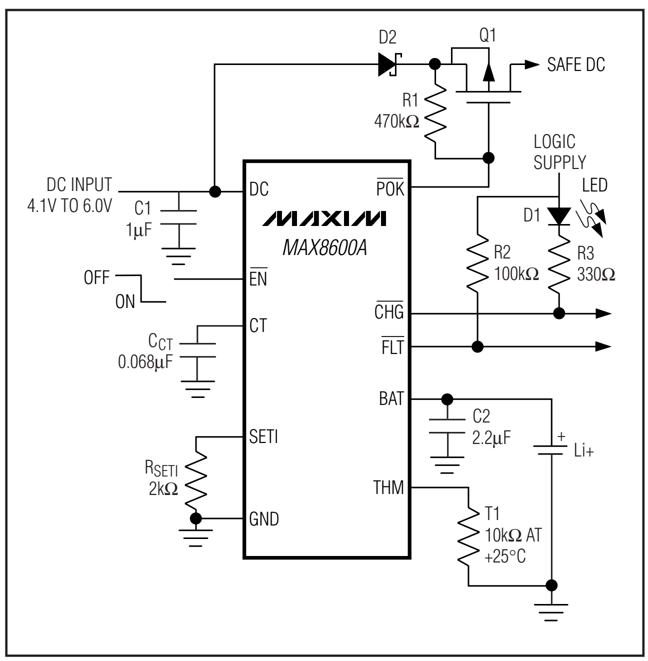


Figure 2. Typical operating circuit. An R_{SETI} of 2kΩ sets a maximum charge current of 750mA.

Figure 2 External Components List

COMPONENT	FUNCTION	DESCRIPTION
C1	Filter capacitor	1µF ceramic capacitor
C2	Filter capacitor	2.2µF ceramic capacitor
C_{CT}	Timing capacitor	0.068µF low TC ceramic capacitor
R_{SETI}	DC charge-current program resistor	2kΩ 1% (for 750mA charge)
R1	Pullup resistor	470kΩ
R2	Pullup resistor	100kΩ
R3	LED current program resistor	330Ω
T1	Negative TC thermistor	Phillips NTC thermistor, P/N 2322-640-63103, 10kΩ 5% at +25°C
D1	Charge indicator LED	LED

Table 1. Fault Temperatures for Different Thermistors

THERMISTOR BETA	3000	3250	3500	3750
Resistance at +25°C	10,000Ω	10,000Ω	10,000Ω	10,000Ω
Resistance at +50°C	4587.78Ω	4299.35Ω	4029.06Ω	3775.75Ω
Resistance at 0°C	25,140.55Ω	27,148.09Ω	29,315.94Ω	31,656.90Ω
Nominal Hot Trip Temperature	+55.14°C	+52.60°C	+50.46°C	+48.63°C
Nominal Cold Trip Temperature	-3.24°C	-1.26°C	+0.46°C	+1.97°C

Applications Information

Figure 2 shows the typical operating circuit for the MAX8600A. The following section describes component changes for different charging current and timer durations.

Charge-Current Selection

The maximum charging current is programmed by an external resistor (R_{SETI}) connected from SETI to GND. Calculate the R_{SETI} value as follows:

$$R_{SETI} = 1500/I_{CHARGE(MAX)}$$

where $I_{CHARGE(MAX)}$ is in amps and R_{SETI} is in ohms. SETI can also be used to monitor the actual charge-current level. The output voltage at SETI is proportional to the charging current as follows:

$$V_{SETI} = (I_{CHARGE} \times R_{SETI})/1000$$

Note that the prequal charge current (when V_{BAT} < 2.5V) operation is 10% of the fast-charge current set by R_{SETI}. Also, the top-off charge-current threshold is set to 6% of the fast-charge current set by R_{SETI}.

$$I_{PREQUAL} = 150/R_{SETI}$$

$$I_{TOP\text{-}OFF} = 90/R_{SETI}$$

Timer Capacitor Selection

The MAX8600A contains timers for prequal, fast-charge, and top-off operation. These time periods are determined by the capacitance from CT to GND. To set the charge times, calculate C_{CT} as follows:

$$T_{FASTCHARGE} = 334\text{min} \times (C_{CT}/0.068\mu F)$$

$$T_{PREQUAL} = 34.8\text{min} \times (C_{CT}/0.068\mu F)$$

$$T_{TOPOFF} = 69.6\text{min} \times (C_{CT}/0.068\mu F)$$

Note that when THM halts charging, the timers stop and hold their value.

Battery Temperature Control

The MAX8600A monitors battery temperature through a negative TC thermistor. Select a thermistor resistance that is 10kΩ at +25°C and has a beta of 3500. The IC suspends charging when it is greater than 28.3kΩ or less than 3.94kΩ, which translates to a temperature limit of 0°C to +50°C. Table 1 shows the nominal temperature limits that result from a wide range of available thermistor temperature curves. The curves are defined by the following equation:

$$R_T = R_{25°C} \times e^{\left\{\beta\left[\left(\frac{1}{T+273}\right)-\left(\frac{1}{298}\right)\right]\right\}}$$

where β is the BETA term in Table 1.

Connect THM to GND to disable the temperature-control function. When R_{THM} disables charging, all timers pause and hold their value.

Capacitor Selection

Connect a 2.2µF ceramic capacitor from BAT to GND for proper stability. Connect a 1µF ceramic capacitor from DC to GND. Use a larger input bypass capacitor for high charging currents to reduce supply noise. All capacitors should be X5R dielectric or better. Be aware that some capacitors have large voltage coefficients that reduce actual capacitance at higher operating voltages and should be avoided.

Thermal Considerations

The MAX8600A is in a thermally enhanced TDFN package with an exposed paddle. Connect the exposed paddle of the package to a large copper ground plane to provide a thermal contact between the device and the circuit board. The exposed paddle transfers heat away from the device, allowing the IC to charge the battery with maximum current, while minimizing the increase in die temperature. Note that the MAX8600A's thermal-limit control allows the charger to be tolerant of thermally restricted PCB layouts that are sometimes unavoidable in compact portable designs. With such non-optimal layouts, the charger still operates, but can reduce charge current to manage temperature rise.

DC Input Sources

The MAX8600A operating input voltage range is 4.1V to 6.0V. The device survives input voltages up to 16V without damage to the IC. If the input voltage is greater than 6.5V (typ), the IC stops charging. An appropriate power supply must provide at least 4.2V plus the voltage drop across the internal pass transistor when sourcing the desired maximum charging current.

$$V_{IN(MIN)} > 4.2V + I_{CHARGE(MAX)} \times R_{ON}$$

where R_{ON} is the input-to-BAT resistance (typically 0.25Ω). Failure to meet this requirement results in an incomplete charge or increased charge time.

Layout and Bypassing

Connect the input capacitors as close as possible to the device. Provide a large copper GND plane to allow the exposed paddle to sink heat away from the device. Connect the battery to BAT as close as possible to the IC to provide accurate battery voltage sensing. Make all high-current traces short and wide to minimize voltage drops. For an example layout, refer to the MAX8600A Evaluation Kit.

Chip Information

TRANSISTOR COUNT: 6838

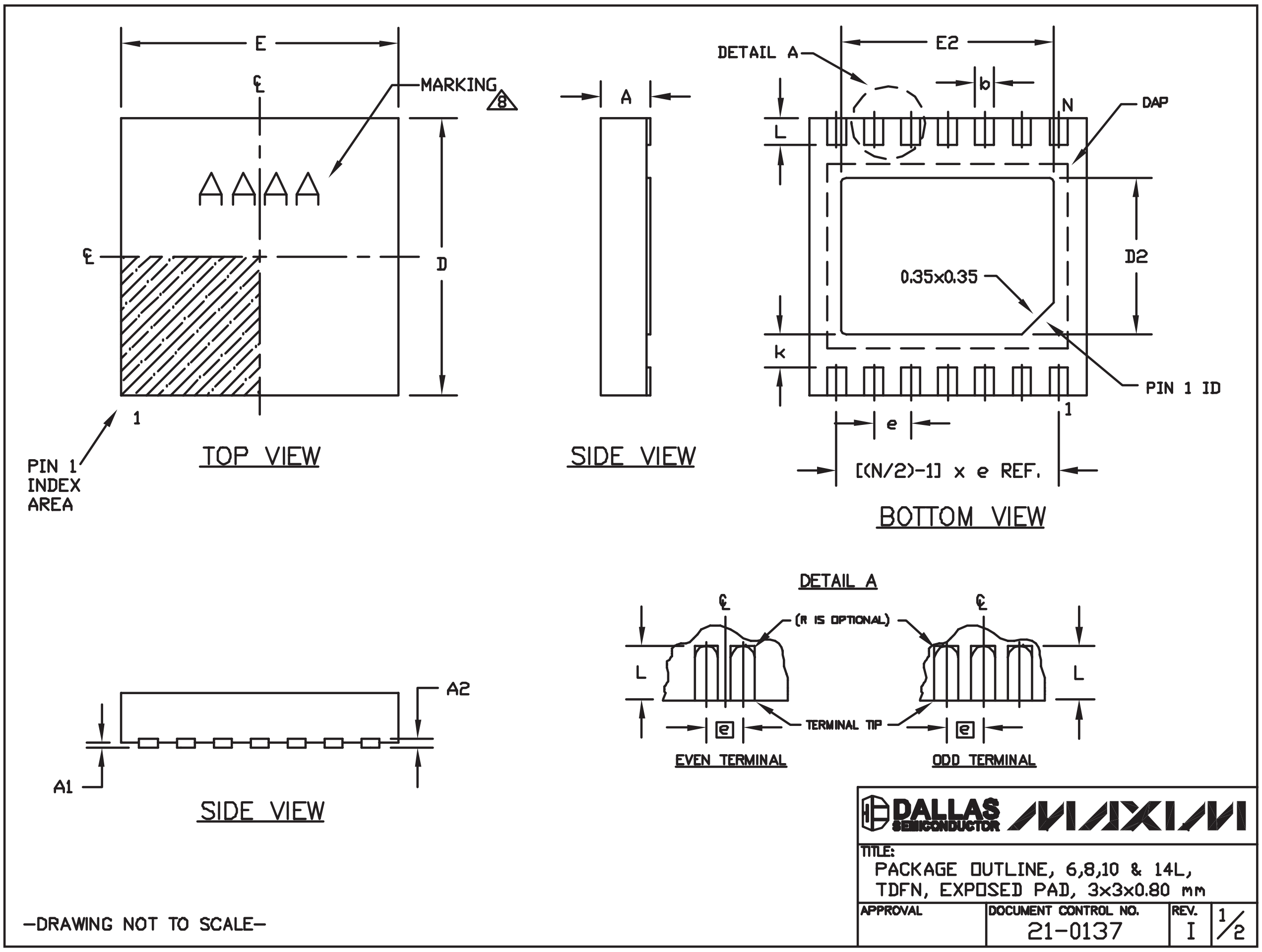
PROCESS: BiCMOS

Single-Input 1-Cell Li+ Charger with OVP Protection and Programmable Charge Timer

Package Information

For the latest package outline information and land patterns, go to **www.maxim-ic.com/packages**.

PACKAGE TYPE	PACKAGE CODE	DOCUMENT NO.
14 TDFN-EP	T1433-2	21-0137



6, 8, &10L, DFN THIN.EPS

Package Information (continued)

For the latest package outline information and land patterns, go to **www.maxim-ic.com/packages**.

COMMON DIMENSIONS		
SYMBOL	MIN.	MAX.
A	0.70	0.80
D	2.90	3.10
E	2.90	3.10
A1	0.00	0.05
L	0.20	0.40
k	0.25 MIN.	
A2	0.20 REF.	

PACKAGE VARIATIONS							
PKG. CODE	N	D2	E2	e	JEDEC SPEC	b	[(N/2)-1] x e
T633-2	6	1.50±0.10	2.30±0.10	0.95 BSC	MO229 / WEEA	0.40±0.05	1.90 REF
T833-2	8	1.50±0.10	2.30±0.10	0.65 BSC	MO229 / WEEC	0.30±0.05	1.95 REF
T833-3	8	1.50±0.10	2.30±0.10	0.65 BSC	MO229 / WEEC	0.30±0.05	1.95 REF
T1033-1	10	1.50±0.10	2.30±0.10	0.50 BSC	MO229 / WEED-3	0.25±0.05	2.00 REF
T1033-2	10	1.50±0.10	2.30±0.10	0.50 BSC	MO229 / WEED-3	0.25±0.05	2.00 REF
T1433-1	14	1.70±0.10	2.30±0.10	0.40 BSC	- - - -	0.20±0.05	2.40 REF
T1433-2	14	1.70±0.10	2.30±0.10	0.40 BSC	- - - -	0.20±0.05	2.40 REF

NOTES:
1. ALL DIMENSIONS ARE IN mm. ANGLES IN DEGREES.
2. COPLANARITY SHALL NOT EXCEED 0.08 mm.
3. WARPAGE SHALL NOT EXCEED 0.10 mm.
4. PACKAGE LENGTH/PACKAGE WIDTH ARE CONSIDERED AS SPECIAL CHARACTERISTIC(S).
5. DRAWING CONFORMS TO JEDEC MO229, EXCEPT DIMENSIONS "D2" AND "E2", AND T1433-1 & T1433-2.
6. "N" IS THE TOTAL NUMBER OF LEADS.
7. NUMBER OF LEADS SHOWN ARE FOR REFERENCE ONLY.
8. MARKING IS FOR PACKAGE ORIENTATION REFERENCE ONLY.

-DRAWING NOT TO SCALE-

DALLAS SEMICONDUCTOR MAXIM

TITLE: PACKAGE OUTLINE, 6,8,10 & 14L, TDFN, EXPOSED PAD, 3x3x0.80 mm

APPROVAL	DOCUMENT CONTROL NO.	REV.	
	21-0137	I	2/2

Single-Input 1-Cell Li+ Charger with OVP Protection and Programmable Charge Timer

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	1/08	Initial release	—
1	1/09	Corrected various errors	1–4, 6, 7

Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

Как с нами связаться

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