

Monitor and Timing Management for Single-Loop NiMH Battery Charger

Features

- Detects and avoids charging alkaline cells
- Monitors voltage, temperature and time for safety and secondary termination
- Drivers PNP type pass element
- Pre-charge qualification for detecting shorted, damaged, or deeply depleted cells
- Automatic recharge keeps batteries charged
- Optional temperature qualified charging

Applications

- Portable computer, cellular phone and PDA
- Charging docks and cradles
- Portable consumer electronics
- Desktop/standalone charger (AAA/AA)
- Digital still camera
- Music player (MP3)
- Game
- Toy
- Emergency lights

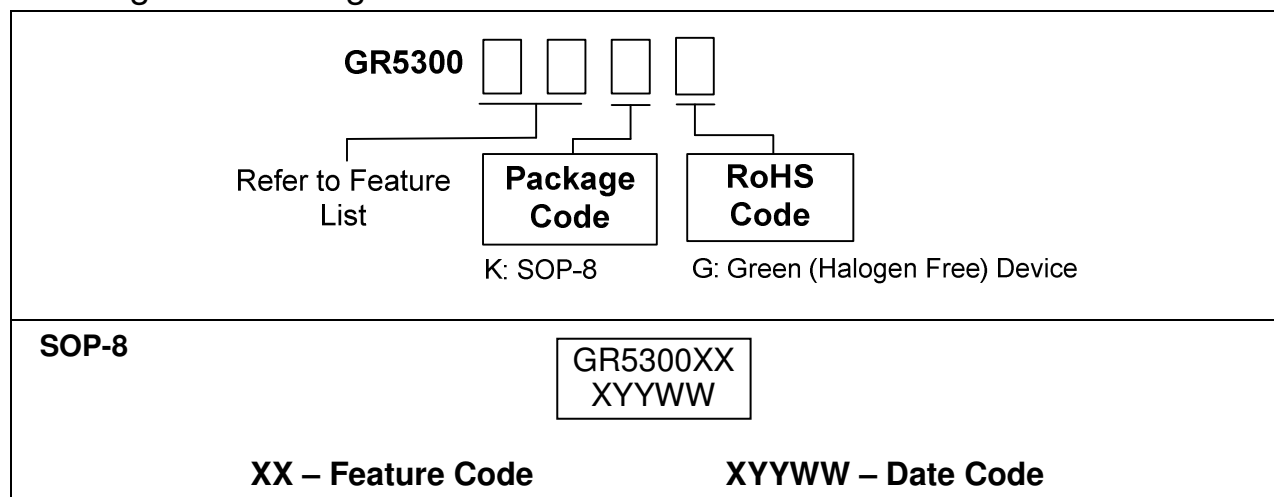
Description

The GR5300 is ideal for standalone charging of 1 to multiple AA or AAA NiMH “loose” cells. NiCd cells can also be charged. Temperature, voltage and charge time are monitored to provide proper fast/slow charging control algorithms for Nickel Metal Hydride (NiMH) batteries. The GR5300 detects the battery chemistry and proceeds with the optimal charging and termination algorithms. This process eliminates undesirable undercharged or overcharged conditions and allows accurate and safe termination of fast/slow charge. Battery tests are included to detect defective or inappropriate cells such as Alkaline primary batteries. The GR5300 supports a parallel charging topology.

The **GR5300AA (SOP-8)** supports one loop single cell charging topology, with monitoring and controls of cell.

The **GR5300DA (SOP-8)** supports one loop two parallel cells charging topology, with the same monitoring and controls of two cells.

Ordering and Marking Information

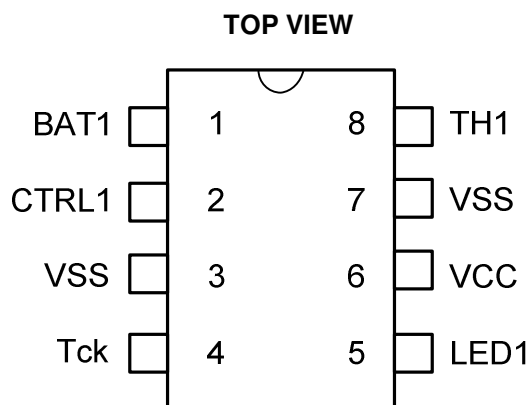


Grenergy OPTO Inc. reserves the right to make changes to improve reliability or manufacture ability without notice, and advise customers to obtain the latest version of relevant information to verify before placing orders.

Feature List

	Fixed Timing
Single Cell	GR5300AA (SOP-8)
Dual Cell	GR5300DA (SOP-8)

Pin Configuration



Pin Description

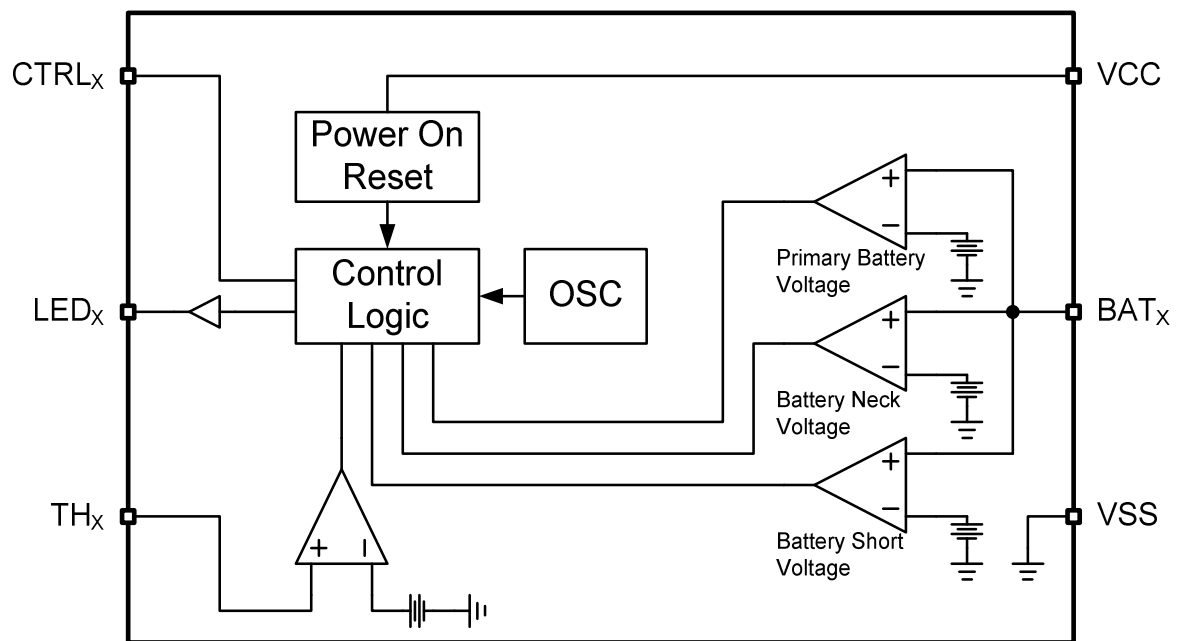
Pin No.	Symbol	Description
1	BAT1	Slot 1, battery voltage input
2	CTRL1	Slot 1, charge switch control
3, 7	VSS	Negative power supply
4	Tck	Tck for test mode and time selection
5	LED1	Slot 1 charge/ Full status LED indicator
6	VCC	Positive power supply
8	TH1	Thermistor input for Slot 1



Absolute Maximum Ratings

Input voltage between VCC and VSS	-----	VSS -0.3 ~ VSS +5.5V
Battery voltage input	-----	VSS -0.3 ~ VSS +5V
LED sink current	-----	4mA
LED driver current	-----	4mA
Operating temperature range	-----	0 to +85 °C
Storage temperature range	-----	-40 to +125 °C

Block Diagram



Electrical Characteristics ($T_A = 25^\circ\text{C}$)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
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POWER SUPPLY

Operating voltage		V_{CC}	4.5	5.0	5.5	V
Supply current	$V_{CC} = 5\text{V}$	I_{CC}	0.4	0.5	0.6	mA
Battery voltage input	GR5300AA	V_{BAT}	0.5		2	V
	GR5300DA	V_{BAT}	0.5		4	V
LED sink current	$V_{CC} = 5\text{V}$	$I_{LED-SINK}$	2.5	3	3.5	mA
LED driver current	$V_{CC} = 5\text{V}$	$I_{LED-Driver}$	2.5	3	3.5	mA
Thermistor input		V_{TH}	1.07	1.12	1.17	V

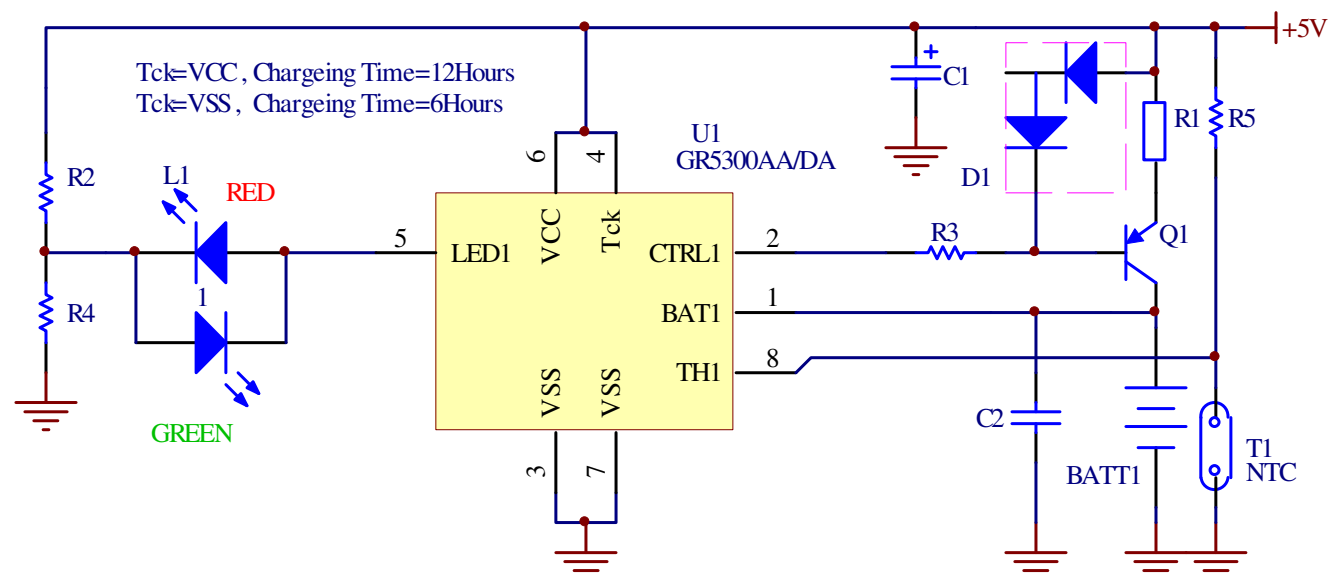
PROTECTION VOLTAGE

Battery short voltage		V_{short}	0.45	0.5	0.55	V
Primary battery voltage	GR5300AA	$V_{primary}$	1.575	1.6	1.625	V
	GR5300DA	$V_{primary}$	3.15	3.2	3.25	V
Battery neck voltage	GR5300AA	V_{neck}	1.395	1.42	1.445	V
	GR5300DA	V_{neck}	2.79	2.84	2.89	V

SAFE TIMER

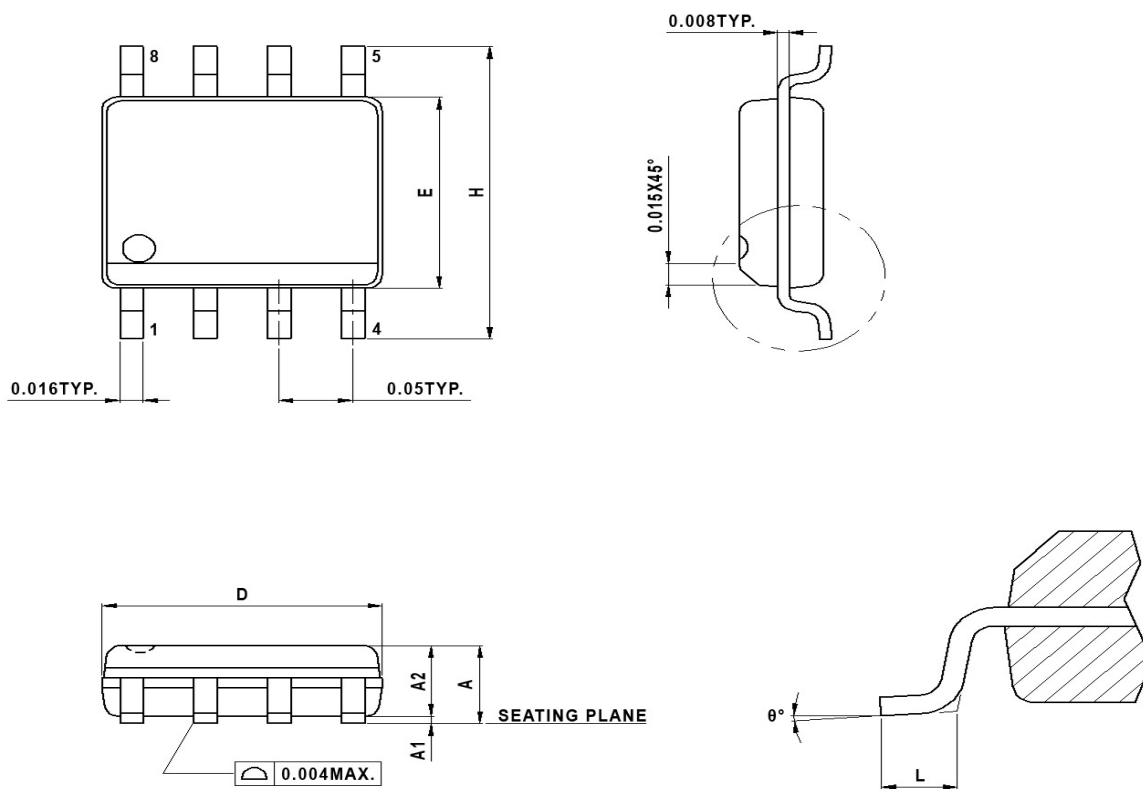
Safe charge timer	TCK = HI	Timer	11.5	12	12.5	hour
Safe charge timer	TCK = LO	Timer	5.5	6	6.5	hour

Typical Application Circuit



Package Information

SOP-8

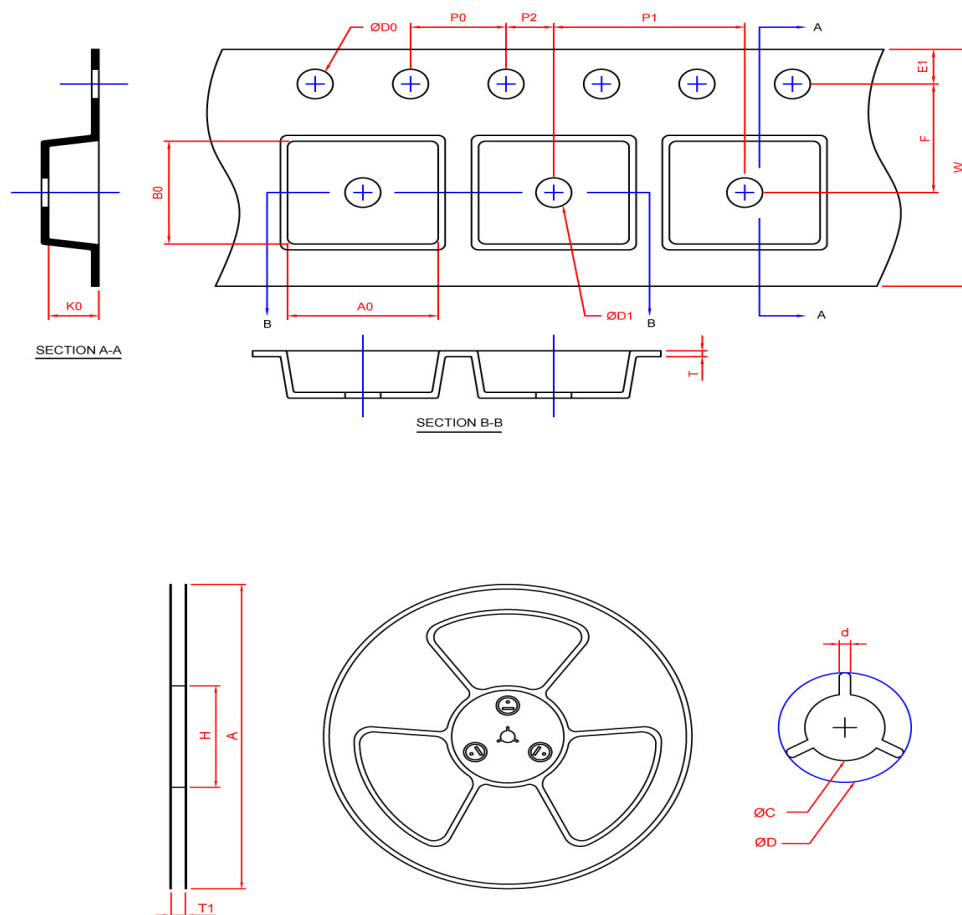


Symbols	Min.	Max.
A	0.057	0.069
A1	0.004	0.010
A2	0.053	0.059
D	0.189	0.196
E	0.150	0.157
H	0.228	0.244
L	0.016	0.050
θ°	0	8

UNIT: INCH

Carrier Tape & Reel Dimensions

SOP- 8



Application	A	H	T1	C	d	D	W	E1	F
SOP-8	330.0±2.0	50 MIN.	12.4+2.00 -0.00	13.0+0.50 -0.20	1.5 MIN.	20.2 MIN.	12.0±0.30	1.75±0.10	5.5±0.05
	P0	P1	P2	D0	D1	T	A0	B0	K0
	4.0±0.10	8.0±0.10	2.0±0.05	1.5+0.10 -0.00	1.5 MIN.	0.6+0.00 -0.40	6.40±0.20	5.20±0.20	2.10±0.20

(mm)

Devices Per Unit

Application	Carrier Width	Cover Tape Width	Devices Per Reel
SOP- 8	12	-	2500

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