turtle by ENEPOWER

TSB002 Series
Digital Universal Battery Charger

LiIon | LiFePO4 | NiMH | NiCd | SLA | LiPo | LTO

Turtle Charger (50W) - Suits all Rechargeable Chemistries
Customisable Pre-programmed Battery Charger

GENERAL SPECIFICATIONS

Input Voltage	10-75VDC
Input Connector	2.1mm DC jack (enclosure)
Output Voltage	0.8V-50V for battery packs up to:
	– 12 cells in series (LiIon / LiPo)
	– 14 cells in series (LiFePO4)
	– 30 cells in series (NiMH / NiCd)
	– 20 cells in series (Lead Acid, LTO)
Output Current	3A max.
Voltage Accuracy	<1%
Voltage Limit	4.20V ±1% p/cell
Current Accuracy	<5%
Tolerance on Timing	±5%
Temp. Accuracy	Internal: <1°C
	External: <1%, resolution 0.01°C
Dimensions	L112mm x W66mm x H40mm (enclosure)
Weight	140 grams (enclosure)

LED PATTERNS - ROUTINE	
Traffic light (red-orange-green):	System reset. Occurs at power on and battery connection.
Slow orange blink:	System waiting. Battery disconnected.
Solid orange:	Constant current phase. (inc. pre-condition if programmed)
Orange with green blink:	Constant voltage phase
Solid green	Charge Complete. Float Charge continues (if programmed)

LED PATTERNS - EXCEPTIONS	
Three red flashes:	Charge suspended. Battery volts too low.
Two red flashes:	Charge suspended. Battery volts too high.
Slow red blinking: (1 flash every 5 sec)	Charge suspended. Battery or PCB too hot (PCB self protected to 75°C)
Fast red blinking:	Thermistor Error. (Needs Power Reset)
Orange blinking: (1 flash every ½ sec)	Timeout. Time limit is customisable on request
Solid red:	Fault. (Needs Power Reset)

DESCRIPTION

The TSB002 Series offer a wide range of single output DC chargers up to 50 Watts.

The Turtle Digital Universal Charger is suitable for all rechargeable battery chemistries. It is custom programmed by our engineers to fit specific design requirements.

Pre-programming includes functions setting charging current and charging voltage, constant current, constant voltage, pre-conditioning, float charging, charge termination methods and setting. Input and output cabling and connector options for all international markets are available upon request.

Features:

- More than 500 different models.
- Suitable for most types of rechargable batteries: LiIon, LiPo, LiFePO4, NiMH, NiCd, Lead Acid, LTO.
- Wide input voltage range.
- Single voltage output up to 50W.
- Constant current limiting overload.
- Proven field reliability and performance.
- Status LED indicator.
- High operating temperature +71°C.

MOUNTING OPTIONS:

Modules available as options below:

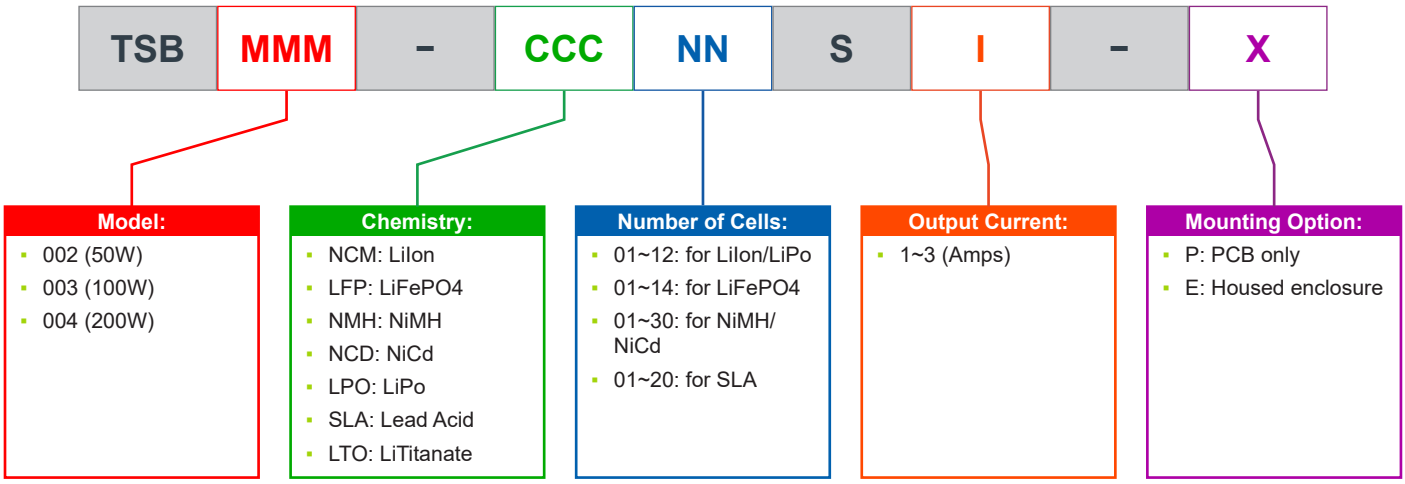
PCB: PCB stand-alone charger.

ENCLOSURE: Housed enclosure for environmental protection.

PCB

ENCLOSURE

PART NUMBER SELECTION KEY



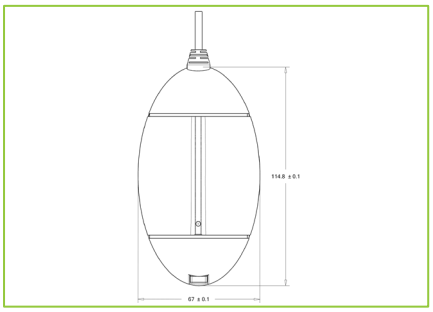
*Termination of choice available.

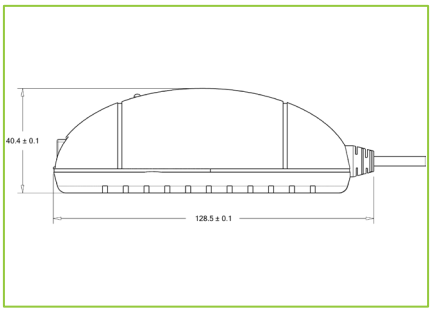
SELECTION TABLE - *Part Number Examples*

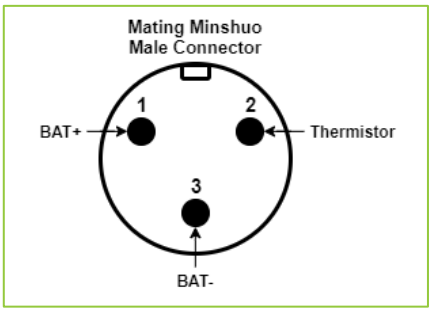
Part Number	Chemistry	Battery Pack Voltage	Input Voltage	Output Current	Mounting Option
TSBMMM-CCCNNSI-X					
TSB002-NCM03S1-E	Li-Ion	11.1VDC (3 cells)	10-75VDC	1A (12.6W)	Housed enclosure
TSB002-NCD30S2-P	NiCd	36VDC (30 cells)	10-75VDC	2A (96W)	PCB only
TSB002-SLA05S3-P	Sealed Lead Acid	10VDC (5 cells)	10-75VDC	3A (33.75W)	PCB only
TSB002-LFP14S2-E	LiFePO4	44.8VDC (14 cells)	10-75VDC	1.95A (100W max)	Housed enclosure

TECHNICAL DIAGRAMS (2D)

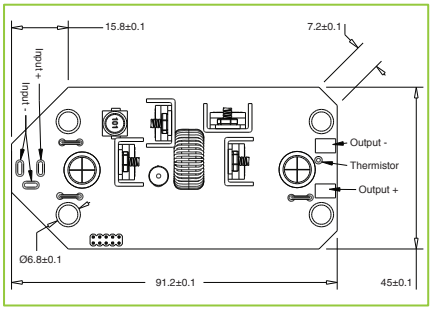
ENCLOSURE

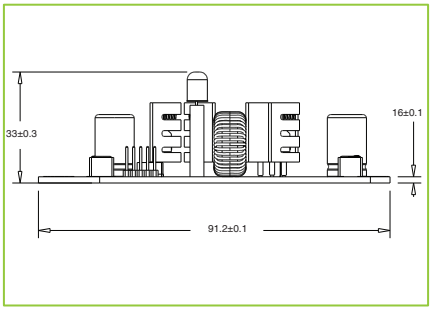






PCB





All dimensions in millimeters (mm).