



# Maker Power™

## Dual LiPO Battery Charger

### Features

- USB Power Input
- External USB Power Charger Input
- Rugged USB Mini connector
- Two linear charge management controllers
- Charges two independent batteries
- Settable Charge Current 50-600mA<sup>1,2</sup>
- Two Charging methods
  - Connected to PC with software
  - Standalone preprogrammed

### Description

The Dual LiPO charger is a small power module that accepts USB power (one for power+data and one for power only) and converts it to charge two independent LiPO batteries. The charge current can be controlled from a PC Program or preprogrammed for standalone mode. The module provides a small and convenient package that is the same form factor as other **Maker Power™** USB power modules.

### Applications

- Maker Applications
- Circuit Prototyping
- Power Isolation
- Field testing
- Remote Area Charging

### Electrical Characteristics

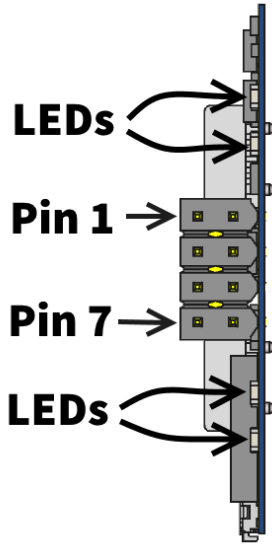
Parameter	Min	Max	Unit
Input Voltage	4.4	5.5	VDC
Battery Voltage		4.2	VDC
Charge Current <sup>1,2</sup>	50	600	mA
3.3 VDC Output @ 600mA	3.15	3.45	VDC
Module Quiescent Current		30	mA

Note 1. Total current out is dependent on the USB Power supply and the environment. Total current out cannot exceed current capability of the USB power supply. Typically the maximum total current is 2.1A.

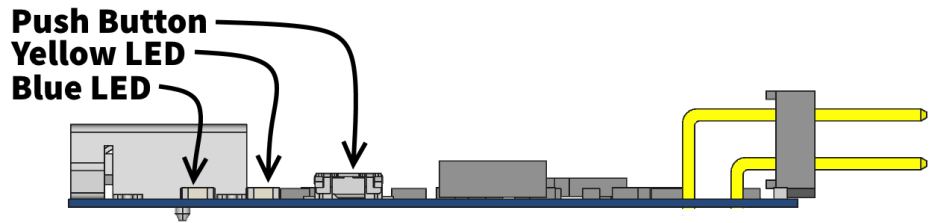
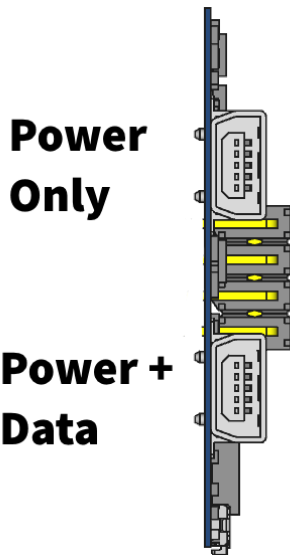
Note 2. The charging system will enter a thermal management mode and limit the charging current as the module temperature increases.

Note 3. For further information on the charging system consult the Microchip Technology MCP73837 data sheet.

# PRELIMINARY



Pin	Function
1	Charger # 2 Output
2	Charger # 2 Output
3	Ground
4	Ground
5	Ground
6	Ground
7	Charger # 1 Output
8	Charger # 1 Output



## Operation

There are two USB inputs, marked power+data and power only. They provide the following functionality.

- Power+Data is designed to be used with the PC control program. When this is the only power source, total charge current is limited to < 500mA or the limit of the PC connection if it is < 500mA. Even if the PC can supply more than 500mA, the module will limit the total charge current to < 500mA. This USB input also provides the data connection between the module and the PC control program.
- Power Only provides power to the entire module. The local processor will power up, recognize there is no USB data connection and enter standalone mode. If there is power applied to both USB connectors, the charging system will default to the Power Only connection. This allows the charging system to achieve the maximum allowable charging current.

# PRELIMINARY

There are two operating Modes, connected to a PC via the Power+Data USB connector (the PC program does not need to be open to enter this mode) and stand alone mode where one or both of the USB connectors are connected to USB power sources.

- Module connected to a PC via Power+Data USB connector is designed to control the charging system through the PC program. Total charging current is limited to less than <500mA or the limit of the PC USB port, whichever is lower. You may connect a USB power charger to the Power Only port in this mode to achieve the maximum allowable charging current. When power is applied to this connector, the charging system defaults to this power source. There is no power adding. The Power+Data connector only supplies power to the local processor and LEDs when the Power Only connector is connected.
- Module connected to a USB power charger via the Power Only USB connector will cause the module to enter the standalone mode. The charging current is set to the preprogrammed value previously entered via the PC program. Charging is controlled by the small button on the side. Pressing the button will toggle the state of both chargers.

## Module Status LEDs

There are 3 possible states and they are indicated by the blue and yellow LEDs on the side next to the button as shown in this table.

State	Blue LED	Yellow LED
Connected to and recognized by the PC (Power+Data )	ON	Flashing
Standalone and charger OFF (Power Only)	OFF	ON
Standalone and charger ON (Power Only)	Alternating	Alternating

The charger status is indicated by red and green LEDs as shown in this table.

State	Red LED	Green LED
Shutdown	OFF	OFF
Standby	ON	OFF
Charging	Alternating	Alternating
Done	OFF	ON
Fault	Flashing	OFF

## PC Program Operation

Please consult the help screen for operation of the program. The help screen is accessed by pressing F1.