

# Hobby Components Micro Lithium Battery Charger

HCMODU0235

# Description

The Hobby Components micro charger is a tiny single cell (3.7V) lithium battery charger module which not only incorporates both battery charging protection and control, but also includes battery voltage & current over discharge protection and battery overload protection. Measuring only 27 x 14mm this tiny module can easily be incorporated into low power lithium battery applications.

The charger will accept power from either a 5V microUSB adapter or via a 4.5 to 6V power supply and will charge a connected single cell lithium battery at a rate of ~0.5A.

The battery can be connected via a JST XH-2.54 connector or by 2 large solder pads (BIN + & BIN -).

The module's output supplies the batteries nominal output of 3.7V (4.2V whilst charging) at a constant current of up to 2A (depending on battery and charger specification). An external device can be connected to this output via a 0.1" pitch pin header or via 2 large solder terminals (BOUT + & GND).

# Safety notes

**Check the polarity of the power supply and battery connections before connecting.**

**DO NOT attempt to charge any type of battery other than a single cell Lithium (3.7V) battery.**

**DO NOT attempt to charge more than one battery at a time**

**DO NOT exceed the specifications of this module or you lithium battery**

**NEVER intentionally short circuit, charge/discharge a lithium battery beyond its specifications or leave a Lithium battery unattended whilst charging.**

# Module specifications

Supported battery type:	Single cell Lithium-ion battery
Module supply voltage:	5V via microUSB or 4.5 to 6V via power in header
Module supply current (max charge):	450mA +/-10%
Module supply current (trickle):	45mA +/- 10%
Module supply current (standby max):	500uA
Battery charge voltage max (float):	4.2V
Battery charge voltage min:	2.9V
Battery stand-by exit voltage:	4.05V
Battery charge current (max):	445mA +/- 10%
Battery charge termination current:	44.5mA +/- 10%
Battery over discharge voltage protection:	2.4V
Battery over discharge current protection:	3.5A +/- 0.9A
BAT out terminal voltage max (charging):	4.3V
BAT out terminal voltage min (discharging):	2.9V
BAT out terminal max continuous current:	2A
Module dimensions:	27 x 14 x 7.5mm

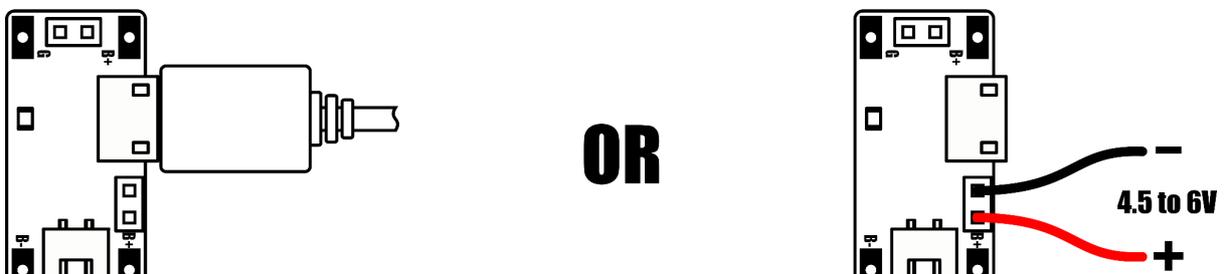
## Connecting a battery



Connect a single cell (3.7) Lithium-Ion battery to either the battery solder pads or if your battery has a JST-XH connector it can be connected via the module's JST socket.

**Ensure that the specification for your battery allows it to be charged at a maximum of 445mA (+/- 10%)**

## Connecting a power supply



Power to the module can be connected via a 5V USB charger or by applying 4.5 to 6V to the power supply pin header.

**If powering external equipment whilst a power supply is connected to the module, the connected power supply must be capable of either supplying the maximum current drawn from the modules output terminals, or 0.5A - whichever current is greater.**

## Connecting a device to the output



Connect your equipment to either power output solder pads, or the power out pin header.

**The output voltage will be equal to the battery voltage when not charging (normally 3.4 to 4.2V depending on how much charge the battery holds).**

**When a charger is connected the output voltage will be between 4 to 4.3V**

## Detailed Functional description

### Charging

A charge cycle begins when USB (5V) power is applied to the microUSB connector, or when 4.5 to 6V supply is applied to the power in header pins. If the battery voltage is above 2.9V the charger will enter constant current mode and will charge the battery up to a maximum of 445mA (+/-10).

If the battery has been over discharged (<2.9V) the charger will go into trickle charge mode until the battery reaches a safe level for charging after which the charger will switch to charging mode.

When the battery has reached its final float voltage (4.3V) the charger will start to decrease the charge current until it reaches 10th of the full charge rate (44.5mA) at which point the charging cycle will end and the charger will enter standby mode. In this state the charger is no longer charging the battery and any loads on the battery out terminals are supplied by the battery.

Whilst in standby mode the charger will constantly monitor the battery voltage and if it drops below 4.05V a new charge cycle will begin. Note, disconnecting and reconnecting the module's power supply whilst the charger is in standby mode will also start a new charge cycle.

## Battery protection

The module will constantly monitor the voltage and current of the battery and will protect it from over discharge voltage and over discharge current.

Over discharge voltage protection: If whilst discharging the battery voltage drops below 2.4V (+/- 0.1V), the module will disconnect the modules GND output terminal from the battery and supply to the externally connected equipment will cease. The module will then stay in this mode until the module starts a new charge cycle.

Over discharge current protection: If the battery discharge current becomes greater than 3.5A (+/- 0.9A) the module will disconnect the modules GND output terminal from the battery and supply to the externally connected equipment will cease. The module will then stay in this mode until the load is removed.