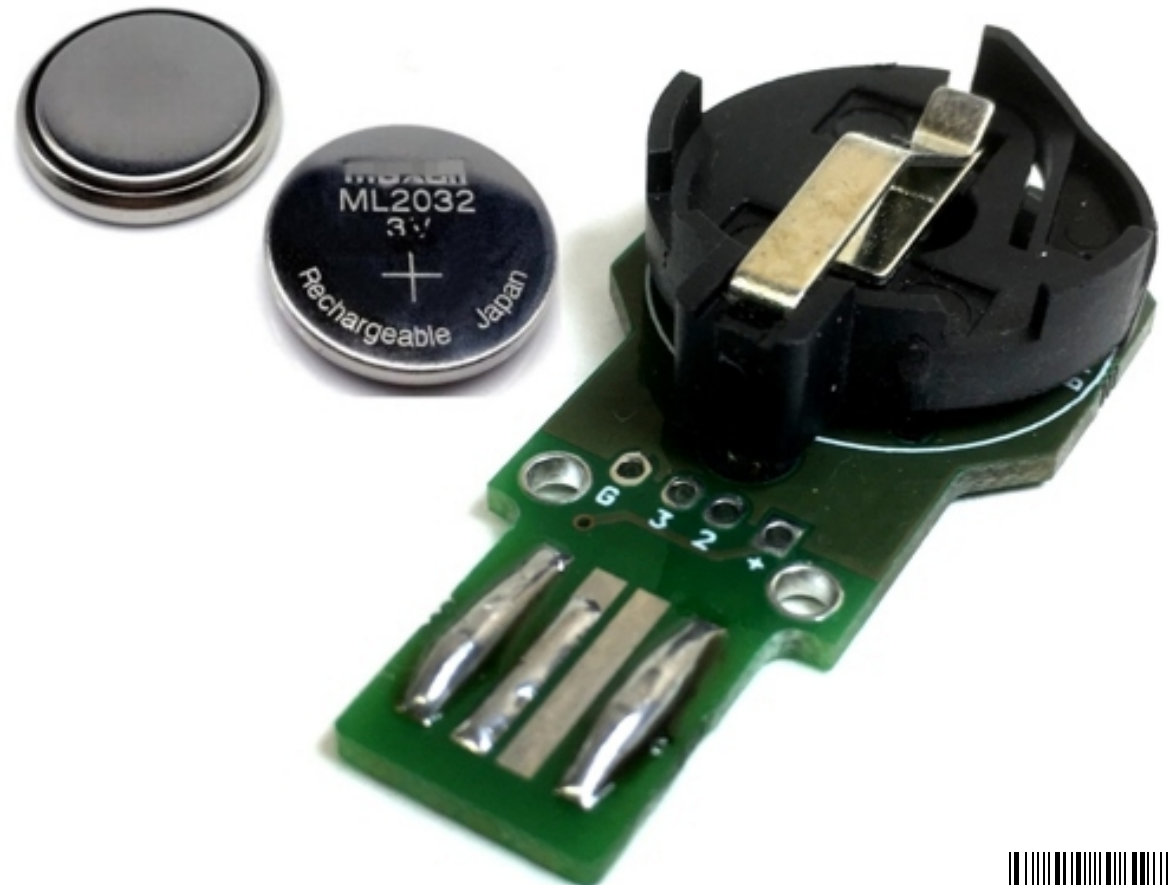


## Lithium Coin Cell Charger For Rechargeable CR2016/CR2025/CR2032

The versatile charger has been designed to charge Lithium Coin Cell Rechargeable CR2016/CR2025/CR2032 Coin Batteries, just insert the battery in to the holder, and plug in to any USB port to recharge, D3 Power LED, D1 LED indicates the charge cycle. The board has been designed to use Dual chips BQ21040 IC from Texas instruments or MCP73831 from Microchip however the board is tested with BQ21040 IC.

### Features (BQ21040)

- Supply Input 5V USB Port
- 1% Charge Voltage Accuracy
- 10% Charge Current Accuracy
- Low Battery Leakage Current (1  $\mu$  A)
- Output Current Approx. 50mA
- 4.2-V Li-Ion and Li-Pol Coin Battery CR2016/CR2025/CR2032
- Over temperature Sensing Protection Through NTC
- Fixed 10-Hour Safety Timer
- Status Indication – Charging/Done
- OUT Short-Circuit Protection and ISET Short Detection
- 125°C Thermal Regulation; 150°C Thermal
- Shutdown Protection



Programmable Charge Current using External Resistor up to 800 mA (default Set to 50mA), follow bellow formula to set the desired current.

An external resistor R2 is used to Program the Output Current (50 to 800 mA) and can be used as a current monitor.

$$R_{ISET} = K_{ISET} / I_{OUT}$$

Where

- IOUT is the desired fast charge current;
- KISET is a gain factor found in the electrical specification (1)

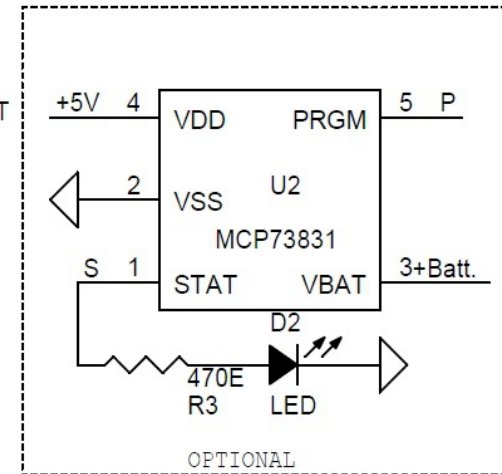
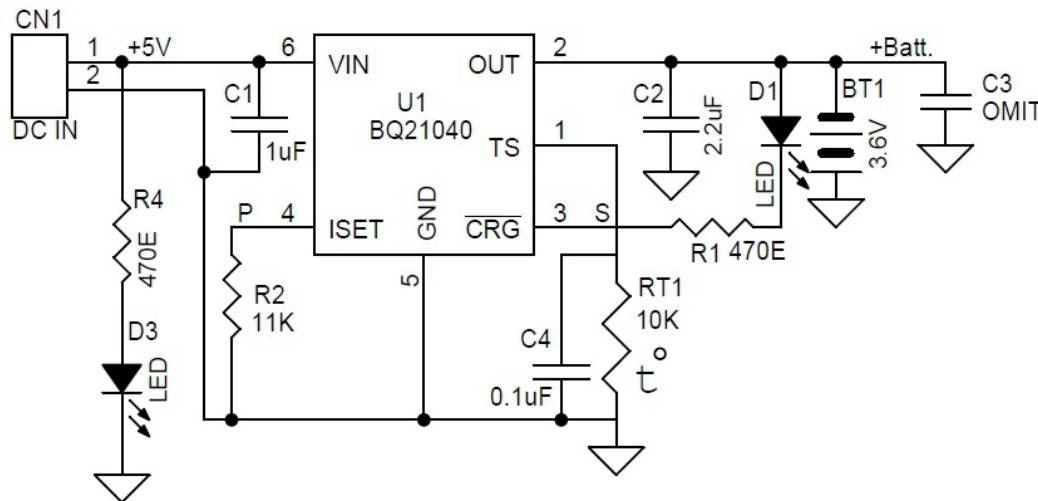
For greater accuracy at lower currents, part of the sense FET is disabled to give better resolution. Figure 1 shows the transition from low current to higher current. Going from higher currents to low currents, there is hysteresis and the transition occurs around 0.15 A.

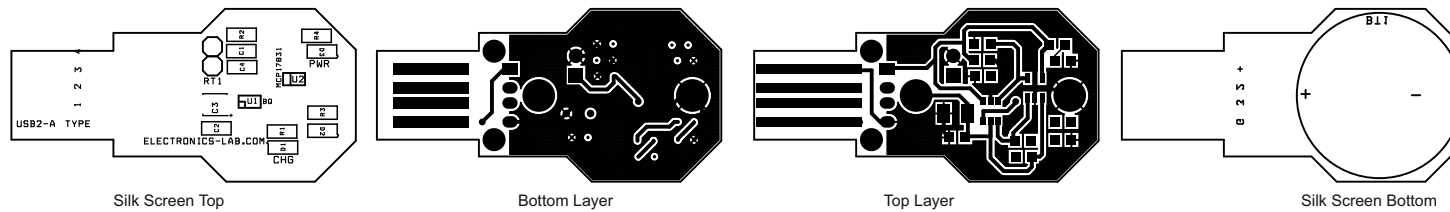
For host monitoring, a pull-up resistor is used between the STATUS terminal and the VCC of the host and for a visual indication a resistor in series with an LED is connected between the STATUS terminal and a power source. First charge after Input supply applied LED will be ON and LED will be OFF when OVP/SLEEP condition.

### **BQ21040**

The bq21040 device is a highly integrated Li-Ion and Li-Pol linear battery charger device targeted at space limited portable applications. The device operates from either a USB port or AC adapter. The high input voltage range with input overvoltage protection supports low-cost unregulated adapters. The bq21040 has a single power output that charges the battery. A system load can be placed in parallel with the battery as long as the average system load does not keep the battery from charging fully during the 10 hour safety timer. The battery is charged in three phases: conditioning, constant current and constant voltage. In all charge phases, an internal control loop monitors the IC junction temperature and reduces the charge current if an internal temperature threshold is exceeded. The charger power stage and charge current sense functions are fully integrated. The charger function has high accuracy current and voltage regulation loops, charge status display, and charge termination. The pre-charge current and termination current threshold are fixed to 20% and 10%, respectively. The fast charge current value is programmable through an external resistor.

**Note:** The board provided dual option for charging IC, refer data sheet of MCP73831 and use appropriate components as per data sheet.





PCB Dimensions 45.55X22.95MM

<b>BOM</b>			
<b>SR.</b>	<b>QNTY.</b>	<b>REF.</b>	<b>DESC.</b>
1	1	BT1	Coin Battery Holder CR2032
2	1	CN1	PCB USB CONNECTOR
3	1	C1	1uF/16V SMD 0805
4	1	C2	2.2uF/16V SMD 0805
5	1	C3	OMIT
6	1	C4	0.1uF SMD 0805
7	2	D1,D3	LED SMD 0805
8	1	RT1	10K NTC SMD 0805
9	2	R1,R4	470E SMD 0805
10	1	R2	11K SMD 0805
11	1	U1	BQ21040
12	1	U2	OMIT
13	1	D2	OMIT
14	1	R3	OMIT