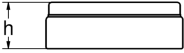
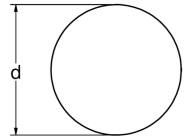

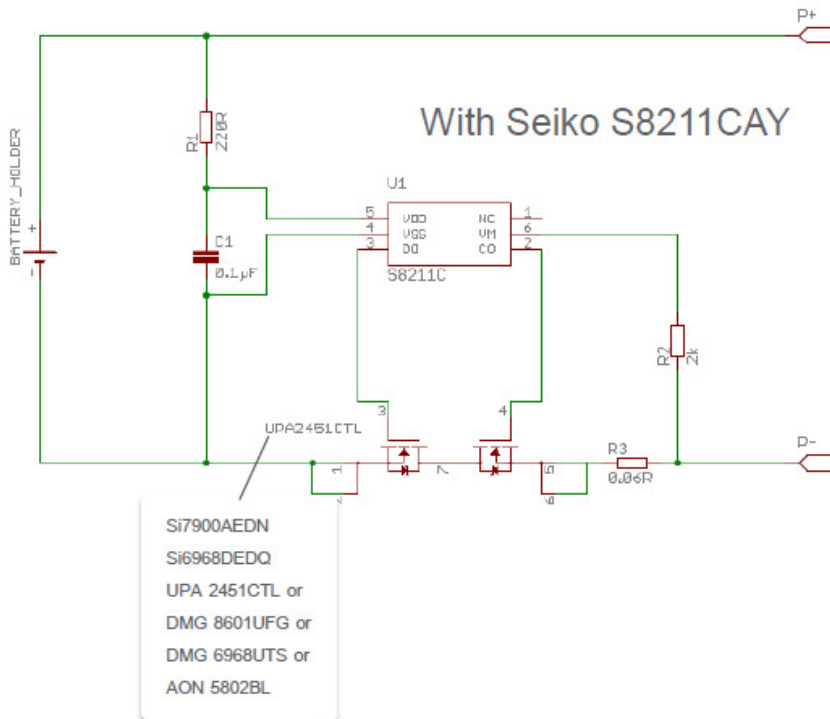


**Data Sheet – CP 1654 (CoinPower®)<sup>1</sup>**

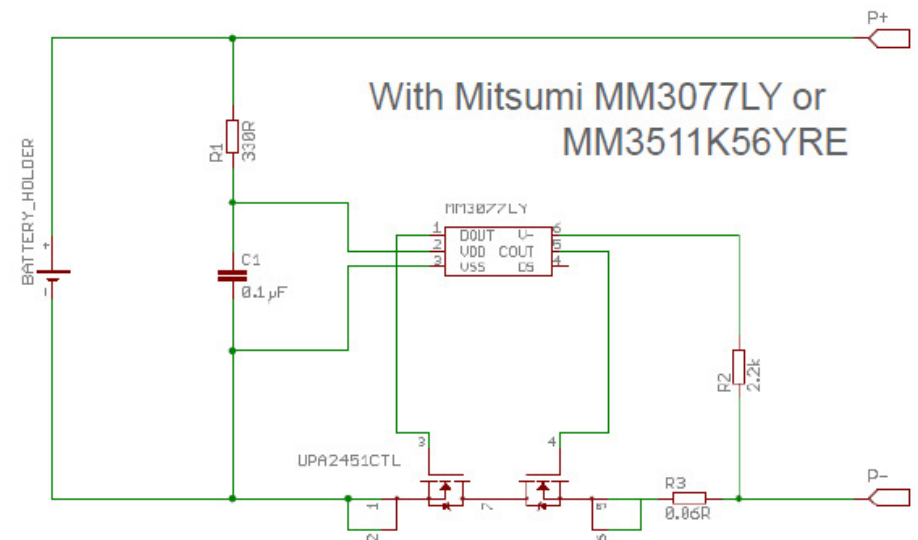
<b>Type Designation</b>	CP 1654
<b>Type Number</b>	63165
<b>Cell Code</b>	ICR1654
<b>System</b>	Graphite - layered metal oxide ( $\text{LiNi}_x\text{Mn}_y\text{Co}_z\text{O}_2$ )
<b>UL Recognition</b>	MH13654
 <b>Nominal Voltage [V]</b>	3.7 (average)
<b>Nominal Capacity C [mAh]</b>	100 (at 0.2 C from 4.2 V to 3.0 V at 20 °C)
 <b>Dimensions [mm] (without Tags)</b>	
<b>Diameter</b>	16.1 +0.0 / -0.3
<b>Height</b>	5.4 +0.2 / -0.1
<b>Weight. approx [g]</b>	3.2 +0.3 / -0.3
 <b>Charging Method</b>	Constant Current + Constant Voltage
<b>Charge Voltage [V]</b>	4.20 ± 0.05
<b>Initial Charge Current [mA]</b>	Standard Charge: 0.5 C Rapid Charge: 1 C
<b>Charging Cut-Off (a) or (b)</b>	
a) by time [h]	Standard Charge: 5 Rapid Charge: 3
b) by min current [mA]	0.02 C
<b>Discharge Cut-Off Voltage [V]</b>	3.0
<b>Max. Pulse Discharge Current [mA]</b>	3 C @ 2 s
<b>Max. Continuous Discharge Current [mA]</b>	2 C
<b>Operating Temperature [°C]</b>	Charge: 0 to 45 Discharge: -20 to 60
<b>Storage Temperature</b>	1 Year at -20 to 20 °C > 80
<b>Capacity Recovery Rate<sup>2</sup> [%]</b>	3 Month at -20 to 45 °C > 80 1 Month at -20 to 60 °C > 75
<b>Impedance Initial [Ω]</b>	< 0,4 @ 1 kHz
<b>Cycle Life 0.2 C / 0.2 C, 20 °C [Cycles]</b>	> 500 (> 80 % of C <sub>ini</sub> )
<b>Cycle Life 1 C / 1 C, 20 °C [Cycles]</b>	> 300 (> 80 % of C <sub>ini</sub> )
<b>Safety</b>	UL passed
<b>Internal Approval</b>	
<b>Overcharge Test (12 V, 3 C, 12 h)</b>	passed
<b>Overcharge Test (12 V, 1 C, 12 h)</b>	passed
<b>Overcharge Test (5 V, 1 A, 12 h)</b>	passed

<sup>1</sup> Recommendations regarding Charging / Discharging and Safety (cf. Product Manual) have to be accepted.  
 Cell must not be used without external safety electronics (PCM – Protection Circuit Module).  
<sup>2</sup> After storage at initial cell voltage of 3.7 to 3.9 V / cell; values estimated – not measured yet.

## Safety Electronic Design - Reference



The small series resistor R3 (60mOhm) allows overcurrent protection being active at 500mA overcurrent.



## Charging ICs

- Texas Instruments
  - BQ 24040
  - BQ24050
  - BQ24052
- Linear Technology
  - LT 4070
  - LT 4071

### bq24040/50

**800mA Linear Charger in 2x2 DFN with USB D+ D- Detection**

#### Features

- 30V input rating with input OVP
- Input voltage dynamic power management
- Selectable 100mA or 500mA USB current limit
- Adjustable precharge and termination current
- TS pin to monitor pack temperature
- USB D+ D- Detection (bq2405x)

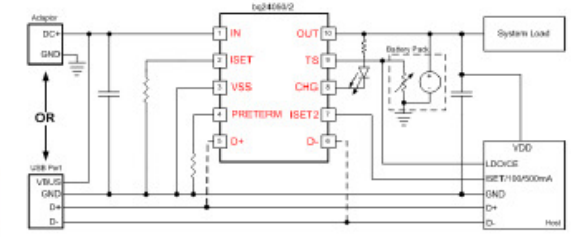
#### Benefits

- Supports unregulated adapters
- Protection against poor USB sources
- USB compliance
- Flexibility
- Meets new safety standard
- Fast charging from adapter before host takes any action

#### Applications

- Mobile Phones
- MP3 Players
- Low Power Handheld

EVM  
 bq24040: \$1.15  
 bq24050: \$1.45



### Low Current Battery Chargers



	LTC4054L	LTC4065L	LTC4070	LTC4071
$V_{IN}$	4.25V to 6.5V (10V Abs Max)	4.5 to 5.5V (6V Abs Max)	Unlimited	Unlimited
Topology	LDO	LDO	Shunt	Shunt
$I_{CHG, MIN}$	7.5mA	8.2mA	~1uA	~1uA
$I_{CHG, MAX}$	200mA	250mA	50/500mA	50/500mA
Low Bat Disconnect	No	No	No	Yes
Shutdown $I_{Q+}$ (typ)	25uA	25uA	450nA	< 0.1nA
Package	SOT-23	2 x 2 DFN-6	2 x 3 DFN-8, MS-8	2x3 DFN-8, MS-8

The charging IC should have adjustable Constant current source for charging current of 1CA (40mAh/80mAh) .