

BM3451 Series

3 ~ 5 Cells Battery Protectors With balanced function, temperature protection, break protection, multi chip cascade usage



The BM3451 Series is a professional 3/4/5 section rechargeable battery protection chip, with high integration characteristics, suitable for power tools, electric bicycles and UPS standby power supply. BM3451 through the detection of the battery voltage, discharge current and ambient temperature and other information to achieve battery overcharge, over discharge, discharge over-current, short-circuit, charging overcurrent, temperature protection and other protection functions, through the external capacitor to adjust overcharge, over discharge, overcurrent protection delay. The BM3451 provides battery capacity balancing function, eliminates the difference in battery capacity in the battery pack and prolongs battery life. BM3451 can be implemented in multiple chip cascade, 6 or 6 sections of the battery pack protection.

Features

- **High-accuracy voltage detection for each cell**
 - Overcharge threshold 3.6 V ~ 4.6 V accuracy: ±25 mV (+25 °C)
 - Overcharge hysteresis 0.1 V accuracy: ±50 mV
 - Over-discharge threshold 1.6 V ~ 3.0 V accuracy: ±80 mV
 - Over-discharge hysteresis 0 / 0.2 / 0.4 V accuracy: ±100 mV
- **Three grades voltage detection of discharge overcurrent**
 - Discharge overcurrent 1 0.025 V ~ 0.30 V (50 mV step) accuracy: ±15 mV
 - Discharge overcurrent 2 0.2 / 0.3 / 0.4 / 0.6 V
 - Short circuit 0.6 / 0.8 / 1.2 V
- **Charge overcurrent detection**
- **Detection voltage** -0.03 / -0.05 / -0.1 / -0.15 / -0.2 V
- **3/4/5 cell protection enable**
- **Multiple chips cascade application**
- **Setting of output delay time**
 - Over-discharge, discharge overcurrent 1 and discharge overcurrent 2 protection delay time can be set by external capacitors
- **Controlling the state of charge or discharge by external signals**
- **The maximum output voltage of CO / DO: 12V**
- **Temperature protection**
- **Breaking wire protection**
- **Internal balance control terminal**

- **Low power consumption**

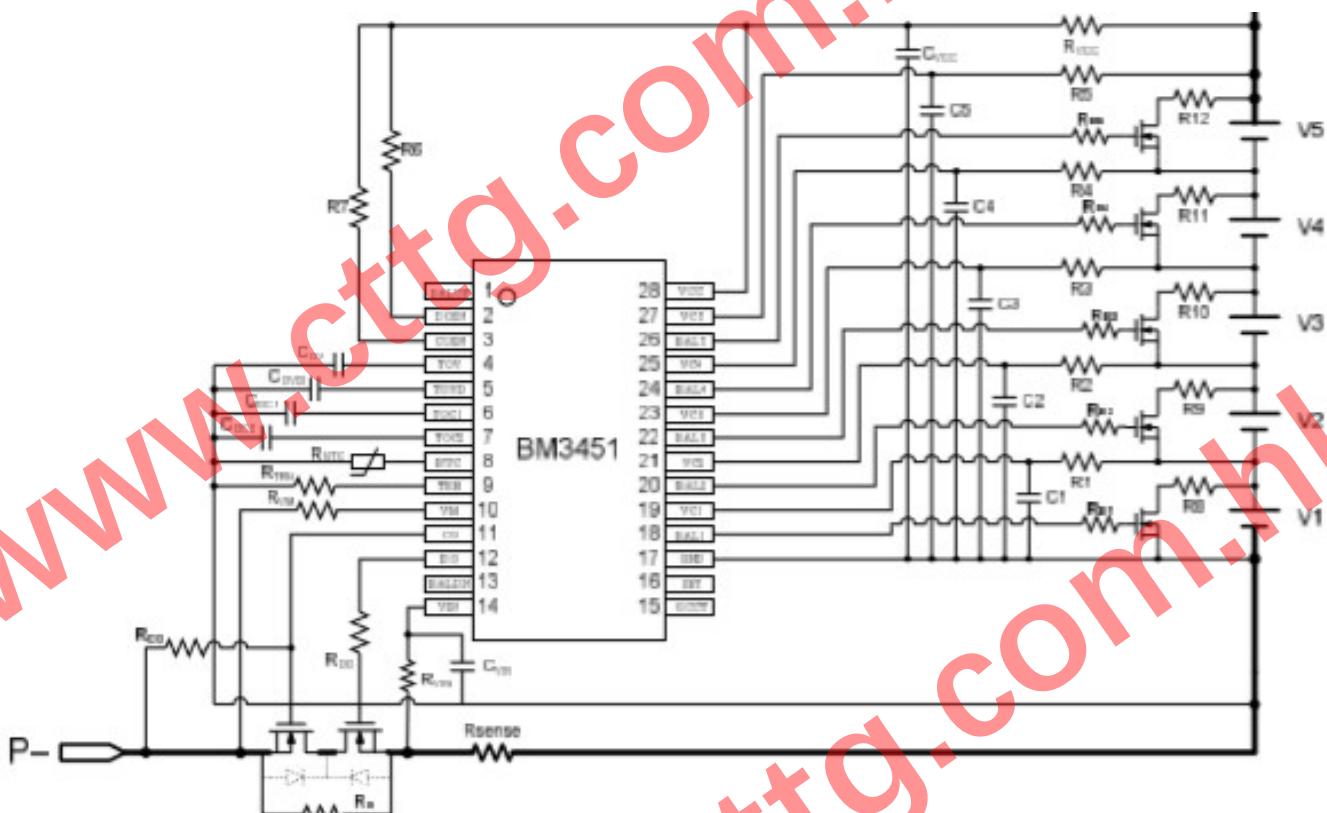
- Operation mode (with Temp protection) 25 uA typical
- Operation mode (without Temp protection) 15 uA typical
- Sleeping mode 6 uA typical

- **Environmental friendly material, Pb free, halogen free**

- **Package**

- TSSOP20
- TSSOP28

Application Circuits :



Application area :

- ✓ Power tool
- ✓ Garden tool
- ✓ Electric bicycle
- ✓ UPS backup power supply
- ✓ Vacuum cleaner



| Type/Item | Overcharge protection voltage V_{DET1} | Overcharge release voltage V_{REL1} | Over-discharge protection voltage V_{DET2} | Over-discharge release voltage V_{REL2} | Discharge overcurrent 1 detection voltage V_{OC1} | Discharge overcurrent 2 detection voltage V_{OC2} | Short circuit detection voltage V_{short} | Short circuit detection voltage V_{ovcc} | Balanced start voltage |
|-----------------|---|--|---|--|--|--|--|---|------------------------|
| BM3451BHDC-T28A | 3.650V | 3.550V | 2.350V | 2.550V | 0.100V | 0.300V | 0.600V | -0.100V | 3.405V |
| BM3451HEDC-T28A | 3.850V | 3.790V | 2.000V | 2.500V | 0.100V | 0.400V | 0.800V | -0.050V | 3.590V |
| BM3451SMDC-T28A | 4.225V | 4.165V | 2.750V | 3.000V | 0.100V | 0.400V | 0.800V | -0.050V | 4.165V |
| BM3451TNDC-T28A | 4.250V | 4.190V | 2.800V | 3.000V | 0.100V | 0.400V | 0.800V | -0.050V | 4.190V |
| BM3451TJDC-T28A | 4.250V | 4.190V | 2.500V | 2.700V | 0.100V | 0.400V | 0.800V | -0.050V | 4.190V |
| BM3451VJDC-T28A | 4.300V | 4.240V | 2.500V | 2.700V | 0.100V | 0.400V | 0.800V | -0.050V | 4.240V |
| BM3451HEDC-T20B | 3.850V | 3.750V | 2.000V | 2.500V | 0.100V | 0.400V | 0.800V | -0.050V | - |
| BM3451SMDC-T20B | 4.225V | 4.110V | 2.750V | 3.000V | 0.100V | 0.400V | 0.800V | -0.050V | - |
| BM3451TNDC-T20B | 4.250V | 4.130V | 2.800V | 3.000V | 0.100V | 0.400V | 0.800V | -0.050V | - |
| BM3451TJDC-T20B | 4.250V | 4.130V | 2.500V | 2.700V | 0.100V | 0.400V | 0.800V | -0.050V | - |
| BM3451VJDC-T20B | 4.300V | 4.180V | 2.500V | 2.700V | 0.100V | 0.400V | 0.800V | -0.050V | |
| BM3451XJDC-T20B | 4.350V | 4.230V | 2.500V | 2.700V | 0.100V | 0.400V | 0.800V | -0.050V | |
| BM3451ZKDC-T20B | 4.425V | 4.300V | 2.650V | 3.000V | 0.100V | 0.400V | 0.800V | -0.050V | |
| BM3451TNDE-T20B | 4.250V | 4.130V | 2.800V | 3.000V | 0.100V | 0.200V | 0.600V | -0.050V | - |