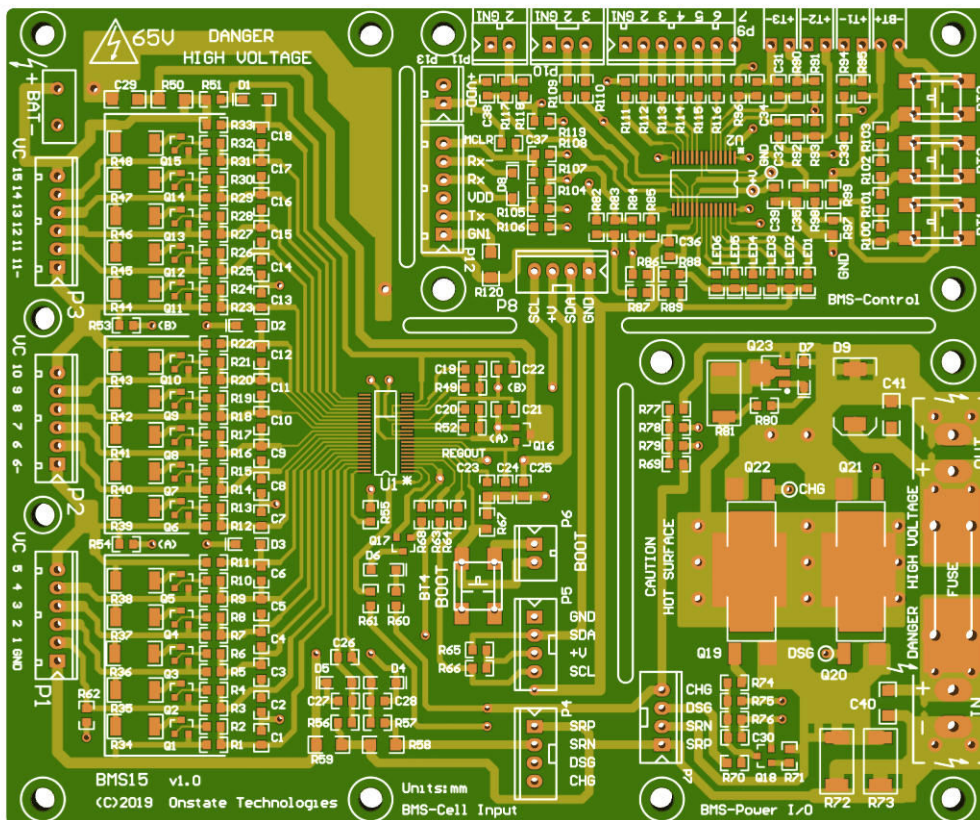


## BMS15 Battery Management System (Lithium-Ion Cells)

The BMS15 is a full featured production and evaluation board for the Texas Instruments bq7693x series (6-10 cells) or bq7694x series (9-15 cells) battery monitoring and protection chips. An external microcontroller is used to set and control all the battery parameters and safety features. A serial port menu control through the PIC can be used to access all the functions.



### Connections

- P1 Pack1 battery connection. Cells 1-5. Connect P1 to PCB first. Note: The battery pack is separated into 3 separate banks for easier changeability. Confirm pin polarities are correct before connecting.
- P2 Pack2 battery connection. Cells 6-10. Connect P2 to PCB second.
- P3 Pack3 battery connection. Cells 11-15. Connect P3 to PCB last.
- P4 BMS-Power I/O control. For cabled connections of SRP/SRN/DSG/CHG control. Connects P4 to P7 when PCB is separated.
- P5 BMS I2C control. For cabled connection of bq chip I2C (SDA/SCL) control. Connects P5 to P8 when PCB is separated.
- P6 BOOT button. External boot button connector.
- P7 BMS-Power I/O control. For cabled connections of SRP/SRN/DSG/CHG control. Connects P7 to P4 when PCB is separated.
- P8 BMS I2C control. For cabled connection of bq chip I2C (SDA/SCL) control. Connects P8 to P5 when PCB is separated.
- P9 (Accessory output control, for future use.)
- P10 External Alarm LED output (GN1, 2).
- P11 External Power Button. Bypass of BT1.
- P12 Serial port and PIC programming port. Serial: 3.3V TTL level, 19200 baud, 8N1.
- P13 VDD power, BMS-Control.

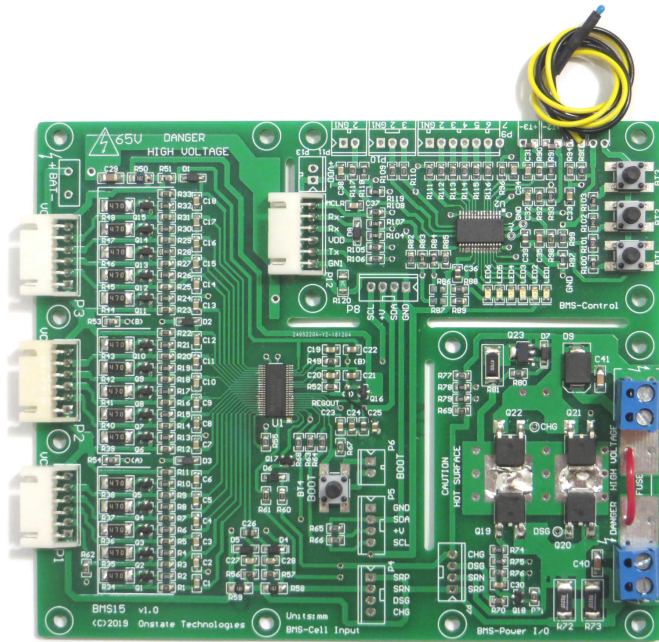
- +T1- External thermistor T1
- +T2- External thermistor T2
- +T3- External thermistor T3
  
- BT+ (button bypass, for future use)
  
- IN Battery pack power input.
- OUT Battery pack power output.
  
- BT1 Button 1. Function control.
- BT2 Button 2. Function control..
- BT3 Button 1. Function control.
- BT4 BMS BOOT button. Initial boot of the BMS.

**Technical Specifications and Settings**

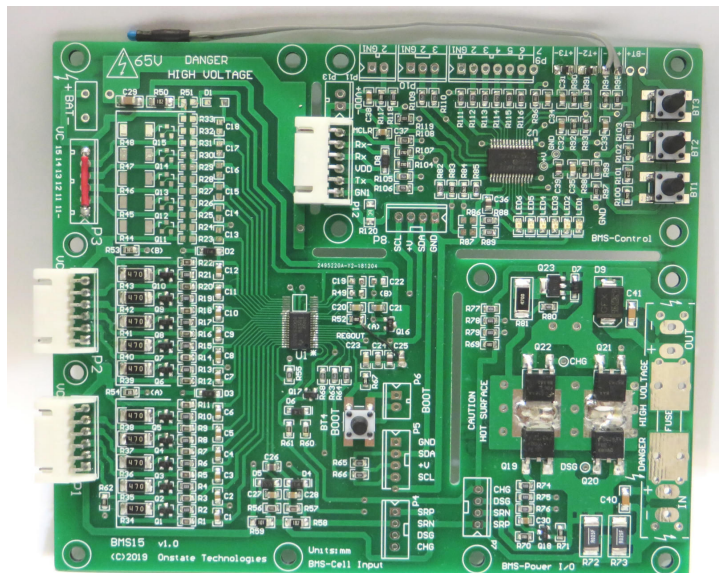
Supported Texas Instruments bq chips (li-ion 3.6V/cell), refer to the TI datasheets for further information:

Chip Model	Cell Count	Voltage	I2C Address
bq7693002	6-10	21.6V – 36V	0x08
bq7693006	6-10	21.6V – 36V	0x18
bq7694002	9-15	32.4V – 54V	0x08
bq7694006	9-15	32.4V – 54V	0x18

**BMS15 Evaluation Board**



BMS15, 15 Cell PCB Assembly



BMS15, 10 Cell PCB Assembly

The BMS15 Battery Management System is available as an assembled evaluation board or just the bare PCB. The evaluation board is ready to use with firmware installed. The user can modify the BMS settings for their battery pack. The bare PCB does not include any parts or firmware. The user is required to purchase all parts (see BOM) and add their own custom firmware. Advanced soldering skills are required to assemble the surface mount parts.

NOTE: Check polarity of battery packs P1, P2 and P3 relative to PCB connectors before installation. Connector orientation/installation determines connector polarity. Install lowest cell pack first: P1 first, then P2 and P3 last. Remove cell packs in reverse sequence: P3 first, then P2 and P1 last. Ensure the system is shut down before removing connectors.