



Lilon

LiFePO<sub>4</sub>

LTO

Na-ion

### PCM for 12S Battery Pack: Programmable for multiple chemistries

## SPECIFICATIONS

| Item                               | Specification           |                     |                     |                    | Remark                          |
|------------------------------------|-------------------------|---------------------|---------------------|--------------------|---------------------------------|
|                                    | MIBMS-12S10A-LNMC-01    | MIBMS-12S10A-LFP-01 | MIBMS-12S10A-LTO-01 | MIBMS-12S10A-NA-01 |                                 |
| <b>1. General</b>                  |                         |                     |                     |                    |                                 |
| Stock Code                         | 70000-012-LNMC          | 70000-012-LFP       | 70000-012-LTO       | 70000-012-NA       |                                 |
| Chemistry                          | Li-Ion NMC              | LiFePO <sub>4</sub> | Lithium Titanate    | Sodium ion         | Programmed for 12S              |
| Dimensions LxWxH                   | 72 x 54 x 9.5mm         |                     |                     |                    |                                 |
| Weight                             | 20g                     |                     |                     |                    |                                 |
| PCB Material                       | FR4. 2oz Copper         |                     |                     |                    |                                 |
| <b>2. IC &amp; Mosfet</b>          |                         |                     |                     |                    |                                 |
| Protection IC                      | BQ76952                 |                     |                     |                    |                                 |
| Gauge IC                           | N/A                     |                     |                     |                    |                                 |
| MosFET                             | ISC037N12NM6ATMA1(120V) |                     |                     |                    |                                 |
| Power consumption - active mode    | <500µA                  |                     |                     |                    |                                 |
| Power consumption - sleep mode     | <100µA                  |                     |                     |                    |                                 |
| <b>3. Voltage</b>                  |                         |                     |                     |                    |                                 |
| Minimum battery pack voltage       | 30V                     | 24V                 | 18V                 | 24V                |                                 |
| Nominal battery pack voltage       | 43.2V                   | 38.4V               | 27.6V               | 36V                |                                 |
| Maximum battery pack voltage       | 50.4V                   | 43.8V               | 34.8V               | 48V                |                                 |
| <b>4. Charge Characteristics</b>   |                         |                     |                     |                    |                                 |
| <b>4.1 Voltage</b>                 |                         |                     |                     |                    |                                 |
| Cell nominal voltage               | 3.6V                    | 3.2V                | 2.3V                | 3V                 |                                 |
| Charge voltage                     | 4.2V/cell               | 3.65V/cell          | 2.9V/cell           | 4V/cell            | #                               |
| Charge over voltage threshold      | 4.25V/cell              | 3.7V/cell           | 2.95V/cell          | 4.05V/cell         | #                               |
| Charge over voltage delay time     | 2s                      |                     |                     |                    | #                               |
| Charge over voltage release        | 3.9V/cell               | 3.35V/cell          | 2.6V/cell           | 3.7V/cell          | #                               |
| 2nd charge over voltage            | 4.5V/cell               | 3.95V/cell          | 3.2V/cell           | 4.3V/cell          | Permanent fail (blows chemfuse) |
| 2nd charge over voltage delay time | 30s                     |                     |                     |                    | Permanent fail (blows chemfuse) |
| Balancing start voltage            | 3.9V/cell               | 3.35V/cell          | 2.6V/cell           | 3.7V/cell          | #                               |
| Balancing start delta voltage      | 20mV                    |                     |                     |                    | #                               |
| <b>4.2 Current</b>                 |                         |                     |                     |                    |                                 |
| Charge over current threshold      | 15A                     |                     |                     |                    | #                               |
| Charge over current delay time     | 426ms                   |                     |                     |                    | #                               |
| Charge over current release        | 426ms                   |                     |                     |                    | #                               |
| <b>4.3 Temperature</b>             |                         |                     |                     |                    |                                 |
| Charge over temperature threshold  | 50°C ± 3°C              |                     |                     |                    | #                               |
| Charge over temperature release    | 45°C ± 3°C              |                     |                     |                    | #                               |
| Charge under temperature threshold | 0°C ± 3°C               |                     |                     |                    | #                               |
| Charge under temperature release   | 5°C ± 3°C               |                     |                     |                    | #                               |
| Temperature protection delay time  | 2s                      |                     |                     |                    | #                               |





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| <b>5. Discharge Characteristics</b>       |                              |                     |                     |                    |        |
| <b>5.1 Voltage</b>                        |                              |                     |                     |                    |        |
| Discharge under voltage threshold         | 2.5V/cell                    | 2V/cell             | 1.5V/cell           | 2V/cell            | #      |
| Discharge under voltage delay time        | 2s                           |                     |                     |                    | #      |
| Discharge under voltage release           | 2.7V/cell                    | 2.5V/cell           | 1.9V/cell           | 2.5V/cell          | #      |
| <b>5.2 Current</b>                        |                              |                     |                     |                    |        |
| Discharge over current threshold          | 18A                          |                     |                     |                    | #      |
| Discharge over current delay time         | 10s                          |                     |                     |                    | #      |
| Discharge over current release            | 0A-10s                       |                     |                     |                    | #      |
| <b>5.3 Temperature</b>                    |                              |                     |                     |                    |        |
| Discharge over temperature threshold      | 60°C ± 3°C                   |                     |                     |                    | #      |
| Discharge over temperature release        | 50°C ± 3°C                   |                     |                     |                    | #      |
| Discharge under temperature threshold     | -10°C ± 3°C                  |                     |                     |                    | #      |
| Discharge under temperature release       | 0°C ± 3°C                    |                     |                     |                    | #      |
| Temperature protection delay time         | 2s                           |                     |                     |                    | #      |
| <b>6. Maximum Current</b>                 |                              |                     |                     |                    |        |
| Max continuous charge / discharge current | At 25°C: 13A<br>At 45°C: 10A |                     |                     |                    |        |
| <b>7. Short Circuit</b>                   |                              |                     |                     |                    |        |
| Short Circuit threshold                   | 20A                          |                     |                     |                    | #      |
| Short Circuit delay time                  | 330µs ± 15µs                 |                     |                     |                    | #      |
| Short Circuit release                     | Load disconnect              |                     |                     |                    | #      |
| <b>8. Maximum Temperature</b>             |                              |                     |                     |                    |        |
| Chemfuse max temperature                  | 65°C                         |                     |                     |                    |        |
| <b>9. Polarity</b>                        |                              |                     |                     |                    |        |
| Reverse polarity protection               | No                           |                     |                     |                    |        |

# indicates factory adjustable





# ENEPOWER

## MIBMS-12S10A series

### Protection Circuit Module (PCM)

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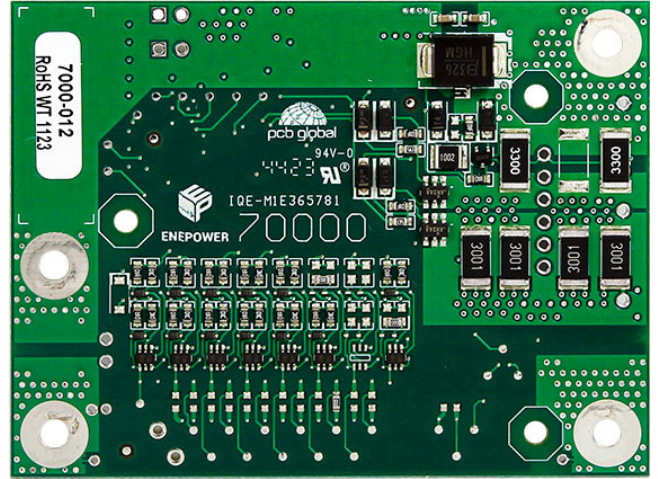
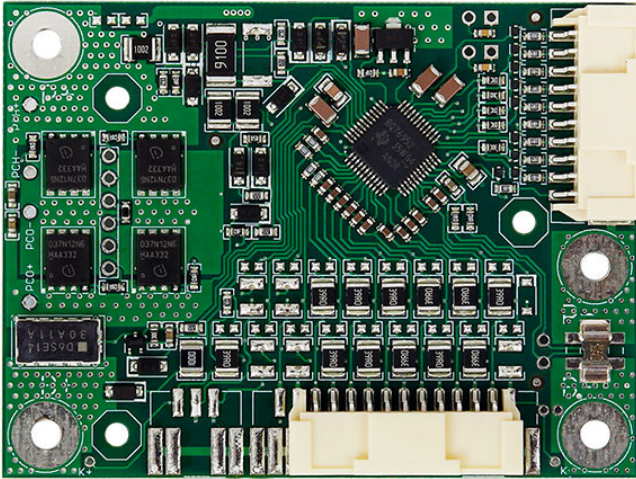
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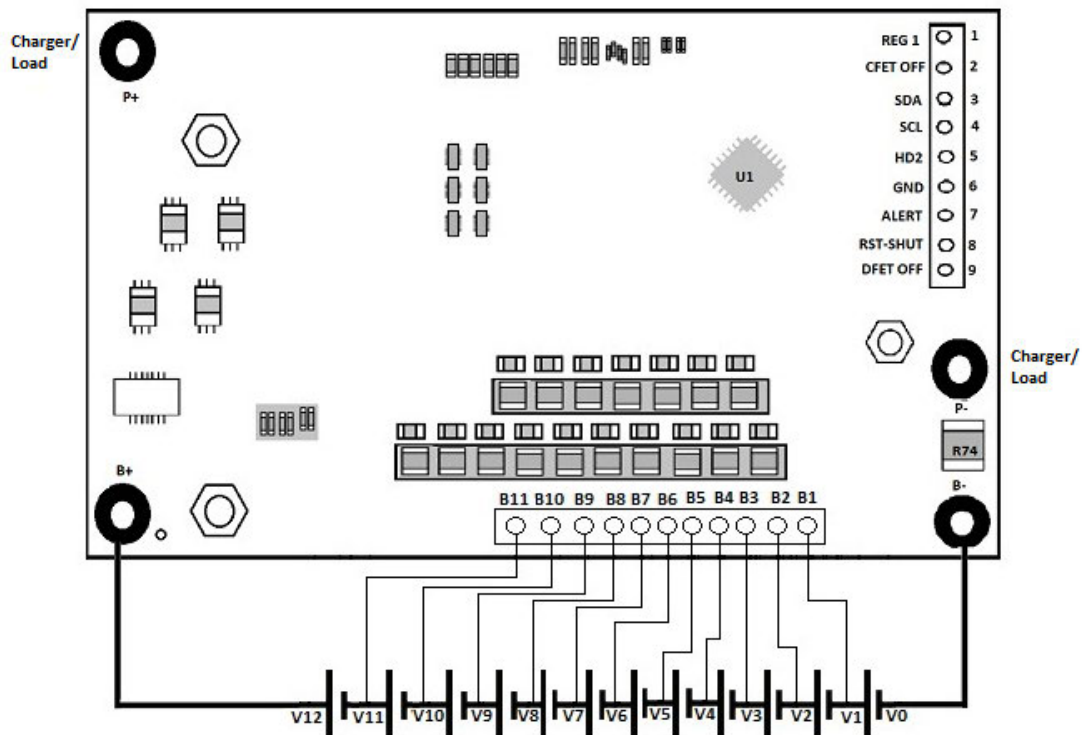
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#### IMAGE



#### CONNECTION DIAGRAM



**BQ76952 Connection Diagram**

