



Electrifuel Pvt. Ltd.

Datasheet

EF-BMS-16S ROMEO 60~100A



Revision H, 2023-04-05

INTRODUCTION

BMS, or *Battery Management System*, is an essential component of every *Lithium* battery. *Electrifuel EF-BMS-16S* supports lithium batteries of any chemistry and up to 60V nominal. Battery capacity from 1 Ah to 100 Ah can be managed easily.

EF-BMS-16S measures individual voltages of parallel cell groups and manages the switching of load and charger. During charging, cells are balanced by bleeding-off current from cells with higher voltage to accomplish full balance and maintain the good health of the battery pack.

SAFETY

Various safety-critical mechanisms are built-in: disconnection of load or charger if any of the Cells or Pack go out of the allowed range of voltage or current, also temperature from 5 zones is measured and can be used for emergency disconnect or for disabling of charging/discharging if cell/board temperature is too low or too high.

FLEXIBILITY

BMS can be configured to any setting as per application requirements.

FEATURES

- Integrated With 60A, 80A & 100A Power switches
- Support up to 16 cells in series
- Support any chemistry having operation voltage between 1.5V to 4.5V
- High side switches for safe operations
- Accurate voltage measurements (+/- 5mV tolerance)
- Accurate current measurements (+/- 1A tolerance)
- 5 dedicated thermistors for temperature monitoring (4 external, 1 on-board)
- All Parameters, Constraints, and Triggers are adjustable i.e., Cell protections, current protections, and temperature protections
- Read Real-Time Data from BMS like Cell Voltage, Temperature, Current, Pack Voltage, Faults, etc.
- Auto sleep mode in IDLE and auto wakeup on load/charger
- Deep Sleep option for long-time battery warehouse storage
- Ultra-low self-power consumption
- Dissipative passive balancing up to 95 mA
- Ultra-compact design: 175x60x20 mm

APPLICATIONS

- Stationary solar & wind energy storage system
- Electric Mobility

ELECTRICAL CHARACTERISTICS

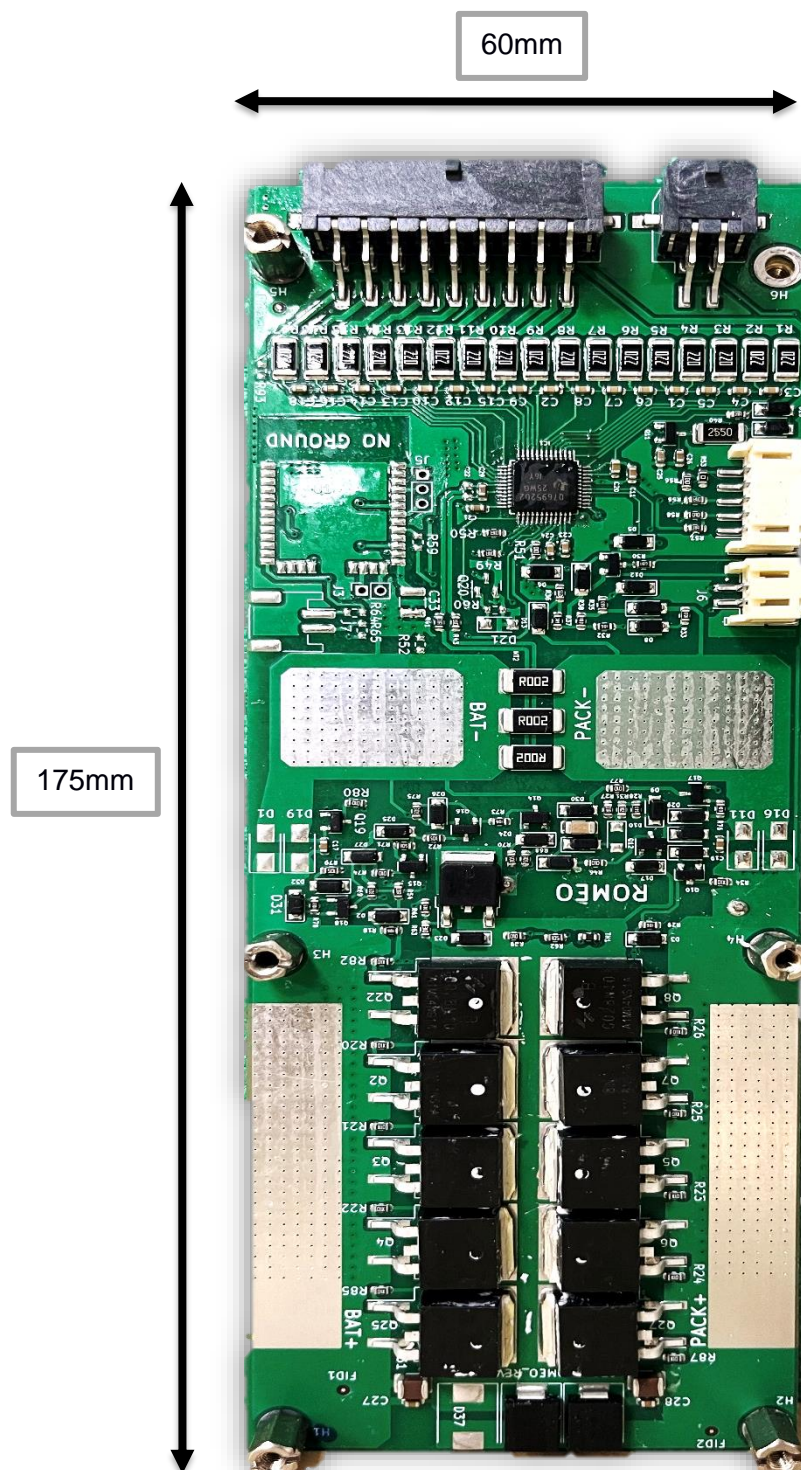
Table 1: Product Standard characteristics (all parameters rated at 25 °C if not specified otherwise)

No of cells in Series	3S TO 16S				
Cell chemistry(NMC / LFP)	NMC				
Functions	Test Parameters	Specifications			Unit
		Min	Typical	Max	
Operating Current	Charge Current (Continuous)	60,80,100			A
	Discharge Current (Continuous)	60,80,100			A
Discharge Protection	Over-discharge Voltage Protection	2.8			V
	Over-discharge Voltage Protection Delay Time	2000			ms
	Over-discharge Protection Recovery Voltage	3.0			V
Charging Protection	Over-charge Voltage Protection	4.2			V
	Over-charge Voltage Protection Delay Time	2000			ms
	Over-charge Protection Recovery Voltage	4.0			V
Over Current Protection	Charge over-current Protection	60A,80A,100A			A
	Charge over-current Protection Delay Time	2000			ms
	Charge over-current Release Time	400			ms
	Discharge Over-current Protection	Typical-80A,100A,120A Max- 90A,110A,130A			A
	Discharge over-current Protection Delay Time		10000	300	ms
	Discharge over-current Release Time	30000			ms
Short Circuit Protection	Short Circuit Protection Activation Current	160			A
	Short Circuit Protection Delay Time	0.195			ms
	Short Circuit Protection Recovery Condition	Load Disconnect			
	Short Circuit Protection Recovery Time	50000			ms
Deep Sleep Protection	Sleep Start Voltage	2.4			V
Temperature Protection	Over-Temperature Charge Protection	55			°C
	Over-Temperature Charge Protection Release	50			°C
	Under-Temperature Charge Protection	-5			°C
	Under-Temperature Charge Protection Release	0			°C
	Over-Temperature Discharge Protection	65			°C
	Over-Temperature Discharge Protection Release	60			°C
	Under-Temperature Discharge Protection	-10			°C
	Under-Temperature Discharge Protection Release	0			°C
Balancing	Balancing start voltage	3400			V
	Balancing Mode	Charging			
	Balancing Current	64	80	95	mA

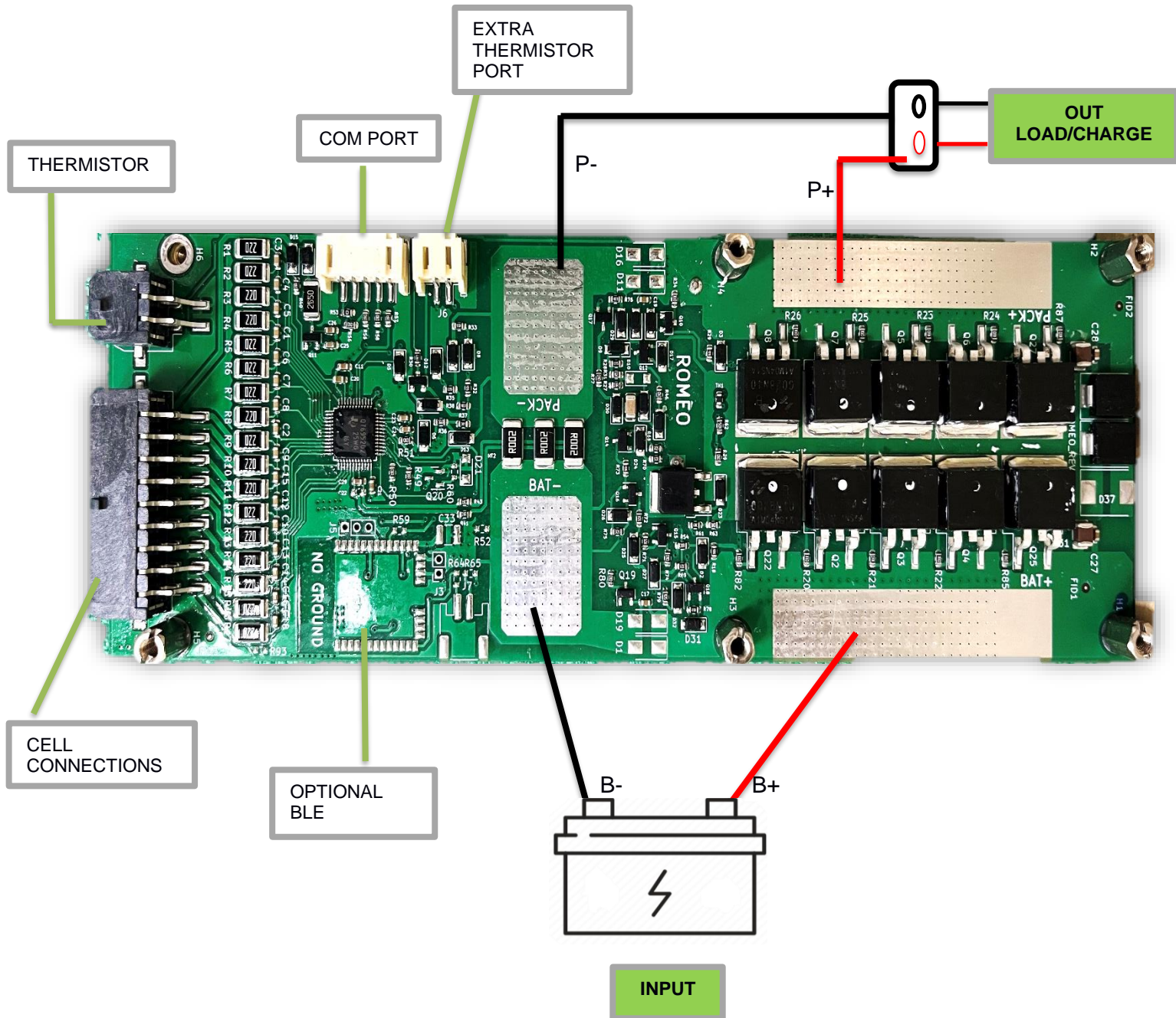
1) Some above parameters are configurable. 2) Parameters includes for 60A,80A,100A Variant

MECHANICAL DATA

UPSIDE VIEW

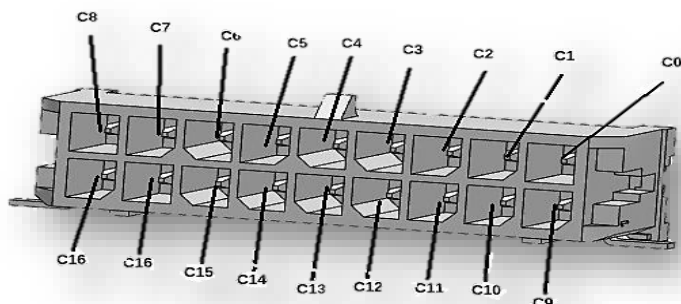


CONNECTION DIAGRAM



CELL CONNECTIONS UP TO 16S

1) Male Connector



2) Female Connector



String	3 Series Pack	4 Series Pack	5 Series Pack	6 Series Pack	7 Series Pack	8 Series Pack
C16 -C15	Short	Short	Short	Short	Short	Short
C15-C14	Short	Short	Short	Short	Short	Short
C14-C13	Short	Short	Short	Short	Short	Short
C13-C12	Short	Short	Short	Short	Short	Short
C12-C11	Short	Short	Short	Short	Short	Short
C11-C10	Short	Short	Short	Short	Short	Short
C10-C9	Short	Short	Short	Short	Short	Short
C9-C8	Short	Short	Short	Short	Short	Short
C8-C7	Short	Short	Short	Short	Short	C8
C7-C6	Short	Short	Short	Short	C7	C7
C6-C5	Short	Short	Short	C6	C6	C6
C5-C4	Short	Short	C5	C5	C5	C5
C4-C3	Short	C4	C4	C4	C4	C4
C3-C2	C3	C3	C3	C3	C3	C3
C2-C1	C2	C2	C2	C2	C2	C2
C1- C0	C1	C1	C1	C1	C1	C1

String	9 Series Pack	10 Series Pack	11 Series Pack	12 Series Pack	13 Series Pack	14 Series Pack	15 Series Pack	16 Series Pack
C16 -C15	Short	Short	Short	Short	Short	Short	Short	C16
C15-C14	Short	Short	Short	Short	Short	Short	C15	C15
C14-C13	Short	Short	Short	Short	Short	C14	C14	C14
C13-C12	Short	Short	Short	Short	C13	C13	C13	C13
C12-C11	Short	Short	Short	C12	C12	C12	C12	C12
C11-C10	Short	Short	C11	C11	C11	C11	C11	C11
C10-C9	Short	C10	C10	C10	C10	C10	C10	C10
C9-C8	C9	C9	C9	C9	C9	C9	C9	C9
C8-C7	C8	C8	C8	C8	C8	C8	C8	C8
C7-C6	C7	C7	C7	C7	C7	C7	C7	C7
C6-C5	C6	C6	C6	C6	C6	C6	C6	C6
C5-C4	C5	C5	C5	C5	C5	C5	C5	C5
C4-C3	C4	C4	C4	C4	C4	C4	C4	C4
C3-C2	C3	C3	C3	C3	C3	C3	C3	C3
C2-C1	C2	C2	C2	C2	C2	C2	C2	C2
C1- C0	C1	C1	C1	C1	C1	C1	C1	C1

Document revision history

Revision	Date	Description
A	2021-08-10	Initial release.
B	2021-11-20	Updated technical parameters
C	2021-12-29	Updated technical details and mechanical data
D	2022-01-28	Updated mechanical data with connection labels
E	2022-03-29	Updated cell connection table
F	2022-06-09	Updated BMS mask color
G	2022-12-28	Updated Parameters
H	2023-04-05	Updated Parameters