

Introduction

EMUS **Tesla Module** is the device that once mounted on a battery pack, measures cells voltages, temperatures, its own temperature, and broadcasts all measured values to the main unit. Also, the tesla module using previously mentioned values and regulates the balancing current to keep the cell's voltage lower than the balancing threshold, while at the same time keeping its own temperature lower than a certain maximum value to protect itself from overheating. Product equipped CAN communication interface that allows EMUS Control Unit to have stable communication with battery cells, manage and monitor battery lifecycle.



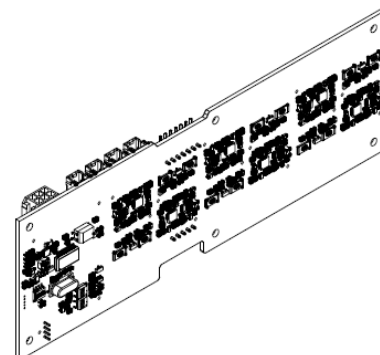
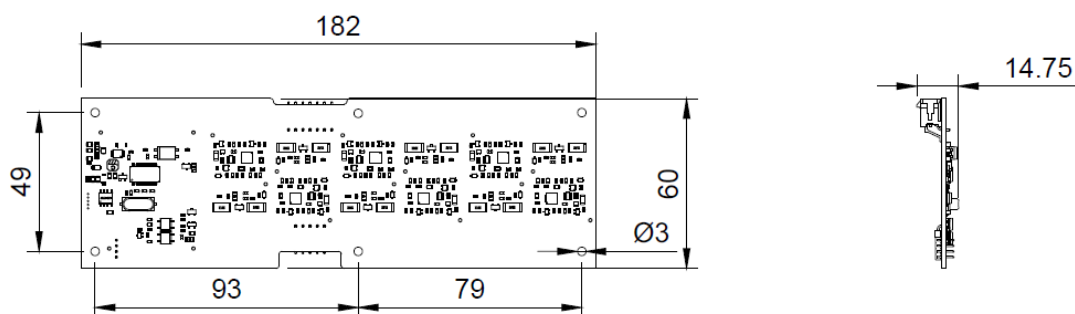
Applications

- Board's form factor designed for Tesla Model S battery Module (24V)
- Second life battery systems

Features

- Connects to 2 original Tesla temperature sensors
- 4 additional external temperature measurement sensors can be connected (sold separately by code ETS06, NTC 10kΩ)
- Wide scalability via CAN bus - up to 24 Tesla battery modules can be connected in series/parallel per one system
- Serial data interface for continuous cell monitoring
- Communication indicating green LED
- Balancing level indicating red LED
- Supports 50, 125, 250, 500, 800 kbit/s and 1 Mbit/s CAN baud rates (default 250kbit/s)
- Maximum balancing current up to 500mA (@4.2V)

Mechanical Information





Tesla Module Retrofit BMS

Product Code: TES011C

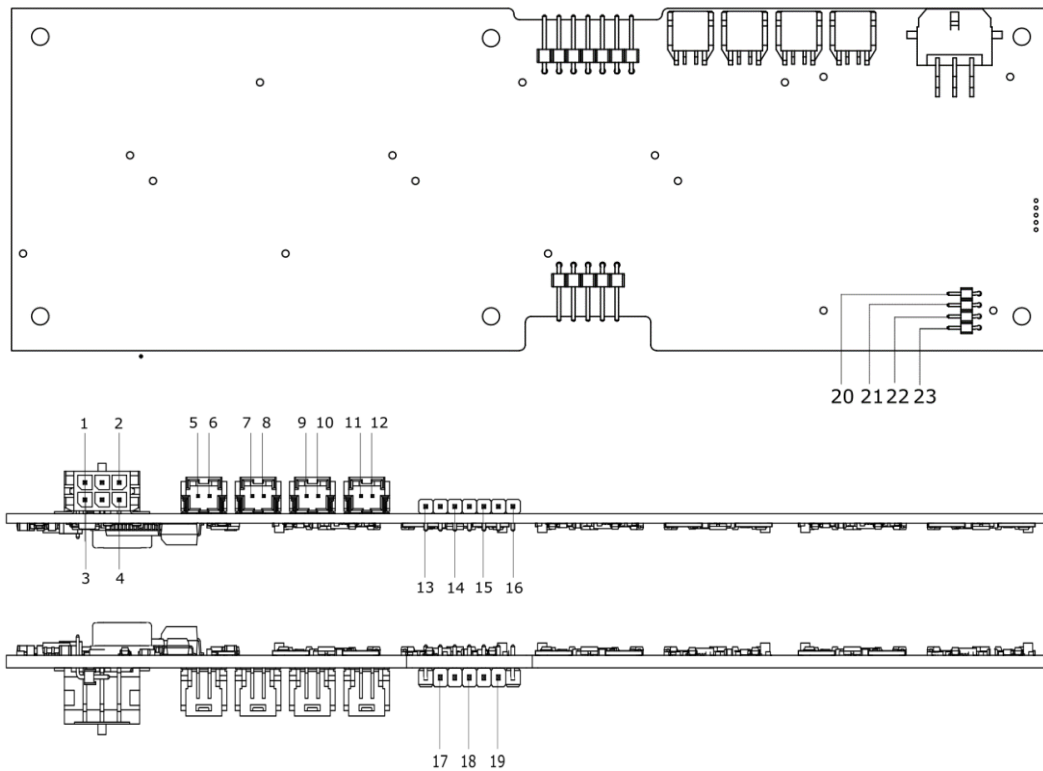


Table 1. TES011C pin assignment

Pin No.	Assignment	Mating housing	Terminal crimp
1	PWR	Microfit 43025-0600	43030-0003 (recommended crimp tool Molex Hand Crimp Tool P/N: 638190000)
2	CAN H		
3	GND		
4	CAN L		
5,6	External temperature sensor 3		
7,8	External temperature sensor 4		
9, 10	External temperature sensor 5		
11, 12	External temperature sensor 6		
13	Cell 1-		
14	Cell 2+		
15	Cell 4+		
16	Cell 6+		
17	Cell 1+		
18	Cell 3+		
19	Cell 5+		
20, 22	External temperature sensor 1		
21, 23	External temperature sensor 2		



Product Code: TES011C

Electrical Characteristics

Table 2. TES011C electrical characteristics

Item	Value
Operating Voltage	2.0 VDC to 4.55 VDC
Voltage measuring range	2.0 VDC to 4.55 VDC
Voltage measurement resolution	10mV
Voltage measurement error	±10mV
Internal temperature measuring range	-40°C to 85°C
Internal temperature measurement resolution	1°C
Internal temperature measurement accuracy	±5°C
External temperature measuring range	-99°C to 154°C
External temperature measurement resolution	1°C
External temperature measurement accuracy	±5°C
Maximum Balancing current	500mA @ 4.2V*
Current consumption in active mode, when communication LED is on, cell voltage = 3.60V	3.2 mA
Current consumption in sleep mode, cell voltage = 3.60V	35µA
Balancing resistor resistance	8 Ω
Balancing resistor rated power	2W

*Maximum balancing current depend on environmental thermal conditions

Other Specifications

Table 3. TES011C other specifications

Item	Value
Reserved CAN IDs	0x1FFFFEE5, 0x1FFFFEE6, 0x1FFFE5E5, and 0x1FFFE5E6
Operating temperature	-40°C to +85°C
IP Rating	IP21
Weight	43g
Dimensions	182x60x15 mm
External temperature sensor type	NTCM-10K-B4150
Sleep mode timeout when not balancing	60 ms
Sleep mode timeout when balancing	10 s
Wakeup source	Cell communication signal edge, watchdog timer timeout (8 s period)