3S Gauge

HW introduce

Catalog

1. Introduction

3S Gauge Evaluation Module (EVM) hardware presentation. Provide hardware reference specification, components of each block. Provide users with 3 series of lithium battery for product development. Users can also refer to the hardware design for their own planning.

EVM Features：

- Provide 3S solutions, no more re-layout to minimize the hardware errors on the products.
- Built-in notification pin for quick user identification.
- Supports IIC and PC GUI connection for testing and displaying product status including battery capacity, health, etc.
- High-side protection, communication is maintained even after protection.

2. EVM hardware

2.1 Hardware Introduction

Through the software GUI, the tuned parameters can be written into the EVM.

Can be soldered with a lithium battery for product testing.

EVM：MSE03GM1AD48 for 3S Gauge

Number：TH251A

Size：70 x 41 (mm)
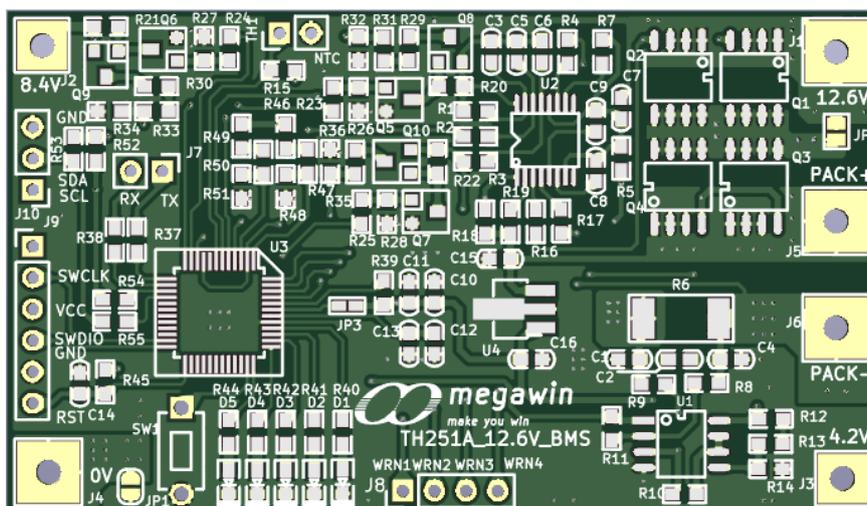
Figure 2-1 MSE03GM1AD48 for 3S Gauge EVM

2.2 Hardware Reference Specification

Item	Min.	Typ.	Max.	Unit.
Overcharge detection voltage	4.225	4.250	4.275	V
Overcharge release voltage	4.070	4.150	4.230	V
Over discharge detection voltage	2.620	2.70	2.780	V
Overdischarge release voltage	2.90	3.00	3.10	V
Overdischarge detection current	-	16	18	A
Overdischarge peak current	-	19	20	A
Overcurrent detection threshold	17.5	20	22.5	A
Charger detection voltage	-	12.6	13	V

2.3 Circuit diagram
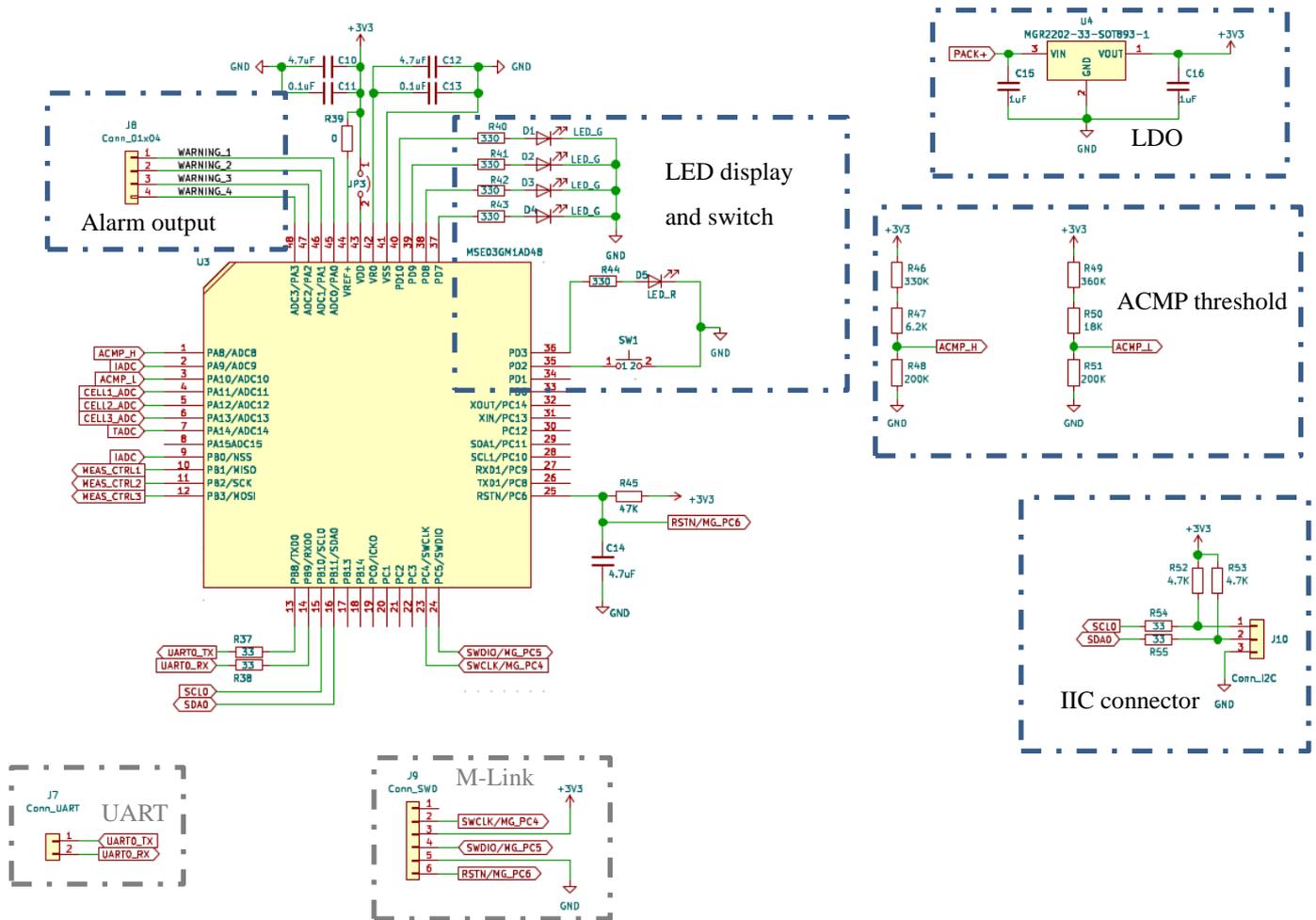
Figure 2-2 MSE03GM1AD48 for 3S Gauge

1. MSE03GM1AD48 MCU：
   (1) Control voltage detection circuit：IO Control MOSFET, ADC samples voltage signal after dividing by resistor
   (2) Power display circuit：LED1 ~ LED4 display SOC 0%~100% Power
   (3) Notification Pin：Output signal notification to external master
   (4) Switches and Health status display

2. LDO：Use MGR2202 Output 3.3V power supply
3. Over Current Protection (OCP)：Resistive dividing voltage setting threshold
4. IIC interface：Transfer the battery information to the software GUI through this serial port
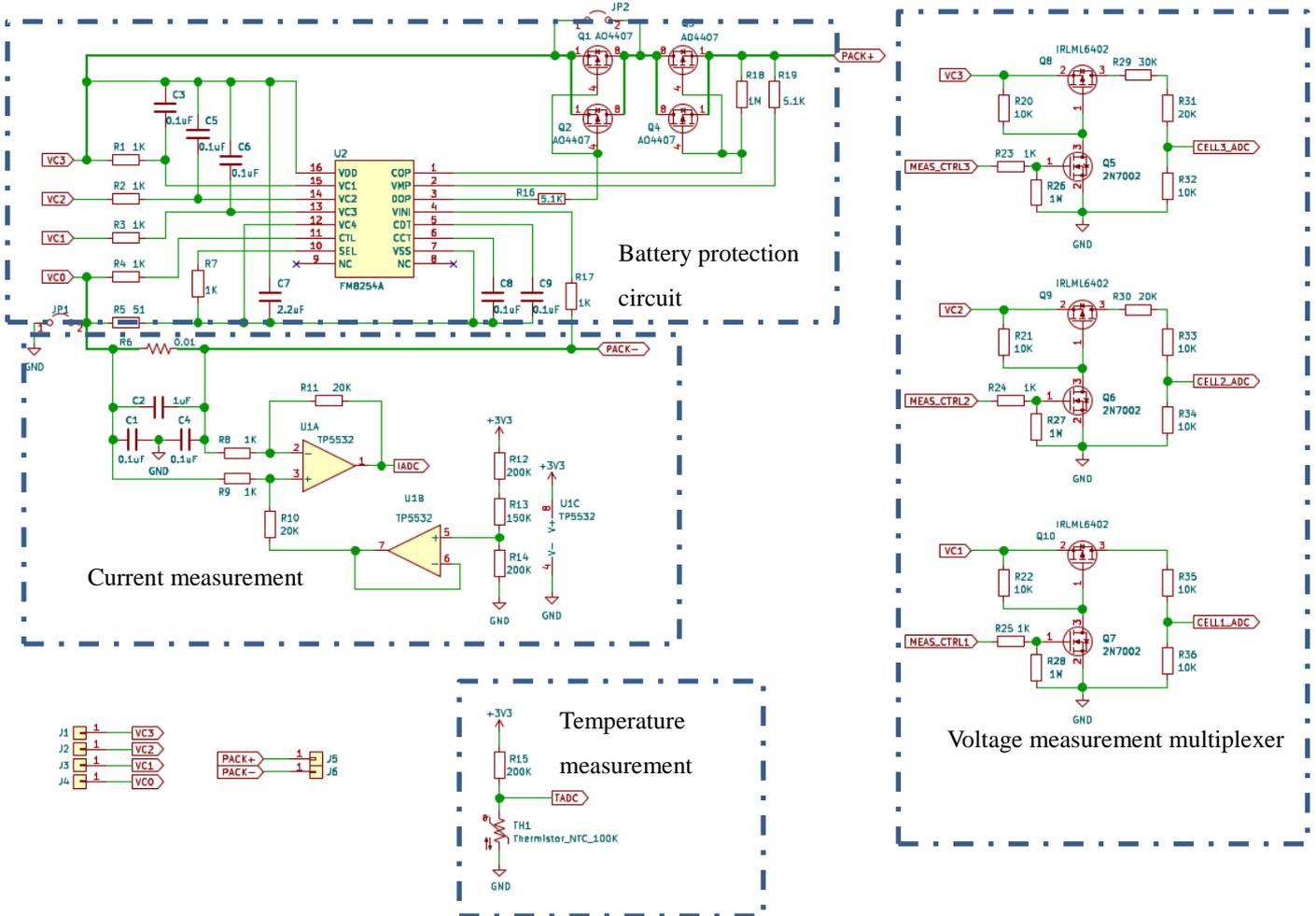
Figure 2-3 MSE03GM1AD48 for 3S Gauge

1. Single string voltage measurement circuit：Sample battery voltage, MOSFET for power saving control
2. Temperature measurement circuit：100K NTC resistance, 3.3V voltage divider
3. Current measurement circuit：Magnification 20 times, sense resistance 10mΩ
4. Protection IC circuit：Front end protection analog circuit