

## Introduction

The MAXREFDES1277 reference design enables quick evaluation of the MAX17852/53 for 48V two-Wheeler battery management applications (BMS).

This design showcases capabilities of the MAX17852/53 like individual 14-cell voltage measurements, pack voltage, temperature (up to four sensors using general purpose inputs/outputs [GPIOs]), pack current (MAX17852 only) measurement, and passive cell balancing.

The MAX17852/53 supports ASIL-D requirements for cell voltage, temperature, current, communication, and failure mode effects analysis (FMEA).

Other features include the following:

- 3 to 14 cell voltage measurement with  $\pm 2\text{mV}$  accuracy at  $5^\circ\text{C}$  to  $40^\circ\text{C}$
- Supports flexi pack configuration
- Pack current measurement using external current sense resistor
- Passive cell balancing up to 300mA with internal switch with odd or even cell balancing scheme (single cell or group)
  - Auto cell balancing configuration with undervoltage (UV) threshold and timer options
  - Manual cell balancing configuration
- Four configurable auxiliary inputs for temperature, voltage, or GPIO
- Internal die temperature measurement
- Individually configurable safety alert
  - Overvoltage (OV), undervoltage, overtemperature and undertemperature faults
  - One cell-mismatch alert
- Selectable universal asynchronous receiver-transmitter (UART) or serial peripheral interface (SPI)
- UART configurations with packet error checking (PEC)
  - Dual UART configuration with redundancy
  - Single UART configuration
- Single-side component placement
- Compatible with MAX17852EVKIT software along with MINIQUSB board

## Hardware Specification

Table 1 shows an overview of the design specification.

**Table 1. Design Specification**

PARAMETER	SYMBOL	MIN	TYP	MAX
Operating Range	$V_{IN}$	9V		65V
Current Consumption				
	Active Mode		5.4mA	
	Standby Mode		2.3mA	
	Shutdown Mode		0.1 $\mu\text{A}$	
Number of Channels				14
Measuring Range Per Channel		0V		5V
Voltage Accuracy ( $5^\circ\text{C}$ to $40^\circ\text{C}$ )			2mV	
Current Measurement at Gain = 256			5mA Resolution	
Auxiliary Inputs (J7, J8, J9, J10)		0V		5V
Cell Balancing Current (Per Channel)				Up to 300mA
Communication Interface				
	UART			2Mbps
	SPI			10Mhz

## Designed–Built–Tested

This document describes the hardware shown in [Figure 1](#).

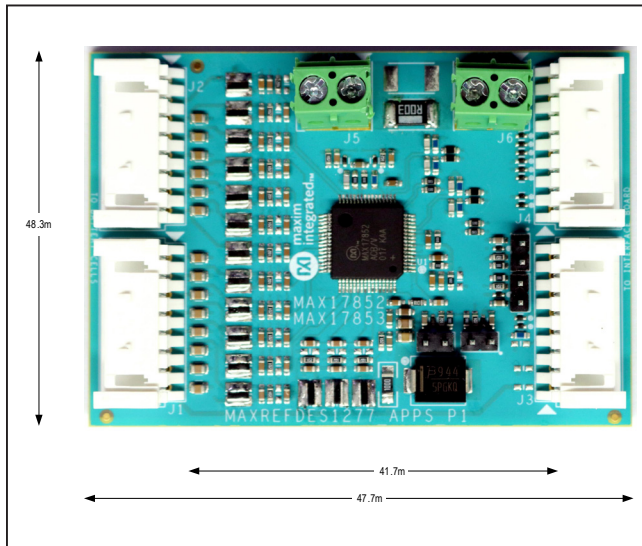
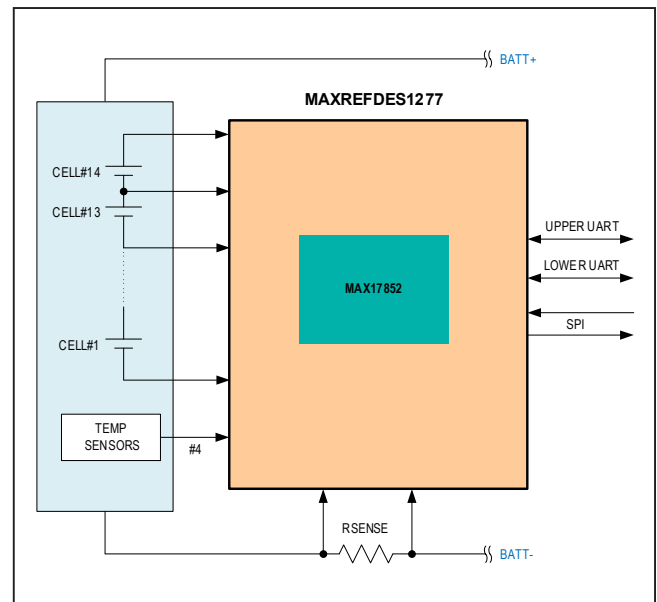


Figure 1. MAXREFDES1277 hardware.

## Typical Application



## Design Resources

Download the complete set of [Design Resources](#) including schematics, bill of materials, PCB layout, and test files.

## Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	4/21	Initial release	—

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