

Click [here](#) for production status of specific part numbers.

MAX17853

14-Channel High-Voltage Data-Acquisition System

General Description

The MAX17853 is a flexible data-acquisition system for the management of high-voltage and low-voltage battery modules. The system can measure 14 cell voltages and a combination of six temperatures or system voltage measurements with fully redundant measurement engines in 263 μ s, or perform all inputs solely with the ADC measurement engine in 156 μ s. There are 14 internal balancing switches rated for > 300mA for cell-balancing current, each supporting extensive built-in diagnostics. Up to 32 devices can be daisy-chained to manage 448 cells and monitor 192 temperatures.

Cell and bus-bar voltages ranging from -2.5V to +5V are measured differentially over a 65V common-mode range, with a typical accuracy of 1mV (3.6V cell, 25°C). If oversampling is enabled, up to 128 measurements per channel can be averaged internally with 14-bit resolution and combined with digital post-processing IIR filtering for increased noise immunity. The system can shut itself down in the event of a thermal overload by measuring its own die temperature.

For robust communications, the system uses a Maxim battery-management UART or SPI protocol, and is optimized to support a reduced feature set of internal diagnostics and rapid-alert communication through both embedded communication and hardware-alert interfaces to support ASIL D and FMEA requirements.

Applications

- High-Voltage Battery Stacks
- Electric Vehicles (EVs)
- Hybrid Electric Vehicles (HEVs)
- Electric Bikes
- Battery-Backup Systems (UPS)
- Super-Cap Systems
- Battery-Powered Tools

Ordering Information appears at end of data sheet.

Benefits and Features

- 65V Operating Voltage
- Ultra-Low-Power Operation
 - Standby Mode: 2mA
 - Shutdown Mode: 2 μ A
- Redundant ADC and Comparator (COMP) Acquisitions
- Simultaneous Cell and Bus-Bar Voltage Acquisitions
- 14 Cell-Voltage Measurement Channels
 - 1mV Accuracy (3.6V, 25°C)
 - 2mV Accuracy (5°C to 40°C)
 - 4.5mV Accuracy (-40°C to +125°C)
- 14 Cell-Balancing Switches
 - > 300mA Software-Programmable Balancing Current
 - Optimized Driving and Parking Balancing Modes
 - Automated Balancing with Individual Cell Timers
 - Automated Balancing by Cell Voltage
 - Emergency Discharge Mode
- Six Configurable Auxiliary Inputs for Temperature, Voltage, or GPIO
- Integrated Die-Temperature Measurement
- Automatic Thermal Protection
- Individually Configurable Safety Alert
 - Overvoltage, Undertemperature Faults
 - Undervoltage, Overtemperature Faults
 - One Cell-Mismatch Alert
- Support ASIL D Requirements for Cell Voltage, Temperature, Communication
- Selectable UART, Dual UART, or SPI Interface
- Battery-Management UART Protocol
 - Daisy-Chain Up to 32 Devices
 - Capacitive Communication-Port Isolation
 - Up to 2Mbps Baud Rate (auto-detect)
 - 1.5 μ s Propagation Delay (per device)
 - Packet-Error Checking (PEC)
- Configurable Hardware-Alert Interfaces
- Factory-Trimmed Oscillator
 - No External Crystals Required
- 32-Bit Unique Device ID
- 64-Pin (10mm x 10mm) LQFP Package

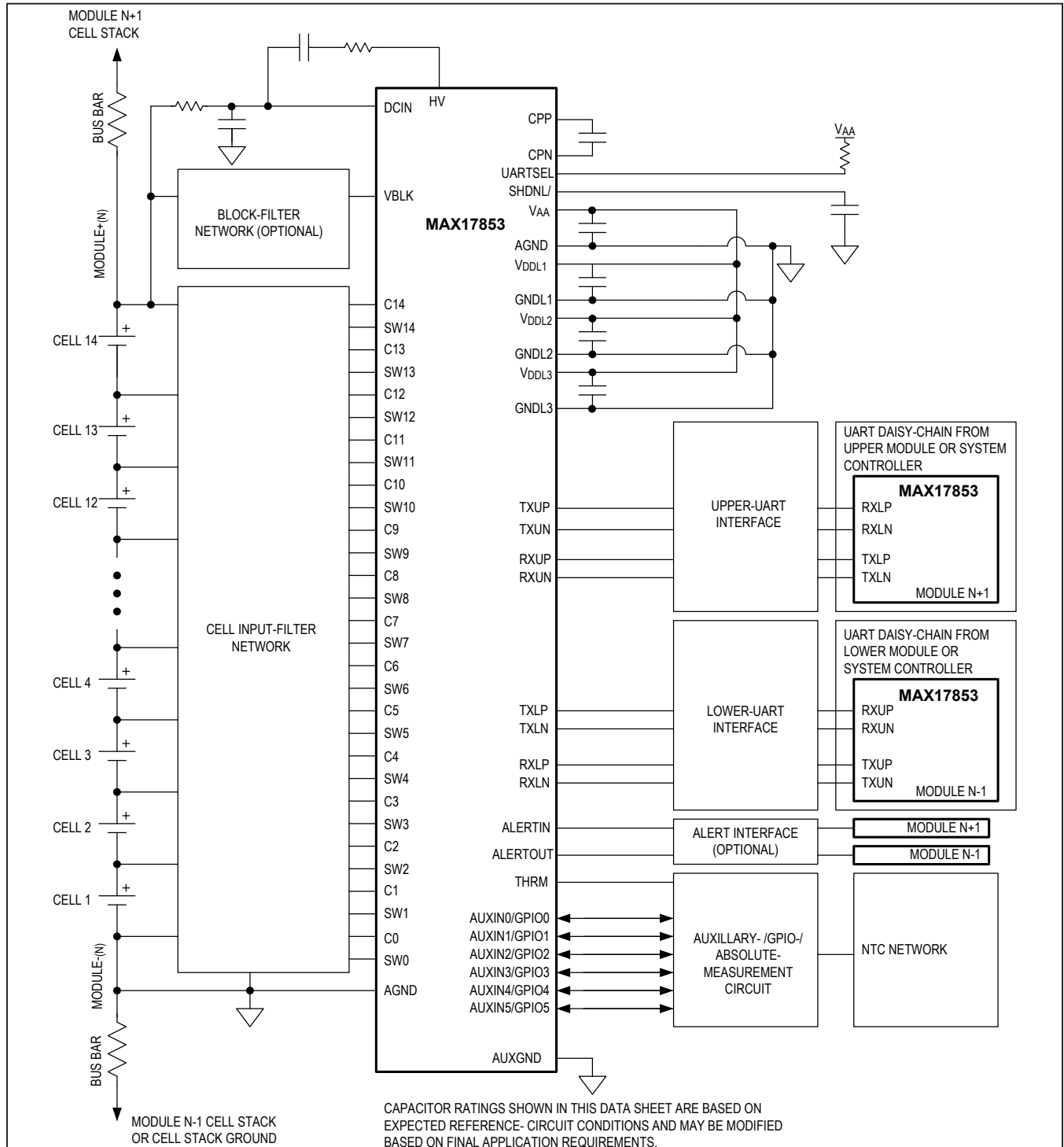
ABRIDGED DATA SHEET

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MAX17853 Simplified Application Diagrams

UART Interface with Single-Ended Alert



ABRIDGED DATA SHEET

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14-Channel High-Voltage Data-Acquisition System

Ordering Information

PART	TEMP RANGE	PIN-PACKAGE
MAX17853GCB/V+	-40°C to +125°C	64 LQFP
MAX17853ACB/V+	-40°C to +125°C	64 LQFP

/V Denotes an automotive-qualified package.

+Denotes a lead(Pb)-free/RoHS-compliant package.