bq29700 Single-cell Li-Ion Protector EVM

The bq29700 EVM is a complete evaluation system for the bq297xy family of second-level protectors. The EVM includes one bq29700-based circuit module.

Contents

1 Features

- bq29700-based circuit module
- Link to support documentation

1.1 Ordering Information

Table 1. Ordering Information

EVM Part Number	Chemistry	Configuration	Capacity
bq29700EVM-610	Li-Ion	1-Series Cell	Any

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2 bq29700-Based Circuit Module

The bq29700-based circuit module is a complete and compact example solution of a bq29700 battery protection IC. The circuit module includes one bq29700 IC, charge and discharge FETs, and all other onboard components necessary to use and interface with the protector. The circuit module connects directly across the battery.

2.1 Circuit Module Connections

Contacts on the circuit module provide the following connections:
- Direct connection to the cell: Cell+, Cell–
- The system load and charger connect across Pack+ and Pack–

2.2 Pin Descriptions

PIN NAME	DESCRIPTION
Cell–	Cell negative terminal
Cell+	Cell positive terminal
Pack–	Load or charger negative terminal
Pack+	Load or charger positive terminal

3 bq29700 Circuit Module Schematic

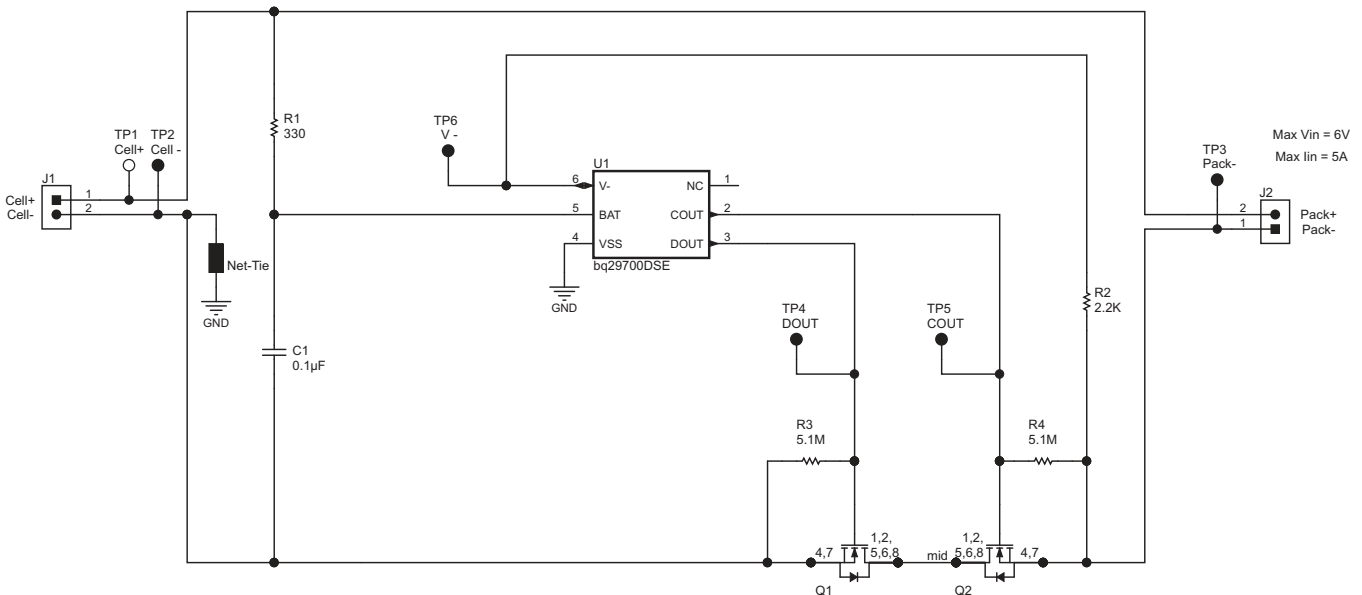This section contains information on the schematic for the bq29700 implementation.

Figure 1. bq29700 Schematic

3.1 Charge and Discharge FETs

The bq29700 protector has the capability to control low-side charge and discharge FETs. These FETs have been included on the EVM board module. Test points TP4 and TP5 have been provided to allow for easy gate-to-source measurements.

> **NOTE:** TP4 and TP6 test points are swapped on the A version of the EVM silk screen. TP4 should be DOUT and TP6 should be V–.

4   Circuit Module Physical Layouts and Bill of Materials

This section contains the board layout, bill of materials, and assembly drawings for the bq29700 circuit module.

4.1   Board Layout

This section shows the dimensions, PCB layers, and assembly drawing for the bq29700 module.
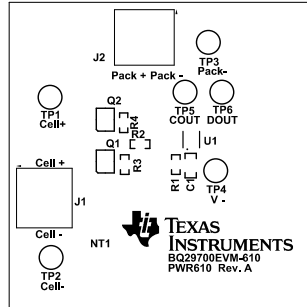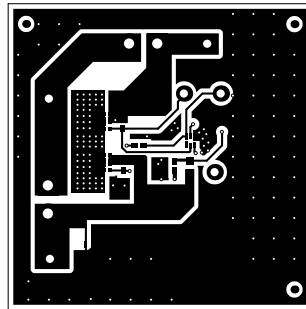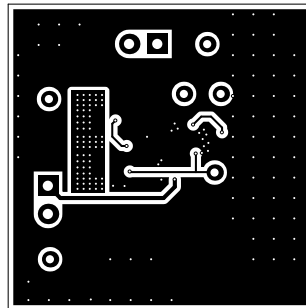

Figure 2. Top Assembly

Figure 3. Top Layer

Figure 4. Bottom Layer

4.2 Bill of Materials

Table 2. Bill of Materials

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
PCB1	1		Printed Circuit Board		PWR610	Any
C1	1	0.1 µF	CAP, CERM, 0.1µF, 50V, ±10%, X7R, 0603	0603	GRM188R71H104KA93D	MuRata
J1, J2	2		Terminal Block, 6A, 3.5mm Pitch, 2-Pos, TH	7.0 x 8.2 x 6.5 mm	ED555/2DS	On-Shore Technology
Q1, Q2	2	25 V	MOSFET, N-CH, 25V, 5A, SON 2x2 mm	SON 2x2 mm	CSD16301Q2	Texas Instruments
R1	1	330	RES, 330 ohm, 5%, 0.063W, 0402	0402	CRCW0402330RJNED	Vishay-Dale
R2	1	2.2 kΩ	RES, 2.2 kohm, 5%, 1/16W, 0402	0402	CRCW04022K20JNED	Vishay Dale
R3, R4	2	5.1 MΩ	RES, 5.1 Mohm, 5%, 1/16W, 0402	0402	RC1005J515CS	Samsung Electromechanics
TP1	1	Red	Test Point, Miniature, Red, TH	Red Miniature Test point	5000	Keystone
TP2, TP3, TP4, TP5, TP6	5	Black	Test Point, Miniature, Black, TH	Black Miniature Test point	5001	Keystone
U1	1		Li-Ion/Li Polymer Battery Protection IC, DSE0006A	DSE0006A	bq29700DSE	Texas Instruments

4.3 bq29700 Circuit Module Performance Specification Summary

This section summarizes the performance specifications of the bq29700 circuit module.

Performance Specification Summary

Specification	Min	Typ	Max	Unit
Input voltage Pack+ to Pack–	0	4	6	V
Charge and discharge current	0	1	5	A

5 EVM Hardware and Software Setup

This section describes how to connect the different components of the bq29700 EVM. Figure 5 shows how to connect the bq29700 circuit module to the cell and system load or charger.
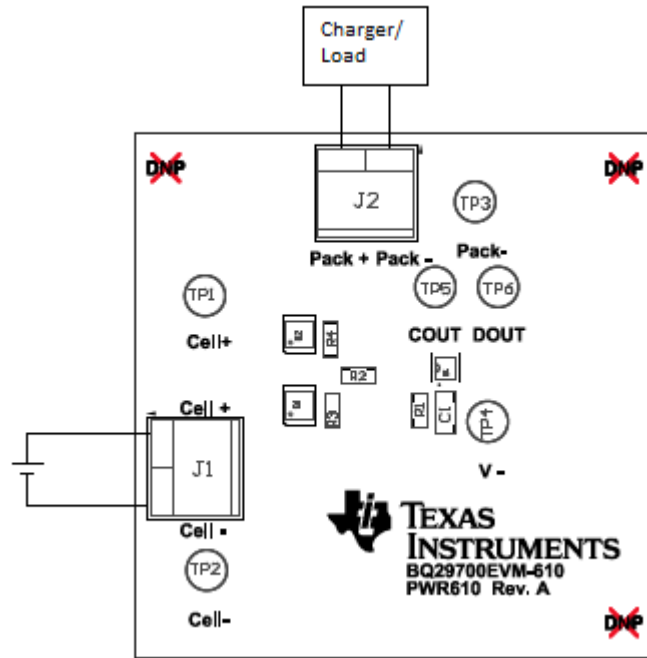
Figure 5. bq29700 Circuit Module Connection to Cell and System Load/Charger

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EVM Warnings and Restrictions

It is important to operate this EVM within the input voltage range of 0 V to 18 V and the output voltage range of (N/A).

Exceeding the specified input range may cause unexpected operation and/or irreversible damage to the EVM. If there are questions concerning the input range, please contact a TI field representative prior to connecting the input power.

Applying loads outside of the specified output range may result in unintended operation and/or possible permanent damage to the EVM. Please consult the EVM User's Guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative.

During normal operation, some circuit components may have case temperatures greater than 60°C. The EVM is designed to operate properly with certain components above 60°C as long as the input and output ranges are maintained. These components include but are not limited to linear regulators, switching transistors, pass transistors, and current sense resistors. These types of devices can be identified using the EVM schematic located in the EVM User's Guide. When placing measurement probes near these devices during operation, please be aware that these devices may be very warm to the touch.

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