EV2720-RH-00A



I²C-Controlled, 1-Cell, 2.5A NVDC Buck Charger Evaluation Board

DESCRIPTION

The EV2720-RH-00A is an evaluation board designed to demonstrate the capabilities of the MP2720, a highly-integrated, 2.5A, switch-mode battery management device for a single-cell Li-ion or Li-polymer battery. The narrow-voltage DC (NVDC) power management structure provides a low-impedance power path that optimizes charging efficiency, reduces battery charging time, and extends battery life during discharging.

USB Battery Charging Specification 1.2 (BC1.2) and non-standard adapter detection are supported by the input source type identification algorithm.

The I²C interface provides complete operating control, charging parameter configuration, and status/interrupt monitoring.

The MP2720 supports a fully customizable JEITA profile with configurable temperature windows and actions.

The EV2720-RH-00A supports an operating voltage up to 6.3V. It also supports boost mode and USB On-The-Go (OTG) operation by supplying a voltage between 5V and 5.35V at the IN pin, with up to 3A current.

PERFORMANCE SUMMARY

Parameters	Value		
Input voltage (V _{IN}) supply	4V to 6.3V		
Battery voltage (V _{BATT})	0V to 4.6V		
Charge current (I _{CC})	0A to 2.5A		
Input current (I _{IN})	0A to 3.2A		
Boost output current (I _{BOOST_OUT})	0A to 3A		

EVALUATION BOARD



LxWxH (6.3cmx6.3cmx1.3cm)

Board Number	MPS IC Number
EV2720-RH-00A	MP2720GRH



QUICK START GUIDE

The EV2720-RH-00A evaluation board is designed for the MP2720. The layout of the EV2720-RH-00A accommodates most commonly used capacitors. The default function of this board is preset for charger mode, and the charge-full voltage is preset to 4.2V for a single-cell Li-ion battery.

Table 1 shows the EV2720-RH-00A's input/output connections.

Table 1: Input/Output Connections

Connectors	Description
J1/VIN	Positive input source terminal.
J2/GND	Negative input source terminal.
J3/SYS	Positive system load terminal.
J4/GND	Negative system load terminal.
J5/BATT	Positive battery pack terminal.
J6/GND	Negative battery pack terminal.
P1	USB Type-C connector.
SCL/SDA/GND	I ² C connector.

Table 2 shows the jumper set-ups for the EV2720-RH-00A.

Table 2: Jumper Installations

Jumper	Description	Default
JP1	I ² C pull-up to VCC.	Off
JP2	NTC1 on-board resistor divider.	On
JP3	NTC2 on-board resistor divider	On
JP4	LED indication for STAT/IB.	On
JP5	IB resistor for STAT/IB. JP4 and JP5 should not be installed at the same time.	Off
JP6	LED indication for PG/NTC2.	On
JP7	NTC2 connection to PG/NTC2. JP6 and JP7 should not be installed at the same time.	Off
JP8	BATTSNS connection to BATT.	On

Evaluation Platform Preparation

- 1. The MP2720 evaluation software must be properly installed on the computer.
- 2. Prepare the USB to I²C communication interface (EVKT-USBI2C-02) (see Figure 1).
- 3. Configure the test set-up for the MP2720 (see Figure 2 on page 3).



Figure 1: USB to I²C Communication Interface

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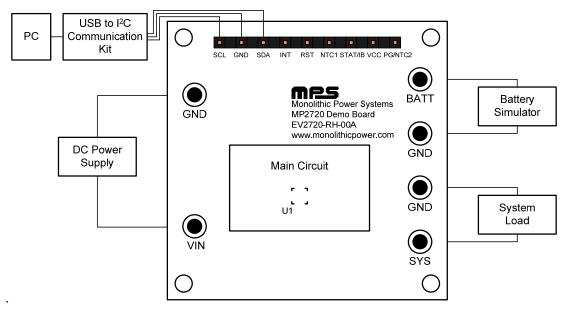


Figure 2: Measurement Equipment Set-Up

Start-Up Procedure

- 1. Set the battery simulator output to 3.8V with the charge/discharge current limit at 5A, then turn off the battery simulator.
- 2. Connect the battery simulator to BATT and GND.
- 3. Set the DC power source output to 5V with output current limit at 5A, then turn off the DC power source. Connect the DC power source to VIN and GND.
- 4. Connect the system load (typically an e-load device) to SYS and GND, then set the system load to 0A.
- 5. Turn on the battery simulator.
- 6. Turn on the DC power source.
- 7. If necessary, turn on the system load.
- 8. Launch the MP2720 evaluation software. Figure 3 shows the GUI software's main window.



Figure 3: MP2720 Evaluation Software



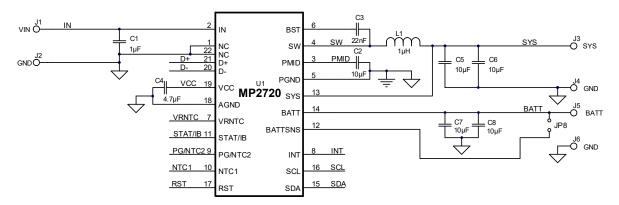
GUI Operating Instructions

- 1. Ensure that all the connections are successful, including the connection between the USB to I²C communication interface and the EV2720-RH-00A. Successful connections are indicated in green on the lower-left side of the window (see Figure 3 on page 3). Once all of the connections are successfully made, the program is ready to be used.
- 2. After all connections are successful, click the "Read All" button to update the GUI to the default settings.
- 3. Change settings as desired.
- 4. After making the desired setting modifications, click the "Update All" button to write the setting(s) to the MP2720's registers.

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EVALUATION BOARD SCHEMATIC



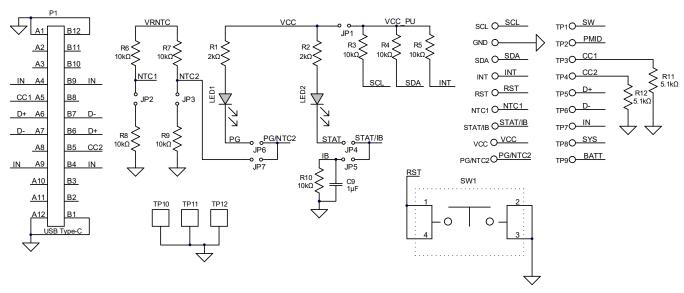


Figure 4: Evaluation Board Schematic



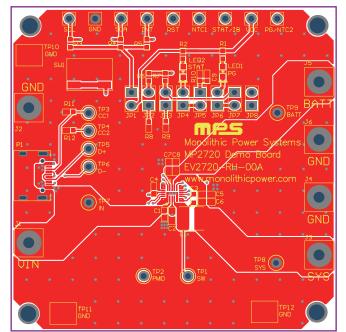
EV2720-RH-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
1	C1	1µF	Ceramic capacitor, 25V, X7R	0603	Murata	GRM188R71E105K A12D
1	C2	10µF	Ceramic capacitor, 25V, X5R	0805	Murata	GRM21BR61E106K A73
1	C3	22nF	Ceramic capacitor, 100V, X7R	0603	Murata	GRM188R72A223K AC4D
1	C4	4.7µF	Ceramic capacitor, 16V, X7R	0603	Murata	GRM188R61C475K AAJD
4	C5, C6, C7, C8	10μF	Ceramic capacitor, 16V, X5R	0805	Murata	GRM21BR61C106K E15L
1	C9	1µF	Ceramic capacitor, 16V, X7R	0603	Murata	GRM188R71C105K A12D
1	L1	1µH	Inductor, $R_{DC} = 12m\Omega$, $I_{SAT} = 9A$	SMD	Wurth	78438356010
2	R1, R2	2kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-072KL
3	R3, R4, R5	10kΩ	Film resistor, 5%	0603	Yageo	RC0603JR-0710K
5	R6, R7, R8, R9, R10	10kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-0710KL
2	R11, R12	5.1kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-075K1L
1	LED1	Red	Red LED	0805	Bright LED	F3D02R-4A
1	LED2	Green	Green LED	0805	Bright LED	F3D02HG-1A
1	SW1	4mmx 10mm	Push button	SMD	Any	
1	P1	5A	USB Type-C connector	SMD	Any	
6	J1, J2, J3, J4, J5, J6	2mm	Connector	DIP	Any	
9	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9	Test point	Test point yellow	DIP	Any	
3	TP10, TP11, TP12	Test point	Test point ground	SMD	Any	
9	GND, INT, NTC1, PG/NTC2, RST, SCL, SDA, STAT/IB, VCC	2.54mm	Row connector	DIP	Any	
8	JP1, JP2, JP3, JP4, JP5, JP6, JP7, JP8	2.54mm	Row connector	DIP	Any	
5	JP2, JP3, JP4, JP6, JP8	2.54mm	Shunt connector	DIP	Any	
1	U1	MP2720	I ² C-controlled, 1-cell, 2.5A, NVDC buck charger	QFN-22 (2.5mmx 3.5mm)	MPS	MP2720GRH

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PCB LAYOUT



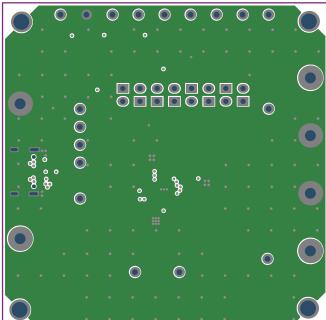


Figure 5: Top Layer

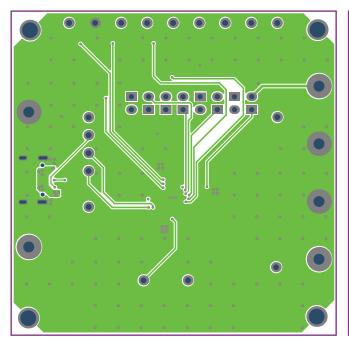


Figure 6: Mid-Layer 1

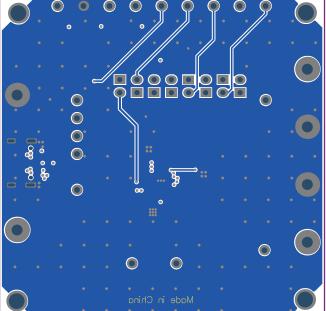


Figure 7: Mid-Layer 2

Figure 8: Bottom Layer



REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	10/14/2021	Initial Release	-
1.1	7/18/2022	Updated headers	3–8
1.2	.2 4/19/2023	Updated "MP2720GRH" to "MP2720" in Figure 4	5
		Updated the BST capacitor (C3) information	5–6

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