EV26124-R-00A

4-Cell, 24V Input, 600kHz, Switching Li-Ion Battery Charger EV Board

DESCRIPTION

The EV26124-R-00A is an evaluation board for the MP26124, a high-performance, 4-cell, Li-ion battery switching charger with a built-in internal power MOSFET.

The EV26124-R-00A achieves 1A of charge current over a wide input supply range. The charge current can be programmed by sensing the current through an accurate sense resistor.

The MP26124 regulates the charge current and full-charge voltage using two control loops to achieve a highly accurate CC charge and CV charge.

The MP26124 integrates trickle charge, auto-recharge, and charger timer functions.

Full protection features includes thermal protection, battery temperature monitoring, and protection. The IC also indicates AC adapter power good and charge status to the system.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input voltage	V_{IN}	10~24	V
Charge current	I_{CHG}	1	A

FEATURES

- Charge 4-Series Li-Ion Cells
- Wide Operating Input Range
- 1A Charging Current
- ±0.75% V_{BATT} Accuracy
- Up to 96% Efficiency
- Fixed 600kHz Frequency
- Preconditioning for Fully Depleted Batteries
- Charging Operation Indicator
- Input Supply and Battery Fault Indicator
- Thermal Shutdown
- Battery Temperature Monitor and Protection

APPLICATIONS

- Distributed Power Systems
- Chargers for 4-Cell Li-Ion Batteries
- Pre-Regulator for Linear Regulators
- Robots
- Cleaners

All MPS parts are lead-free, halogen-free, and adhere to the RoHS directive. For MPS green status, please visit the MPS website under Quality Assurance. “MPS”, the MPS logo, and “Simple, Easy Solutions” are trademarks of Monolithic Power Systems, Inc. or its subsidiaries.

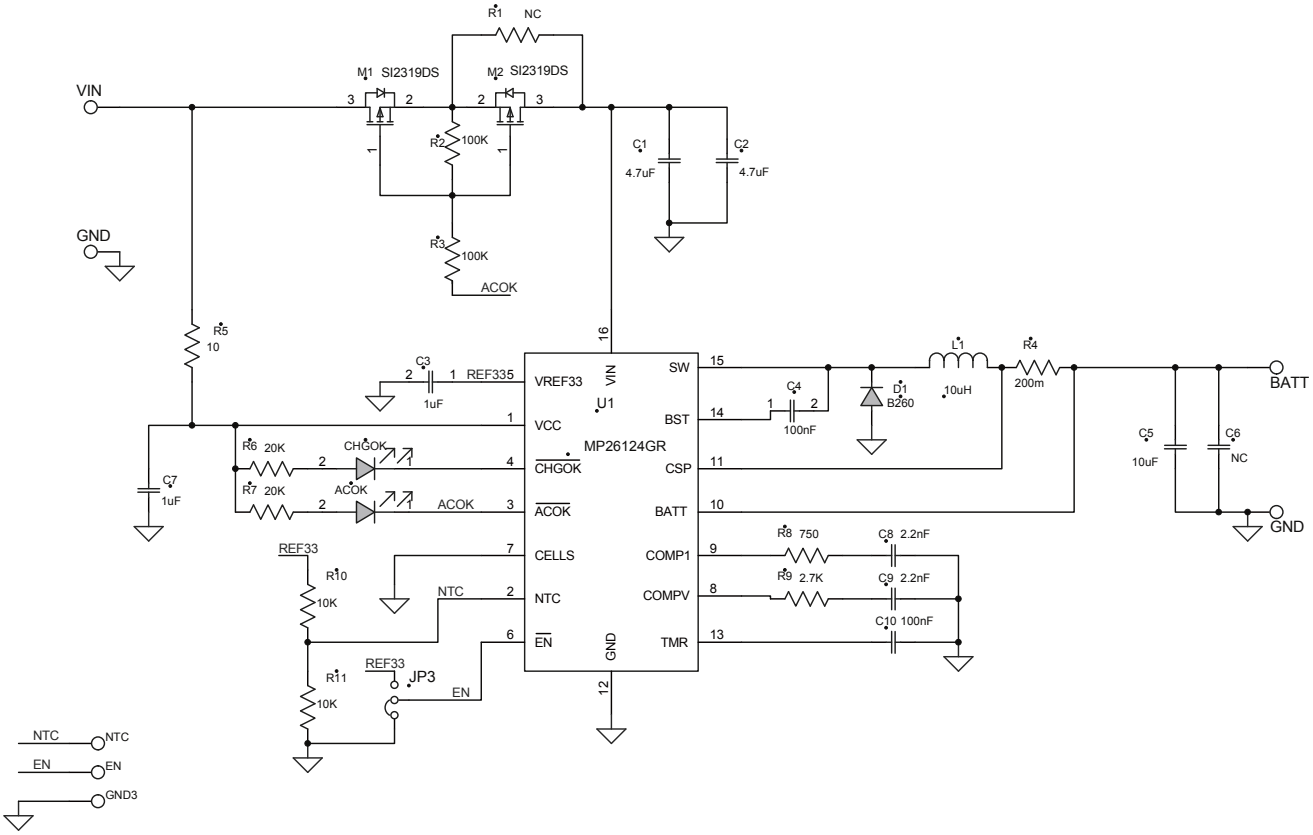
EV26124-R-00A EVALUATION BOARD

(L x W x H) (6.25cm x 6.35cm x 1.2cm)

Board Number	MPS IC Number
EV26124-R-00A	MP26124GR

MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2018 MPS. All Rights Reserved.

EVALUATION BOARD SCHEMATIC



MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2018 MPS. All Rights Reserved.

EV26124-R-00A BILL OF MATERIALS

Qty	RefDes	Value	Description	Package	Manufacturer	Manufactuer_P/N
2	C1, C2	4.7μF	Ceramic Capacitor; 50V;X7R	1210	muRata	GRM32ER71H475KA88L
1	C3	1μF	Ceramic Capacitor;25V; X7R	0603	muRata	GRM188R71E105KA12D
2	C4, C10	100nF	Ceramic Capacitor;50V; X7R	0603	TDK	C1608X7R1H104K
1	C5	10μF	Ceramic Capacitor;35V; X7R	1210	muRata	GRM32ER7YA106KA12L
1	C6	NC	Ceramic Capacitor; 35V;X7R	1210	muRata	GRM32ER7YA106KA12L
1	C7	1μF	Ceramic Capacitor; 50V;X7R	0805	muRata	GRM21BR71H105KA12L
1	C8	4.7nF	Ceramic Capacitor; 50V;X7R;0603	0603	TDK	C1608X7R1H472K
1	C9	2.2nF	Ceramic Capacitor; 50V;X7R;0603	0603	TDK	C1608X7R1H222K
1	D1	B260A	schottky diode 2A 60V;	SMB	Diodes	B260A
1	CHGOK		LED, Green	0805		BL-HGB35A-TRB
1	L1	10μH	Inductor;10uH;36m;3.2A	SMD	TMP	SPC-08045-100GP
2	M1, M2	SI2319 DS	P-Channel MOSFET; -40V; 130mohm	SOT-23	Vishay	SI2319DS
1	R1	NC	Film Resistor;5%;	0805		0805S8J0000T5E
2	R2, R3	100kΩ	Resistor;5%;	0603	Royalohm	0603J0104T5E
1	R4	200mΩ	Film Resistor;1%;2W;	2512	Yageo	
1	R5	10Ω	Film Resistor;5%;	0603		0603SAJ0100T5E
2	R6, R7	20kΩ	Film Resistor;5%;	0603		653610846CR03T03705NJ20K
1	R8	750Ω	Film Resistor;1%	0603	Yageo	RC0603FR-07750RL
1	R9	2.7kΩ	Film Resistor;5%;1/10W	0603	LIZ	CR0603JA0272G
2	R10, R11	10kΩ	Film Resistor;1%;	0603	Yageo	RC0603FR-0710KL
1	ACOK		LED, Red	0805		BL-HUF35A-TRB
1	U1		Switching charger	QFN-16 (4x4)	MPS	MP26124GR

MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2018 MPS. All Rights Reserved.

PRINTED CIRCUIT BOARD (PCB) LAYOUT

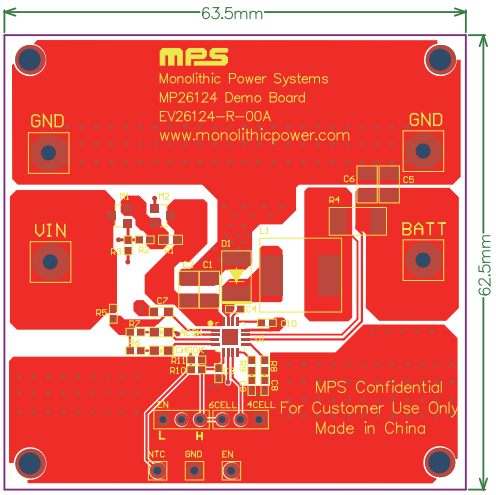


Figure 1: Top Layer

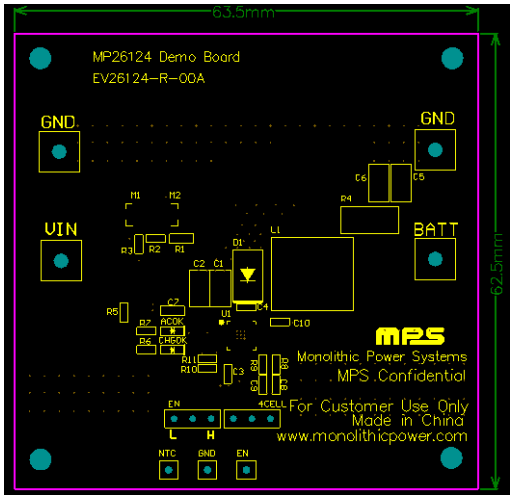


Figure 2: Top Silk Layer

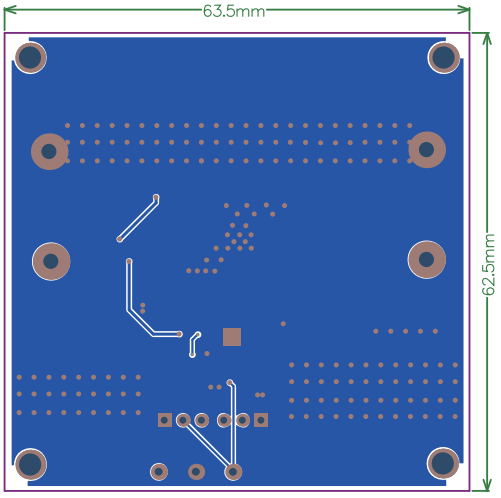


Figure 3: Bottom Layer

MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2018 MPS. All Rights Reserved.

QUICK-START GUIDE

This board is used for the MP26124 application of standalone switching chargers, which can charge four Li-ion batteries. The board layout accommodates the most commonly used capacitors.

The two LEDs are operating status indicators. When the input is sufficient for charging the battery load, the ACOK LED is on; otherwise, it is off. When the charging operation is normal, the CHGOK LED is on. If any event occurs including battery full, NTC fault, timer out, thermal protection, or EN disable, CHGOK LED turns off.

Particularly, CHGOK LED will be twinkling if BATT is floated.

Follow the steps below to quick-start the board.

1. Charge current setting:

   The charge current can be programmed by the sense resistor R4 with Equation (1):

$$I_{CHG}(A) = \frac{200mV}{R4(m\Omega)} \quad (1)$$

2. Preset the power supply output to 24V and then turn it off. Attach the positive and negative ends of the power supply output to the VIN and GND pins, respectively.
3. Attach the positive and negative ends of the battery to the BATT and GND pins, respectively.
4. Turn the power supply on. The board starts up automatically if EN is pulled to GND.
5. To use the enable function, apply a digital input to the EN pin. Drive EN above 1.8V to turn off the charger. Drive EN below 0.4V to turn on the charger.

Refer to the MP26124 datasheet for further detailed information.

NOTICE: The information in this document is subject to change without notice. Please contact MPS for current specifications. Users should warrant and guarantee that third party Intellectual Property rights are not infringed upon when integrating MPS products into any application. MPS will not assume any legal responsibility for any said applications.

MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2018 MPS. All Rights Reserved.