

DESCRIPTION

The EV2618EV-01A is an evaluation board for the MP2618, a high performance 2~3 cell Li-Ion battery switching charger with built-in internal power MOSFET.

The EV2618EV-01A achieves up to 2A charge current over a wide input supply range. The charge current can be programmed by sensing the current through an accurate sense resistor.

MP2618 regulates the charge current and battery full voltage using two control loops to realize high accuracy constant current (CC) charge and constant voltage (CV) charge.

Fault condition protection includes time out control, battery full terminated control, thermal protection, battery temperature monitoring and protection. The board also indicates AC adapter power good and charge status indications to the system.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	10~24	V
Charge Current	I_{CHG}	2	A

FEATURES

- Charge 2-3 cells Li-Ion Battery Packs
- Wide Operating Input Range
- Up to 2A Programmable Charging Current
- $\pm 0.75\%$ V_{BATT} Accuracy
- Up to 90% 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 2-Cell or 3-Cell Li-Ion Batteries
- Pre-Regulator for Linear Regulators
- Smart Phones
- Net-book

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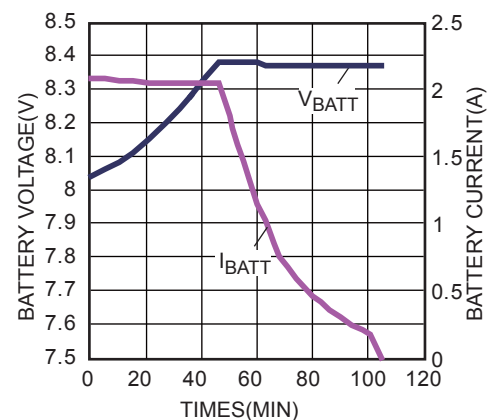
EV2618EV-01A EVALUATION BOARD



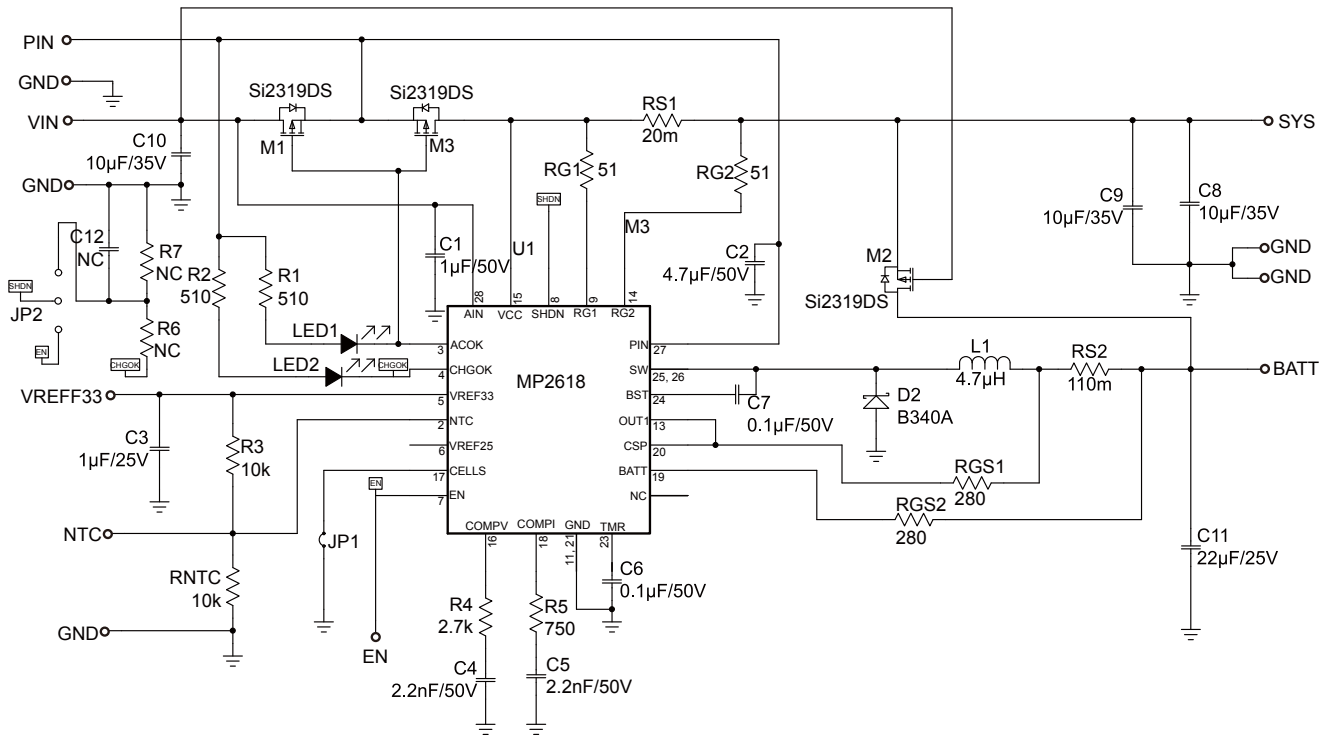
(L x W x H) 2.5" x 2.5" x 0.5"
(6.35cm x 6.35cm x 1.2cm)

Board Number	MPS IC Number
EV2618EV-01A	MP2618EV

2 Cells Battery Charge Curve



EVALUATION BOARD SCHEMATIC



EV2618EV-01A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	1 μ F	Ceramic Cap., 50V, X7R	0805	Murata	GRM21BR71H105KA12L
1	C2	4.7 μ F	Ceramic Cap., 50V, X7R	1210	Murata	GRM32ER71H475KA88L
1	C3	1 μ F	Ceramic Cap., 25V, X5R	0603	TDK	C1608X5R1E105K
2	C4, C5	2.2nF	Ceramic Cap., 50V, X7R	0603	TDK	C1608X7R1H222K
2	C6, C7	0.1 μ F	Ceramic Cap., 50V, X7R	0603	Murata	GRM188R71H104KA93D
3	C8, C9, C10	10 μ F	Ceramic Cap, 35V, X7R	1210	Murata	GRM32ER7YA106KA12L
1	C11	22 μ F	Ceramic Cap., 25V, X5R	1210	Murata	GRM32ER61E226KE15L
1	C12	NC				
2	R1, R2	510 Ω	Film Res., 5%	0805	LIZ	0805J510R
2	R3, RNTC	10k Ω	Film Res., 1%	0603	Yageo	RC0603FR-0710KL
1	R4	2.7k Ω	Film Res., 5%	0603	LIZ	CR0603JA0272K
1	R5	750 Ω	Film Res., 1%	0603	Yageo	RC0603FR-07750RL
2	R6, R7	NC				
2	RG1, RG2	51 Ω	Film Res., 1%	0603	Yageo	RC0603FR-0751RL
2	RGS1, RG2	280 Ω	Film Res., 1%	0603	Yageo	RC0603FR-07280RL
1	RS1	20m Ω	Film Res., 1%	1206	Vishay	WSL1206-18
1	RS2	110m Ω	Film Res., 1%	2512	Vishay	WSL2512R1100FEA
1	JP1		2-Pin Connector Header			
1	JP2		3-Pin Connector Header			
1	LED1	Green	Led Green, Surface Mount	0805		
1	LED2	Red	Led Red, Surface Mount	0805		
1	D2		Diode Schottky, 40V, 3A	SMA	Diodes Inc	B340A-13-F
1	L1	4.7 μ H	Inductor, 3.8A	SMD	Toko	DS84LC-B1015AS-4R7N
			Inductor, 3.78A	SMD	Cooper	DR37-4R7-R
			Inductor, 6.5A	SMD	Würth	74431490
3	M1, M2, M3	40V/2.A	PMOS	SOT23	Vishay	Si2319DS
1	U1		Switching Charger	QFN28	MPS	MP2618EV

PRINTED CIRCUIT BOARD LAYOUT

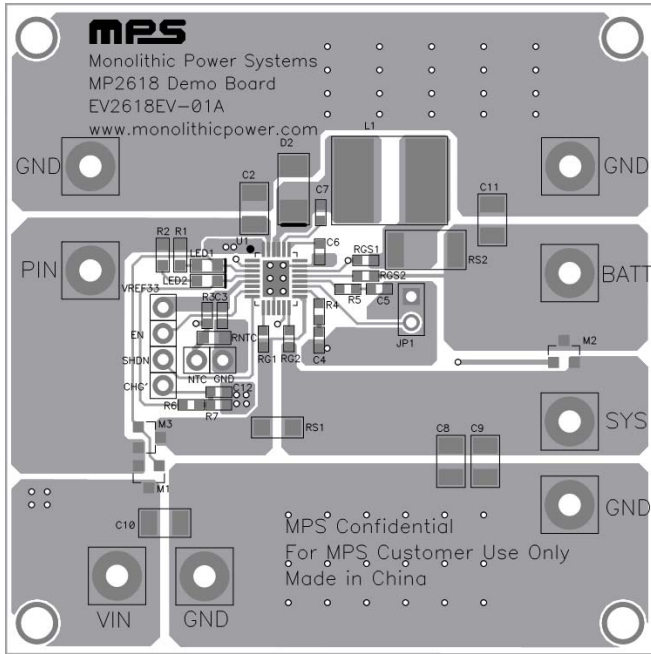


Figure 1—TOP + TOP SILK Layer

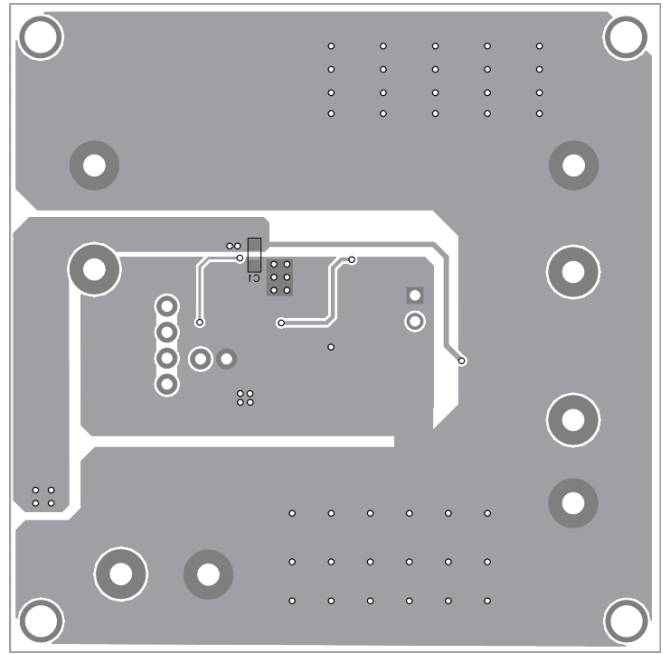


Figure 2—BOT +BOT SILK Layer

QUICK START GUIDE

This board can be used for dual applications of MP2618: standalone switching charger or switching charger with power path management. The board layout accommodates most commonly used capacitors.

The default output voltage on this board is preset to 8.4V for 2 cell Li-Ion battery. Connect the CELLS pin to VREF33 to regulate the output to 12.6V for 3 cell Li-Ion batteries.

The two LEDs are operating status indicators. When the input is OK for charging the battery load, LED1 will be on. Otherwise it is off. The LED2 is on when the charging operation is normal and turns off once the charging is completed. If any event including timer out, thermal protection and EN disabled occurs, both LED1 and LED2 will be off.

1. Charge current setting:

1) For the standalone switching charger, the charge current can be programmed by the sense resistor RS2, the formula is as:

$$I_{CHG}(A) = \frac{200mV}{RS2(m\Omega)}$$

2) For the switching charger with power path management application, as influenced by MP8110's sense error, the charge current sense resistance needs calibration. In the application, choose RS1 as small as possible for less the power loss (20mΩ on this board). RG1 and RG2 is 51Ω on this board. Then, RS2 need to be changed to 110mΩ for setting 2A charge current with RGS1 and RGS2 set at 280Ω. Following table is the value of calibrated RS2, RGS1 and RGS2 for setting different charge current.

$I_{CHG}(A)$	RGS1(Ω)	RGS2(Ω)	RS2(mΩ)
2	280	280	110
1.5	402	402	160
1	665	665	260
0.8	909	909	360
0.5	2k	2k	800

- For the standalone switching charger, LED1 and LED2 can be powered by VREF33. While in the switching charger with power path management application, LED1 and LED2 need to be powered by V_{IN} .
- Attached the input voltage ($V_{IN}=19V$) and the input ground to the VIN and GND pins, respectively.
- Attach the positive and negative ends of the load to the SYS and GND pins, respectively.
- Attach the positive and negative ends of the battery to the BATT and GND pins, respectively.

Please see the datasheet of MP2618 for further detailed information.

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