

DESCRIPTION

The EV2678EG-104-00A is an evaluation board for MP2678EG-104, the high-performance protection IC for single cell Li⁺ battery charger maintaining a 5V output with the input voltage up to over voltage protection threshold 10.4V.

The device operates like a linear regulator, provides fault indication to the system when any protection events happens, including input over voltage protection (OVP), battery over voltage protection (BOVP), and over charge current protection (OCP). Additionally, it also monitors its own internal temperature and provides thermal protection (OTP).

EV2678EG-104-00A can also be used to evaluate other version MP2678EG with different input over voltage protection threshold with IC replacement.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V _{IN}	6	V
Input Over Voltage Protection	V _{OVP}	10.4	V
Limit Current	I _{LIM}	1.5	A

FEATURES

- Input Surge up to 30V
- 5V Regulated Output
- Input Over Voltage Protection in 1us.
- Proprietary Battery Over-Voltage Protection
- Output Short-Circuit Protection.
- Soft-Stop to Prevent Voltage Spikes
- Support up to 1.7A Load Current
- Temperature Monitoring and Protection
- Fault Indication
- Fully Assembled and Tested

APPLICATIONS

- Cell Phones
- MP3 Players
- Smart Phones
- PDAs
- Digital Cameras
- Low-Power Handheld Devices

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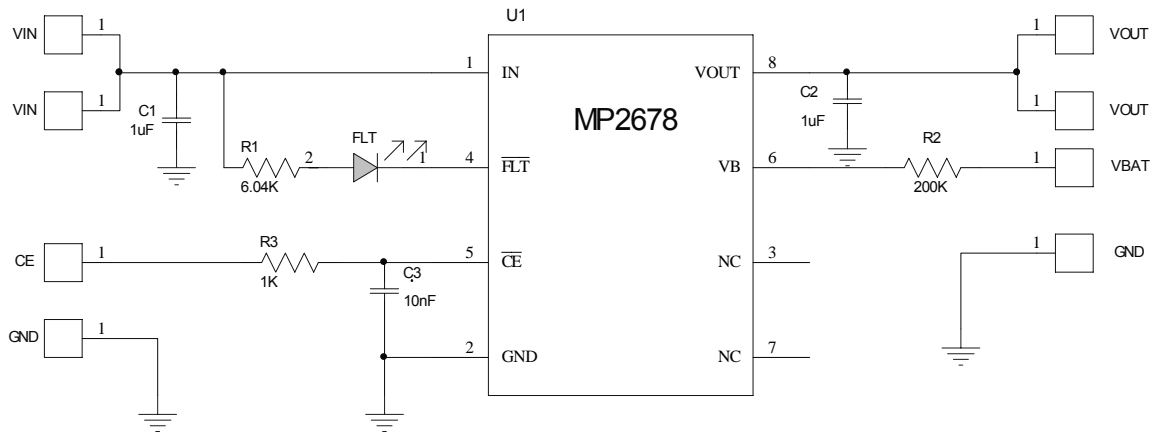
EV2678EG-00A EVALUATION BOARD



(L x W x H) 1.06" x 1.02" x 0.4" (2.7cm x 2.6cm x 1.1cm)

Board Number	MPS IC Number
EV2678EG-104-00A	MP2678EG-104

EVALUATION BOARD SCHEMATIC



EV2678EG-00A BILL OF MATERIALS

Qty	RefDes	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1, C2	1µF	Ceramic Capacitor., 50V, X7R	SMD0805	muRata	GRM21BR71H105KA12L
1	C3	10nF	Ceramic Capacitor., 50V, X7R	SMD 0603	muRata	GRM188R71H103KA01D
1	R1	6.04k	Film Resistor., 1%	SMD 0603	Yageo	RC0603FR-076K04L
1	R2	200k	Film Resistor., 5%	SMD 0603	Yageo	RC0603JR-07200KL
1	R3	1k	Film Resistor., 1%	SMD 0603	Yageo	RC0603FR-071KL
1	FLT		Red LED	SMD 0805	BRIGHT LED	BL-HUF35A-TRB
1	U1		Li-Ion Battery Charger Protection IC with LDO Mode	QFN8 (2mm*2mm)	MPS	MP2678EG-104

PRINTED CIRCUIT BOARD LAYOUT

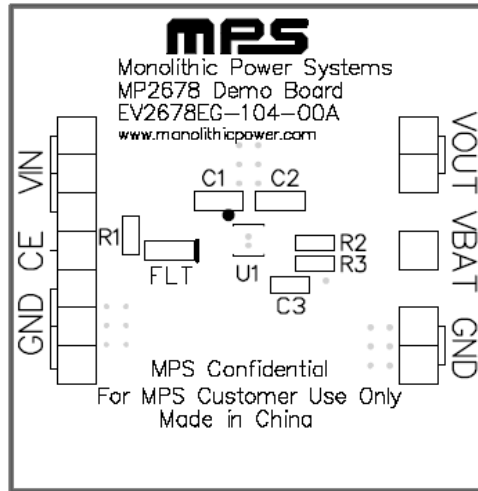


Figure 1—Top Silk Layer

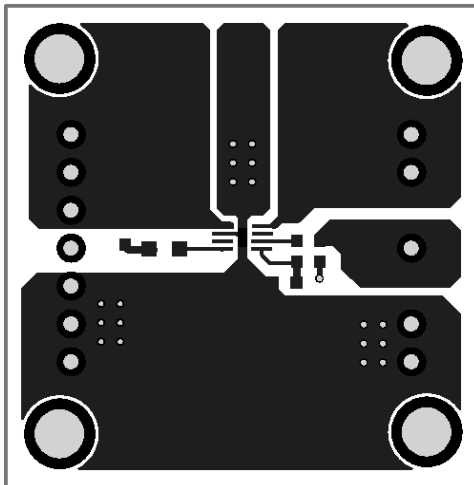


Figure 2—Top Layer

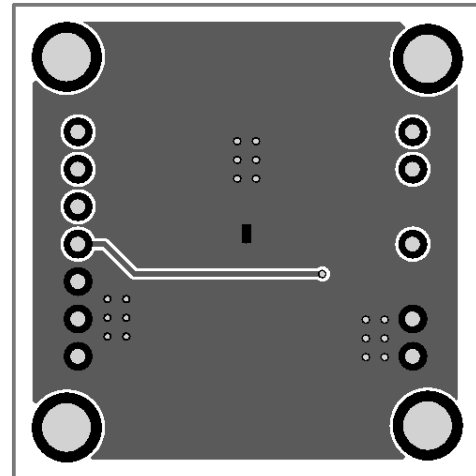


Figure 3—Bottom Layer

QUICK START GUIDE

1. The board layout accommodates most commonly used capacitors and resistors.
2. Attach the output voltage and output ground to the V_{OUT} and GND pins respectively.
3. Attach the input voltage (max 30V) and input ground to the V_{IN} and GND pins respectively. It starts up when V_{IN} is higher than 2.6V and shut down when V_{IN} is below 2.4V.
4. If the input voltage exceeds 10.4V, the MP2678EG-104 detects it as an input OVP fault, and cuts off the connection between the V_{IN} and V_{OUT} pins.
5. The battery over voltage is monitored via the VBAT pin. Once the voltage of VBAT is higher than 4.35V, the MP2678EG-104 takes it as a battery OVP fault., and cuts off the connection between the V_{IN} and V_{OUT} pins The resistor R_{VB} is used to limit the sink current to the chip, the recommended value is 200k Ω to 1M Ω .
6. The current limit of MP2678EG-104 is internally preset to 1.5A, As soon as the input current is larger than 1.5A, the OCP event is triggered and the voltage of V_{OUT} pin drops to 0V.
7. The over-temperature protection (OTP) event may be triggered because of the large power loss resulted in by large input to output voltage difference. For example, assume $V_{IN}=7V$, $V_{OUT}=5V$, $I_{IN}=I_{OUT}=1A$:

$$P_{Loss} = (V_{IN} - V_{OUT}) \times I_{IN}$$
$$P_{Loss} = (7V - 5V) \times 1A = 2W$$

For QFN 3X3 θ_{JA} is 80°C/W. 2W power is dissipated when 1A input current goes through the part with $V_{IN}=7V$, $V_{OUT}=5V$. This gives a rise in die temperature for 2W x 80°C/W=160°C. The sum of 160°C and room temperature (e.g. 25°C) exceeds the OTP threshold (140°C). Thus the OTP event is triggered on this condition.

8. Once any fault event occurs, the open drain output \overline{FLT} pin turns low.

This board is set up from the factory for MP2678EG-104 evaluation. This EV board can also be used to evaluate the MP2678EG-73 and MP2678EG-95 (with IC replacement). Please refer to the datasheet for the detailed information of the different input over voltage protection options of MP2678.

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