

### DESCRIPTION

The MP2631 is a linear, high performance single cell Li-Ion or Li-Polymer battery charger with 10mA LDO and on-chip input polarity reverse protection. By integrating high voltage input protection into the charger IC, the MP2631 can tolerate an input surge up to 28V and input surge down to -16V.

The MP2631 features constant current (CC) and constant voltage (CV) charging modes with programmable charge current (200mA to 1A) reverse current blocking and trickle charge.

The other features include the internally set battery full threshold (10% of the programmed charge current) and auto-recharge.

The OVP circuitry will automatically disconnect both charger and LDO from input when VIN exceeds 7V.

### ELECTRICAL SPECIFICATION

| Parameter      | Symbol    | Value       | Units |
|----------------|-----------|-------------|-------|
| Input Voltage  | $V_{IN}$  | 4.5V – 6.5V | V     |
| Charge Current | $I_{CHG}$ | 0.2-1.0     | A     |
| LDO            | $V_O$     | 5           | V     |

### FEATURES

- Input Surge Up to 28V
- 5V LDO output
- Wide input operating range 3.0V – 7V
- Programmable Charge Current: 200mA to 1A
- Termination and auto-recharge
- 0.75% VBATT Accuracy over Temperature
- <1µA Battery Reverse Current
- Automatic die temperature limiting
- Fault and Charge Status Indicators
- Soft-Start to limit inrush current
- Tiny 3mm x 3mm QFN Package

### APPLICATIONS

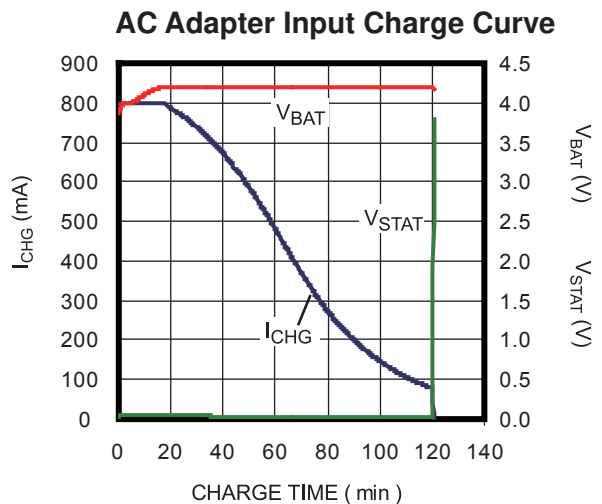
- Cell Phones
- Digital Cameras
- Smart Phones
- PDAs
- MP3 Players

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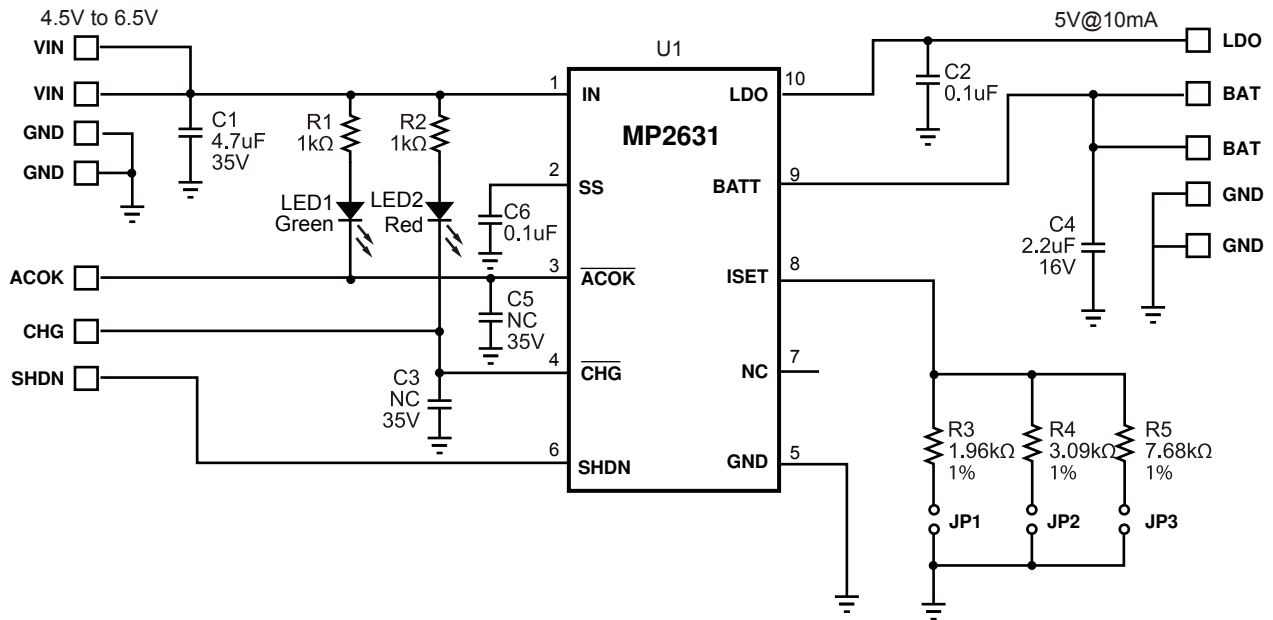
### EV2631DQ-00A EVALUATION BOARD



| Board Number | MPS IC Number |
|--------------|---------------|
| EV2631DQ-00A | MP2631DQ      |



## EVALUATION BOARD SCHEMATIC



## EV2631DQ-00A BILL OF MATERIALS

| Qty | Ref       | Value  | Description                      | Package | Manufacturer | Manufacturer P/N   |
|-----|-----------|--------|----------------------------------|---------|--------------|--------------------|
| 1   | C1        | 4.7uF  | Ceramic Cap., 35V, X7R           | 1210    | Murata       | GRM32ER71H475KA88L |
| 2   | C2, C6    | 0.1uF  | Ceramic Cap., 16V, X7R           | 0603    | TDK          | C1608X7R1C104K     |
| 2   | C3, C5    | NS     |                                  | 0603    |              |                    |
| 1   | C4        | 2.2uF  | Ceramic Cap., 16V, X7R           | 1210    | Murata       | GRM32MR71C225MC01L |
| 3   | JP1, 2, 3 |        | 3x2-Pin Connector Header, 0.100" |         | Molex        | 10-89-1601         |
| 1   | LED1      |        | Led Green, Surface Mount         | 0603    | Lumex        | SML-LX0603GW-TR    |
| 1   | LED2      |        | Led Red, Surface Mount           | 0603    | Lumex        | SML-LX0603IW-TR    |
| 2   | R1, R2    | 1kΩ    | Film Res., 5%                    | 0603    | Yageo        | 9C06031A1001FKHFT  |
| 1   | R3        | 1.96kΩ | Film Res., 1%                    | 0603    | Yageo        | 9C06031A1961FKHFT  |
| 1   | R4        | 3.09kΩ | Film Res., 1%                    | 0603    | Yageo        | 9C06031A3091FKHFT  |
| 1   | R5        | 7.68kΩ | Film Res., 1%                    | 0603    | Yageo        | 9C06031A7681FKHFT  |
| 1   | R6        | NS     | Not Stuffed                      | 0603    |              |                    |
| 1   | U1        |        | Linear Charger                   | QFN10   | MPS          | MP2631DQ           |

## PRINTED CIRCUIT BOARD LAYOUT

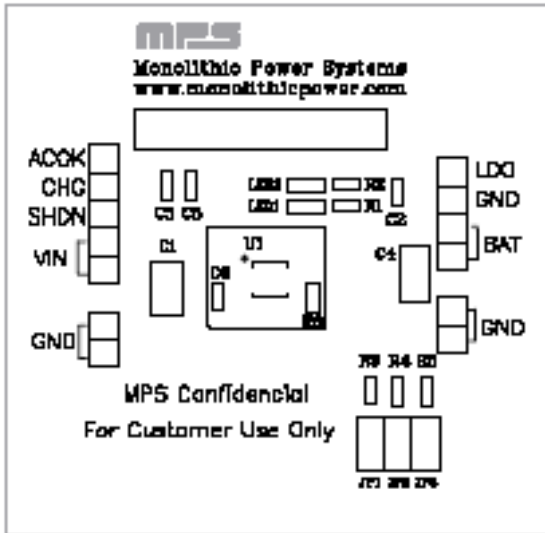


Figure 1—Top Silk Layer

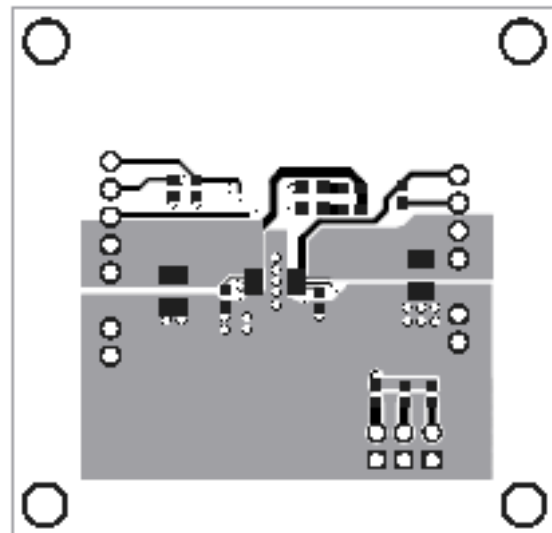


Figure 2—Top Layer

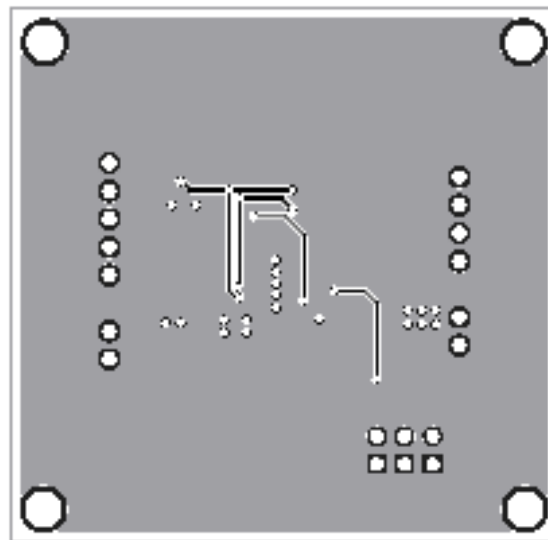


Figure 3—Bottom Layer

## QUICK START GUIDE

The output voltage on this board is preset to 4.2V (for a single cell battery). The board layout accommodates most commonly used capacitors.

The LEDs are power indicators. When LED1 is on, the 5V input is present (LED1 is off when the input is disconnected). When LED2 is on, the battery is charging, and when the battery is full or there is no battery connected, LED 2 will turn off.

1. Set the charge current I<sub>CHG</sub> using the jumpers JP1, JP2, and JP3 per the following table:

| JP1 | JP2 | JP3 | I <sub>CHG</sub> |
|-----|-----|-----|------------------|
| X   |     | X   | 1000mA           |
| X   |     |     | 800mA            |
|     | X   | X   | 700mA            |
|     | X   |     | 500mA            |
|     |     | X   | 200mA            |

Where “X” indicates a connection.

2. Attach the positive and negative ends of the load to the VOUT and GND pins, respectively.
3. Attach the input voltage (VIN=4.5V) and the input ground to the VIN and GND pins, respectively.
4. LDO; is a Output with maximum load current 10mA.
5. Set the battery charge current I<sub>CHG</sub> should be follow under equation:

$$I_{CHG} = \frac{1A \times 1.55k\Omega}{R_{CHG}}$$

Where the R<sub>CHG</sub> are R3, R4 and R5

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