

DESCRIPTION

The EV3120EJ-00A is a Boost converter evaluation board for the MP3120EJ, a synchronous, 1.1MHz fixed frequency, current mode step-up converter with output to input disconnect.

It can startup from an input voltage as low as 0.8V and provides inrush current limiting as well as output short circuit protection.

The output voltage also can be regulated when $V_{in} > U_o$, and the P-channel MOS is no longer act as a low impedance switch.

The EV3120EJ-00A regulates the output voltage up to 3.3V from single cell AA battery without the uses of an external Schottky diode.

The MP3120EJ is offered in a TSOT23-6 package.

ELECTRICAL SPECIFICATION

| Parameter | Symbol | Value | Units |
|----------------|-----------|-------|-------|
| Input Voltage | V_{IN} | 0.8-5 | V |
| Output Voltage | V_{OUT} | 3.3 | V |

FEATURES

- Up to 96% Efficiency
- True Output Load Disconnect
- Inrush Current Limiting and Internal Soft-Start
- Low Voltage Start-Up: 0.8V
- Internal Synchronous Rectifier
- Current Mode Control with Internal Compensation
- Short-Circuit Protection
- 1.1MHz Fixed Frequency Switching
- Input Range: 0.8V to 5V
- Output Range: 2.5V to 5V
- Tiny External Components
- Small 6-lead ThinSOT Package

APPLICATION

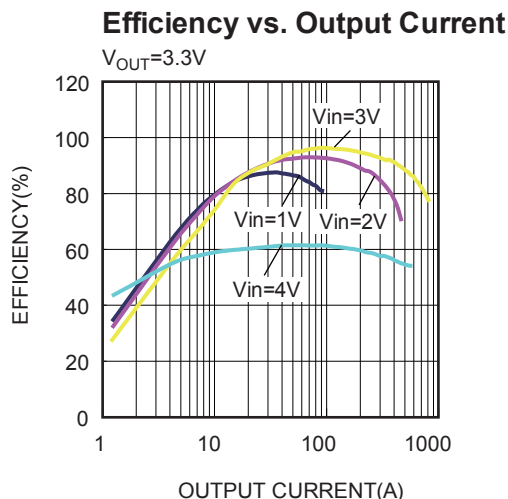
- Single-cell, Two-cell and Three-cell Alkaline, NiCd or NiMH or single-cell Li Battery Consumer Products
- MP3 Players
- Wireless Mouse
- Audio Recorders

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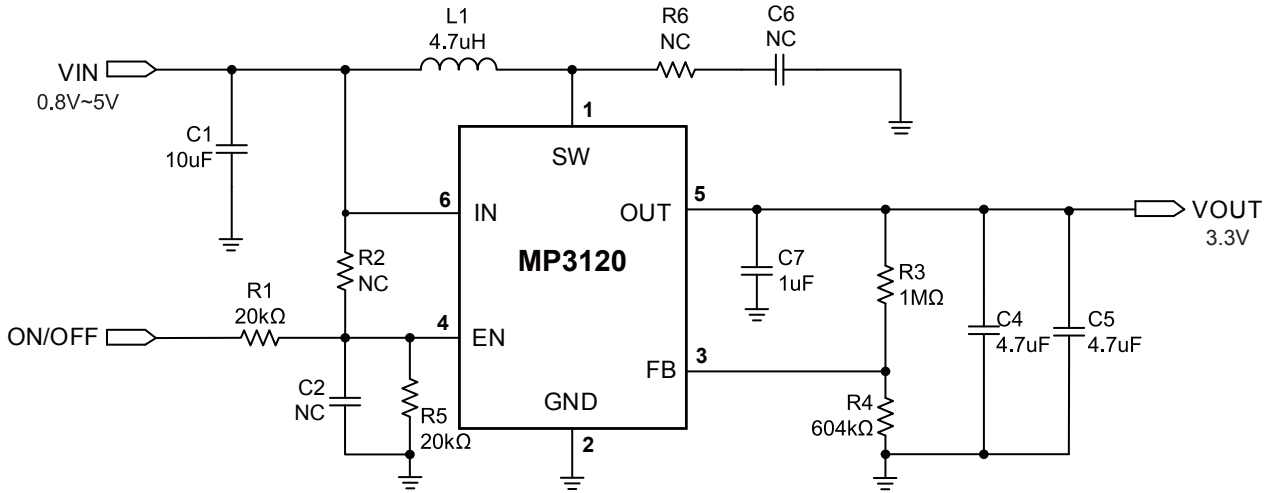
EV3120EJ-00A EVALUATION BOARD



| Board Number | MPS IC Number |
|--------------|---------------|
| EV3120EJ-00A | MP3120EJ |



EVALUATION BOARD SCHEMATIC



EV3120EJ-00A BILL OF MATERIALS

| Qty | Ref | Value | Description | Package | Manufacturer | Manufacturer P/N |
|-----|--------|-------|-----------------------------|---------|--------------|------------------|
| 1 | L1 | 4.7uH | 1.6A inductor | SMD | TDK | SLF6028T-4R7M1R6 |
| 1 | C1 | 10uF | Ceramic Capacitor, 25V, X7R | 1210 | TDK | C3225X5R1E106K |
| 1 | C2 | NC | | 0603 | TDK | |
| 1 | C3 | 150p | Ceramic Capacitor, 50V, X7R | 0603 | TDK | C1608X7R1C151K |
| 2 | C4, C5 | 4.7uF | Ceramic Capacitor, 16V, X7R | 1206 | TDK | C3216X7R1C475K |
| 1 | C6 | NC | | | | |
| 1 | R1 | 20kΩ | Resistor 5% | 0603 | Yageo | RC0603JR-0720KL |
| 1 | R2 | NC | | | | |
| 1 | R3 | 1MΩ | Resistor 1% | 0603 | Yageo | RC0603FR-071ML |
| 1 | R4 | 604kΩ | Resistor 1% | 0603 | Yageo | RC0603FR-07604KL |
| 1 | R5 | 20kΩ | Resistor 5% | 0603 | Yageo | RC0603JR-0720KL |
| 1 | R6 | NC | | | | |

PRINTED CIRCUIT BOARD LAYOUT

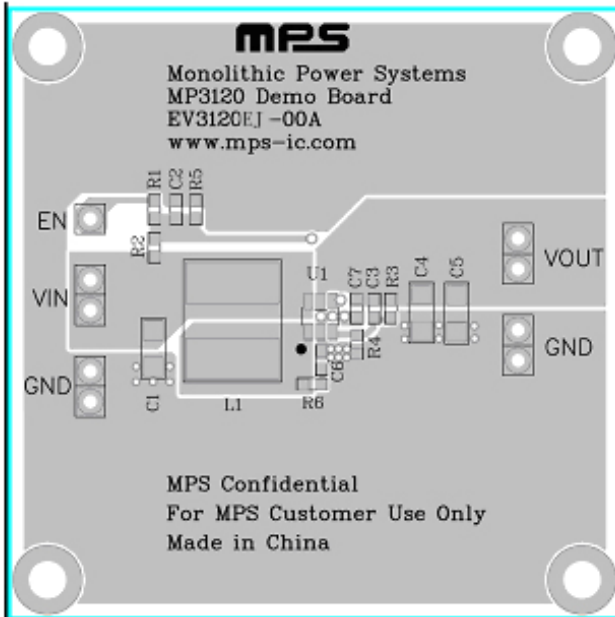


Figure1-Top layer and Top silk

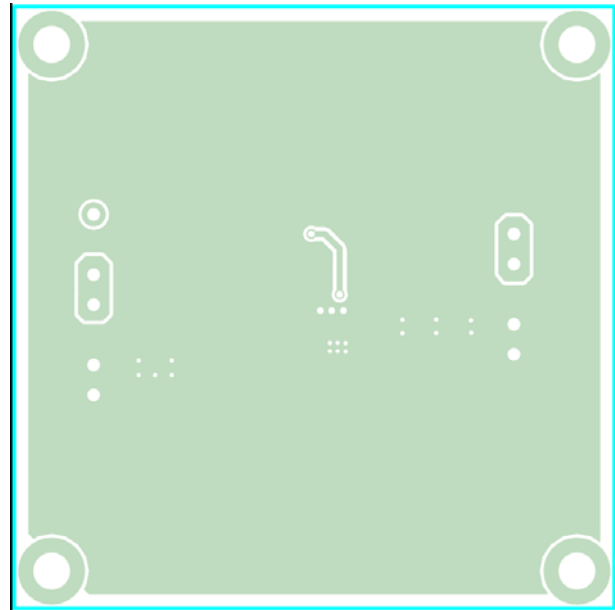


Figure2-Bottom Layer

QUICK START GUIDE

The output voltage of this board is set to 3.3V. The board layout accommodates most commonly used inductors and output capacitors.

1. Preset power supply to $0.8V \leq U_{IN} \leq 5V$;
2. Turn off the power supply;
3. Connect power supply terminals to
Positive(+): IN
Negative(-): GND
4. Connect Load to:
Positive(+): OUT
Negative(-): GND
5. Connect the EN to 5V power supply
Positive(+): EN
Negative(-): GND
6. Turn on the power supply;
7. The output voltage U_{OUT} can be adjusted by changing R3. And the value of R3 can be calculated by the following formula:

$$R3 = R4 \times \left(\frac{U_{OUT} - U_{FB}}{U_{FB}} \right)$$

Where $U_{FB}=1.2V$ and $R4=604k\Omega$

For example, if $U_{OUT}=3.3V$

$$R3 = 604k\Omega \times \left(\frac{3.3 - 1.2}{1.2} \right) = 1057k\Omega$$

Therefore use a 1M Ω resistor.

8. The U_{OUT} in the EVB is set to 3.3V, if other output is need the R3 can be changed.

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