General Description

The MIC5234 is a low-quiescent current, μCap low-dropout regulator. A maximum operating input voltage of 30V and quiescent current of 20μA make it ideal for supplying keep-alive power in systems with high-voltage batteries.

Capable of 150mA output, the MIC5234 has a dropout voltage of only 320mV. It can also survive an input transient of –20V to +32V. The MIC5234 needs only a 2.2μF output capacitor for stable operation.

The MIC5234 is available in an 8-pin ePad SOIC package with a junction operating range from –40°C to +125°C.

Data sheets and support documentation are available on the Micrel web site: www.micrel.com.

Requirements

The MIC5234YME Evaluation Board requires a 2.3V to 30V power supply, and a test load. Make sure that the power supply can provide the wattage needed for the chosen test load. The load can be active (electronic load) or passive (resistor). Additionally, monitor the Power Good output (PG) with a multimeter or an oscilloscope.

Precautions

There is no reverse input protection on this board. While connecting supplies and signals, make sure that correct polarities are observed.

Getting Started

1. **V IN Supplies**

   Connect the V IN supply (2.3V to 30V) across the VIN and GND terminals. Monitor V IN at the VIN and GND terminals with a voltmeter. JP1 is a 2-pin header test point provided for monitoring V IN.

2. **Enable Inputs**

   The enable input EN is logic high active and needs pull up to input or a voltage source. When EN is pulled low the output is off; when EN is high the output is on.

3. **Monitor Outputs**

   Monitor the output V OUT with a scope or DVM connected across the VOUT and GND terminals.

4. **Output Load**

   Connect a load across the VOUT and GND terminals. Use an active or passive load.

5. **Turn On the Power**

   Turn on the power supply and verify that V OUT = 1.8V.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIC5234YME EV</td>
<td>Evaluation Board for the MIC5234YME</td>
</tr>
</tbody>
</table>
Evaluation Board Features

See the \textit{MIC5234 Data Sheet} for detailed explanations of these functions.

Enable (EN)

EN allows the MIC5234 to turn on/off. A logic low on EN pin keeps MIC5234 in shutdown mode with a typical 0.1\(\mu\)A input current.

Output Adjust (ADJ)

The MIC5234 can be adjusted from 1.24V to 20V by using two external resistors. The resistors set the output voltage based on Equation 1:

\[
V_{\text{out}} = V_{\text{REF}} \times \left(1 + \frac{R_1}{R_2}\right) \quad \text{Eq. 1}
\]

Where \(V_{\text{REF}} = 1.23V\).

The evaluation board is provided with \(R_2=120\Omega\) and jumper (JP3-JP6) to easily set the output voltage to 5V, 3.3V, 2.5V, and 1.8V.

Reverse Current Protection

The MIC5234 is designed to limit the reverse current flow from output to input if the MIC5234 output has been tied to the output of another power supply.

Output Capacitor

The MIC5234 has been designed to minimize the effect of the output capacitor ESR on the closed loop stability. As a result, ceramic or film capacitors can be used at the output. Stability can also be maintained throughout the specified load and line conditions with 2.2\(\mu\)F film or ceramic capacitors.

Input Capacitor

An input capacitor may be needed when the device is not near the source power supply or when it is supplied by a battery. Small, surface mount, ceramic capacitors can be used for bypassing. Larger values may be needed if the source supply has high ripple.
## Evaluation Board Schematic

![Evaluation Board Schematic](image)

## Bill of Materials

<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
<th>Manufacturer</th>
<th>Description</th>
<th>Qty.</th>
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<td>EKY-500ELL101MHB5D</td>
<td>United Chemi-con&lt;sup&gt;(1)&lt;/sup&gt;</td>
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<td>AVX&lt;sup&gt;(2)&lt;/sup&gt;</td>
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<td>Murata&lt;sup&gt;(3)&lt;/sup&gt;</td>
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<td>AVX</td>
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<td>U1</td>
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<td>Micrel&lt;sup&gt;(6)&lt;/sup&gt;</td>
<td>Low-Quiescent Current µCap LDO Regulator</td>
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### Notes:
1. United Chemi-Con: [www.chemi-con.com](http://www.chemi-con.com).
2. AVX: [www.avx.com](http://www.avx.com).
4. TDK: [www.tdk.com](http://www.tdk.com).
5. Vishay: [www.vishay.com](http://www.vishay.com).
Evaluation Board PCB Layout

MIC5234 Evaluation Board Top Layer

MIC5234 Evaluation Board Top Silk
Evaluation Board PCB Layout (Continued)