MCP1702

2 μA Low Dropout Positive Voltage Regulator Product Brief

Features:
- 2.0 μA Typical Quiescent Current
- Input Operating Voltage Range: 2.7V to 13.2V
- Low Dropout Voltage:
  - 650 mV (typ.) @ 250 mA (VOUT = 2.5V)
- 250 mA Output Current for Output Voltages ≥ 2.5V
- 200 mA Output Current for Output Voltages < 2.5V
- High-Accuracy Output Voltage: ±2% (max.)
- Low Temperature Drift: ±100 ppm/°C (typ.)
- Excellent Line Regulation: 0.2%/V (typ.)
- Package Options: 3-Pin SOT-23A, 3-Pin SOT-89, and 3-Pin TO-92
- Short Circuit Protection and Thermal Shutdown Protection
- Stable with 1.0 μF to 22 μF Output Capacitance
- Standard Output Voltage Options:
  - 1.20V, 1.5V, 1.8V, 2.5V, 2.8V, 3.0V, 3.3V, 4.0V, 5.0V

Applications:
- Battery-Powered Devices
- Battery-Powered Alarm Circuits
- Smoke Detectors
- CO2 Detectors
- Smart Battery Packs
- PDAs
- Low Quiescent Current Voltage Reference
- Cameras and Portable Video Equipment
- Pagers and Cellular Phones
- Solar-Powered Instruments
- Consumer Products
- Microcontroller Power
- Battery Powered Data Loggers

General Description:
The MCP1702 is a family of CMOS low dropout (LDO), positive voltage regulators that can deliver up to 250 mA of current while consuming only 2.0 μA of quiescent current (typ.). The input operating voltage range is specified up to 13.2V, making it ideal for lithium-ion (one, two or three cells), 9V alkaline and other three to six primary cell battery-powered applications.

The MCP1702 is capable of delivering 250 mA with an input-to-output voltage differential (dropout voltage) of 650 mV. The low dropout voltage extends the battery operating lifetime. It also permits high currents in small packages when operated with minimum VIN – VOUT differentials.

The MCP1702 has a tight tolerance output voltage regulation of ±0.5% (typ.) and very good line regulation at ±0.2%/V. The LDO output is stable when using only 1 μF of output capacitance of either ceramic, tantalum or aluminum-electrolytic style capacitors. The MCP1702 LDO also incorporates short circuit and thermal shutdown protection to ensure maximum reliability.

The MCP1702 device is offered in the 3-pin SOT-23A, 3-pin SOT-89, and 3-Pin TO-92 package options with a temperature range of -40°C to +125°C.

Related Literature:
- AN766, “Pin-Compatible CMOS Upgrades to Bipolar LDOs”, DS00766, Microchip Technology Inc., 2002

Package Types

3-Pin SOT-23A

3-Pin SOT-89

3-Pin TO-92

Note: 3-Pin SOT-23A is equivalent to the EIAJ SC-59.
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Functional Block Diagram

Typical Application Circuits
Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
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