

Power Management Fact Sheet

MC34700

9.0V to 18V quad-output power supply

Overview

The MC34700 is a 9.0V to 18V quad-output integrated MOSFET power supply that is ideal for power designs in space-constrained applications. This power management IC contains three step-down switching regulators and one low-dropout linear regulator, making it a compact, simple-to-use and flexible general-purpose power product for a variety of power design requirements.

Four Power Rails from One Control IC

Four output rails can be generated from a single control IC, supplying power for such components as microprocessors, microcontrollers, memory, small motors and LCD panels. The switching regulators utilize voltage-mode control with external compensation, allowing flexibility in optimizing the performance of the MC34700 for the needs of a given application. Each output channel features a separate enable input, providing control over the power-up sequencing characteristics of all four output power rails.

Wide Operating Range

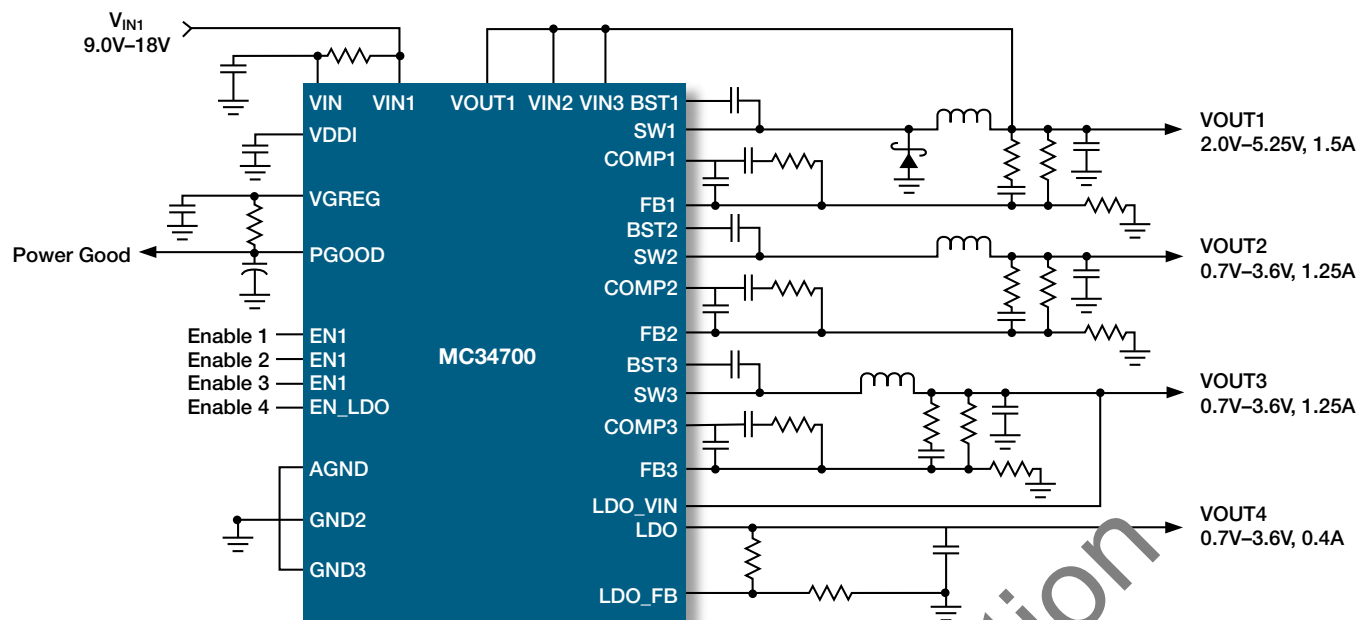
Channel 1 of the MC34700 can operate from an input voltage of 9.0V to 18V, while channels 2, 3 and 4 operate from an input voltage of 1.5V to 6.0V. Channels 2 and 3 can derive their input supplies from the output of channel 1 or from an external bias voltage. Channel 4 can derive its input supply from any of the outputs of channels 1 through 3, or from an external bias voltage.

The MC34700 features a power-good output, in addition to overvoltage, undervoltage, overcurrent and overtemperature protection, ensuring robust and reliable operation and exceptional fault tolerance. In addition to the internal power MOSFETs, the MC34700 features a fixed 800 kHz switching frequency and internal soft-start, enabling rapid power supply design and development. This frees the power designer from the burden of choosing power MOSFETs, optimizing switching frequencies or programming soft-start times.

Applications

- Set-top boxes
- Cable modems
- Point-of-sale terminals
- Laser printers
- Inkjet printers
- Scanners
- Televisions
- Small appliances
- Telecom line cards
- DVD players

MC34700 Simplified Application Diagram



Features

- Three switching regulators: two synchronous and one non-synchronous
- One low dropout linear regulator
- Output current capability:
 - 1.5A continuous on channel 1
 - 1.25A continuous on channels 2 and 3
 - 400 mA continuous on channel 4
- Internal power MOSFETs on all channels
- Voltage feedforward on channel 1
- $\pm 1.5\%$ output voltage accuracy on all channels
- Cycle-by-cycle current limit and short-circuit protection
- Fixed 800 kHz switching frequency
- Internal soft-start
- Overvoltage and undervoltage protection
- Overtemperature protection
- Open-drain power-good output signal
- Separate active high enable input for each channel

Parametric Table

Performance	Typical Values
Voltage Regulators	3 Buck DC/DC, 1 Linear
Output Voltages	VOUT1 = 2.0V to 5.25V; VOUT2 = 0.7V to 3.6V; VOUT3 = 0.7V to 3.6V; LDO = 0.7V to 3.6V
Output Currents	IOUT1 = 1500mA; IOUT2 and IOUT3 = 1250mA; LDO = 400mA
PWM	800 KHz
ESD	2 KV
Control Communication	Parallel
Operating Voltage	VIN1 = 9-18V; VIN2, VIN3, LDO_VIN = 1.5-6V
Temp. Ranges (T _A)	-40°C to +85°C

Orderable Parts

Part Number	Description
MC34700EP/R2	9.0-18V, 4-ch. multi-purpose power supply
KIT34700EPEVBE	Evaluation board

Documentation

Document Number	Document Type	Description
MC34700	Data Sheet	Electrical specifications for this product
SG1002	Selector Guide	Analog and power management device comparison
AN3592	Application Note	Low power management unit with MC34700
AN1902	Application Note	Quad Flat No-Lead (QFN)

Learn More: For more information about Freescale products, please visit www.freescale.com/analog.