



600mA, Ultra-low Noise LDO Regulator

General Description

The LP3986H is designed for portable applications with demanding performance and space requirements. The LP3986H performance is optimized for battery-powered systems to deliver ultra low noise and low quiescent current. Regulator ground current increases only slightly in dropout, further prolonging the battery life. The LP3986H also works with low-ESR ceramic capacitors, reducing the amount of board space necessary for power applications, critical in hand-held wireless devices. The other features include ultra low dropout voltage, high output accuracy, current limiting protection, and high ripple rejection ratio. Available in the 3-lead of SOT-23 and SOT-89 packages.

Order Information

| | | | | | |
|---------|--------------|------|---|---|---|
| LP3986H | □ | □ | □ | □ | □ |
| | F: Pb-Free | | | | |
| | Package Type | | | | |
| | B3: SOT23-3 | | | | |
| | X3: SOT-89 | | | | |
| | Output Type | | | | |
| | 12: | 1.2V | | | |
| | 15: | 1.5V | | | |
| | 18: | 1.8V | | | |
| | 25: | 2.5V | | | |
| | 28: | 2.8V | | | |
| | 30: | 3.0V | | | |
| | 33: | 3.3V | | | |
| | 50: | 5.0V | | | |

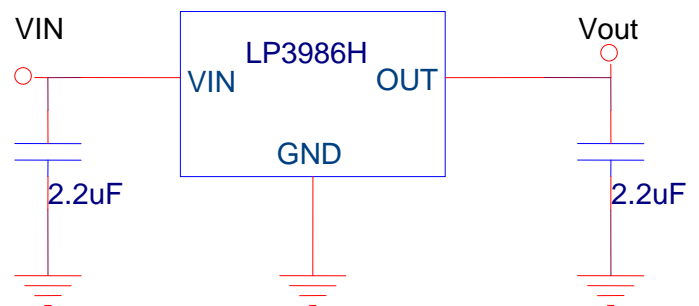
Features

- ◆ Ultra-Low-Noise for RF Application
- ◆ 2.5V- 6.5V Input Voltage Range
- ◆ Low Dropout : 480mV @ 600mA
- ◆ Ultra-Fast Response in Line/Load Transient
- ◆ Current Limiting and Thermal Shutdown Protection

Applications

- ◇ PMP/PDA/MP3 players
- ◇ Cellular and Mobile phone
- ◇ RF Module
- ◇ Sensor Module

Typical Application Circuit



Marking Information

| Device | Marking | Package | Shipping |
|------------|---------|---------|----------|
| LP3986HB3F | | SOT23-3 | 3K/REEL |
| LP3986HX3F | | SOT89 | 1K/REEL |



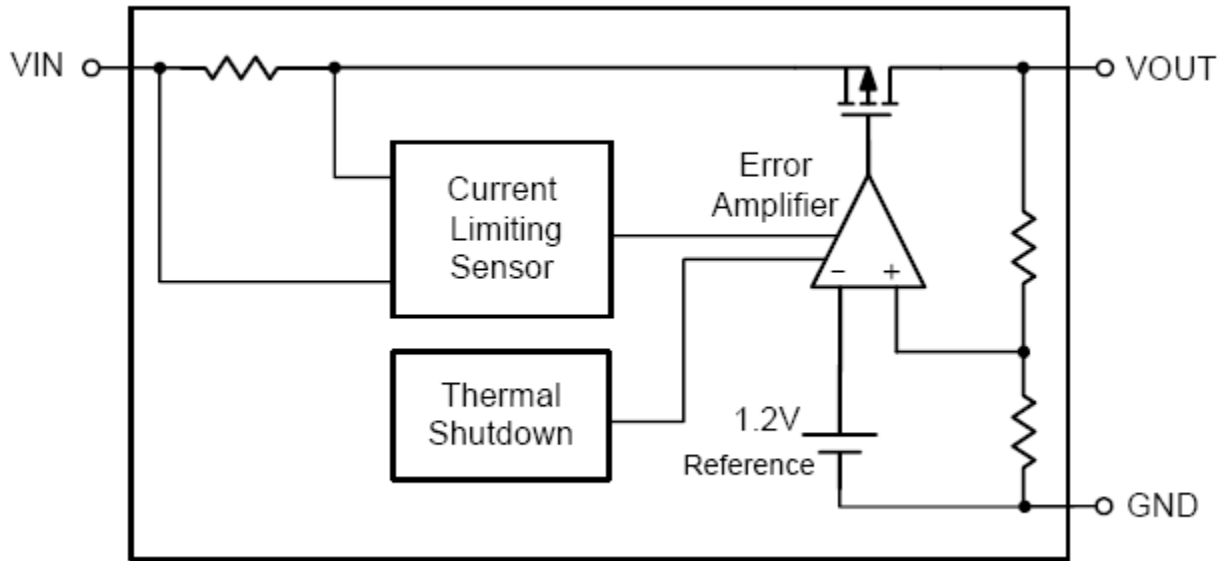
Functional Pin Description

| Package Type | Pin Configurations |
|------------------|--------------------|
| SOT23-3 / SOT-89 | |

Pin Description

| Pin | | Name | Description |
|--------|---------|------|------------------|
| SOT-89 | SOT23-5 | | |
| 1 | 1 | GND | Ground. |
| 2 | 3 | VIN | Power Input Pin. |
| 3 | 2 | OUT | Output Pin. |

Function Diagram





Absolute Maximum Ratings

- ◇ Supply Input Voltage ----- 7V
Power Dissipation, PD @ TA = 25°C
- ◇ SOT-23 ----- 450mW
- ◇ SOT-89 ----- 700mW
- Package Thermal Resistance
- ◇ SOT-23, θ_{JA} ----- 250°C/W
- ◇ SOT-89, θ_{JA} ----- 165°C/W
- ◇ Lead Temperature (Soldering, 10 sec.) ----- 260°C
- ◇ Storage Temperature Range ----- -65°C to 165°C
- ESD Susceptibility
- ◇ HBM (Human Body Mode) ----- 2kV
- ◇ MM(Machine-Mode) ----- 200V
- Recommended Operating Conditions
- ◇ Supply Input Voltage ----- 2.5V to 6V
- ◇ Operation Junction Temperature Range ----- -40°C to 125°C
- ◇ Operation Ambient Temperature Range ----- -40°C to 85°C

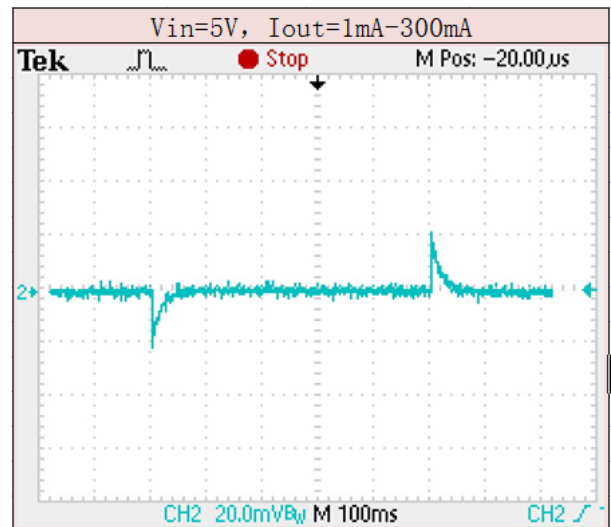
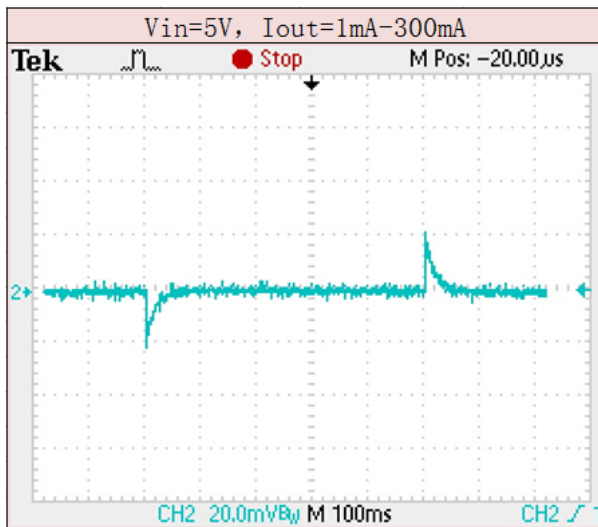
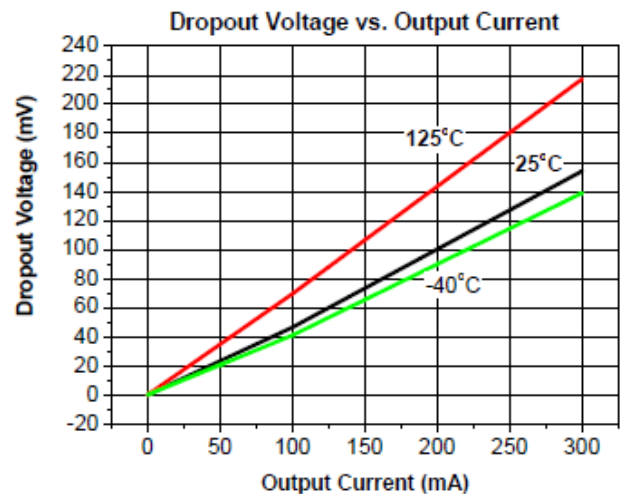
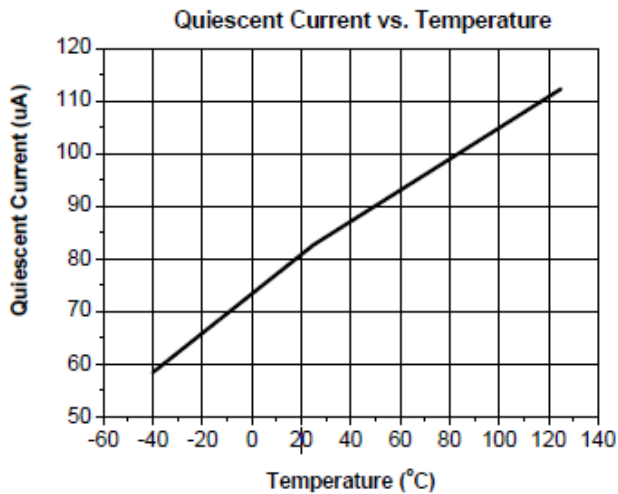
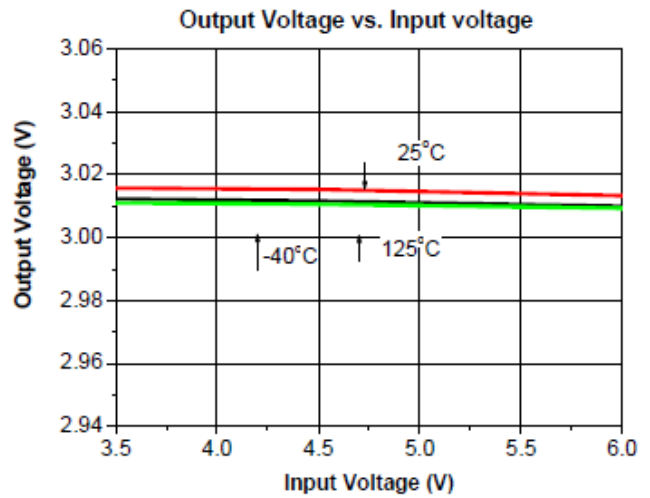
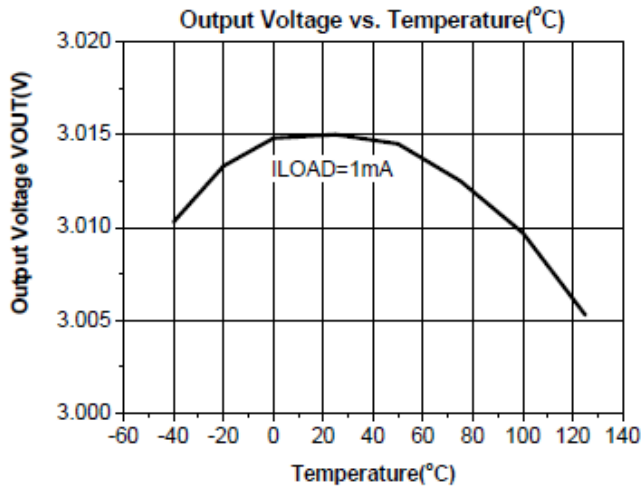
Electrical Characteristics

(VIN = VOUT + 1V, CIN = COUT = 2.2μF, TA = 25° C, unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ. | Max | Units |
|------------------------------|--------------------------|--|-----|------|-----|-------|
| Output Voltage Accuracy | $\Delta V_{OUT}/V_{OUT}$ | $I_{OUT} = 1mA$ | -3 | -- | +3 | % |
| Current Limit | I_{LIM} | $R_{LOAD} = 1\Omega$ | 650 | | | mA |
| Quiescent Current | I_Q | $I_{OUT} = 0mA$ | | 90 | | μA |
| Dropout Voltage | V_{DROP} | $I_{OUT} = 600mA, V_{OUT} > 2.8V$ | | 480 | | mV |
| Line Regulation | $\Delta V_{OUT}/V_{OUT}$ | $V_{IN} = (V_{OUT} + 1V) \text{ to } 5.5V,$ $I_{OUT} = 1mA$ | | | 0.2 | % |
| Load Regulation | ΔV_{LOAD} | $1mA < I_{OUT} < 300mA$ | | | 2 | % |
| Thermal Shutdown Temperature | T_{SD} | | | 150 | | °C |
| Thermal Shutdown Hysteresis | | | | 20 | | °C |



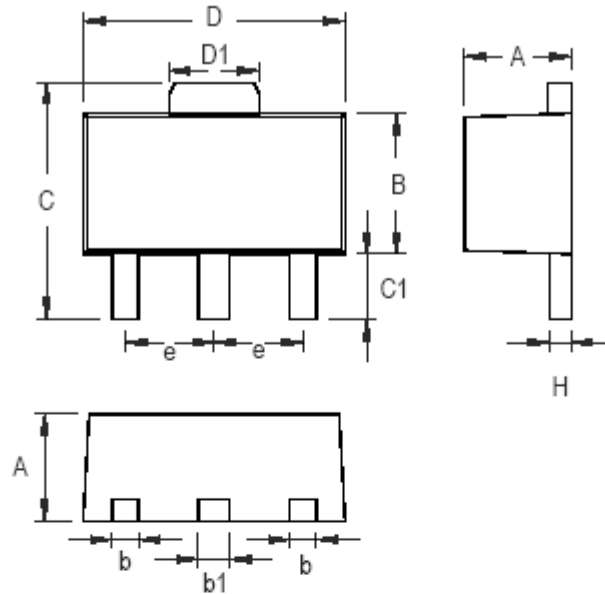
Typical Operating Characteristics





Packaging Information

SOT-89-3

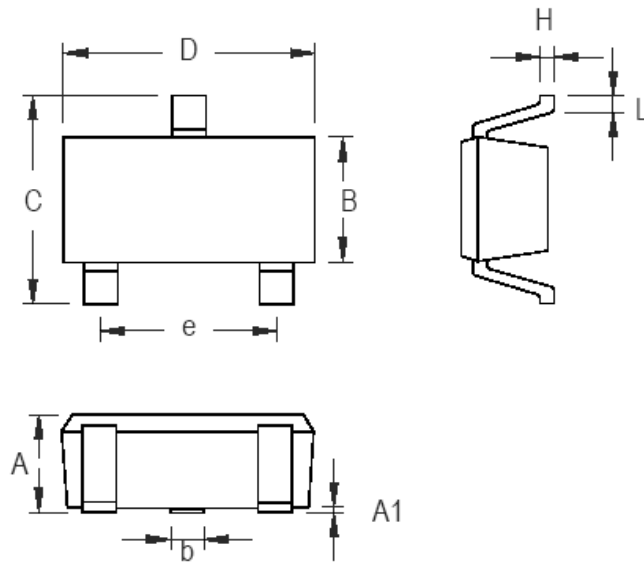


| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.397 | 1.600 | 0.055 | 0.063 |
| b | 0.356 | 0.483 | 0.014 | 0.019 |
| B | 2.388 | 2.591 | 0.094 | 0.102 |
| b1 | 0.406 | 0.533 | 0.016 | 0.021 |
| C | 3.937 | 4.242 | 0.155 | 0.167 |
| C1 | 0.787 | 1.194 | 0.031 | 0.047 |
| D | 4.394 | 4.597 | 0.173 | 0.181 |
| D1 | 1.397 | 1.753 | 0.055 | 0.069 |
| e | 1.448 | 1.549 | 0.057 | 0.061 |
| H | 0.356 | 0.432 | 0.014 | 0.017 |

3-Lead SOT-89 Surface Mount Package



SOT23-3



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.889 | 1.295 | 0.035 | 0.051 |
| A1 | 0.000 | 0.152 | 0.000 | 0.006 |
| B | 1.397 | 1.803 | 0.055 | 0.071 |
| b | 0.356 | 0.508 | 0.014 | 0.020 |
| C | 2.591 | 2.997 | 0.102 | 0.118 |
| D | 2.692 | 3.099 | 0.106 | 0.122 |
| e | 1.803 | 2.007 | 0.071 | 0.079 |
| H | 0.080 | 0.254 | 0.003 | 0.010 |
| L | 0.300 | 0.610 | 0.012 | 0.024 |

SOT-23 Surface Mount Package

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