



## 300mA, Ultra-low Noise LDO Regulator

### General Description

The LP3986 is designed for portable applications with demanding performance and space requirements. The LP3986 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 LP3986 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 packages

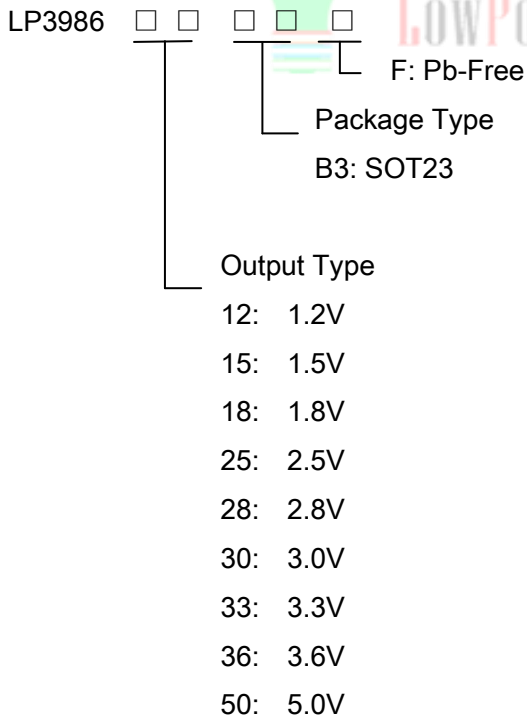
### Features

- ◆ Ultra-Low-Noise for RF Application
- ◆ 2.5V- 6V Input Voltage Range
- ◆ Low Dropout : 220mV @ 300mA
- ◆ Ultra-Fast Response in Line/Load Transient
- ◆ Current Limiting and Thermal Shutdown Protection

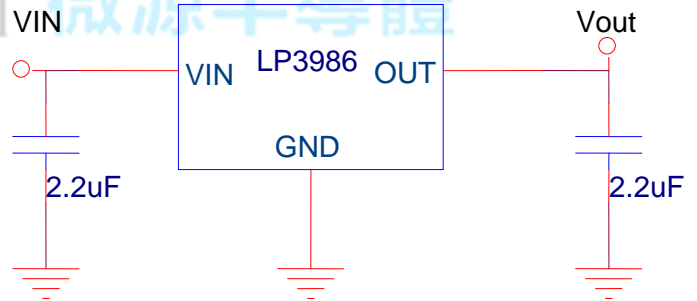
### Applications

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

### Order Information



### Typical Application Circuit

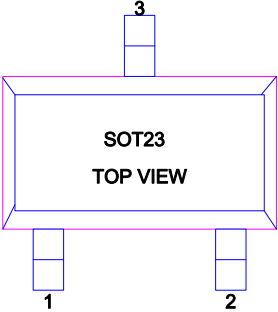


### Marking Information

| Device    | Marking | Package | Shipping |
|-----------|---------|---------|----------|
| LP3986B3F |         | SOT23-3 | 3K/REEL  |



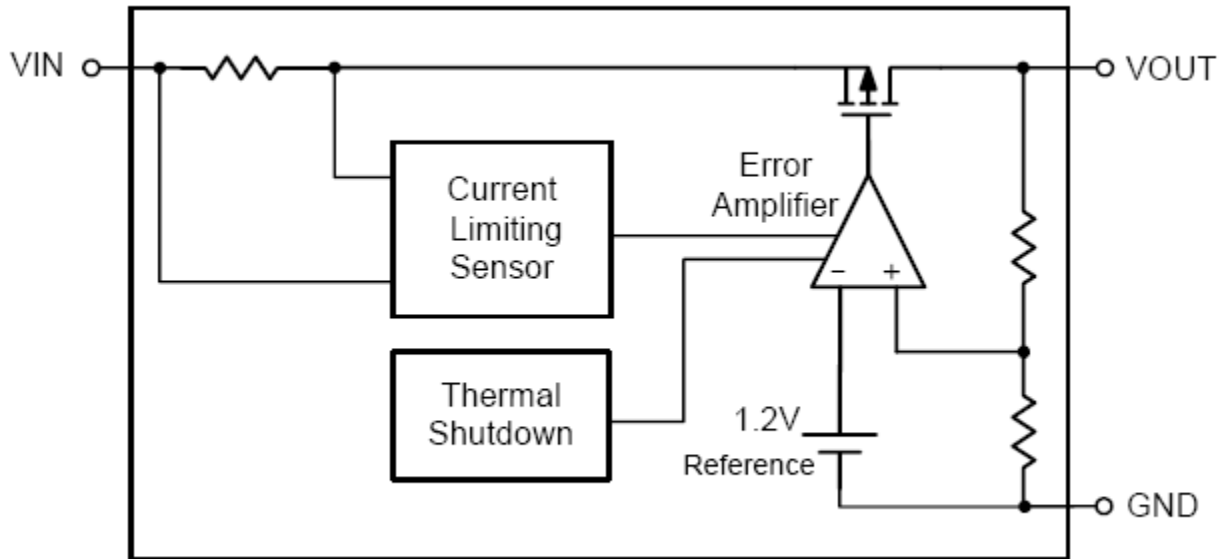
### Functional Pin Description

| Package Type | Pin Configurations   |
|--------------|--|
| SOT23        |  |

### Pin Description

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

### Function Diagram





## Absolute Maximum Ratings

- ◇ Supply Input Voltage ----- 7V  
Power Dissipation, PD @ TA = 25°C
- ◇ SOT-23-3 ----- 350mW  
Package Thermal Resistance
- ◇ SOT-23-3,  $\theta_{JA}$  ----- 350°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

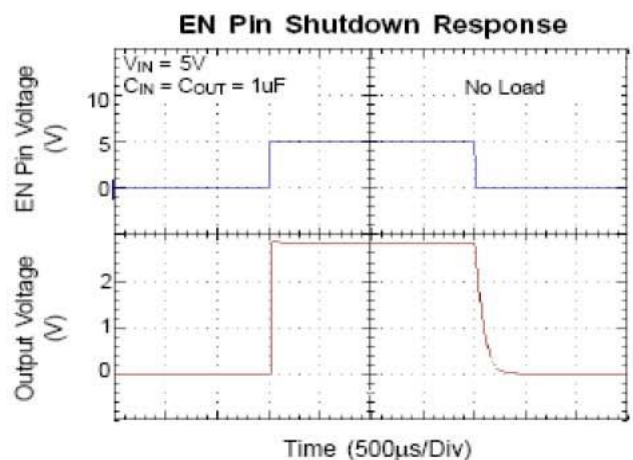
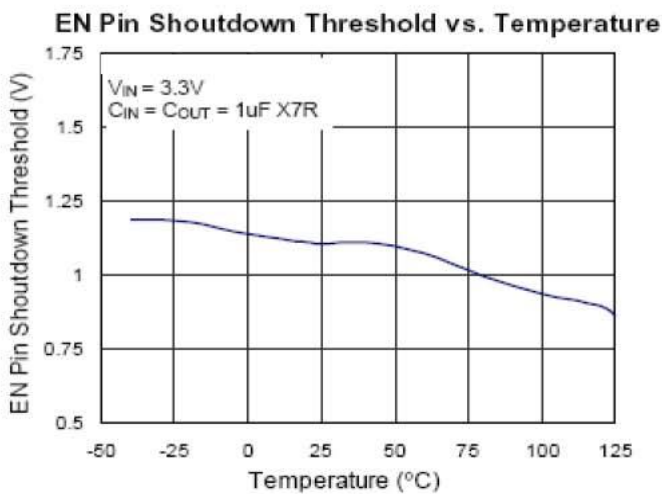
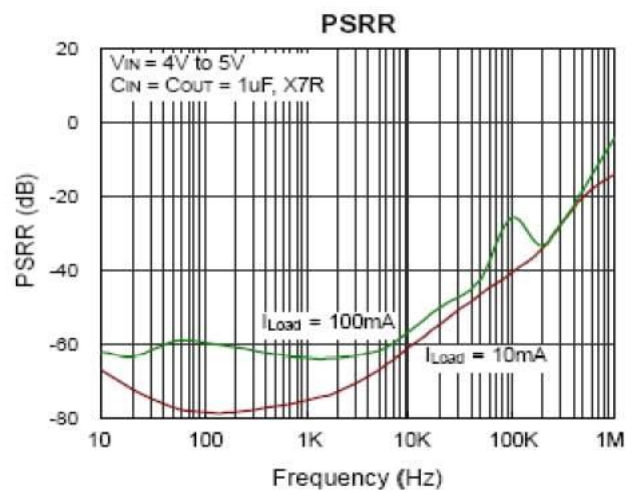
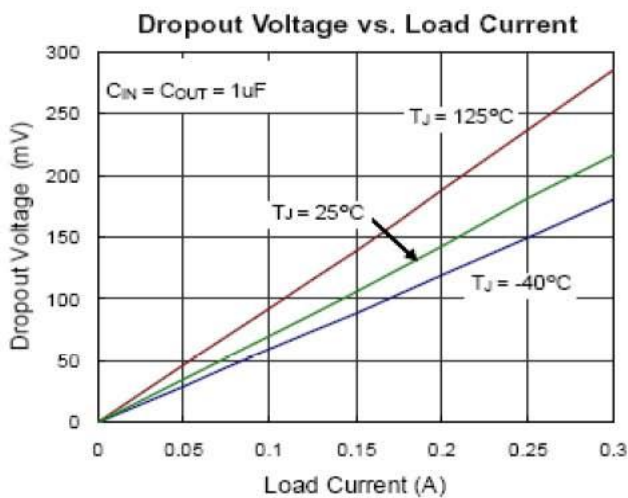
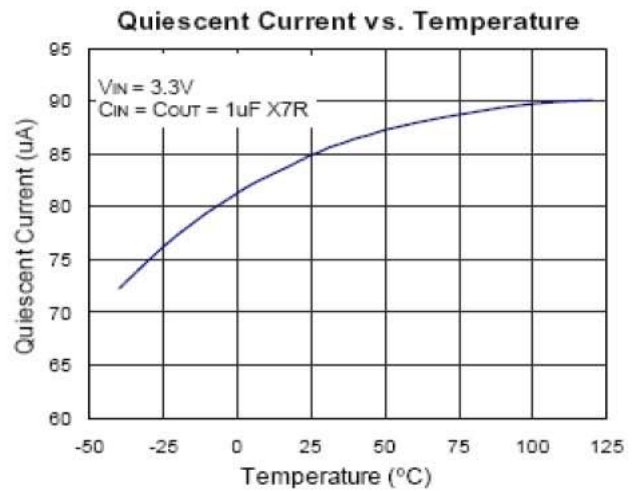
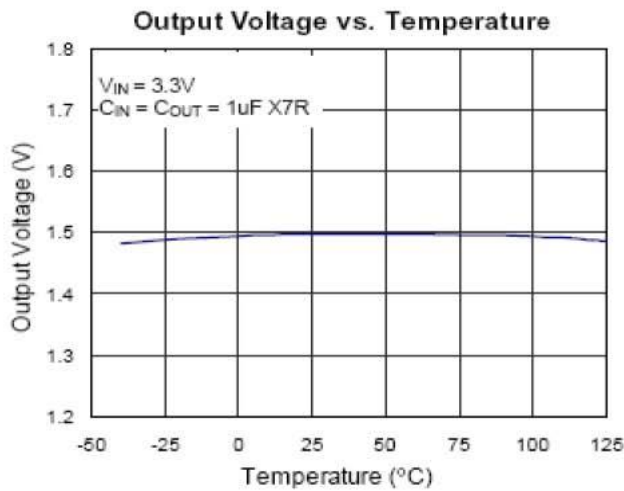
## Electrical Characteristics

(LP3986-33B3F, VIN = VOUT + 1V, CIN = COUT = 2.2μF, TA = 25° C, unless otherwise specified)

| Parameter                       | Symbol            | Test Conditions                          | Min | Typ. | Max | Units |
|---------------------------------|-------------------|--|-----|------|-----|-------|
| Output Voltage Accuracy         | $\Delta V_{OUT}$  | IOUT = 1mA                               | -3  | --   | +3  | %     |
| Output Voltage                  | VOUT              | IOUT = 1mA                               |     | 3.33 |     | V     |
| Current Limit                   | ILIM              | RLOAD = 1Ω                               | 350 |      |     | mA    |
| Quiescent Current               | IQ                | IOUT = 0mA, Vout=3.3V                    |     | 75   | 130 | μA    |
| Dropout Voltage                 | VDROP             | IOUT = 300mA, VOUT > 2.8V                |     | 220  | 300 | mV    |
| Line Regulation                 | $\Delta V_{LINE}$ | VIN = (VOUT + 1V) to 5.5V,<br>IOUT = 1mA |     |      | 0.2 | %     |
| Load Regulation                 | $\Delta V_{LOAD}$ | 1mA < IOUT < 300mA                       |     |      | 2   | %     |
| Power Supply Rejection<br>Reat  | PSRR              | Iout=100mA F=1KHz                        |     | -76  |     | dB    |
|                                 |                   | Iout=100mA F=10KHz                       |     | -65  |     | dB    |
| Thermal Shutdown<br>Temperature | TSD               |  |     | 150  |     | °C    |
| Thermal Shutdown<br>Hysteresis  |                   |  |     | 20   |     | °C    |

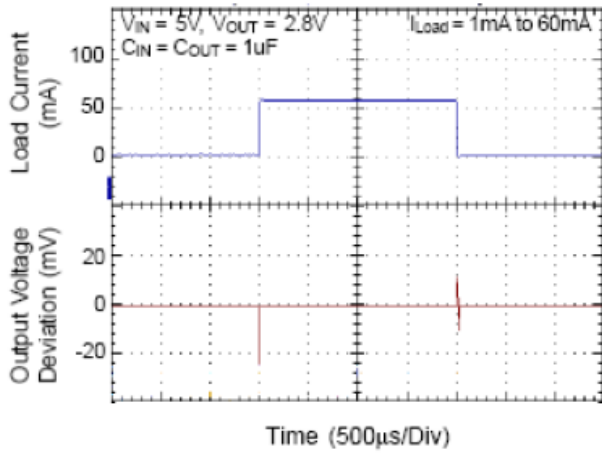


## Typical Operating Characteristics

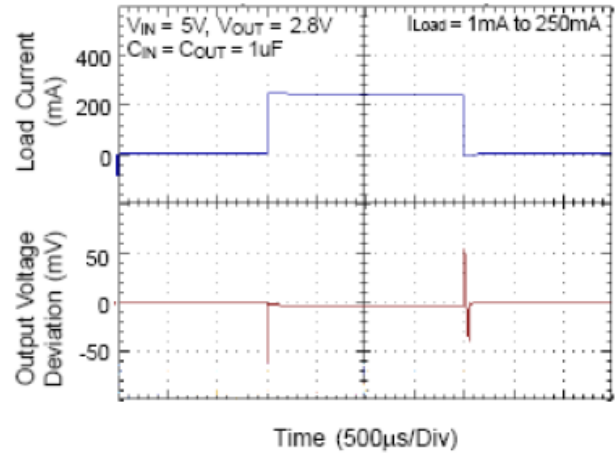




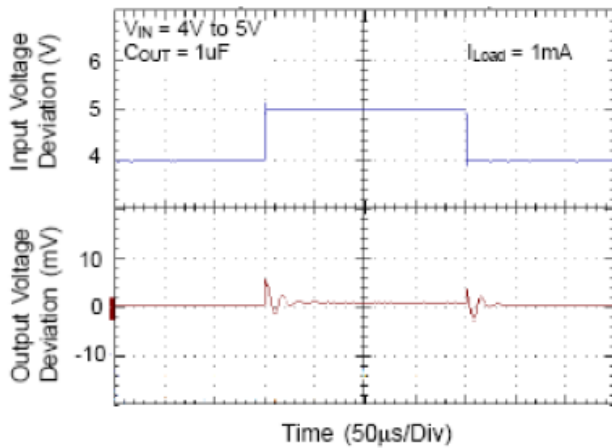
Load Transient Response



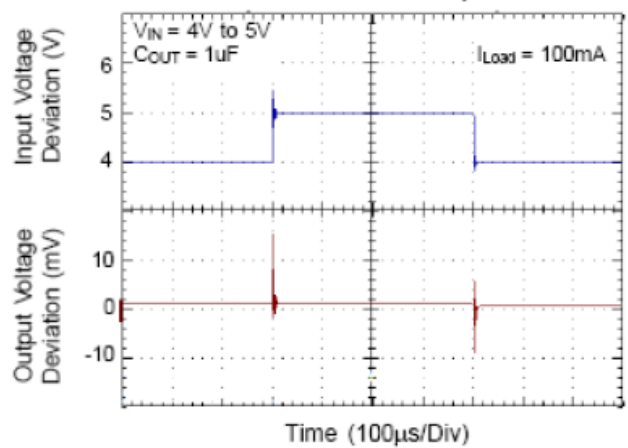
Load Transient Response



Line Transient Response



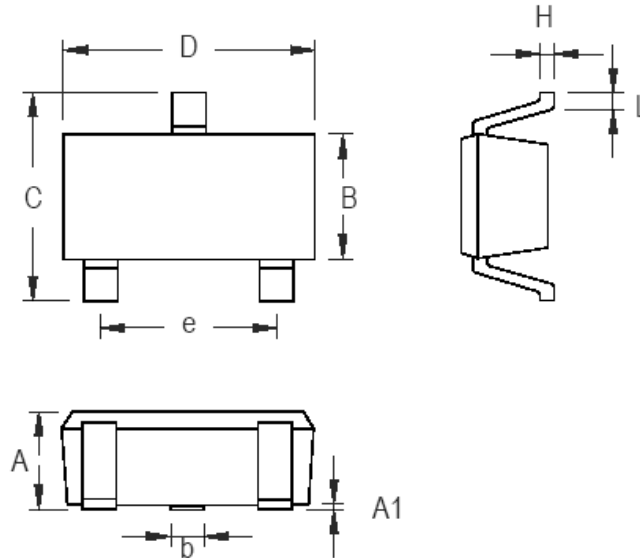
Line Transient Response





### Packaging Information

#### 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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