

# 300mA Low Dropout Linear Regulator

## DESCRIPTION

The EUP7968 is a 300mA fixed output voltage low dropout linear regulator operating from 2.5V to 5.5V input. Typical ground current is approximately 90 $\mu$ A. Built-in output current-limiting and thermal-limiting provide maximal protection against any fault conditions.

The EUP7968 is available in 1.2V, 1.5V, 1.8V, 2.5V, 2.8V, 3V, 3.3V and 3.5V versions.

## FEATURE

- Very Low Dropout Voltage of 170mV at Output Current 300mA
- Guaranteed 300mA Output Current
- Low Ground Current at 90 $\mu$ A
- Stable with low ESR Ceramic Capacitors
- Fast Transient Response
- Current-limiting and Thermal Protection
- SOT23-3 and SOT89 Package
- RoHS Compliant and 100% Lead (Pb)-Free

## APPLICATIONS

- Voltage Regulator for LAN Card, CD-ROM, and DVD
- Wireless Communication Systems
- Battery Powered Systems

## Block Diagram

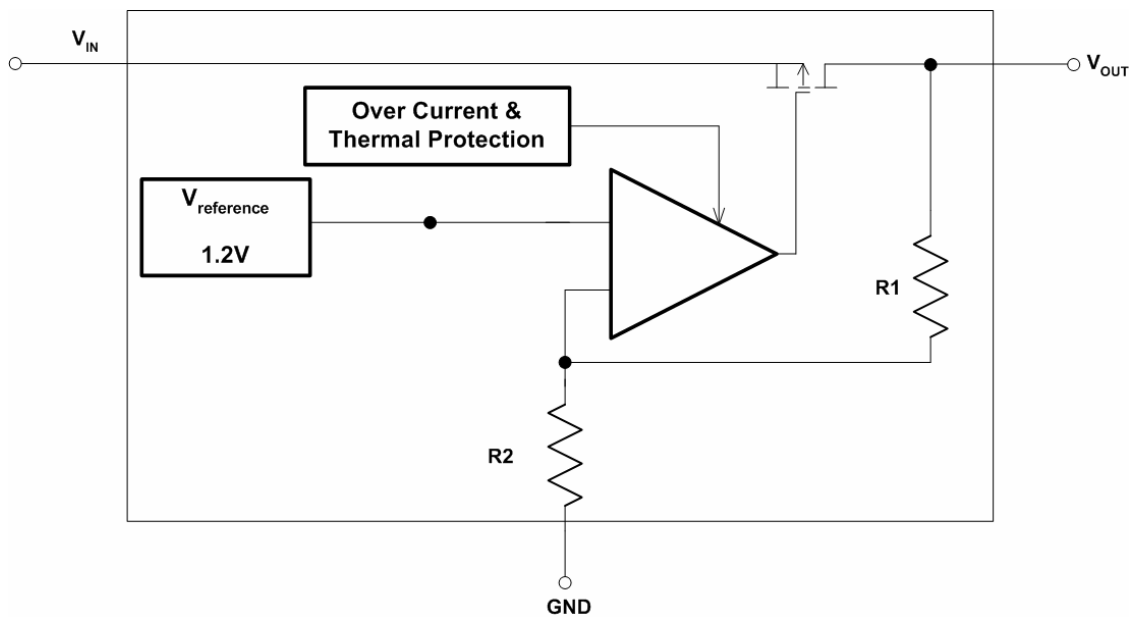


Figure 1.

Typical Application Circuit

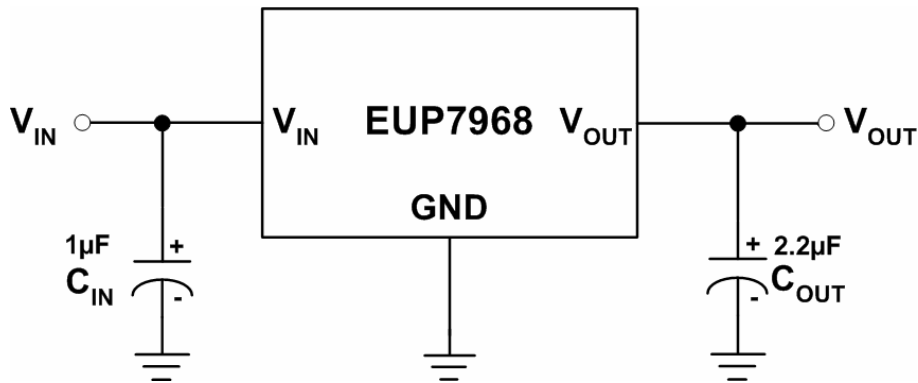


Figure 2.

Pin Configurations

Package Type	Pin Configurations
SOT23-3	<p>Diagram showing the SOT23-3 package with pins labeled 1, 2, and 3. Pin 3 is labeled <math>V_{IN}</math>, pin 1 is labeled <math>GND</math>, and pin 2 is labeled <math>V_{OUT}</math>.</p>
SOT89-3	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>(A)</p> <p>Diagram showing the SOT89-3 package (A) with pins labeled 1, 2, and 3. Pin 1 is labeled <math>V_{OUT}</math>, pin 2 is labeled <math>GND</math>, and pin 3 is labeled <math>V_{IN}</math>.</p> </div> <div style="text-align: center;"> <p>(B)</p> <p>Diagram showing the SOT89-3 package (B) with pins labeled 1, 2, and 3. Pin 1 is labeled <math>GND</math>, pin 2 is labeled <math>V_{IN}</math>, and pin 3 is labeled <math>V_{OUT}</math>.</p> </div> </div>

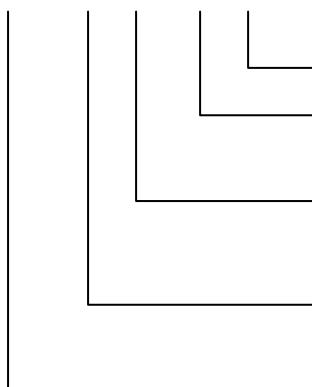
Pin Description

PIN	SOT23-3	SOT89-3(A)	SOT89-3(B)	DESCRIPTION
$V_{IN}$	3	3	2	Input voltage of the LDO
$GND$	1	2	1	Common Ground
$V_{OUT}$	2	1	3	Output voltage of the LDO

## Ordering Information

Order Number	Package Type	Marking	Operating Temperature range
EUP7968-12VIR1	SOT23-3	IT □□□□	-40°C to 85°C
EUP7968-15VIR1	SOT23-3	I0 □□□□	-40°C to 85°C
EUP7968-18VIR1	SOT23-3	I1 □□□□	-40°C to 85°C
EUP7968-25VIR1	SOT23-3	I2 □□□□	-40°C to 85°C
EUP7968-28VIR1	SOT23-3	I6 □□□□	-40°C to 85°C
EUP7968-30VIR1	SOT23-3	I5 □□□□	-40°C to 85°C
EUP7968-33VIR1	SOT23-3	I3 □□□□	-40°C to 85°C
EUP7968-35VIR1	SOT23-3	IR □□□□	-40°C to 85°C
EUP7968-15CAIR1	SOT89-3	XXXXX 68CA	-40°C to 85°C
EUP7968-18CAIR1	SOT89-3	XXXXX 68DA	-40°C to 85°C
EUP7968-25CAIR1	SOT89-3	XXXXX 68BA	-40°C to 85°C
EUP7968-28CAIR1	SOT89-3	XXXXX 68EA	-40°C to 85°C
EUP7968-30CAIR1	SOT89-3	XXXXX 68GA	-40°C to 85°C
EUP7968-33CAIR1	SOT89-3	XXXXX 68HA	-40°C to 85°C
EUP7968-35CAIR1	SOT89-3	XXXXX 68RA	-40°C to 85°C
EUP7968-15CBIR1	SOT89-3	XXXXX 68CB	-40°C to 85°C
EUP7968-18CBIR1	SOT89-3	XXXXX 68DB	-40°C to 85°C
EUP7968-25CBIR1	SOT89-3	XXXXX 68BB	-40°C to 85°C
EUP7968-28CBIR1	SOT89-3	XXXXX 68EB	-40°C to 85°C
EUP7968-30CBIR1	SOT89-3	XXXXX 68GB	-40°C to 85°C
EUP7968-33CBIR1	SOT89-3	XXXXX 68HB	-40°C to 85°C
EUP7968-35CBIR1	SOT89-3	XXXXX 68RB	-40°C to 85°C

EUP7968



Lead Free Code

1: Lead Free 0: Lead

Packing R: Tape &amp; Reel

Operating temperature range

I: Industry Standard C: Commercial

Package Type

V: SOT23 CA: SOT89-3 (A) CB: SOT89-3 (B)

Output Voltage

12: 1.2V 25: 2.5V 33: 3.3V

15: 1.5V 28: 2.8V 35: 3.5V

18: 1.8V 30: 3.0V

**Absolute Maximum Ratings**

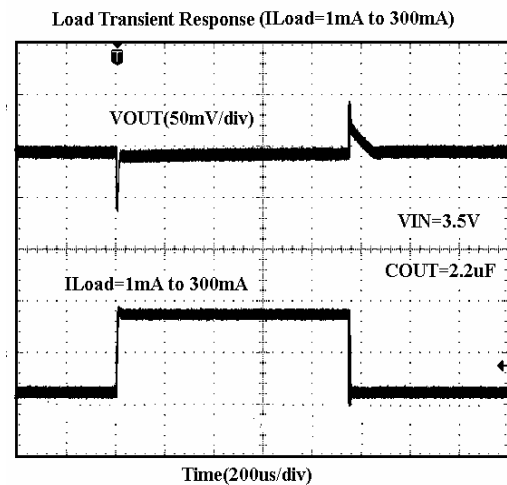
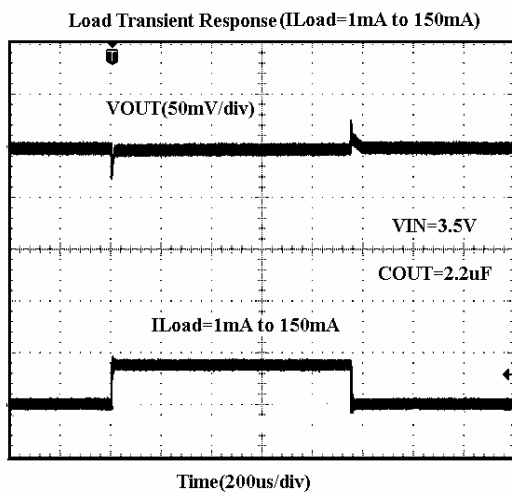
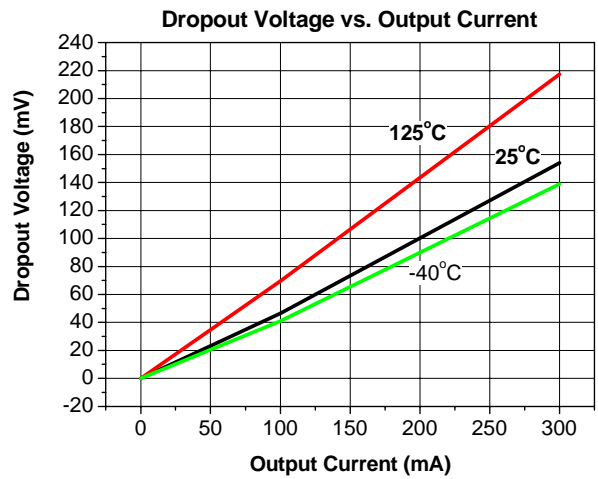
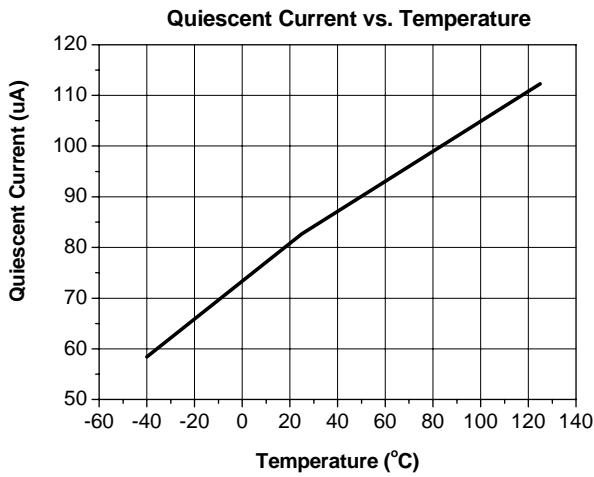
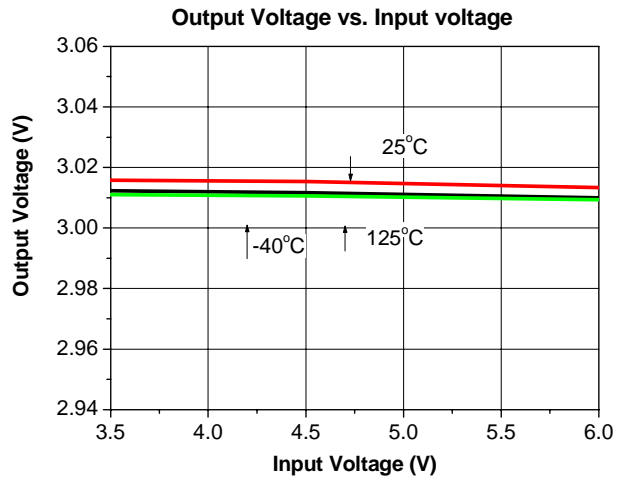
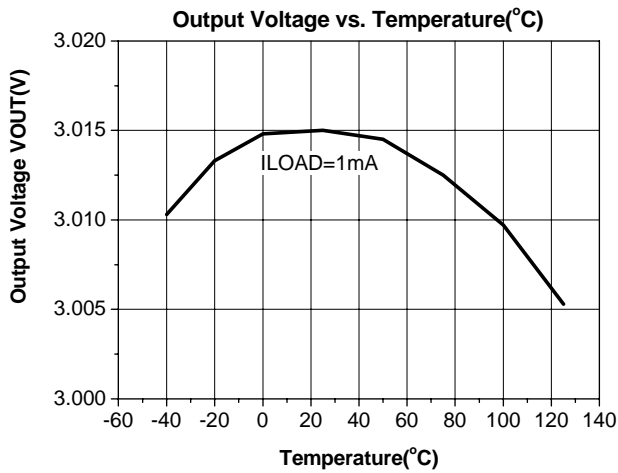
- Input Voltage ----- -0.3V to 6V
- Operating Junction Temperature Range ----- -40°C to 125°C
- Storage Temperature Range ----- -65°C to 150°C
- Power Dissipation ,P<sub>D</sub> @ T<sub>A</sub>=25°C
  - SOT-23 ----- 0.15W
  - SOT-89 ----- 0.5W
- Package Thermal Resistance
  - SOT-23, J<sub>A</sub> ----- 250°C/W
  - SOT-89, J<sub>A</sub> ----- 300°C/W

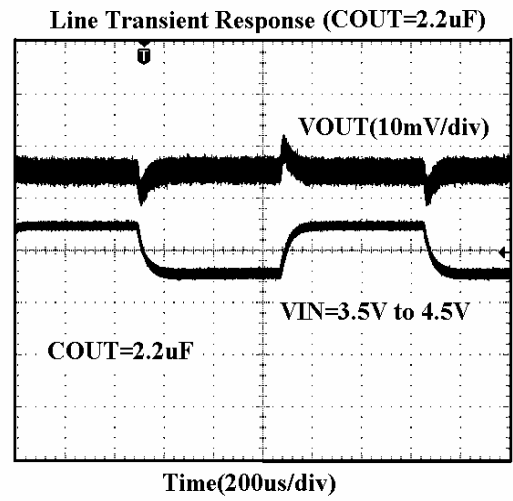
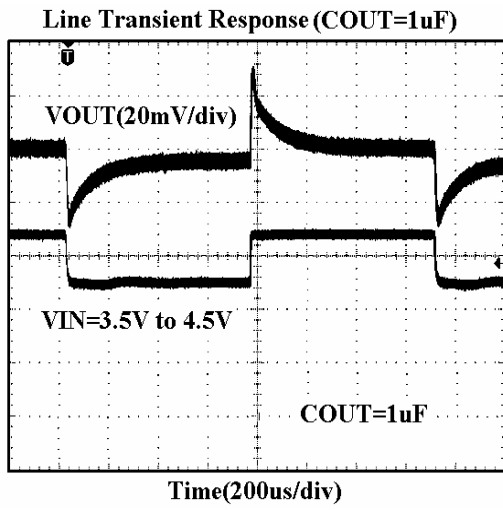
**Electrical Characteristics**

Unless otherwise specified, all limits guaranteed for V<sub>IN</sub>= V<sub>O</sub> +0.5V, C<sub>IN</sub>=C<sub>OUT</sub>=2.2μF, T<sub>A</sub> =25°C.

Symbol	Parameter	Conditions	EUP7968			Unit
			Min	Typ	Max.	
V <sub>IN</sub>	Input Voltage		2.5		5.5	V
Δ V <sub>O</sub>	Output Voltage Tolerance	100μA ≤ I <sub>OUT</sub> ≤ 300mA V <sub>IN</sub> =V <sub>O</sub> +0.5V,	-3		+3	% of V <sub>OUT(NOM)</sub>
I <sub>O</sub>	Maximum Output Current	Continuous	300			mA
I <sub>LIMIT</sub>	Output Current Limit	T <sub>A</sub> = -40°C to 85°C	350	720		mA
I <sub>Q</sub>	Supply Current	I <sub>OUT</sub> =0mA		90	200	μA
V <sub>DO</sub>	Dropout Voltage	I <sub>OUT</sub> =300mA		170		mV
Δ V <sub>O</sub>	Line Regulation	I <sub>OUT</sub> = 1mA, (V <sub>O</sub> +0.5V) ≤ V <sub>I</sub> ≤ 5.5V		0.05	0.2	%/V
	Load Regulation	1mA ≤ I <sub>OUT</sub> ≤ 300mA		15	35	mV
T <sub>SD</sub>	Thermal Shutdown Temperature			160		°C
	Thermal Shutdown Hysteresis			20		

Typical Operating Characteristics





## **Application Information**

### **External Capacitors**

Like any low-dropout regulator, the EUP7968 requires external capacitors for regulator stability. The EUP7968 is specifically designed for portable applications requiring minimum board space and smallest components. These capacitors must be correctly selected for good performance.

### **Input Capacitor**

A minimum input capacitance of 1 $\mu$ F is required between the EUP7968 input pin and ground (the amount of the capacitance may be increased without limit). This capacitor must be located a distance of not more than 1cm from the input pin and returned to a clean analog ground.

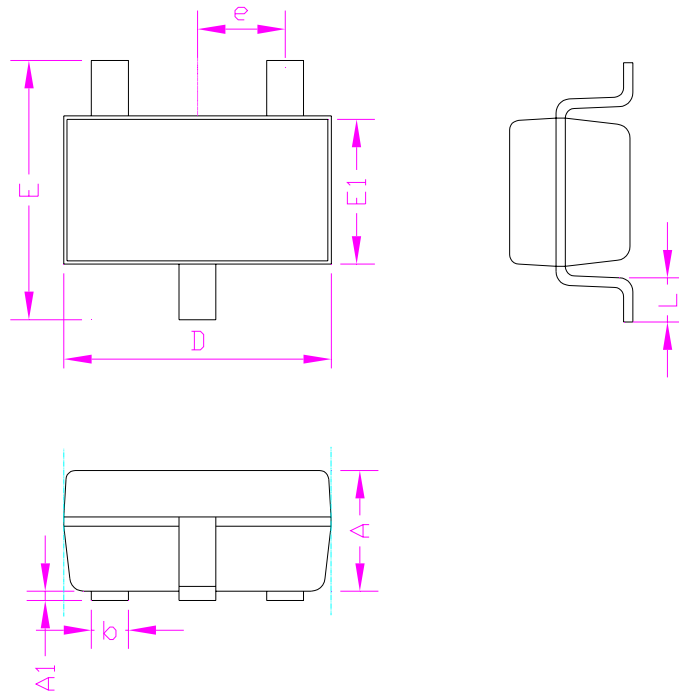
Any good quality ceramic, tantalum, or film capacitor may be used at the input. If a tantalum capacitor is used at the input, it must be guaranteed by the manufacturer to have a surge current rating sufficient for the application.

### **Output Capacitance**

The EUP7968 is specifically designed to employ ceramic output capacitors as low as 2.2 $\mu$ F. Ceramic capacitors below 10 $\mu$ F offer significant cost and space savings, along with high frequency noise filtering. Higher values and other types and of capacitor may be used, but their equivalent series resistance (ESR) should be maintained below 0.5 $\Omega$ . Ceramic capacitor of the value required by the EUP7968 are available in the following dielectric types: Z5U, Y5V, X5R, and X7R. The Z5U and Y5V types exhibit a 50% or more drop in capacitance value as their temperature increase from 25 $^{\circ}$ C, an important consideration. The X5R generally maintain their capacitance value within  $\pm$  20%. The X7R type are desirable for their tighter tolerance of 10% over temperature.

Packaging Information

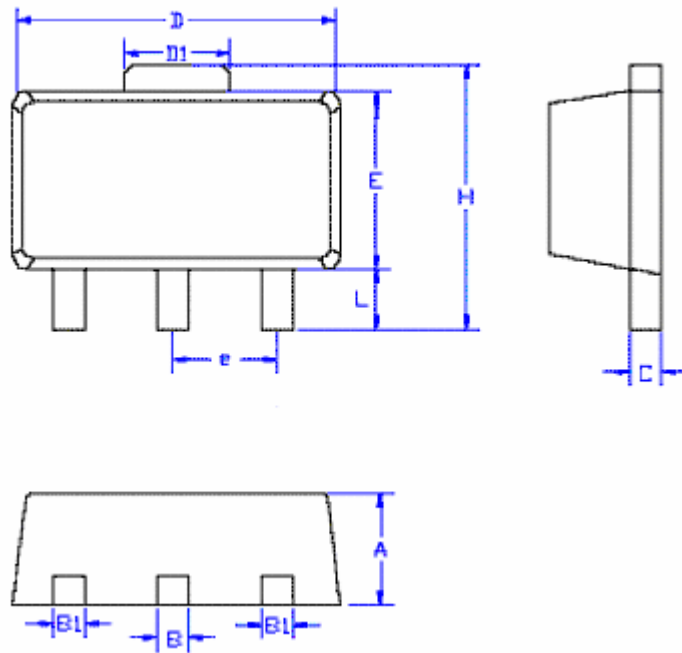
SOT23-3



SYMBOLS	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	-	1.30	-	0.052
A1	0.00	0.15	0.000	0.006
D	2.90		0.114	
E1	1.60		0.063	
E	2.60	3.00	0.102	0.118
L	0.30	0.60	0.012	0.024
b	0.30	0.50	0.012	0.020
e	0.95		0.037	



## SOT89-3



SYMBOLS	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	1.40	1.60	0.055	0.063
L	0.89	1.20	0.035	0.047
B1	0.36	0.48	0.014	0.019
B	0.44	0.56	0.017	0.022
C	0.35	0.44	0.014	0.017
D	4.40	4.60	0.173	0.181
D1	1.35	1.83	0.053	0.072
H	3.94	4.25	0.155	0.167
E	2.29	2.60	0.090	0.102
e	1.50		0.059	