

LM2931A

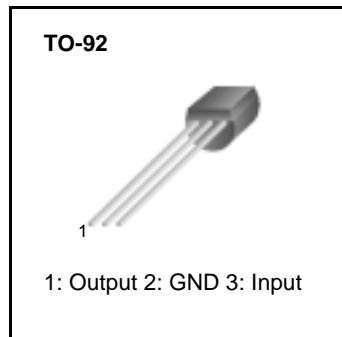
Low Dropout Voltage Regulator

Features

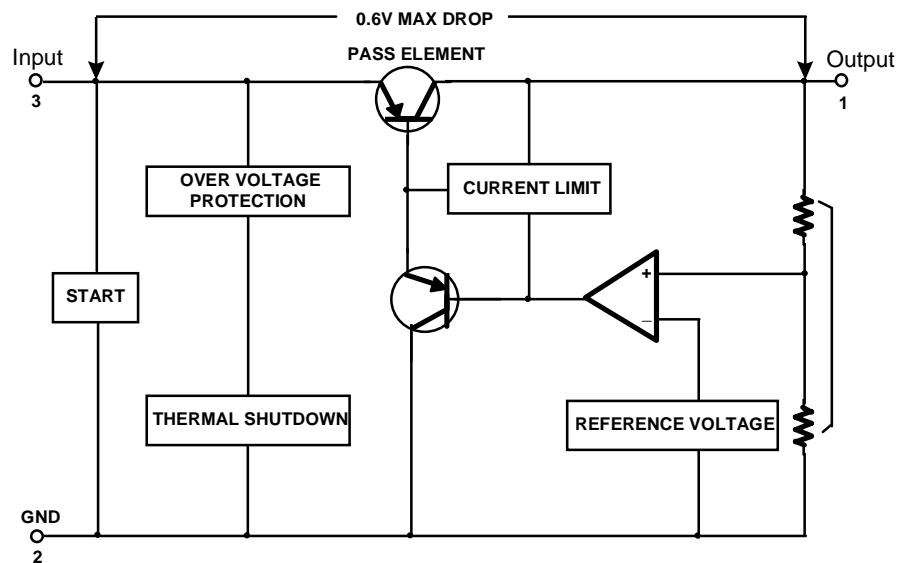
- Limited input voltage and high efficiency.
- Internal thermal over load protection.
- 60V load dump protection.
- Output current up to 0.1A.

Description

LM2931A is a fixed 3-terminal low dropout voltage regulator designed to need very low quiescent current. Internally, implemented circuits include 60V load dump protection, -50V reverse transient short circuit and thermal over load protection.



Internal Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input Voltage	V _I	33	V
Over Protection Voltage	V(OP)	60	V
Operating Temperature Range	T _{OPR}	-40~+125	°C
Maximum Junction Temperature	T _J	150	°C
Storage Temperature Range	T _{TSG}	-65~+150	°C

Electrical Characteristics

(V_I = 14V, I_O = 10mA, C_O = 100μF, T_A = 25 °C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage (I)	V _O (I)	V _I = 14V, I _O = 10mA	4.81	5.0	5.19	V
Output Voltage (II)	V _O (II)	V _I = 6 ~ 26V, I _O = 100mA T _J = -40 ~ +125 °C	4.75	5.0	5.25	V
Line Regulation (I)	ΔV _O (I)	V _I = 9 ~ 16V, I _O = 10mA	-	2.0	10	mV
Line Regulation (II)	ΔV _O (II)	V _I = 6 ~ 26V, I _O = 10mA	-	4.0	30	mV
Load Regulation	ΔV _O (III)	V _I = 14V, I _O = 5 ~ 100mA	-	10	50	mV
Output Impedance	Z _O	V _I = 14V, I _O = 100mA	-	100	600	mΩ
Quiescent Current (I)	I _Q (I)	V _I = 6 ~ 26V, I _O ≤ 10mA	-	0.1	1.0	mA
Quiescent Current (II)	I _Q (II)	V _I = 14V, I _O ≤ 100mA	-	5.0	30	mA
Output Noise Voltage	V _N	V _I = 14V, I _O = 10mA, f = 10Hz ~ 100KHz	-	150	1000	μVrms
Ripple Rejection	RR	V _I = 14V, I _O = 10mA, f = 120Hz	55	80	-	dB
Dropout Voltage (I)	V _D (I)	I _O = 10mA, V _D = V _I - V _O	-	0.03	0.2	V
Dropout Voltage (II)	V _D (II)	I _O = 100mA, V _D = V _I - V _O	-	0.1	0.6	V
Max Operational Input Voltage	V _{IN}	I _O = 10mA	26	33	-	V
Max Line Transient	V _{LT(MAX)}	V _I = 14V, I _O = 10mA, Time = 100ms	60	70	-	V
Reverse Polarity Input Voltage DC	V _{I(DC)}	V _I = 14V, I _O = 10mA, V _O ≥ -0.3V	-15	-30	-	V
Reverse Polarity Input Voltage Transient	V _{I(TR)}	V _I = 14V, I _O = 10mA, Time ≤ 10ms	-50	-80	-	V
Peak Output Current	I _{PK}	V _I = 14V	200	400	600	mA

Typical Performance Characteristics

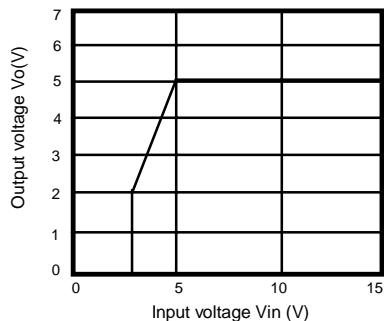


Figure 1. Output Voltage vs. Input Voltage

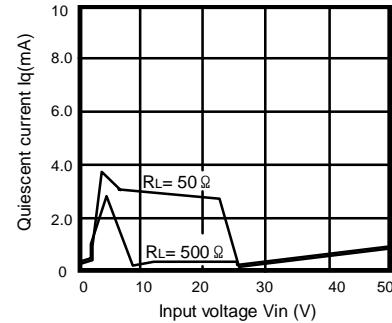


Figure 2. Quiescent Current vs. Input Voltage

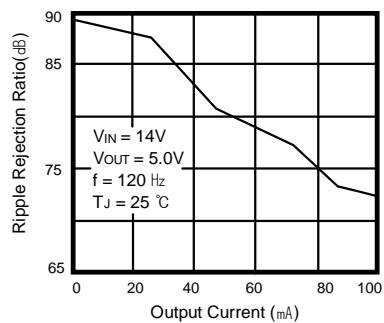


Figure 3. Ripple Rejection vs. Output Voltage

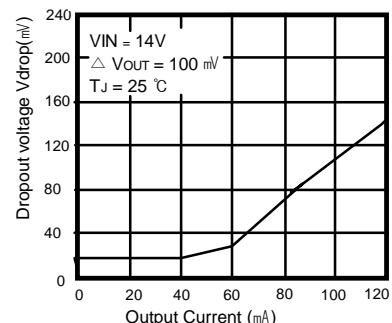
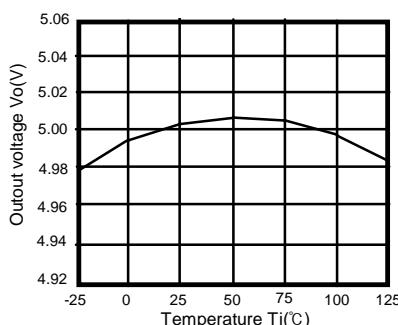
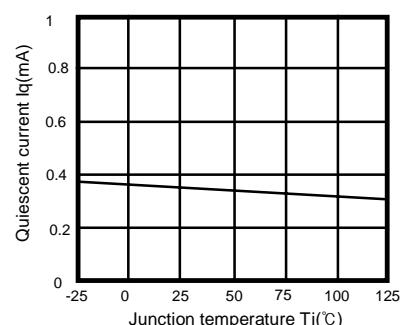


Figure 4. Drop Voltage vs. Output Current

Figure 5. Output Voltage vs. Temperature(T_j)Figure 6. Quiescent Current vs. Temperature(T_j)

Typical Application

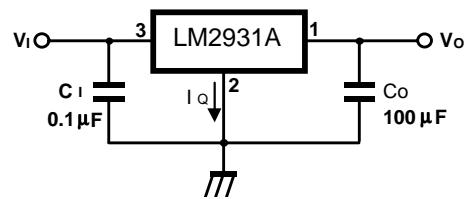


Figure 1. Application Circuit

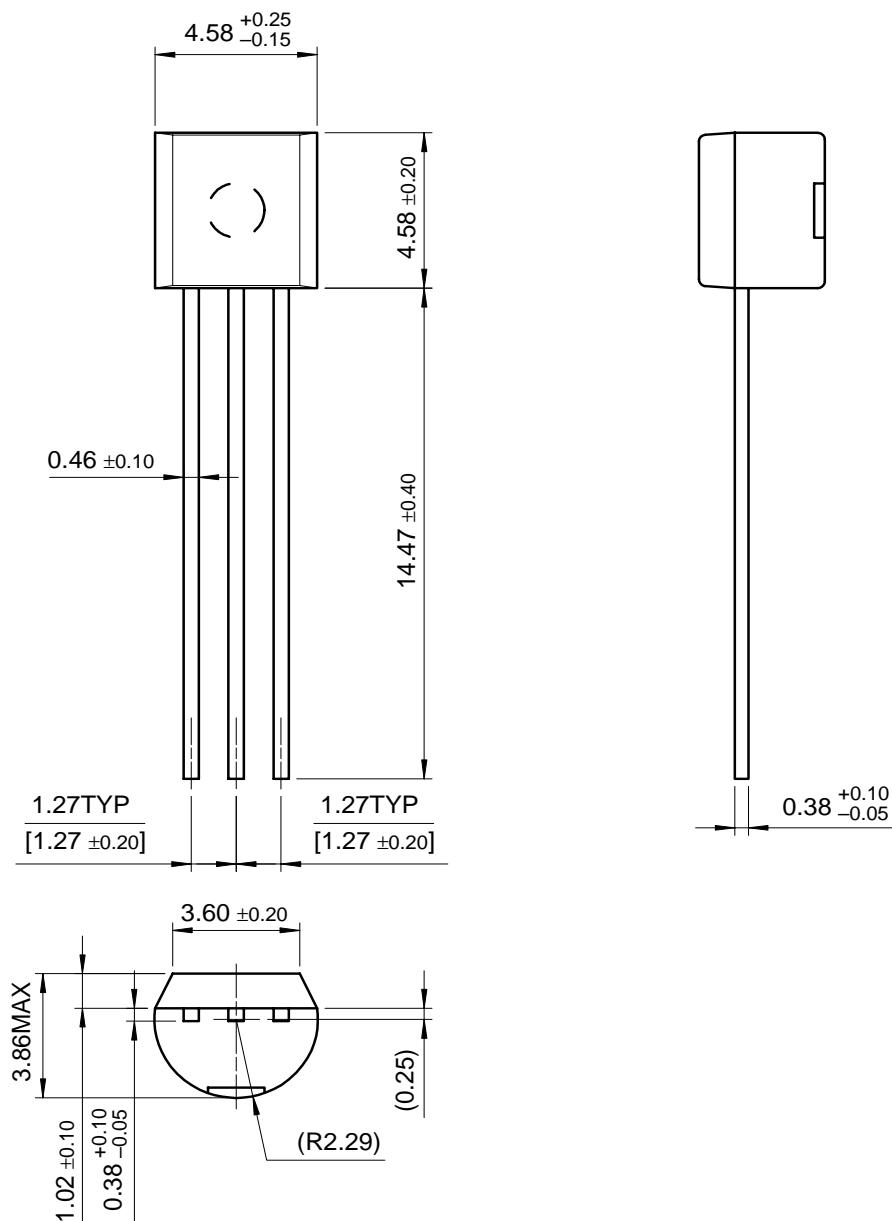
- C_I is required if regulator is located an appreciable distance from power supply filter.
- C_o improves stability .

Mechanical Dimensions

Package

Dimensions in millimeters

TO-92



Ordering Information

Product Number	Package	Operating Temperature
LM2931AZ5	TO-92	-40°C to + 125°C

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