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.

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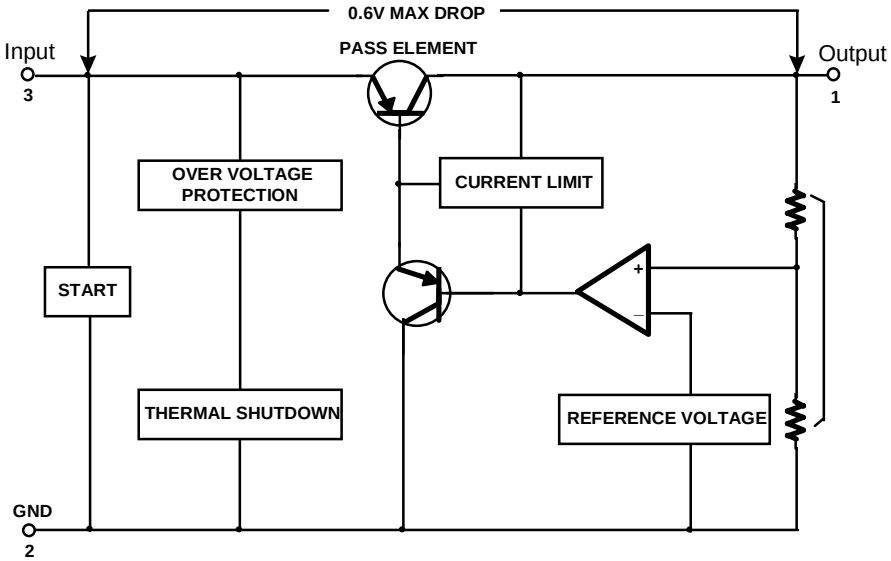
1: Output 2: GND 3: Input

Internal Block Diagram



Rev. 1.0.0

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input Voltage	Vi	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_{STG}	-65~+150	°C

Electrical Characteristics

(V_I =14V, I_O =10mA, C_O =100µF, T_A = 25 ^oC)

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 ^oC	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 Perfomance Characteristics

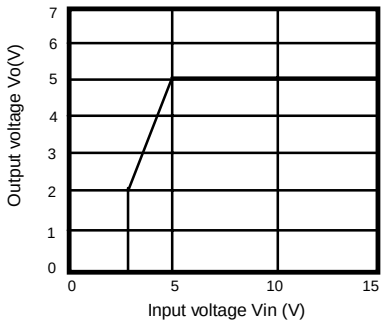


Figure 1. Output Voltage vs. Input Voltage

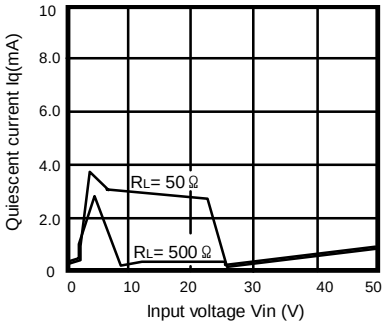


Figure 2. Quiescent Current vs. Input Voltage

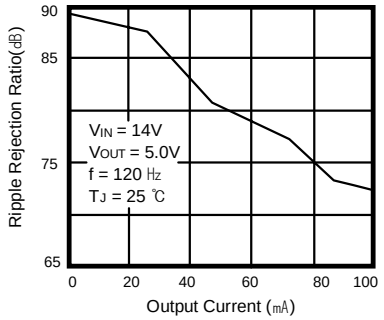


Figure 3. Ripple Rejection vs. Output Voltage

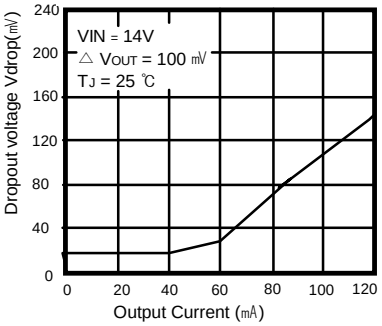


Figure 4. Drop Voltage vs. Output Current

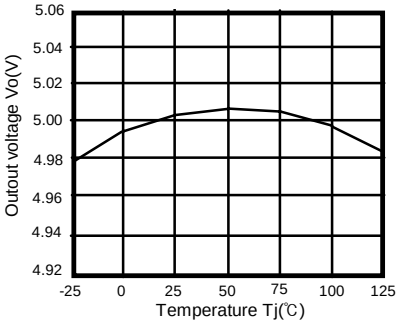


Figure 5. Output Voltage vs. Temperature(Tj)

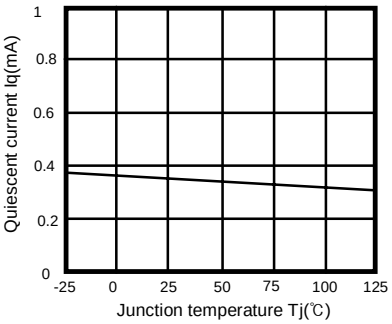


Figure 6. Quiescent Current vs. Temperature(Tj)

Typical Application

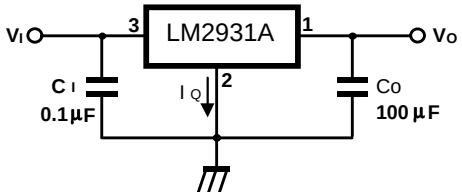


Figure 1. Application Circuit

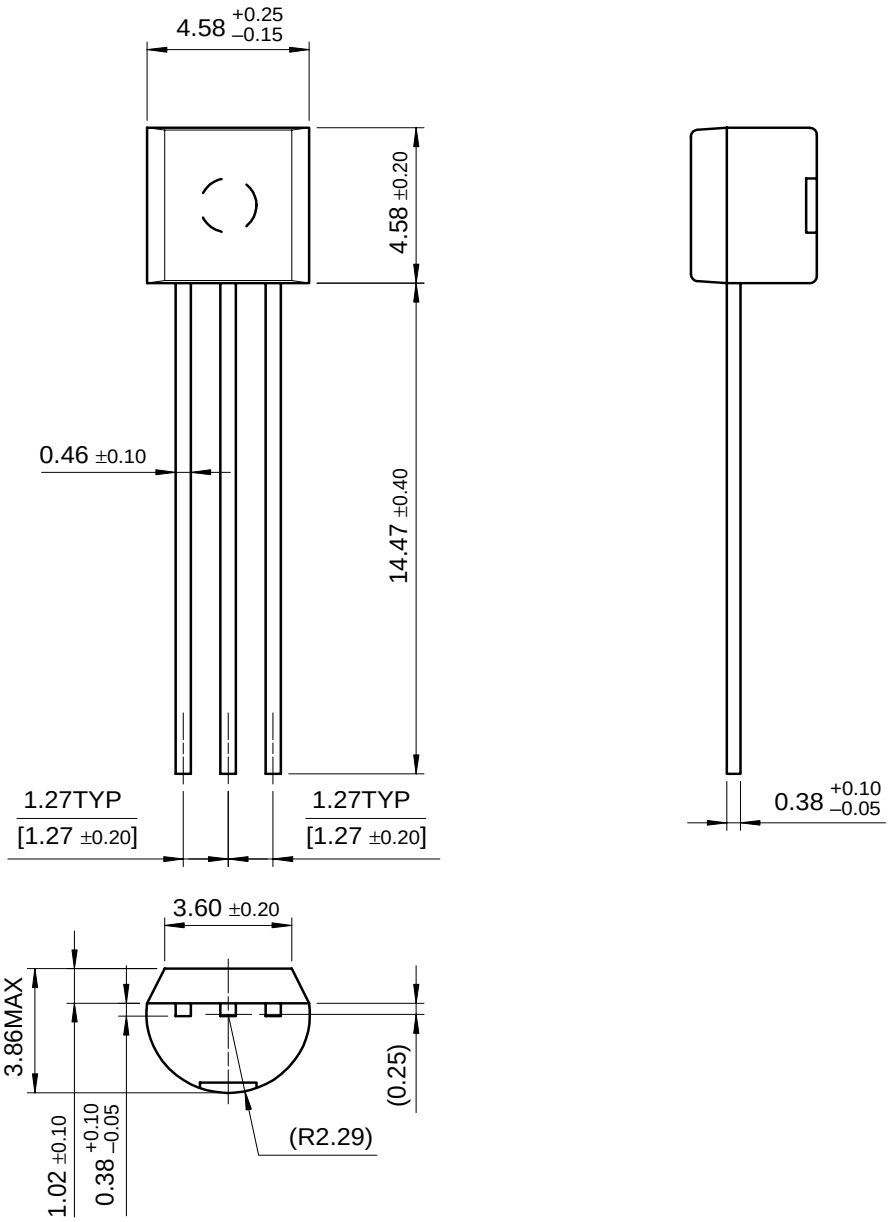
- Ci is required if regulator is located an appreciable distance from power supply filter.
- Co improves stability .

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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