

IL2931 SERIES

LOW DROPOUT VOLTAGE REGULATORS

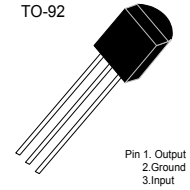
The LM2931 series consists of positive fixed and adjustable output voltage regulators that are specifically designed to maintain proper regulation with an extremely low input-to-output voltage differential. These devices are capable of supplying output currents in excess of 100 mA and feature a low bias current of 0.4 mA at 10 mA output.

Designed primarily to survive in the harsh automotive environment, these devices will protect all external load circuitry from battery jump starts, and excessive line transients during load dump. This series also includes internal current limiting, thermal shutdown, and additionally, is able to withstand temporary power-up with mirror-image insertion.

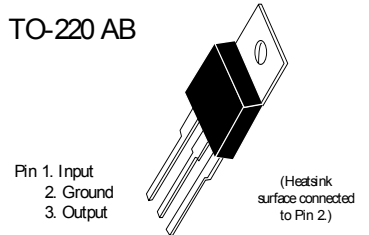
Due to the low dropout voltage and bias current specifications, the LM2931 series is ideally suited for battery powered industrial and consumer equipment where an extension of useful battery life is desirable. The 'C' suffix adjustable output regulators feature an output inhibit pin which is extremely useful in microprocessor-based systems.

- Input-to-Output Voltage Differential of Less Than 0.6 V at 100mA
- Output Current in Excess of 100 mA
- Low Bias Current
- 60 V Load Dump Protection
- -50 V Reverse Transient Protection
- Internal Current Limiting with Thermal Shutdown
- Temporary Mirror-Image Protection
- Ideally Suited for Battery Powered Equipment

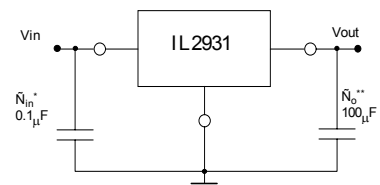
TO-226AA /
TO-92



TO-220 AB



Standard application



Ordering Information

Device	Output		Package Case Number
	Voltage	Tolerance	
IL2931-5	5.0 V	+5%	TO-226AA/TO92, TO-220AB
IL2931-9	9.0 V	+5%	TO-226AA/TO92, TO-220AB

Maximum Ratings

Rating	Symbol	Value	Unit
Input Voltage Continuous	Vin	40	Vdc
Transient Input Voltage ($r \leq 100$ ms)	Vin(r)	60	Vpk
Transient Reverse Polarity Input Voltage 1.0% Duty Cycle, $r \leq 100$ ms	-Vin(r)	-50	Vpk
Power Dissipation Case TO-220AA (TO-92) TA = +25 °C Thermal Resistance Junction to Ambient Thermal Resistance Junction to Case	PD RθJA RθJC	Internally Limited 178 83	Watts °C/W °C/W
Power Dissipation Case TO-220AB TA = +25 °C Thermal Resistance Junction to Ambient Thermal Resistance Junction to Case	PD RθJC RθJC	Internally Limited 65 5.0	Watts °C/W °C/W
Tested Operating Junction Temperature Range	TJ	-40 to +125	°C
Storage Temperature Range	Tstg	-65 to +150	C

IL2931 SERIES

IL2931-5

Electrical characteristics

($V_{in} = 14V$, $I_o = 10mA$, $C_o = 100 \mu F$, $C_o(ESR) = 0.3 \Omega$, $T_J = +25^\circ C$ Note 1, unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Fixed Output					
Output Voltage $V_{in} = 14V$, $I_o = 10mA$, $T_J = 25^\circ C$ $V_{in} = 6.0$ to $26V$, $I_o \leq 100mA$, $T_J = -40$ to $125^\circ C$	V_o	4.75 4.5	5.0 -	5.25 5.5	Vcd
Line Regulation $V_{in} = 9.0V$ to $16V$ $V_{in} = 6.0V$ to $26V$	Reg_{line}	- -	2.0 4.0	10 30	mV
Load Regulation($I_o = 5.0mA$ to $100mA$)	Reg_{load}	-	14	50	mV
Output Impedance $I_o = 10mA$, $\Delta I_o = 1.0mA$, $f = 100Hz$ to $10kHz$	Z_o	-	200	-	$m\Omega$
Bias Current $V_{in} = 14V$, $I_o = 100mA$, $T_J = 25^\circ C$ $V_{in} = 6.0V$ to $26V$, $I_o = 10mA$, $T_J = -40$ to $+125^\circ C$	I_B	- -	5.8 0.4	30 1.0	mA
Output Noise Voltage ($f = 10Hz$ to $100kHz$)	V_n	-	700	-	μV_{rms}
Long -Term Stability	S	-	20	-	mV/kHz
Ripple Rejection ($f = 120Hz$)	RR	60	90	-	dB
Dropout Voltage $I_o = 10A$ $I_o = 100A$	$V_{in} - V_o$	-	0.015 0.06	0.2 0.6	V
Over -Voltage Shutdown Threshold	$V_{th(ov)}$	26	29.5	40	V
Output Voltage with Reverse Polarity Input ($V_{in} = -15V$)	$-V_o$	-0.3	0	-	V

IL2931-9

Electrical characteristics

($V_{in} = 16V$, $I_o = 10mA$)

Characteristic	Symbol	Min	Typ	Max	Unit
Fixed Output					
Output Voltage $V_{in} = 16V$, $I_o = 10mA$, $T_J = 25^\circ C$ $V_{in} = 10$ to $26V$, $I_o \leq 100mA$, $T_J = -40$ to $+125^\circ C$	V_o	8.55 8.1	9.0 -	9.45 9.9	Vcd
Line Regulation $V_{in} = 9.0V$ to $16V$ $V_{in} = 6.0V$ to $26V$	Reg_{line}	- -	4.0 8.0	20 60	mV
Load Regulation($I_o = 5.0mA$ to $100mA$)	Reg_{load}	-	30	100	mV
Output Impedance $I_o = 10mA$, $\Delta I_o = 1.0mA$, $f = 100Hz$ to $10kHz$	Z_o	-	200	-	$m\Omega$
Bias Current $V_{in} = 14V$, $I_o = 100mA$, $T_J = 25^\circ C$ $V_{in} = 6.0V$ to $26V$, $I_o = 10mA$, $T_J = -40$ to $+125^\circ C$	I_B	- -	5.8 0.4	30 1.0	mA
Output Noise Voltage ($f = 10Hz$ to $100kHz$)	V_n	-	700	-	μV_{rms}
Long -Term Stability	S	-	20	-	mV/kHz
Ripple Rejection ($f = 120Hz$)	RR	60	90	-	dB
Dropout Voltage $I_o = 10A$ $I_o = 100A$	$V_{in} - V_o$	-	0.015 0.06	0.2 0.6	V
Over - Voltage Shutdown Threshold	$V_{th(ov)}$	26	29.5	40	V
Output Voltage with Reverse Polarity Input ($V_{in} = -15V$)	$-V_o$	-0.3	0	-	V

Note :

1. Low duty cycle pulse techniques are used during test to maintain junction temperature as close to ambient as possible.