Features

- Output Voltage Range Adjustable from 1.2 V to 37 V
- Output Current Capability of 1.5A (or 100mA) Max
- Input Regulation Typically 0.01 % Per Input - Volt Change
- Output Regulation Typically 0.1 %
- Peak Output Current Constant Over Temperature Range of Regulator
- Ripple Rejection Typically 80 dB

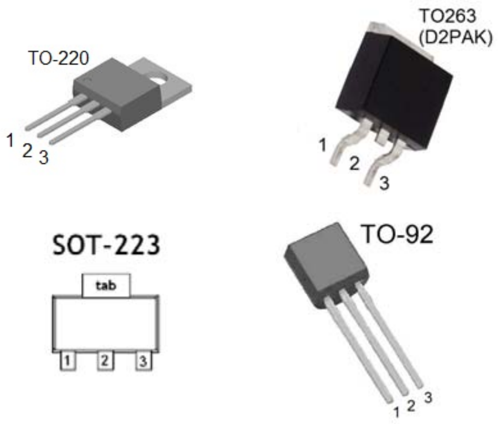
Applications

- High efficiency linear regulators
- Post regulators for switching supplies
- Adjustable power supply

General Description

The LD6301 are adjustable three terminal positive voltage regulators capable of supplying 1.5A (or 100mA for LD6301T1-TRY only) over a differential voltage range of 3V to 40V. They are exceptionally easy to use and require only two external resistors to set the output voltage. Both input and output regulation is better than standard fixed regulators.
In addition to higher performance than fixed regulators, these regulators offer full overload protection available only in integrated circuits. Included on the chip are current limit, thermal overload protection, and safe-area protection. All overload protection circuitry remains fully functional even if the adjustment terminal is disconnected. Normally, no capacitors are needed unless the device is situated far from the input filter capacitors in which case an input bypass is needed. An optional output capacitor can be added to improve transient response.
The primary applications of each of these regulators is that of a programmable output regulator, but by connecting a fixed resistor between adjustment terminal and the output terminal, each device can be used as a precision current regulator. Even though the regulator is floating and sees only the input-to-output differential voltage, use of these devices to regulate output voltages that would cause the maximum-rated differential voltage to be exceeded if the output became shorted to ground is not recommended.

Package Pin Out



Pin	Function
1	ADJ
2	OUT
3	IN

Ordering Information

		Packing Options	
Part No.	Package	Tube (TU)	Tape & Reel (TR)
LD6301	TO220	LD6301T3-TUX	LD6301T3-TRX
	TO263	LD6301T3-TUX	LD6301T8-TRX
	SOT223	–	LD6301L8-TRX
	TO-92	–	LD6301T1-TRX

Current Selection

Part Number	Output Current
LD6301T1-TRX	1.5A
LD6301T1-TRY	100mA

- Package material default is "Green" package.

Product Marking

LD8888
SSSSS…
●

- ✧ Line 1 – "LD" is a fixed character
  8888: product name
- ✧ Line 2 – SSSSS…: lot number

Absolute Maximum Ratings

Parameter	Maximum	Unit
Input-to-output differential voltage, V_I - V_O	40	V
Output current range	10~1500	mA
Continuous total dissipation at 25°C free-air	2	W
Continuous total dissipation below 25°C case	15	W
Operating free-air, case temperature range	0 to 125	°C
Operating virtual junction temperature, T_J	0 to 125	°C
Storage temperature	-65 to 150	°C
Lead temperature 1.6 mm from case for 10 seconds	260	°C

The values beyond the boundaries of absolute maximum rating may cause the damage to the device. Functional operation in this context is not implied. Continuous use of the device at the absolute rating level might influence device reliability. All voltages have their reference to device ground.

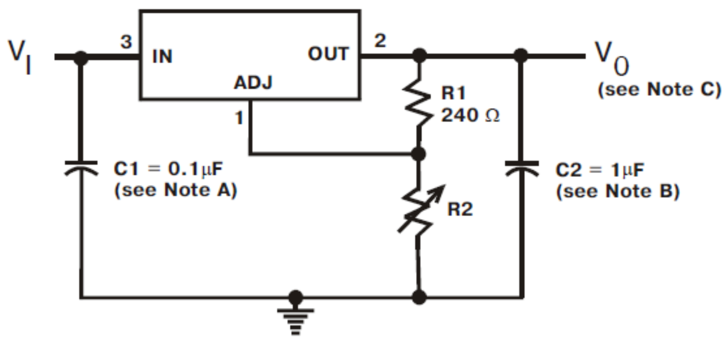
Electrical Characteristics

V_I-V_O=5V, I_{LOAD} = 0.5A and T_J=25°C unless specified notes [*1]

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Input regulation [*2]	R_{LINE}	V_I-V_O=3V~40V	–	0.01	0.04	%/ V
		V_I-V_O=3V~40V [*3*5]	–	0.02	0.07	
Ripple rejection	R_{REJ}	V_O=10V, f=120 Hz, no cap	66	65	–	dB
		V_O=10V, f=120 Hz, 10μF btwn ADJ&GND [*5]	–	80	–	
Output regulation	R_{LOAD}	I_O=10mA~1.5A(or 100mA), V_O≦5V [*3]	–	5	25	mV
		I_O=10mA~1.5A(or 100mA), V_O>5V [*3]	–	0.1	0.5	%
		I_O=10mA~1.5A(or 100mA), V_O≦5V [*3*5]	–	20	70	mV
		I_O=10mA~1.5A(or 100mA), V_O>5V [*3*5]	–	0.3	1.5	%
Output voltage change with temperature	$I_{OUTTEMP}$	T_J = MIN to MAX	–	1	–	%
Output voltage long-term drift [*4]	$I_{OUTDRIFT}$	After 1000 hrs at T_J = MAX, V_I-V_O=40V	–	0.3	1	%
Output noise voltage	$I_{OUTNOISE}$	f= 10Hz to 10KHz	–	0.003	–	%
Minimum output current	I_{OUTMIN}	V_I-V_O=40V	–	3.5	10	mA
Peak output current (1.5A version)	$I_{OUTPEAK}$	V_I-V_O≦15V [*5]	1.5	2.2	–	A
		V_I-V_O≦40V	0.15	0.4	–	
Peak output current (100mA version)	$I_{OUTPEAK}$	V_I-V_O≦15V [*5]	100	200	–	mA
		V_I-V_O≦40V	25	50	–	
Adjustment-terminal current	I_{ADJ}	–	–	50	100	μA
Change in adjustment-terminal current	I_{ADJDEV}	V_I-V_O=2.5V~40V, I_O=10mA~1.5A(or 100mA)	–	0.2	5.0	μA
Reference voltage (output to ADJ)	V_{REF}	V_I-V_O=3V~ 40V, I_O=10mA~1.5A(or 100mA)	1.2	1.25	1.3	V

Notes:
1. All characteristics are measured with a 0.1μF capacitor across the input and a 1μF capacitor across the output.
2. Input regulation is expressed here as the percentage change in output voltage per 1V change at the input.
3. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately.
4. Since long-term drift cannot be measured on the individual devices prior to shipment, this specification is not intended to be a guarantee or warranty. It is an engineering estimate of the average drift to be expected from lot to lot.
5. T_J = MIN to MAX

Typical Application Circuit



Notes:

A. Use of an input bypass capacitor is recommended if regulator is far from filter capacitors.

B. Use of an output capacitor improves transient response but is optional.

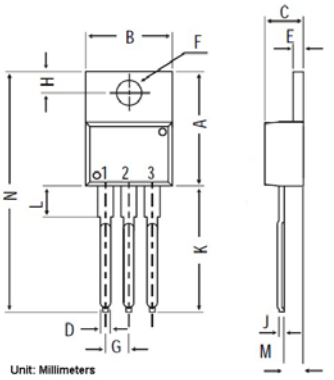
C. Output voltage is calculated from the equation:

$$V_0 = V_{ref}\left(1 + \frac{R_2}{R_1}\right)$$

Where Vref equals the difference between the output and adjustment terminal voltages

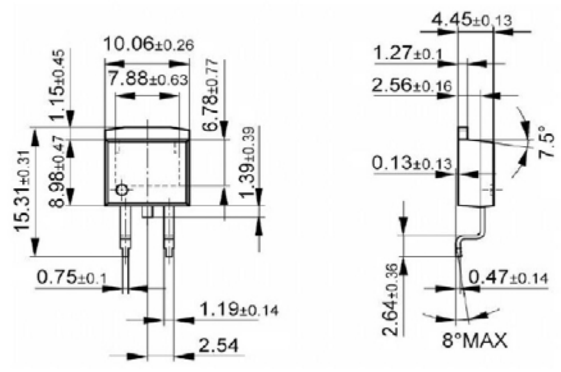
Package Outline

TO-220:

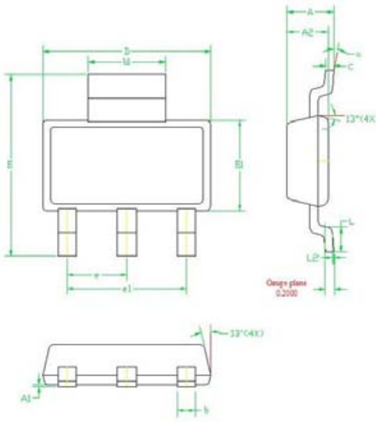


Symbols	Minimum	Normal	Maximum
A	14.42	15.47	16.51
B	9.63	10.15	10.67
C	3.56	4.20	4.83
D	-	0.90	-
E	1.15	1.28	1.4
F	3.75	3.82	3.88
G	2.29	2.54	2.79
H	2.54	2.99	3.43
J	-	0.56	-
K	12.7	13.72	14.73
L	2.8	3.44	4.07
M	2.03	2.48	2.92
N	-	31.24	-

TO-263:

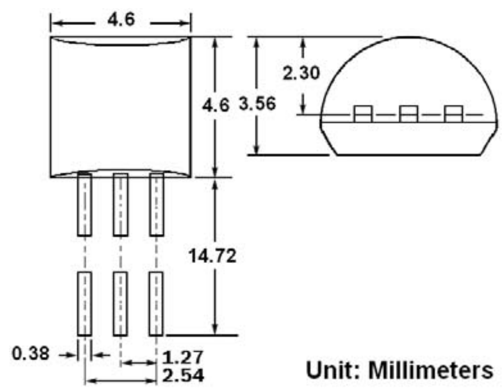


SOT223:



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.52	1.80	0.061	0.071
A1	0.02	0.10	0.0008	0.0040
A2	1.50	1.70	0.059	0.067
b	0.60	0.80	0.024	0.031
b1	2.90	3.10	0.114	0.122
c	0.24	0.32	0.009	0.013
D	6.30	6.80	0.248	0.268
E1	3.30	3.70	0.130	0.146
e	2.30 BSC		0.090 BSC	
e1	4.60 BSC		0.181 BSC	
E	6.70	7.30	0.264	0.287
L	0.90 MIN		0.036 MIN	
L2	0.06 BSC		0.0024BSC	
α	0°	10°	0°	10°

TO-92:



LD Tech Corporation

Tel: +886-3-567-8806
Fax: +886-3-567-8706
E-mail: sales@ldtech.com.tw
Website: www.ldtech.com.tw

