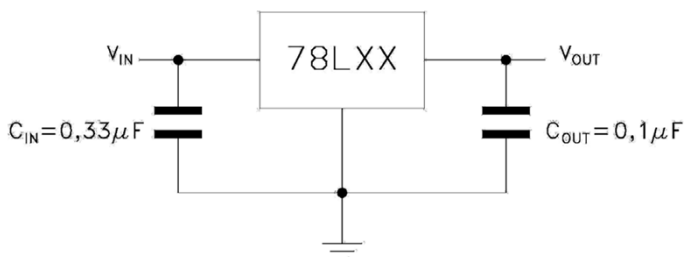


Positive-Voltage Regulators 78L05

Features

- 3-Terminal Positive-Voltage Regulators
- Output Current up to 150 mA
- Internal Thermal-Overload Protection
- Internal Short-Circuit Current Limiting
- No External Components
- Output voltages of 5.0V
- Available in plastic TO-92, SOT-89 and SOT-23 packages

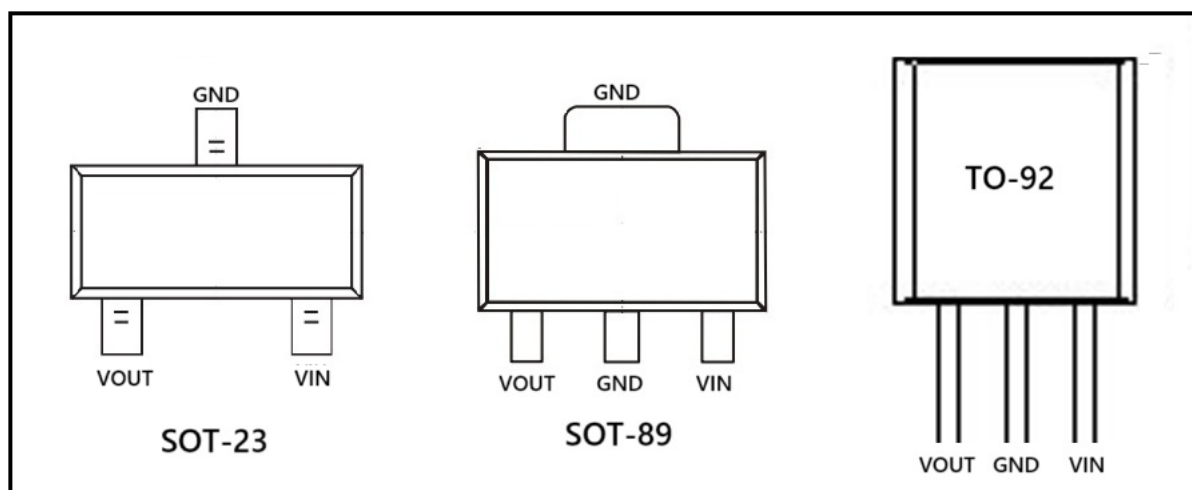


Equivalent Circuit or Test Circuit

Description

The 78L05 is three-terminal positive regulators. One of these regulators can deliver up to 150 mA of output current. The internal limiting and thermal-shutdown features of the regulator make them essentially immune to overload. When used as a replacement for a zener diode-resistor combination, an effective improvement in output impedance can be obtained, together with lower quiescent current.

Available Packages and Pin Configuration



Thermal Information

Thermal Metric	Symbol	TO-92	SOT-89	SOT-23	Unit
Junction-to-ambient thermal resistance	$R_{\theta JA}$	160	200	330	°C/W
Junction-to-case thermal resistance	$R_{\theta JC}$	40	50	84	°C/W

Absolute Maximum Rating

Parameter	Symbol	Value	Unit
Input voltage	V_I	30	V
Output current	I_O	150	mA
Power Dissipation	P_D	Internally Limited (*)	W
Storage Temperature	T_{STG}	-65~150	°C
Operating Temperature (Operating free-air, case, or virtual junction temperature range)	T_{OP}	-40~+125	°C

(*) Refer to Thermal Information for details.

Recommended operating condition

Parameter	Min	Max	Unit
Input voltage	7	20	V
Output current		100	mA
Operating Temperature	-25	125	°C

Electrical characteristics

78L05 ($V_I=10V$, $I_O=40mA$, $C_I = 0.33 \mu F$, $C_O = 0.1 \mu F$, unless otherwise noted)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Output voltage	V_O		25°C	4.8	5	5.2	V
		$I_O=1mA$ to $40mA$ $V_I=7V$ to $20V$	0 to 125 °C	4.75	5	5.25	
		$I_O=1mA$ to $70mA$		4.75	5	5.25	
Input regulation	ΔV_O	$V_I=7V$ to $20V$	25°C			150	mV
		$V_I=8V$ to $20V$				100	
Ripple rejection	RR	$V_I=8V$ to $18V$, $f=120Hz$	25°C	41			dB
Output regulation	ΔV_O	$I_O=1mA$ to $100mA$	25°C			60	mV
		$I_O=1mA$ to $40mA$				30	
Output noise voltage	V_N	$f=10Hz-100Hz$	25°C		42		μV
Dropout voltage	V_D		25°C		1.7		V
Bias current	I_Q		25°C			6	mA
			125°C			5.5	
Bias current change	ΔI_Q	$V_I=8V$ to $20V$	0 to 125 °C			1.5	
		$I_O=1mA$ to $40mA$				0.1	

*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.

**This specification applies only for dc power dissipation permitted by absolute maximum ratings.