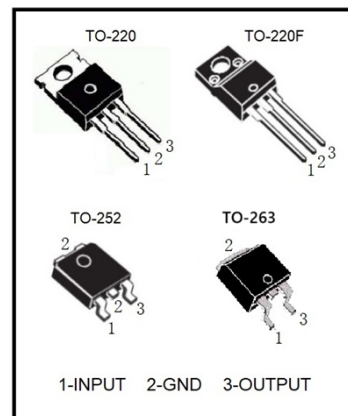


Positive-Voltage Regulators 7809

FEATURES

- Output current to 1.5 A
- Output voltages of 9 V
- Thermal overload protection
- Short circuit protection
- Output Transistor Operating Area Protection
- Package: TO-220, TO-220F, TO-263 and TO-252



DESCRIPTION

The 78 series of three-terminal positive regulators is available in TO-220, TO-220F, TO-263 and TO-252 packages and with several fixed output voltages, making it useful in a wide range of applications. Each type employs internal current limiting, thermal shutdown and safe area protection, resulting it essentially indestructible. If adequate heat sinking is provided, they can deliver over 1.5A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltage and currents.

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Input voltage	V_I	35	V
Output current	I_O	Internally limited	A
Power dissipation	P_D	Internally limited	W
Storage Temperature	T_{STG}	-65~ 150	°C
Operating Temperature	T_{OP}	-40~+125	

Note: Absolute maximum ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

THERMAL DATA

Parameter	Symbol	TO-220	TO-220F	TO-263	TO-252	UNIT
Thermal resistance junction-case	R_{thJC}	5.5	6	5	8	°C/W
Thermal resistance junction-ambient	R_{thJA}	65	67	62	100	°C/W

ELECTRICAL CHARACTERISTICS

7809

($V_I = 15V$, $I_O = 500mA$, $C_I = 0.33 \mu F$, $C_O = 0.1 \mu F$, $T_J = -40$ to $125^\circ C$, unless otherwise noted.)

Parameter	Symbol	Test Conditions	T_J	Min	Typ	Max	Unit
Output voltage	V_O		$25^\circ C$	8.65	9.00	9.35	V
		$I_O = 5mA$ to $1A$, $V_I = 11.5$ to $24V$		8.60	9.00	9.40	
Line Regulation ⁽¹⁾	Regline	$V_I = 11.5$ to $25V$	$25^\circ C$			180	mV
		$V_I = 12$ to $17V$				90	
Load Regulation ⁽¹⁾	Regload	$I_O = 5mA$ to $1.5A$	$25^\circ C$			180	mV
		$I_O = 250$ to $750mA$				90	
Quiescent Current	I_Q		$25^\circ C$			8	mA
Quiescent current change	ΔI_Q	$I_O = 5mA$ to $1A$				0.5	
		$V_I = 11.5$ to $26V$				1.3	
Output Voltage Drift ⁽²⁾	$\Delta V_O / \Delta T$	$I_O = 5mA$			-1.0		mV/ $^\circ C$
Output noise voltage	V_N	$f = 10Hz$ to $100kHz$	$25^\circ C$		58		μV
Ripple Rejection ⁽²⁾	RR	$V_I = 13$ to $23V$, $f = 120Hz$		56	71		dB
Dropout voltage	V_{DROP}	$I_O = 1A$	$25^\circ C$		2		V
Output Resistance ⁽²⁾	R_O	$f = 1kHz$			17		m Ω
Short-Circuit Current	I_{SC}	$V_I = 35V$	$25^\circ C$		250		mA
Peak Current	I_{PK}		$25^\circ C$		2.2		A

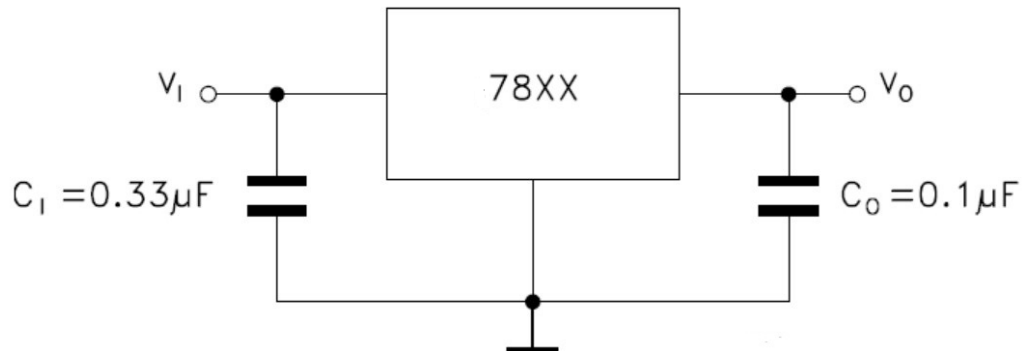
Notes:

1. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.

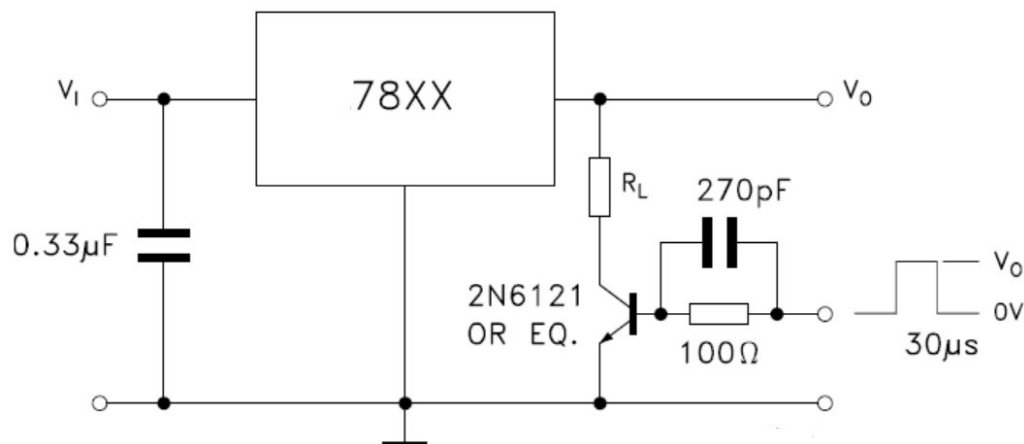
2. These parameters, although guaranteed, are not 100% tested in production.

TEST CIRCUITS

DC parameter



Load regulation



Ripple rejection

