

Description

The PJ79DXXTE series of three-terminal negative regulators are available in TO-252 package and with several fixed output voltages. making them useful in a wide range of applications. Each type employs internal current limiting, thermal shut-down and safe area protection, making it essentially indestructible.

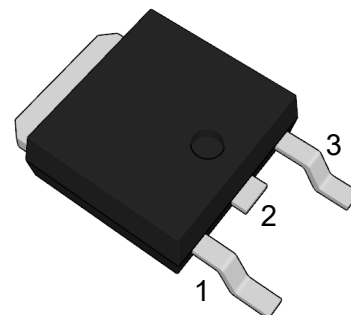
Features

- Input voltage: up to -35V
- Output voltage: -3V,-5V,-12V,-15V,-18V,
- Output current up to 1 A
- Thermal overload protection
- Short circuit current limiting

Applications

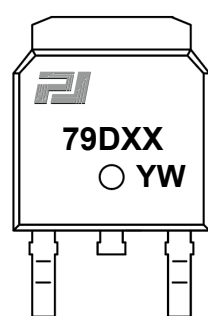
- DC motor drivers
- Household electric appliances
- Industrial power supplies
- Test and measurement equipment

TO-252



1. GND 2. VIN 3. VOUT

Ordering Information

Orderable Device	Package	Reel (inch)	Package Qty (PCS)	Eco Plan ^{Note}	MSL Level	Marking Code
PJ79D03TE	TO-252	13	2500	RoHS & Green	MSL3	 79DXX: Product code e.g. PJ79D05TE:79D05 YW: Year code and Week code
PJ79D05TE						
PJ79D12TE						
PJ79D15TE						
PJ79D18TE						

Note:

RoHS: PJ defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials.

Green: PJ defines "Green" to mean Halogen-Free and Antimony-Free.



The schematic diagram illustrates a precision current source circuit. It features a common ground (GND) at the top and a common input terminal at the bottom. A voltage reference block is connected to GND and provides a reference voltage to the inverting input (-) of an operational amplifier. The non-inverting input (+) of the op-amp is connected to the input terminal. The op-amp's output drives the base of a PNP transistor (Q1). The emitter of Q1 is connected to the input terminal, and its collector is connected to the inverting input of the op-amp, forming a negative feedback loop. A protection circuitry block is connected between the emitter and collector of Q1. A series combination of resistors R1, R2, and Rsc is connected between the input terminal and the collector of Q1. The output of the circuit is taken from the collector of Q1. Two current sources, I1 and I2, are shown as circles with downward arrows, connected to the reference voltage and the input terminal, respectively.

The diagram shows the PJ79DXXTE op-amp in a voltage follower configuration. The input V_i is connected to pin 2, and the output V_o is connected to pin 3. Both pins 2 and 3 are connected to pin 1 through capacitors C_1 (2.2 μF) and C_2 (1 μF) respectively. Pin 1 is connected to ground.

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Input Voltage	-V _I	35	V
Output Current	I _o	1	A
Maximum Power Dissipation	P _D	1.5	W
Operating Temperature Range	T _{OPR}	0 to +125	°C
Storage Temperature Range	T _{STG}	-65 to +150	°C



PJ79DXXTE

3-Terminal Voltage Regulators

PJ79D03TE Electrical Characteristics

$V_I = -8V$, $I_O = 500mA$, $-20 < T_J < 125^{\circ}C$, $C_I = 0.22\mu F$, $C_O = 1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	$-V_O$	$T_J = 25^{\circ}C$	2.88	3.0	3.12	V
		$I_O = 5mA$ to $1A$ $V_I = -6V$ to $-20V$	2.85	3.0	3.15	V
Line Regulation	ΔV_O	$V_I = -5V$ to $-25V$, $T_J = 25^{\circ}C$	--	--	60	mV
		$V_I = -6V$ to $-15V$, $T_J = 25^{\circ}C$	--	--	30	mV
Load Regulation	ΔV_O	$I_O = 5mA$ to $1A$, $T_J = 25^{\circ}C$	--	--	60	mV
		$I_O = 250mA$ to $750mA$, $T_J = 25^{\circ}C$	--	--	30	mV
Ripple Rejection	RR	$\Delta V_I = 10V$, $f = 120Hz$	54	60	--	dB
Dropout Voltage	V_D	$I_O = 1A$, $T_J = 25^{\circ}C$	--	1.5	--	V
Quiescent Current	I_Q	, $T_J = 25^{\circ}C$	--	--	6	mA
Temperature coefficient of V_O	$\Delta V_O / \Delta T$	$I_O = 5mA$	--	0.5	--	mV/ $^{\circ}C$
Quiescent Current Change	ΔI_Q	$I_O = 5mA$ to $1A$	--	--	0.5	mA
		$V_I = -5V$ to $-20V$	--	--	0.8	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_A = 25^{\circ}C$	--	40	--	μV



PJ79DXXTE

3-Terminal Voltage Regulators

PJ79D05TE Electrical Characteristics

$V_I = -10V$, $I_O = 500mA$, $-20 < T_J < 125^{\circ}C$, $C_I = 0.22\mu F$, $C_O = 1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	$-V_O$	$T_J = 25^{\circ}C$	4.8	5.0	5.2	V
		$I_O = 5mA$ to $1A$ $V_I = -7V$ to $-20V$	4.75	5.0	5.25	V
Line Regulation	ΔV_O	$V_I = -7V$ to $-25V$, $T_J = 25^{\circ}C$	--	--	100	mV
		$V_I = -8V$ to $-12V$, $T_J = 25^{\circ}C$	--	--	50	mV
Load Regulation	ΔV_O	$I_O = 5mA$ to $1A$, $T_J = 25^{\circ}C$	--	--	100	mV
		$I_O = 250mA$ to $750mA$, $T_J = 25^{\circ}C$	--	--	50	mV
Ripple Rejection	RR	$\Delta V_I = 10V$, $f = 120Hz$	54	60	--	dB
Dropout Voltage	V_D	$I_O = 1A$, $T_J = 25^{\circ}C$	--	1.5	--	V
Quiescent Current	I_Q	, $T_J = 25^{\circ}C$	--	--	6	mA
Temperature coefficient of V_O	$\Delta V_O / \Delta T$	$I_O = 5mA$	--	0.5	--	mV/ $^{\circ}C$
Quiescent Current Change	ΔI_Q	$I_O = 5mA$ to $1A$	--	--	0.5	mA
		$V_I = -8V$ to $-25V$	--	--	0.8	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_A = 25^{\circ}C$	--	40	--	μV



PJ79DXXTE

3-Terminal Voltage Regulators

PJ79D12TE Electrical Characteristics

$V_I = -19V$, $I_O = 500mA$, $-20 < T_J < 125^{\circ}C$, $C_I = 0.22\mu F$, $C_O = 1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	$-V_O$	$T_J = 25^{\circ}C$	11.5	12	12.5	V
		$I_O = 5mA$ to $1A$ $V_I = -16V$ to $-25V$	11.4	12	12.6	V
Line Regulation	ΔV_O	$V_I = -14.5V$ to $-30V$, $T_J = 25^{\circ}C$	--	--	240	mV
		$V_I = -16V$ to $-25V$, $T_J = 25^{\circ}C$	--	--	120	mV
Load Regulation	ΔV_O	$I_O = 5mA$ to $1A$, $T_J = 25^{\circ}C$	--	--	240	mV
		$I_O = 250mA$ to $750mA$, $T_J = 25^{\circ}C$	--	--	120	mV
Ripple Rejection	RR	$\Delta V_I = 10V$, $f = 120Hz$	54	60	--	dB
Dropout Voltage	V_D	$I_O = 1A$, $T_J = 25^{\circ}C$	--	2	--	V
Quiescent Current	I_Q	, $T_J = 25^{\circ}C$	--	--	6	mA
Temperature coefficient of V_O	$\Delta V_O / \Delta T$	$I_O = 5mA$	--	1.2	--	mV/ $^{\circ}C$
Quiescent Current Change	ΔI_Q	$I_O = 5mA$ to $1A$	--	--	0.5	mA
		$V_I = -14.5V$ to $-30V$	--	--	1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_A = 25^{\circ}C$	--	200	--	μV



PJ79DXXTE

3-Terminal Voltage Regulators

PJ79D15TE Electrical Characteristics

$V_I = -23V$, $I_O = 500mA$, $-20 < T_J < 125^\circ C$, $C_I = 0.22\mu F$, $C_O = 1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	$-V_O$	$T_J = 25^\circ C$	14.4	15	15.6	V
		$I_O = 5mA$ to $1A$ $V_I = -20V$ to $-26V$	14.25	15	15.75	V
Line Regulation	ΔV_O	$V_I = -17.5V$ to $-30V$, $T_J = 25^\circ C$	--	--	300	mV
		$V_I = -20V$ to $-26V$, $T_J = 25^\circ C$	--	--	150	mV
Load Regulation	ΔV_O	$I_O = 5mA$ to $1A$, $T_J = 25^\circ C$	--	--	300	mV
		$I_O = 250mA$ to $750mA$, $T_J = 25^\circ C$	--	--	150	mV
Ripple Rejection	RR	$\Delta V_I = 10V$, $f = 120Hz$	54	60	--	dB
Dropout Voltage	V_D	$I_O = 1A$, $T_J = 25^\circ C$	--	2	--	V
Quiescent Current	I_Q	, $T_J = 25^\circ C$	--	--	6	mA
Temperature coefficient of V_O	$\Delta V_O / \Delta T$	$I_O = 5mA$	--	1.5	--	mV/ $^\circ C$
Quiescent Current Change	ΔI_Q	$I_O = 5mA$ to $1A$	--	--	0.5	mA
		$V_I = -17.5V$ to $-30V$	--	--	1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_A = 25^\circ C$	--	250	--	μV



PJ79DXXTE

3-Terminal Voltage Regulators

PJ79D18TE Electrical Characteristics

$V_I = -27V$, $I_O = 500mA$, $-20 < T_J < 125^\circ C$, $C_I = 0.22\mu F$, $C_O = 1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	$-V_O$	$T_J = 25^\circ C$	17.28	18	18.72	V
		$I_O = 5mA$ to $1A$ $V_I = -22.5V$ to $-33V$	17.1	18	18.9	V
Line Regulation	ΔV_O	$V_I = -21V$ to $-33V$, $T_J = 25^\circ C$	--	--	360	mV
		$V_I = -24V$ to $-30V$, $T_J = 25^\circ C$	--	--	180	mV
Load Regulation	ΔV_O	$I_O = 5mA$ to $1A$, $T_J = 25^\circ C$	--	--	360	mV
		$I_O = 250mA$ to $750mA$, $T_J = 25^\circ C$	--	--	180	mV
Ripple Rejection	RR	$\Delta V_I = 10V$, $f = 120Hz$	--	40	--	dB
Dropout Voltage	V_D	$I_O = 1A$, $T_J = 25^\circ C$	--	2	--	V
Quiescent Current	I_Q	, $T_J = 25^\circ C$	--	--	6	mA
Temperature coefficient of V_O	$\Delta V_O / \Delta T$	$I_O = 5mA$	--	0.5	--	mV/ $^\circ C$
Quiescent Current Change	ΔI_Q	$I_O = 5mA$ to $1A$	--	--	0.5	mA
		$V_I = -21V$ to $-33V$	--	--	0.8	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_A = 25^\circ C$	--	300	--	μV



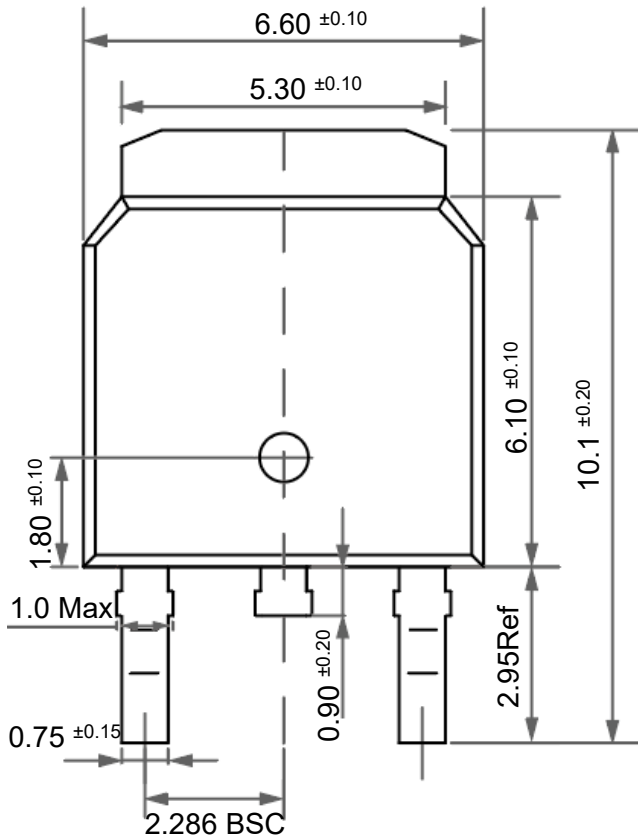
PJ79DXXTE

3-Terminal Voltage Regulators

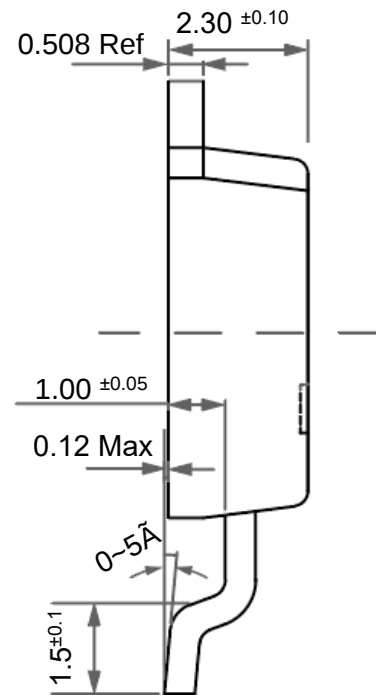
Package Outline

TO-252

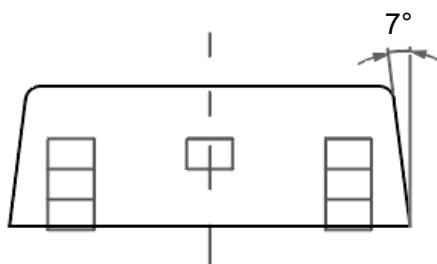
Dimensions in mm



Front View



Side View



Bottom View