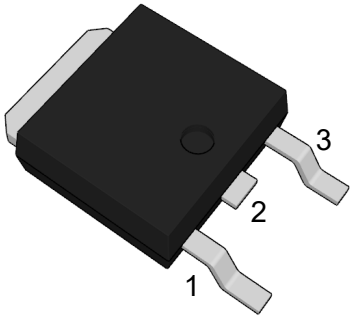
3-Terminal Voltage Regulators

Description

The TN79XXTE series of three-terminal negative regulators are available in TO-252 package. Each type employs internal current limiting, thermal shut-down and safe area protection, making it essentially indestructible. If adequate heat sinking is provided,It can deliver over 1.5A output current, Although designed as fixed voltage regulator, This device can be used with external components to obtain adjustable voltage and currents.

TO-252



1. GND 2. VIN 3. VOUT

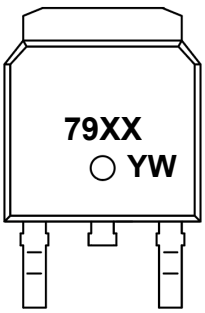
Features

- Input voltage: up to -35V
- Output voltage: -5V,-6V,-8V,-9V,-10V,-12V,-15V
- Output current up to 1.5 A
- Thermal overload protection
- Short circuit current limiting

Applications

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

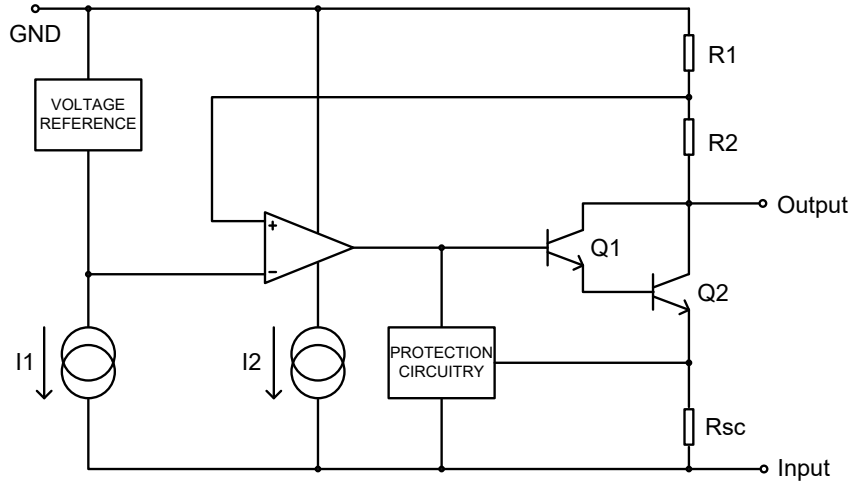
Ordering Information

Orderable Device	Package	Reel (inch)	Package Qty (PCS)	Eco Plan Note	MSL Level	Marking Code
TN7905TE	TO-252	13	2500	RoHS & Green	MSL3	
TN7906TE						
TN7908TE						
TN7909TE						
TN7910TE						
TN7912TE						
TN7915TE						

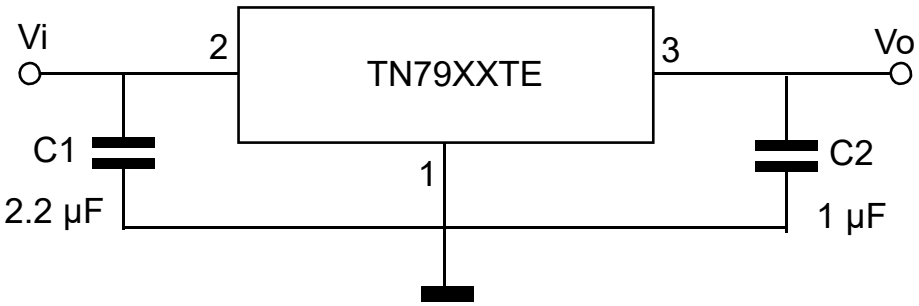
79XX: Product code
e.g. TN7905TE:7905
YW: Year code and Week code

Note:
RoHS: TN 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: TN defines "Green" to mean Halogen-Free and Antimony-Free.

Function Block Diagram



Typical Application Circuit



Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Input Voltage	$-V_I$	35	V
Output Current	I_O	1.5	A
Maximum Power Dissipation	P_D	2	W
Operating Temperature Range	T_{OPR}	0 to +125	°C
Storage Temperature Range	T_{STG}	-65 to +150	°C

TN7905TE Electrical Characteristics

V_I=-10V, I_O=500mA, 0<T_J<125℃, C_I=2.2μF,C_O=1μF,unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	-V_O	T_J=25°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	△V_O	V_I=-7V to -25V, T_J=25°C	--	--	100	mV
		V_I=-8V to -12V, T_J=25°C	--	--	50	mV
Load Regulation	△V_O	I_O=5mA to 1.5A, T_J=25°C	--	--	100	mV
		I_O=250mA to 750mA, T_J=25°C	--	--	50	mV
Ripple Rejection	RR	△V_I=10V, f=120Hz	54	60	--	dB
Dropout Voltage	V_D	I_O=1A, T_J=25°C	--	2	--	V
Quiescent Current	I_Q	T_J=25°C	--	--	6	mA
Temperature coefficient of V_O	△V_O/△T	I_O=5mA	--	0.5	--	mV/°C
Quiescent Current Change	△I_Q	I_O=5mA to 1A	--	--	0.8	mA
		I_O=500mA, V_I=-8V to -25V	--	--	0.5	mA
Output Noise Voltage	V_N	10Hz≤f≤100kHz,T_A=25°C	--	40	--	μV

TN7906TE Electrical Characteristics

V_I=-11V, I_O=500mA, 0<T_J<125℃, C_I=2.2μF,C_O=1μF,unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	-V_O	T_J=25°C	5.75	6.0	6.25	V
		I_O=5mA to 1A V_I=-9V to -21V	5.7	6.0	6.3	V
Line Regulation	△V_O	V_I=-8V to -25V, T_J=25°C	--	--	120	mV
		V_I=-9V to -13V, T_J=25°C	--	--	60	mV
Load Regulation	△V_O	I_O=5mA to 1.5A, T_J=25°C	--	--	120	mV
		I_O=250mA to 750mA, T_J=25°C	--	--	60	mV
Ripple Rejection	RR	△V_I=10V, f=120Hz	54	60	--	dB
Dropout Voltage	V_D	I_O=1A, T_J=25°C	--	2	--	V
Quiescent Current	I_Q	T_J=25°C	--	--	6	mA
Temperature coefficient of V_O	△V_O/△T	I_O=5mA	--	0.6	--	mV/°C
Quiescent Current Change	△I_Q	I_O=5mA to 1A	--	--	0.5	mA
		V_I=-8V to -25V	--	--	1	mA
Output Noise Voltage	V_N	10Hz≤f≤100kHz,T_A=25°C	--	130	--	μV

TN7908TE Electrical Characteristics

V_I=-14V, I_O=500mA, 0<T_J<125℃, C_I=2.2μF,C_O=1μF,unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	-V_O	T_J=25°C	7.7	8.0	8.3	V
		I_O=5mA to 1A V_I=-10V to -23V	7.6	8.0	8.4	V
Line Regulation	△V_O	V_I=-10.5V to -25V, T_J=25°C	--	--	160	mV
		V_I=-11V to -17V, T_J=25°C	--	--	80	mV
Load Regulation	△V_O	I_O=5mA to 1.5A, T_J=25°C	--	--	160	mV
		I_O=250mA to 750mA, T_J=25°C	--	--	80	mV
Ripple Rejection	RR	△V_I=10V, f=120Hz	54	60	--	dB
Dropout Voltage	V_D	I_O=1A, T_J=25°C	--	2	--	V
Quiescent Current	I_Q	T_J=25°C	--	--	6	mA
Temperature coefficient of V_O	△V_O/△T	I_O=5mA	--	0.8	--	mV/°C
Quiescent Current Change	△I_Q	I_O=5mA to 1A	--	--	0.5	mA
		V_I=-10.5V to -25V	--	--	1	mA
Output Noise Voltage	V_N	10Hz≤f≤100kHz,T_A=25°C	--	175	--	μV

TN7909TE Electrical Characteristics

V_I=-15V, I_O=500mA, 0<T_J<125℃, C_I=2.2μF,C_O=1μF,unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	-V_O	T_J=25°C	8.7	9.0	9.3	V
		I_O=5mA to 1A V_I=-7V to -20V	8.6	9.0	9.4	V
Line Regulation	△V_O	V_I=-11.5V to -26V, T_J=25°C	--	--	180	mV
		V_I=-12V to -18V, T_J=25°C	--	--	90	mV
Load Regulation	△V_O	I_O=5mA to 1.5A, T_J=25°C	--	--	180	mV
		I_O=250mA to 750mA, T_J=25°C	--	--	90	mV
Ripple Rejection	RR	△V_I=10V, f=120Hz	54	60	--	dB
Dropout Voltage	V_D	I_O=1A, T_J=25°C	--	2	--	V
Quiescent Current	I_Q	T_J=25°C	--	3	6	mA
Temperature coefficient of V_O	△V_O/△T	I_O=5mA	--	0.9	--	mV/°C
Quiescent Current Change	△I_Q	I_O=5mA to 1A	--	--	0.5	mA
		V_I=-11.5V to -26V	--	--	1	mA
Output Noise Voltage	V_N	10Hz≤f≤100kHz,T_A=25°C	--	175	--	μV

TN7910TE Electrical Characteristics

V_I=-17V, I_O=500mA, 0<T_J<125℃, C_I=2.2μF,C_O=1μF,unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	-V_O	T_J=25°C	9.6	10	10.4	V
		I_O=5mA to 1A V_I=-10V to -23V	9.5	10	10.5	V
Line Regulation	△V_O	V_I=-12.5V to -28V, T_J=25°C	--	--	200	mV
		V_I=-14V to -20V, T_J=25°C	--	--	100	mV
Load Regulation	△V_O	I_O=5mA to 1.5A, T_J=25°C	--	--	200	mV
		I_O=250mA to 750mA, T_J=25°C	--	--	100	mV
Ripple Rejection	RR	△V_I=10V, f=120Hz	54	60	--	dB
Dropout Voltage	V_D	I_O=1A, T_J=25°C	--	2	--	V
Quiescent Current	I_Q	T_J=25°C	--	--	6	mA
Temperature coefficient of V_O	△V_O/△T	I_O=5mA	--	1	--	mV/°C
Quiescent Current Change	△I_Q	I_O=5mA to 1A	--	--	0.5	mA
		V_I=-12.5V to -28V	--	--	1	mA
Output Noise Voltage	V_N	10Hz≤f≤100kHz,T_A=25°C	--	280	--	μV

TN7912TE Electrical Characteristics

V_I=-19V, I_O=500mA, 0<T_J<125℃, C_I=2.2μF,C_O=1μF,unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	-V_O	T_J=25°C	11.5	12	12.5	V
		I_O=5mA to 1A V_I=-7V to -20V	11.4	12	12.6	V
Line Regulation	△V_O	V_I=-14.5V to -30V, T_J=25°C	--	--	240	mV
		V_I=-16V to -22V, T_J=25°C	--	--	120	mV
Load Regulation	△V_O	I_O=5mA to 1.5A, T_J=25°C	--	--	240	mV
		I_O=250mA to 750mA, T_J=25°C	--	--	120	mV
Ripple Rejection	RR	△V_I=10V, f=120Hz	54	60	--	dB
Dropout Voltage	V_D	I_O=1A, T_J=25°C	--	2	--	V
Quiescent Current	I_Q	T_J=25°C	--	--	6	mA
Temperature coefficient of V_O	△V_O/△T	I_O=5mA	--	1.2	--	mV/°C
Quiescent Current Change	△I_Q	I_O=5mA to 1A	--	--	0.5	mA
		V_I=-14.5V to -30V	--	--	1	mA
Output Noise Voltage	V_N	10Hz≤f≤100kHz,T_A=25°C	--	200	--	μV

TN7915TE Electrical Characteristics

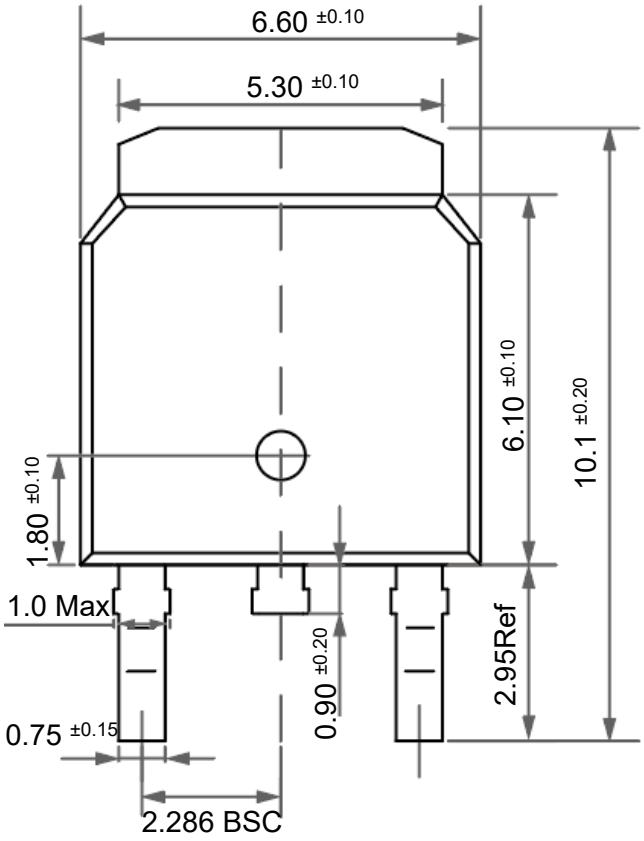
V_I=-23V, I_O=500mA, 0<T_J<125℃, C_I=2.2μF,C_O=1μF,unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	-V_O	T_J=25°C	14.4	15	15.6	V
		I_O=5mA to 1A V_I=-7V to -20V	14.25	15	15.75	V
Line Regulation	△V_O	V_I=-17.5V to -30V, T_J=25°C	--	--	300	mV
		V_I=-20V to -26V, T_J=25°C	--	--	150	mV
Load Regulation	△V_O	I_O=5mA to 1.5A, T_J=25°C	--	--	300	mV
		I_O=250mA to 750mA, T_J=25°C	--	--	150	mV
Ripple Rejection	RR	△V_I=10V, f=120Hz	54	60	--	dB
Dropout Voltage	V_D	I_O=1A, T_J=25°C	--	2	--	V
Quiescent Current	I_Q	T_J=25°C	--	--	6	mA
Temperature coefficient of V_O	△V_O/△T	I_O=5mA	--	1.5	--	mV/°C
Quiescent Current Change	△I_Q	I_O=5mA to 1A	--	--	0.5	mA
		V_I=-17.5V to -30V	--	--	1	mA
Output Noise Voltage	V_N	10Hz≤f≤100kHz,T_A=25°C	--	250	--	μV

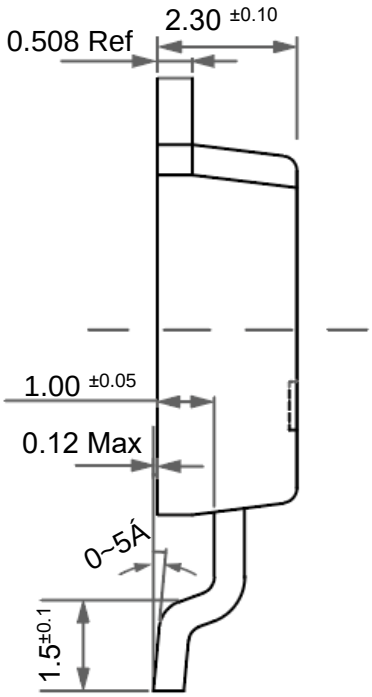
Package Outline

TO-252

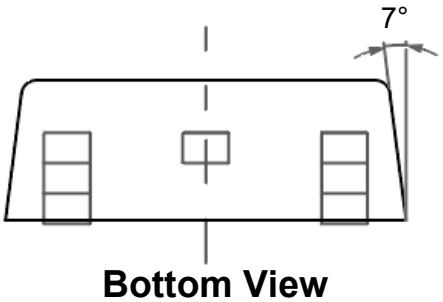
Dimensions in mm



Front View



Side View



Bottom View

Contact Information

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For additional information, please contact your local Sales Representative.

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