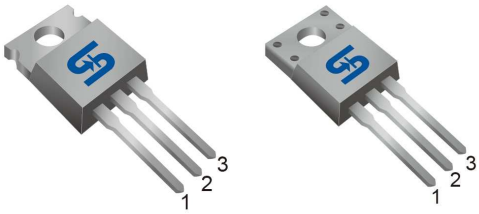
TS7900 Series

3-Terminal Fixed Negative Voltage Regulator

TO-220 ITO-220



Pin Definition:
1. Ground
2. Input (tab)
3. Output

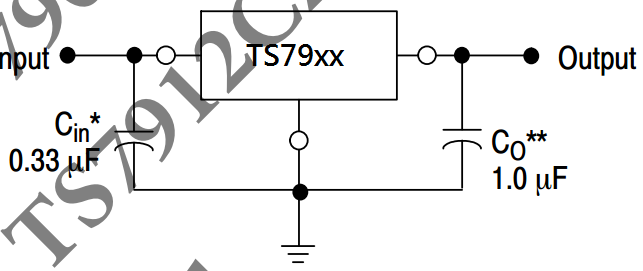
General Description

The TS7900 series of fixed output negative voltage regulators are intended as complements to the popular TS7800 series device. These negative regulators are available in the same seven-voltage options as the TS7900 devices. In addition, one extra voltage option commonly employed in MECL systems is also available in the negative TS7900 Series. Available in fixed output voltage options from -5.0 to -24 volts, these regulators employ current limiting, thermal shutdown, and safe-area compensation--making them remarkably rugged under most operating conditions. With adequate heat sinking they can deliver output currents in excess of 1 ampere.

Features

- Output Voltage: -5 & -12V
- Output current up to 1A
- No external components required
- Internal thermal overload protection
- Internal short-circuit current limiting
- Output transistor safe-area compensation
- Output voltage offered in 4% tolerance

Standard Application Circuit



A common ground is required between the input and the output voltages. The input voltage must remain typically 2.0V above the output voltage even during the low point on the Input ripple voltage.
XX = these two digits of the type number indicate voltage.
* = Cin is required if regulator is located an appreciable distance from power supply filter.
** = Co is not needed for stability; however, it does improve transient response.

Ordering Information

Part No.	Package	Packing
TS79xxCZ C0	TO-220	50pcs / Tube
TS79xxCZ C0G	TO-220	50pcs / Tube
TS79xxCI C0	ITO-220	50pcs / Tube
TS79xxCI C0G	ITO-220	50pcs / Tube

Note: Where xx denote voltage option
05=-5V, **12**=-12V
"G" denote for Green Product Halogen Free

Absolute Maximum Rating (Ta = 25°C unless otherwise noted)

Parameter		Symbol	Limit	Unit
Input Voltage		V_{IN}	-35	V
Power Dissipation		P_D	Internal Limited	W
Operating Junction Temperature Range		T_{JOPR}	0 ~ +125	°C
Junction Temperature		T_J	+150	°C
Storage Temperature Range		T_{STG}	-65~+150	°C
Thermal Resistance - Junction to Case	TO-220	$R\Theta_{JC}$	3	°C/W
	ITO-220		5	
Thermal Resistance - Junction to Ambient	TO-220	$R\Theta_{JA}$	50	°C/W
	ITO-220		60	

Note: * Follow the derating curve

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TS7905 Electrical Characteristics

(Vin= -10V, Iout=500mA, 0°C≤Tj≤125°C, Cin=0.33uF, Cout=0.1uF; unless otherwise specified.)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Output voltage	Vout	Tj=25°C		-4.80	-5	-5.20	V
		-7.5V≤Vin≤-20V, 10mA≤Iout≤1A, PD≤15W		-4.75	-5	-5.25	
Line Regulation	REGline	Tj=25°C	-7.5V≤Vin≤-25V	--	3	100	mV
			-8V≤Vin≤-12V	--	1	50	
Load Regulation	REGload	Tj=25°C	10mA≤Iout≤1A	--	15	100	
			250mA≤Iout≤750mA	--	5	50	
Quiescent Current	Iq	Iout=0, Tj=25°C		--	4	8	mA
Quiescent Current Change	ΔIq	-7.5V≤Vin≤-25V		--	--	1.3	
		10mA≤Iout≤1A		--	--	0.5	
Output Noise Voltage	Vn	10Hz≤f≤100KHz, Tj=25°C		--	40	--	μV
Ripple Rejection Ratio	RR	f=120Hz, -8V≤Vin≤-18V		62	74	--	dB
Voltage Drop	Vdrop	Iout=1A, Tj=25°C		--	2	--	V
Output Short Circuit Current	Ios	Tj=25°C		--	750	--	mA
Peak Output Current	Io peak	Tj=25°C		--	2.1	--	A
Temperature Coefficient of Output Voltage	ΔVout/ ΔTj	Iout=10mA, 0°C≤Tj≤125°C		--	-0.1	--	mV/ °C

TS7912 Electrical Characteristics

(Vin= -19V, Iout=500mA, 0°C≤Tj≤125°C, Cin=0.33uF, Cout=0.1uF; unless otherwise specified.)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Output Voltage	Vout	Tj=25°C		-11.53	-12	-12.48	V
		-14.5V≤Vin≤-27V, 10mA≤Iout≤1A, PD ≤15W		-11.42	-12	-12.60	
Line Regulation	REGline	Tj=25°C	-14.5V≤Vin≤-30V	--	10	240	mV
			-15V≤Vin≤-19V	--	3	120	
Load Regulation	REGload	Tj=25°C	10mA≤Iout≤1A	--	12	240	
			250mA≤Iout≤750mA	--	4	120	
Quiescent Current	Iq	Tj=25°C, Iout=0		--	4.3	8	mA
Quiescent Current Change	ΔIq	-14.5V≤Vin≤-30V		--	--	1	
		10mA≤Iout≤1A		--	--	0.5	
Output Noise Voltage	Vn	10Hz≤f≤100KHz, Tj=25°C		--	75	--	uV
Ripple Rejection Ratio	RR	f=120Hz, -15V≤Vin≤-25V		55	70	--	dB
Voltage Drop	Vdrop	Iout=1A, Tj=25°C		--	2	--	V
Output Short Circuit Current	Ios	Tj=25°C		--	350	--	mA
Peak Output Current	Io peak	Tj=25°C		--	2.1	--	A
Temperature Coefficient of Output Voltage	ΔVout/ ΔTj	Iout=10mA, 0°C≤Tj≤125°C		--	-1	--	mV/ °C

- Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible, and thermal effects must be taken into account separately.
- This specification applies only for DC power dissipation permitted by absolute maximum ratings.

Electrical Characteristics Curve

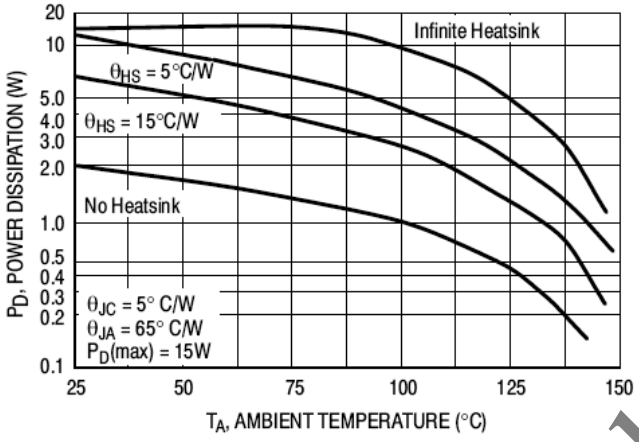

Figure 1. Worse Case Power Dissipation as a Function of Ambient Temperature

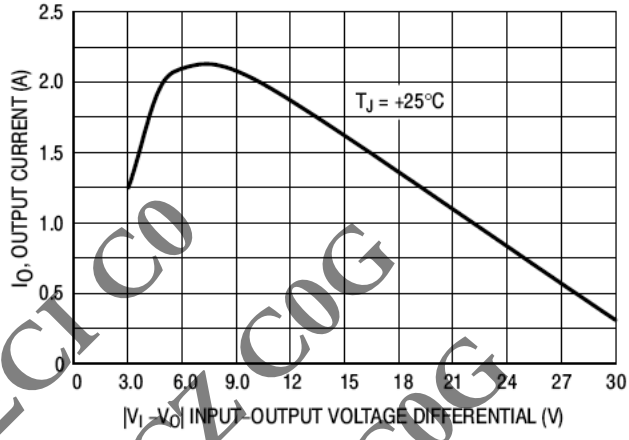

Figure 2. Peak Output Current as a Function of Input-Output Differential Voltage

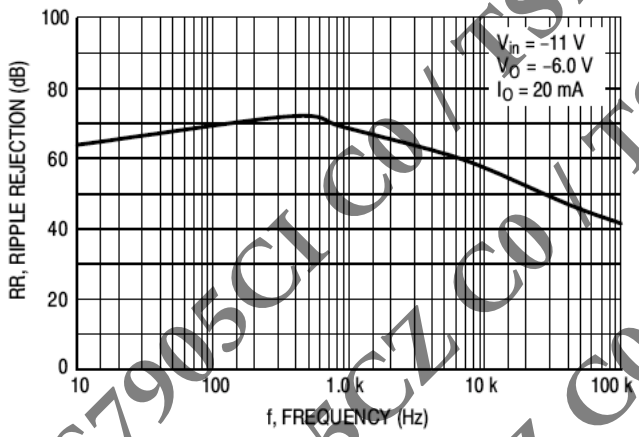

Figure 3. Ripple Rejection as a Function of Frequency

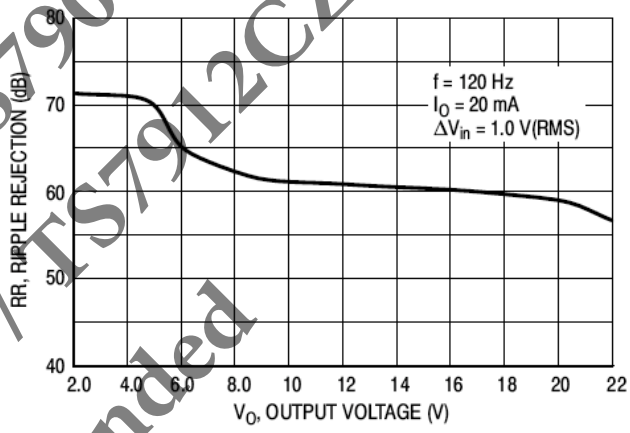

Figure 4. Ripple Rejection as a Function of Output Voltage

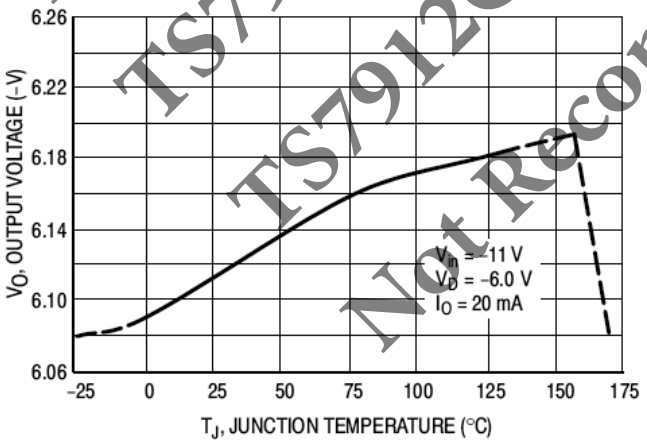

Figure 5. Output Voltage as a Function of Junction Temperature

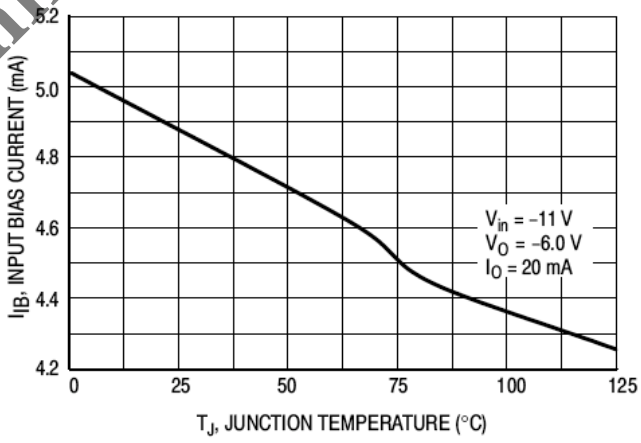

Figure 5. Output Voltage as a Function of Junction Temperature

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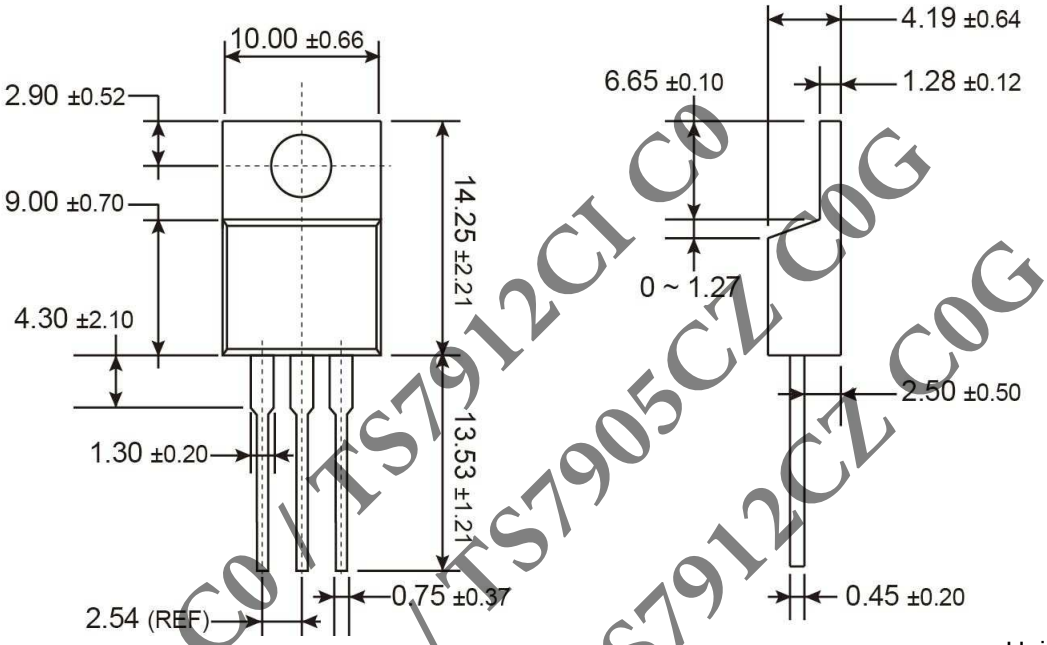
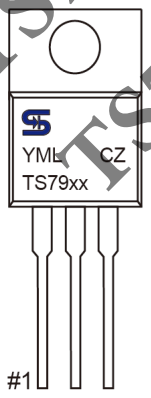
TO-220 Mechanical Drawing



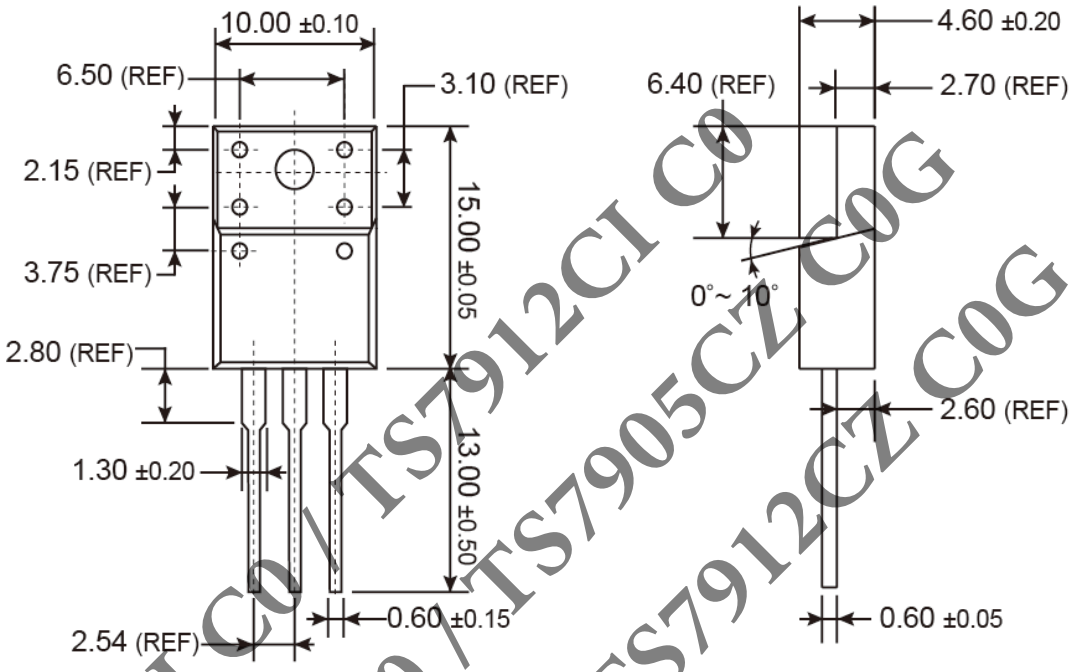
Unit: Millimeters

Marking Diagram



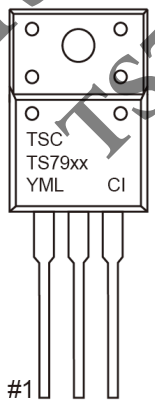
XX = Output Voltage
(05=-5V, 12=-12V)
Y = Year Code
M = Month Code
(**A**=Jan, **B**=Feb, **C**=Mar, **D**=Apl, **E**=May, **F**=Jun, **G**=Jul, **H**=Aug, **I**=Sep, **J**=Oct, **K**=Nov, **L**=Dec)
= Month Code for Halogen Free Product
(**O**=Jan, **P**=Feb, **Q**=Mar, **R**=Apl, **S**=May, **T**=Jun, **U**=Jul, **V**=Aug, **W**=Sep, **X**=Oct, **Y**=Nov, **Z**=Dec)
L = Lot Code
CZ = Package Code for TO-220

ITO-220 Mechanical Drawing



Unit: Millimeters

Marking Diagram



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L = Lot Code
CI = Package Code for ITO-220

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