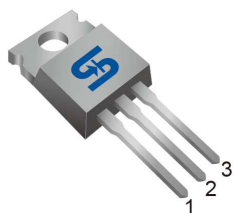
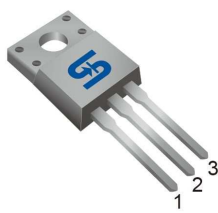


TO-220

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

Ordering Information

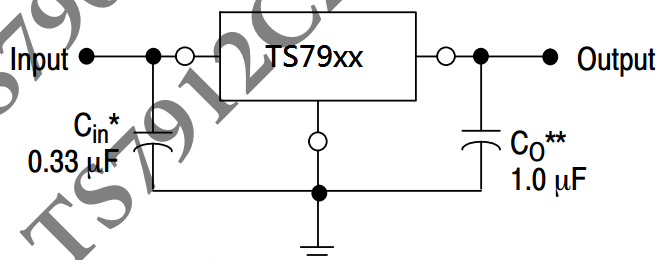
Part No.	Package	Packing
TS79xxCZ C0	TO-220	50pcs / Tube
TS79xxCZ C0G	TO-220	50pcs / Tube
TS79xxCI C0	ITO-220	50pcs / Tube
TS79xxCI C0G	ITO-220	50pcs / Tube

Note: Where **xx** denote voltage option

05 = -5V, **12** = -12V

"G" denote for Green Product Halogen Free

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.

* = C_{in} is required if regulator is located an appreciable distance from power supply filter.

** = C_o is not needed for stability; however, it does improve transient response.

Absolute Maximum Rating ($T_a = 25^\circ\text{C}$ 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	$^\circ\text{C}$
Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65~+150	$^\circ\text{C}$
Thermal Resistance - Junction to Case	TO-220	$R\theta_{JC}$	3
	ITO-220		
Thermal Resistance - Junction to Ambient	TO-220	$R\theta_{JA}$	50
	ITO-220		

Note: * Follow the derating curve

TS7900 Series

3-Terminal Fixed Negative Voltage Regulator

TS7905 Electrical Characteristics

($V_{in} = -10V$, $I_{out} = 500mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{in} = 0.33\mu F$, $C_{out} = 0.1\mu F$; unless otherwise specified.)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Output voltage	V_{out}	$T_j = 25^{\circ}C$	-4.80	-5	-5.20	V
		$-7.5V \leq V_{in} \leq -20V$, $10mA \leq I_{out} \leq 1A$, $PD \leq 15W$	-4.75	-5	-5.25	
Line Regulation	REGline	$T_j = 25^{\circ}C$	-7.5V $\leq V_{in} \leq$ -25V	--	3	mV
			-8V $\leq V_{in} \leq$ -12V	--	1	
Load Regulation	REGload	$T_j = 25^{\circ}C$	$10mA \leq I_{out} \leq 1A$	--	15	
			$250mA \leq I_{out} \leq 750mA$	--	5	
Quiescent Current	I_q	$I_{out} = 0$, $T_j = 25^{\circ}C$	--	4	8	mA
Quiescent Current Change	ΔI_q	$-7.5V \leq V_{in} \leq -25V$	--	--	1.3	
		$10mA \leq I_{out} \leq 1A$	--	--	0.5	
Output Noise Voltage	V_n	$10Hz \leq f \leq 100KHz$, $T_j = 25^{\circ}C$	--	40	--	μV
Ripple Rejection Ratio	RR	$f = 120Hz$, $-8V \leq V_{in} \leq -18V$	62	74	--	dB
Voltage Drop	V_{drop}	$I_{out} = 1A$, $T_j = 25^{\circ}C$	--	2	--	V
Output Short Circuit Current	I_{os}	$T_j = 25^{\circ}C$	--	750	--	mA
Peak Output Current	$I_{o peak}$	$T_j = 25^{\circ}C$	--	2.1	--	A
Temperature Coefficient of Output Voltage	$\Delta V_{out} / \Delta T_j$	$I_{out} = 10mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$	--	-0.1	--	mV/ $^{\circ}C$

TS7912 Electrical Characteristics

($V_{in} = -19V$, $I_{out} = 500mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{in} = 0.33\mu F$, $C_{out} = 0.1\mu F$; unless otherwise specified.)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage	V_{out}	$T_j = 25^{\circ}C$	-11.53	-12	-12.48	V
		$-14.5V \leq V_{in} \leq -27V$, $10mA \leq I_{out} \leq 1A$, $PD \leq 15W$	-11.42	-12	-12.60	
Line Regulation	REGline	$T_j = 25^{\circ}C$	-14.5V $\leq V_{in} \leq$ -30V	--	10	mV
			-15V $\leq V_{in} \leq$ -19V	--	3	
Load Regulation	REGload	$T_j = 25^{\circ}C$	$10mA \leq I_{out} \leq 1A$	--	12	
			$250mA \leq I_{out} \leq 750mA$	--	4	
Quiescent Current	I_q	$T_j = 25^{\circ}C$, $I_{out} = 0$	--	4.3	8	mA
Quiescent Current Change	ΔI_q	$-14.5V \leq V_{in} \leq -30V$	--	--	1	
		$10mA \leq I_{out} \leq 1A$	--	--	0.5	
Output Noise Voltage	V_n	$10Hz \leq f \leq 100KHz$, $T_j = 25^{\circ}C$	--	75	--	μV
Ripple Rejection Ratio	RR	$f = 120Hz$, $-15V \leq V_{in} \leq -25V$	55	70	--	dB
Voltage Drop	V_{drop}	$I_{out} = 1A$, $T_j = 25^{\circ}C$	--	2	--	V
Output Short Circuit Current	I_{os}	$T_j = 25^{\circ}C$	--	350	--	mA
Peak Output Current	$I_{o peak}$	$T_j = 25^{\circ}C$	--	2.1	--	A
Temperature Coefficient of Output Voltage	$\Delta V_{out} / \Delta T_j$	$I_{out} = 10mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$	--	-1	--	mV/ $^{\circ}C$

- 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

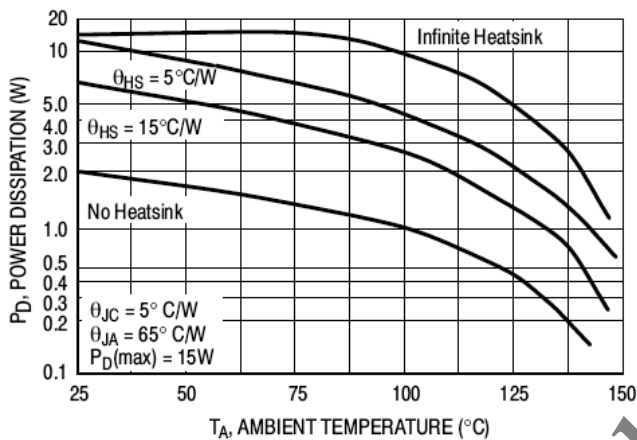


Figure 1. Worst Case Power Dissipation as a Function of Ambient Temperature

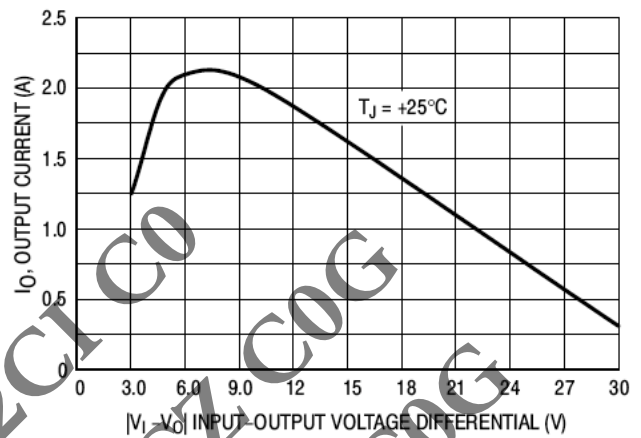


Figure 2. Peak Output Current as a Function of Input-Output Differential Voltage



Figure 3. Ripple Rejection as a Function of Frequency

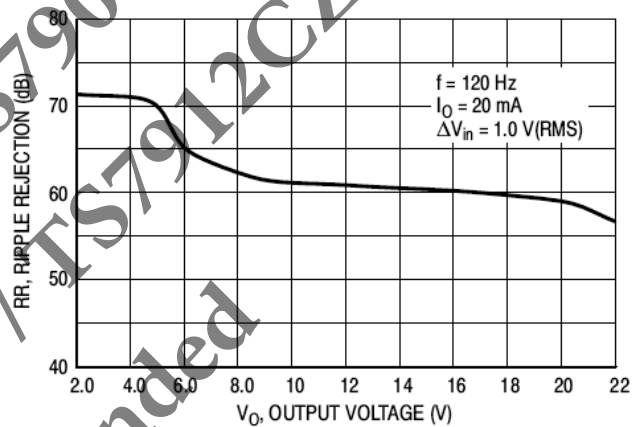


Figure 4. Ripple Rejection as a Function of Output Voltage

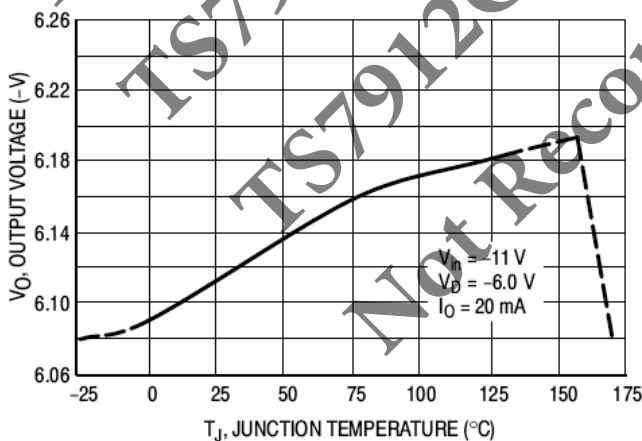


Figure 5. Output Voltage as a Function of Junction Temperature

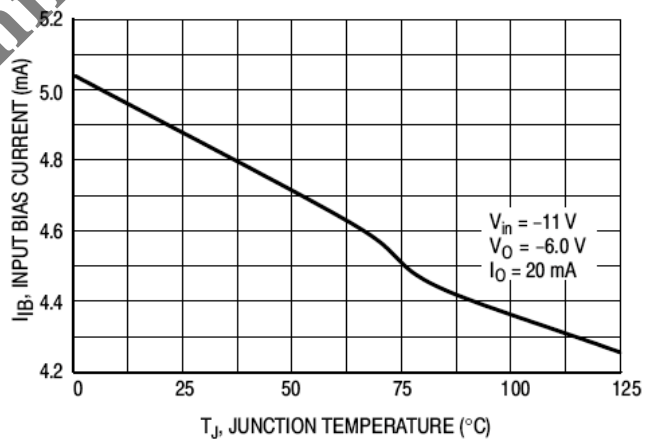
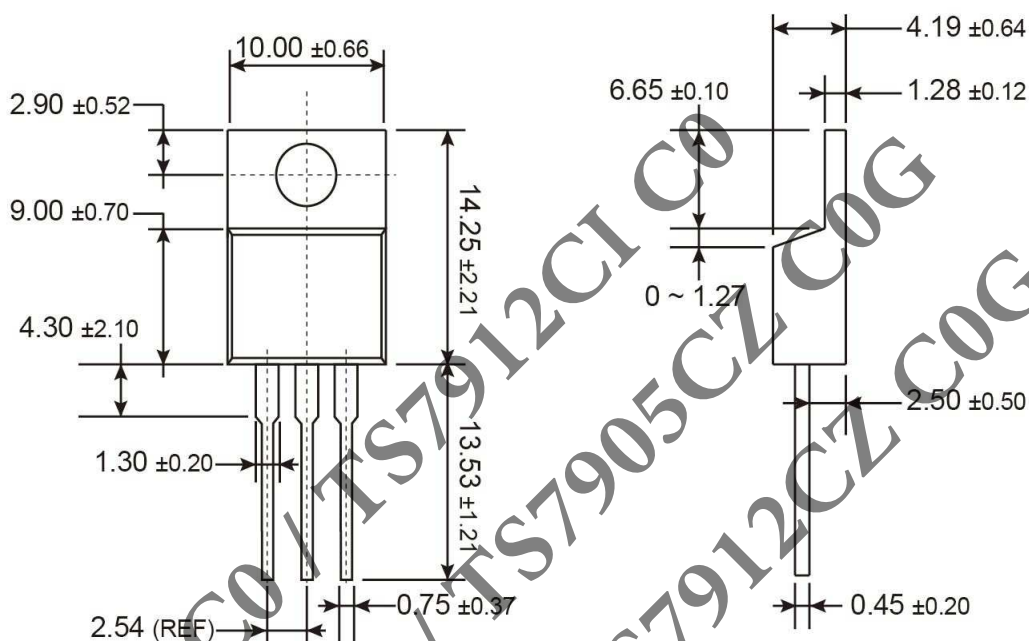


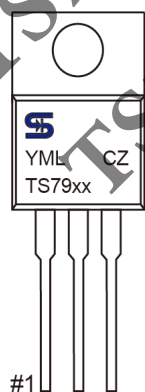
Figure 5. Output Voltage as a Function of Junction Temperature

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)

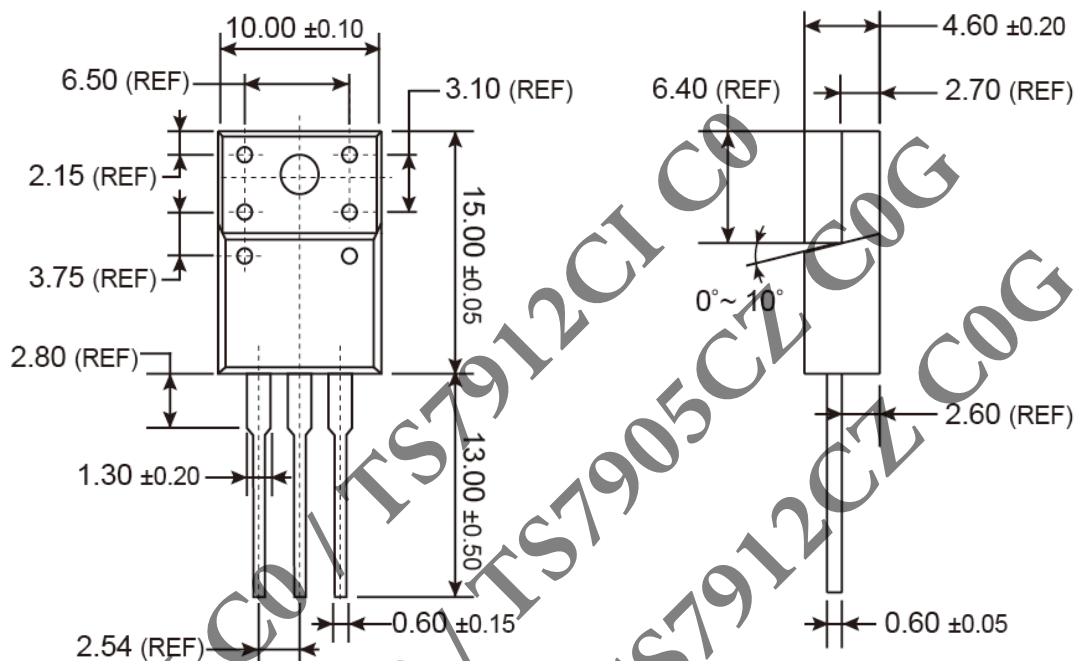
= Month Code for Halogen Free Product

(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

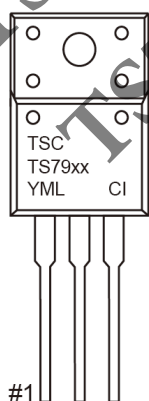
CZ = Package Code for TO-220

ITO-220 Mechanical Drawing



Unit: Millimeters

Marking Diagram



- 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
- CI** = Package Code for ITO-220

TS7900 Series

3-Terminal Fixed Negative Voltage Regulator

TS7905CI C0 / TS7912CI C0
TS7905CZ C0 / TS7905CZ C0G
TS7912CZ C0 / TS7912CZ C0G
Not Recommended

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