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TO-252-3L



TO-220F-3L

Description

The SN79xxx series are three-terminal Negative regulators providing over 1A output current with internal current limiting, thermal shutdown and safe area protection. These regulators are useful in a wide range of applications. Although they are just fixed voltage regulators, the SN79xxx series can be used with external components to obtain adjustable voltages and Currents.

Application

- ◆ Consumer and personal electronics
- ◆ SMPS post-regulator / dc-to-dc modules
- ◆ High-efficiency linear power supplies

Features and Benefits

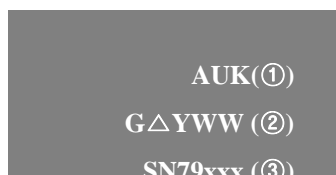
- ◆ Output Current up to 1.0A
- ◆ Output Voltage : -5, -6, -8, -9, -10, -12, -15, -18, -24V
- ◆ Built in OVP, CLP circuit.
- ◆ Built in TSD Protection.
- ◆ Output Transistor Safe Area Protection.
- ◆ Ultra High level of ESD [Built in ESD Protection Cell]

ORDERING INFORMATION

Product	Marking	Package
SN79xxD	SN79xxD	TO-252-3L
SN79xxPI	SN79xxPI	TO-220F-3L

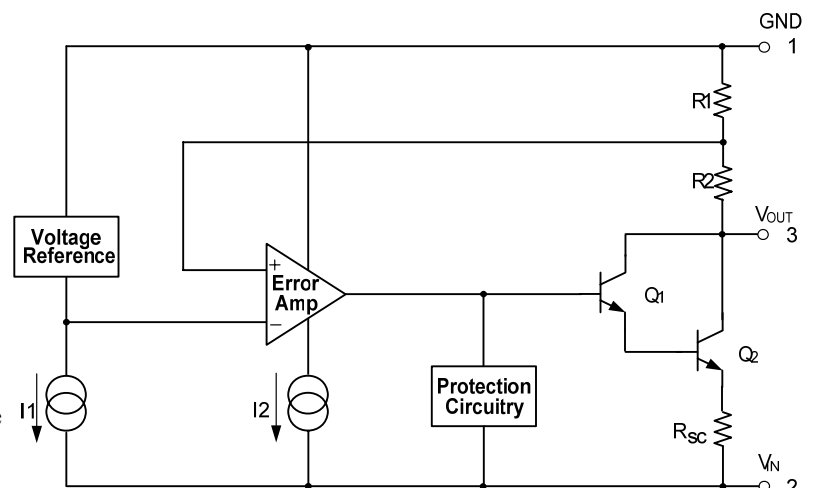
▲ Marking Detail Information

[TO-220F-3L & TO-252-3L PKG Marking]

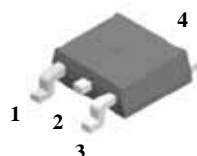


- ① AUK Logo
- ② Grade & M Code & Year & Week Code
- ③ Device Code

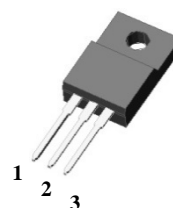
Equivalent Circuit



◆ Pin Configuration

**TO-252-3L**

- 1: GND
- 2: V_{IN}
- 3: V_{OUT}
- 4: V_{IN}

**TO-220F-3L**

- 1: GND
- 2: V_{IN}
- 3: V_{OUT}

◆ Product Line-up

Product Name	V_{OUT}	Operating Temperature	Package
SN7905D	-5.0V	-40~85°C	TO-252-3L
SN7906D	-6.0V	-40~85°C	TO-252-3L
SN7908D	-8.0V	-40~85°C	TO-252-3L
SN7909D	-9.0V	-40~85°C	TO-252-3L
SN7910D	-10V	-40~85°C	TO-252-3L
SN7912D	-12V	-40~85°C	TO-252-3L
SN7915D	-15V	-40~85°C	TO-252-3L
SN7918D	-18V	-40~85°C	TO-252-3L
SN7924D	-24V	-40~85°C	TO-252-3L
SN7905PI	-5.0V	-40~85°C	TO-220F-3L
SN7906PI	-6.0V	-40~85°C	TO-220F-3L
SN7908PI	-8.0V	-40~85°C	TO-220F-3L
SN7909PI	-9.0V	-40~85°C	TO-220F-3L
SN7910PI	-10V	-40~85°C	TO-220F-3L
SN7912PI	-12V	-40~85°C	TO-220F-3L
SN7915PI	-15V	-40~85°C	TO-220F-3L
SN7918PI	-18V	-40~85°C	TO-220F-3L
SN7924PI	-24V	-40~85°C	TO-220F-3L

◆ Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Parameter		Symbol	Limits		Unit
			TO-220F-3L	TO-252-3L	
Input Voltage		V_{IN}	-40.0 (SN7924x)		V
			-35.0 (All Others)		
Power Dissipation	TO-252-3L	P_d	1.3		W
	TO-220F-3L		2.0		
Thermal Resistance Junction to Case(TO-220F)		$R_{\theta JC}$	5	5	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction to Air(TO-220F)		$R_{\theta JA}$	65	92	$^\circ\text{C}/\text{W}$
Junction Temperature		T_J	150		$^\circ\text{C}$
Operate Temperature Range		T_{opr}	-40 ~ +85		$^\circ\text{C}$
Storage Temperature Range		T_{stg}	-55 ~ +150		$^\circ\text{C}$

Absolute maximum ratings indicate limits beyond which damage to the component may occur. Electrical specifications do not apply when operating the device outside of its operating ratings. The maximum allowable power dissipation is a function of the maximum junction temperature, $T_{J(max)}$, the junction-to-ambient thermal resistance, θ_{JA} , and the ambient temperature, T_A .

The maximum allowable power dissipation at any ambient temperature is calculated using:

$PD(max) = (T_{J(max)} - T_A) \div \theta_{JA}$. Exceeding the maximum allowable power dissipation will result in excessive die temperature, and the regulator will go into thermal shutdown.

◆ Electrical characteristics

($V_{IN} = -10V$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 1.0\mu F$, $I_{OUT} = 500mA$, $T_J = 0^\circ C \sim 125^\circ C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*	SN7905x			Unit	
			Min.	Typ.	Max.		
Output Voltage**	V_O	$T_J = 25^\circ C$	-4.80	-5.0	-5.20	V	
		$-7.0V \leq V_{IN} \leq -20.0V$ $5.0mA \leq I_O \leq 1.0A$, $P_D \leq 15W$	-4.75	-5.0	-5.25		
Line Regulation	$\Delta V_{O(\Delta V)}$	$-7.0V \leq V_{IN} \leq -25.0V$	-	35	100	mV	
		$-8.0V \leq V_{IN} \leq -12.0V$	-	8	50		
Load Regulation	$\Delta V_{O(\Delta I)}$	$5.0mA \leq I_O \leq 1.5A$	-	10	100	mV	
		$250mA \leq I_O \leq 750 mA$	-	3.0	50		
Quiescent Current	I_{QC}	$T_J = 25^\circ C$	-	3.0	6.0	mA	
Quiescent Current Change	ΔI_{QC}	$-8.0V \leq V_{IN} \leq -25V$	-	0.1	1.3	mA	
		$5.0mA \leq I_O \leq 1.0A$	-	0.05	0.5		
Ripple Rejection	RR	$-8.0V \leq V_{IN} \leq -18.0V$, $I_O = 500 mA$ $f = 120 Hz$	54	60	-	dB	
Dropout Voltage	V_{DROP}	$I_O = 1.0A$	$T_J = 25^\circ C$	-	2.0	-	V
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^\circ C$	-	100	-	$\mu V / V_O$
Short Circuit Current	I_{SC}	$V_I = -35V$	$T_A = 25^\circ C$	-	300	-	mA
Peak Output Current	I_{PK}	$T_J = 25^\circ C$	-	2.2	-	A	
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O = 5.0 mA$	-	-0.4	-	$mV / ^\circ C$	

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

◆ Electrical characteristics

($V_{IN} = -11V$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 1.0\mu F$, $I_{OUT} = 500mA$, $T_J = 0^\circ C \sim 125^\circ C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*	SN7906x			Unit	
			Min.	Typ.	Max.		
Output Voltage**	V_O	$T_J = 25^\circ C$	-5.75	-6.0	-6.2	V	
		$-9.0V \leq V_{IN} \leq -21V$ $5.0mA \leq I_O \leq 1.0A$, $P_D \leq 15W$	-5.70	-6.0	-6.3		
Line Regulation	$\Delta V_{O(\Delta V)}$	$-8.0V \leq V_{IN} \leq -25.0V$	-	10	120	mV	
		$-9.0V \leq V_{IN} \leq -13.0V$	-	5	60		
Load Regulation	$\Delta V_{O(\Delta I)}$	$5.0mA \leq I_O \leq 1.5A$	-	10	120	mV	
		$250mA \leq I_O \leq 750 mA$	-	3.0	60		
Quiescent Current	I_{QC}	$T_J = 25^\circ C$	-	3.0	6.0	mA	
Quiescent Current Change	ΔI_{QC}	$-8.0V \leq V_{IN} \leq -25.0V$	-	0.1	1.3	mA	
		$5.0mA \leq I_O \leq 1.0A$	-	0.05	0.5		
Ripple Rejection	RR	$-9.0V \leq V_{IN} \leq -19.0V$ $f = 120 Hz$	54	60	-	dB	
Dropout Voltage	V_{DROP}	$I_O = 1.0A$	$T_J = 25^\circ C$	-	2.0	-	V
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^\circ C$	-	130	-	$\mu V / V_O$
Short Circuit Current	I_{SC}	$V_I = -35V$	$T_A = 25^\circ C$	-	300	-	mA
Peak Output Current	I_{PK}	$T_J = 25^\circ C$	-	2.2	-	A	
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O = 5.0 mA$	-	-0.5	-	$mV / ^\circ C$	

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

◆ Electrical characteristics

($V_{IN} = -14V$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 1.0\mu F$, $I_{OUT} = 500mA$, $T_J = 0^\circ C \sim 125^\circ C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*	SN7908x			Unit	
			Min.	Typ.	Max.		
Output Voltage**	V_O	$T_J = 25^\circ C$	-7.7	-8.0	-8.3	V	
		$-10.5V \leq V_{IN} \leq -23.0V$ $5.0mA \leq I_O \leq 1.0A$, $P_D \leq 15W$	-7.6	-8.0	-8.4		
Line Regulation	$\Delta V_{O(\Delta V)}$	$-10.5V \leq V_{IN} \leq -25.0V$	-	10	160	mV	
		$-11V \leq V_{IN} \leq -17V$	-	5.0	80		
Load Regulation	$\Delta V_{O(\Delta I)}$	$5.0mA \leq I_O \leq 1.5A$	-	12	160	mV	
		$250mA \leq I_O \leq 750 mA$	-	4.0	80		
Quiescent Current	I_{QC}	$T_J = 25^\circ C$	-	3.0	6.0	mA	
Quiescent Current Change	ΔI_{QC}	$-10.5V \leq V_{IN} \leq -25.0V$	-	0.1	1.0	mA	
		$5.0mA \leq I_O \leq 1.0A$	-	0.05	0.5		
Ripple Rejection	RR	$-11.5V \leq V_{IN} \leq -21.5V$ $f = 120 Hz$	54	60	-	dB	
Dropout Voltage	V_{DROP}	$I_O = 1.0A$	$T_J = 25^\circ C$	-	2.0	-	V
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^\circ C$	-	175	-	$\mu V / V_O$
Short Circuit Current	I_{SC}	$V_I = -35V$	$T_A = 25^\circ C$	-	300	-	mA
Peak Output Current	I_{PK}	$T_J = 25^\circ C$	-	2.2	-	-	A
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O = 5.0 mA$	-	-0.6	-	-	$mV / ^\circ C$

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

◆ Electrical characteristics

($V_{IN} = -15V$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 1.0\mu F$, $I_{OUT} = 500mA$, $T_J = 0^\circ C \sim 125^\circ C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*	SN7909x			Unit	
			Min.	Typ.	Max.		
Output Voltage**	V_O	$T_J = 25^\circ C$	-8.70	-9.0	-9.30	V	
		$-11.5V \leq V_{IN} \leq -24.0V$ $5.0mA \leq I_O \leq 1.0A$, $P_D \leq 15W$	-8.60	-9.0	-9.40		
Line Regulation	$\Delta V_{O(\Delta V)}$	$-11.5V \leq V_{IN} \leq -26.0V$	-	10	180	mV	
		$-12.0V \leq V_{IN} \leq -18.0V$	-	5.0	90		
Load Regulation	$\Delta V_{O(\Delta I)}$	$5.0mA \leq I_O \leq 1.5A$	-	12	180	mV	
		$250mA \leq I_O \leq 750 mA$	-	4.0	90		
Quiescent Current	I_{QC}	$T_J = 25^\circ C$	-	3.0	6.0	mA	
Quiescent Current Change	ΔI_{QC}	$-11.5V \leq V_{IN} \leq -26.0V$	-	0.1	1.0	mA	
		$5.0mA \leq I_O \leq 1.0A$	-	0.05	0.5		
Ripple Rejection	RR	$-13.0V \leq V_{IN} \leq -23.0V$ $f = 120 Hz$	54	60	-	dB	
Dropout Voltage	V_{DROP}	$I_O = 1.0A$	$T_J = 25^\circ C$	-	2.0	-	V
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^\circ C$	-	175	-	$\mu V / V_O$
Short Circuit Current	I_{SC}	$V_I = -35V$	$T_A = 25^\circ C$	-	300	-	mA
Peak Output Current	I_{PK}	$T_J = 25^\circ C$	-	2.2	-	A	
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O = 5.0 mA$	-	-0.6	-	$mV / ^\circ C$	

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

◆ Electrical characteristics

($V_{IN} = -16V$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 1.0\mu F$, $I_{OUT} = 500mA$, $T_J = 0^\circ C \sim 125^\circ C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*	SN7910x			Unit	
			Min.	Typ.	Max.		
Output Voltage**	V_O	$T_J = 25^\circ C$	-9.6	-10.0	-10.4	V	
		$-12.0V \leq V_{IN} \leq -28.0V$ $5.0mA \leq I_O \leq 1.0A$, $P_D \leq 15W$	-9.5	-10.0	-10.5		
Line Regulation	$\Delta V_{O(\Delta V)}$	$-12.5V \leq V_{IN} \leq -28.0V$	-	12.0	200	mV	
		$-14.0V \leq V_{IN} \leq -20.0V$	-	6.0	100		
Load Regulation	$\Delta V_{O(\Delta I)}$	$5.0mA \leq I_O \leq 1.5A$	-	12.0	200	mV	
		$250mA \leq I_O \leq 750 mA$	-	4.0	100		
Quiescent Current	I_{QC}	$T_J = 25^\circ C$	-	3.0	6.0	mA	
Quiescent Current Change	ΔI_{QC}	$-12.5V \leq V_{IN} \leq -28V$	-	0.1	1.0	mA	
		$5.0mA \leq I_O \leq 1.0A$	-	0.05	0.5		
Ripple Rejection	RR	$-13.0V \leq V_{IN} \leq -23.0V$ $f = 120 Hz$	54	60	-	dB	
Dropout Voltage	V_{DROP}	$I_O = 1.0A$	$T_J = 25^\circ C$	-	2.0	-	V
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^\circ C$	-	58	-	$\mu V / V_O$
Short Circuit Current	I_{SC}	$V_I = -35V$	$T_A = 25^\circ C$	-	300	-	mA
Peak Output Current	I_{PK}	$T_J = 25^\circ C$	-	2.2	-	A	
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O = 5.0 mA$	-	-1.0	-	$mV / ^\circ C$	

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

◆ Electrical characteristics

($V_{IN} = -19V$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 1.0\mu F$, $I_{OUT} = 500mA$, $T_J = 0^\circ C \sim 125^\circ C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*	SN7812x			Unit	
			Min.	Typ.	Max.		
Output Voltage**	V_O	$T_J = 25^\circ C$	-11.5	-12.0	-12.5	V	
		$-15.5V \leq V_{IN} \leq -27.0V$ $5.0mA \leq I_O \leq 1.0A$, $P_D \leq 15W$	-11.4	-12.0	-12.6		
Line Regulation	$\Delta V_{O(\Delta V)}$	$-14.5V \leq V_{IN} \leq -30.0V$	-	12.0	240	mV	
		$-16.0V \leq V_{IN} \leq -22.0V$	-	6.0	120		
Load Regulation	$\Delta V_{O(\Delta I)}$	$5.0mA \leq I_O \leq 1.5A$	-	12.0	240	mV	
		$250mA \leq I_O \leq 750 mA$	-	4.0	120		
Quiescent Current	I_{QC}	$T_J = 25^\circ C$	-	3.0	6.0	mA	
Quiescent Current Change	ΔI_{QC}	$-14.5V \leq V_{IN} \leq -30.0V$	-	0.1	1.0	mA	
		$5.0mA \leq I_O \leq 1.0A$	-	0.05	0.5		
Ripple Rejection	RR	$-15.0V \leq V_{IN} \leq -25.0V$ $f = 120 Hz$	54	64	-	dB	
Dropout Voltage	V_{DROP}	$I_O = 1.0A$	$T_J = 25^\circ C$	-	2.0	-	V
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^\circ C$	-	200	-	$\mu V / V_O$
Short Circuit Current	I_{SC}	$V_I = -35V$	$T_A = 25^\circ C$	-	300	-	mA
Peak Output Current	I_{PK}	$T_J = 25^\circ C$	-	2.2	-	-	A
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O = 5.0 mA$	-	-0.8	-	-	$mV / ^\circ C$

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

◆ Electrical characteristics

($V_{IN} = -23V$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 1.0\mu F$, $I_{OUT} = 500mA$, $T_J = 0^\circ C \sim 125^\circ C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*	SN7915x			Unit	
			Min.	Typ.	Max.		
Output Voltage**	V_O	$T_J = 25^\circ C$	-14.4	-15.0	-15.6	V	
		$-18.0V \leq V_{IN} \leq -30.0V$ $5.0mA \leq I_O \leq 1.0A$, $P_D \leq 15W$	-14.25	-15.0	-15.75		
Line Regulation	$\Delta V_{O(\Delta V)}$	$-17.5V \leq V_{IN} \leq -30.0V$	-	12.0	300	mV	
		$-20.0V \leq V_{IN} \leq -26.0V$	-	6.0	150		
Load Regulation	$\Delta V_{O(\Delta I)}$	$5.0mA \leq I_O \leq 1.5A$	-	12.0	300	mV	
		$250mA \leq I_O \leq 750 mA$	-	4.0	150		
Quiescent Current	I_{QC}	$T_J = 25^\circ C$	-	3.0	6.0	mA	
Quiescent Current Change	ΔI_{QC}	$-17.5V \leq V_{IN} \leq -30.0V$	-	0.1	1.0	mA	
		$5.0mA \leq I_O \leq 1.0A$	-	0.05	0.5		
Ripple Rejection	RR	$-18.5V \leq V_{IN} \leq -28.5V$ $f = 120 Hz$	54	60	-	dB	
Dropout Voltage	V_{DROP}	$I_O = 1.0A$	$T_J = 25^\circ C$	-	2.0	-	V
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^\circ C$	-	250	-	$\mu V / V_O$
Short Circuit Current	I_{SC}	$V_I = -35V$,	$T_A = 25^\circ C$	-	300	-	mA
Peak Output Current	I_{PK}	$T_J = 25^\circ C$	-	2.2	-	A	
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O = 5.0 mA$	-	-0.9	-	$mV / ^\circ C$	

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

◆ Electrical characteristics

($V_{IN} = -27V$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 1.0\mu F$, $I_{OUT} = 500mA$, $T_J = 0^\circ C \sim 125^\circ C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*	SN7918x			Unit	
			Min.	Typ.	Max.		
Output Voltage**	V_O	$T_J = 25^\circ C$	-17.3	-18.0	-18.7	V	
		$-22.5V \leq V_{IN} \leq -33.0V$ $5.0mA \leq I_O \leq 1.0A$, $P_D \leq 15W$	-17.1	-18.0	-18.9		
Line Regulation	$\Delta V_{O(\Delta V)}$	$-21.0V \leq V_{IN} \leq -33.0V$	-	15.0	360	mV	
		$-24.0V \leq V_{IN} \leq -30.0V$	-	8.0	180		
Load Regulation	$\Delta V_{O(\Delta I)}$	$5.0mA \leq I_O \leq 1.5A$	-	15.0	360	mV	
		$250mA \leq I_O \leq 750 mA$	-	5.0	180		
Quiescent Current	I_{QC}	$T_J = 25^\circ C$	-	5.2	8.0	mA	
Quiescent Current Change	ΔI_{QC}	$-21.0V \leq V_{IN} \leq -33.0V$	-	0.1	1.0	mA	
		$5.0mA \leq I_O \leq 1.0A$	-	0.05	0.5		
Ripple Rejection	RR	$-22.0V \leq V_{IN} \leq -32.0V$ $f = 120 Hz$	54	60	-	dB	
Dropout Voltage	V_{DROP}	$I_O = 1.0A$	$T_J = 25^\circ C$	-	2.0	-	V
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^\circ C$	-	300	-	$\mu V / V_O$
Short Circuit Current	I_{SC}	$V_I = -35V$,	$T_A = 25^\circ C$	-	300	-	mA
Peak Output Current	I_{PK}	$T_J = 25^\circ C$	-	2.2	-	A	
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O = 5.0 mA$	-	-1.0	-	$mV / ^\circ C$	

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

◆ Electrical characteristics

($V_{IN} = -33V$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 1.0\mu F$, $I_{OUT} = 500mA$, $T_J = 0^\circ C \sim 125^\circ C$; unless otherwise specified)

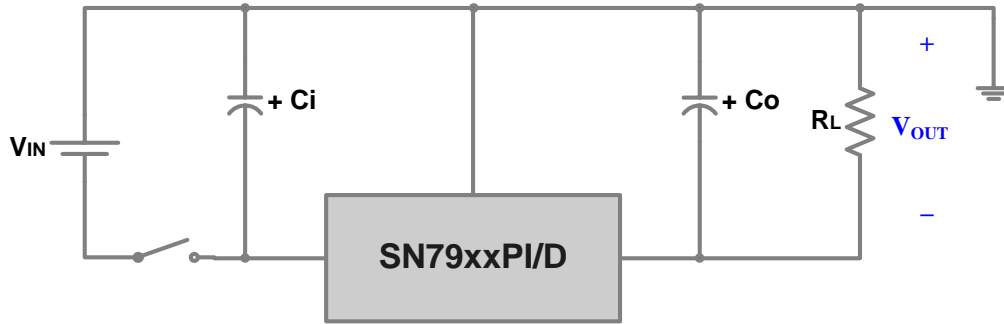
Characteristic	Symbol	Test Condition*	SN7924x			Unit	
			Min.	Typ.	Max.		
Output Voltage**	V_O	$T_J = 25^\circ C$	-23.0	-24.0	-25.0	V	
		$-27.0V \leq V_{IN} \leq -38.0V$ $5.0mA \leq I_O \leq 1.0A$, $P_D \leq 15W$	-22.8	-24.0	-25.2		
Line Regulation	$\Delta V_{O(\Delta V)}$	$-27.0V \leq V_{IN} \leq -38.0V$	-	15.0	480	mV	
		$-30.0V \leq V_{IN} \leq -36.0V$	-	8.0	180		
Load Regulation	$\Delta V_{O(\Delta I)}$	$5.0mA \leq I_O \leq 1.5A$	-	15.0	480	mV	
		$250mA \leq I_O \leq 750 mA$	-	5.0	240		
Quiescent Current	I_{QC}	$T_J = 25^\circ C$	-	3.0	6.0	mA	
Quiescent Current Change	ΔI_{QC}	$-27.0V \leq V_{IN} \leq -38.0V$	-	0.1	1.0	mA	
		$5.0mA \leq I_O \leq 1.0A$	-	0.05	0.5		
Ripple Rejection	RR	$28.0V \leq V_{IN} \leq 38.0V$ $f = 120 Hz$	54	60	-	dB	
Dropout Voltage	V_{DROP}	$I_O = 1.0A$	$T_J = 25^\circ C$	-	2.0	-	V
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^\circ C$	-	400	-	$\mu V / V_O$
Short Circuit Current	I_{SC}	$V_I = -35V$,	$T_A = 25^\circ C$	-	300	-	mA
Peak Output Current	I_{PK}	$T_J = 25^\circ C$	-	2.2	-	A	
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O = 5.0 mA$	-	-1.0	-	$mV / ^\circ C$	

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

Typical Application

Negative Fixed Output Regulator



- 1) C_{IN} should be required if regulators are located far from power supply filter
- 2) C_O improves output stability and transient response
- 3) To specify an output voltage, substitute voltage value for “xx”

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Split Power Supply / OP-AMP Supply ($\pm 12V / 1.0A$)

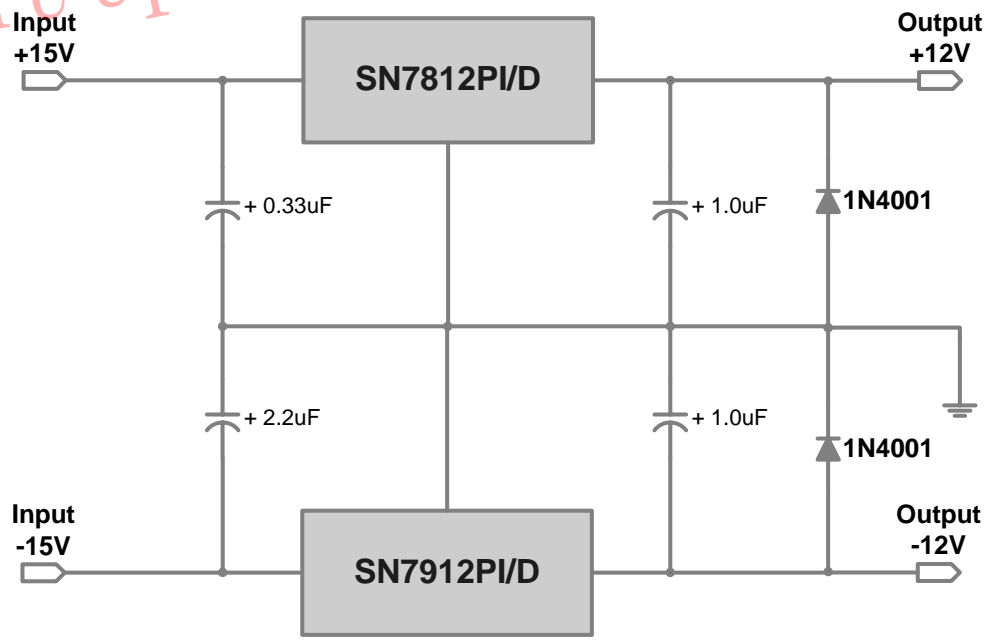


Fig.1 Quiescent Current vs. Junction Temperature

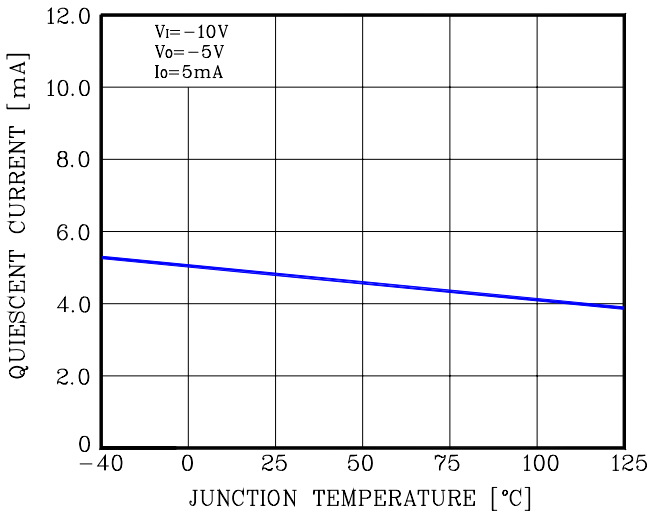


Fig.2 Output Peak Current vs. Input to Output Differential

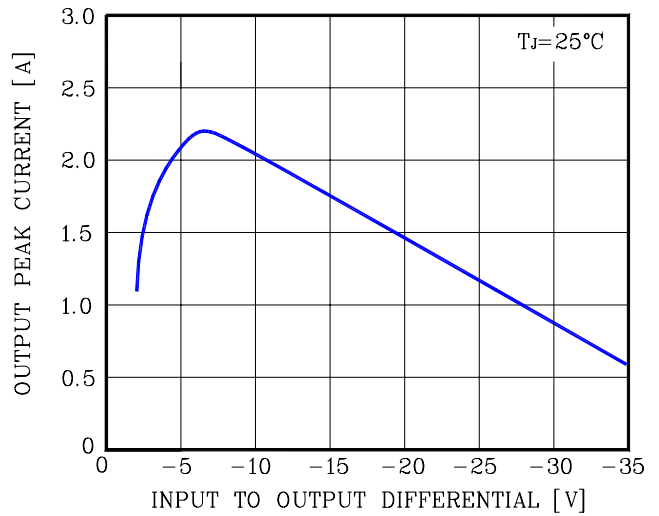


Fig.3 Output Voltage vs. Junction Temperature

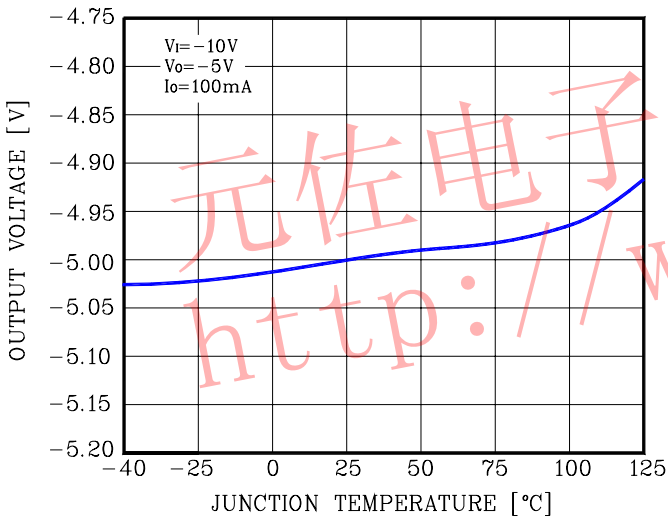


Fig.4 Dropout Voltage vs. Input Voltage

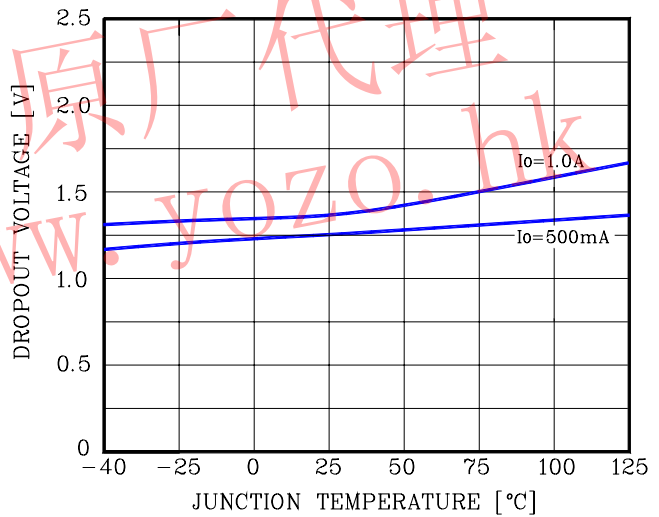


Fig.5 Line Transient Response

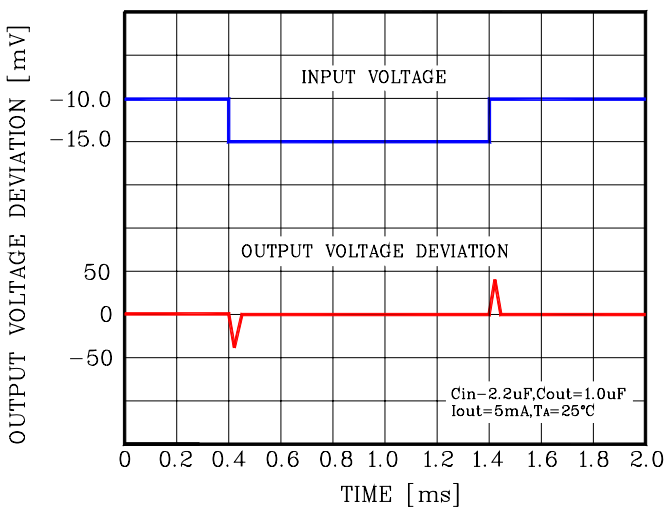
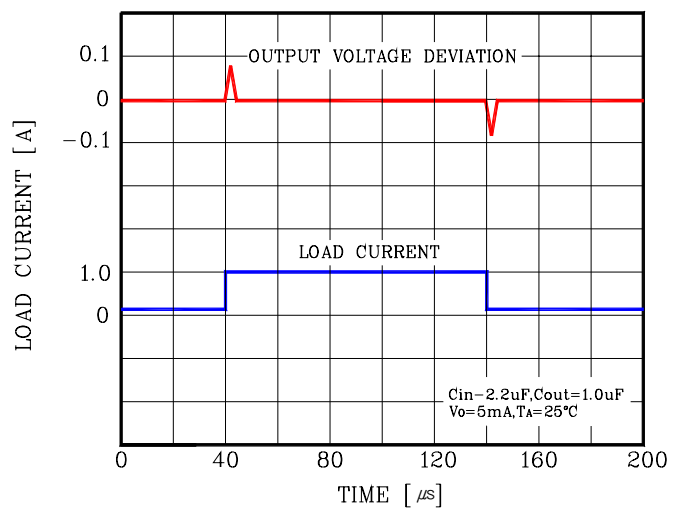
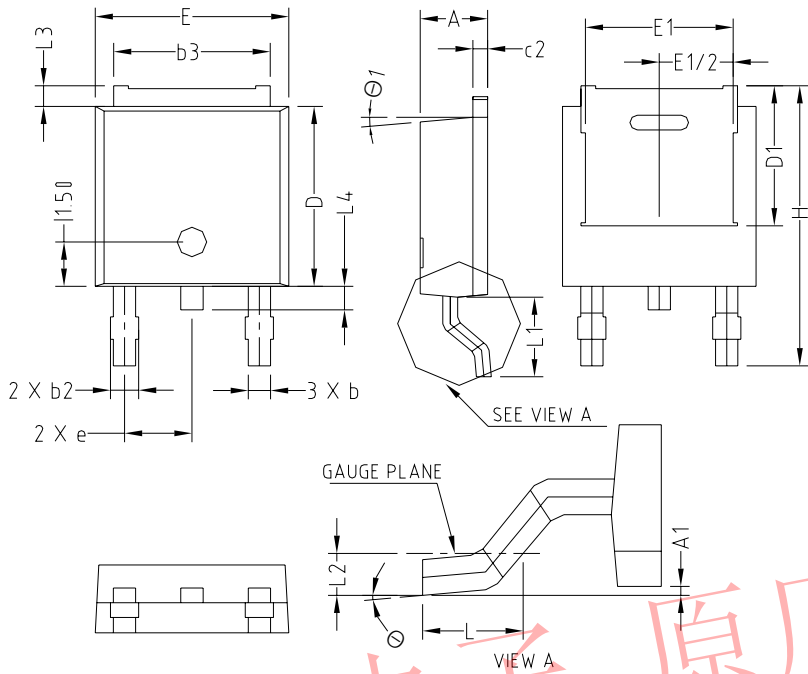


Fig.6 Load Transient Response



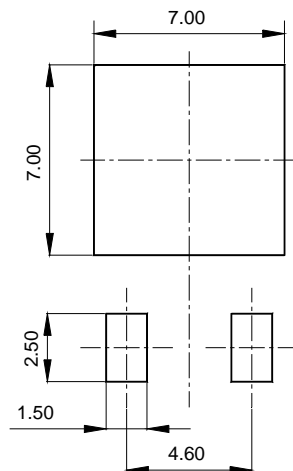
◆ TO-252-3L Outline Dimension (Unit : mm)



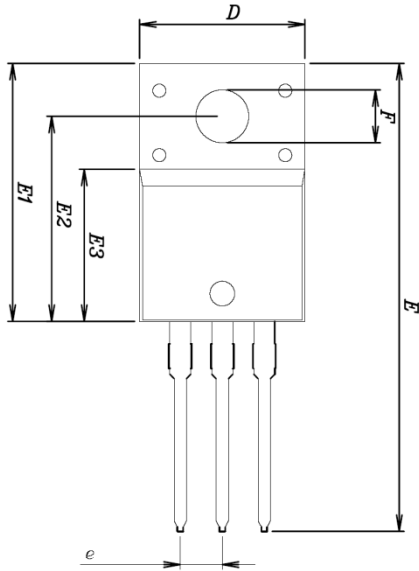
SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	2.20	2.30	2.40	
A1	0.00		0.127	
b	0.66	0.76	0.86	
b2	-	-	0.96	
b3	5.04	5.34	5.64	
c2	0.40	0.50	0.60	
D	5.90	6.10	6.30	
D1	4.75			
E	6.40	6.60	6.80	
E1	5.04			
e	2.30 BSC			
H	9.20	9.50	9.80	
L	1.27	1.47	1.67	
L1	2.50	2.70	2.90	
L2	0.508 BSC			
L3	0.50	0.70	0.90	
L4	0.60	0.80	1.00	
Θ	0°			10°
$\Theta1$	5°			

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※ Recommend PCB solder land [Unit: mm]



◆ TO-220F-3L Outline Dimension (Unit : mm)



SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	—	—	4.60	
A1	2.45	2.50	2.55	
A2	1.95	2.00	2.05	
b	0.65	0.75	0.85	
b1	1.07	1.27	1.47	
C	0.40	0.50	0.60	
C1	2.70	2.80	2.90	
D	9.90	10.00	10.10	
E	28.00	—	28.60	
E1	15.50	15.60	15.70	
E2	12.30	12.40	12.50	
E3	9.15	9.20	9.25	
F	3.10	3.20	3.30	
G	3.30	3.40	3.50	
e	2.54 BSC			
L	12.40	—	13.00	
L1	3.46 BSC			

