

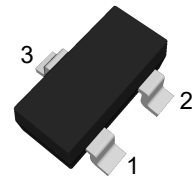


PJ78LXXSA 3-Terminal Voltage Regulators

Description

The PJ78LXXSA series of fixed voltage monolithic integrated circuit voltage three-terminal positive regulators are suitable for applications that required supply up to 100mA.

SOT-23



1. VOUT 2. VIN 3. GND

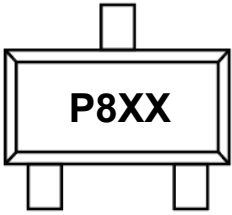
Features

- Input voltage: 30V($V_{OUT}=5\sim 10V$); 35V($V_{OUT}=12\sim 15V$)
- Output voltage: 5V,6V,8V,9V,10V,12V,15V
- Output current up to 100 mA
- Thermal overload protection
- Short circuit current limiting

Applications

- TV Board
- Air Conditioner
- Charging Device

Ordering Information

Orderable Device	Package	Reel (inch)	Package Qty (PCS)	Eco Plan ^{Note}	MSL Level	Marking Code
PJ78L05SA	SOT-23	7	3000	RoHS & Green	MSL1	 XX:Output Voltage(5V=05) e.g. PJ78L05SA=P805 PJ78L12SA=P812
PJ78L06SA						
PJ78L08SA						
PJ78L09SA						
PJ78L10SA						
PJ78L12SA						
PJ78L15SA						

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.

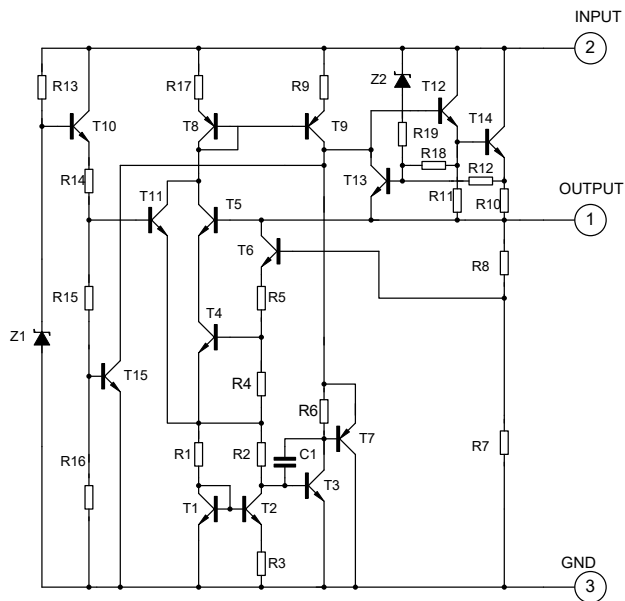
Green: PJ defines "Green" to mean Halogen-Free and Antimony-Free.



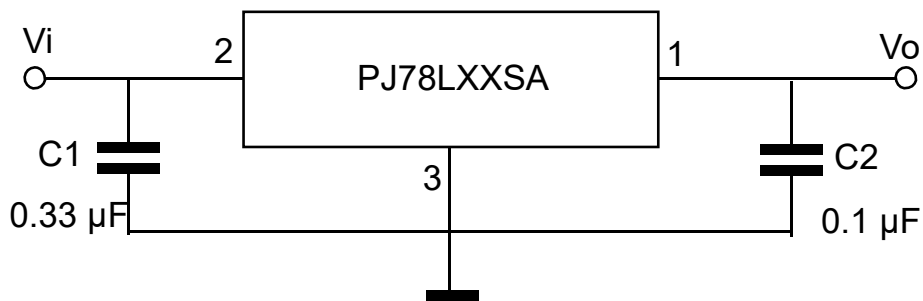
PJ78LXXSA

3-Terminal Voltage Regulators

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	$V_{OUT}=5V\sim 10V$	30	V
		$V_{OUT}=12V\sim 15V$	35	V
Output Current	I_O	100	mA	
Maximum Power Dissipation	P_D	300	mW	
Junction Temperature	T_J	125	°C	
Operating Temperature Range	T_{OPR}	-40 to +125	°C	
Storage Temperature Range	T_{STG}	-40 to +150	°C	



PJ78LXXSA

3-Terminal Voltage Regulators

PJ78L05SA Electrical Characteristics

$V_I=10V$, $I_O=40mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, 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
		$I_O=1mA$ to $40mA$, $V_I=7V$ to $20V$	4.75	--	5.25	V
		$I_O=1mA$ to $70mA$	4.75	--	5.25	V
Line Regulation	ΔV_O	$V_I=7V$ to $20V$, $T_J=25^{\circ}C$	--	10	150	mV
		$V_I=8V$ to $20V$, $T_J=25^{\circ}C$	--	5	100	mV
Load Regulation	ΔV_O	$I_O=1mA$ to $100mA$, $T_J=25^{\circ}C$	--	15	60	mV
		$I_O=1mA$ to $40mA$, $T_J=25^{\circ}C$	--	10	30	mV
Ripple Rejection	RR	$V_I=8V$ to $18V$, $f=120Hz$, $T_J=25^{\circ}C$	40	49	--	dB
Dropout Voltage	V_D		--	1.7	--	V
Quiescent Current	I_Q	$T_J=25^{\circ}C$	--	2.0	5.5	mA
Temperature coefficient of V_O	$\Delta V_O/\Delta T$	$I_O=5mA$	--	0.65	--	mV/ $^{\circ}C$
Quiescent Current Change	ΔI_Q	$V_I=8V$ to $20V$	--	--	1.5	mA
		$I_O=1mA$ to $40mA$	--	--	0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_J=25^{\circ}C$	--	40	--	μV



PJ78LXXSA

3-Terminal Voltage Regulators

PJ78L06SA Electrical Characteristics

$V_I=12V$, $I_O=40mA$, $0^\circ C \leq T_J \leq 125^\circ C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^\circ C$	5.75	6.0	6.25	V
		$I_O=1mA$ to 40mA, $V_I=8.5V$ to 20V	5.7	--	6.3	V
		$I_O=1mA$ to 70mA	5.7	--	6.3	V
Line Regulation	ΔV_O	$V_I=8.5V$ to 20V, $T_J=25^\circ C$	--	--	150	mV
		$V_I=9V$ to 20V, $T_J=25^\circ C$	--	--	100	mV
Load Regulation	ΔV_O	$I_O=1mA$ to 100mA, $T_J=25^\circ C$	--	--	60	mV
		$I_O=1mA$ to 40mA, $T_J=25^\circ C$	--	--	30	mV
Ripple Rejection	RR	$V_I=9V$ to 20V, $f=120Hz$, $T_J=25^\circ C$	38	--	--	dB
Dropout Voltage	V_D		--	1.7	--	V
Quiescent Current	I_Q	$T_J=25^\circ C$	--	--	5.5	mA
Quiescent Current Change	ΔI_Q	$V_I=9V$ to 20V	--	--	1.5	mA
		$I_O=1mA$ to 40mA	--	--	0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_J=25^\circ C$	--	50	--	μV



PJ78LXXSA

3-Terminal Voltage Regulators

PJ78L08SA Electrical Characteristics

$V_I=14V$, $I_O=40mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^{\circ}C$	7.7	8.0	8.3	V
		$I_O=1mA$ to $40mA$, $V_I=10.5V$ to $23V$	7.6	--	8.4	V
		$I_O=1mA$ to $70mA$	7.6	--	8.4	V
Line Regulation	ΔV_O	$V_I=10.5V$ to $23V$, $T_J=25^{\circ}C$	--	--	175	mV
		$V_I=11V$ to $23V$, $T_J=25^{\circ}C$	--	--	125	mV
Load Regulation	ΔV_O	$I_O=1mA$ to $100mA$, $T_J=25^{\circ}C$	--	--	80	mV
		$I_O=1mA$ to $40mA$, $T_J=25^{\circ}C$	--	--	40	mV
Ripple Rejection	RR	$V_I=12V$ to $23V$, $f=120Hz$, $T_J=25^{\circ}C$	36	--	--	dB
Dropout Voltage	V_D		--	1.7	--	V
Quiescent Current	I_Q	$T_J=25^{\circ}C$	--	--	5.5	mA
Quiescent Current Change	ΔI_Q	$V_I=11V$ to $23V$	--	--	1.5	mA
		$I_O=1mA$ to $40mA$	--	--	0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_J=25^{\circ}C$	--	60	--	μV



PJ78LXXSA

3-Terminal Voltage Regulators

PJ78L09SA Electrical Characteristics

$V_I=15V$, $I_O=40mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^{\circ}C$	8.64	9.0	9.36	V
		$I_O=1mA$ to $40mA$, $V_I=11.5V$ to $23V$	8.55	--	9.45	V
		$I_O=1mA$ to $70mA$	8.55	--	9.45	V
Line Regulation	ΔV_O	$V_I=11.5V$ to $23V$, $T_J=25^{\circ}C$	--	18	225	mV
		$V_I=12V$ to $23V$, $T_J=25^{\circ}C$	--	9	150	mV
Load Regulation	ΔV_O	$I_O=1mA$ to $100mA$, $T_J=25^{\circ}C$	--	27	80	mV
		$I_O=1mA$ to $40mA$, $T_J=25^{\circ}C$	--	18	40	mV
Ripple Rejection	RR	$V_I=12V$ to $23V$, $f=120Hz$, $T_J=25^{\circ}C$	36	44	--	dB
Dropout Voltage	V_D		--	1.7	--	V
Quiescent Current	I_Q	$T_J=25^{\circ}C$	--	2.0	5.5	mA
Quiescent Current Change	ΔI_Q	$V_I=12V$ to $23V$	--	--	1.5	mA
		$I_O=1mA$ to $40mA$	--	--	0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_J=25^{\circ}C$	--	70	--	μV



PJ78LXXSA

3-Terminal Voltage Regulators

PJ78L10SA Electrical Characteristics

$V_I=16V$, $I_O=40mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^{\circ}C$	9.6	10	10.4	V
		$I_O=1mA$ to $40mA$, $V_I=12.5V$ to $23V$	9.5	--	10.5	V
		$I_O=1mA$ to $70mA$	9.5	--	10.5	V
Line Regulation	ΔV_O	$V_I=12.5V$ to $23V$, $T_J=25^{\circ}C$	--	--	230	mV
		$V_I=13V$ to $23V$, $T_J=25^{\circ}C$	--	--	170	mV
Load Regulation	ΔV_O	$I_O=1mA$ to $100mA$, $T_J=25^{\circ}C$	--	--	90	mV
		$I_O=1mA$ to $40mA$, $T_J=25^{\circ}C$	--	--	45	mV
Ripple Rejection	RR	$V_I=14V$ to $23V$, $f=120Hz$, $T_J=25^{\circ}C$	36	--	--	dB
Dropout Voltage	V_D		--	1.7	--	V
Quiescent Current	I_Q	$T_J=25^{\circ}C$	--	--	5.5	mA
Quiescent Current Change	ΔI_Q	$V_I=13V$ to $23V$	--	--	1.5	mA
		$I_O=1mA$ to $40mA$	--	--	0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_J=25^{\circ}C$	--	60	--	μV



PJ78LXXSA

3-Terminal Voltage Regulators

PJ78L12SA Electrical Characteristics

$V_I=19V$, $I_O=40mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^{\circ}C$	11.5	12	12.6	V
		$I_O=1mA$ to $40mA$, $V_I=14.5V$ to $27V$	11.4	--	12.6	V
		$I_O=1mA$ to $70mA$	11.4	--	12.6	V
Line Regulation	ΔV_O	$V_I=14.5V$ to $27V$, $T_J=25^{\circ}C$	--	--	250	mV
		$V_I=16V$ to $27V$, $T_J=25^{\circ}C$	--	--	200	mV
Load Regulation	ΔV_O	$I_O=1mA$ to $100mA$, $T_J=25^{\circ}C$	--	--	240	mV
		$I_O=1mA$ to $40mA$, $T_J=25^{\circ}C$	--	--	120	mV
Ripple Rejection	RR	$V_I=15V$ to $25V$, $f=120Hz$, $T_J=25^{\circ}C$	36	--	--	dB
Dropout Voltage	V_D		--	1.7	--	V
Quiescent Current	I_Q	$T_J=25^{\circ}C$	--	--	5.5	mA
Quiescent Current Change	ΔI_Q	$V_I=16V$ to $27V$	--	--	1.5	mA
		$I_O=1mA$ to $40mA$	--	--	0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_J=25^{\circ}C$	--	80	--	μV



PJ78LXXSA

3-Terminal Voltage Regulators

PJ78L15SA Electrical Characteristics

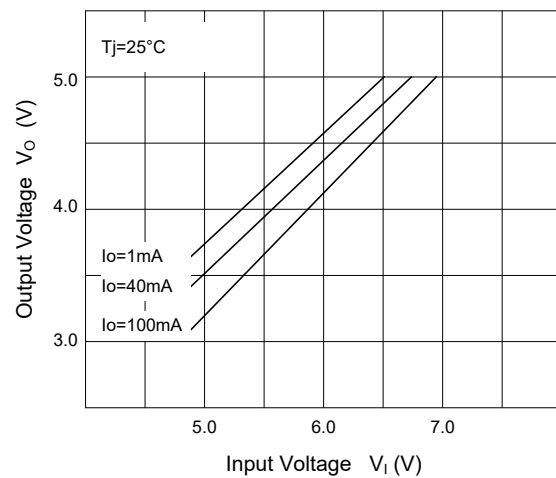
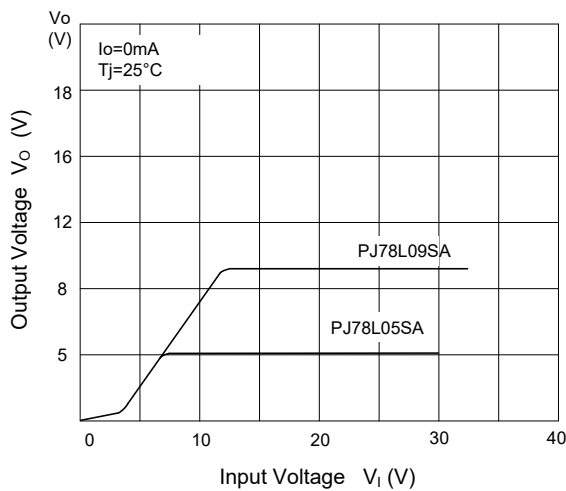
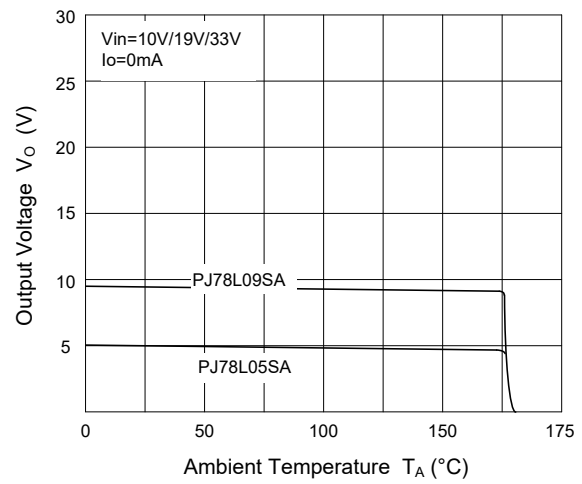
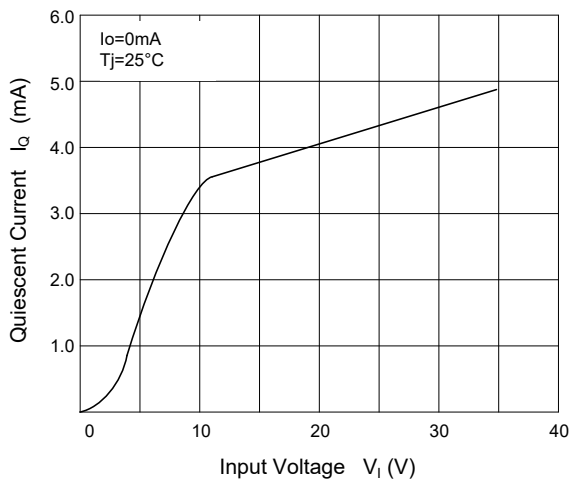
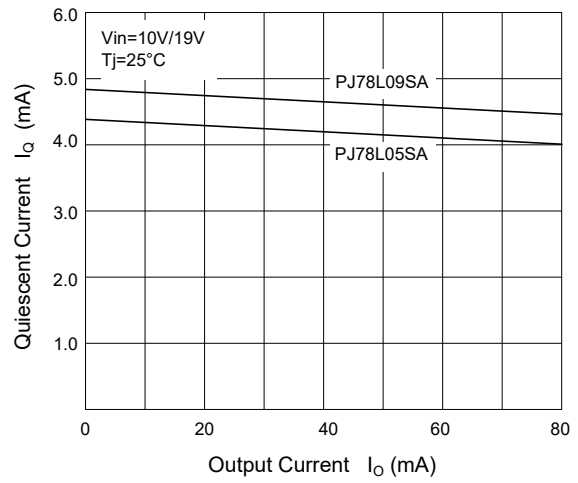
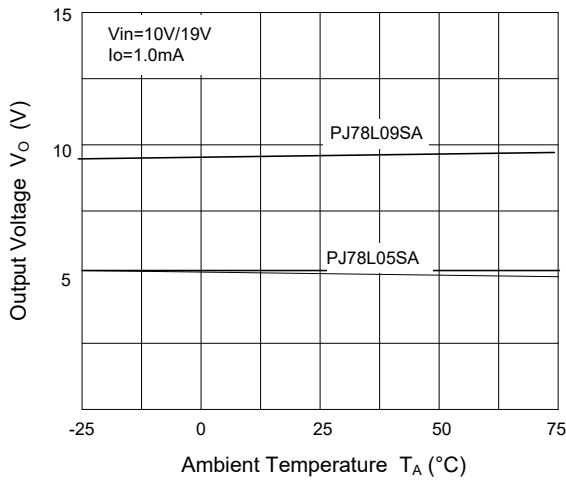
$V_I=23V$, $I_O=40mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^{\circ}C$	14.4	15	15.6	V
		$I_O=1mA$ to $40mA$, $V_I=17.5V$ to $30V$	14.25	--	15.75	V
		$I_O=1mA$ to $70mA$	14.25	--	15.75	V
Line Regulation	ΔV_O	$V_I=17.5V$ to $30V$, $T_J=25^{\circ}C$	--	--	300	mV
		$V_I=20V$ to $30V$, $T_J=25^{\circ}C$	--	--	250	mV
Load Regulation	ΔV_O	$I_O=1mA$ to $100mA$, $T_J=25^{\circ}C$	--	--	150	mV
		$I_O=1mA$ to $40mA$, $T_J=25^{\circ}C$	--	--	75	mV
Ripple Rejection	RR	$V_I=18.5V$ to $28.5V$, $f=120Hz$, $T_J=25^{\circ}C$	33	--	--	dB
Dropout Voltage	V_D		--	1.7	--	V
Quiescent Current	I_Q	$T_J=25^{\circ}C$	--	--	6.0	mA
Quiescent Current Change	ΔI_Q	$V_I=20V$ to $30V$	--	--	1.5	mA
		$I_O=1mA$ to $40mA$	--	--	0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_J=25^{\circ}C$	--	90	--	μV



PJ78LXXSA 3-Terminal Voltage Regulators

Typical Characteristic Curves(PJ78L05SA&PJ78L09SA)





PJ78LXXSA

3-Terminal Voltage Regulators

Package Outline

SOT-23

Dimensions in mm

