



PJ78SxxSQ

3-Terminal Voltage Regulators

Description

The PJ78SxxSQ series of fixed voltage monolithic integrated circuit voltage three-terminal positive regulators are suitable for applications that required supply up to 200mA.

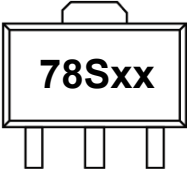
Features

- Input voltage: up to 30V
- Output voltage: 3.3V, 5V, 6V, 8V, 9V, 10V, 12V, 15V
- Output current up to 200 mA
- Thermal overload protection
- Short circuit current limiting

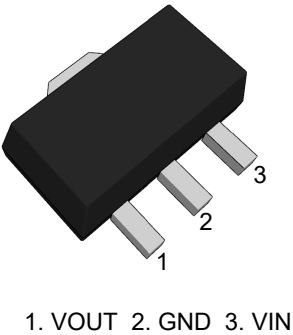
Applications

- TV Board
- Air Conditioner
- Charging Device

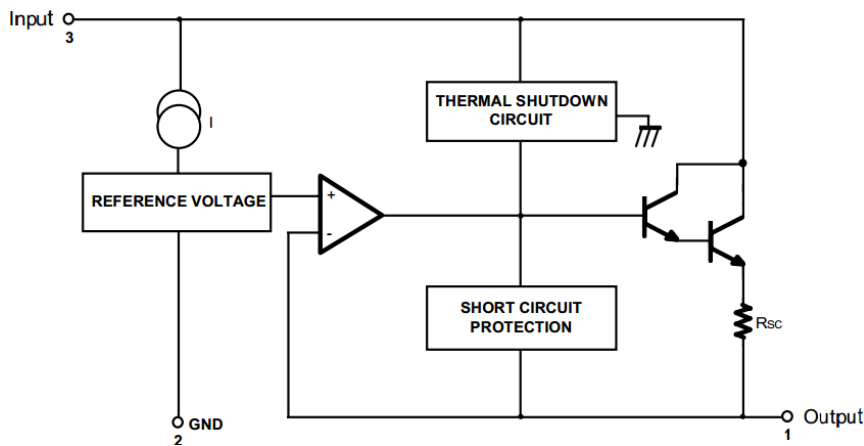
Ordering Information

Orderable Device	Package	Reel (inch)	Package Qty (PCS)	Eco Plan ^{Note}	MSL Level	Marking Code
PJ78S33SQ	SOT-89	7/13	1000/3000	RoHS & Green	MSL1	 78Sxx: Product Code e.g. PJ78S33SQ: 78S33
PJ78S05SQ						
PJ78S06SQ						
PJ78S08SQ						
PJ78S09SQ						
PJ78S10SQ						
PJ78S12SQ						
PJ78S15SQ						

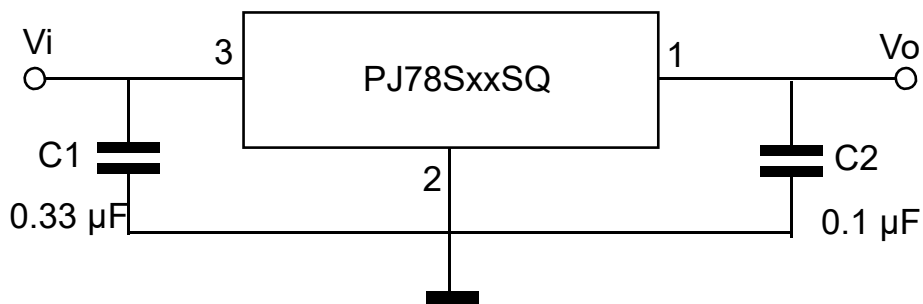
SOT-89



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	30	V
Output Current	I_O	200	mA
Maximum Power Dissipation	P_D	600	mW
Junction Temperature	T_J	125	°C
Operating Temperature Range	T_{OPR}	-40 to +120	°C
Storage Temperature Range	T_{STG}	-40 to +150	°C



PJ78SxxSQ

3-Terminal Voltage Regulators

PJ78S33SQ Electrical Characteristics

$V_I=8.3V$, $I_O=80mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^{\circ}C$	3.168	3.3	3.432	V
		$I_O=1mA$ to $80mA$, $V_I=5.3V$ to $20V$	3.135	--	3.465	V
		$I_O=1mA$ to $140mA$	3.135	--	3.465	V
Line Regulation	ΔV_O	$V_I=5.3V$ to $20V$, $T_J=25^{\circ}C$	--	7	150	mV
		$V_I=6.3V$ to $20V$, $T_J=25^{\circ}C$	--	4	100	mV
Load Regulation	ΔV_O	$I_O=1mA$ to $200mA$, $T_J=25^{\circ}C$	--	10	60	mV
		$I_O=1mA$ to $80mA$, $T_J=25^{\circ}C$	--	7	30	mV
Ripple Rejection	RR	$V_I=6.3V$ to $16.3V$, $f=120Hz$, $T_J=25^{\circ}C$	40	49	--	dB
Dropout Voltage	V_D		--	1.7	--	V
Quiescent Current	I_Q	$T_J=25^{\circ}C$	--	2.0	5.5	mA
Quiescent Current Change	ΔI_Q	$V_I=6.3V$ to $20V$	--	--	1.5	mA
		$I_O=1mA$ to $80mA$	--	--	0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_J=25^{\circ}C$	--	40	--	μV



PJ78SxxSQ

3-Terminal Voltage Regulators

PJ78S05SQ Electrical Characteristics

$V_I=10V$, $I_O=80mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, 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 $80mA$, $V_I=7V$ to $20V$	4.75	--	5.25	V
		$I_O=1mA$ to $140mA$	4.75	--	5.25	V
Line Regulation	ΔV_O	$V_I=7V$ to $20V$, $T_J=25^{\circ}C$	--	15	150	mV
		$V_I=8V$ to $20V$, $T_J=25^{\circ}C$	--	10	100	mV
Load Regulation	ΔV_O	$I_O=1mA$ to $200mA$, $T_J=25^{\circ}C$	--	10	60	mV
		$I_O=1mA$ to $80mA$, $T_J=25^{\circ}C$	--	5	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
Quiescent Current Change	ΔI_Q	$V_I=8V$ to $20V$	--	--	1.5	mA
		$I_O=1mA$ to $80mA$	--	--	0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_J=25^{\circ}C$	--	40	--	μV



PJ78SxxSQ

3-Terminal Voltage Regulators

PJ78S06SQ Electrical Characteristics

$V_I=12V$, $I_O=80mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, 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 $80mA$, $V_I=8.5V$ to $20V$	5.7	--	6.3	V
		$I_O=1mA$ to $140mA$	5.7	--	6.3	V
Line Regulation	ΔV_O	$V_I=8.5V$ to $20V$, $T_J=25^{\circ}C$	--	12	150	mV
		$V_I=9V$ to $20V$, $T_J=25^{\circ}C$	--	6	100	mV
Load Regulation	ΔV_O	$I_O=1mA$ to $200mA$, $T_J=25^{\circ}C$	--	18	60	mV
		$I_O=1mA$ to $80mA$, $T_J=25^{\circ}C$	--	12	30	mV
Ripple Rejection	RR	$V_I=9V$ to $20V$, $f=120Hz$, $T_J=25^{\circ}C$	38	46	--	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	$V_I=9V$ to $20V$	--	--	1.5	mA
		$I_O=1mA$ to $80mA$	--	--	0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_J=25^{\circ}C$	--	50	--	μV



PJ78SxxSQ

3-Terminal Voltage Regulators

PJ78S08SQ Electrical Characteristics

$V_I=14V$, $I_O=80mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, 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 $80mA$, $V_I=10.5V$ to $23V$	7.6	--	8.4	V
		$I_O=1mA$ to $140mA$	7.6	--	8.4	V
Line Regulation	ΔV_O	$V_I=10.5V$ to $23V$, $T_J=25^{\circ}C$	--	16	175	mV
		$V_I=11V$ to $23V$, $T_J=25^{\circ}C$	--	8	125	mV
Load Regulation	ΔV_O	$I_O=1mA$ to $200mA$, $T_J=25^{\circ}C$	--	24	80	mV
		$I_O=1mA$ to $80mA$, $T_J=25^{\circ}C$	--	16	40	mV
Ripple Rejection	RR	$V_I=12V$ to $23V$, $f=120Hz$, $T_J=25^{\circ}C$	36	45	--	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	$V_I=11V$ to $23V$	--	--	1.5	mA
		$I_O=1mA$ to $80mA$	--	--	0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_J=25^{\circ}C$	--	60	--	μV



PJ78SxxSQ

3-Terminal Voltage Regulators

PJ78S09SQ Electrical Characteristics

$V_I=15V$, $I_O=80mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, 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 $80mA$, $V_I=11.5V$ to $23V$	8.55	--	9.45	V
		$I_O=1mA$ to $140mA$	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 $200mA$, $T_J=25^{\circ}C$	--	27	80	mV
		$I_O=1mA$ to $80mA$, $T_J=25^{\circ}C$	--	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 $80mA$	--	--	0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_J=25^{\circ}C$	--	70	--	μV



PJ78SxxSQ

3-Terminal Voltage Regulators

PJ78S10SQ Electrical Characteristics

$V_I=16V$, $I_O=80mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, 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 $80mA$, $V_I=12.5V$ to $23V$	9.5	--	10.5	V
		$I_O=1mA$ to $140mA$	9.5	--	10.5	V
Line Regulation	ΔV_O	$V_I=12.5V$ to $23V$, $T_J=25^{\circ}C$	--	20	230	mV
		$V_I=13V$ to $23V$, $T_J=25^{\circ}C$	--	10	170	mV
Load Regulation	ΔV_O	$I_O=1mA$ to $200mA$, $T_J=25^{\circ}C$	--	30	90	mV
		$I_O=1mA$ to $80mA$, $T_J=25^{\circ}C$	--	20	45	mV
Ripple Rejection	RR	$V_I=14V$ to $23V$, $f=120Hz$, $T_J=25^{\circ}C$	36	45	--	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	$V_I=13V$ to $23V$	--	--	1.5	mA
		$I_O=1mA$ to $80mA$	--	--	0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_J=25^{\circ}C$	--	60	--	μV



PJ78SxxSQ

3-Terminal Voltage Regulators

PJ78S12SQ Electrical Characteristics

$V_I=19V$, $I_O=80mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, 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 $80mA$, $V_I=14.5V$ to $27V$	11.4	--	12.6	V
		$I_O=1mA$ to $140mA$	11.4	--	12.6	V
Line Regulation	ΔV_O	$V_I=14.5V$ to $27V$, $T_J=25^{\circ}C$	--	24	250	mV
		$V_I=16V$ to $27V$, $T_J=25^{\circ}C$	--	12	200	mV
Load Regulation	ΔV_O	$I_O=1mA$ to $200mA$, $T_J=25^{\circ}C$	--	36	240	mV
		$I_O=1mA$ to $80mA$, $T_J=25^{\circ}C$	--	24	120	mV
Ripple Rejection	RR	$V_I=15V$ to $25V$, $f=120Hz$, $T_J=25^{\circ}C$	36	42	--	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	$V_I=16V$ to $27V$	--	--	1.5	mA
		$I_O=1mA$ to $80mA$	--	--	0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_J=25^{\circ}C$	--	80	--	μV



PJ78SxxSQ

3-Terminal Voltage Regulators

PJ78S15SQ Electrical Characteristics

$V_I=21V$, $I_O=80mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise specified.

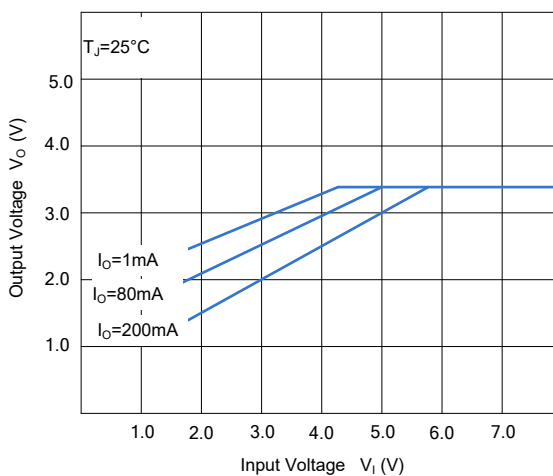
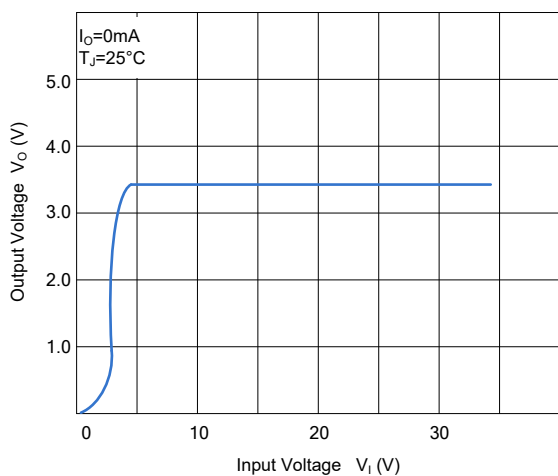
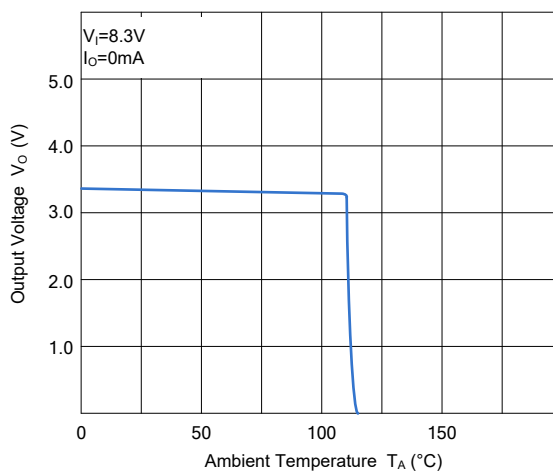
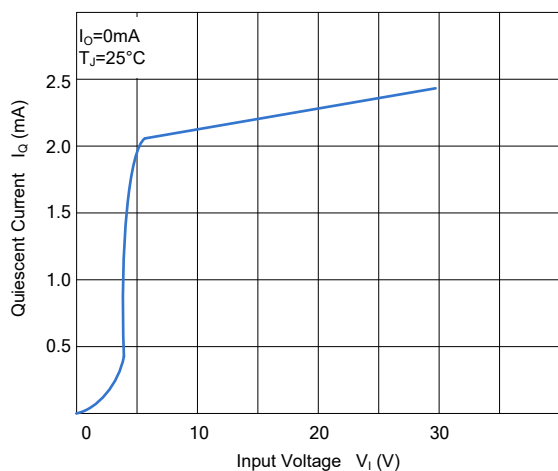
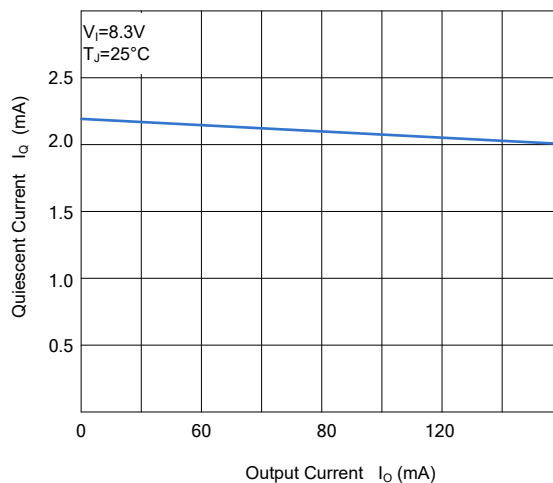
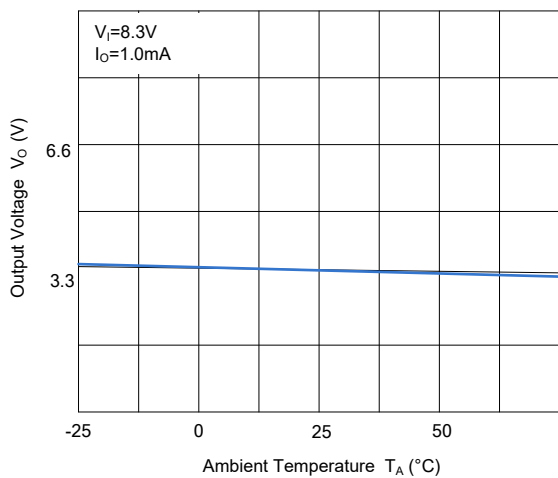
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^{\circ}C$	14.4	15	15.6	V
		$I_O=1mA$ to $80mA$, $V_I=17.5V$ to $30V$	14.25	--	15.75	V
		$I_O=1mA$ to $140mA$	14.25	--	15.75	V
Line Regulation	ΔV_O	$V_I=17.5V$ to $30V$, $T_J=25^{\circ}C$	--	30	300	mV
		$V_I=20V$ to $30V$, $T_J=25^{\circ}C$	--	15	250	mV
Load Regulation	ΔV_O	$I_O=1mA$ to $200mA$, $T_J=25^{\circ}C$	--	45	150	mV
		$I_O=1mA$ to $80mA$, $T_J=25^{\circ}C$	--	30	75	mV
Ripple Rejection	RR	$V_I=18.5V$ to $28.5V$, $f=120Hz$, $T_J=25^{\circ}C$	33	39	--	dB
Dropout Voltage	V_D		--	1.7	--	V
Quiescent Current	I_Q	$T_J=25^{\circ}C$	--	2.2	6.0	mA
Quiescent Current Change	ΔI_Q	$V_I=20V$ to $30V$	--	--	1.5	mA
		$I_O=1mA$ to $80mA$	--	--	0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$, $T_J=25^{\circ}C$	--	90	--	μV



PJ78SxxSQ

3-Terminal Voltage Regulators

Typical Characteristic Curves(PJ78S33SQ)





PJ78SxxSQ

3-Terminal Voltage Regulators

Package Outline

SOT-89

Dimensions in mm

