AUK Semiconductor

S79xxPI

Fixed-Negative-Voltage Regulator

Descriptions

This series of fixed-negative-voltage monolithic integrated-circuit voltage regulators is designed to complement series S7800 in a wide range of applications. These applications include on-card regulator for elimination of noise and distribution problems associated with single point regulations. Each of these regulators can deliver up to 1.0 amperes of output current. The internal current Limiting and thermal shutdown features of these regulators make them essentially immune to overload. In addition to use as fixed-voltage regulators, these devices can be used with external components to obtain adjustable output voltages and also as the power pass element in precision regulators.

Features

- Output Current of 1A
- Thermal Shutdown Protection
- Short-Circuit Current Limit Protection
- No External Components
- Output Transistor Safe Operating Area Protection

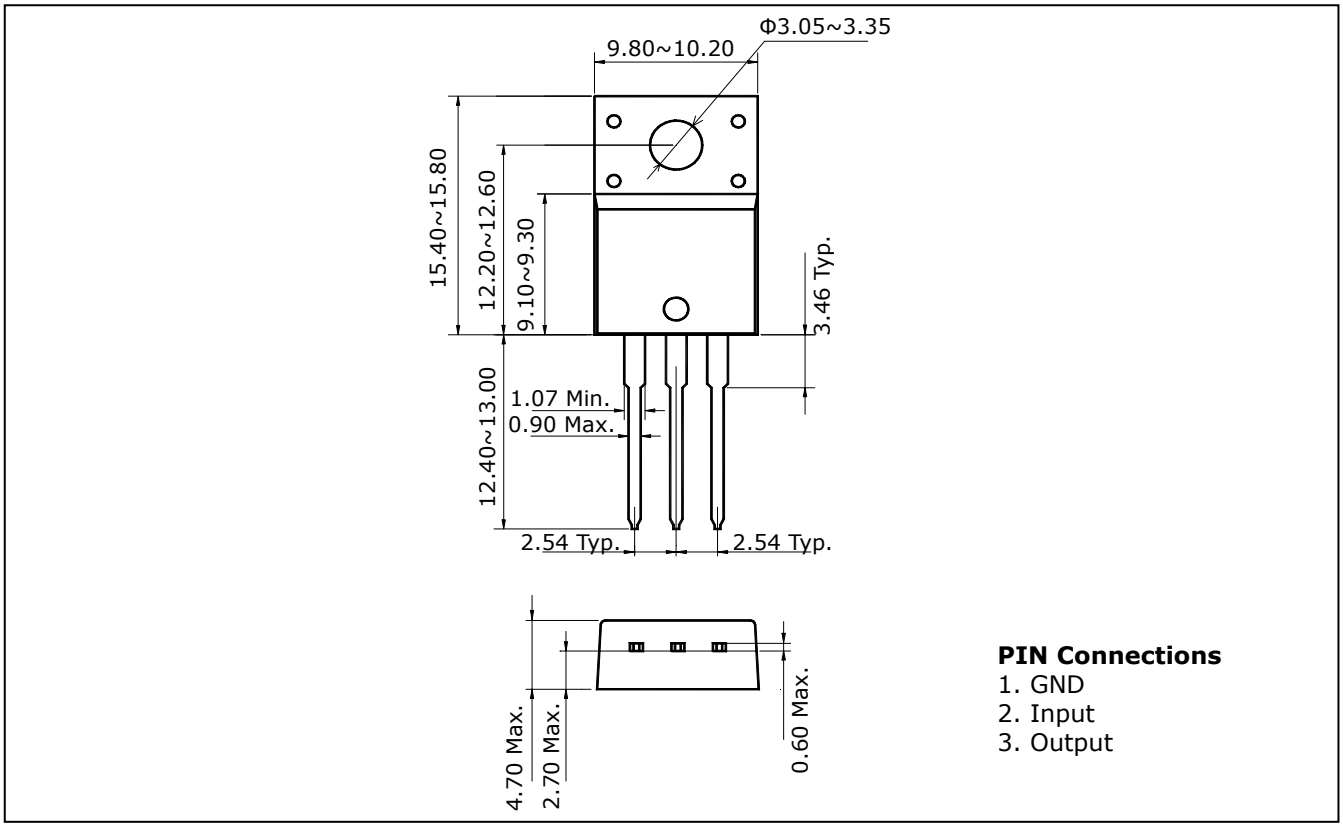
Ordering Information

Type NO.	Marking	Package Code
S79xxPI	S79□□PI	TO-220F-3L

□□: Voltage Code (05: -5V, 08: -8V, 09: -9V, 12: -12V, 15: -15V)

Outline Dimensions

unit: mm



PIN Connections
1. GND
2. Input
3. Output

Absolute Maximum Ratings

Ta=25°C

Characteristic	Symbol	Ratings	Unit
Operating Input Voltage	V_{IN}	-35	V
Power Dissipation (Tc=25℃)	P_D	20.8	W
Power Dissipation (without Heatsink)	P_D	2.0	W
Operating Temperature Range	T_{opr}	-40 ~ 85	°C
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 ~ 150	°C

Electrical Characteristics

(T_J = 0 to 125℃, Vin= -10V, Iout=500mA, unless otherwise specified.)

Characteristic	Symbol	Test Condition*		S7905PI			Unit
				Min.	Typ.	Max.	
Output Voltage**	V_{OUT}		T_j =25℃	-5.20	-5.0	-4.80	V
		I_{OUT}=5mA ~ 1A, V_{IN}=-20V ~ -7.0V		-5.25	-5.0	-4.75	
Line Regulation	$\triangle V_{OUT}$	V_{IN}=-25V ~ -7.0V	T_j =25℃	-	12.5	50	mV
		V_{IN}=-12V ~ -8.0V		-	4	15	
Load Regulation	$\triangle V_{OUT}$	I_{OUT}=5mA ~ 1.0A	T_j =25℃	-	15	100	mV
		I_{OUT}=250mA ~ 750mA		-	5	50	
Quiescent Current	I_B		T_j =25℃	-	1.5	2.0	mA
Quiescent Current Change	$\triangle I_B$	V_{IN} = -25V ~ -7.0V		-	0.15	0.5	mA
		I_{OUT} = 5mA ~ 1A		-	0.08	0.5	
Output Noise Voltage	V_N	f=10Hz ~ 100KHz	T_j =25℃	-	125	-	uV_{rms}
Ripple Rejection Ratio	RR	f=120Hz, V_{IN} =-18V ~ -8.0V		54	60	-	dB
Dropout Voltage	V_D	I_{OUT}=1A	T_j =25℃	-	2.0	-	V
Temperature Coefficient of Output Voltage Drift	T_{CVO}	I_{OUT}=5mA		-	-0.4	-	mV/℃
Peak Output Current	I_{PK}		T_j =25℃	-	2.1	-	A

* 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

(T_J = 0 to 125℃, Vin= -14V, Iout=500mA, unless otherwise specified.)

Characteristic	Symbol	Test Condition*		S7908PI			Unit
				Min.	Typ.	Max.	
Output Voltage**	V_{OUT}		T_j =25℃	-8.30	-8.0	-7.70	V
		I_{OUT}=5mA ~ 1A, V_{IN}=-23V ~ -10.5V		-8.40	-8.0	-7.60	
Line Regulation	$\triangle V_{OUT}$	V_{IN}=-25V ~ -10.5V	T_j =25℃	-	12.5	160	mV
		V_{IN}=-17V ~ -11V		-	4	80	
Load Regulation	$\triangle V_{OUT}$	I_{OUT}=5mA ~ 1.0A	T_j =25℃	-	15	160	mV
		I_{OUT}=250mA ~ 750mA		-	5	80	
Quiescent Current	I_B		T_j =25℃	-	1.5	2.0	mA
Quiescent Current Change	$\triangle I_B$	V_{IN} = -25V ~ -10.5V		-	0.15	1.0	mA
		I_{OUT} = 5mA ~ 1A		-	0.08	0.5	
Output Noise Voltage	V_N	f=10Hz ~ 100KHz	T_j =25℃	-	200	-	uV_{rms}
Ripple Rejection Ratio	RR	f=120Hz, V_{IN} =-21.5V ~ -11.5V		54	60	-	dB
Dropout Voltage	V_D	I_{OUT}=1A	T_j =25℃	-	2.0	-	V
Temperature Coefficient of Output Voltage Drift	T_{CVO}	I_{OUT}=5mA	T_j =25℃	-	-0.6	-	mV/℃
Peak Output Current	I_{PK}		T_j =25℃	-	2.1	-	A

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Electrical Characteristics

(T_J = 0 to 125℃, Vin= -15V, Iout=500mA, unless otherwise specified.)

Characteristic	Symbol	Test Condition*		S7909PI			Unit
				Min.	Typ.	Max.	
Output Voltage**	V_{OUT}		T_j =25℃	-9.30	-9.0	-8.70	V
		I_{OUT}=5mA ~ 1A, V_{IN}=-23V ~ -11.5V		-9.40	-9.0	-8.60	
Line Regulation	$\triangle V_{OUT}$	V_{IN}=-25V ~ -10.5V	T_j =25℃	-	10	180	mV
		V_{IN}=-17V ~ -11V		-	5	90	
Load Regulation	$\triangle V_{OUT}$	I_{OUT}=5mA ~ 1.0A	T_j =25℃	-	12	180	mV
		I_{OUT}=250mA ~ 750mA		-	4	90	
Quiescent Current	I_B		T_j =25℃	-	3	6	mA
Quiescent Current Change	$\triangle I_B$	V_{IN} = -25V ~ -11.5V		-	0.1	1.0	mA
		I_{OUT} = 5mA ~ 1A		-	0.08	0.5	
Output Noise Voltage	V_N	f=10Hz ~ 100KHz	T_j =25℃	-	175	-	uV_{rms}
Ripple Rejection Ratio	RR	f=120Hz, V_{IN} =-21.5V ~ -11.5V		54	60	-	dB
Dropout Voltage	V_D	I_{OUT}=1A	T_j =25℃	-	2.0	-	V
Temperature Coefficient of Output Voltage Drift	T_{CVO}	I_{OUT}=5mA	T_j =25℃	-	-0.4	-	mV/℃
Peak Output Current	I_{PK}		T_j =25℃	-	2.1	-	A

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

Electrical Characteristics

(T_J = 0 to 125℃, Vin= -19V, Iout=500mA, unless otherwise specified.)

Characteristic	Symbol	Test Condition*		S7912PI			Unit
				Min.	Typ.	Max.	
Output Voltage**	V_{OUT}		T_j =25℃	-12.5	-12.0	-11.5	V
		I_{OUT}=5mA ~ 1A, V_{IN}=-27V ~ -14.5V		-12.6	-12.0	-11.4	
Line Regulation	$\triangle V_{OUT}$	V_{IN}=-30V ~ -14.5V	T_j =25℃	-	5	80	mV
		V_{IN}=-22V ~ -16V		-	3	30	
Load Regulation	$\triangle V_{OUT}$	I_{OUT}=5mA ~ 1.0A	T_j =25℃	-	15	200	mV
		I_{OUT}=250mA ~ 750mA		-	5	75	
Quiescent Current	I_B		T_j =25℃	-	2.0	3.0	mA
Quiescent Current Change	$\triangle I_B$	V_{IN} = -30V ~ -14.5V		-	0.04	0.5	mA
		I_{OUT} = 5mA ~ 1A		-	0.08	0.5	
Output Noise Voltage	V_N	f=10Hz ~ 100KHz,	T_j =25℃	-	300	-	uV_{rms}
Ripple Rejection Ratio	RR	f=120Hz, V_{IN} =-25V ~ -15V		54	60	-	dB
Dropout Voltage	V_D	I_{OUT}=1A	T_j =25℃	-	2.0	-	V
Temperature Coefficient of Output Voltage Drift	T_{CVO}	I_{OUT}=5mA	T_j =25℃	-	-0.8	-	mV/℃
Peak Output Current	I_{PK}		T_j =25℃	-	2.1	-	A

* 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

(T_J = 0 to 125℃, Vin= -23V, Iout=500mA, unless otherwise specified.)

Characteristic	Symbol	Test Condition*		S7915PI			Unit
				Min.	Typ.	Max.	
Output Voltage**	V_{OUT}		T_j =25℃	-15.6	-15.0	-14.4	V
		I_{OUT}=5mA ~ 1A, V_{IN}=-30V ~ -17.5V		-15.75	-15.0	-14.25	
Line Regulation	ΔV_{OUT}	V_{IN}=-30V ~ -17.5V	T_j =25℃	-	5	100	mV
		V_{IN}=-26V ~ -20V		-	3	50	
Load Regulation	ΔV_{OUT}	I_{OUT}=5mA ~ 1.0A	T_j =25℃	-	15	200	mV
		I_{OUT}=250mA ~ 750mA		-	5	75	
Quiescent Current	I_B		T_j =25℃	-	2.0	3.0	mA
Quiescent Current Change	ΔI_B	V_{IN} = -30V ~ -17.5V		-	0.04	0.5	mA
		I_{OUT} = 5mA ~ 1A		-	0.08	0.5	
Output Noise Voltage	V_N	f=10Hz ~ 100KHz,	T_j =25℃	-	375	-	uV_{rms}
Ripple Rejection Ratio	RR	f=120Hz, V_{IN} =-28.5V ~ -18.5V		54	60	-	dB
Dropout Voltage	V_D	I_{OUT}=1A	T_j =25℃	-	2.0	-	V
Temperature Coefficient of Output Voltage Drift	T_{CVO}	I_{OUT}=5mA	T_j =25℃	-	-1.0	-	mV/℃
Peak Output Current	I_{PK}		T_j =25℃	-	2.1	-	A

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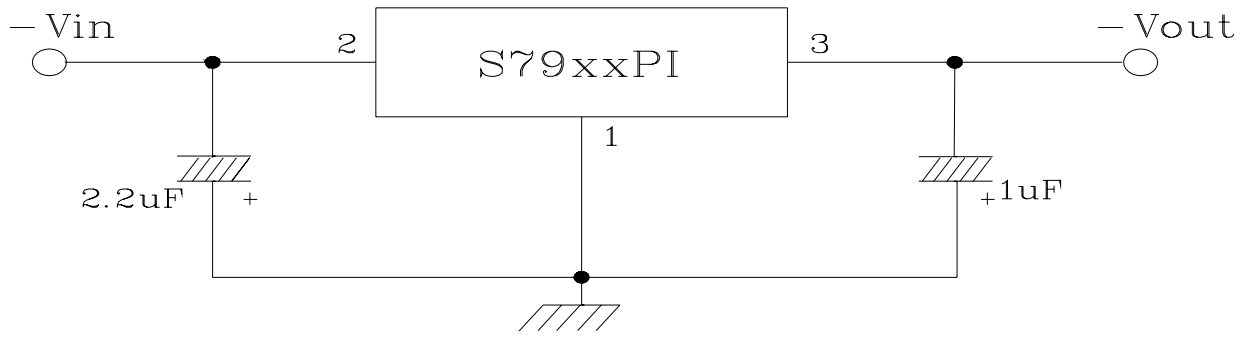
■Test circuit



Electrical Characteristic Curves

Fig. 1 V_{OUT} - V_{IN}

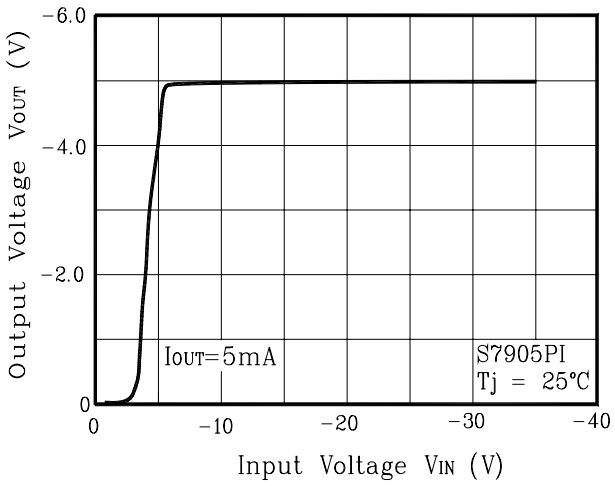


Fig. 2 V_{DROP} - Ta

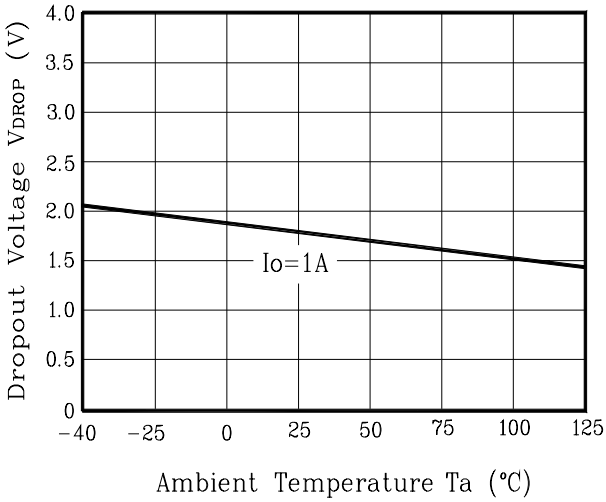


Fig. 3 I_B - T_j

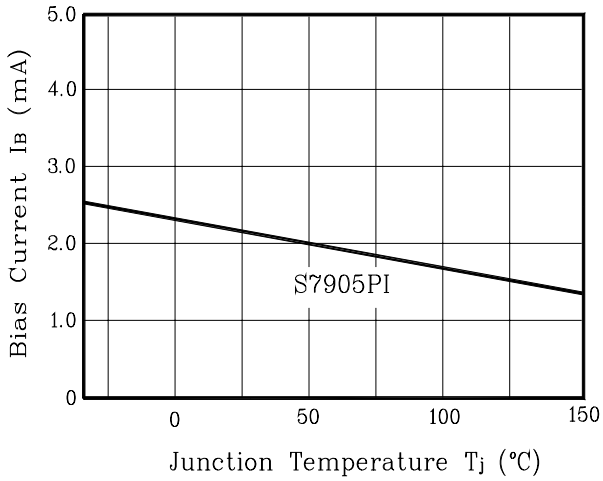


Fig. 4 V_{OUT} - T_j

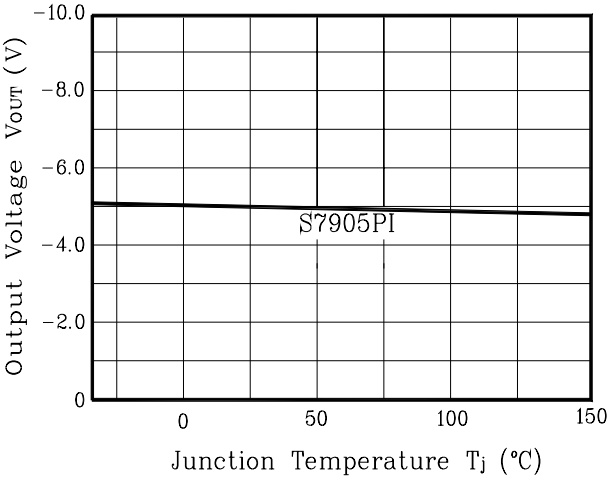
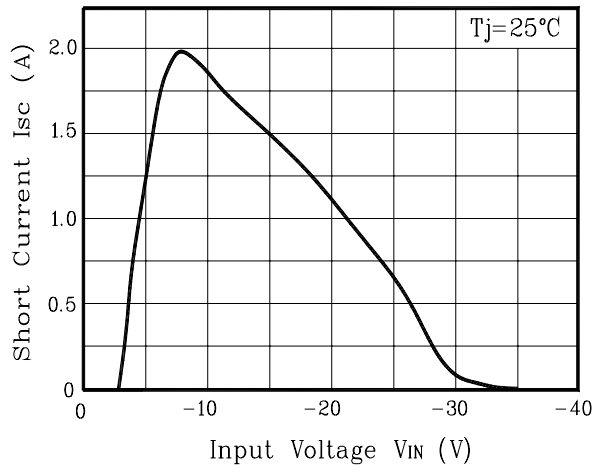


Fig. 5 I_{SC} - V_{IN}



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