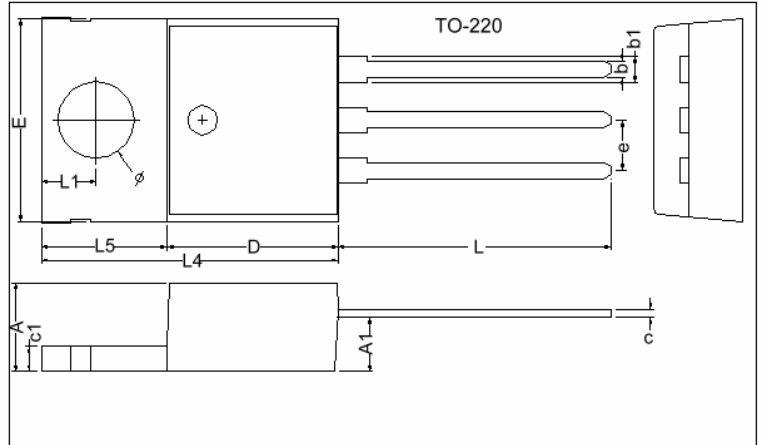


Description

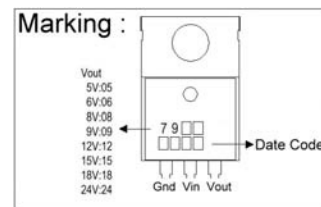
The SE79XX series of fixed-voltage monolithic integrated-circuit voltage regulators designed to complement Series SE78XX in a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. Each of these regulators can deliver up to 1A 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 voltage and current and also as the power pass element in precision regulators.



Features

- *-5V,-6V,-8V,-9V,-10V,-12V,-15V,-18V,-24V Output Voltage Available
- *Output Transistor Safe-Area Compensation
- *No External Components
- *Internal Thermal Overload Protection
- *Internal Short-Circuit Current Limiting

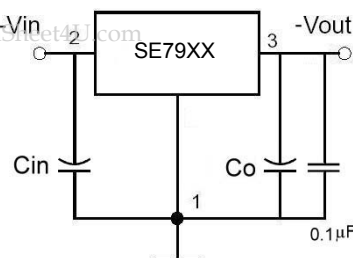
REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.40	4.80	c1	1.25	1.45
b	0.76	1.00	b1	1.17	1.47
c	0.36	0.50	L	13.25	14.25
D	8.60	9.00	E	2.54 REF.	
E	9.80	10.4	L1	2.60	2.89
L4	14.7	15.3	Ø	3.71	3.96
L5	6.20	6.60	A1	2.60	2.80



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit	
Input Voltage	SE7905~18	V_{IN}	-35	V
	SE7924	V_{IN}	-40	V
Output Current	I_o	1	A	
Operating Junction And Storage Temperature Range	T_j, T_{stg}	-55~+150	°C	
Thermal Resistance Junction-Air ($R\theta_{JA}$)	$R\theta_{JA}$	65	W/°C	
Thermal Resistance Junction-Cases ($R\theta_{JC}$)	$R\theta_{JC}$	5	W/°C	

Typical Application



Electrical Characteristics

SE7905 (Refer to the test circuits, $T_j=0\sim 125^\circ\text{C}$, $I_o=500\text{mA}$, $V_{in}=-10\text{V}$, $C_{in}=2.2\mu\text{F}$, $C_o=1\mu\text{F}$ unless otherwise specified)

Symbol		Min.	Typ.	Max.	Unit	Test Conditions
VO	A-Rank (3%)	-4.85	-5.0	-5.15	V	$V_{in}=-10\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$ $-7\text{V} \leq V_{in} \leq -20\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$, $PD \leq 15\text{W}$
	B-Rank (5%)	-4.75	-	-5.25		
ΔV_O (Line Regulation)		-	10	50	mV	$-7\text{V} \leq V_{in} \leq -25\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$
		-	-	25		$-8\text{V} \leq V_{in} \leq -12\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$
ΔV_O (Load Regulation)		-	10	100	mV	$V_{in}=-10\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$, $T_j=25^\circ\text{C}$
		-	3	50		$V_{in}=-10\text{V}$, $250\text{mA} \leq I_o \leq 750\text{mA}$, $T_j=25^\circ\text{C}$
IQ		-	-	6.0	mA	$V_{in}=-10\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$
ΔI_Q		-	-	0.5	mA	$V_{in}=-10\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$
		-	-	1.3		$-7\text{V} \leq V_{in} \leq -25\text{V}$, $I_o=500\text{mA}$
Vn		-	100	-	μV	$10\text{Hz} \leq f \leq 100\text{KHz}$, $T_a=25^\circ\text{C}$
RR		54	-	-	dB	$-8\text{V} \leq V_{in} \leq -18\text{V}$, $f=120\text{Hz}$, $T_j=25^\circ\text{C}$
VD		-	2	-	V	$I_o=1\text{A}$, $T_j=25^\circ\text{C}$
Ipk		-	2.2	-	A	$T_j=25^\circ\text{C}$
$\Delta V_o / \Delta T_j$		-	-0.4	-	$\text{mV}/^\circ\text{C}$	$I_o=5\text{mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$

SE7906 (Refer to the test circuits, $T_j=0\sim 125^\circ\text{C}$, $I_o=500\text{mA}$, $V_{in}=-11\text{V}$, $C_{in}=2.2\mu\text{F}$, $C_o=1\mu\text{F}$ unless otherwise specified)

Symbol		Min.	Typ.	Max.	Unit	Test Conditions
VO	A-Rank (3%)	-5.82	-6.0	-6.18	V	$V_{in}=-11\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$ $-8\text{V} \leq V_{in} \leq -21\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$, $PD \leq 15\text{W}$
	B-Rank (5%)	-5.70	-	-6.30		
ΔV_O (Line Regulation)		-	10	120	mV	$-8\text{V} \leq V_{in} \leq -25\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$
		-	5	60		$-9\text{V} \leq V_{in} \leq -13\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$
ΔV_O (Load Regulation)		-	10	120	mV	$V_{in}=-11\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$, $T_j=25^\circ\text{C}$
		-	3	60		$V_{in}=-11\text{V}$, $250\text{mA} \leq I_o \leq 750\text{mA}$, $T_j=25^\circ\text{C}$
IQ		-	-	6.0	mA	$V_{in}=-11\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$
ΔI_Q		-	-	0.5	mA	$V_{in}=-11\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$
		-	-	1.3		$-8\text{V} \leq V_{in} \leq -25\text{V}$, $I_o=500\text{mA}$
Vn		-	130	-	μV	$10\text{Hz} \leq f \leq 100\text{KHz}$, $T_a=25^\circ\text{C}$
RR		54	-	-	dB	$-9\text{V} \leq V_{in} \leq -19\text{V}$, $f=120\text{Hz}$, $T_j=25^\circ\text{C}$
VD		-	2	-	V	$I_o=1\text{A}$, $T_j=25^\circ\text{C}$
Ipk		-	2.2	-	A	$T_j=25^\circ\text{C}$
$\Delta V_o / \Delta T_j$		-	-0.5	-	$\text{mV}/^\circ\text{C}$	$I_o=5\text{mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$

SE7908 (Refer to the test circuits, $T_j=0\sim 125^\circ\text{C}$, $I_o=500\text{mA}$, $V_{in}=-14\text{V}$, $C_{in}=2.2\mu\text{F}$, $C_o=1\mu\text{F}$ unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
VO	A-Rank (3%)	-7.76	-8.0	-8.24	V	$V_{in}=-14\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$ $-10.5\text{V} \leq V_{in} \leq -23\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$, $PD \leq 15\text{W}$
	B-Rank (5%)	-7.60	-	-8.40		
ΔV_O (Line Regulation)	-	10	160	mV	$-10.5\text{V} \leq V_{in} \leq -25\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$	
	-	5	80		$-11.5\text{V} \leq V_{in} \leq -17\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$	
ΔV_O (Load Regulation)	-	12	160	mV	$V_{in}=-14\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$, $T_j=25^\circ\text{C}$	
	-	4	80		$V_{in}=-14\text{V}$, $250\text{mA} \leq I_o \leq 750\text{mA}$, $T_j=25^\circ\text{C}$	
IQ	-	-	6.0	mA	$V_{in}=-14\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$	
ΔIQ	-	-	0.5	mA	$V_{in}=-14\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$	
	-	-	1.0		$-11.5\text{V} \leq V_{in} \leq -25\text{V}$, $I_o=500\text{mA}$	
Vn	-	175	-	μV	$10\text{Hz} \leq f \leq 100\text{KHz}$, $T_a=25^\circ\text{C}$	
RR	54	-	-	dB	$-11.5\text{V} \leq V_{in} \leq -21.5\text{V}$, $f=120\text{Hz}$, $T_j=25^\circ\text{C}$	
VD	-	2	-	V	$I_o=1\text{A}$, $T_j=25^\circ\text{C}$	
Ipk	-	2.2	-	A	$T_j=25^\circ\text{C}$	
$\Delta V_o / \Delta T_j$	-	-0.6	-	$\text{mV}/^\circ\text{C}$	$I_o=5\text{mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$	

SE7909 (Refer to the test circuits, $T_j=0\sim 125^\circ\text{C}$, $I_o=500\text{mA}$, $V_{in}=-15\text{V}$, $C_{in}=2.2\mu\text{F}$, $C_o=1\mu\text{F}$ unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
VO	A-Rank (3%)	-8.73	-9.0	-9.27	V	$V_{in}=-15\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$ $-11.5\text{V} \leq V_{in} \leq -23\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$, $PD \leq 15\text{W}$
	B-Rank (5%)	-8.55	-	-9.45		
ΔV_O (Line Regulation)	-	10	180	mV	$-11.5\text{V} \leq V_{in} \leq -26\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$	
	-	5	90		$-12\text{V} \leq V_{in} \leq -18\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$	
ΔV_O (Load Regulation)	-	12	180	mV	$V_{in}=-15\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$, $T_j=25^\circ\text{C}$	
	-	4	90		$V_{in}=-15\text{V}$, $250\text{mA} \leq I_o \leq 750\text{mA}$, $T_j=25^\circ\text{C}$	
IQ	-	-	6.0	mA	$V_{in}=-15\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$	
ΔIQ	-	-	0.5	mA	$V_{in}=-15\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$	
	-	-	1.0		$-11.5\text{V} \leq V_{in} \leq -26\text{V}$, $I_o=500\text{mA}$	
Vn	-	175	-	μV	$10\text{Hz} \leq f \leq 100\text{KHz}$, $T_a=25^\circ\text{C}$	
RR	54	-	-	dB	$-12.5\text{V} \leq V_{in} \leq -22.5\text{V}$, $f=120\text{Hz}$, $T_j=25^\circ\text{C}$	
VD	-	2	-	V	$I_o=1\text{A}$, $T_j=25^\circ\text{C}$	
Ipk	-	2.2	-	A	$T_j=25^\circ\text{C}$	
$\Delta V_o / \Delta T_j$	-	-0.6	-	$\text{mV}/^\circ\text{C}$	$I_o=5\text{mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$	

SE7912 (Refer to the test circuits, $T_j=0\sim 125^\circ\text{C}$, $I_o=500\text{mA}$, $V_{in}=-19\text{V}$, $C_{in}=2.2\mu\text{F}$, $C_o=1\mu\text{F}$ unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
A-Rank (3%)	-11.64	-12.0	-12.36	V	$V_{in}=-19\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$ $-14.5\text{V} \leq V_{in} \leq -27\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$, $PD \leq 15\text{W}$
	B-Rank (5%)	-11.40	-		
ΔV_O (Line Regulation)	-	12	240	mV	$-14.5\text{V} \leq V_{in} \leq -30\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$
	-	6	120		$-16\text{V} \leq V_{in} \leq -22\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$
ΔV_O (Load Regulation)	-	12	240	mV	$V_{in}=-19\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$, $T_j=25^\circ\text{C}$
	-	4	120		$V_{in}=-19\text{V}$, $250\text{mA} \leq I_o \leq 750\text{mA}$, $T_j=25^\circ\text{C}$
IQ	-	-	6.0	mA	$V_{in}=-19\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$
ΔIQ	-	-	0.5	mA	$V_{in}=-19\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$
	-	-	1.0		$-14.5\text{V} \leq V_{in} \leq -30\text{V}$, $I_o=500\text{mA}$
V_n	-	200	-	μV	$10\text{Hz} \leq f \leq 100\text{KHz}$, $T_a=25^\circ\text{C}$
RR	54	-	-	dB	$-15\text{V} \leq V_{in} \leq -25\text{V}$, $f=120\text{Hz}$, $T_j=25^\circ\text{C}$
VD	-	2	-	V	$I_o=1\text{A}$, $T_j=25^\circ\text{C}$
Ipk	-	2.2	-	A	$T_j=25^\circ\text{C}$
$\Delta V_o / \Delta T_j$	-	-0.8	-	$\text{mV}/^\circ\text{C}$	$I_o=5\text{mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$

SE7915 (Refer to the test circuits, $T_j=0\sim 125^\circ\text{C}$, $I_o=500\text{mA}$, $V_{in}=-23\text{V}$, $C_{in}=2.2\mu\text{F}$, $C_o=1\mu\text{F}$ unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
VO	A-Rank (3%)	-14.55	-15.0	-15.45	V	$V_{in}=-23\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$ $-17.5\text{V} \leq V_{in} \leq -30\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$, $PD \leq 15\text{W}$
	B-Rank (5%)	-14.25	-	-15.75		
ΔV_O (Line Regulation)	-	12	300	mV	$-17.5\text{V} \leq V_{in} \leq -30\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$	
	-	6	150		$-20\text{V} \leq V_{in} \leq -26\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$	
ΔV_O (Load Regulation)	-	12	300	mV	$V_{in}=-23\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$, $T_j=25^\circ\text{C}$	
	-	4	150		$V_{in}=-23\text{V}$, $250\text{mA} \leq I_o \leq 750\text{mA}$, $T_j=25^\circ\text{C}$	
IQ	-	-	6.0	mA	$V_{in}=-23\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$	
ΔIQ	-	-	0.5	mA	$V_{in}=-23\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$	
	-	-	1.0		$-17.5\text{V} \leq V_{in} \leq -30.5\text{V}$, $I_o=500\text{mA}$	
V_n	-	250	-	μV	$10\text{Hz} \leq f \leq 100\text{KHz}$, $T_a=25^\circ\text{C}$	
RR	54	-	-	dB	$-18.5\text{V} \leq V_{in} \leq -28.5\text{V}$, $f=120\text{Hz}$, $T_j=25^\circ\text{C}$	
VD	-	2	-	V	$I_o=1\text{A}$, $T_j=25^\circ\text{C}$	
Ipk	-	2.2	-	A	$T_j=25^\circ\text{C}$	
$\Delta V_o / \Delta T_j$	-	-0.9	-	$\text{mV}/^\circ\text{C}$	$I_o=5\text{mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$	

SE7918 (Refer to the test circuits, $T_j=0\sim 125^\circ\text{C}$, $I_o=500\text{mA}$, $V_{in}=-27\text{V}$, $C_{in}=2.2\mu\text{F}$, $C_o=1\mu\text{F}$ unless otherwise specified)

Symbol		Min.	Typ.	Max.	Unit	Test Conditions
VO	A-Rank (3%)	-17.46	-18.0	-18.54	V	$V_{in}=-27\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$ $-21\text{V} \leq V_{in} \leq -33\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$, $PD \leq 15\text{W}$
	B-Rank (5%)	-17.10	-	-18.9		
ΔVO (Line Regulation)		-	15	360	mV	$-21\text{V} \leq V_{in} \leq -33\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$
		-	8	180		$-24\text{V} \leq V_{in} \leq -30\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$
ΔVO (Load Regulation)		-	15	360	mV	$V_{in}=-27\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$, $T_j=25^\circ\text{C}$
		-	5	180		$V_{in}=-27\text{V}$, $250\text{mA} \leq I_o \leq 750\text{mA}$, $T_j=25^\circ\text{C}$
IQ		-	-	6.0	mA	$V_{in}=-27\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$
ΔIQ		-	-	0.5	mA	$V_{in}=-27\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$
		-	-	1.0		$-21\text{V} \leq V_{in} \leq -33\text{V}$, $I_o=500\text{mA}$
Vn		-	300	-	μV	$10\text{Hz} \leq f \leq 100\text{KHz}$, $T_a=25^\circ\text{C}$
RR		54	-	-	dB	$-22\text{V} \leq V_{in} \leq -32\text{V}$, $f=120\text{Hz}$, $T_j=25^\circ\text{C}$
VD		-	2	-	V	$I_o=1\text{A}$, $T_j=25^\circ\text{C}$
Ipk		-	2.2	-	A	$T_j=25^\circ\text{C}$
$\Delta VO / \Delta T_j$		-	-1.0	-	$\text{mV}/^\circ\text{C}$	$I_o=5\text{mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$

SE7924 (Refer to the test circuits, $T_j=0\sim 125^\circ\text{C}$, $I_o=500\text{mA}$, $V_{in}=-33\text{V}$, $C_{in}=2.2\mu\text{F}$, $C_o=1\mu\text{F}$ unless otherwise specified)

Symbol		Min.	Typ.	Max.	Unit	Test Conditions
VO	A-Rank (3%)	-23.28	-24.0	-24.72	V	$V_{in}=-33\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$ $-27\text{V} \leq V_{in} \leq -38\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$, $PD \leq 15\text{W}$
	B-Rank (5%)	-22.80	-	-25.20		
ΔVO (Line Regulation)		-	15	480	mV	$-27\text{V} \leq V_{in} \leq -38\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$
		-	8	240		$-30\text{V} \leq V_{in} \leq -36\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$
ΔVO (Load Regulation)		-	15	480	mV	$V_{in}=-33\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$, $T_j=25^\circ\text{C}$
		-	5	240		$V_{in}=-33\text{V}$, $250\text{mA} \leq I_o \leq 750\text{mA}$, $T_j=25^\circ\text{C}$
IQ		-	-	6.0	mA	$V_{in}=-33\text{V}$, $I_o=500\text{mA}$, $T_j=25^\circ\text{C}$
ΔIQ		-	-	0.5	mA	$V_{in}=-33\text{V}$, $5\text{mA} \leq I_o \leq 1\text{A}$
		-	-	1.0		$-27\text{V} \leq V_{in} \leq -38\text{V}$, $I_o=500\text{mA}$
Vn		-	400	-	μV	$10\text{Hz} \leq f \leq 100\text{KHz}$, $T_a=25^\circ\text{C}$
RR		54	-	-	dB	$-28\text{V} \leq V_{in} \leq -38\text{V}$, $f=120\text{Hz}$, $T_j=25^\circ\text{C}$
VD		-	2	-	V	$I_o=1\text{A}$, $T_j=25^\circ\text{C}$
Ipk		-	2.2	-	A	$T_j=25^\circ\text{C}$
$\Delta VO / \Delta T_j$		-	-1.0	-	$\text{mV}/^\circ\text{C}$	$I_o=5\text{mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$