

3 TERMINAL 1.5A NEGATIVE VOLTAGE REGULATOR

DESCRIPTION

The SK79XX series of three-terminal negative regulators are available in TO-220/TO-252 package, and with several fixed output voltages, making them useful in a wide range of applications. Each type employs internal current limiting, thermal shut-down and safe operating area protection, making it essentially indestructible.

*Chip Size(before saw): $1.53 \times 1.80 \text{ (mm)}^2$

*Wafer Size : 5 inch

*PAD Size: $200 \times 300 (\mu\text{m})^2$

*Top Metal: AlSi, Thickness: 1.6μm

*Surface Passvation: PESiO2

*Chip Thickness: before grind :525±15 (μm);

after grind:300±10 (μm)

*Scribe Line: 100μm

FEATURES

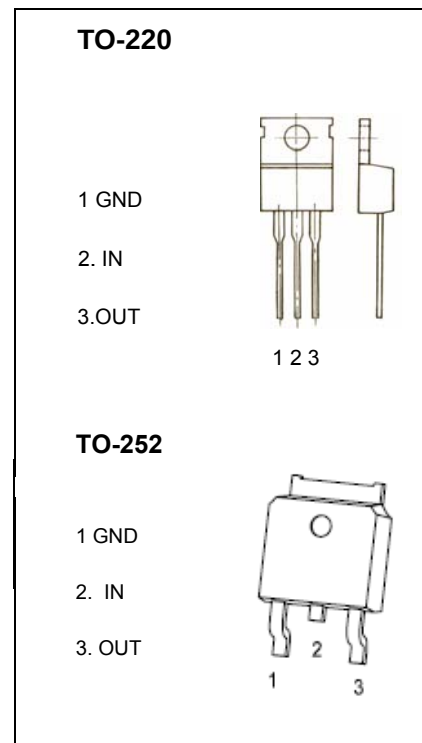
*Output current in excess of 1.5A

*-5,-12V output voltages available

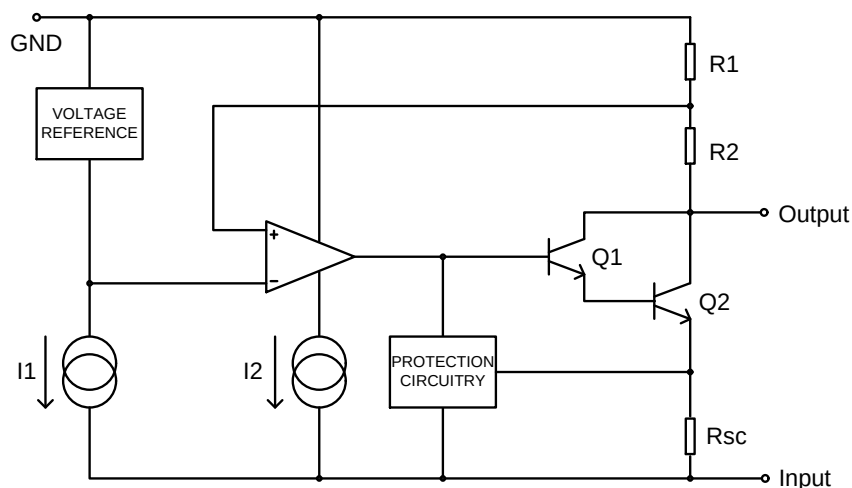
*Internal Thermal overload protection

*Short circuit protection

*Output transistor SOA protection



BLOCK DIAGRAM



PACKAGE

SK79XXAU	TO-220
SK79XXU	TO-252

3 TERMINAL 1.5A NEGATIVE VOLTAGE REGULATOR

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Characteristic	Symbol	Value	Unit
Input voltage	V_i	-35	V
Thermal resistance junction-air	$R_{\theta JA}$	65	°C/W
Thermal resistance junction-cases	$R_{\theta JC}$	5	°C/W
Operating Temperature	T_{opr}	0~+125	°C
Storage Temperature	T_{stg}	-65~+150	°C

Note:

1. Thermal resistance test board
Size: 76.2mmX114.3mmX1.6mm(1SOP)
JEDEC standard: JESD51-3, JESD51-7
2. Assume no ambient airflow

SK7905AU/SK7905U ELECTRICAL CHARACTERISTICS

(Refer to test circuits, $0 < T_j < 125^\circ\text{C}$, $I_o = 500\text{mA}$, $V_i = -10\text{V}$, $C_i = 2.2\mu\text{F}$, $C_o = 1\mu\text{F}$, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Units
Output voltage	V_o	$T_j = 25^\circ\text{C}$	-4.8	-5.0	-5.2	V
		$5\text{mA} < I_o < 1\text{A}$, $P_o < 15\text{W}$ $V_i = -7\text{V}$ to -20V	-4.75	-5.0	-5.25	
Line regulation(Note)	ΔV_o	$T_j = 25^\circ\text{C}$, $V_i = -7\text{V}$ to -25V	-	35	100	mV
		$T_j = 25^\circ\text{C}$, $V_i = -8\text{V}$ to -12V	-	8	50	
Load regulation(Note)	ΔV_o	$T_j = 25^\circ\text{C}$, $I_o = 5\text{mA}$ to 1.5A	-	10	100	mV
		$T_j = 25^\circ\text{C}$, $I_o = 250\text{mA}$ to 750mA	-	3	50	
Quiescent current	I_Q	$T_j = 25^\circ\text{C}$	-	3	6	mA
Quiescent current change	ΔI_Q	$I_o = 5\text{mA}$ to 1A	-	0.05	0.5	mA
		$V_i = -8\text{V}$ to -25V	-	0.1	0.8	
Temperature coefficient of V_D	$\Delta V_o / \Delta T$	$I_o = 5\text{mA}$	-	0.5	-	mV/°C
Output noise voltage	V_N	$f = 10\text{Hz}$ to 100kHz , $T_a = 25^\circ\text{C}$	-	40	-	μV
Ripple rejection	RR	$f = 120\text{Hz}$, $\Delta V_i = 10\text{V}$	54	60	-	dB
Dropout voltage	V_D	$I_o = 1\text{A}$, $T_j = 25^\circ\text{C}$	-	2	-	V
Short circuit current	I_{sc}	$V_i = -35\text{V}$, $T_j = 25^\circ\text{C}$	-	10	-	mA

Note: Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty is used.

3 TERMINAL 1.5A NEGATIVE VOLTAGE REGULATOR

SK7912AU/SK7912U ELECTRICAL CHARACTERISTICS

(Refer to test circuits, $0 < T_j < 125^\circ\text{C}$, $I_o = 500\text{mA}$, $V_i = -19\text{V}$, $C_i = 2.2\mu\text{F}$, $C_o = 1\mu\text{F}$, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Units
Output voltage	V_o	$T_j = 25^\circ\text{C}$	-11.5	-12	-12.5	V
		$5\text{mA} < I_o < 1\text{A}$, $P_o < 15\text{W}$ $V_i = -7\text{V to } -20\text{V}$	-11.4	-12	-12.6	
Line regulation(Note1)	ΔV_o	$T_j = 25^\circ\text{C}$, $V_i = -14.5\text{V to } -30\text{V}$	-	12	240	mV
		$T_j = 25^\circ\text{C}$, $V_i = -16\text{V to } -22\text{V}$	-	6	120	
Load regulation(Note1)	ΔV_o	$T_j = 25^\circ\text{C}$, $I_o = 5\text{mA to } 1.5\text{A}$	-	12	240	mV
		$T_j = 25^\circ\text{C}$, $I_o = 250\text{mA to } 750\text{mA}$	-	4	120	
Quiescent current	I_Q	$T_j = 25^\circ\text{C}$	-	3	6	mA
Quiescent current change	ΔI_Q	$I_o = 5\text{mA to } 1\text{A}$	-	0.05	0.5	mA
		$V_i = -14.5\text{V to } -30\text{V}$	-	0.1	1	
Temperature coefficient of V_o	$\Delta V_o / \Delta T$	$I_o = 5\text{mA}$	-	1.2	-	mV/ $^\circ\text{C}$
Output noise voltage	V_N	$f = 10\text{Hz to } 100\text{kHz}$, $T_a = 25^\circ\text{C}$	-	200	-	μV
Ripple rejection	RR	$f = 120\text{Hz}$, $\Delta V_i = 10\text{V}$	54	60	-	dB
Dropout voltage	V_D	$I_o = 1\text{A}$, $T_j = 25^\circ\text{C}$	-	2	-	V
Short circuit current	I_{sc}	$V_i = -35\text{V}$, $T_j = 25^\circ\text{C}$	-	10	-	mA

Note: Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty is used.

APPLICATION CIRCUITS

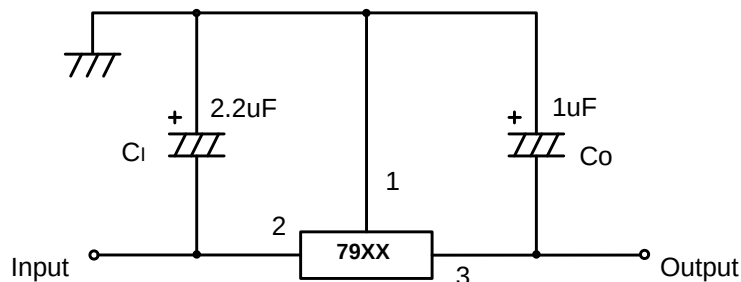


Fig.1 Negative fixed output regulator

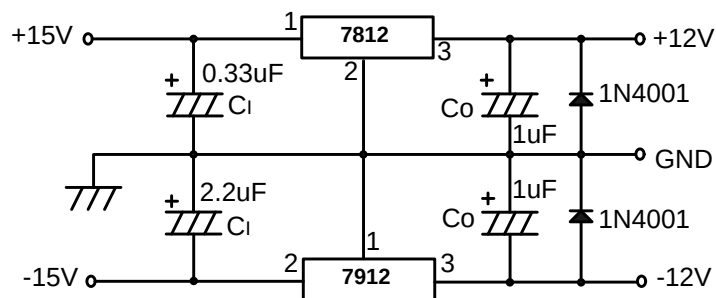
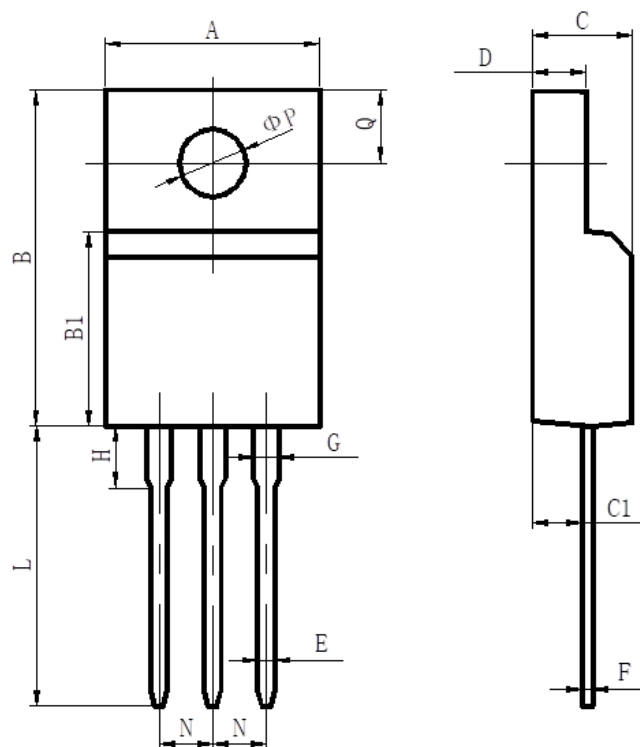


Fig.2 Split power supply($\pm 12\text{V}/1\text{A}$)

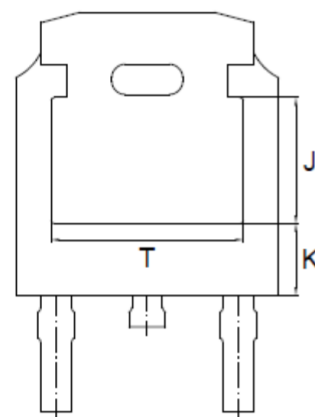
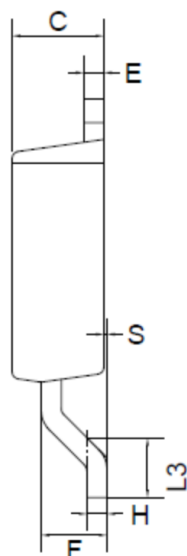
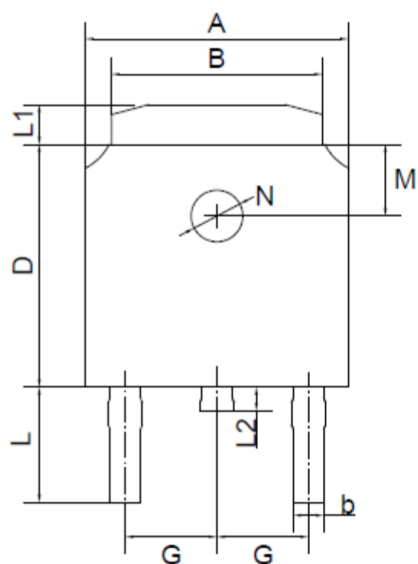
PACKAGE OUTLINE

TO-220F



	Unit (mm)	
	MIN	MAX
A	9.70	10.30
B	15.50	16.10
B1	8.99	9.39
C	4.40	4.80
C1	2.15	2.55
D	2.50	2.90
E	0.70	0.90
F	0.40	0.60
G	1.12	1.42
H	3.40	3.80
L	12.6	13.6
N	2.34	2.74
Q	3.15	3.55
Φ P	3.00	3.30

TO-252(D-PAK)



TO-252(D-PAK) mechanical data

UNIT		A	B	b	C	D	E	F	G	H	L	L1	L2	L3	S	M	N	J	K	T
mm	max	6.7	5.5	0.8	2.5	6.3	0.6	1.8	2.29 TYPICAL	0.55	3.1	1.2	1.0	1.75	0.1	1.8 TYPICAL	1.3 TYPICAL	3.16 ref.	1.80 ref.	4.83 ref.
	min	6.3	5.1	0.3	2.1	5.9	0.4	1.3		0.45	2.7	0.8	0.6	1.40	0.0					
mil	max	264	217	31	98	248	24	71	90 TYPICAL	22	122	47	39	69	4	71 TYPICAL	51 TYPICAL	124 ref.	71 ref.	190 ref.
	min	248	201	12	83	232	16	51		18	106	31	24	55	0					