

## 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\*1.80 (mm)<sup>2</sup>

\*Wafer Size : 5 inch

\*PAD Size: 200\*300(μm)<sup>2</sup>

\*Top Metal: AISi. Thickness: 1.6μm

\*Surface Passvation: PESiO<sub>2</sub>

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

after grind:300±10 (μm)

\*Scribe Line: 100μm

### FEATURES

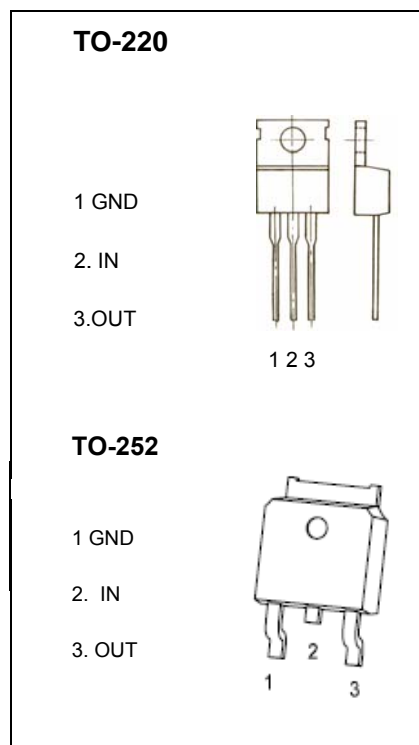
\*Output current in excess of 1.5A

\*-5,-12V output voltages available

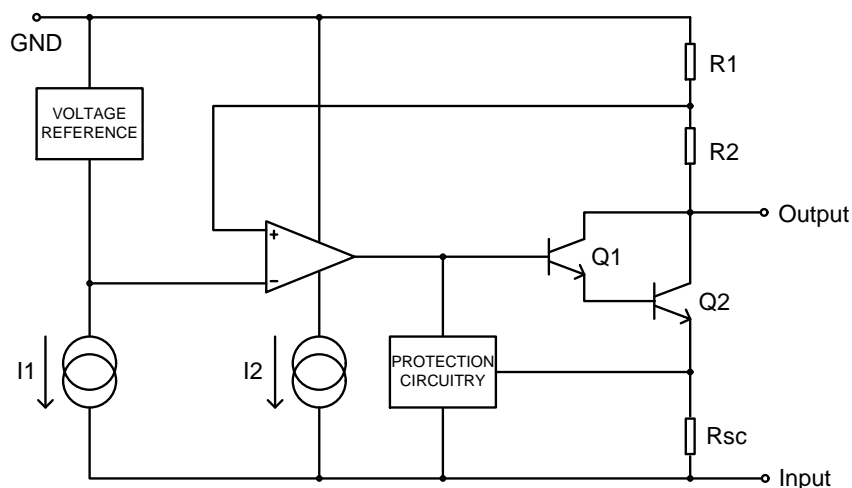
\*Internal Thermal overload protection

\*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:

- Thermal resistance test board  
Size: 76.2mmX114.3mmX1.6mm(1S0P)  
JEDEC standard: JESD51-3, JESD51-7
- Assume no ambient airflow

### SK7905AG/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
		$5\text{mA} < I_o < 1\text{A}$ , $P_o < 15\text{W}$ $V_i = -7\text{V to } -20\text{V}$	-4.75	-5.0	-5.25	
Line regulation(Note)	$\Delta V_o$	$T_j = 25^\circ\text{C}$ , $V_i = -7\text{V to } -25\text{V}$	-	35	100	mV
		$T_j = 25^\circ\text{C}$ , $V_i = -8\text{V to } -12\text{V}$	-	8	50	
Load regulation(Note)	$\Delta V_o$	$T_j = 25^\circ\text{C}$ , $I_o = 5\text{mA to } 1.5\text{A}$	-	10	100	mV
		$T_j = 25^\circ\text{C}$ , $I_o = 250\text{mA to } 750\text{mA}$	-	3	50	
Quiescent current	$I_Q$	$T_j = 25^\circ\text{C}$	-	3	6	mA
Quiescent current change	$\Delta I_Q$	$I_o = 5\text{mA to } 1\text{A}$	-	0.05	0.5	mA
		$V_i = -8\text{V to } -25\text{V}$	-	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	$V_N$	$f = 10\text{Hz to } 100\text{kHz}$ , $T_a = 25^\circ\text{C}$	-	40	-	$\mu\text{V}$
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

### SK7912AG/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)	$\Delta V_o$	$T_j = 25^\circ\text{C}$ , $V_i = -14.5\text{V to } -30\text{V}$	-	12	240	mV
		$T_j = 25^\circ\text{C}$ , $V_i = -16\text{V to } -22\text{V}$	-	6	120	
Load regulation(Note1)	$\Delta V_o$	$T_j = 25^\circ\text{C}$ , $I_o = 5\text{mA to } 1.5\text{A}$	-	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	$\Delta I_q$	$I_o = 5\text{mA to } 1\text{A}$	-	0.05	0.5	mA
		$V_i = -14.5\text{V to } -30\text{V}$	-	0.1	1	
Temperature coefficient of $V_D$	$\Delta V_o / \Delta T$	$I_o = 5\text{mA}$	-	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	-	$\mu\text{V}$
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

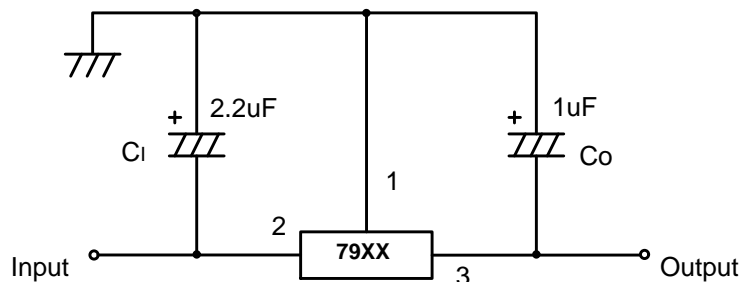


Fig.1 Negative fixed output regulator

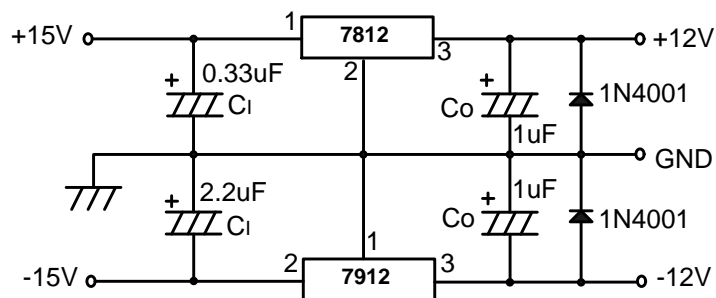
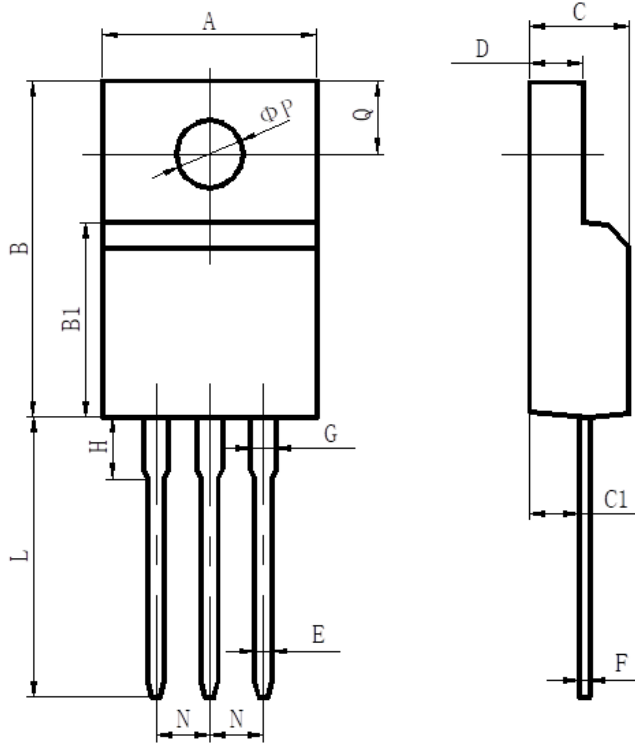


Fig.2 Split power supply( $\pm 12\text{V}/1\text{A}$ )

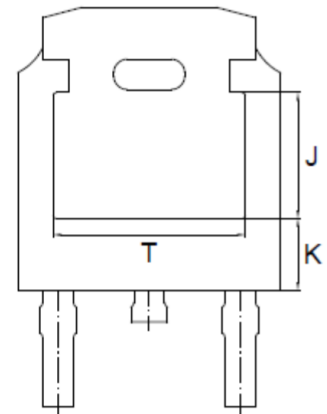
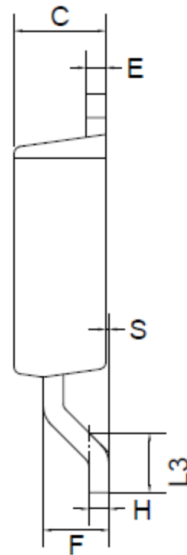
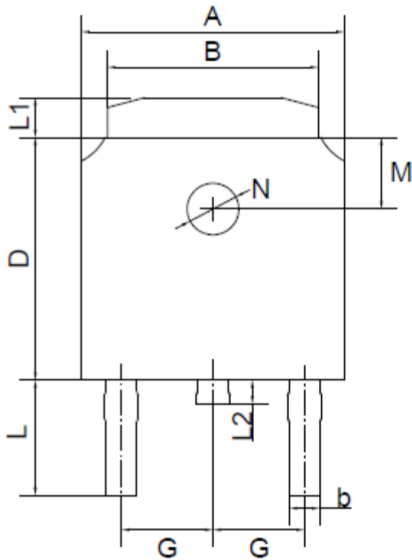
## PACKAGE OUTLINE

### 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
$\phi P$	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 TYPICAL	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						
mil	max	264	217	31	98	248	24	71	90 TYPICAL	22	122	47	39	69	4 TYPICAL	71 TYPICAL	51 TYPICAL	124 ref.	71 ref.	190 ref.
	min	248	201	12	83	232	16	51		18	106	31	24	55						