

3 TERMINAL 1.0 A POSITIVE VOLTAGE REGULATORS

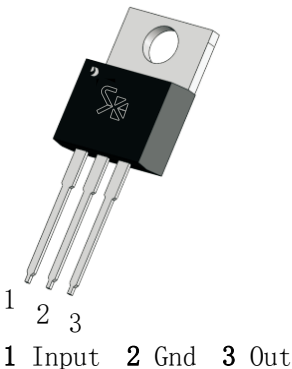
DESCRIPTION

The SK78XXA series of three-terminal positive regulators are available in TO-220 packages. Each type employs internal current limiting, thermal shut-down and safe area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 1.0A output current. Although designed as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltage and currents.

FEATURES

- *Output current up to 1.0A
- *Thermal overload protection
- *Short circuit protection
- *Output transistor SOA protection

Symbol	Parameter	Value	UNIT
V_I	Input Voltage	35	V
TOPR	Operating Temperature Range	-40 ~ +125	°C
TSTG	Storage Temperature Range	-65 ~ +150	°C
R(JA)	Thermal resistance junction-air	65	°C/W
RθJC	Thermal resistance junction-cases	5	°C/W



ELECTRICAL CHARACTERISTICS

Refer to test circuits, $0 < T_j < 125^\circ\text{C}$, $I_O = 500\text{mA}$, $V_I = 21\text{V}$, $C_i = 0.33\mu\text{F}$, $C_o = 0.1\mu\text{F}$, unless otherwise specified

Parameter	Symbol	Test Condition	MIN	TYP	MAX	UNIT
Output Voltage	V_O	$T_J = 25^\circ\text{C}$	14.4	15	15.6	V
		$I_O = 5\text{mA to } 1\text{A}$, $P_O < 15\text{W}$ $V_I = 17.5\text{V to } 30\text{V}$	14.25	15	15.75	
Line Regulation	ΔV_O	$T_J = 25^\circ\text{C}$ $V_I = 17.5\text{V to } 30\text{V}$		15	300	mV
		$V_I = 20\text{V to } 26\text{V}$		7	150	
Load Regulation	ΔV_O	$T_J = 25^\circ\text{C}$ $I_O = 5\text{mA to } 1.0\text{A}$		25	300	mV
		$T_J = 25^\circ\text{C}$ $I_O = 250\text{mA to } 750\text{mA}$		10	150	
Quiescent Current	I_Q	$T_J = 25^\circ\text{C}$		4	8	mA
Quiescent Current Change	ΔI_Q	$I_O = 5\text{mA to } 1\text{A}$			0.5	mA
		$V_I = 15\text{V to } 30\text{V}$, $I_O = 500\text{mA}$			0.8	
Output voltage drift	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$		1.8		mV/°C
Output noise voltage	V_N	$f = 10\text{Hz to } 100\text{kHz}$, $T_a = 25^\circ\text{C}$		42		uV/ V_O
Ripple rejection	RR	$f = 120\text{Hz}$, $V_i = 18\text{V to } 28\text{V}$		60		dB
Dropout voltage	V_O	$I_O = 1.0\text{A}$, $T_J = 25^\circ\text{C}$		2		V
Output resistance	R_O	$f = 1\text{kHz}$		18		mΩ
Short Circuit Current	ISC	$T_J = 25^\circ\text{C}$, $V_I = 35\text{V}$		200		mA

TEST CIRCUITS

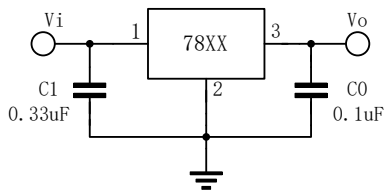


FIG.1 DC PARAMETERS

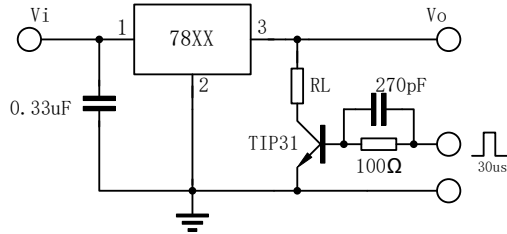


FIG.2 LOAD REGULATION

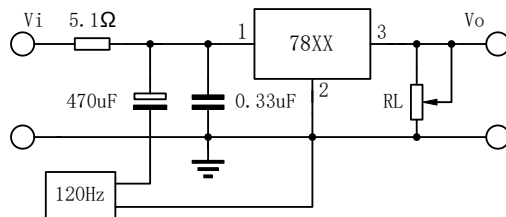


FIG.3 RIPPLE REJECTION

APPLICATION CIRCUITS

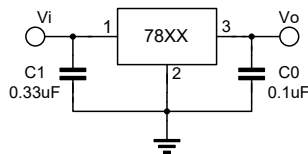


Fig.4 Fixed output regulator

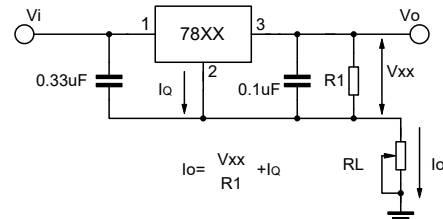


Fig.5 Constant current regulator

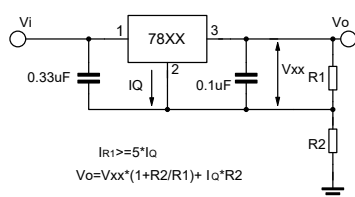


Fig.6 Circuit for increasing Regulator output voltage

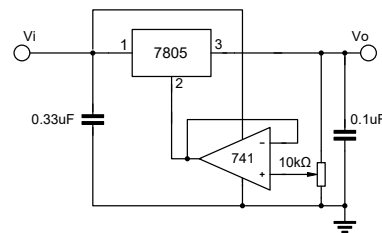
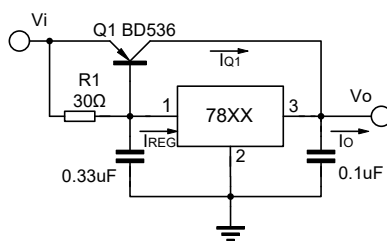


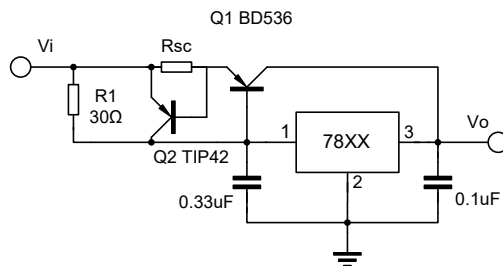
Fig.7 Adjustable output



$$I_o = I_{REG} \cdot (I_{REG} - V_{BEQ1}/R_1)$$

$$R_1 = V_{BEQ1}/(I_{REG} - I_{Q1})$$

Fig.8 High current with voltage regulator



$$R_{sc} = V_{BEQ2}/I_{sc}$$

Fig.9 High output current short circuit protection

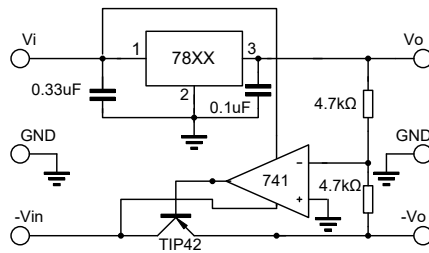


Fig.10 Tracking voltage regulator

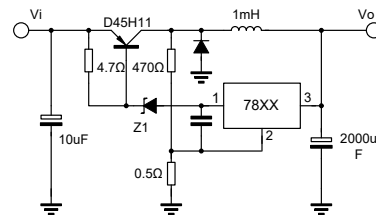


Fig.11 switching regulator

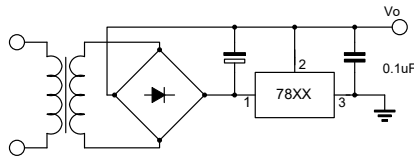
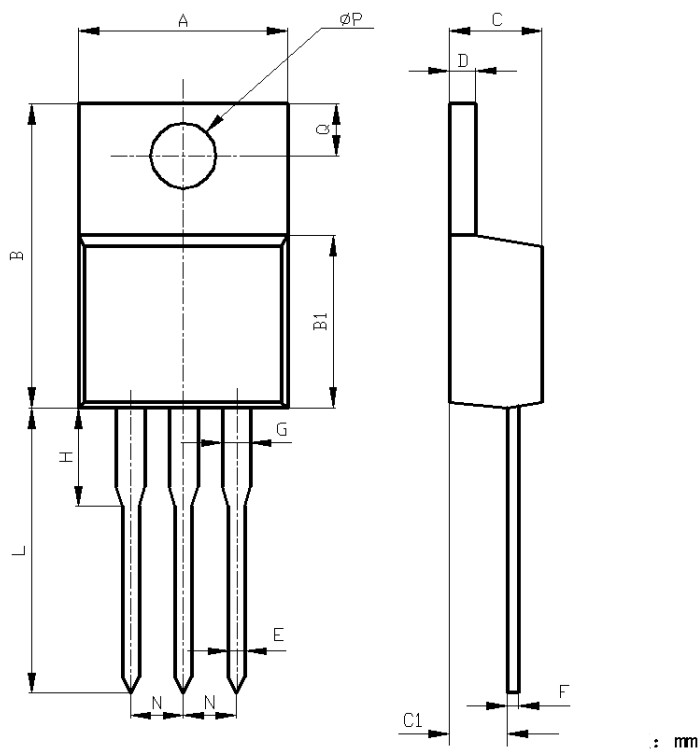


Fig.12 Negative output voltage circuit

PACKAGE OUTLINE

TO-220



	Unit (mm)	
	MIN	MAX
A	10.1	10.5
B	15.2	15.6
B1	9.00	9.40
C	4.40	4.60
C1	2.40	3.00
D	1.20	1.40
E	0.70	0.90
F	0.40	0.60
G	1.17	1.37
H	3.30	3.80
L	13.1	13.7
N	2.34	2.74
Q	2.40	3.00
ϕ P	3.70	3.90