3-TERMINAL FIXED VOLTAGE REGULATOR

H 7815

Description

The H7815 series of three terminal positive Regulators are available in the TO-220 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. If adequate heat sinking is provided, they can deliver over 1A output current. Although designed primarily as fixed voltage regulator, these devices can be used with external components to obtain adjustable voltages and currents.

Features

- Output current up to 1A
- Output Voltages of 15V
- Thermal Overload Protection
- Short Circuit Protection
- Output Transistor Safe Operating Area Protection

TO-220



1—INPUT
2—GND
3—OUTPUT

Absolute Maximum Ratings（T_a=25℃）

V_I——Input Voltage (for V_O=5V to 18V)…… 35V

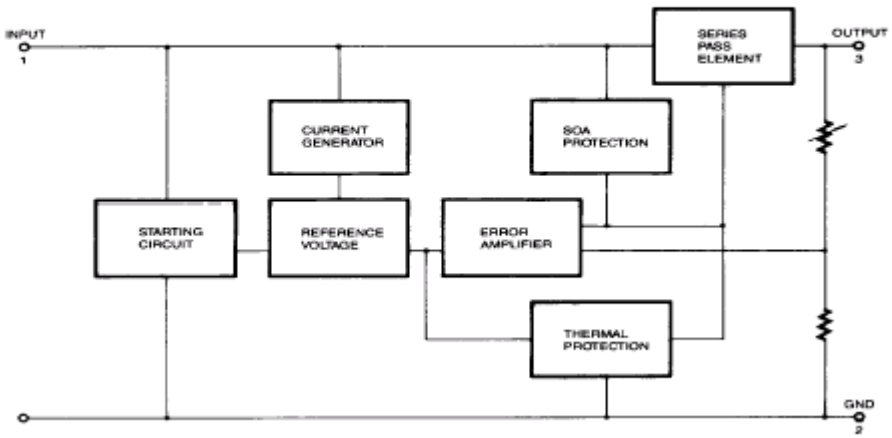
$R_{\theta JC}$——Thermal Resistance Junction-Cases…… 5℃/W

$R_{\theta JA}$——Thermal Resistance Junction-Air…… 65℃/W

T_{OPR}——Operating Temperature Range…… 0~125℃

T_{STG}——Storage Temperature Range…… -65~150℃

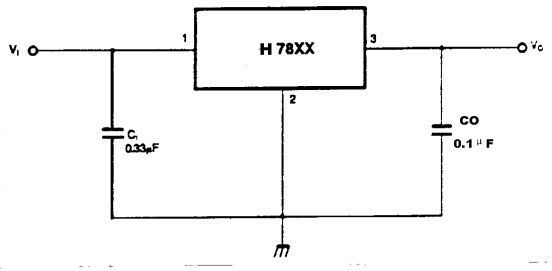
Internal Block Digram



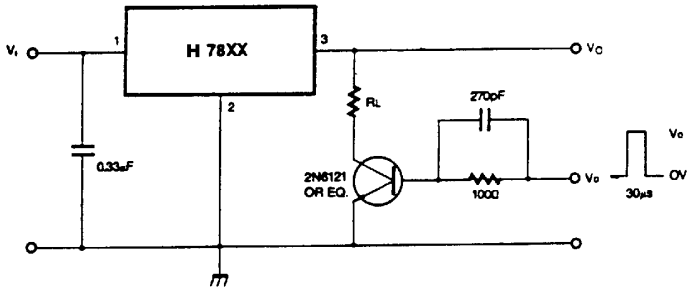
(Refer to test circuit, unless otherwise specified, $0°C \leq T_J \leq 125°C$, I_O=500mA, V_I=23V, C_I=0.33μF, C_O=0.1μF)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Conditions
V_O	Output Voltage	14.4	15	15.6	V	T_J=25°C
		14.25	15	15.75		5.0mA≤I_O≤1.0A, P_D≤15W, 17.5V≤V_I≤30V
ΔV_O	Line Regulation (Note1)		11	300	mV	T_J=25°C, 17.5V≤V_I≤30V
			3	150		T_J=25°C, 20V≤V_I≤26V
ΔV_O	Load Regulation (Note1)		12	300	mV	T_J=25°C, 5.0mA≤I_O≤1.5A
			4	150		T_J=25°C, 250mA≤I_O≤750mA
I_Q	Quiescent Current		5.2	8	mA	T_J=25°C
ΔI_Q	Quiescent Current Change			0.5	mA	5mA≤I_O≤1.0A
				1.0		17.5V≤V_I≤30V
$\Delta V_O/\Delta T$	Output Voltage Drift		-1		mV/°C	I_O=5mA
V_N	Output Noise Voltage		90		μV	T_A=25°C, 10Hz≤f≤100kHz
RR	Ripple Rejection	54	70		dB	f=120Hz, 18.5V ≤ V_I ≤ 28.5V
V_D	Dropout Voltage		2		V	I_O=1A, T_J=25°C
R_O	Output Resistance		19		mΩ	f=1kHz
I_{SC}	Short Circuit Current		250		mA	V_I=35V, T_A=25°C
I_{PK}	Peak Current		2.2		A	T_J=25°C

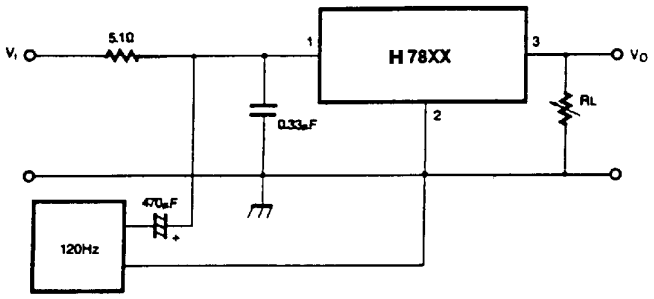
Typical Applications



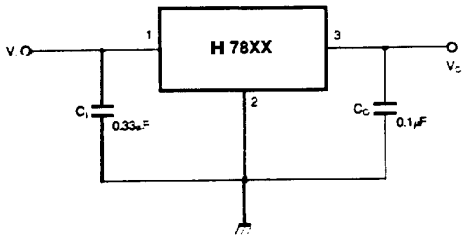
1、DC Parameters



2、Load Regulation



3、Ripple Rejection



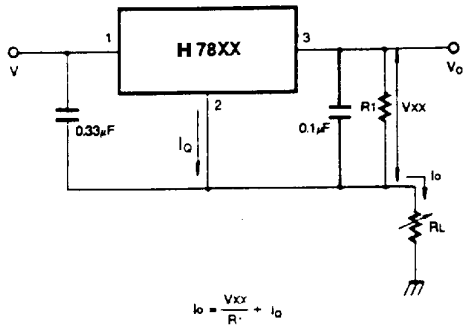
4、Fixed Output Regulator

Notes:

(1) To specify an output voltage. substitute voltage value for "XX." A common ground is required between the input and the Output voltage. The input voltage must remain typically 2.0V above the output voltage even during the low point on the input ripple voltage.

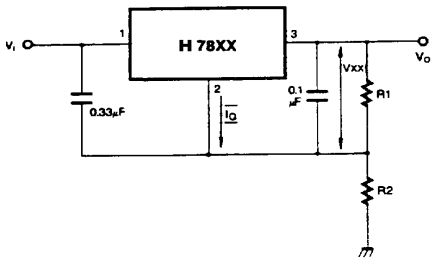
(2) C_I is required if regulator is located an appreciable distance from power Supply filter.

(3) C_O improves stability and transient response.



$I_o = \frac{V_{XX}}{R_1} + I_Q$

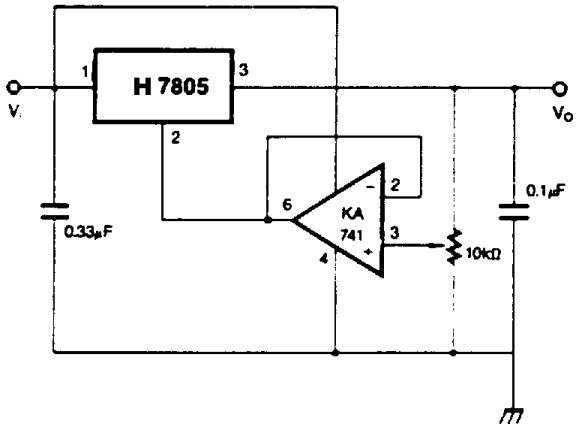
5、Constant Current Regulator



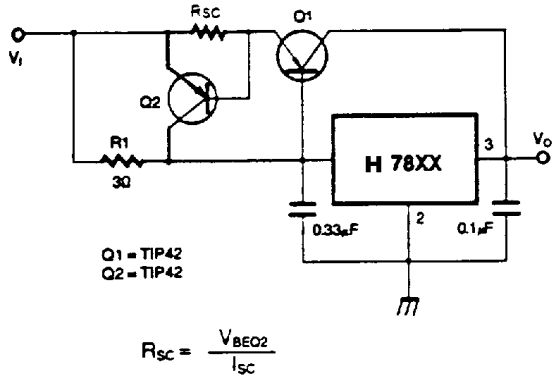
$I_{R1} \geq 5\ I_Q$

$V_O = V_{XX}\ (1 + R_2/R_1) + I_Q R_2$

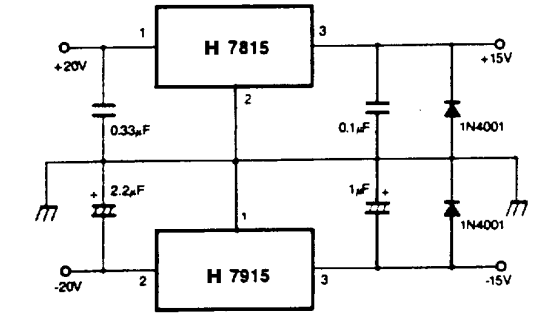
6、Circuit for Increasing Output Voltage



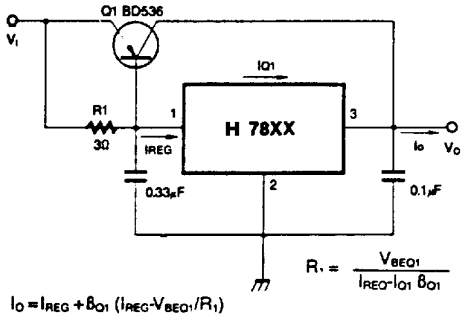
7、 Adjustable Output Regulator (7 to 30V)



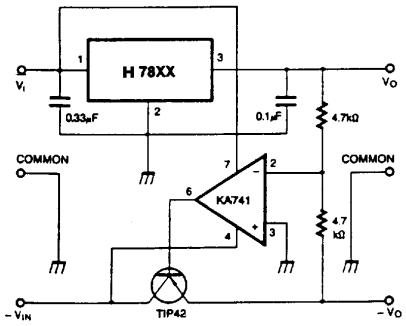
9、 High Output Current with Short Circuit Protection



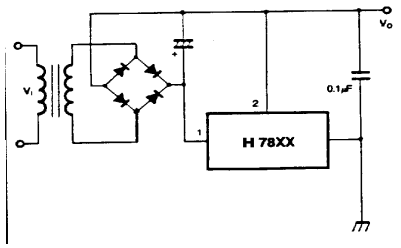
11、 Split Power Supply (±15V-1A)



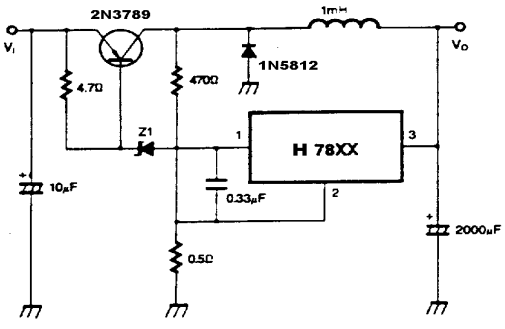
8、 High Current Voltage Regulator



10、Tracking Voltage Regulator



12、Negative Output Voltage Circuit



13、 Switching Regulator

Typical Perfomance Characteristics

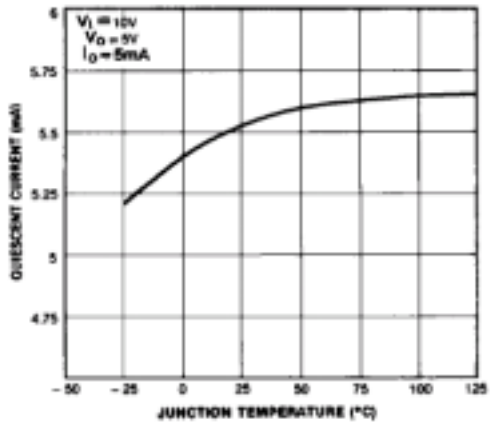


Figure 1. Quiescent Current

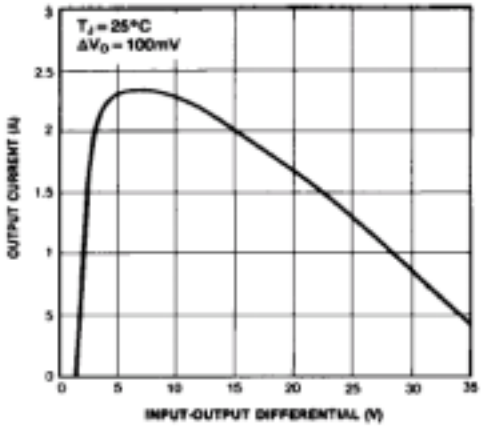


Figure 2. Peak Output Current

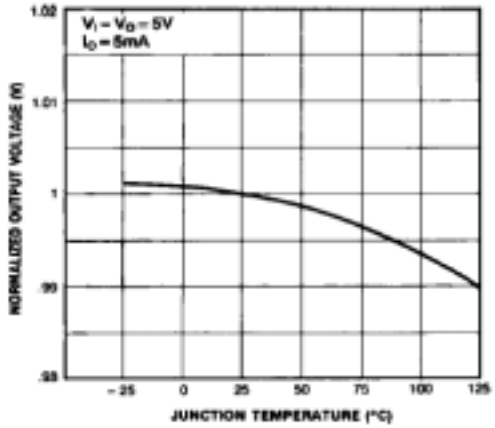


Figure 3. Output Voltage

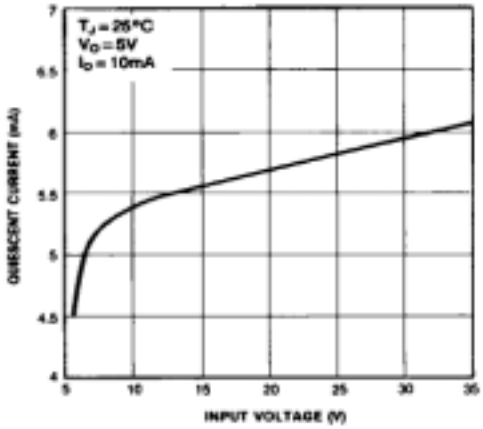


Figure 4. Quiescent Current