3-Terminal Positive Voltage Regulator

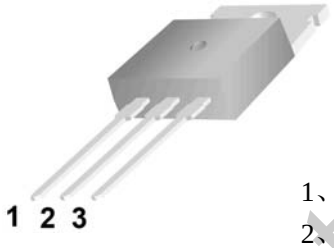
WGP7812

Features:

- ☐ Output Current up to 1.0A
- ☐ Short Circuit Protection
- ☐ Thermal overload protection
- ☐ Output Transistor Safe Operating Area Protection
- ☐ 100% Avalanche Tested

TO-220

RoHS COMPLIANT

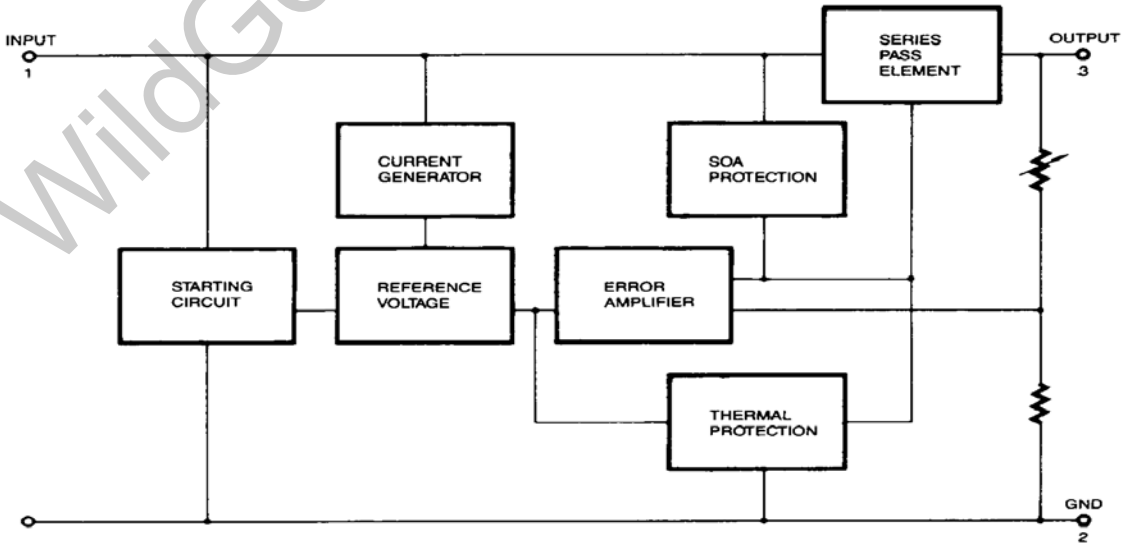


1、 Input
2、 Ground
3、 Output

Absolute Maximum Ratings* (TA=25℃ unless otherwise noted)

Parameter		Symbol	Value	Unit
Input voltage	V_0=12	V_i	35	V
Thermal resistance junction-air		$R_{\theta JA}$	62.5	℃/W
Thermal resistance junction-cases		$R_{\theta JC}$	3	℃/W
Operating Junction Temperature		T_{opr}	-20~+125	℃
Storage Temperature		T_{STG}	-65~+150	℃

Internal Block Digram



Electrical Characteristics

(Refer to test circuit , 0℃ < Tj < 125℃, I_O = 500mA, V_I = 10V, C_I= 0.33μF, C_O= 0.1μF, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_0	I_O=500mA, T_j=25℃	11.75	12.00	12.25	V
		I_O=5mA to 1A,P_0≤15W V_i=14.8V to 27V	11.50	12.00	12.50	
Line Regulation (Note1)	Regline	V_O = 14.8V to 30V,I_O=500mA	-	10.0	120	mV
		V_i = 16V to 22V	-	4.0	120	
		V_i=14.5V to 27V	-	10.0	120	
		V_i=16V to 22V		3.0	60	
Load Regulation (Note1)	Regload	I_O = 5mA to 1.5 A	-	12.0	100	mV
		I_O=5mA to 1.0 A	-	12.0	100	
		I_O =250mA to 750 mA		5.0	50	
Quiescent Current	I_Q	-	-	5.1	6.0	mA
Quiescent Current Change	ΔI_Q	V_i= 15V to 30V	-	-	0.8	mA
		V_i= 14V to 27V ,I_O = 500mA	-	-	0.8	
		I_O = 5mA to 1.0A		-	0.5	
Output Voltage Drift	$\Delta V_O/\Delta T$	I_O=5mA	-	-1.0	-	mV/℃
Output Noise Voltage	V_N	f = 10Hz to 100KHz	-	10	-	μV/V_O
Ripple Rejection	R_R	f = 120Hz, V_O = 14V to 24V, I_O=500mA	-	60	-	dB
Dropout Voltage	V_{Drop}	I_O = 1A	-	2	-	V
Output Resistance	R_O	f = 1KHz	-	18	-	mΩ
Short Circuit Current	ISC	V_i = 35V	-	250	-	mA
Peak Current	IPK	-	-	2.2	-	A

Note: 1. 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.

Typical Characteristics

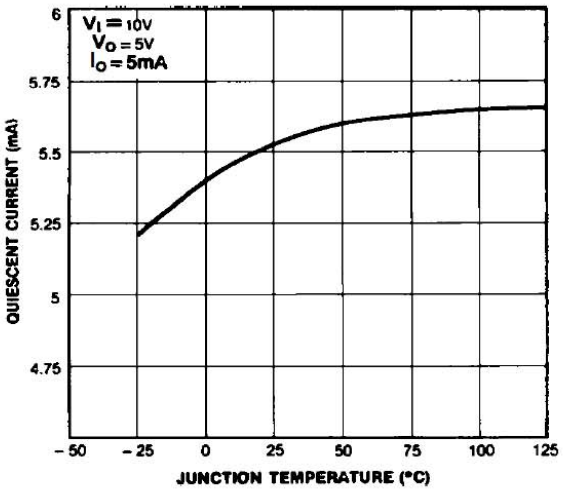


Figure 1. Quiescent Current

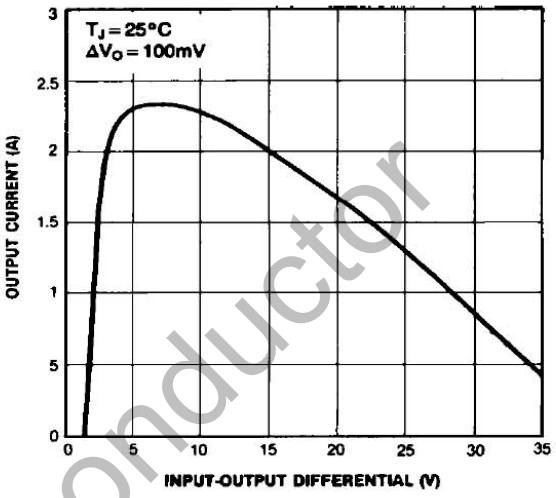


Figure 2. Peak Output Current

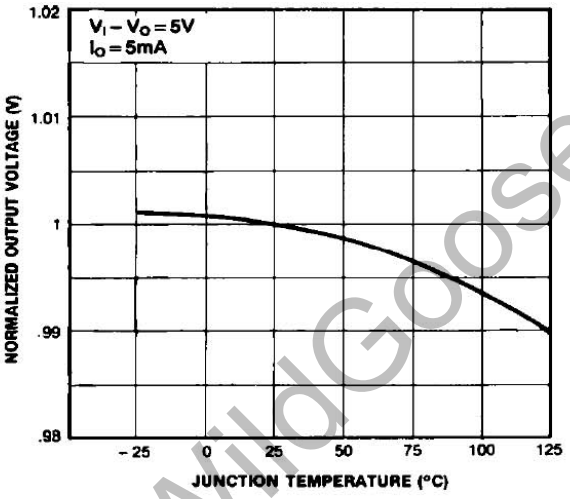


Figure 3. Output Voltage

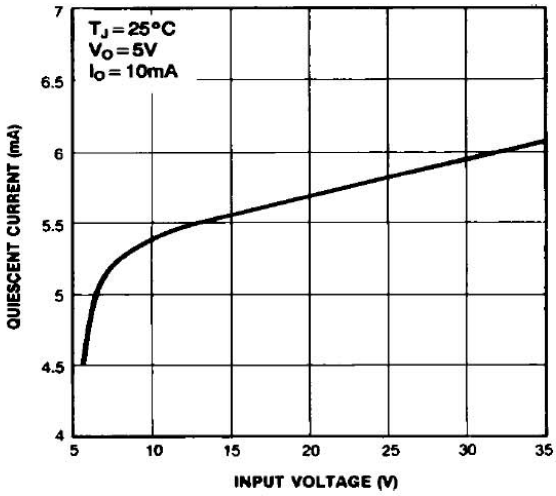


Figure 4. Quiescent Current

Typical Applications

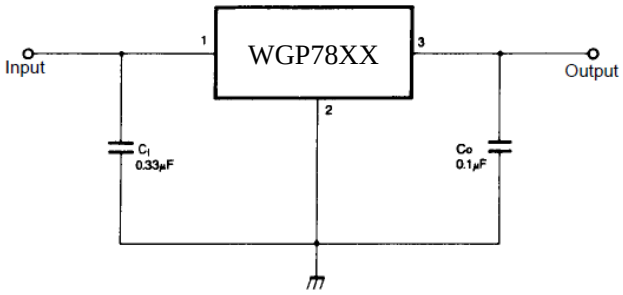


Figure 5. DC Parameters

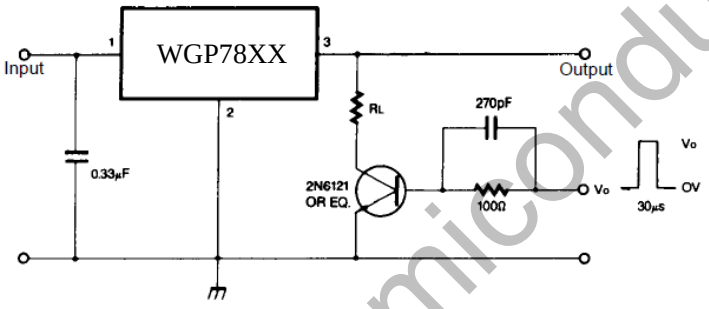


Figure 6. Load Regulation

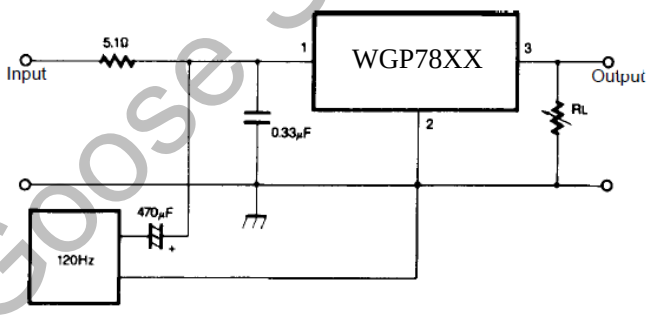


Figure 7. Ripple Rejection

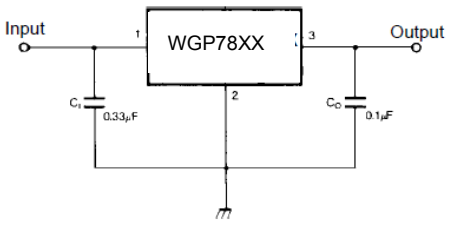
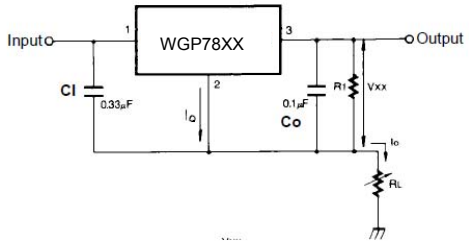


Figure 8. Fixed Output Regulator

Typical Applications (Continued)



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

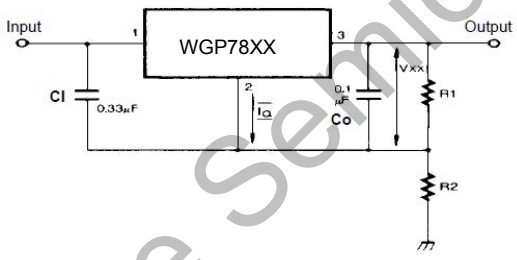
Figure 9. Constant Current Regulator

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.

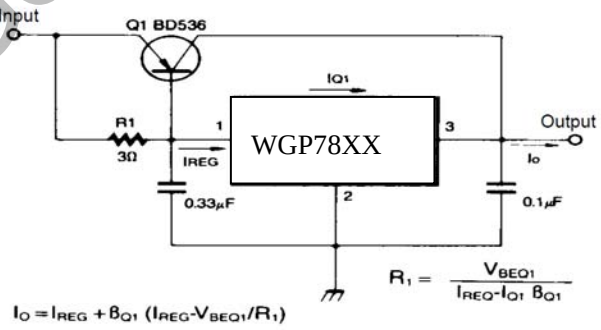
(3) C_O improves stability and transient response.



$$I_{R1} \geq 5I_Q$$

$$V_O = V_{XX}(1+R_2/R_1)+I_QR_2$$

Figure 10. Circuit for Increasing Output Voltage



$$R_1 = \frac{V_{BEQ1}}{I_{REG}-I_{Q1}\,\beta_{Q1}}$$

$$I_O = I_{REG} + \beta_{Q1}\,(I_{REG}-V_{BEQ1}/R_1)$$

Figure 11. High Current Voltage Regulator

Typical Applications (Continued)

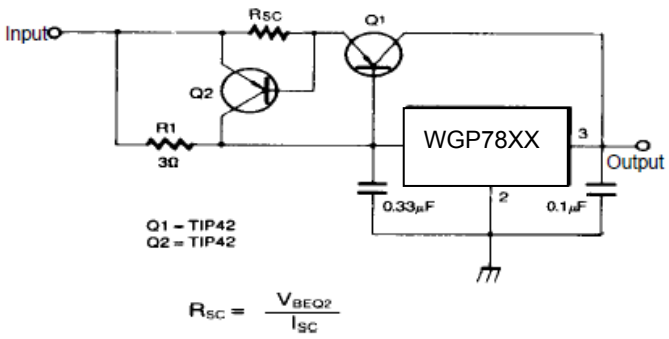


Figure 12. High Output Current with Short Circuit Protection

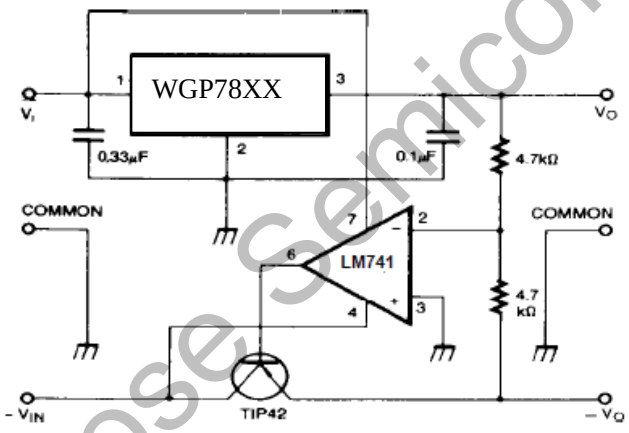


Figure 13. Tracking Voltage Regulator

Typical Applications (Continued)

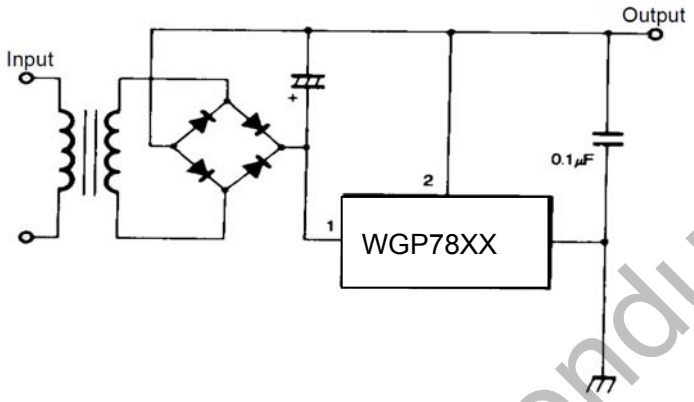


Figure 14. Negative Output Voltage Circuit

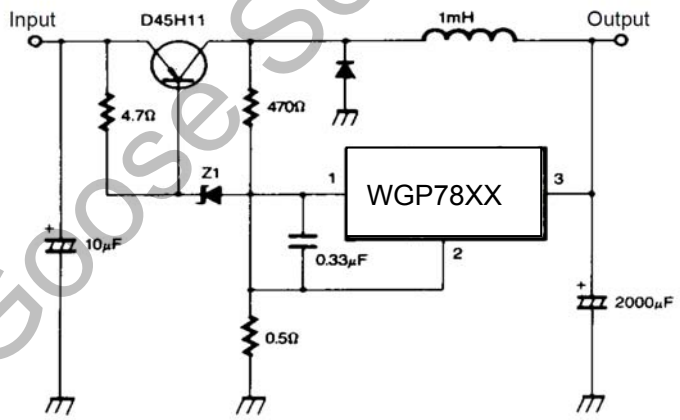


Figure 15. Switching Regulator

Package Dimension

TO-220

Unit: mm