


3-Terminal Positive Voltage Regulator

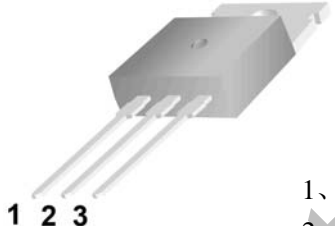


WGP7815


Features:

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

TO-220



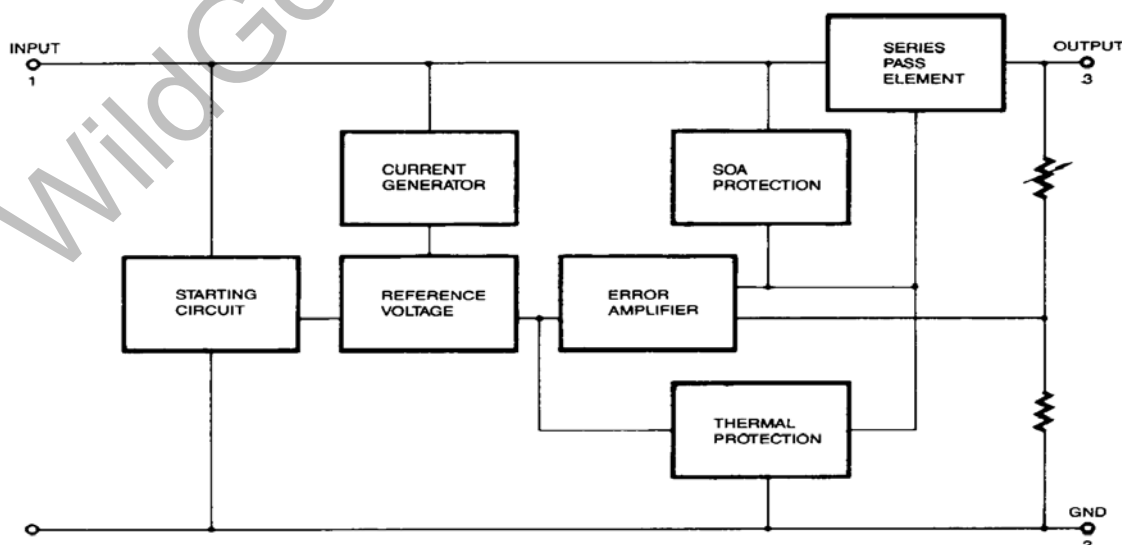
1, Input
2, Ground
3, Output



Absolute Maximum Ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Input voltage	V_i	35	V
Thermal resistance junction-air	$R_{\theta JA}$	62.5	°C/W
Thermal resistance junction-cases	$R_{\theta JC}$	3	°C/W
Operating Junction Temperature	T_{opr}	0~+125	°C
Storage Temperature	T_{STG}	-65~+150	°C

Internal Block Diagram



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Electrical Characteristics

(Refer to test circuit , $0^{\circ}\text{C} < T_j < 125^{\circ}\text{C}$, $I_o = 500\text{mA}$, $V_i = 23\text{V}$, $C_i = 0.33\mu\text{F}$, $C_o = 0.1\mu\text{F}$, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_o	$I_o = 500\text{mA}$, $T_j = 25^{\circ}\text{C}$	14.50	15.00	15.60	V
		$I_o = 5\text{mA}$ to 1A , $P_o \leq 15\text{W}$ $V_i = 17.5\text{V}$ to 30V	14.25	15.00	15.75	
Line Regulation (Note1)	Regline	$V_o = 17.5\text{V}$ to 30V , $I_o = 500\text{mA}$	-	11.0	300	mV
		$V_i = 20\text{V}$ to 26V	-	3.0	150	
Load Regulation (Note1)	Regload	$I_o = 5\text{mA}$ to 1.5A	-	12.0	300	mV
		$I_o = 250\text{mA}$ to 750mA	-	4.0	150	
Quiescent Current	I_Q	-	-	5.2	8.0	mA
Quiescent Current Change	ΔI_Q	$V_i = 17.5\text{V}$ to 30V	-	-	1.0	mA
		$I_o = 5\text{mA}$ to 1.0A	-	-	0.5	
Output Voltage Drift	$\Delta V_o / \Delta T$	$I_o = 5\text{mA}$	-	-1.0	-	mV/ $^{\circ}\text{C}$
Output Noise Voltage	V_N	$f = 10\text{Hz}$ to 100KHz	-	90	-	$\mu\text{V}/V_o$
Ripple Rejection	R_R	$f = 120\text{Hz}$, $V_i = 18.5\text{V}$ to 28.5V ,	54	70	-	dB
Dropout Voltage	V_{Drop}	$I_o = 1\text{A}$	-	2	-	V
Output Resistance	R_o	$f = 1\text{KHz}$	-	19	-	m Ω
Short Circuit Current	I_{SC}	$V_i = 35\text{V}$	-	250	-	mA
Peak Current	I_{PK}	-	-	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

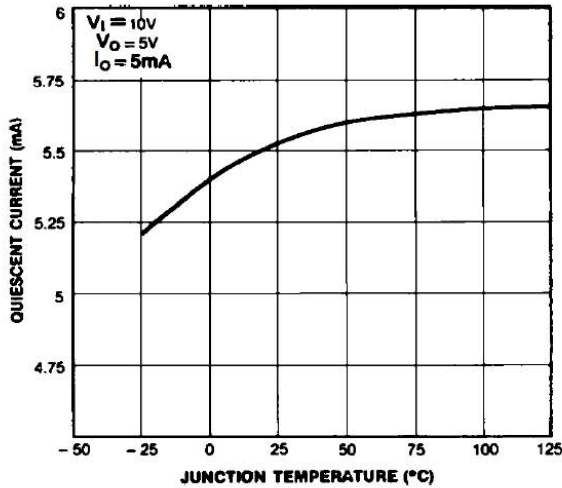


Figure 1. Quiescent Current

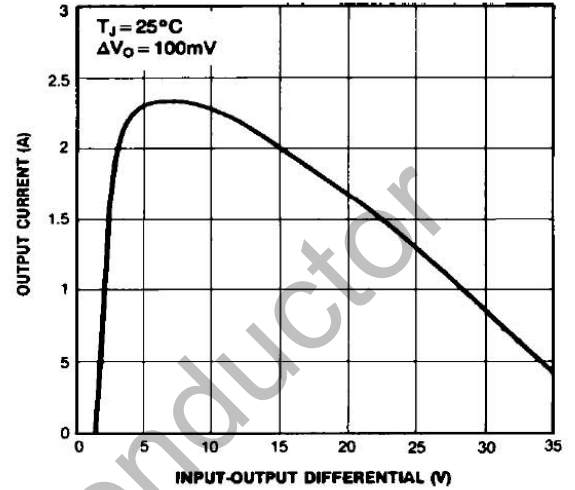


Figure 2. Peak Output Current

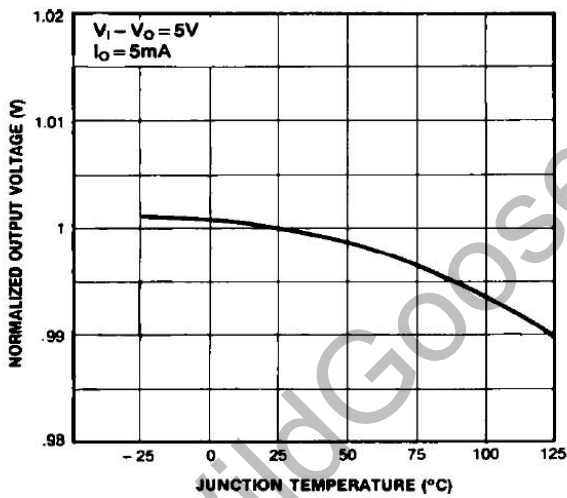


Figure 3. Output Voltage

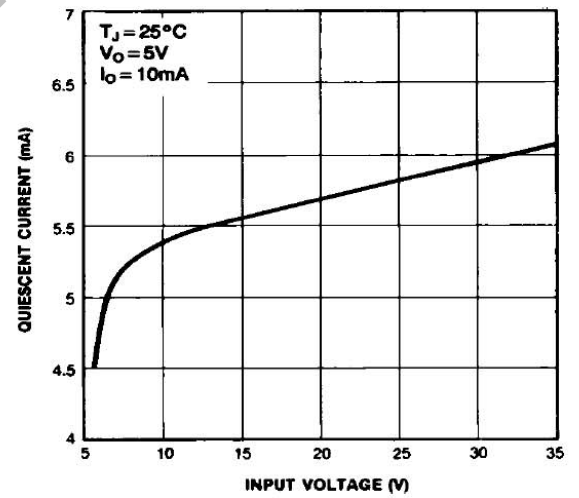


Figure 4. Quiescent Current

Typical Applications

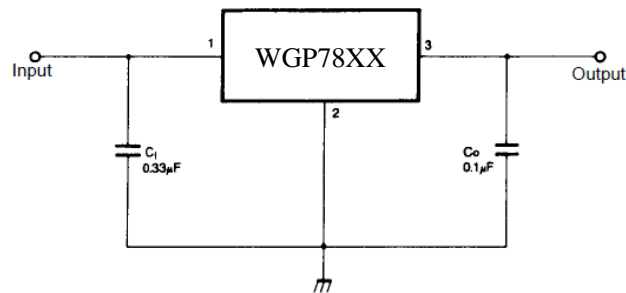


Figure 5. DC Parameters

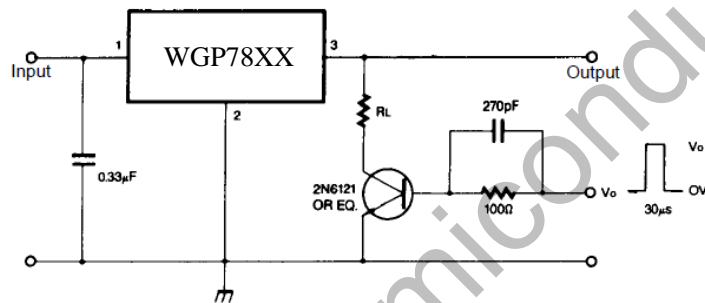


Figure 6. Load Regulation

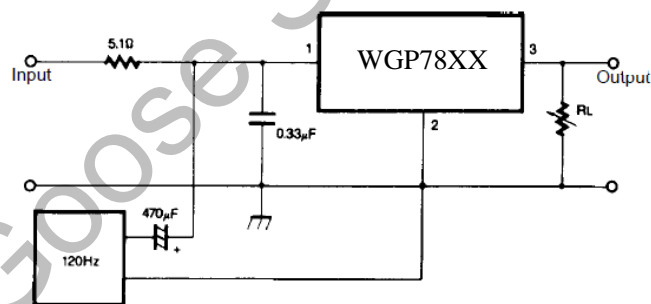


Figure 7. Ripple Rejection

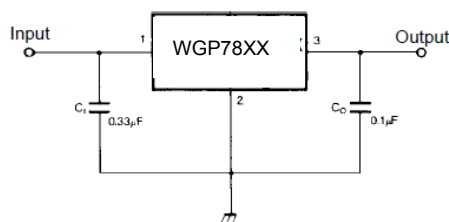
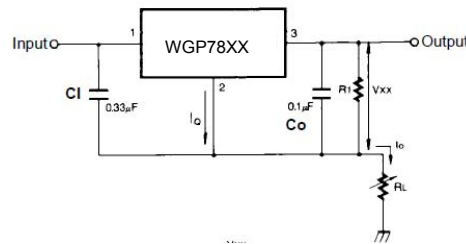


Figure 8. Fixed Output Regulator

Typical Applications (Continued)

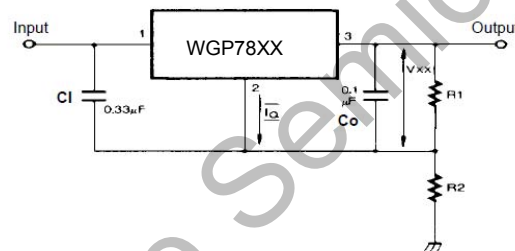


$$I_o = \frac{V_{XX}}{R_1} + I_q$$

Figure 9. Constant Current Regulator

Notes:

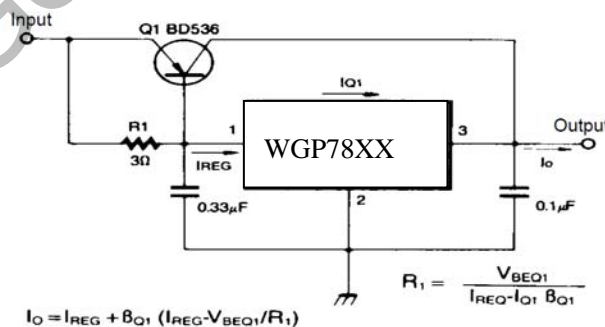
- (1) To specify an output voltage, substitute voltage value for "XX." A common ground is required between the input and the Output voltage. The input voltage must remain typically 2.0V above the output voltage even during the low point on the input ripple voltage.
- (2) C₁ is required if regulator is located an appreciable distance from power Supply filter.
- (3) C_o improves stability and transient response.



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

$$V_o = V_{XX}(1+R_2/R_1) + I_q R_2$$

Figure 10. Circuit for Increasing Output Voltage



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

$$R_1 = \frac{V_{BEQ1}}{I_{REG} - I_{O1} \beta_{Q1}}$$

Figure 11. High Current Voltage Regulator

Typical Applications (Continued)

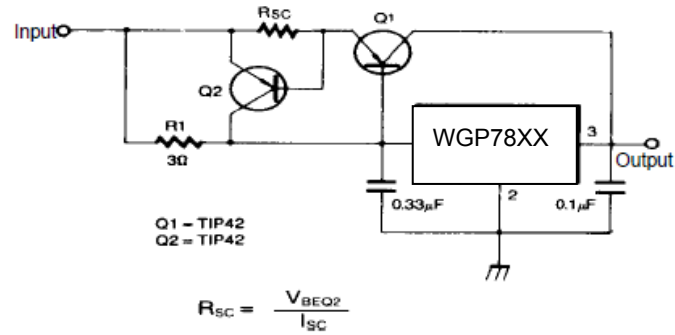


Figure 12. High Output Current with Short Circuit Protection

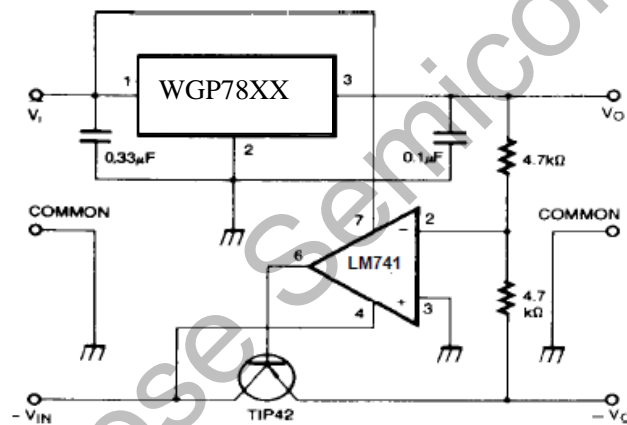


Figure 13. Tracking Voltage Regulator

Typical Applications (Continued)

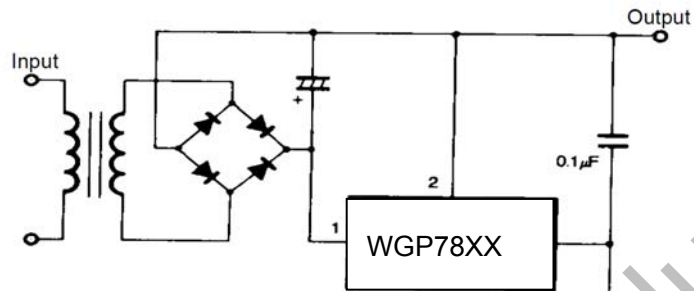


Figure 14. Negative Output Voltage Circuit

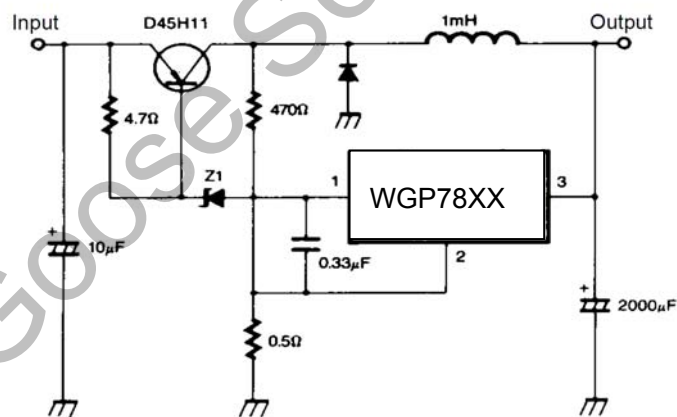


Figure 15. Switching Regulator

