

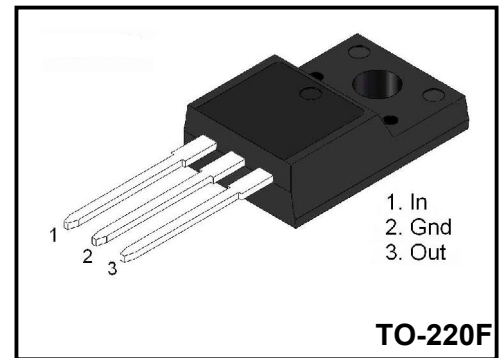
**3-Terminal 1.0A Positive Voltage Regulator**

**Description**

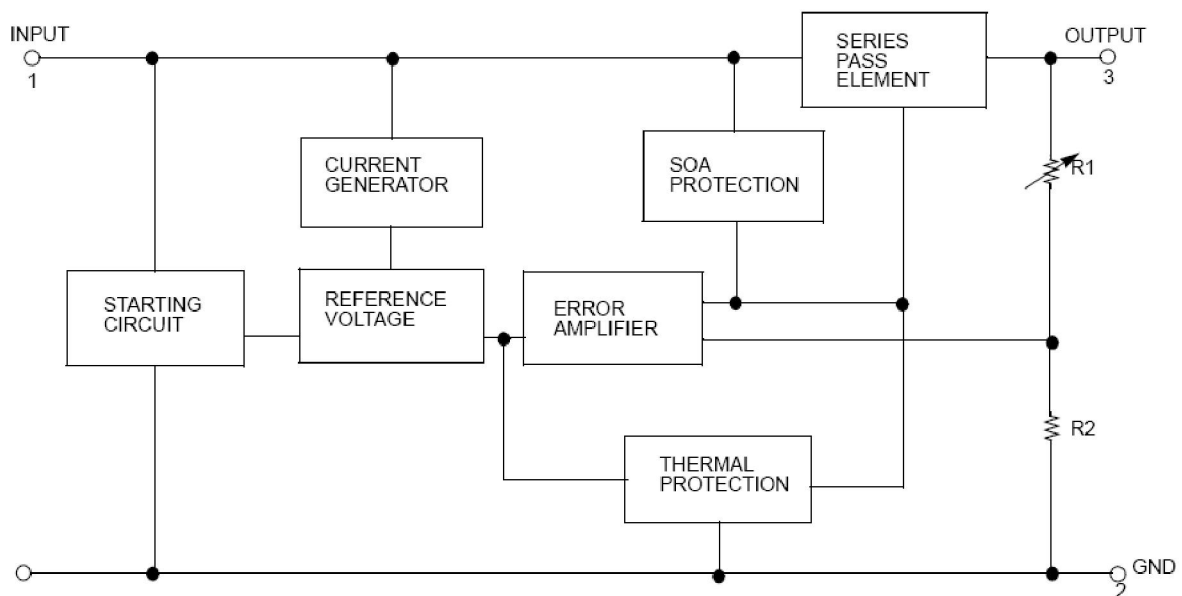
The 78M24 3-terminal positive regulators are available in the TO-220F package with several fixed output voltages making it useful in a wide range of applications.

**Features**

- ◆ Output Current up to 1.0A
- ◆ Output Voltages of 24V
- ◆ Thermal Overload Protection Short Circuit Protection
- ◆ Output Transistor Safe Operating area (SOA)Protection



**Internal Block Diagram**



**Absolute Maximum Rating**

Parameter	Symbol	Value	Unit
Input Voltage	$V_{IN}$	40	V
Thermal Resistance Junction-Case	$R_{\theta JC}$	5	°C/W
Thermal Resistance Junction-Air ( $T_a = +25^{\circ}C$ )	$R_{\theta JA}$	65	°C/W
Operating Junction Temperature Range	$T_{OPR}$	-20~+150	°C
Storage Temperature Range	$T_{STG}$	-55~+150	°C

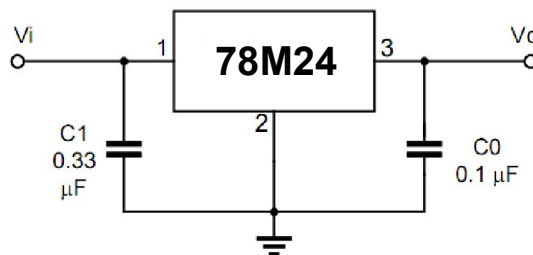
**Electrical Characteristics**

(Refer to the test circuits,  $0 < T_j < +125^{\circ}\text{C}$ ,  $I_o = 0.5\text{A}$ ,  $V_i = 33\text{V}$ , unless otherwise specified,  $C_1 = 0.33\mu\text{F}$ ,  $C_o = 0.1\mu\text{F}$ )

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output Voltage	$V_o$	$T_j = 25^{\circ}\text{C}$ , $I_o = 5\text{mA} \sim 1.0\text{A}$	23.04	24.0	24.96	V
		$V_i = 27\text{V} \sim 38\text{V}$ , $I_o = 5\text{mA} \sim 1.0\text{A}$ , $P_D \leq 15\text{W}$	22.80	24.0	25.20	V
Line Regulation(Note)	$\Delta V_o$	$V_i = 27\text{V} \sim 38\text{V}$ , $T_j = 25^{\circ}\text{C}$			240	mV
		$V_i = 27\text{V} \sim 38\text{V}$ , $I_o = 1\text{A}$ , $T_j = 25^{\circ}\text{C}$			240	
Load Regulation(Note)	$\Delta V_o$	$T_j = 25^{\circ}\text{C}$	$I_o = 5\text{mA} \sim 1.0\text{A}$		240	mV
			$I_o = 0.25\text{A} \sim 0.75\text{A}$		120	
Quiescent Current	$I_Q$	$T_j = 25^{\circ}\text{C}$			8.0	mA
Quiescent Current Change	$\Delta I_Q$	$V_i = 28\text{V} \sim 38\text{V}$			1.0	mA
		$I_o = 5\text{mA} \sim 1.0\text{A}$			0.5	
Output Noise Voltage	$V_N$	$f_i = 10\text{Hz} \sim 100\text{KHz}$		170		$\mu\text{V}$
Output Voltage Drift	$\Delta V / \Delta T$	$I_o = 5\text{mA}$		-2.8		$\text{mV}/^{\circ}\text{C}$
Ripple Rejection	RR	$V_i = 28\text{V} \sim 38\text{V}$ , $f = 120\text{Hz}$ , $T_j = 25^{\circ}\text{C}$		66		dB
Short Circuit Current	$I_{SC}$	$V_i = 35\text{V}$ , $T_j = 25^{\circ}\text{C}$		250		mA
Peak Current	$I_{PK}$	$T_j = 25^{\circ}\text{C}$		1.6		A
Dropout Voltage	$V_D$	$T_j = 25^{\circ}\text{C}$		2.0		V

**Notes:** Load and line regulation are specified at constant junction temperature. Change in  $V_o$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**Applications Circuit**



Note : Bypass capacitors are recommended for optimum stability and transient response and should be located as close as possible to the regulators

Package Dimensions

TO-220F

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.50	4.90	0.177	0.193
A1	2.34	2.74	0.092	0.108
A2	2.66	2.86	0.105	0.113
b	0.75	0.85	0.030	0.033
b1	1.24	1.44	0.049	0.057
c	0.40	0.60	0.016	0.024
D	10.00	10.32	0.394	0.406
E	15.75	16.05	0.620	0.632
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
F	3.10	3.5	0.122	0.138
L	12.90	13.50	0.508	0.531
L1	2.90	3.30	0.114	0.130
Φ	3.10	3.30	0.122	0.130