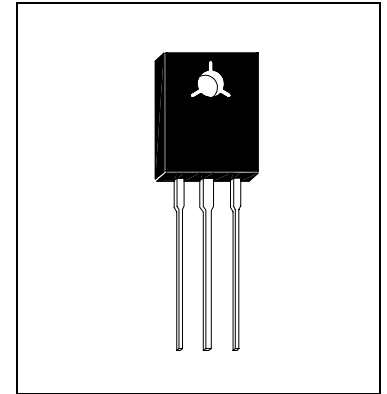




# H78M09AT

# H78M09BT

3-TERMINAL POSITIVE VOLTAGE REGULATOR



## Description

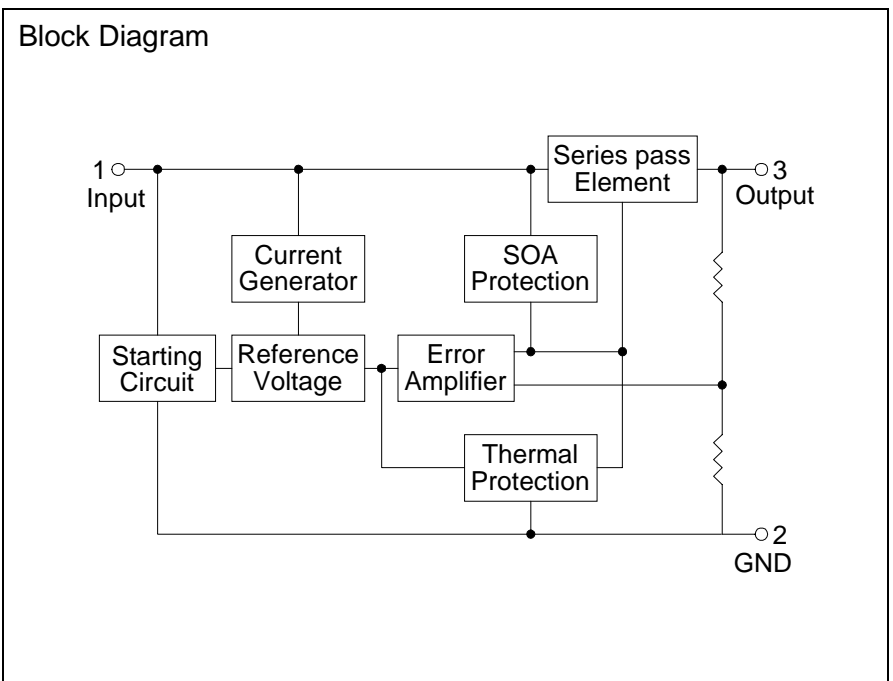
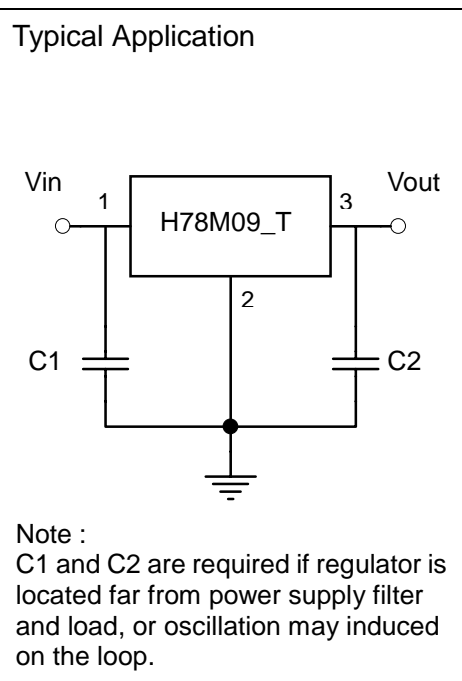
The H78M09\_T series of three-terminal positive regulators are available in the TO-126 package. This regulator can provide local on-card regulation, eliminating the distribution problems associated with single point regulation. Each device employs internal current limiting, thermal shut-down and safe operating area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 0.5A output current. Although designed primarily as fixed voltage regulators, this device can be used with external components to obtain adjustable voltages and currents.

## Description

- Output current up to 500mA is available.
- Eliminates external compensating circuit.
- Built-in current limiter prevents elements from destruction when load is short circuit.
- Built-in chip junction temperature limiting circuit protects elements against thermal destruction.
- Built-in internal power dissipation limiting circuit protects transistors at output driver.

## Absolute Maximum Ratings (Ta=25°C)

- Input Voltage ..... 35 V
- Total Power Dissipation (Tc=25°C) ..... Internally limited
- Operating Junction Temperature ..... 0 °C to 125 °C
- Output Current (Tc=25°C) ..... 0.5 A
- Lead Temperature (Soldering 10S) ..... 230 °C





### Electrical Characteristics

• H78M09AT

$V_{in}=15V$ ,  $I_o=350mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ ,  $PD \leq 5W$ , unless otherwise specified

Symbol	Characteristic	Min	Typ	Max	Units
$V_o$	Output Voltage ( $T_j=25^{\circ}C$ )	8.73	9	9.27	V
$V_o$	Output Voltage ( $11.5V \leq V_{in} \leq 24V$ , $5mA \leq I_o \leq 350mA$ )	8.64	9	9.36	V
Regline	Line Regulation ( $T_j=25^{\circ}C$ , $I_o=200mA$ ), $11.5V \leq V_{in} \leq 25V$	-	5	100	mV
	Line Regulation ( $T_j=25^{\circ}C$ , $I_o=200mA$ ), $12V \leq V_{in} \leq 25V$	-	5	50	
Regload	Load Regulation ( $T_j=25^{\circ}C$ ), $5mA \leq I_o \leq 500mA$	-	-	150	mV
	Load Regulation ( $T_j=25^{\circ}C$ ), $5mA \leq I_o \leq 200mA$	-	-	75	
$I_B$	Quiescent Current ( $T_j=25^{\circ}C$ )	-	3.2	6	mA
$\Delta I_B$	Quiescent Current Change ( $T_j=25^{\circ}C$ ), $11.5V \leq V_{in} \leq 25V$ , $I_o=200mA$	-	-	0.8	mA
	Quiescent Current Change ( $T_j=25^{\circ}C$ ), $5mA \leq I_o \leq 350mA$	-	-	0.5	
RR	Ripple Rejection, $13V \leq V_{in} \leq 23V$ , $I_o=300mA$ , $f=120Hz$	56	-	-	dB
$V_i-V_o$	Dropout Voltage ( $I_o=500mA$ , $T_j=25^{\circ}C$ )	-	2	-	V
VN	Output Noise Voltage ( $T_j=25^{\circ}C$ ), $10Hz \leq f \leq 100KHz$	-	60	100	$\mu V$
Isc	Short Circuit Current Limit ( $T_j=25^{\circ}C$ ), $V_{in}=35V$	-	300	-	mA
I <sub>max</sub>	Peak Output Current ( $T_j=25^{\circ}C$ )	-	700	-	mA
TC <sub>V<sub>o</sub></sub>	Average Temperature Coefficient of Output Voltage, $I_o=5mA$	-	-0.5	-	mV/ $^{\circ}C$

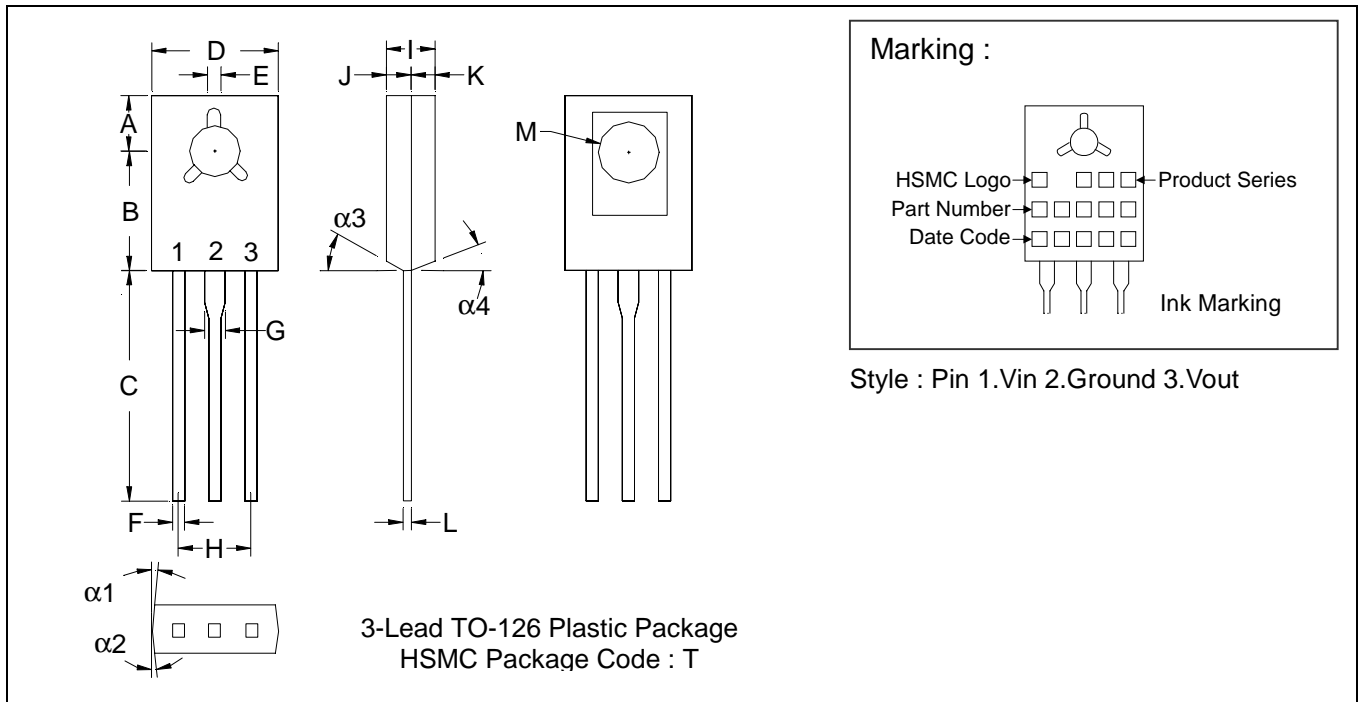
• H78M09BT

$V_{in}=15V$ ,  $I_o=350mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ ,  $PD \leq 5W$ , unless otherwise specified

Symbol	Characteristic	Min	Typ	Max	Units
$V_o$	Output Voltage ( $T_j=25^{\circ}C$ )	8.55	9	9.45	V
$V_o$	Output Voltage ( $11.5V \leq V_{in} \leq 24V$ , $5mA \leq I_o \leq 350mA$ )	8.55	9	9.45	V
Regline	Line Regulation ( $T_j=25^{\circ}C$ , $I_o=200mA$ ), $11.5V \leq V_{in} \leq 25V$	-	5	120	mV
	Line Regulation ( $T_j=25^{\circ}C$ , $I_o=200mA$ ), $12V \leq V_{in} \leq 25V$	-	5	60	
Regload	Load Regulation ( $T_j=25^{\circ}C$ ), $5mA \leq I_o \leq 500mA$	-	-	170	mV
	Load Regulation ( $T_j=25^{\circ}C$ ), $5mA \leq I_o \leq 200mA$	-	-	85	
$I_B$	Quiescent Current ( $T_j=25^{\circ}C$ )	-	3.2	6	mA
$\Delta I_B$	Quiescent Current Change ( $T_j=25^{\circ}C$ ), $11.5V \leq V_{in} \leq 25V$ , $I_o=200mA$	-	-	1	mA
	Quiescent Current Change ( $T_j=25^{\circ}C$ ), $5mA \leq I_o \leq 350mA$	-	-	0.6	
RR	Ripple Rejection, $13V \leq V_{in} \leq 23V$ , $I_o=300mA$ , $f=120Hz$	56	-	-	dB
$V_i-V_o$	Dropout Voltage ( $I_o=500mA$ , $T_j=25^{\circ}C$ )	-	2	-	V
VN	Output Noise Voltage ( $T_j=25^{\circ}C$ ), $10Hz \leq f \leq 100KHz$	-	60	120	$\mu V$
Isc	Short Circuit Current Limit ( $T_j=25^{\circ}C$ ), $V_{in}=35V$	-	300	-	mA
I <sub>max</sub>	Peak Output Current ( $T_j=25^{\circ}C$ )	-	700	-	mA
TC <sub>V<sub>o</sub></sub>	Average Temperature Coefficient of Output Voltage, $I_o=5mA$	-	-0.5	-	mV/ $^{\circ}C$



### TO-126 Dimension



\*:Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
$\alpha 1$	-	*3°	-	*3°	F	0.0280	0.0319	0.71	0.81
$\alpha 2$	-	*3°	-	*3°	G	0.0480	0.0520	1.22	1.32
$\alpha 3$	-	*3°	-	*3°	H	0.1709	0.1890	4.34	4.80
$\alpha 4$	-	*3°	-	*3°	I	0.0950	0.1050	2.41	2.66
A	0.1500	0.1539	3.81	3.91	J	0.0450	0.0550	1.14	1.39
B	0.2752	0.2791	6.99	7.09	K	0.0450	0.0550	1.14	1.39
C	0.5315	0.6102	13.50	15.50	L	-	*0.0217	-	*0.55
D	0.2854	0.3039	7.52	7.72	M	0.1378	0.1520	3.50	3.86
E	0.0374	0.0413	0.95	1.05					

Notes : 1.Dimension and tolerance based on our Spec. dated Mar. 6,1995.  
 2.Controlling dimension : millimeters.  
 3.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.  
 4.If there is any question with packing specification or packing method, please contact your local HSMC sales office.

**Material :**

- Lead : 42 Alloy ; solder plating
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0

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