



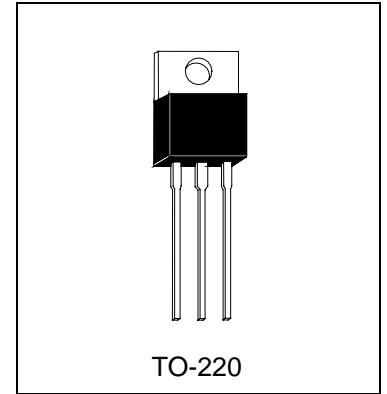
# H7809AE

# H7809BE

3-TERMINAL POSITIVE VOLTAGE REGULATOR

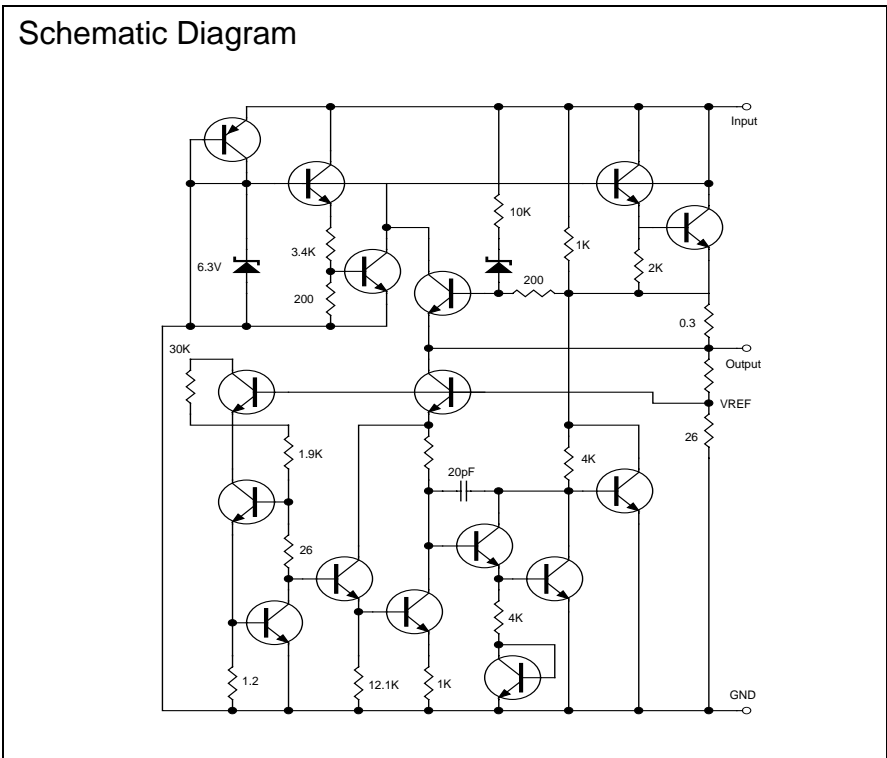
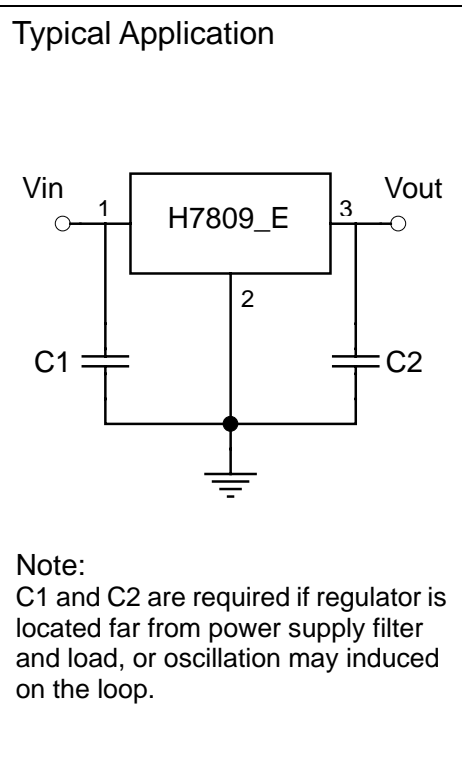
## Description

The H7809\_E series of three-terminal positive regulators are available in the TO-220AB package. These regulators can provide local on-card regulation, eliminating the distribution problems associated with single point regulation. Each 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 regulators, these devices can be used with external components to obtain adjustable voltages and currents. H7809\_E is characterized for operation from 0°C to +125°C, and if operating temperature is always high, please refer to the power dissipation curve.



## Absolute Maximum Ratings (Ta=25°C)

- Input Voltage..... 35 V
- Total Power Dissipation..... Internally limited
- Operating Temperature Range ..... 0 °C to +125 °C
- Maximum Junction Temperature..... 125 °C
- Storage Temperature Range..... -55 °C to +150 °C
- Lead Temperature (Soldering 10S)..... 230 °C





### Electrical Characteristics

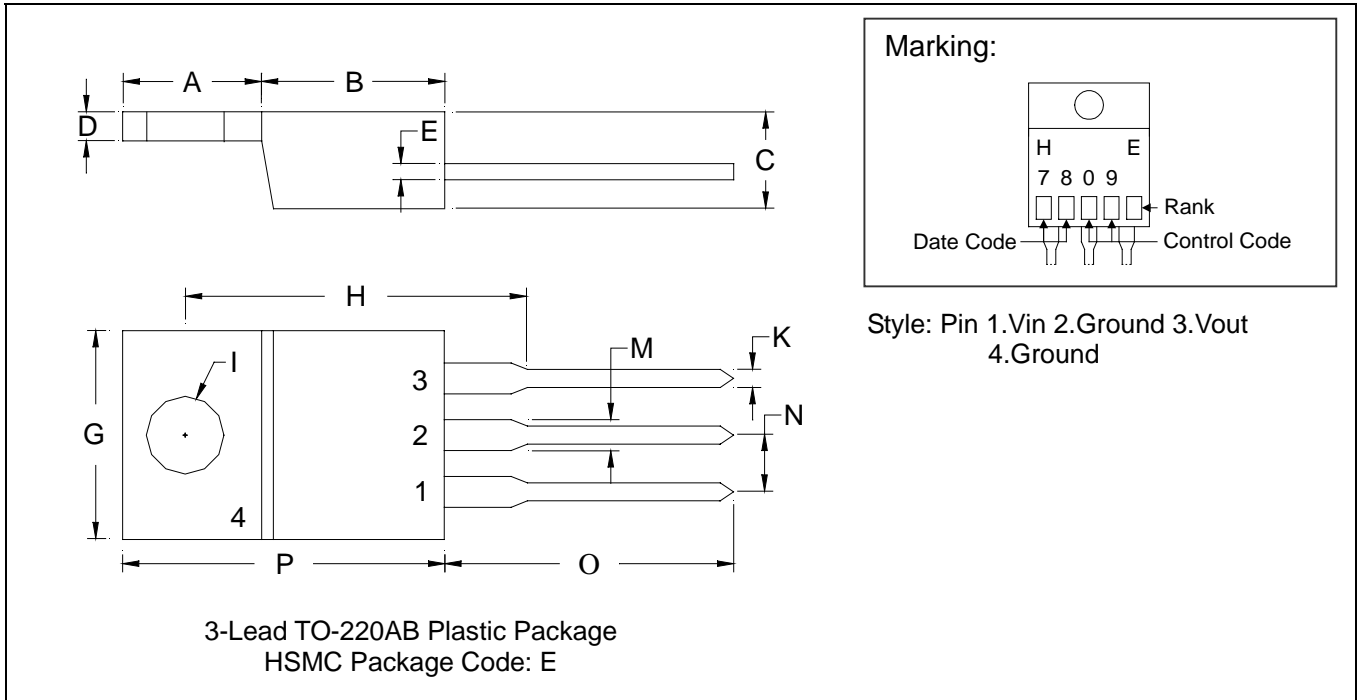
$V_{in}=15V$ ,  $I_o=500mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$  (unless otherwise noted)

| Symbol                  | Parameter                | Conditions                                        | H7809AE |      |      | Units          |
|-------------------------|--------------------------|---------------------------------------------------|---------|------|------|----------------|
|                         |                          |                                                   | Min     | Typ  | Max  |                |
| Vo                      | Output Voltage           | $T_j=25^{\circ}C$                                 | 8.73    | 9    | 9.27 | V              |
|                         |                          | $PD \leq 15W, 5mA \leq I_o \leq 1A$               | 8.73    | 9    | 9.27 |                |
| $\Delta V_o$            | Line Regulation          | $T_j=25^{\circ}C, 11.5V \leq V_{in} \leq 25V$     | -       | 6    | 90   | mV             |
|                         |                          | $T_j=25^{\circ}C, 12V \leq V_{in} \leq 25V$       | -       | 2    | 45   |                |
| $\Delta V_o$            | Load Regulation          | $5mA \leq I_o \leq 1.5A$                          | -       | -    | 100  | mV             |
|                         |                          | $250mA \leq I_o \leq 750mA$                       | -       | -    | 50   |                |
| IQ                      | Quiescent Current        | $I_o \leq 1A, T_j=25^{\circ}C$                    | -       | 5.5  | 8    | mA             |
| $\Delta IQ$             | Quiescent Current Change | $5mA \leq I_o \leq 1A$                            | -       | -    | 0.5  | mA             |
|                         |                          | $11.5V \leq V_{in} \leq 26V$                      | -       | -    | 1.3  |                |
| Vn                      | Output Noise Voltage     | $T_a=25^{\circ}C, 10Hz \leq f \leq 100KHz$        | -       | -    | 200  | $\mu V$        |
| RR                      | Ripple Rejection         | $13V \leq V_{in} \leq 23V, f=120Hz$               | -       | 68   | -    | dB             |
| VD                      | Dropout Voltage          | $T_j=25^{\circ}C, I_o=1A$                         | -       | 2    | -    | V              |
| Isc                     | Short Circuit Current    | $T_j=25^{\circ}C$                                 | -       | 1.5  | -    | A              |
| Ipk                     | Peak Output Current      | $T_j=25^{\circ}C$                                 | 1.7     | -    | -    | A              |
| $\Delta V_o / \Delta T$ | Average Tc of Vout       | $0^{\circ}C \leq T_j \leq +125^{\circ}C, I_o=5mA$ | -       | -0.8 | -    | $mV/^{\circ}C$ |

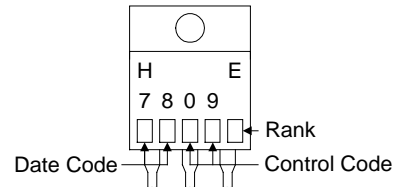
| Symbol                  | Parameter                | Conditions                                        | H7809BE |      |      | Units          |
|-------------------------|--------------------------|---------------------------------------------------|---------|------|------|----------------|
|                         |                          |                                                   | Min     | Typ  | Max  |                |
| Vo                      | Output Voltage           | $T_j=25^{\circ}C$                                 | 8.64    | 9    | 9.36 | V              |
|                         |                          | $PD \leq 15W, 5mA \leq I_o \leq 1A$               | 8.55    | 9    | 9.45 |                |
| $\Delta V_o$            | Line Regulation          | $T_j=25^{\circ}C, 11.5V \leq V_{in} \leq 25V$     | -       | 4    | 100  | mV             |
|                         |                          | $T_j=25^{\circ}C, 12V \leq V_{in} \leq 25V$       | -       | 2    | 50   |                |
| $\Delta V_o$            | Load Regulation          | $5mA \leq I_o \leq 1.5A$                          | -       | -    | 180  | mV             |
|                         |                          | $250mA \leq I_o \leq 750mA$                       | -       | -    | 90   |                |
| IQ                      | Quiescent Current        | $I_o \leq 1A, T_j=25^{\circ}C$                    | -       | 5.5  | 8    | mA             |
| $\Delta IQ$             | Quiescent Current Change | $5mA \leq I_o \leq 1A$                            | -       | -    | 0.5  | mA             |
|                         |                          | $11.5V \leq V_{in} \leq 26V$                      | -       | -    | 1.3  |                |
| Vn                      | Output Noise Voltage     | $T_a=25^{\circ}C, 10Hz \leq f \leq 100KHz$        | -       | -    | 300  | $\mu V$        |
| RR                      | Ripple Rejection         | $13V \leq V_{in} \leq 23V, f=120Hz$               | 62      | 73   | -    | dB             |
| VD                      | Dropout Voltage          | $T_j=25^{\circ}C, I_o=1A$                         | -       | 2.5  | -    | V              |
| Isc                     | Short Circuit Current    | $T_j=25^{\circ}C$                                 | -       | 1.5  | -    | A              |
| Ipk                     | Peak Output Current      | $T_j=25^{\circ}C$                                 | 1.7     | -    | -    | A              |
| $\Delta V_o / \Delta T$ | Average Tc of Vout       | $0^{\circ}C \leq T_j \leq +125^{\circ}C, I_o=5mA$ | -       | -0.8 | -    | $mV/^{\circ}C$ |



### TO-220AB Dimension



Marking:



Style: Pin 1.Vin 2.Ground 3.Vout  
4.Ground

\*: Typical

| DIM | Inches |         | Millimeters |        | DIM | Inches |         | Millimeters |       |
|-----|--------|---------|-------------|--------|-----|--------|---------|-------------|-------|
|     | Min.   | Max.    | Min.        | Max.   |     | Min.   | Max.    | Min.        | Max.  |
| A   | 0.2197 | 0.2949  | 5.58        | 7.49   | I   | -      | *0.1508 | -           | *3.83 |
| B   | 0.3299 | 0.3504  | 8.38        | 8.90   | K   | 0.0295 | 0.0374  | 0.75        | 0.95  |
| C   | 0.1732 | 0.185   | 4.40        | 4.70   | M   | 0.0449 | 0.0551  | 1.14        | 1.40  |
| D   | 0.0453 | 0.0547  | 1.15        | 1.39   | N   | -      | *0.1000 | -           | *2.54 |
| E   | 0.0138 | 0.0236  | 0.35        | 0.60   | O   | 0.5000 | 0.5618  | 12.70       | 14.27 |
| G   | 0.3803 | 0.4047  | 9.66        | 10.28  | P   | 0.5701 | 0.6248  | 14.48       | 15.87 |
| H   | -      | *0.6398 | -           | *16.25 |     |        |         |             |       |

- Notes: 1.Dimension and tolerance based on our Spec. dated Sep. 07,1997.  
 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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