

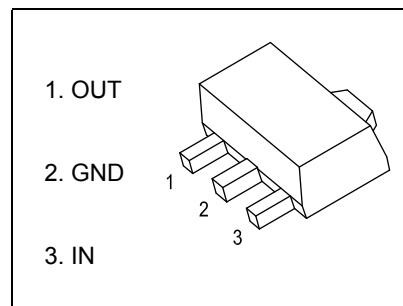
## SOT-89 Plastic-Encapsulate Voltage Regulators

### 78L08 Three-terminal positive voltage regulator

### SOT-89-3L

#### FEATURES

- Maximum output current  
 $I_{OM}$ : 0.1A
- Output voltage  
 $V_O$ : 8V
- Continuous total dissipation  
 $P_D$ : 0.6 W ( $T_a = 25^\circ\text{C}$ )



#### ABSOLUTE MAXIMUM RATINGS (Operating temperature range applies unless otherwise specified)

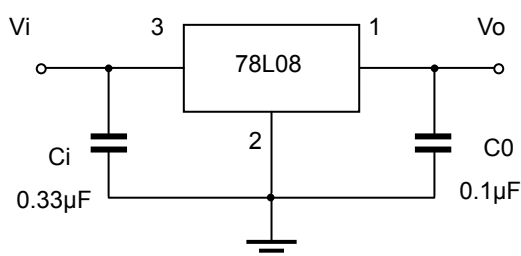
| Parameter                                   | Symbol          | Value    | Unit               |
|---------------------------------------------|-----------------|----------|--------------------|
| Input Voltage                               | $V_i$           | 30       | V                  |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 166.7    | $^\circ\text{C/W}$ |
| Operating Junction Temperature Range        | $T_{OPR}$       | -40~+125 | $^\circ\text{C}$   |
| Storage Temperature Range                   | $T_{STG}$       | -65~+150 | $^\circ\text{C}$   |

ELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE ( $V_i=14\text{V}$ ,  $I_o=40\text{mA}$ ,  $C_i=0.33\mu\text{F}$ ,  $C_o=0.1\mu\text{F}$ , unless otherwise specified)

| Parameter                | Symbol       | Test conditions                                                        | Min                   | Typ | Max | Unit              |
|--------------------------|--------------|------------------------------------------------------------------------|-----------------------|-----|-----|-------------------|
| Output voltage           | $V_o$        | $25^\circ\text{C}$                                                     | 7.7                   | 8.0 | 8.3 | V                 |
|                          |              | $10.5\text{V} \leq V_i \leq 23\text{V}$ , $I_o=1\text{mA}-40\text{mA}$ | 7.6                   | 8.0 | 8.4 | V                 |
|                          |              | $I_o=1\text{mA}-70\text{mA}$                                           | 7.6                   | 8.0 | 8.4 | V                 |
| Load Regulation          | $\Delta V_o$ | $I_o=1\text{mA}-100\text{mA}$                                          | $25^\circ\text{C}$    | 18  | 80  | mV                |
|                          |              | $I_o=1\text{mA}-40\text{mA}$                                           | $25^\circ\text{C}$    | 10  | 40  | mV                |
| Line regulation          | $\Delta V_o$ | $10.5\text{V} \leq V_i \leq 23\text{V}$                                | $25^\circ\text{C}$    | 42  | 175 | mV                |
|                          |              | $11\text{V} \leq V_i \leq 23\text{V}$                                  | $25^\circ\text{C}$    | 36  | 125 | mV                |
| Quiescent Current        | $I_q$        | $25^\circ\text{C}$                                                     | 4                     | 6.0 |     | mA                |
| Quiescent Current Change | $\Delta I_q$ | $11\text{V} \leq V_i \leq 23\text{V}$                                  | $0-125^\circ\text{C}$ | 1.5 |     | mA                |
|                          | $\Delta I_q$ | $1\text{mA} \leq I_o \leq 40\text{mA}$                                 | $0-125^\circ\text{C}$ | 0.1 |     | mA                |
| Output Noise Voltage     | $V_N$        | $10\text{Hz} \leq f \leq 100\text{KHz}$                                | $25^\circ\text{C}$    | 54  |     | $\mu\text{V}/V_o$ |
| Ripple Rejection         | RR           | $13\text{V} \leq V_i \leq 23\text{V}$ , $f=120\text{Hz}$               | $0-125^\circ\text{C}$ | 37  | 46  | dB                |
| Dropout Voltage          | $V_d$        | $25^\circ\text{C}$                                                     | 1.7                   |     |     | V                 |

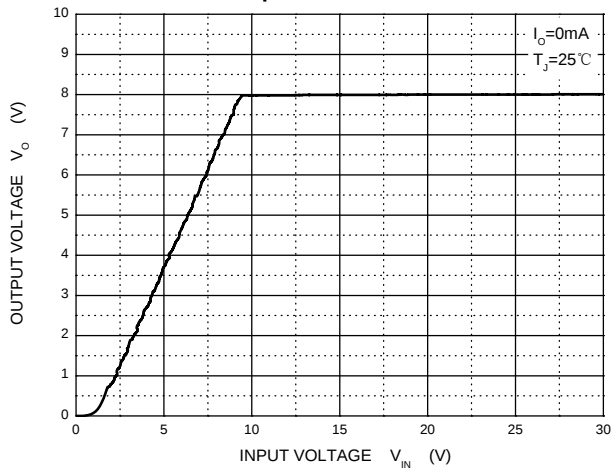
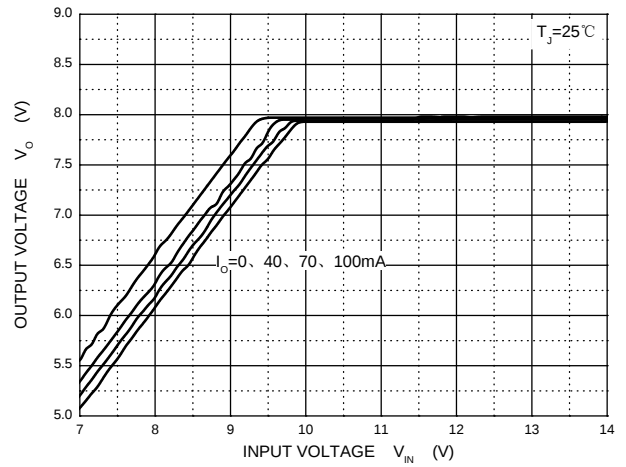
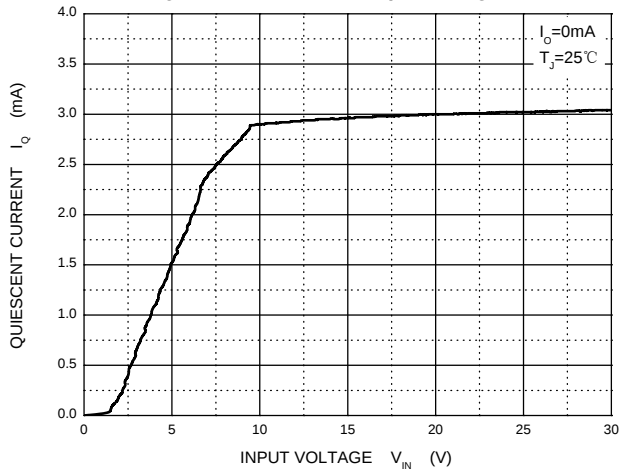
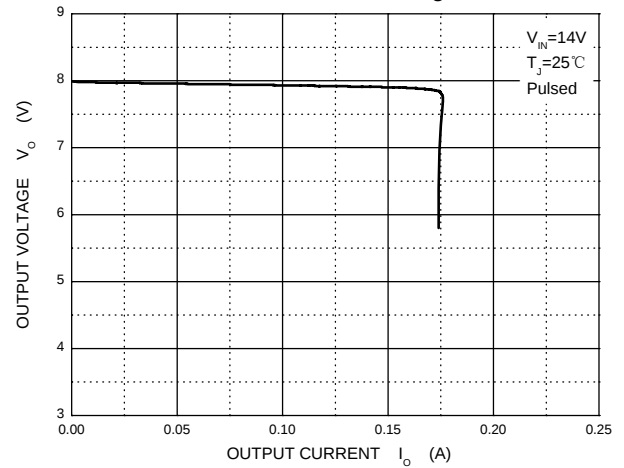
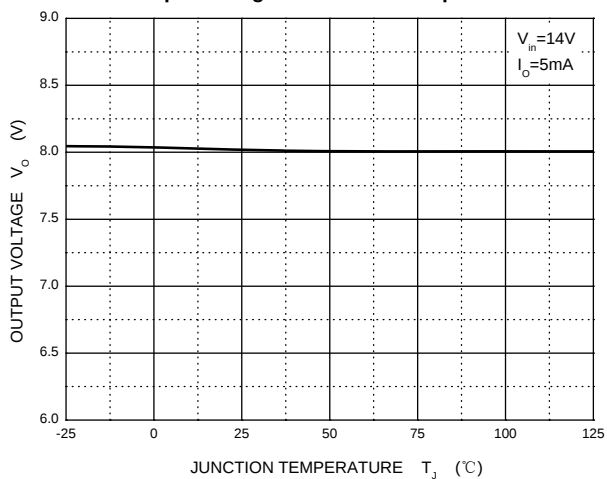
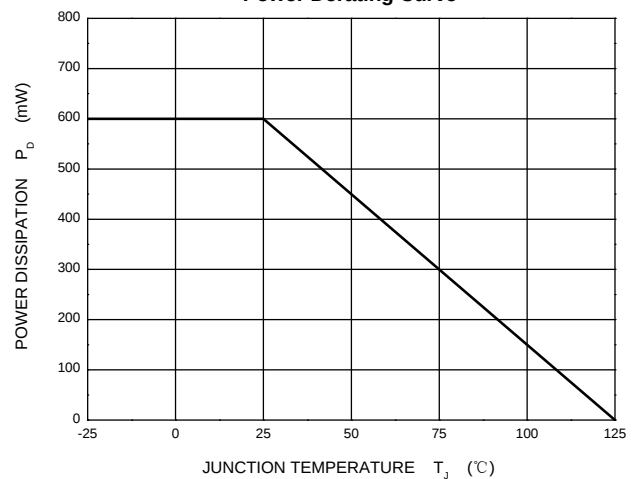
\* Pulse test.

#### TYPICAL APPLICATION



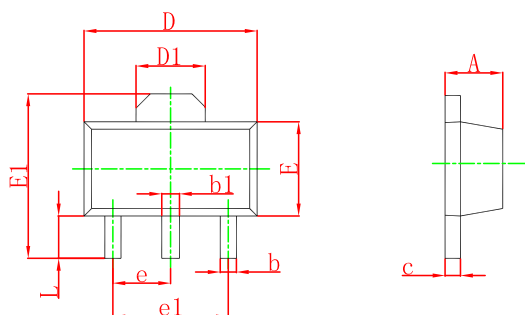
Note: Bypass capacitors are recommended for optimum stability and transient response and should be located as close as possible to the pins.

## Typical Characteristics

**Output Characteristics**

**Dropout Characteristics**

**Quiescent Current vs Input Voltage**

**Current Cut-off Grid Voltage**

**Output Voltage vs Junction Temperature**

**Power Derating Curve**


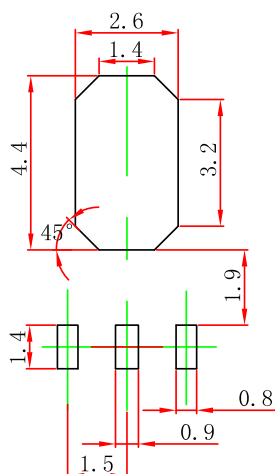
## Outline Drawing

### SOT-89-3L Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 1.400                     | 1.600 | 0.055                | 0.063 |
| b      | 0.320                     | 0.520 | 0.013                | 0.020 |
| b1     | 0.400                     | 0.580 | 0.016                | 0.023 |
| c      | 0.350                     | 0.440 | 0.014                | 0.017 |
| D      | 4.400                     | 4.600 | 0.173                | 0.181 |
| D1     | 1.550 REF.                |       | 0.061 REF.           |       |
| E      | 2.300                     | 2.600 | 0.091                | 0.102 |
| E1     | 3.940                     | 4.250 | 0.155                | 0.167 |
| e      | 1.500 TYP.                |       | 0.060 TYP.           |       |
| e1     | 3.000 TYP.                |       | 0.118 TYP.           |       |
| L      | 0.900                     | 1.200 | 0.035                | 0.047 |

### SOT-89-3L Suggested Pad Layout



Note:

1. Controlling dimension: in/millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

## PACKAGE SPECIFICATIONS

| Package   | Reel Size | Reel DIA.<br>(mm) | Q'TY/Reel<br>(pcs) | Box Size<br>(mm) | QTY/Box<br>(pcs) | Carton Size<br>(mm) | G.W.(Kg) |
|-----------|-----------|-------------------|--------------------|------------------|------------------|---------------------|----------|
| SOT-89-3L | 7'        | 330               | 1000               | 203×203×195      | 40000            | 438×438×220         | 180000   |

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