


## Features

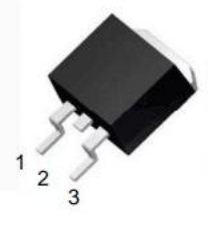
- Three-terminal positive voltage regulator
- OUTPUT CURRENT TO 1.2A
- OUTPUT VOLTAGES OF 5;6;8;9; 12V
- THERMAL OVERLOAD PROTECTION
- SHORT CIRCUIT PROTECTION
- OUTPUT TRANSITION SOA PROTECTION

## 1、 Absolute Maximum Ratings $T_c=25^\circ\text{C}$

| Symbol | Parameter                   | Value      | UNIT             |
|--------|-----------------------------|------------|------------------|
| $V_I$  | Input Voltage               | 35         | V                |
| TOPR   | Operating Temperature Range | 0 ~ +125   | $^\circ\text{C}$ |
| TSTG   | Storage Temperature Range   | -65 ~ +150 | $^\circ\text{C}$ |



**TO-220**



**TO-263-3**

**1 Input 2 Gnd 3 Out**

## 2、 Electrical Characteristics( $T_c=25^\circ\text{C}$ )of 7805(refer to the test circuits, $T_J=-55$

to  $150^\circ\text{C}$   $V_I=10\text{V}$ ,  $I_O=500\text{mA}$ ,  $C_I=0.33\mu\text{F}$ ,  $C_O=0.1\mu\text{F}$  specified).

unless otherwise

| Parameter                | Symbol                | Test Condition   | MIN                             | TYP  | MAX  | UNIT                 |
|--------------------------|-----------------------|--|---------------------------------|------|------|----------------------|
| Output Voltage           | $V_O$                 | $T_J=+25^\circ\text{C}$  | 4.8                             | 5    | 5.2  | V                    |
|                          |                       | $I_O=5\text{mA}$ to $1\text{A}$ , $P_O \leq 15\text{W}$<br>$V_I=8\text{V}$ to $20\text{V}$ | 4.75                            | 5    | 5.25 |                      |
| Line Regulation(Notel)   | $\Delta V_O$          | $T_J=+25^\circ\text{C}$  | $V_I=7\text{V}$ to $25\text{V}$ |      | 100  | mV                   |
|                          |                       |  | $V_I=8\text{V}$ to $12\text{V}$ |      | 50   |                      |
| Load Regulation(Notel)   | $\Delta V_O$          | $T_J=+25^\circ\text{C}$<br>$I_O=5\text{mA}$ to $1.2\text{A}$                               |                                 |      | 100  | mV                   |
|                          |                       | $T_J=+25^\circ\text{C}$<br>$I_O=250\text{mA}$ to $750\text{mA}$                            |                                 |      | 50   |                      |
| Quiescent Current        | $I_Q$                 | $T_J=+25^\circ\text{C}$  |                                 |      | 6    | mA                   |
| Quiescent Current Change | $\Delta I_Q$          | $I_O=5\text{mA}$ to $1\text{A}$  |                                 |      | 0.5  | mA                   |
|                          |                       | $V_I=8\text{V}$ to $25\text{V}$  |                                 |      | 0.8  |                      |
| Quiescent Current Change | $\Delta V_O/\Delta T$ | $I_O=5\text{mA}$   |                                 | 0.6  |      | mV/ $^\circ\text{C}$ |
| Short Circuit Current    | ISC                   | $T_J=+25^\circ\text{C}$ , $V_I=35\text{V}$   |                                 | 0.75 | 1.2  | A                    |

### 3、Electrical Characteristics (Tc=25°C) Of 7806(refer to the test circuits, TJ = -55

to 150°C VI = 11V ,

IO = 500 mA , CI = 0.33 μ F , CO = 0.1 μ F unless otherwise specified)。

| Parameter                | Symbol   | Test Condition                             | MIN            | TYP  | MAX  | UNIT |       |
|--------------------------|----------|--|----------------|------|------|------|-------|
| Output Voltage           | VO       | TJ = +25°C                                 | 5.75           | 6    | 6.25 | V    |       |
|                          |          | IO = 5mA to 1A, PO ≤ 15W<br>VI = 9V to 21V | 5.7            | 6    | 6.3  |      |       |
| Line Regulation (Note1)  | Δ VO     | TJ = +25°C                                 | VI = 8V to 25V |      |      | 100  | mV    |
|                          |          |  | VI = 9V to 13V |      |      | 50   |       |
| Load Regulation (Note1)  | Δ VO     | TJ = +25°C<br>IO = 5mA to 1.2A             |                |      |      | 100  | mV    |
|                          |          | TJ = +25°C<br>IO = 250mA to 750mA          |                |      |      | 50   |       |
| Quiescent Current        | IQ       | TJ = +25°C                                 |                |      |      | 6    | mA    |
| Quiescent Current Change | Δ IQ     | IO = 5mA to 1A                             |                |      |      | 0.5  | mA    |
|                          |          | VI = 9V to 25V                             |                |      |      | 0.8  |       |
| Quiescent Current Change | Δ Vo/Δ T | IO = 5mA                                   |                | 0.7  |      |      | mV/°C |
| Short Circuit Current    | ISC      | TJ = +25°C, VI = 35V                       |                | 0.75 | 1.2  |      | A     |

#### 4、Electrical Characteristics (Tc=25°C) Of 7808(refer to the test circuits, TJ = -55

to 150°C VI = 14V, IO = 500 mA, CI = 0.33 μ F, CO = 0.1 μ F unless otherwise specified)

| Parameter                | Symbol   | Test Condition                                | MIN               | TYP  | MAX | UNIT  |
|--------------------------|----------|---|-------------------|------|-----|-------|
| Output Voltage           | VO       | TJ = +25°C                                    | 7.7               | 8    | 8.3 | V     |
|                          |          | IO = 5mA to 1A, PO ≤ 15W<br>VI = 11.5V to 23V | 7.6               | 8    | 8.4 |       |
| Line Regulation (Note1)  | Δ VO     | TJ = +25°C                                    | VI = 10.5V to 25V |      | 100 | mV    |
|                          |          |   | VI = 11V to 17V   |      | 50  |       |
| Load Regulation (Note1)  | Δ VO     | TJ = +25°C<br>IO = 5mA to 1.2A                |                   |      | 100 | mV    |
|                          |          | TJ = +25°C<br>IO = 250mA to 750mA             |                   |      | 50  |       |
| Quiescent Current        | IQ       | TJ = +25°C                                    |                   |      | 6   | mA    |
| Quiescent Current Change | Δ IQ     | IO = 5mA to 1A                                |                   |      | 0.5 | mA    |
|                          |          | VI = 11.5V to 25V                             |                   |      | 1   |       |
| Quiescent Current Change | Δ Vo/Δ T | IO = 5mA                                      |                   | 1    |     | mV/°C |
| Short Circuit Current    | ISC      | TJ = +25°C, VI = 35V                          |                   | 0.75 | 1.2 | A     |

#### 5、Electrical Characteristics (Tc=25°C) Of 7809(refer to the test circuits, TJ = -55

to 150°C  $V_I = 15V$ ,  $I_O = 500\text{ mA}$ ,  $C_I = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$  unless otherwise specified)。

| Parameter                | Symbol   | Test Condition                                | MIN               | TYP | MAX  | UNIT |       |
|--------------------------|----------|---|-------------------|-----|------|------|-------|
| Output Voltage           | VO       | TJ = +25°C                                    | 8.64              | 9   | 9.36 | V    |       |
|                          |          | IO = 5mA to 1A, PO ≤ 15W<br>VI = 11.5V to 26V | 8.55              | 9   | 9.45 |      |       |
| Line Regulation (Note1)  | Δ VO     | TJ = +25°C                                    | VI = 11.5V to 26V |     |      | 100  | mV    |
|                          |          |   | VI = 12V to 18V   |     |      | 50   |       |
| Load Regulation (Note1)  | Δ VO     | TJ = +25°C<br>IO = 5mA to 1.2A                |                   |     |      | 100  | mV    |
|                          |          | TJ = +25°C<br>IO = 250mA to 750mA             |                   |     |      | 50   |       |
| Quiescent Current        | IQ       | TJ = +25°C                                    |                   |     | 6    | mA   |       |
| Quiescent Current Change | Δ IQ     | IO = 5mA to 1A                                |                   |     |      | 0.5  | mA    |
|                          |          | VI = 11.5V to 26V                             |                   |     |      | 1    |       |
| Quiescent Current Change | Δ Vo/Δ T | IO = 5mA                                      |                   |     | 1    |      | mV/°C |
| Short Circuit Current    | ISC      | TJ = +25°C, VI = 35V                          |                   |     | 0.75 | 1.2  | A     |

## 6、Electrical Characteristics (Tc=25°C) Of 7812 (refer to the test circuits, TJ = -55

to 150°C  $V_I = 19V$ ,  $I_O = 500\text{ mA}$ ,  $C_I = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$  unless otherwise specified)。

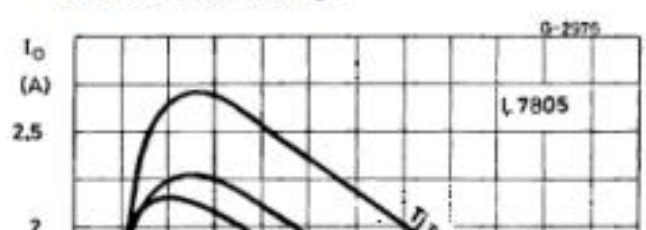
| Parameter                | Symbol   | Test Condition                                | MIN               | TYP  | MAX  | UNIT  |
|--------------------------|----------|---|-------------------|------|------|-------|
| Output Voltage           | VO       | TJ = +25°C                                    | 11.5              | 12   | 12.5 | V     |
|                          |          | IO = 5mA to 1A, PO ≤ 15W<br>VI = 15.5V to 27V | 11.4              | 12   | 12.6 |       |
| Line Regulation (Note1)  | Δ VO     | TJ = +25°C                                    | VI = 14.5V to 30V |      | 100  | mV    |
|                          |          |   | VI = 16V to 22V   |      | 50   |       |
| Load Regulation (Note1)  | Δ VO     | TJ = +25°C<br>IO = 5mA to 1.2A                |                   |      | 100  | mV    |
|                          |          | TJ = +25°C<br>IO = 250mA to 750mA             |                   |      | 50   |       |
| Quiescent Current        | IQ       | TJ = +25°C                                    |                   |      | 6    | mA    |
| Quiescent Current Change | Δ IQ     | IO = 5mA to 1A                                |                   |      | 0.5  | mA    |
|                          |          | VI = 15V to 30V                               |                   |      | 1    |       |
| Quiescent Current Change | Δ Vo/Δ T | IO = 5mA                                      |                   | 1.5  |      | mV/°C |
| Short Circuit Current    | ISC      | TJ = +25°C, VI = 35V                          |                   | 0.75 | 1.2  | A     |

## 7、Typical Characteristics

**Figure 1:** Dropout Voltage vs Junction Temperature

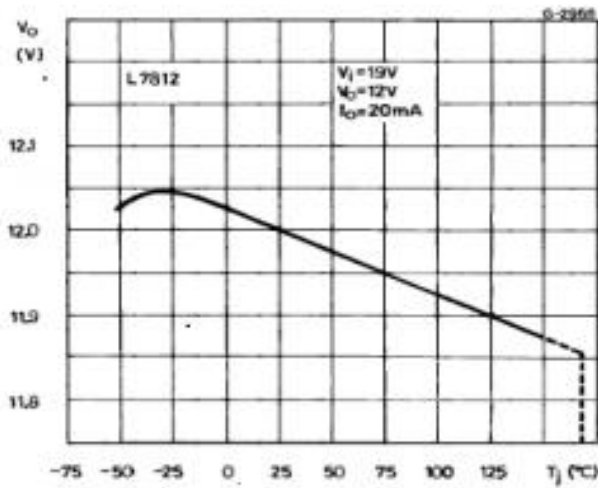


**Figure 2:** Peak Output Current vs Input/output Differential Voltage

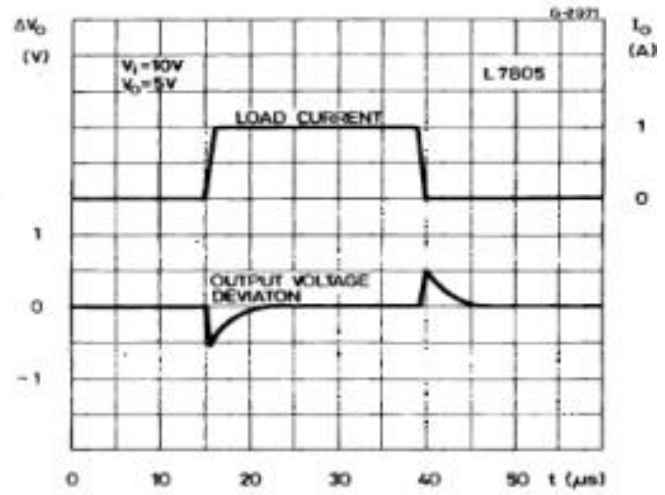




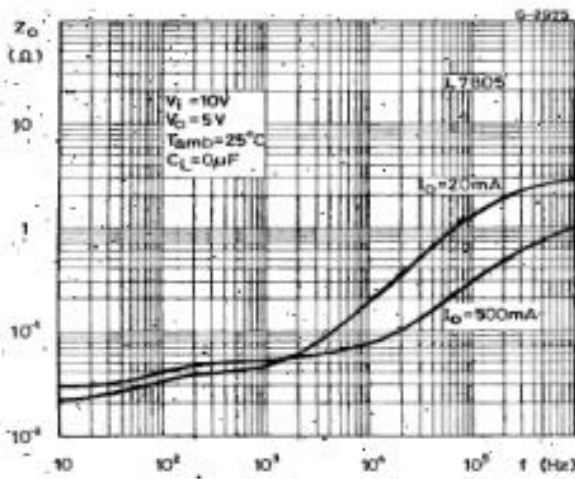
**Figure 5: Output Voltage vs Junction Temperature**



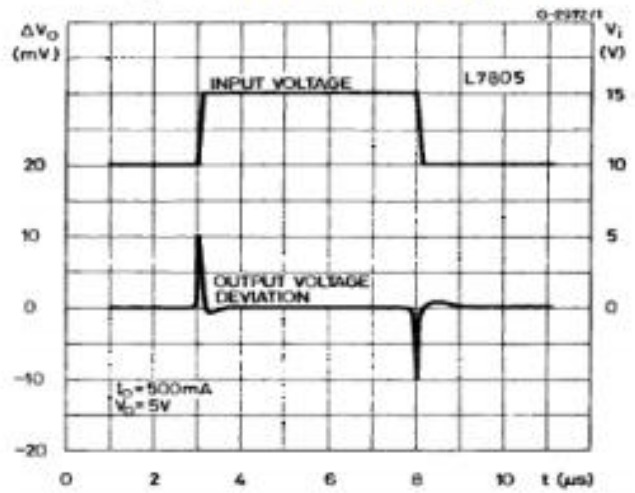
**Figure 6: Load Transient Response**



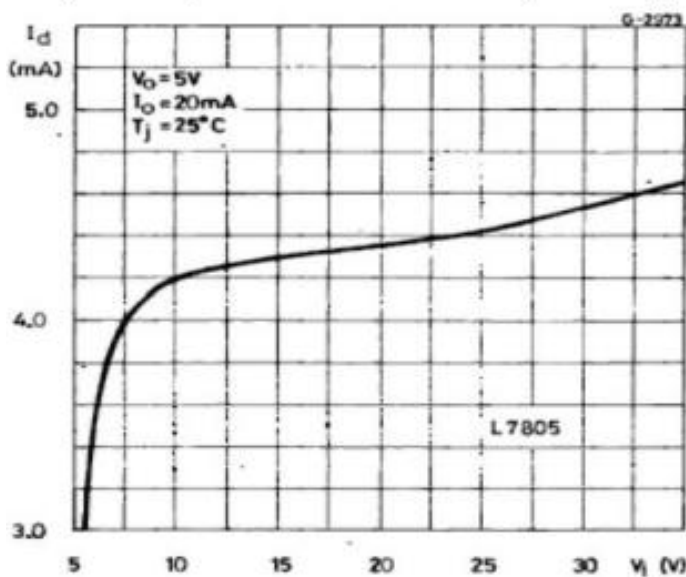
**Figure 7: Output Impedance vs Frequency**



**Figure 8: Line Transient Response**



**Figure 9: Quiescent Current vs Input Voltage**

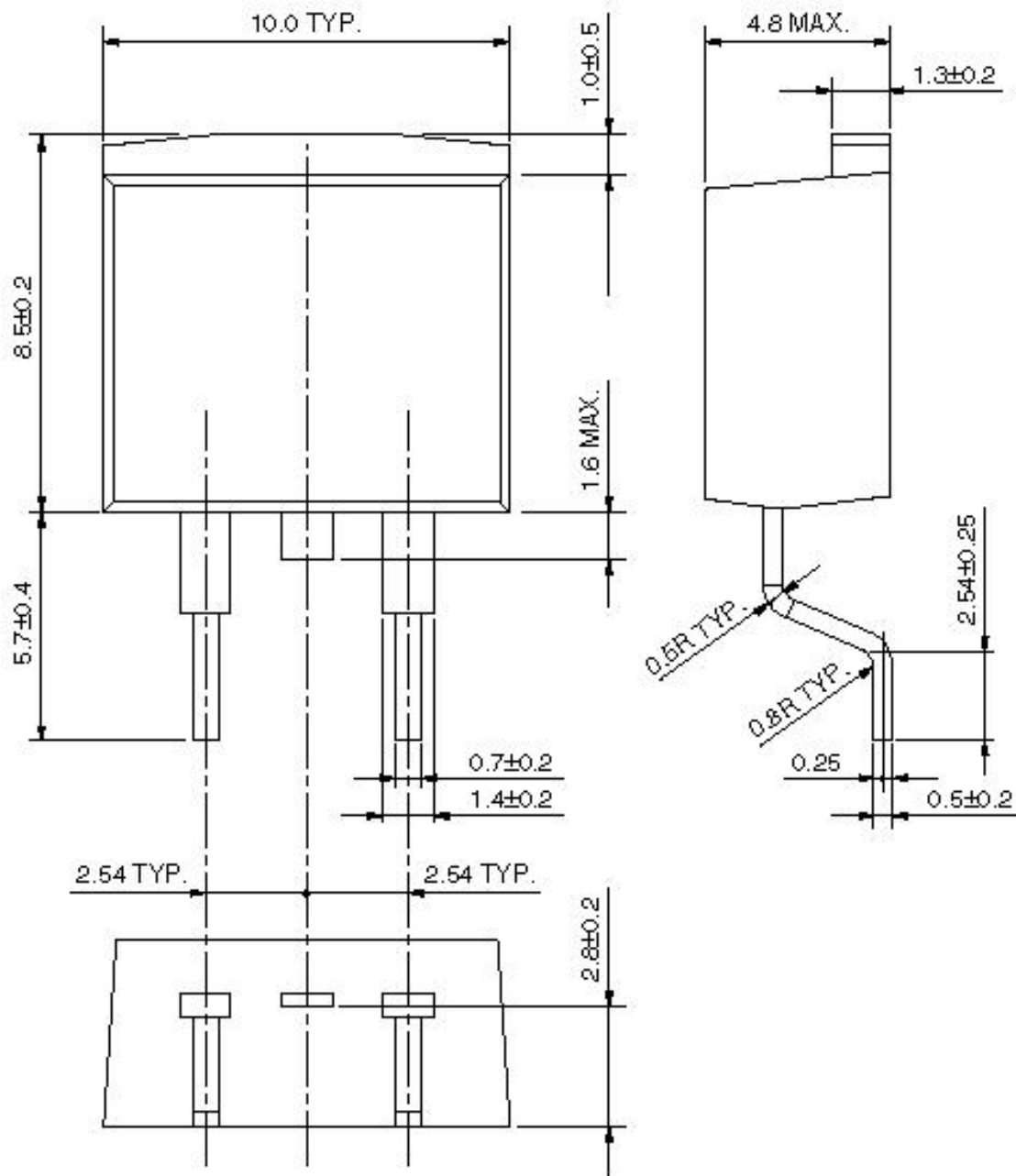


## 8、 Package Demensions

T0-263-3

T0-263封装尺寸:

UNIT: mm



: The area without solder plated

## 9、 Package Demens ions



**T0-220**

| DIM. | mm.   |      |       | inch  |       |       |
|------|-------|------|-------|-------|-------|-------|
|      | MIN.  | TYP  | MAX.  | MIN.  | TYP.  | MAX.  |
| A    | 4.40  |      | 4.60  | 0.173 |       | 0.181 |
| b    | 0.61  |      | 0.88  | 0.024 |       | 0.034 |
| b1   | 1.15  |      | 1.70  | 0.045 |       | 0.067 |
| c    | 0.49  |      | 0.70  | 0.019 |       | 0.027 |
| D    | 15.25 |      | 15.75 | 0.600 |       | 0.620 |
| E    | 10.0  |      | 10.40 | 0.393 |       | 0.409 |
| e    | 2.4   |      | 2.7   | 0.094 |       | 0.106 |
| e1   | 4.95  |      | 5.15  | 0.194 |       | 0.203 |
| F    | 1.23  |      | 1.32  | 0.048 |       | 0.051 |
| H1   | 6.2   |      | 6.6   | 0.244 |       | 0.260 |
| J1   | 2.40  |      | 2.72  | 0.094 |       | 0.107 |
| L    | 13.0  |      | 14.0  | 0.511 |       | 0.551 |
| L1   |       |      | 2.98  | 0.137 |       | 0.154 |
| L20  |       | 15.7 |       |       | 0.645 |       |
| L30  |       | 28.9 |       |       | 1.138 |       |
| φP   | 3.75  |      | 3.85  | 0.147 |       | 0.151 |
| Q    | 2.65  |      | 2.95  | 0.104 |       | 0.116 |

