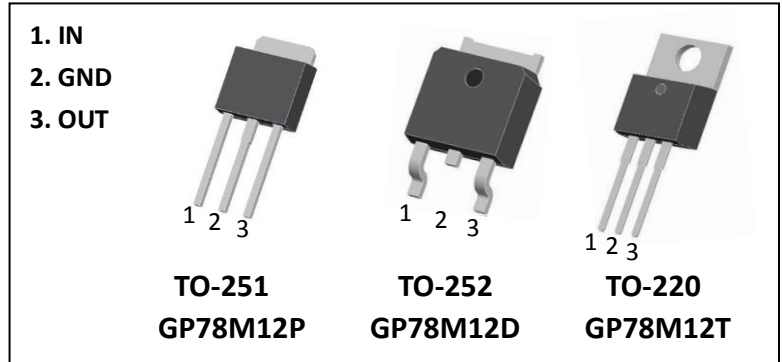


## GP78M12X

### Feature

- Thermal Overload Protection
- Short Circuit Protection
- Output Voltage: 5V
- Output Current: 500mA
- Output Transition Safe-Area Compensation



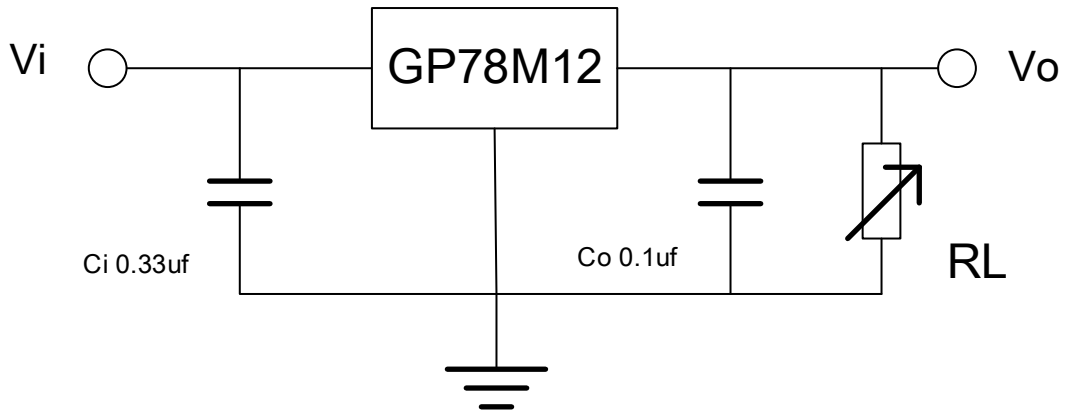
### Absolute Maximum Ratings (Ta=25°C unless otherwise noted)

| Parameter   | Symbol          | Value    | Unit |
|---|-----------------|----------|------|
| Input voltage   | $V_i$           | 35       | V    |
| Thermal Resistance from Junction to Air (TO-251/TO-252) | $R_{\theta JA}$ | 80       | °C/W |
| Thermal Resistance from Junction to Air (TO-220)        | $R_{\theta JA}$ | 66.7     | °C/W |
| Operating Junction Temperature Range                    | $T_{OPR}$       | -25~+125 | °C   |
| Storage Temperature Range                               | $T_{STG}$       | -25~+150 | °C   |

### Electrical Characteristics (Ta=25°C unless otherwise noted)

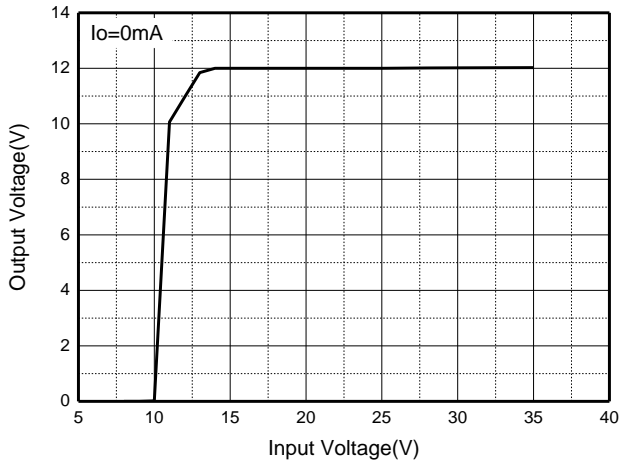
| Parameter                | Symbol       | Test Condition                                     | Min  | Type | Max  | Unit |
|--------------------------|--------------|--|------|------|------|------|
| Output voltage           | $V_o$        | $V_{IN} = 19V, I_o = 350mA$                        | 11.5 | 12   | 12.5 | V    |
|                          |              | $V_{IN} = 14.5\sim 27V, I_o = 5\sim 350mA$         | 11.4 | 12   | 12.6 | V    |
| Load Regulation          | $\Delta V$   | $I_o = 200mA, 14.5V \leq V_{in} \leq 30V$          |      |      | 100  | mV   |
|                          |              | $I_o = 200mA, 16V \leq V_{in} \leq 30V$            |      |      | 50   | mV   |
| Line regulation          | $\Delta V$   | $5mA \leq I_o \leq 250mA, V_{in} = 19V$            |      |      | 120  | mV   |
|                          |              | $5mA \leq I_o \leq 500mA, V_{in} = 19V$            |      |      | 240  | mV   |
| Quiescent Current        | $I_q$        | $V_{in} = 19V$                                     |      |      | 6    | mA   |
| Quiescent Current Change | $\Delta I_B$ | $5mA \leq I_o \leq 350mA, V_{in} = 19V$            |      |      | 0.5  | mA   |
|                          |              | $14.5V \leq V_{in} \leq 30V, I_o = 200mA$          |      |      | 0.8  | mA   |
| Dropout Voltage          | $V_d$        | $I_o = 350mA$                                      |      | 2    |      | V    |
| Ripple Rejection         | RR           | $15V \leq V_{in} \leq 25V, I_o = 300mA, f = 120Hz$ | 55   | 80   |      | dB   |

**Typical Application**

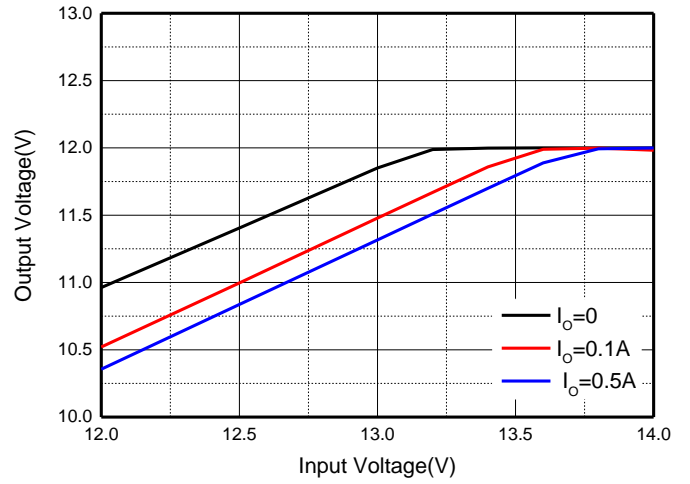


**Typical Performance Characteristics**

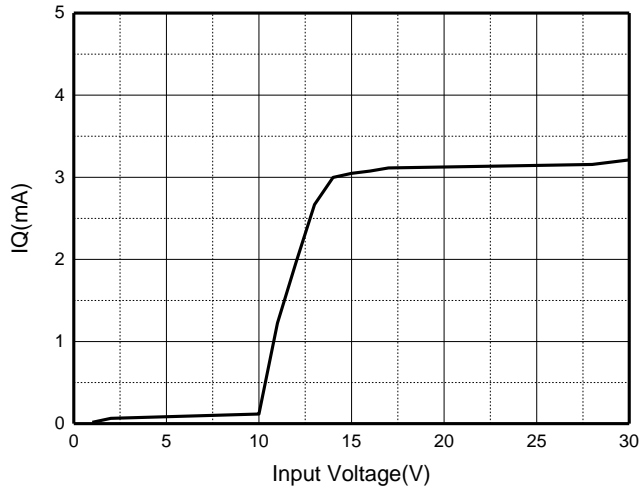
**Output Characteristics**



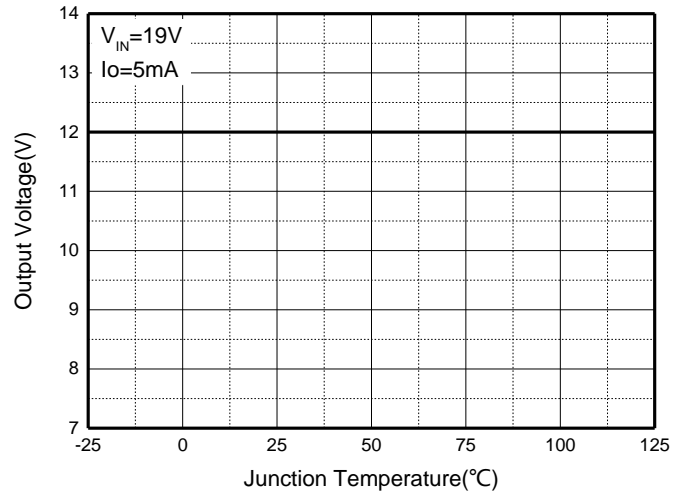
**Output Characteristics**



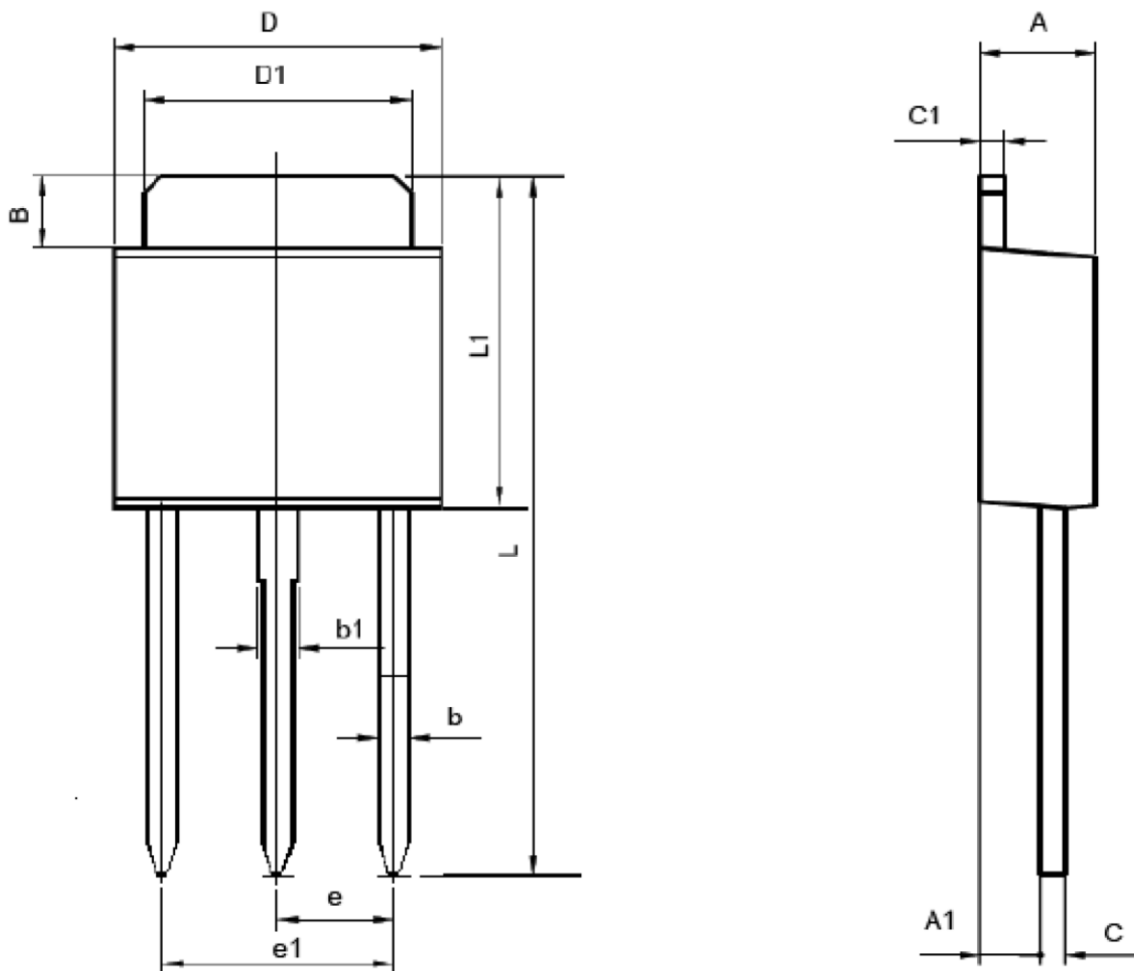
**Quiescent Current**



**Output Voltage vs Junction Temperature**

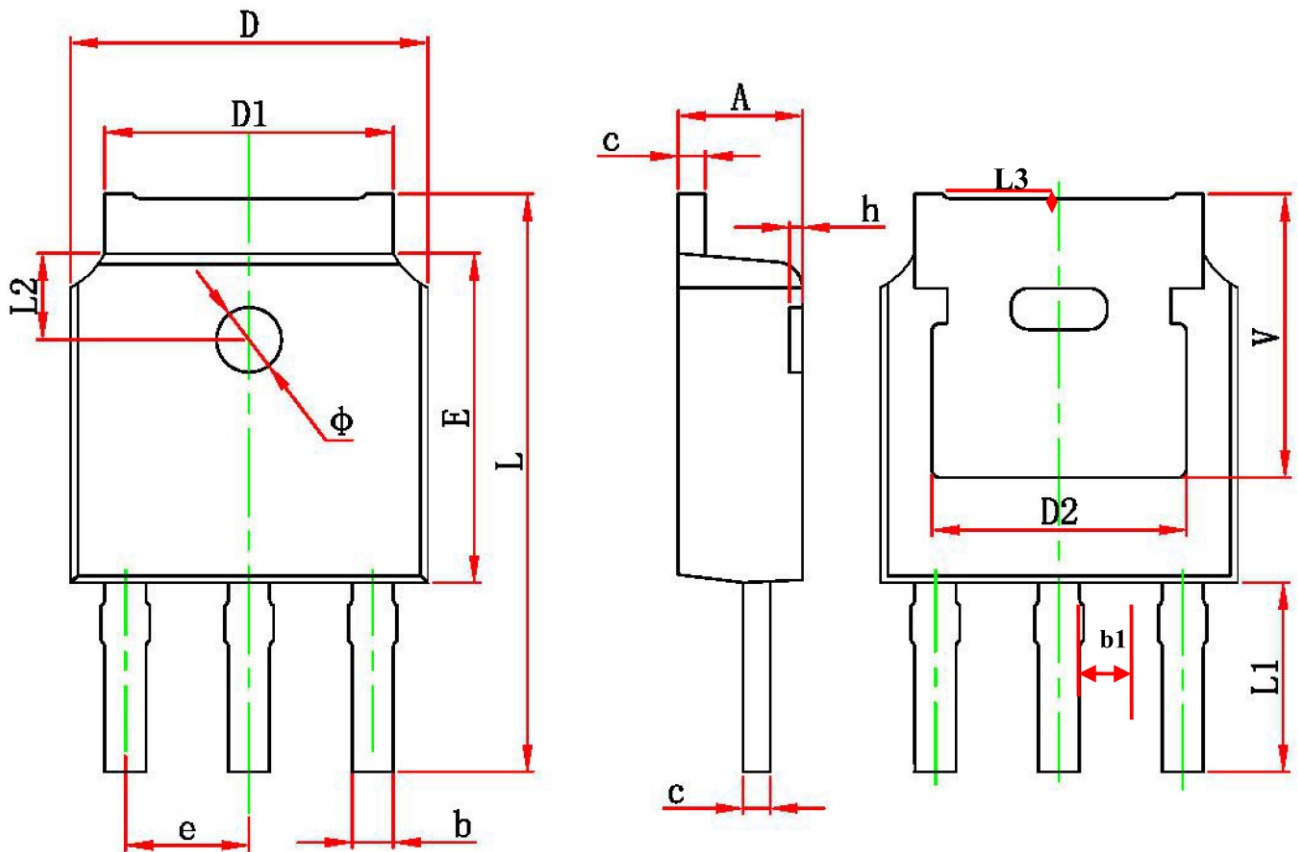


## TO-251 Package Outline Dimensions



| SYMBOL |          |       |           |        |
|--------|----------|-------|-----------|--------|
|        | MIN      | MAX   | MIN       | MAX    |
| A      | 2.2      | 2.4   | 0.087     | 0.091  |
| A1     | 1.1      | 1.3   | 0.043     | 0.051  |
| B      | 1.3      | 1.7   | 0.051     | 0.067  |
| b      | 0.5      | 0.7   | 0.02      | 0.028  |
| b1     | 0.7      | 0.9   | 0.028     | 0.035  |
| c      | 0.46     | 0.56  | 0.018     | 0.022  |
| c1     | 0.46     | 0.56  | 0.018     | 0.022  |
| D      | 6.36     | 6.65  | 0.25      | 0.2622 |
| D1     | 5.2      | 5.4   | 0.205     | 0.213  |
| L1     | 6.85     | 7.15  | 0.27      | 0.281  |
| e      | 2.30TYP. |       | 0.091TYP. |        |
| e1     | 4.5      | 4.7   | 0.177     | 0.185  |
| L      | 14.85    | 15.45 | 0.585     | 0.608  |

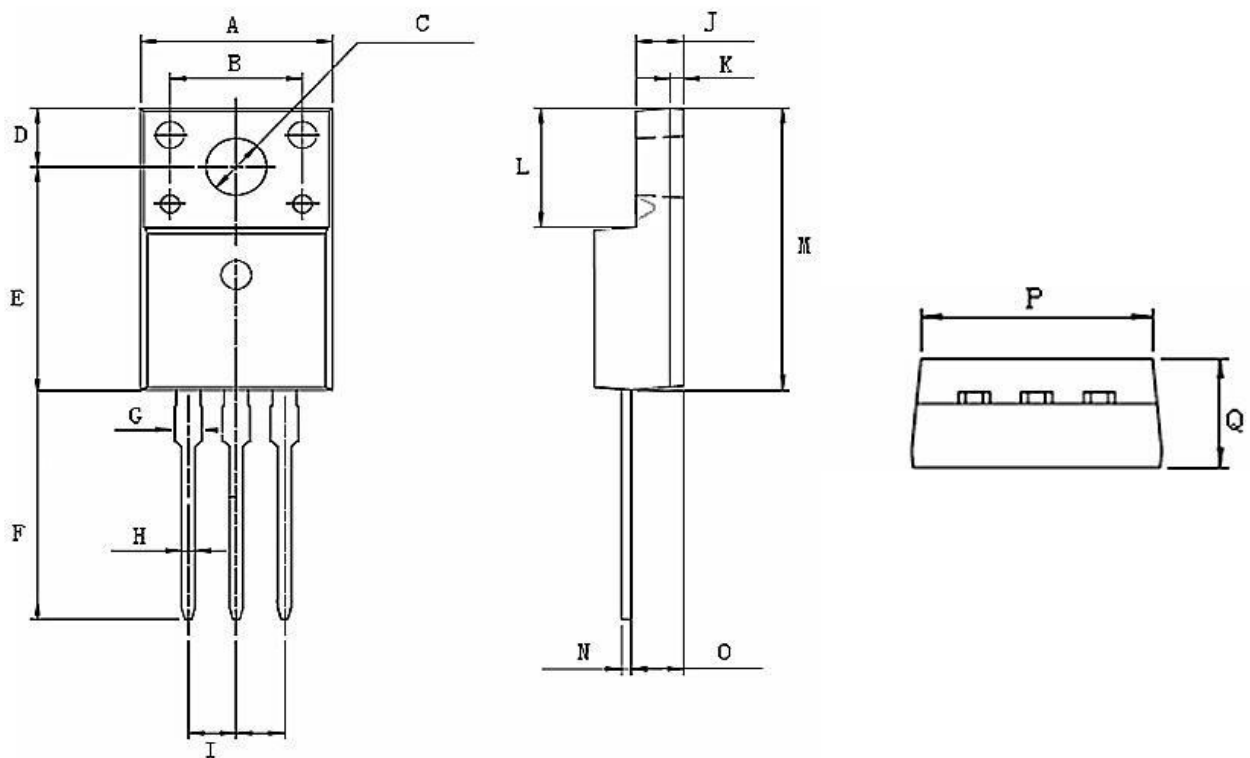
## TO-252 Package Outline Dimensions



| SYMBOL | MIN       | MAX   | SYMBOL   | MIN      | MAX |
|--------|-----------|-------|----------|----------|-----|
| A      | 2.2       | 2.4   | L1       | 2.90 REF |     |
| A1     | 0         | 0.125 | L2       | 1.4      | 1.7 |
| b      | 0.66      | 0.86  | L3       | 1.60 REF |     |
| c      | 0.46      | 0.58  | L4       | 0.6      | 1   |
| D      | 6.5       | 6.7   | $\phi$   | 1.1      | 1.3 |
| D1     | 5.1       | 5.46  | $\theta$ | 0°       | 8°  |
| D2     | 4.830 REF |       | h        | 0        | 0.3 |
| E      | 6         | 6.2   | V        | 5.35 REF |     |
| e      | 2.186     | 2.386 |          |          |     |
| L      | 9.8       | 10.4  |          |          |     |
| 共面度    | 0         | 0.09  |          |          |     |

单位: mm

## TO-220F Package Outline Dimensions



| SYMBOL | MIN       | MAX   | SYMBOL | MIN  | MAX  |
|--------|-----------|-------|--------|------|------|
| A      | 9.92      | 10.32 | K      | 0.55 | 0.75 |
| B      | 6.9       | 7.1   | L      | 6.57 | 6.77 |
| C      | 3.35      | 3.55  | M      | 15.8 | 16   |
| D      | 3.25      | 3.35  | N      | 0.4  | 0.6  |
| E      | 12.35     | 12.75 | O      | 2.62 | 2.92 |
| F      | 12.8      | 13.2  | P      | 9.2  | 9.4  |
| G      | 1.22      | 1.42  | Q      | 4.6  | 4.8  |
| H      | 0.7       | 0.9   |        |      |      |
| I      | 2.54 Typ. |       |        |      |      |
| J      | 2.45      | 2.65  |        |      |      |

单位: mm