

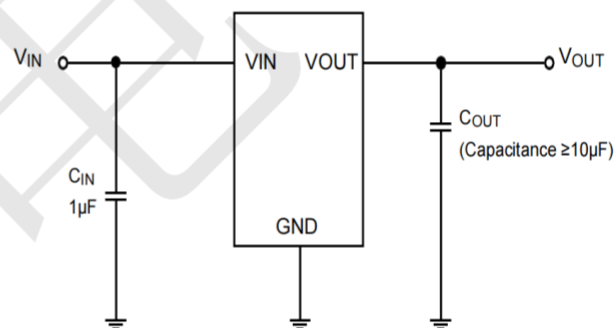
### Features

- Wide Input Voltage Range: 3.0V to 55V
- Low Power Consumption: 2  $\mu$ A (Typ)
- Maximum Output Current: 500mA
- Low Dropout Voltage:  
 $V_{DROP} = 350\text{mV} @ I_{OUT} = 100\text{mA (Typ.)}$   
 $V_{DROP} = 1900\text{mV} @ I_{OUT} = 500\text{mA (Typ.)}$
- High PSRR: 85dB @1kHz
- Output Voltage Accurate:  $\pm 2\%$
- Excellent Line/Load Regulation
- Good Transient Response
- Integrated Short-Circuit Protection
- Over-Temperature Protection
- Output Current Limit
- Low Temperature Coefficient
- Stable with Ceramic Capacitor
- RoHS Compliant and Lead (Pb) Free
- -40°C to +85°C Operating Temperature Range
- Fixed Output Voltage Versions: 3.0,3.3,3.6 and 5.0V.
- Available in Green TO252-3L Packages

### Applications

- Powering MCUs and CAN/LIN transceivers
- Battery-powered equipment
- EV and HEV battery management systems
- Portable, Battery Powered Equipment
- Car Audio/Video Equipmen
- Body control modules

### Application Circuits

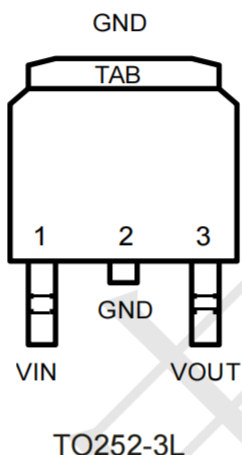


### Ordering Information

TP602C50K3G

OUTPUT VOLTAGE: 30=3.0V  
33=3.3V  
36=3.6V  
50=5.0V

### Pin Configuration (TOP VIEW)



### Absolute Maximum Ratings

| Item                                                       | Symbol                             | Rating             | Unit  |
|------------------------------------------------------------|------------------------------------|--------------------|-------|
| Supply Input Voltage                                       | V <sub>IN</sub>                    | -0.3 ~ 55          | V     |
| V <sub>OUT</sub> to V <sub>IN</sub>                        | V <sub>OUT</sub> _ V <sub>IN</sub> | -35 ~ -0.3         | V     |
| Regulated Output Voltage                                   | V <sub>OUT</sub>                   | -0.3 ~ 6.0         | V     |
| Output Current                                             | I <sub>OUT</sub>                   | Internally limited | mA    |
| Power Dissipation<br>P <sub>D</sub> @T <sub>A</sub> =+25°C | P <sub>D</sub>                     | 1650               | mW    |
| Thermal Resistance<br>(Junction to air)                    | $\theta_{JA}$                      | 75                 | °C /W |
| Human Body Model (HBM)                                     |                                    | ±4000              | V     |
| Charged Device Mode (CDM)                                  |                                    | ±2000              | V     |
| Machine Mode (MM)                                          |                                    | 200                | V     |
| Storage Temperature Range                                  | T <sub>STG</sub>                   | -65 ~ +150         | °C    |
| Operating Junction Temperature                             | T <sub>J</sub>                     | +150               | °C    |
| Lead Temperature (Soldering 10s)                           | T <sub>LEAD</sub>                  | +260               | °C    |

Note:

- 1、Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these conditions is not implied. Exposure to absolute-maximum-rated conditions for extended period may affect device reliability.
- 2、Ratings apply to ambient temperature at +25°C
- 3、The package thermal impedance is calculated in accordance to JESD 51-7.

### Recommended Operating Conditions

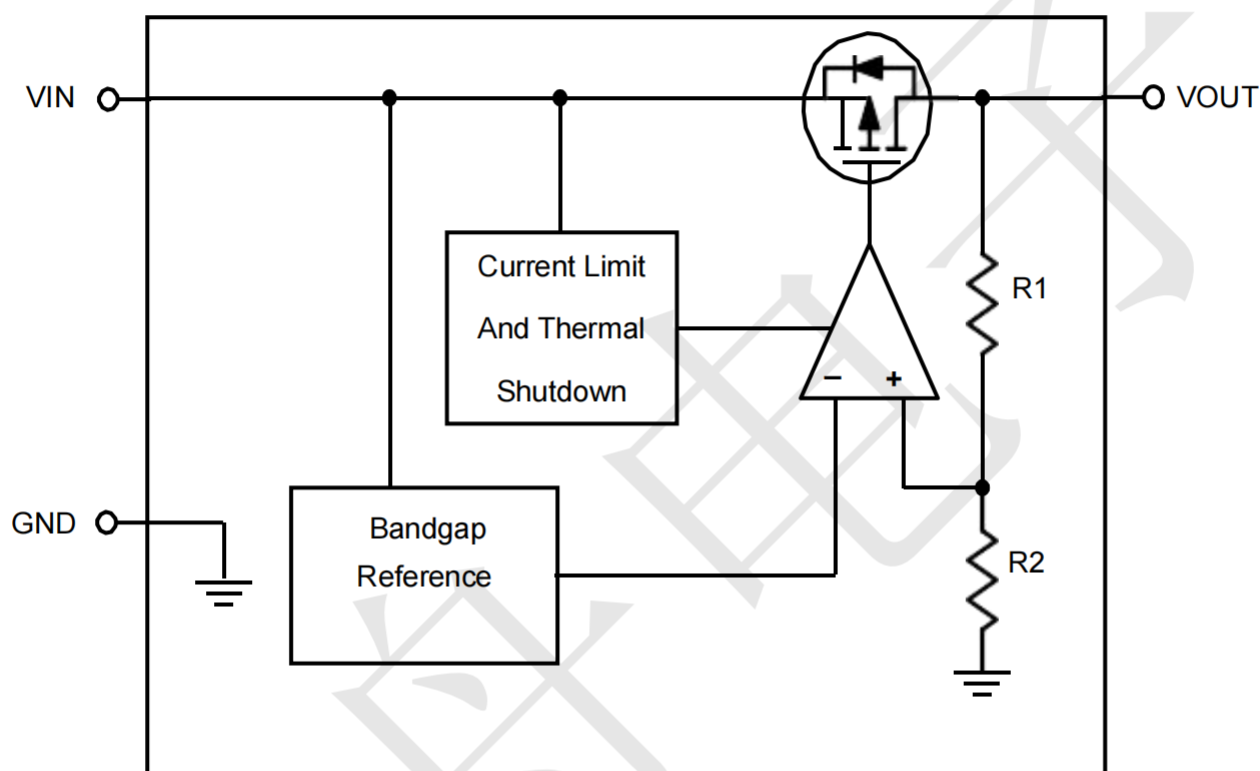
| Item                          | Min | Max | Unit |
|-------------------------------|-----|-----|------|
| Operating Ambient Temperature | -40 | +85 | °C   |
| Input Voltage                 | 3.0 | 55  | V    |
| Output Voltage                | 1.8 | 5.0 | V    |

### Electronic Characteristics

Test Conditions: V<sub>IN</sub> = V<sub>OUT</sub> + 2V, C<sub>IN</sub> = 1μF, C<sub>OUT</sub> = 10μF, T<sub>A</sub> = 25°C, unless otherwise specified

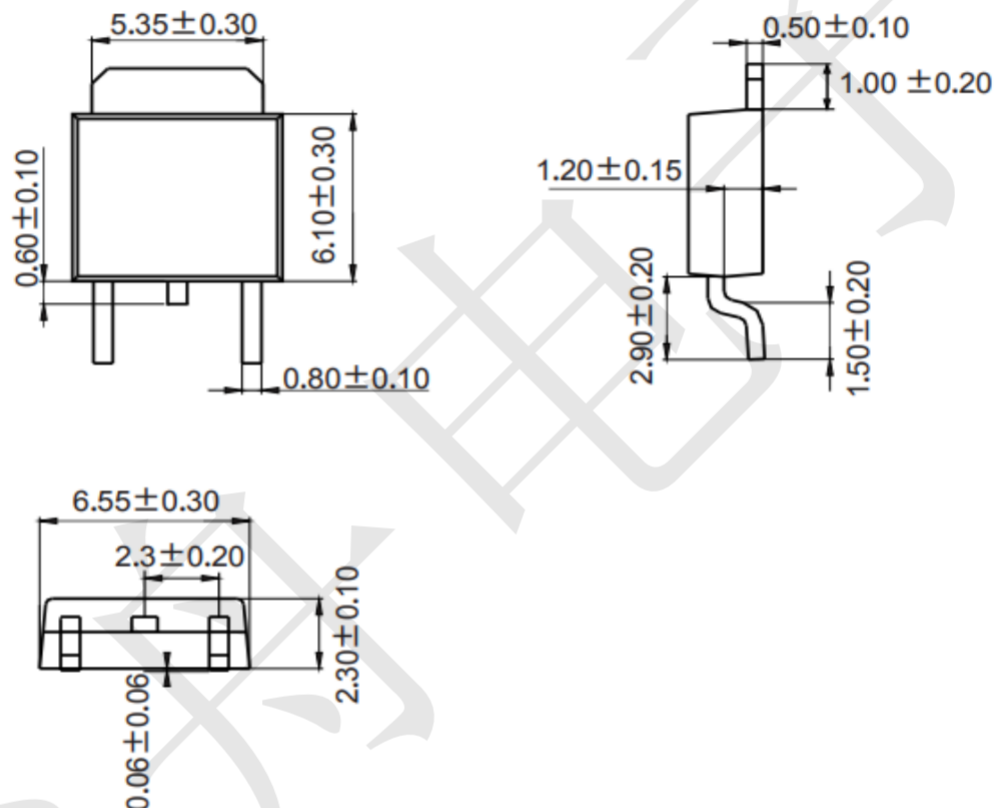
| Symbol              | Parameter                    | Test Conditions                                                                 | Min                        | Typ  | Max                        | Unit  |
|---------------------|------------------------------|---------------------------------------------------------------------------------|----------------------------|------|----------------------------|-------|
| V <sub>IN</sub>     | Input Voltage                | —                                                                               | 3.0                        | —    | 55                         | V     |
| I <sub>Q</sub>      | Quiescent Current            | V <sub>IN</sub> = 12V, No Load                                                  | —                          | 2    | 5                          | μA    |
| V <sub>OUT</sub>    | Output Voltage               | V <sub>IN</sub> = 12V<br>I <sub>OUT</sub> = 10mA                                | V <sub>OUT</sub> x<br>0.98 | —    | V <sub>OUT</sub> x<br>1.02 | V     |
| I <sub>OUT</sub>    | Output Current               | —                                                                               | —                          | 500  | —                          | mA    |
| V <sub>DROP</sub>   | Dropout Voltage              | I <sub>OUT</sub> = 100mA,<br>V <sub>OUT</sub> = V <sub>OUTNOM</sub> - 0.1V      | —                          | 350  | 500                        | mV    |
|                     |                              | I <sub>OUT</sub> = 500mA<br>V <sub>OUT</sub> = V <sub>OUTNOM</sub> - 0.1V       | —                          | 1900 | 2100                       | mV    |
| Δ V <sub>LOAD</sub> | Load Regulation              | V <sub>IN</sub> = 12V<br>1mA ≤ I <sub>OUT</sub> ≤ 100mA                         | —                          | 0.02 | 0.025                      | %/mA  |
| Δ V <sub>LINE</sub> | Line Regulation              | V <sub>OUTNOM</sub> + 2V ≤ V <sub>IN</sub> ≤ 45V<br>I <sub>OUT</sub> = 1mA      | —                          | 0.01 | 0.02                       | %/V   |
| I <sub>LIMIT</sub>  | Current Limit                | —                                                                               | —                          | 650  | —                          | mA    |
| T <sub>OTSD</sub>   | Thermal Shutdown Temperature | —                                                                               | —                          | +150 | —                          | °C    |
| THY <sub>OTSD</sub> | Thermal Shutdown Hysteresis  | —                                                                               | —                          | +20  | —                          | °C    |
| PSRR                | Power Supply Rejection Ratio | V <sub>IN</sub> = 12V, I <sub>OUT</sub> = 10mA<br>V <sub>OUT</sub> = 3.3V @1kHz | —                          | 85   | —                          | dB    |
| V <sub>ON</sub>     | Output Noise Voltage         | C <sub>OUT</sub> = 10μF, I <sub>OUT</sub> = 30mA<br>BW = 10Hz~100kHz            | —                          | 100  | —                          | μVrms |

Note : All limits specified at room temperature (T<sub>A</sub> = 25°C) unless otherwise specified. All room temperature limits are 100% production tested. All limits at temperature extremes are ensured through correlation using standard Statistical Quality Control (SQC) methods. All limits are used to calculate Average Outgoing Quality Level (AOQL).



## Package information (Unit: mm)

TO252-3L



## Mounting Pad Layout (Unit: mm)

