# GPL7750 Series

## 500mA CMOS Voltage Regulators

### Product Summary

The GPL7750 series are a group of positive voltage regulators manufactured by CMOS technologies with ultra-low power consumption and low dropout voltage, which provide large output currents even when the difference of the input-output voltage is small. The GPL7750 series can deliver 500mA output current and allow an input voltage as high as 8V. The series are very suitable for the battery-powered equipments, such as RF applications and other systems requiring a quiet voltage source.

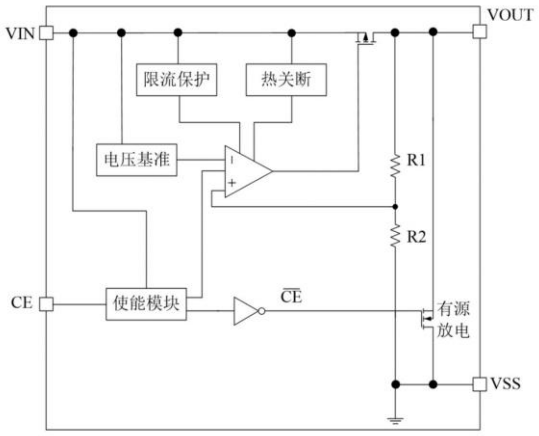
### Features

- Low Quiescent Current: 40μA
- Input Voltage Up To: 8V
- Output Current: 500mA
- Output Voltage: 1.2~3.3V
- High Accuracy: ±1%
- High Power Supply Rejection Ratio: 80dB@1kHz

### Applications

- Portable consumer equipments
- Radio control systems
- Laptop, Palmtops and PDAs
- Wireless Communication Equipments
- Portable Audio Video Equipments
- Ultra-low Power Microcontroller

### Block Diagram



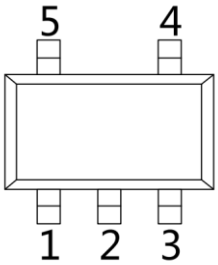

### Order Information

GPL7750V①②

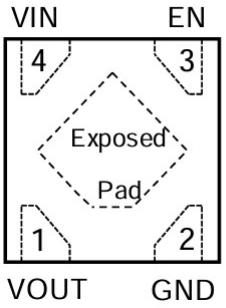
| Designator | Description |
|---|---|
| ① | Output Voltage<br>e.g.1.8V=①:V, ②:1,③:8 |
| ② | Package:<br>SOT-23-5L=K5<br>DFN1X1-4L=H1 |

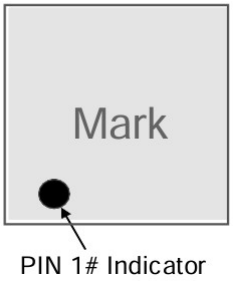
## Pin Configuration

**SOT-23-5L**




**DFN1X1-4L**




**SOT-23-5L & DFN1X1-4L**

| Pin Number | | Pin Name | Function |
|---|---|---|---|
| SOT-23-5L | DFN1X1-4L | | |
| 1 | 4 | $V_{IN}$ | Power input |
| 2 | 2 | GND | Ground |
| 3 | 3 | EN | Chip Enable Pin |
| 4 | - | NC | No Connection |
| 5 | 1 | $V_{OUT}$ | Output |

## Absolute Maximum Ratings ($T_A$=25℃,unless otherwise noted)

| Parameter | | Symbol | Ratings | Units |
|---|---|---|---|---|
| Input Voltage | | $V_{IN}$ | -0.3~8 | V |
| Output Voltage | | $V_{OUT}$ | -0.3~5 | V |
| EN Pin Withstand Voltage | | $V_{EN}$ | -0.3~$V_{IN}$ +0.3 | V |
| Output Current | | $I_{OUT}$ | 500 | mA |
| Power Dissipation | SOT-23-5L | $P_D$ | 500 | mW |
| | DFN1X1-4L | | 530 | mW |
| Storage Temperature | | $T_{STG}$ | -65~+150 | °C |
| ESD | | HBM | +4000 | V |
| | | CDM | +1500 | V |

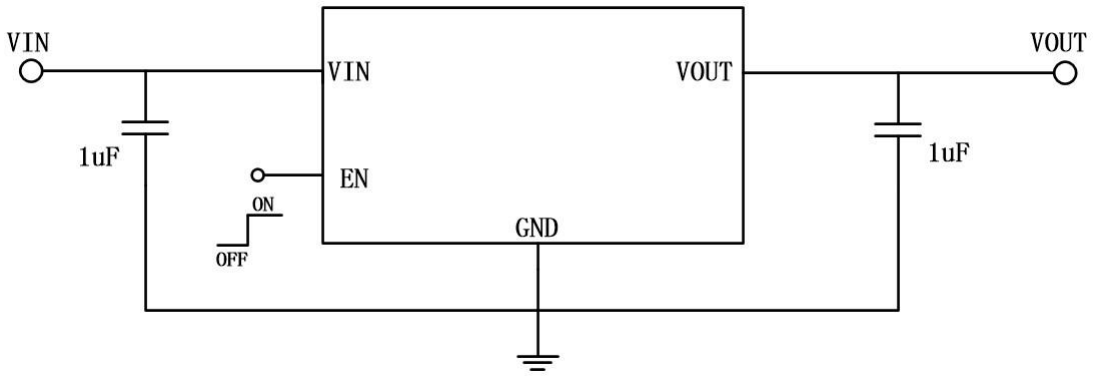
## Recommended Operating Conditions

| Parameter | Min. | Nom. | Max. | Units |
|---|---|---|---|---|
| Supply voltage at $V_{IN}$ | 2 | | 7 | V |
| Operating junction temperature range, $T_J$ | | 150 | | °C |

**Electrical Characteristics ($V_{IN}$=$V_{OUT}$+1V, $C_{IN}$=$C_{OUT}$=1μF，$T_A$=25℃,unless otherwise specified)**

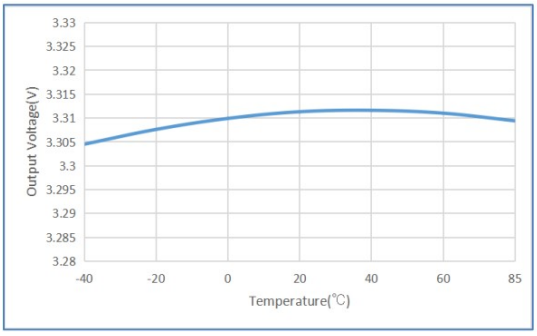
| Parameter | Symbol | Conditions | | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|---|
| Input Voltage | $V_{IN}$ | | | 2 | | 7 | V |
| Output Voltage Range | $V_{OUT}$ | | | $V_{OUT}$*0.99 | | $V_{OUT}$*1.01 | V |
| Dropout Voltage | $V_{DROP}$ | $I_{OUT}$ =100mA | | | 100 | 120 | mV |
| | | $I_{OUT}$ =500mA | | | 650 | 700 | mV |
| Supply Current | $I_{SS}$ | Non-Loaded | | | 40 | 50 | μA |
| Shutdown Current | $I_{ST}$ | EN=GND | | | 0.01 | 0.05 | μA |
| Enable The Low Threshold | $V_{ENL}$ | | | | | 0.4 | V |
| Enable The High Threshold | $V_{ENH}$ | | | 1.2 | | | V |
| Load Adjustment Degree | $\Delta V_{OUT}$ | 1mA≤$I_{OUT}$≤100mA | | | 5 | 20 | mV |
| Line Regulation | $\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta V_{IN}}$ | $I_{OUT}$ =10mA<br>$V_{OUT}$ +1V≤$V_{IN}$≤7V | | | 0.03 | 0.1 | %/V |
| Temperature Coefficient | $\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta T_A}$ | $I_{OUT}$=30mA,<br>0°C≤$T_A$≤70°C | | | ±100 | | ppm |
| Power Supply Rejection Ratio | PSRR | $V_{IN}$=5V,<br>$I_{OUT}$=10mA<br>$V_{OUT}$=3.3V | f=1KHz | | 80 | | dB |
| | | | f=10KHz | | 70 | | dB |
| Thermal Turn-Off Temperature | $T_{SD}$ | Rise In Temperature | | | 150 | | °C |
| Thermal Disconnection Is Delayed | $\Delta T_{SD}$ | Temperature Drop | | | 20 | | °C |

## Typical Application

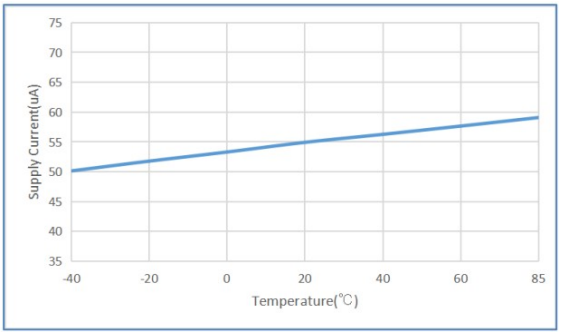


## Typical Performance Characteristics

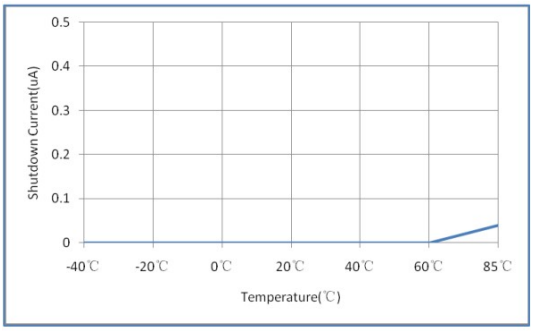
（$V_{IN}$=4.3V;$I_{OUT}$=1mA,$V_{OUT}$=3.3V, $C_{IN}$=$C_{OUT}$=1uF, TA=25℃）



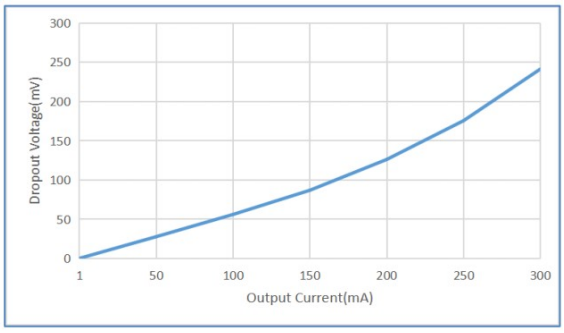

输出电压与温度的关系



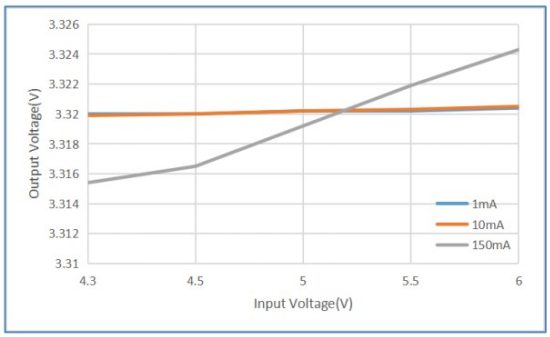

电源电流与温度



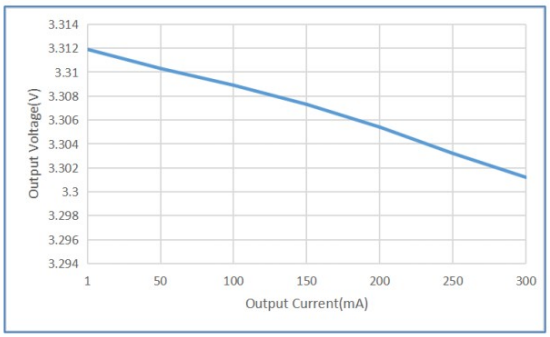

关闭电流与温度



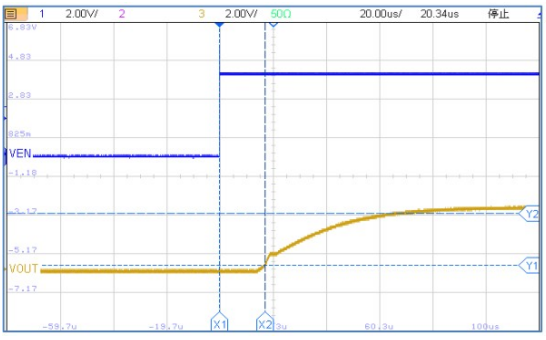

输出电压与输出电流的关系



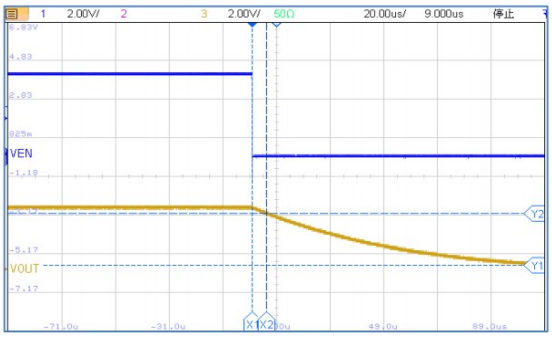

输出电压与输入电压




输出电压与输出电流

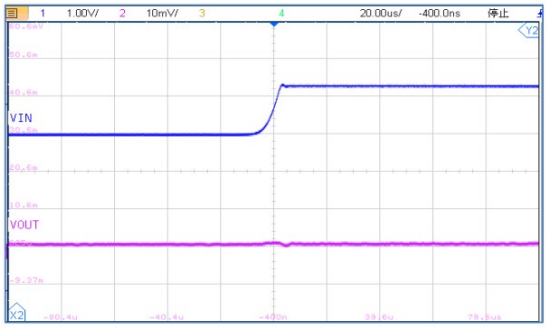



开启速度 VS EN 电压（IOUT=30mA）



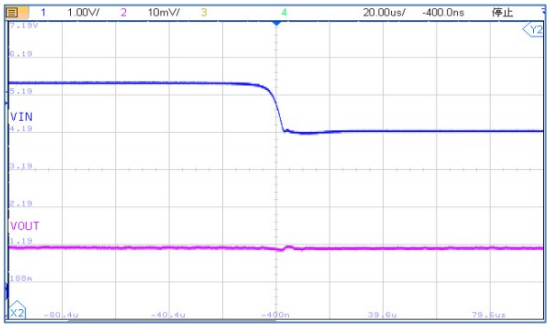

关闭速度与 EN 电压（IOUT=30mA

## Typical Performance Characteristics



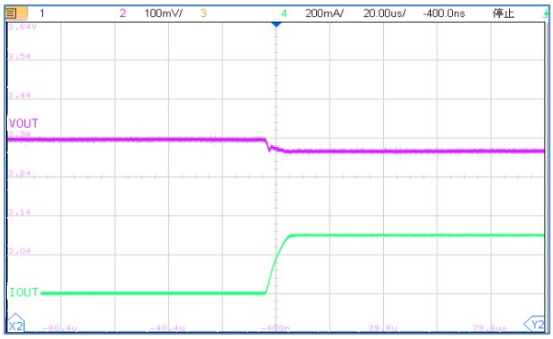

线路瞬态响应

$V_{IN}$=4.3V-5.5V;$I_{OUT}$=1mA,$V_{OUT}$=3.3V



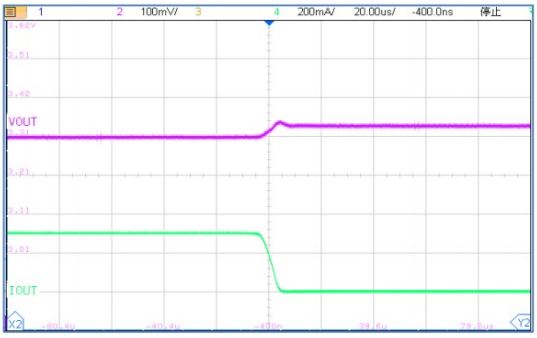

线路瞬态响应

$V_{IN}$=5.5V-4.3V;$I_{OUT}$=1mA,$V_{OUT}$=3.3V




负载瞬态响应

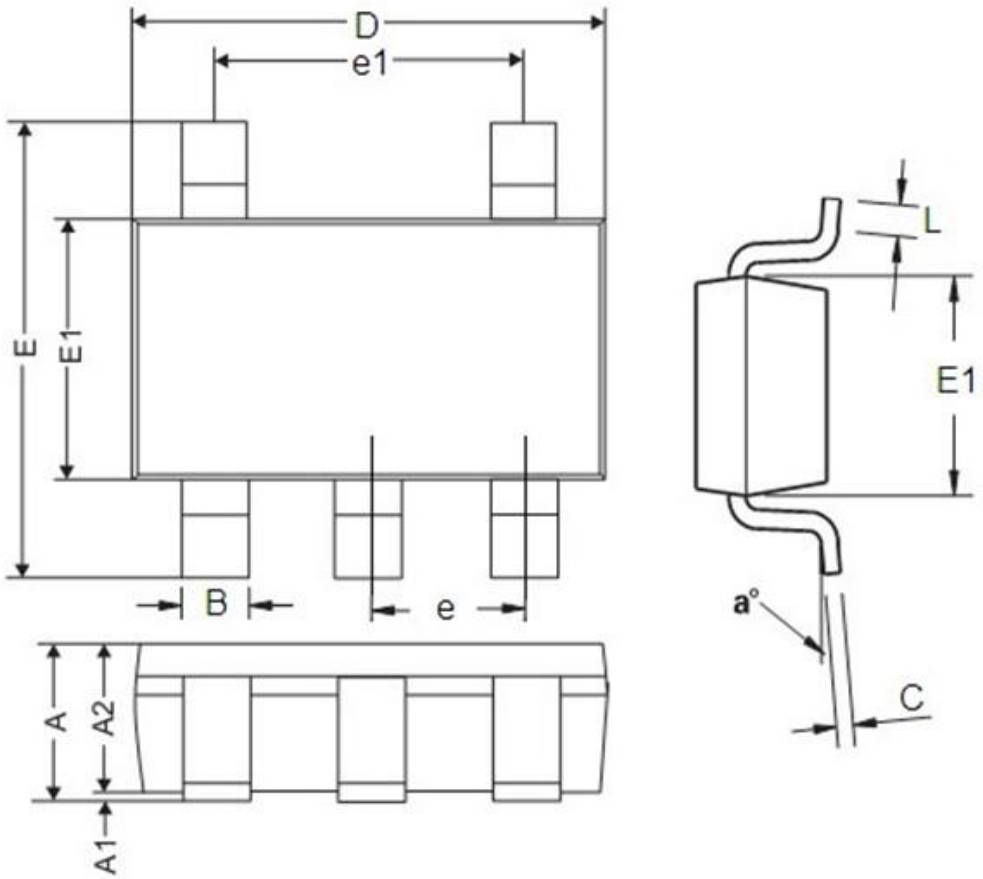
$V_{IN}$=4.3V;$I_{OUT}$=1mA-300mA,$V_{OUT}$=3.3V




负载瞬态响应

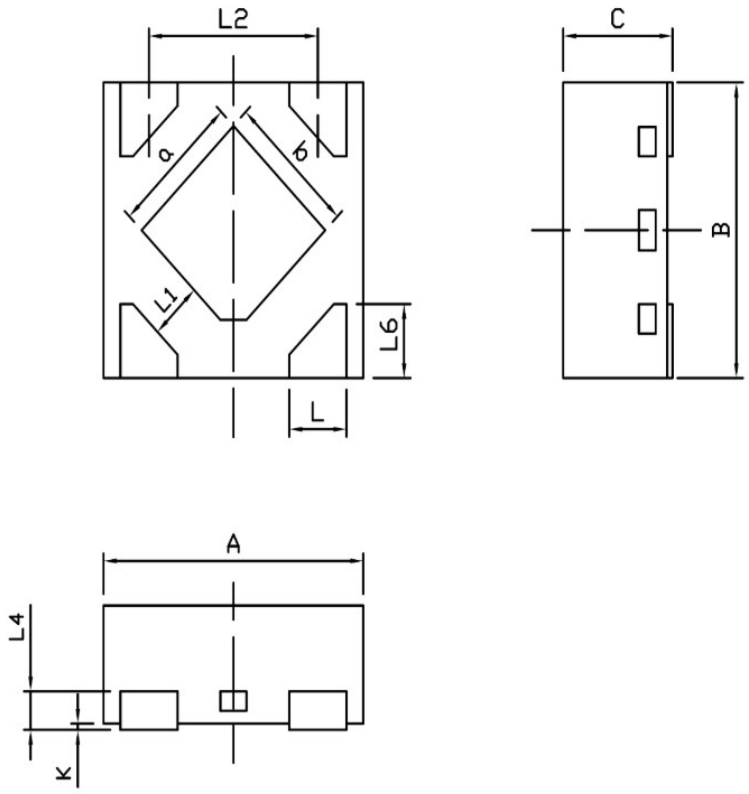
$V_{IN}$=4.3V;$I_{OUT}$=300mA-1mA,$V_{OUT}$=3.3V

## SOT-23-5L Package Outline Dimensions




| Symbol | Dimensions In Millimeters | |
|---|---|---|
| | Min. | Max. |
| A | 1.050 | 1.450 |
| A1 | 0 | 0.150 |
| A2 | 0.900 | 1.300 |
| B | 0.250 | 0.500 |
| C | 0.100 | 0.250 |
| D | 2.800 | 3.100 |
| E | 2.600 | 3.100 |
| E1 | 1.500 | 1.800 |
| e | 0.950TYP | |
| e1 | 1.900TYP | |
| L | 0.100 | 0.600 |
| θ | 0° | 30° |

## DFN1X1-4L Package Outline Dimensions




| Symbol | Dimensions In Millimeters | |
|---|---|---|
| | Min. | Max. |
| A | 0.95 | 1.05 |
| B | 0.95 | 1.05 |
| C | 0.35 | 0.45 |
| L | 0.17 | 0.27 |
| L1 | 0.15 | - |
| L2 | 0.65REF | |
| L4 | 0.127REF | |
| L6 | 0.2 | 0.3 |
| K | - | 0.05 |
| a | 0.43 | 0.53 |
| b | 0.43 | 0.53 |

**Attention：**

- GreenPower Electronics reserves the right to improve product design function and reliability without notice.
- Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.
- GreenPower Electronics products belong to consumer electronics or other civilian electronic products.