

Features

- 2μA Ground Current at no Load
- ±2% Output Accuracy
- 200mA Output Current
- Wide Operating Input Voltage Range: 2V to 36V
- Dropout Voltage: 0.65V at 100mA ($V_{OUT}=5V$)
- Support Fixed Output Voltage 1.8V, 3.3V, 5V, 9V, 12V
- Stable with Ceramic or Tantalum Capacitor
- Current Limit Protection
- Over-Temperature Protection
- SOT-23-5 Package Available

Applications

- Portable, Battery Powered Equipment
- Low Power Microcontrollers
- Laptop, Palmtops and PDAs
- Wireless Communication Equipment
- Audio/Video Equipment
- Car Navigation Systems
- Industrial Controls
- Weighting Scales
- Meters
- Home Automation

General Description

The TP362C is a low-dropout (LDO) voltage regulators with enable function offering the benefits of high input voltage, low-dropout voltage, low-power consumption, and miniaturized packaging.

The features of low quiescent current as low as 2μA and zero disable current is ideal for powering the battery equipment to a longer service life. The TP362C

is stable with the ceramic output capacitor over its wide input range from 2V to 36V and the entire range of output load current.

Ordering Information

TP362C50S5

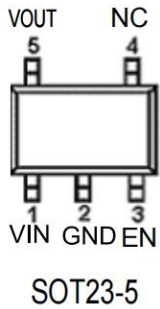
S5:SOT23-5 Package

Output voltage: 12=1.2V
15=1.5V
18=1.8V
30=3.0V
33=3.3V
50=5.0V
A9=9V
B2=12V

Marking

TP362C12S5 Marking: **PH12**
TP362C15S5 Marking: **PH15**
TP362C18S5 Marking: **PH18**
TP362C30S5 Marking: **PH30**
TP362C33S5 Marking: **PH33**
TP362C50S5 Marking: **PH50**

PIN CONFIGURATION



| Pin No | Pin Name | Pin Function |
|--------|----------|--------------------------|
| 1 | VIN | Input of Supply Voltage. |
| 2 | GND | Ground |
| 3 | EN | Enable Control Input. |
| 4 | NC | No Internal Connection. |
| 5 | VOUT | Output of the Regulator |

Typical Application Circuit

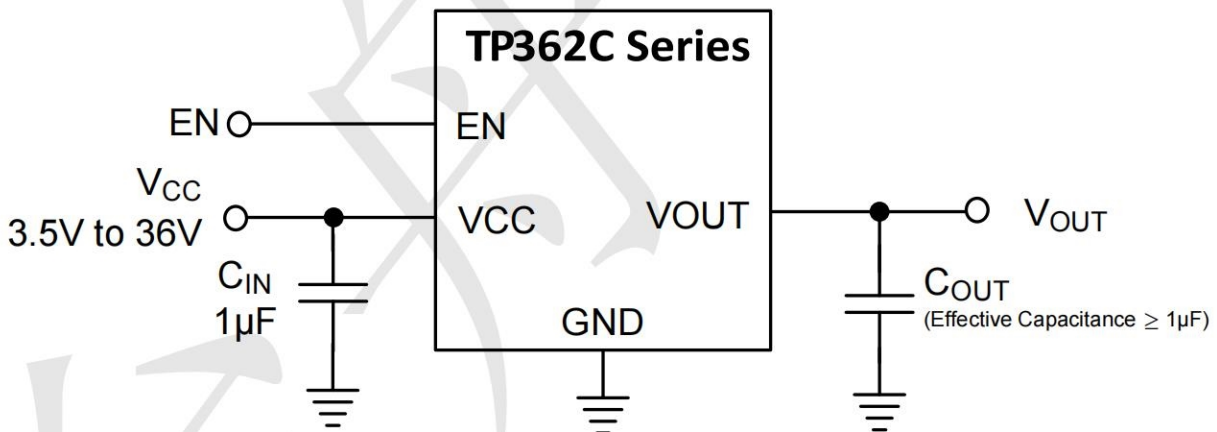
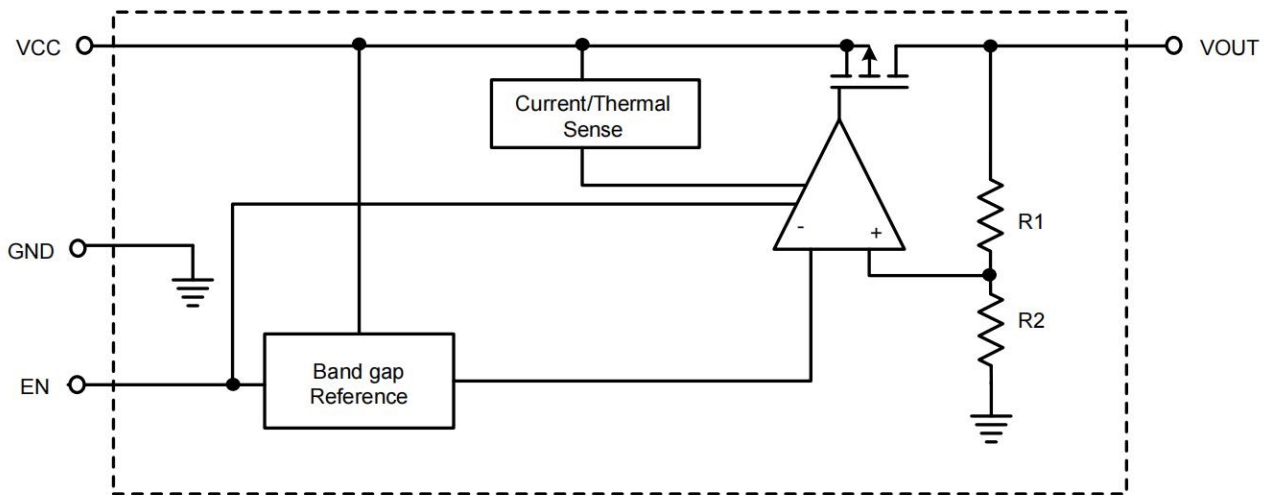


Figure 1: Application circuit of Fixed V_{OUT} LDO with enable and sense functions

BLOCK DIAGRAM



Absolute Maximum Ratings

| | |
|--|---------------|
| VIN Pin to GND Pin Voltage | -0.3V to 40V |
| VOUT Pin to GND Pin Voltage TP362CA1, B2 ,S5 | -0.3V to 14V |
| TP362C18 ,33,50 S5 | -0.3V to 6.0V |
| VOUT Pin to VIN Pin Voltage | -40V to 0.3V |
| Storage Temperature Range | -60°C~150°C |
| Lead Temperature (Soldering, 10 sec) | 260°C |
| Junction Temperature | 150°C |
| Operating Ambient Temperature Range T_A | -40°C~85°C |
| SOT-23-5, θ_{JA} | 218.1°C/W |
| SOT-23-5, θ_{JC} | 28.5°C/W |

(Assume no Ambient Airflow, no Heatsink)

Recommended Operating Conditions

| | |
|----------------------------------|----------------|
| Supply Input Voltage | 3.5V to 36V |
| Junction Temperature Range | -40°C to 125°C |
| Ambient Temperature Range | -40°C to 85°C |

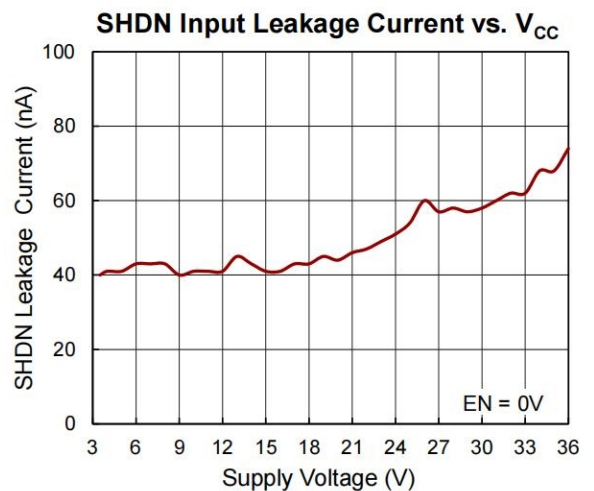
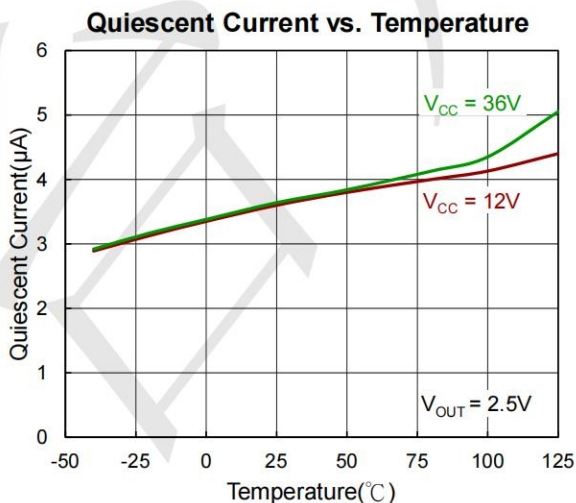
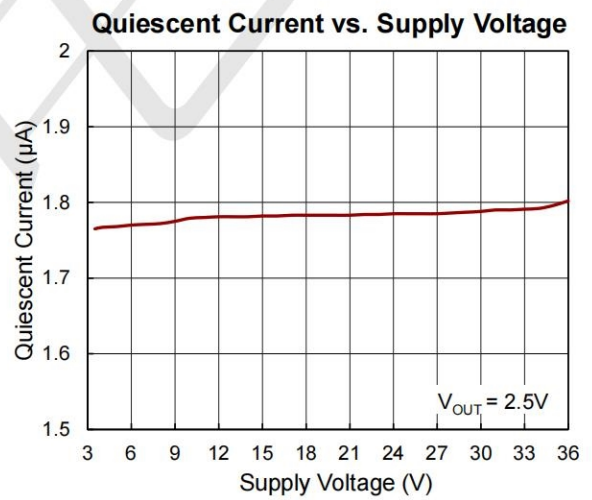
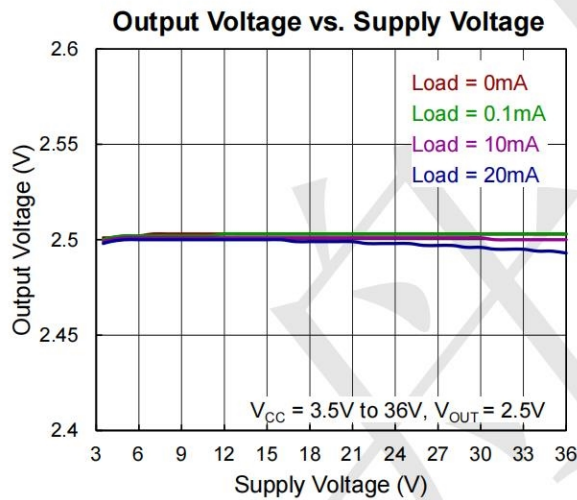
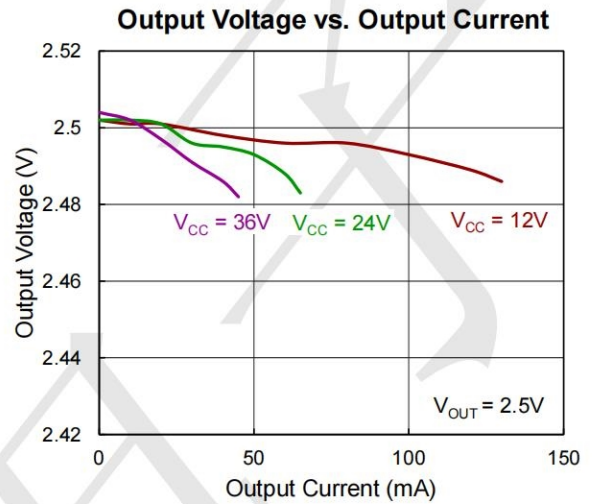
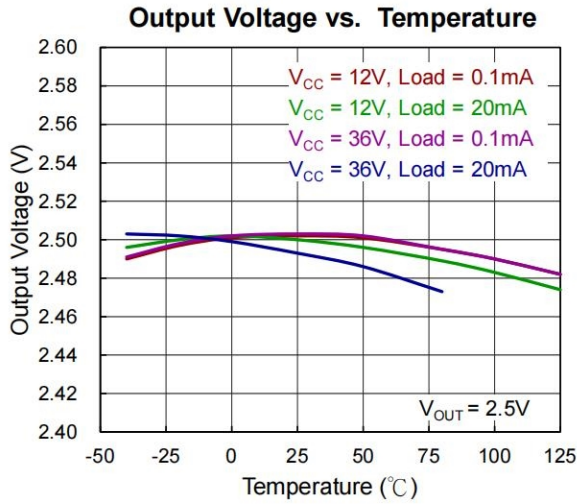
Electrical Characteristics

($V_{IN}=15V$, $V_{EN}=5V$, $T_A=25^{\circ}C$, unless otherwise specified) (Note 1)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--|------------------|---|-----|------|-----|-------------|
| Supply Voltage | V_{IN} | | 2 | -- | 36 | V |
| DC Output Voltage Accuracy | | $I_{LOAD} = 0.1mA$ | -2 | | 2 | % |
| Dropout Voltage ($I_{LOAD} = 100mA$) | V_{DROP} | $V_{OUT} \geq 5V$ | -- | 0.66 | | V |
| | $V_{DROP_3.3V}$ | $V_{OUT} = 3.3V$ | | 0.75 | | |
| | $V_{DROP_1.8V}$ | $V_{OUT} = 1.8V$ | | 1 | | |
| Ground Current ($I_{LOAD} = 0mA$) | I_Q | $V_{OUT} \leq 5V$ | | 2 | | μA |
| | I_{QH} | $5V < V_{OUT} \leq 12V$ | | 4.5 | | |
| Shutdown Ground Current | I_{SD} | $V_{EN} = 0V$, $V_{OUT} = 0V$ | | 0.01 | 0.5 | μA |
| V_{OUT} Shutdown Leakage Current | I_{LEAK} | | | 0.01 | 0.5 | μA |
| Enable Threshold Voltage | V_{IH} | EN Rising | | | 2 | V |
| | V_{IL} | EN Falling | 0.6 | | | |
| EN Input Current | I_{EN} | $V_{EN} = 36V$ | | 10 | 100 | nA |
| Line Regulation | Δ_{LINE} | $I_{LOAD} = 1mA$, $5 \leq V_{IN} \leq 36V$ | -- | 0.3 | | % |
| Load Regulation | Δ_{LOAD} | $1mA \leq I_{LOAD} \leq 0.2A$ | | 0.1 | | % |
| Output Current Limit | I_{LIM} | $V_{OUT} = 0$ | 200 | 300 | | mA |
| Power Supply Rejection Ratio | PSRR | $V_{OUT} = 5V$, $I_{LOAD} = 1mA$, $V_{IN} = 12V$, $f = 100Hz$ | | 70 | | dB |
| Thermal Shutdown Temperature | T_{SD} | $I_{LOAD} = 10mA$ | -- | 160 | -- | $^{\circ}C$ |
| Thermal Shutdown Hysteresis | ΔT_{SD} | | | 15 | | $^{\circ}C$ |

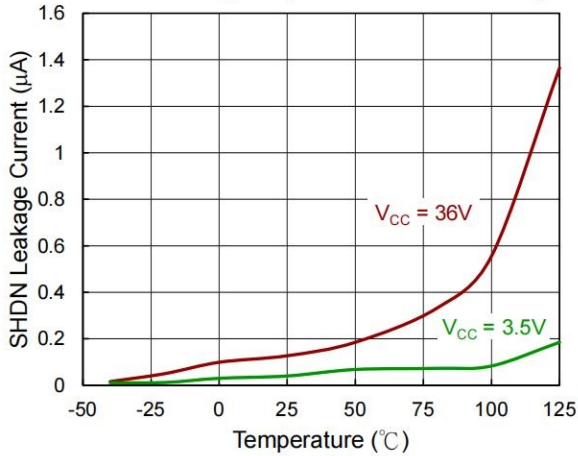
Note 1. Specifications are production tested at $T_A=25^{\circ}C$. Specifications over the $-40^{\circ}C$ to $85^{\circ}C$ operating temperature range are assured by design, characterization and correlation with Statistical Quality Controls (SQC).

Typical Operating Characteristics

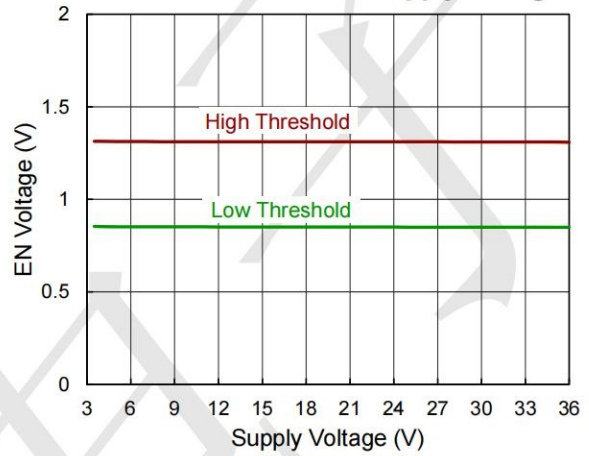




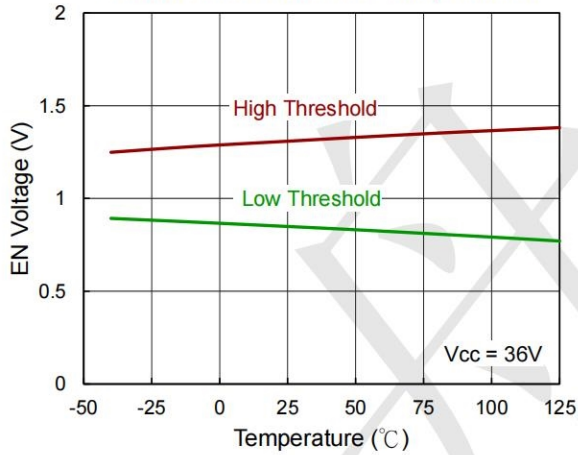
SHDN Leakage Input Current vs. Temp.



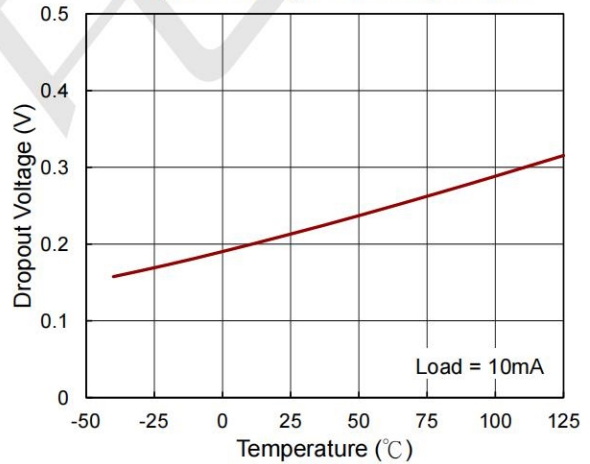
Enable Threshold vs. Supply Voltage



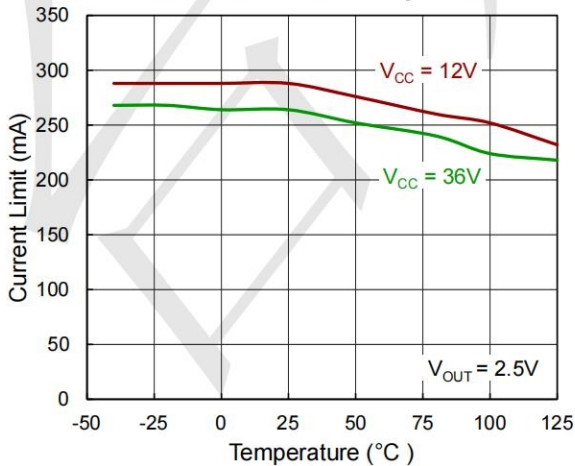
Enable Threshold vs. Temperature



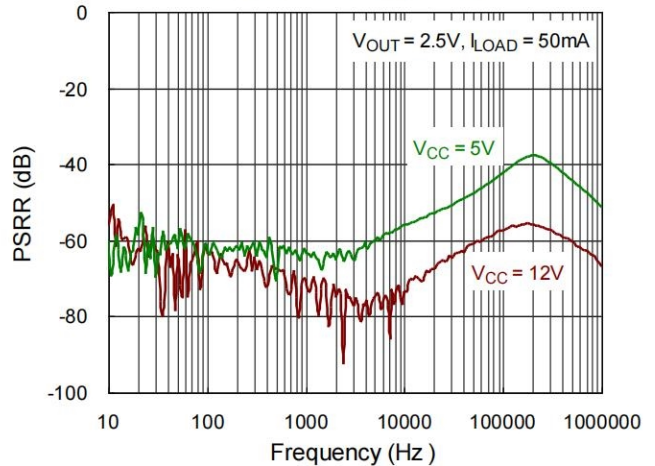
Dropout Voltage vs. Temperature

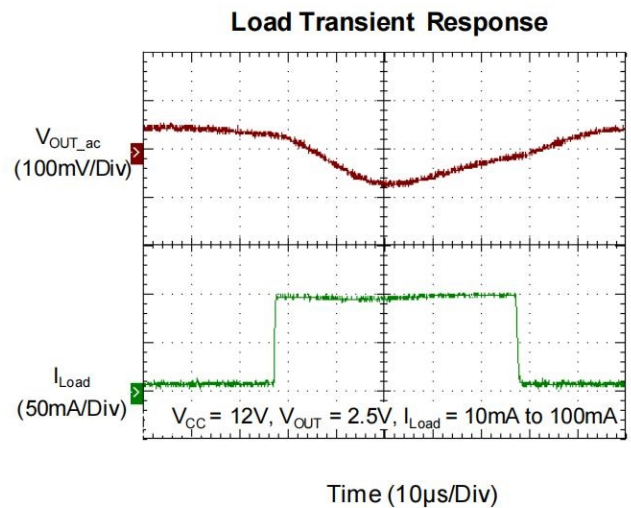
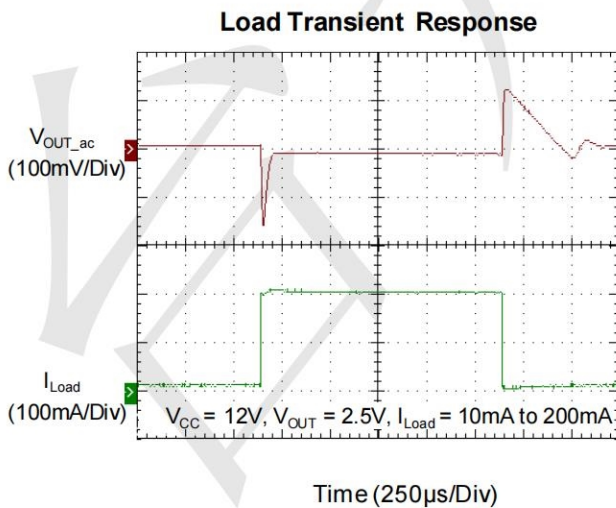
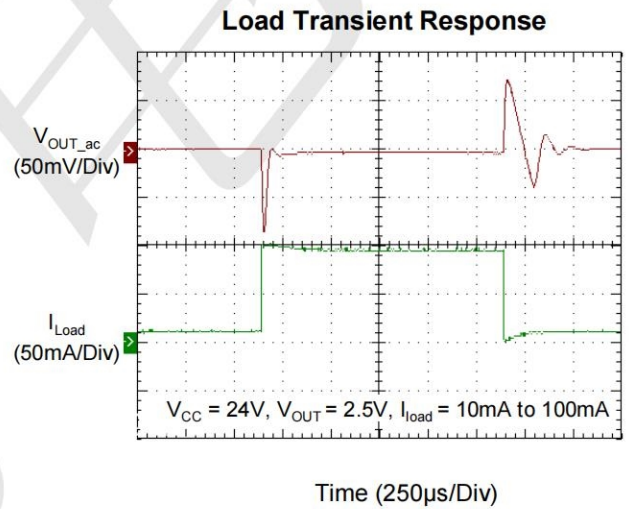
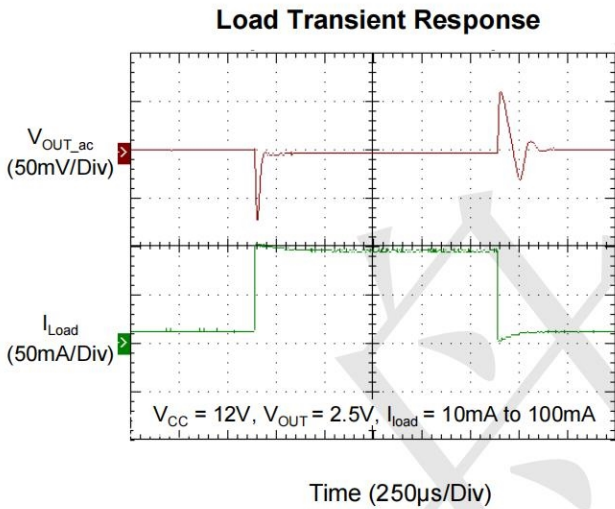
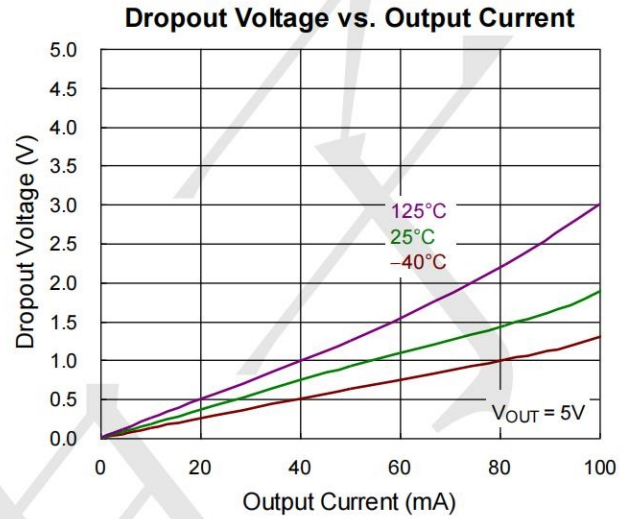
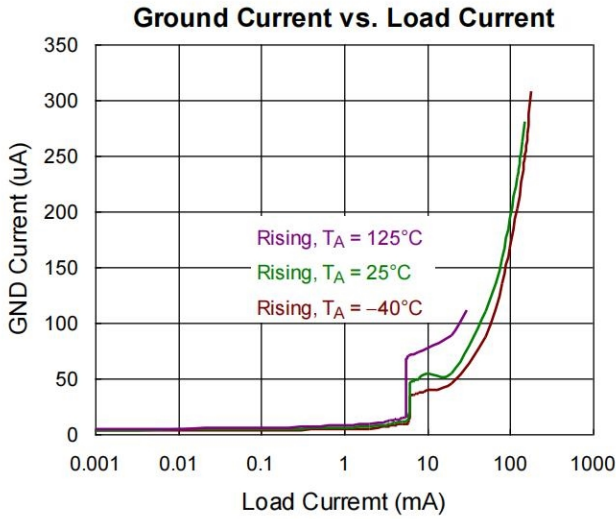


Current Limit vs. Temperature

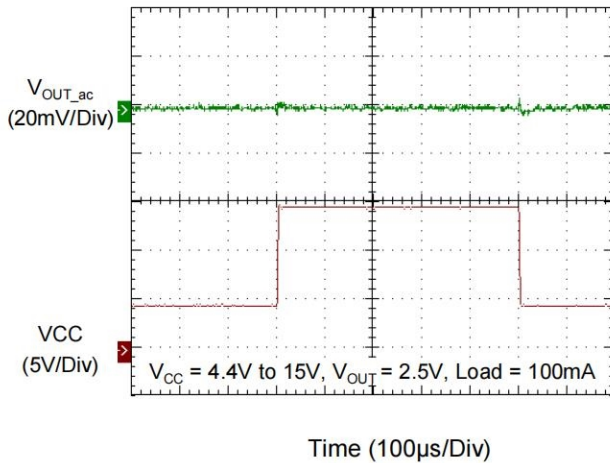


PSRR vs. Frequency

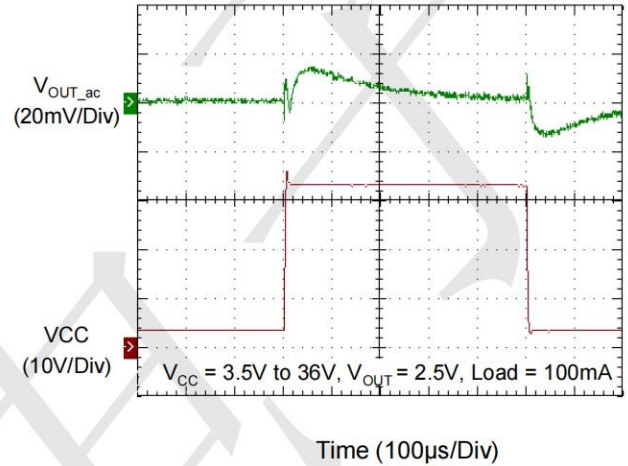




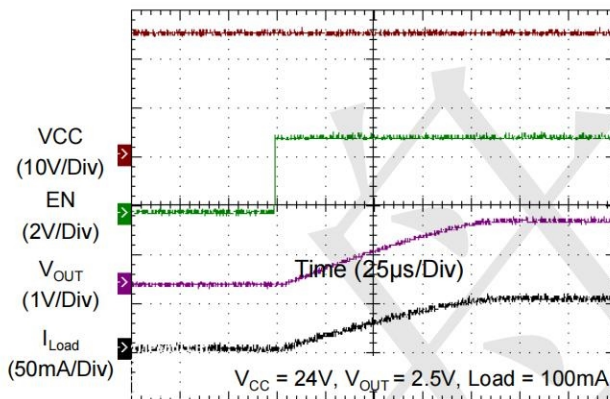
Line Transient Response



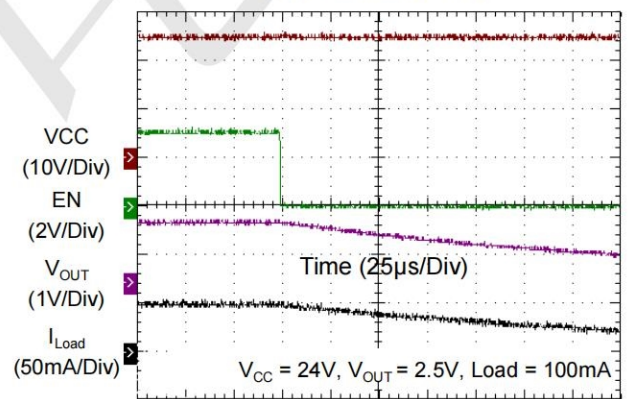
Line Transient Response



Power On from EN



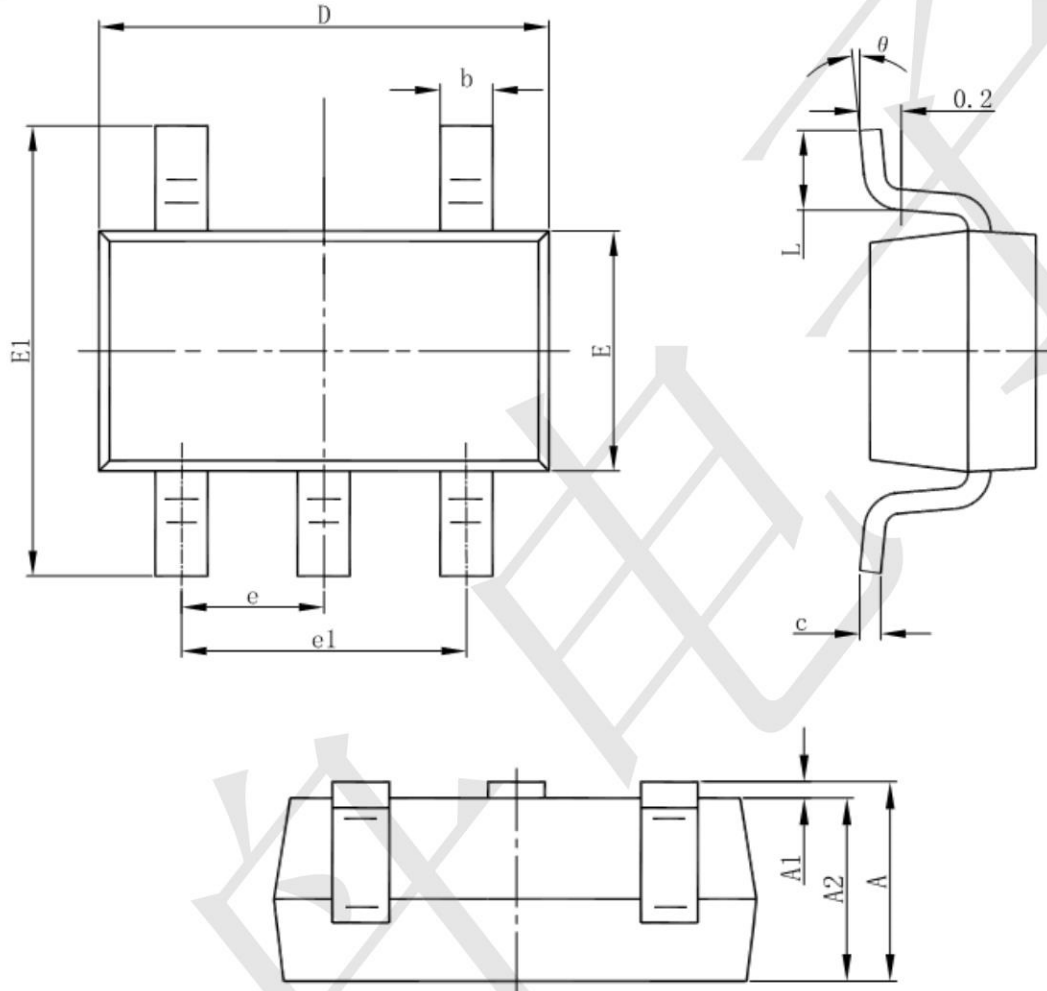
Power Off from EN





Package informantion

SOT23-5



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E | 1.500 | 1.700 | 0.059 | 0.067 |
| E1 | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950(BSC) | | 0.037(BSC) | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0° | 8° | 0° | 8° |