

Features

- 10 μ A Ground Current at no Load
- $\pm 2\%$ Output Accuracy
- 50mA Output Current
- Wide Operating Input Voltage Range: 2V to 16V
- Dropout Voltage: 0.17V at 50mA ($V_{OUT}=5V$)
- Support Fixed Output Voltage 2.5V, 3.0V, 3.3V, 5V,
- Stable with Ceramic or Tantalum Capacitor
- Current Limit Protection
- Over-Temperature Protection
- SOT-23-5 Package

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

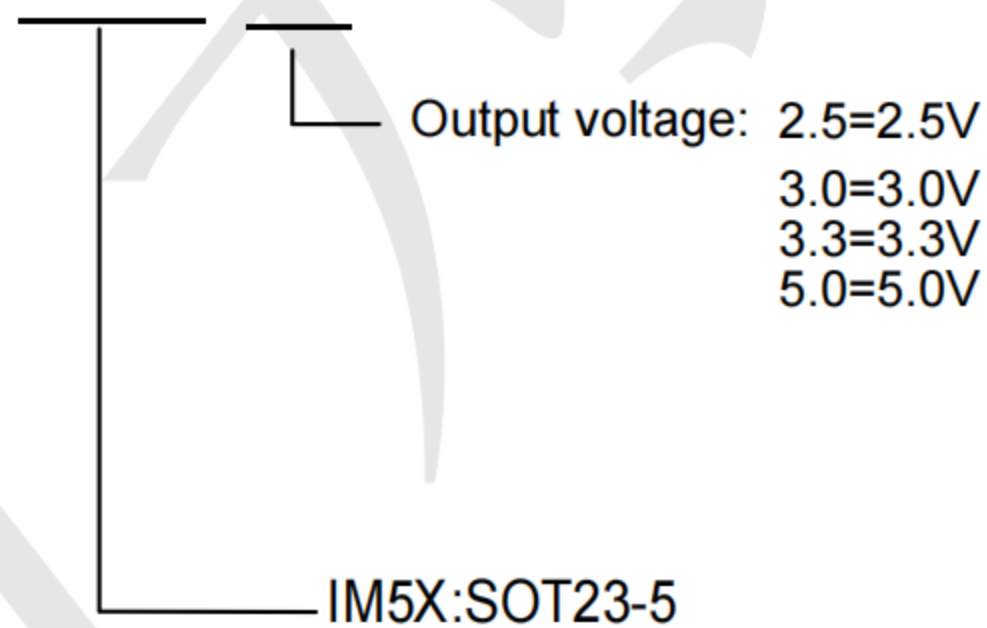
The Device is a low-dropout (LDO) voltage regulator with enable function offering the benefits of high input voltage, low-dropout voltage, low-power consumption, and miniaturized packaging.

The features of low quiescent current as low as 10 μ A and zero disable current is ideal for powering the battery equipment to a longer service life. The Device

is stable with the ceramic output capacitor over its wide input range from 2V to 16V and the entire range of output load current.

Ordering Information

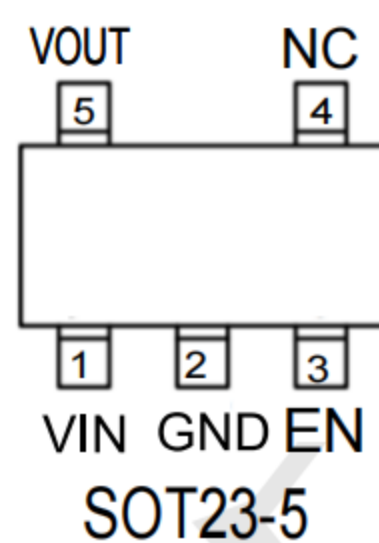
LP2980IM5X-5.0



Marking

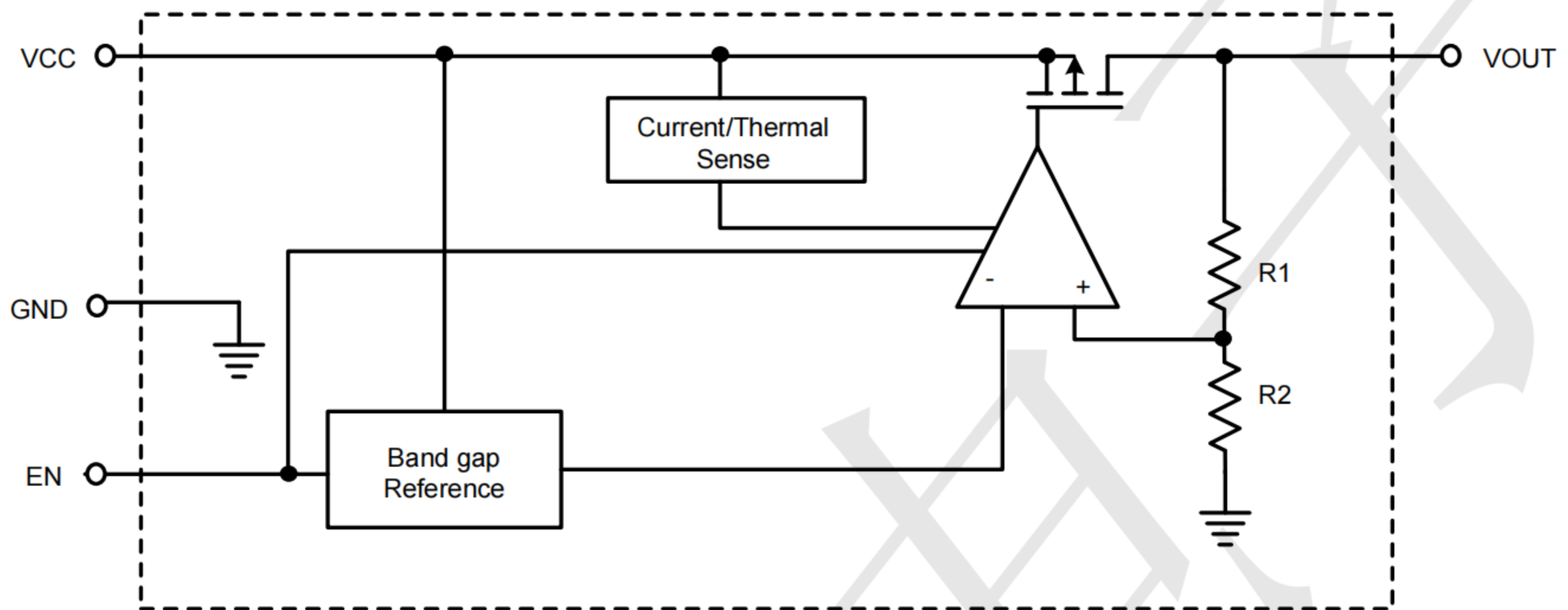
LP2980IM5X-2.5 Marking: L0NB
LP2980IM5X-3.0 Marking: L02B
LP2980IM5X-3.3 Marking: L00B
LP2980IM5X-5.0 Marking: L01B

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 |

BLOCK DIAGRAM



Absolute Maximum Ratings

| | |
|---|------------------|
| VIN Pin to GND Pin Voltage | -0.3V to 20V |
| VOUT Pin to GND Pin Voltage | -0.3V to 6.0V |
| VOUT Pin to VIN Pin Voltage | -20V to 0.3V |
| Package Thermal Resistance (Note 2) | |
| SOT-23-5, SOT-23-3, θ_{JA} | 200 °C /W |
| Lead Temperature (Soldering, 10 sec.) | 260 °C |
| Junction Temperature | 150 °C |
| Storage Temperature Range | -40 °C to 150 °C |
| ESD Susceptibility | |
| HBM | 2KV |
| MM | 200V |

Recommended Operating Conditions

| | |
|----------------------------------|----------------|
| Supply Input Voltage | -2.0V to 16V |
| 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 | -- | 16 | V |
| DC Output Voltage Accuracy | | $I_{LOAD} = 0.1mA$ | -2 | | 2 | % |
| Dropout Voltage ($I_{LOAD} = 50mA$) | V_{DROP} | $V_{OUT} \geq 5V$ | -- | 0.17 | | V |
| | $V_{DROP_3.3V}$ | $V_{OUT} = 3.3V$ | | 0.22 | | |
| | $V_{DROP_1.8V}$ | $V_{OUT} = 1.8V$ | | 0.25 | | |
| Ground Current ($I_{LOAD} = 0mA$) | I_Q | $V_{OUT} \leq 5V$ | | 10 | 15 | μA |
| 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 | 1.1 | | | V |
| | V_{IL} | EN Falling | | | 0.4 | |
| EN Input Current | I_{EN} | $V_{EN} = 16V$ | | 10 | 100 | nA |
| Line Regulation | Δ_{LINE} | $I_{LOAD} = 1mA$, $10 \leq V_{IN} \leq 16V$ | -- | 0.3 | | % |
| Load Regulation | Δ_{LOAD} | $10mA \leq I_{LOAD} \leq 0.2A$ | | 0.3 | | % |
| Output Current Limit | I_{LIM} | $V_{OUT} = 0$ | 50 | 100 | | mA |
| Power Supply Rejection Ratio | PSRR | $V_{OUT} = 5V$, $I_{LOAD} = 30mA$, $V_{IN} = 12V$, $f = 1kHz$ | | 70 | | dB |
| Thermal Shutdown Temperature | T_{SD} | $I_{LOAD} = 10mA$ | -- | 160 | -- | $^{\circ}C$ |
| Thermal Shutdown Hysteresis | ΔT_{SD} | | | 15 | | $^{\circ}C$ |

Typical Application Circuit

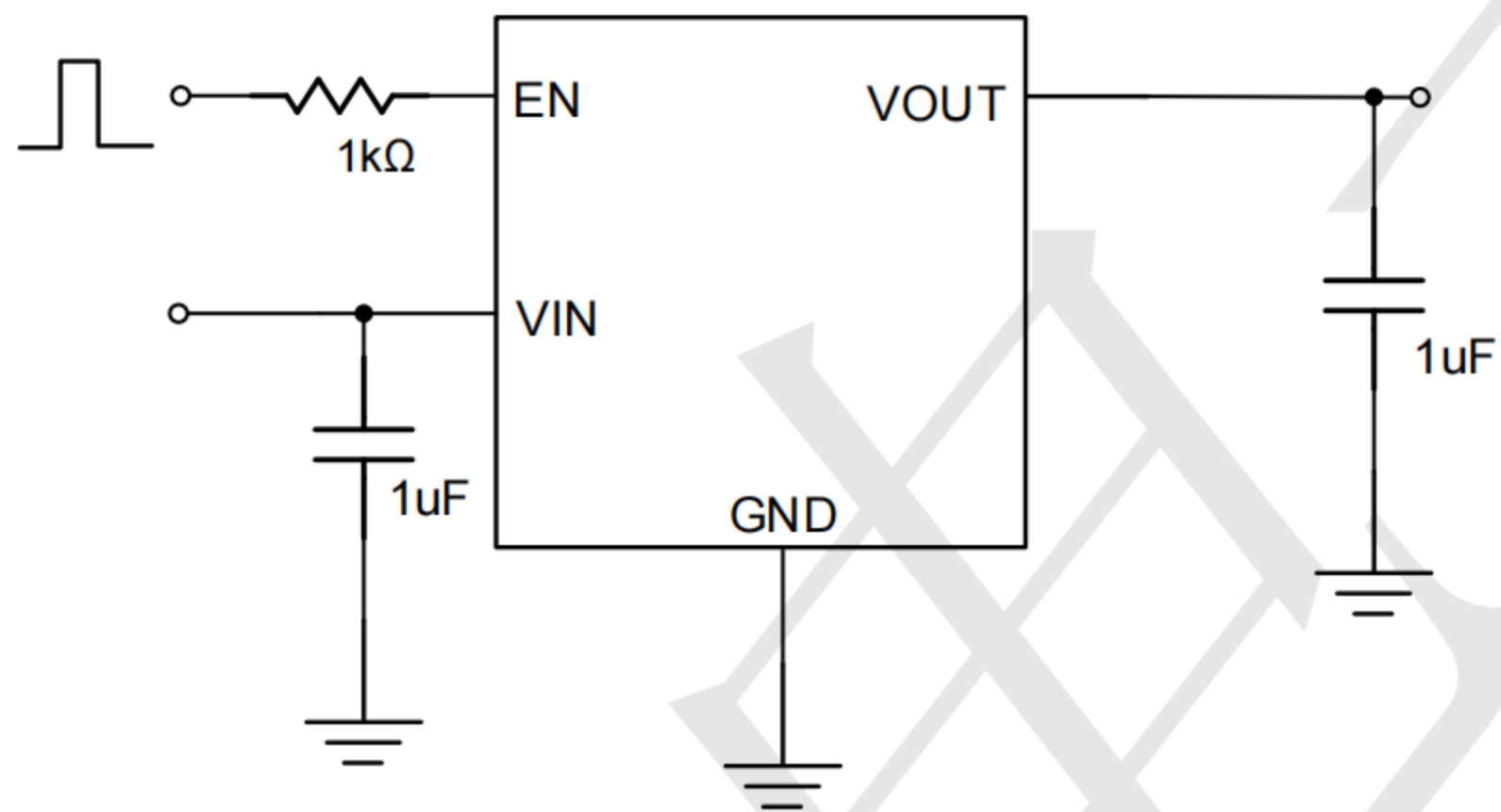
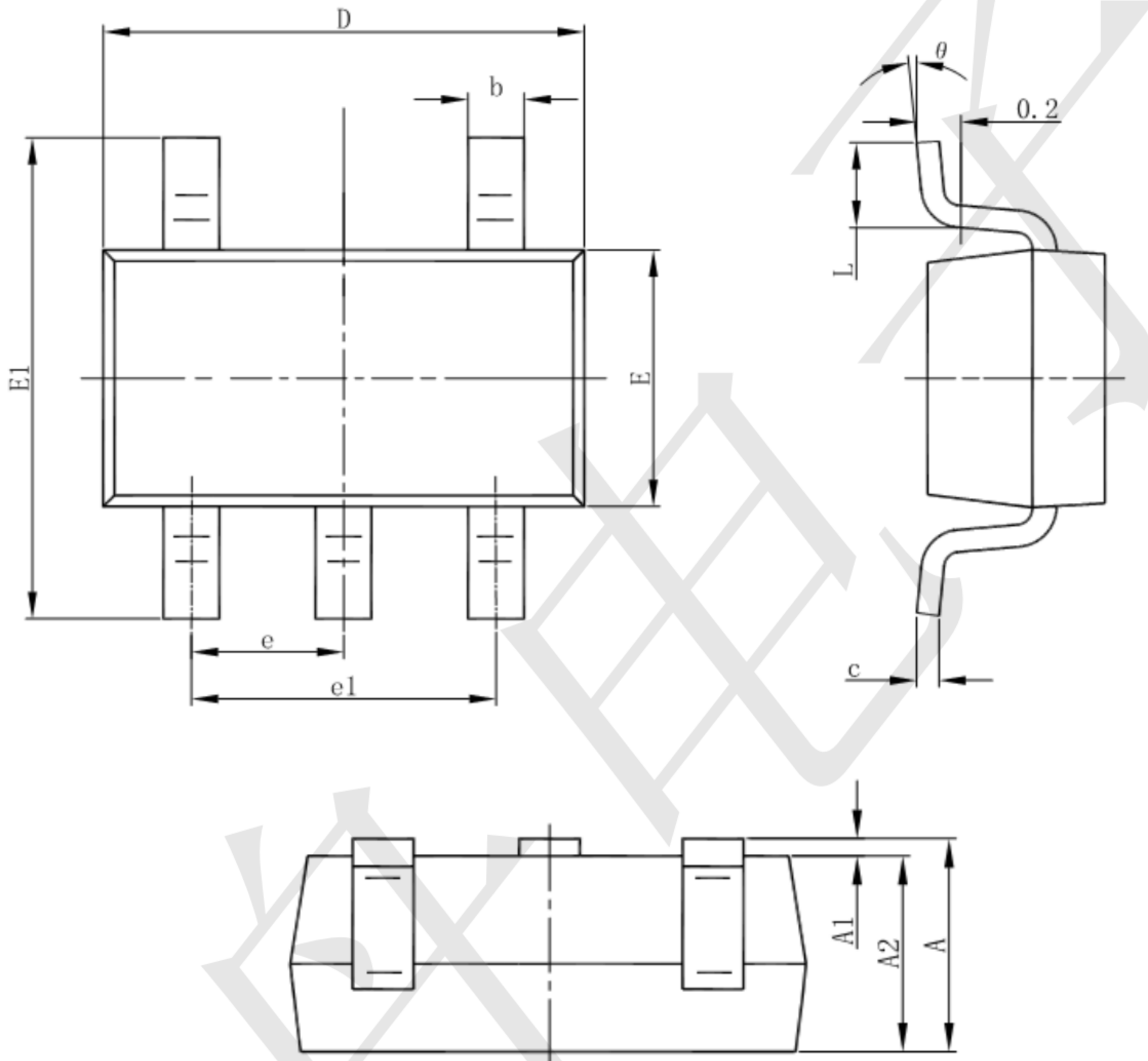


Figure 1: Application circuit of Fixed VOUT LDO with enable function



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 |
| theta | 0° | 8° | 0° | 8° |