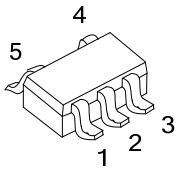
# ULTRA-LOW-NOISE, HIGH-SPEED, LOW-DROPOUT, 300mA LINEAR REGULATOR



SOT-25

## ■ DESCRIPTION

As a low dropout linear regulator, the UTC **L1127** only needs low input voltage (2.5~6V), and can deliver current to 300mA for setting the output voltage.

The UTC **L1127** is ideal for being used in such battery-powered equipments notebook, personal computer and mother board. Its typical dropout voltage is 200mV at loading current 300mA.

**L1127** has 1.0V, 1.2V, 1.5V, 1.8V, 2.5V, 3.0V, 3.3V, 4.2V, 4.75V, fixed voltage versions and 0.8V to 5.5V adjustable voltage versions.

To protect itself against current over-loads and over temperature, the **L1127** has short current limit and thermal shutdown functions.

## ■ FEATURES

* Operating Voltage: 2.5V~6V
* Low Voltage Dropout
* Output Current Guaranteed 300mA
* For Setting Output Voltage Two Modes
  - Fixed mode : 1.0V,1.2V,1.5V,1.8V, 2.5V, 3.0V, 3.3V, 4.2V, 4.75V
  - ADJ mode: Adjustable Output Voltage 0.8V~5.5V
* Internal Current Limit Protection
* With Soft-Start
* Internal Thermal Protection
* Work Stably with Low ESR Ceramics Capacitor

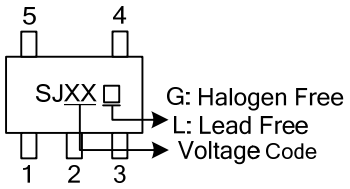
## ■ ORDERING INFORMATION

| Ordering Number | | Package | Packing |
|---|---|---|---|
| Lead Free | Halogen Free | | |
| L1127L-xx-AF5-R | L1127G-xx-AF5-R | SOT-25 | Tape Reel |

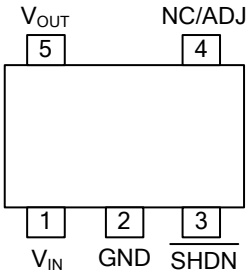
Note: xx: Output Voltage, refer to Marking Information.

L1127L-xx-AF5-R
- (1)Packing Type — (1) R: Tape Reel
- (2)Package Type — (2) AF5: SOT-25
- (3)Output Voltage Code — (3) xx: Refer to Marking Information
- (4)Lead Free — (4) G: Halogen Free, L: Lead Free

## ■ MARKING INFORMATION

| PACKAGE | VOLTAGE CODE | MARKING |
|---|---|---|
| SOT-25 | 10:1.0V<br>12:1.2V<br>15:1.5V<br>18:1.8V<br>25:2.5V<br>30:3.0V<br>33:3.3V<br>42:4.2V<br>4H: 4.75V |  |

## ■ PIN CONFIGURATION

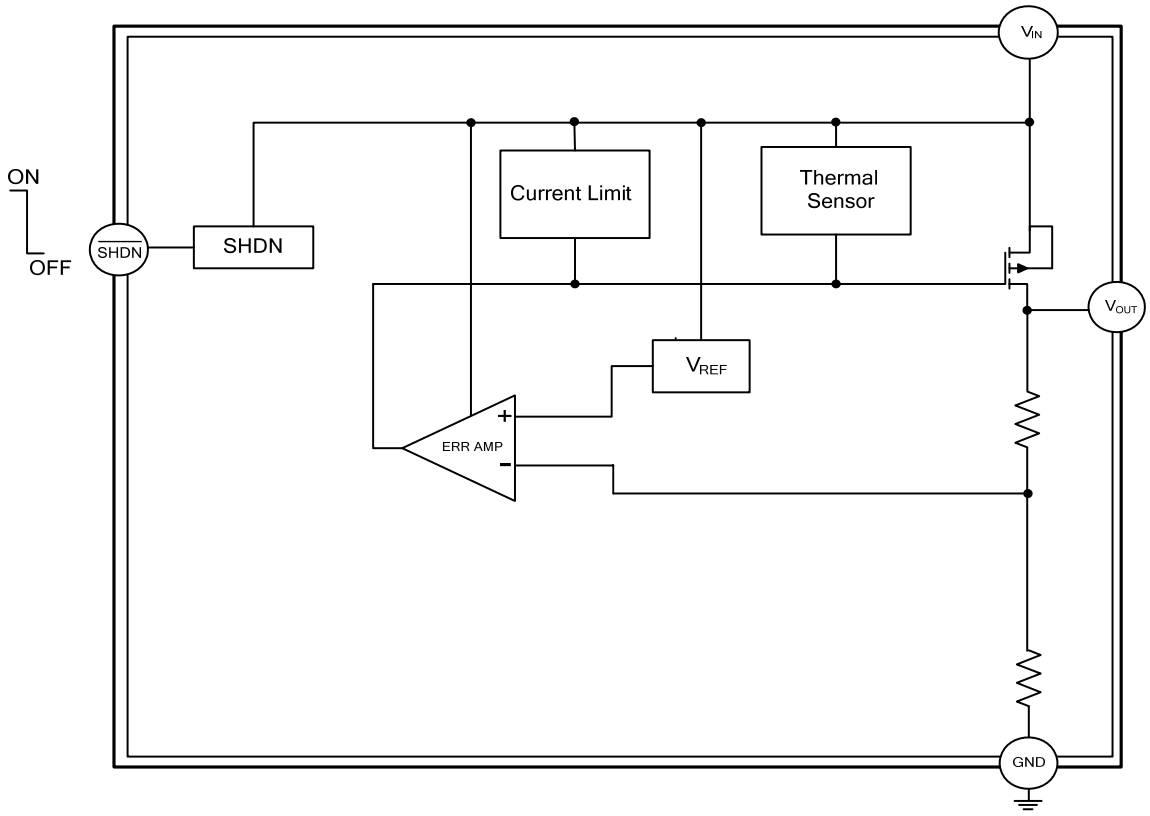



## ■ PIN DESCRIPTION

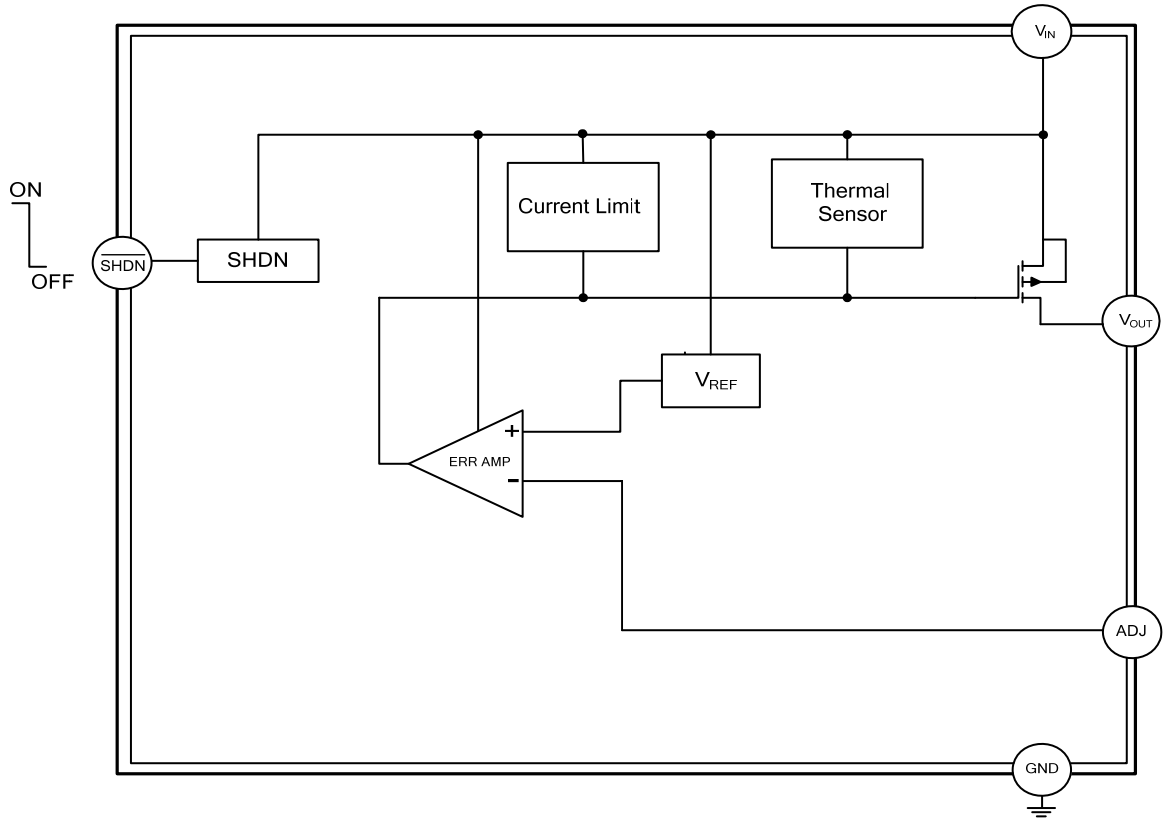
| NO. | PIN NAME | I/O | DESCRIPTION |
|---|---|---|---|
| 1 | $V_{IN}$ | I | Voltage supply |
| 2 | GND | | Ground |
| 3 | $\overline{SHDN}$ | I | Control pin for shutdown; logic high: enable ;logic low: shutdown |
| 4 | NC. | | |
| | ADJ | | This pin is connected to an external resistor divider, turns to adjustable output voltage mode operation. |
| 5 | $V_{OUT}$ | O | Output pin |

## ■ BLOCK DIAGRAM

**For Fixed Output Voltage Mode:**




**For Adjustable Output Voltage Mode:**



## ■ ABSOLUTE MAXIMUM RATING

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| $V_{IN}$ Supply Voltage ($V_{IN}$ to GND) | $V_{IN}$ | +6.5 | V |
| $\overline{SHDN}$ Input Voltage ($\overline{SHDN}$ to GND) | $V_{\overline{SHDN}}$ | -0.3 ~ +6.5 | V |
| Power Dissipation | $P_D$ | 400 | mW |
| Junction Temperature | $T_J$ | +125 | °C |
| Storage Temperature | $T_{STG}$ | -65 ~ +150 | °C |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

## ■ RECOMMENDED OPERATING CONDITIONS

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| $V_{IN}$ Supply Voltage | $V_{IN}$ | 2.5 ~ 6 | V |
| Output Voltage | $V_{OUT}$ | 0.8 ~ 5.5 | V |
| $V_{OUT}$ Output Current | $I_{OUT}$ | 0 ~ 300 | mA |
| Operating Temperature | $T_{OPR}$ | -40 ~ +85 | °C |

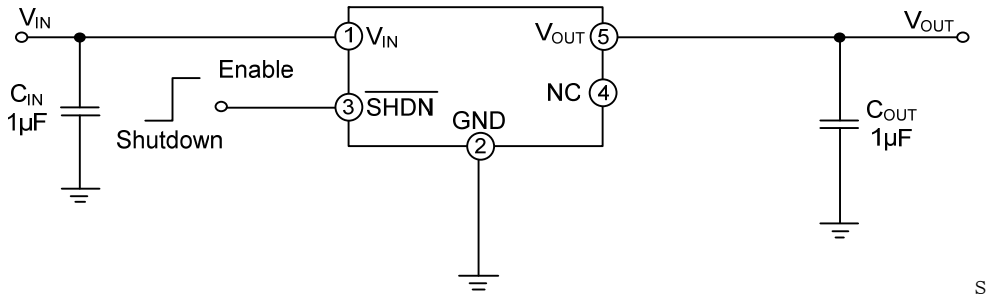
## ■ ELECTRICAL CHARACTERISTICS

($V_{IN}$ = $V_{OUT}$+0.5V (min $V_{IN}$=2.5V), $I_{OUT}$=0~300mA, $C_{IN}$ = 1μF, $C_{OUT}$ =1μF, $T_A$ = 25°C, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Output Voltage | | $V_{IN}$ = $V_{OUT}$+0.5V, 1mA≤$I_{OUT}$≤300mA | 98%x $V_{OUT}$ | | 102%x $V_{OUT}$ | V |
| Input Voltage | $V_{IN}$ | | 2.5 | | 6 | V |
| Line Regulation | $REG_{LINE}$ | $V_{OUT}$+0.5V≤$V_{IN}$≤6V,$I_{OUT}$= 10mA | | | 0.06 | %/V |
| Load Regulation | $REG_{LOAD}$ | $V_{IN}$ = $V_{OUT}$+0.5V, 1mA≤$I_{OUT}$≤300mA | | | 0.6 | %/A |
| Reference Voltage | $V_{REF}$ | $V_{IN}$ = $V_{OUT}$+0.5V, 1mA≤$I_{OUT}$≤300mA | 0.784 | 0.8 | 0.816 | V |
| Maximum Output Current | $I_{OUT(MAX)}$ | $V_{IN}$=$V_{OUT}$+0.5V, $V_{OUT}$= 0.98x$V_{OUT}$ | 300 | 400 | | mA |
| Quiescent Current | $I_Q$ | $I_{OUT}$ =10mA ~300mA | | 120 | 200 | μA |
| Dropout Voltage | $V_D$ | $V_{OUT}$ = 1.0V, $I_{OUT}$ = 300mA | | 1400 | 1500 | mV |
| | | $V_{OUT}$ = 1.2V, $I_{OUT}$ = 300mA | | 1200 | 1300 | |
| | | $V_{OUT}$ = 1.5V, $I_{OUT}$ = 300mA | | 900 | 1000 | |
| | | $V_{OUT}$ = 1.8V, $I_{OUT}$ = 300mA | | 600 | 700 | |
| | | $V_{OUT}$ =2.5V,2.8V,3.3V,4.2V, $I_{OUT}$ = 300mA | | 170 | 300 | |
| | | $V_{OUT}$=4.75V, $I_{OUT}$=300mA | | 140 | 300 | |
| Power Supply Ripple Rejection Ratio | PSRR | f = 10kHz, $I_{OUT}$ = 300mA | | 45 | | dB |
| Short Current Limit | $I_{SHORT}$ | $V_{OUT}$ = 0V | | 50 | | mA |
| Shutdown Threshold | $V_{IH}$ | | 1.5 | | 6 | V |
| | $V_{IL}$ | | 0 | | 0.4 | V |
| Shutdown Supply Current | $I_{OFF}$ | $\overline{SHDN}$ = Low, $V_{IN}$ = $V_{OUT}$+0.5V | | 0.1 | 1 | μA |
| Soft Start Time | $T_{SS}$ | | | 50 | | μs |
| RMS Output Noise | $V_{NOISE}$ | $T_A$=25°C, 10Hz ≤ f ≤100kHz, $V_{OUT}$ = 0.8V | | 60 | | $μV_{RMS}$ |
| $V_{OUT}$ Discharge MOSFET $R_{DS(ON)}$ | | $\overline{SHDN}$ = low | | 60 | | Ω |
| $\overline{SHDN}$ Pull Down Resistance | | | | 3 | | MΩ |
| Output Voltage Temperature Coefficient | | $T_J$= -40°C~85°C | | ±100 | | ppm/°C |
| Thermal Shutdown Temperature | $T_{SHDN}$ | | | 165 | | °C |
| Thermal Shutdown Hysteresis | $DT_{SHDN}$ | | | 30 | | °C |

## ■ TYPICAL APPLICATION CIRCUITS

**For Fixed Output Voltage Mode:**

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**For Adjustable Output Voltage Mode:**