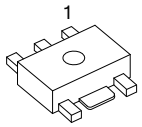
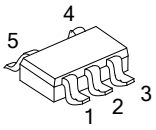
# 700mA HIGH SPEED LDO REGULATOR WITH REVERSE CURRENT PROTECTION




SOT-89-5




SOT-25

## ■ DESCRIPTION

The UTC **UR6227** operate from a +1.7V ~ +6V input supply as fast low-dropout linear regulators. Wide output voltage range options are available. The fast response characteristic to make UTC **UR6227** suitable for low voltage microprocessor application. The low quiescent current operation and low dropout quality caused by the CMOS process.

The UTC **UR6227** has low dropout voltage. The ground pin current is typically 100μA. Output Voltage Precision: Multiple output voltage options are available and ranging from 1.5V~5V at room temperature with a guaranteed accuracy of ±1.5%, and ±3.0% when varying line and load. With the reverse current protection unction of a driver transistor, the reverse current flow is prohibited when $V_{OUT}$ voltage is higher than VIN voltage. For an example, when a battery is connected to the $V_{OUT}$ pin, battery current will not flow back to the UTC **UR6227**.

## ■ FEATURES

* The Guaranteed Output Current is 700mA DC
* Low Power Consumption: 100μA
* Dropout Voltage: 120mV @$I_{OUT}$=300mA ($V_{OUT}$=3.0V)
* Output Voltage Accuracy ±1.5%
* The reverse current protection

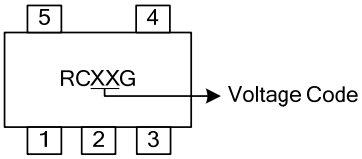
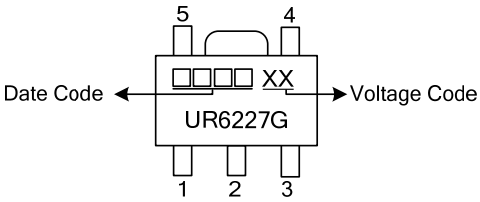
## ■ ORDERING INFORMATION

| Ordering Number | Package | Packing |
|---|---|---|
| UR6227G-xx-AB5-R | SOT-89-5 | Tape Reel |
| UR6227G-xx-AF5-R | SOT-25 | Tape Reel |

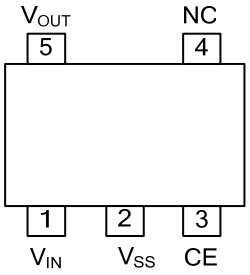
Note: xx: Output Voltage, refer to Marking Information.

| | |
|---|---|
| UR6227G-xx-AB5-R<br>(1)Packing Type<br>(2)Package Type<br>(3)Output Voltage Code<br>(4)Green Package | (1) R: Tape Ree<br>(2) AB5: SOT-89-5, AF5: SOT-25<br>(3) xx: Refer to Marking Information<br>(4) G: Halogen Free and Lead Free |

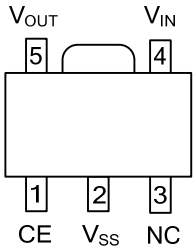
## ■ MARKING INFORMATION

| PACKAGE | VOLTAGE CODE | MARKING |
|---|---|---|
| SOT-25 | 15 : 1.5V<br>18: 1.8V<br>25: 2.5V<br>28: 2.8V<br>30: 3.0V<br>33: 3.3V<br>50: 5.0V |  |
| SOT-89-5 | |  |

## ■ PIN CONFIGURATION




SOT-25

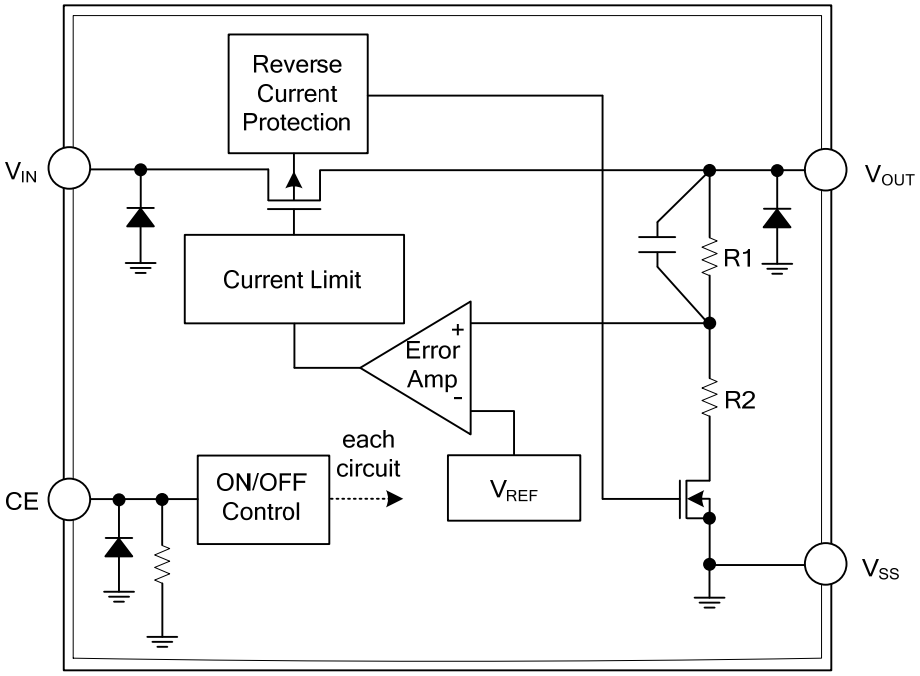



SOT-89-5

## ■ PIN DESCRIPTION

| PIN NO. | | PIN NAME | DESCRIPTION |
|---|---|---|---|
| SOT-25 | SOT-89-5 | | |
| 1 | 4 | $V_{IN}$ | Power Input |
| 2 | 2 | $V_{SS}$ | Ground |
| 3 | 1 | CE | ON/OFF Control |
| 4 | 3 | NC | No Connection |
| 5 | 5 | $V_{OUT}$ | Output |

## ■ BLOCK DIAGRAM



## ■ ABSOLUTE MAXIMUM RATING

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---|---|---|---|---|
| Input Voltage | | $V_{IN}$ | 6.5 | V |
| Output Voltage | | $V_{OUT}$ | 6.5 | V |
| CE Input Voltage | | $V_{CE}$ | 6.5 | V |
| Power Dissipation | SOT-25 | $P_D$ | 250 | mW |
| | SOT-89-5 | | 500 | mW |
| Operating Ambient Temperature | | $T_{OPR}$ | -40 ~ +85 | °C |
| Storage Temperature | | $T_{STG}$ | -55 ~ +125 | °C |

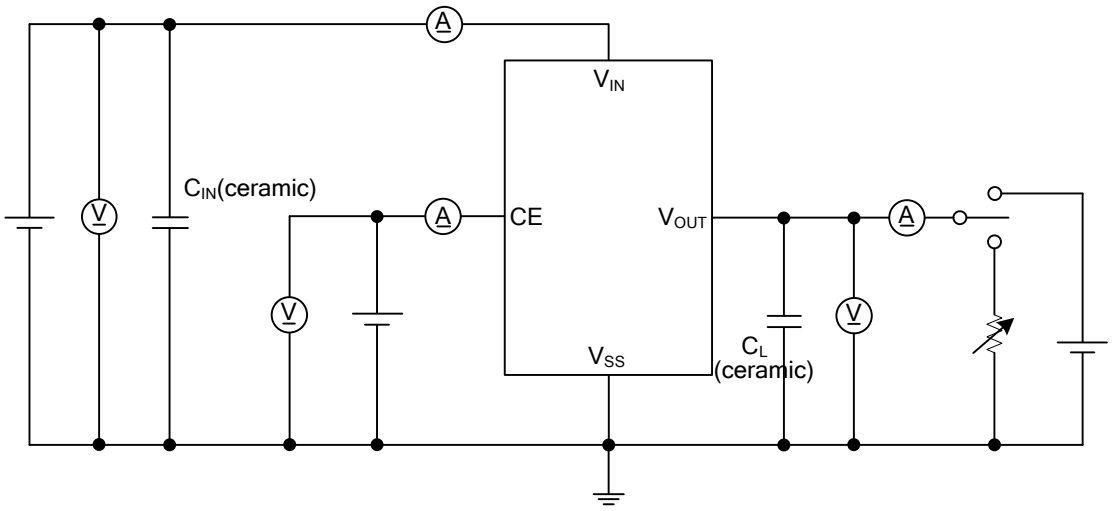
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

## ■ ELECTRICAL CHARACTERISTICS ($T_A$=25°C)

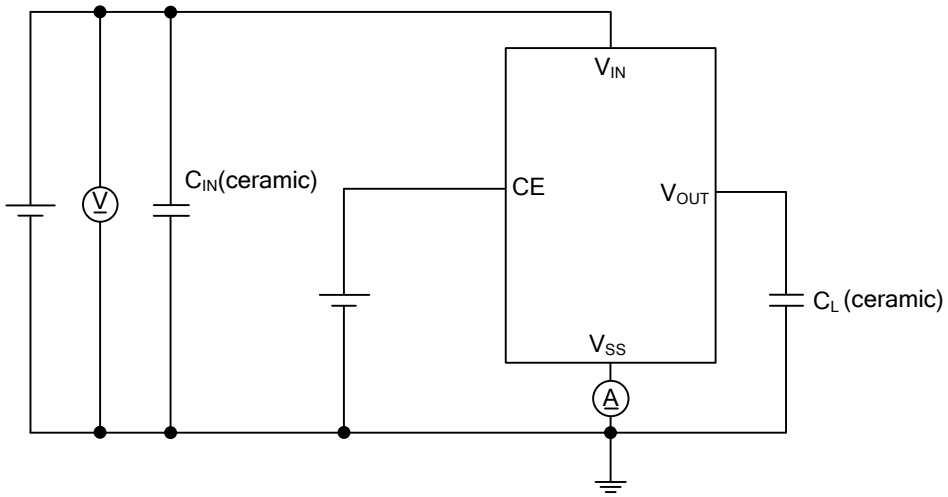
| PARAMETER | SYMBOL | CIRCUIT | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT(E)}$ | 1 | $V_{CE}$=$V_{IN}$, $I_{OUT}$=10mA | ×0.985 | $V_{OUT(T)}$ | ×1.015 | V |
| Output Current | $I_{OUTMAX}$ | 1 | $V_{CE}$=$V_{IN}$, $V_{IN}$=$V_{OUT(T)}$+1.0V | 700 | | | mA |
| Load Regulation | $\Delta V_{OUT}$ | 1 | $V_{CE}$=$V_{IN}$, 0.1mA≤$I_{OUT}$≤300mA | -20 | 5 | 20 | mV |
| Dropout Voltage | $V_{dif}$ | 1 | $I_{OUT}$=300mA, $V_{CE}$=$V_{IN}$ | | 120 | 300 | mV |
| Supply Current | $I_{SS}$ | 2 | $V_{IN}$=$V_{CE}$=$V_{OUT(T)}$+1.0V, $I_{OUT}$=0mA | | 100 | 200 | μA |
| Stand-by Current | $I_{STBY}$ | 2 | $V_{IN}$=6.0V, $V_{CE}$=$V_{SS}$ | | 0.3 | 1.5 | μA |
| Line Regulation | $\Delta V_{OUT}$/ ($\Delta V_{IN} \cdot V_{OUT}$) | 1 | $V_{OUT(T)}$+0.5V≤$V_{IN}$≤6.0V<br>$V_{CE}$=$V_{IN}$, $I_{OUT}$=30mA | | 0.01 | 0.1 | %/V |
| Input Voltage | $V_{IN}$ | 1 | | | | 6.0 | V |
| Output Voltage Temperature Characteristics | $\Delta V_{OUT}$/ ($\Delta T_A \cdot V_{OUT}$) | 1 | $V_{CE}$=$V_{IN}$, $I_{OUT}$=30mA<br>-40°C≤$T_A$≤85°C | | ±100 | | ppm /°C |
| Power Supply Rejection Ratio | PSRR | 3 | $V_{IN}$={$V_{OUT(T)}$+1.0}$V_{DC}$+0.5Vp-pAC<br>$V_{CE}$=$V_{IN}$, $I_{OUT}$=30mA, f=1kHz | | 65 | | dB |
| Limit Current | $I_{LIM}$ | 1 | $V_{CE}$=$V_{IN}$, $V_{IN}$=$V_{OUT(T)}$+1.0V | 720 | 950 | | mA |
| Short Current | $I_{short}$ | 1 | $V_{CE}$=$V_{IN}$, Short $V_{OUT}$ to $V_{SS}$ Level | | 450 | | mA |
| CE High Level Voltage | $V_{CEH}$ | 1 | | 1.5 | | | V |
| CE Low Level Voltage | $V_{CEL}$ | 1 | | | | 0.3 | V |
| CE High Level Current | $I_{CEH}$ | 1 | $V_{CE}$=$V_{IN}$=6.0V | | 2.0 | | μA |
| CE Low Level Current | $I_{CEL}$ | 1 | $V_{CE}$=$V_{SS}$ | -0.1 | | 0.1 | μA |
| Reverse Current | $I_{REV}$ | 1 | $V_{IN}$=0V, $V_{OUT}$=6.0V | | 0.3 | | μA |
| $V_{OUT}$ Pin Sink Current | $I_{REVS}$ | 1 | $V_{IN}$=5.0V, $V_{OUT}$=6.0V | | 0.3 | | μA |
| Thermal Shutdown Detect Temperature | $T_{TSD}$ | 1 | Junction Temperature | | 150 | | °C |
| Thermal Shutdown Release Temperature | $T_{TSR}$ | 1 | Junction Temperature | | 125 | | °C |

## ■ TEST CIRCUIT

Circuit 1

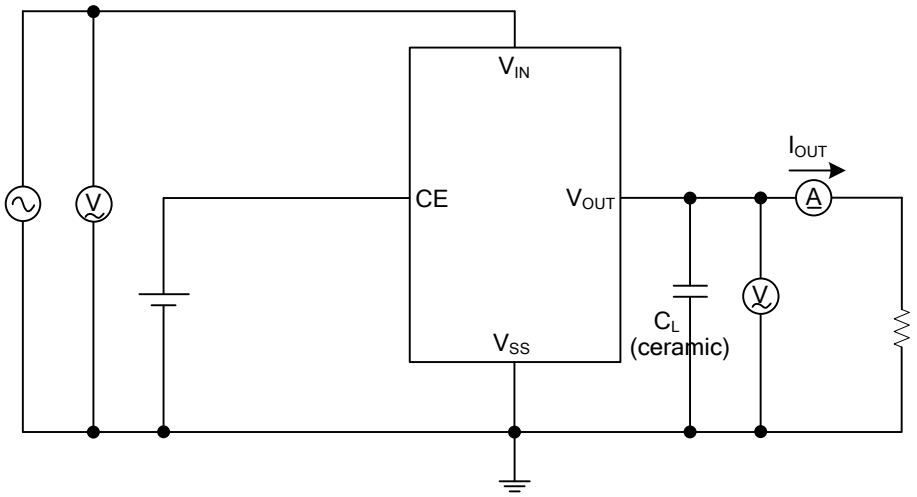



Circuit 2



## ■ TEST CIRCUIT (Cont.)

Circuit 3




$C_{IN}$: 2.2μF or higher
$C_L$: 2.2μF or higher ($V_{OUT}$=2.5~5.0V)
4.7μF or higher ($V_{OUT}$=2.1~2.45V)
6.8μF or higher ($V_{OUT}$=0.8~2.05V)

## ■ TYPICAL APPLICATION CIRCUIT