



### 800MA LDO REGULATOR

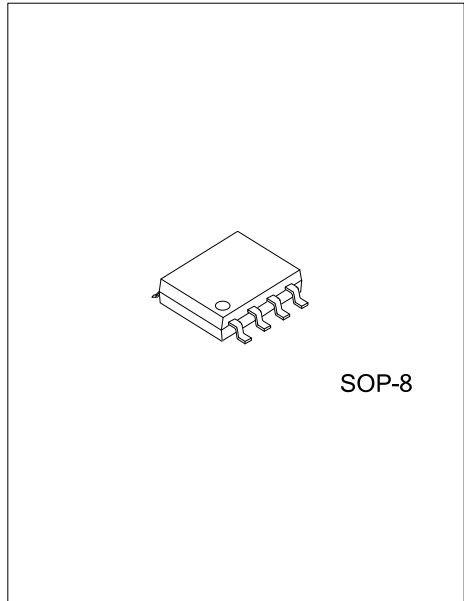
#### DESCRIPTION

The UTC **UR1170** is a typical LDO (linear regulator) with the features of high output voltage accuracy, low supply current, low ON-resistance, and high ripple rejection.

During operation of the UTC **UR1170**, the dropout voltage is very low and the response of line transient and load transient are very well.

Internally, there're many functions of UTC **UR1170** which can be seen in the block figure. There are a voltage reference unit, an error amplifier, resistor-net for voltage setting, a current limit circuit, and a chip enable circuit in each UTC **UR1170**.

The UTC **UR1170** can be used as an ideal of the power supply for hand-held communication equipment, such as: power source for portable communication equipment, power source for electrical appliances, for example, cameras, VCRs and camcorders and power source for battery-powered equipment.



#### FEATURES

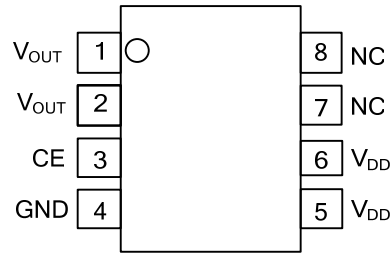
- \* Low standby current
- \* Ultra-Low supply current
- \* Output voltage (stepwise setting with a step of 0.1V in the range of 1.2V~4.0V)
- \* Output current (MIN=800mA@V<sub>IN</sub>=V<sub>OUT</sub>+1.0V)
- \* Low dropout voltage
- \* Line regulation
- \* High output voltage accuracy
- \* Low temperature-drift coefficient of output voltage
- \* Built-in thermal shunt circuit
- \* Built-in current limit circuit

#### ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UR1170xL-S08-T	UR1170xG-S08-T	SOP-8	Tube
UR1170xL-S08-R	UR1170xG-S08-R	SOP-8	Tape Reel

<p>UR1170xL-S08-R</p> <ul style="list-style-type: none"> <li>(1)Packing Type</li> <li>(2)Package Type</li> <li>(3)Lead Free</li> <li>(4)Enable Threshold Level</li> </ul>	<ul style="list-style-type: none"> <li>(1) T: Tube, R: Tape Reel</li> <li>(2) S08: SOP-8</li> <li>(3) L: Lead Free, G: Halogen Free</li> <li>(4) L: Low, H: High</li> </ul>
---	---

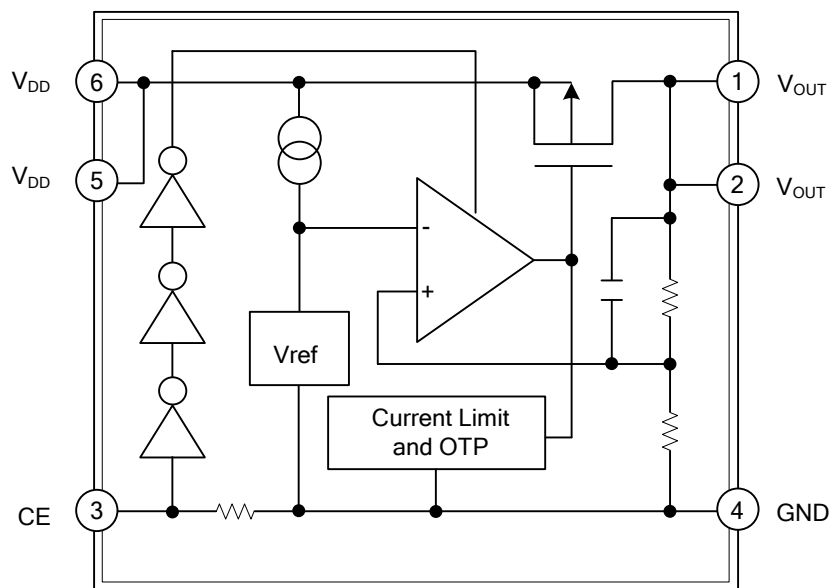
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1, 2	V <sub>OUT</sub>	Voltage Regulator Output Pin
3	CE or CE	Chip Enable Pin Voltage Regulator Output Pin
4	GND	Ground Pin
5, 6	V <sub>DD</sub>	Input Pin
7, 8	NC	No Connection

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	$V_{IN}$	7.0	V
Input Voltage(CE or CE Input Pin)	$V_{CE}$	-0.3~ $V_{IN}+0.3$	V
Output Voltage	$V_{OUT}$	-0.3~ $V_{IN}+0.3$	V
Output Current	$I_{OUT}$	1.2	A
Power Dissipation	$P_D$	Internally limited	
Operating Temperature	$T_{OPT}$	-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 ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

UR1170L

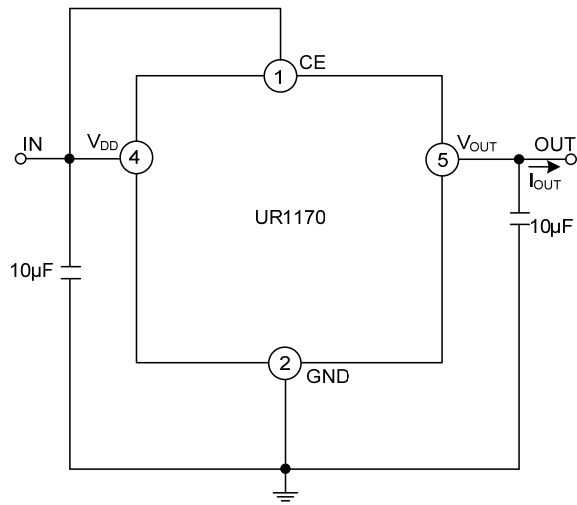
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Input Voltage	$V_{IN}$				6.0	V	
Supply Current1	$I_{SS1}$	$V_{IN}-V_{OUT}=1.0\text{V}$ , $V_{CE}=\text{GND}$		80	160	$\mu\text{A}$	
Standby Current	$I_{STB}$	$V_{IN}=V_{CE}=6.0\text{V}$		0.1	1.0	$\mu\text{A}$	
Output Voltage	$V_{OUT}$	$V_{IN}-V_{OUT}=1.0\text{V}$ , $I_{OUT}=100\text{mA}$	x0.98		x1.02	V	
Output Current	$I_{OUT1}$	$V_{IN}-V_{OUT}=1.0\text{V}$	800			mA	
Load Regulation	$\Delta V_{OUT}/\Delta I_{OUT}$	$V_{IN}-V_{OUT}=1.0\text{V}$ , $1\text{mA}\leq I_{OUT}\leq 300\text{mA}$		30	100	mV	
Dropout Voltage	$V_{DIF}$	$I_{OUT}=300\text{mA}$		$V_{OUT}=1.5$	0.35	0.45	V
				$V_{OUT}=1.6$	0.30	0.35	V
				$V_{OUT}=1.7$	0.25	0.30	V
				$V_{OUT}=1.8\leq V_{OUT}\leq 2.0$	0.20	0.25	V
				$V_{OUT}=2.1\leq V_{OUT}\leq 2.4$	0.15	0.20	V
	$V_{OUT}=2.5\leq V_{OUT}\leq 4.0$	0.12	0.18	V			
Line Regulation	$\Delta V_{OUT}/\Delta V_{IN}$	$I_{OUT}=100\text{mA}$ , $V_{OUT}+0.5\text{V}\leq V_{IN}\leq 8.0\text{V}$		0.05	0.30	%/V	
Ripple Rejection	RR	$f=1\text{kHz}$ , Ripple 0.5V <sub>P-P</sub> , $V_{IN}-V_{OUT}=1.0\text{V}$		50		dB	
Output Voltage Temperature Coefficient	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=10\text{mA}$ , $-40^{\circ}\text{C}\leq T_A\leq 85^{\circ}\text{C}$		$\pm 100$		ppm/ °C	
Short Current Limit	$I_{LIM}$	$V_{OUT}=0\text{V}$		40		mA	
Pull-up resistance for $\overline{\text{CE}}$ pin	$R_{PU}$		1.25	2.50	5.00	M $\Omega$	
CE Input Voltage "H"	$V_{CEH}$		1.50			V	
CE Input Voltage "L"	$V_{CEL}$				0.25	V	
Thermal Shutdown Detector Threshold Temperature	$T_{TSD}$	Junction Temperature		150		°C	
Thermal Shutdown Released Temperature	$T_{TSR}$	Junction Temperature		120		°C	

■ ELECTRICAL CHARACTERISTICS(Cont.)

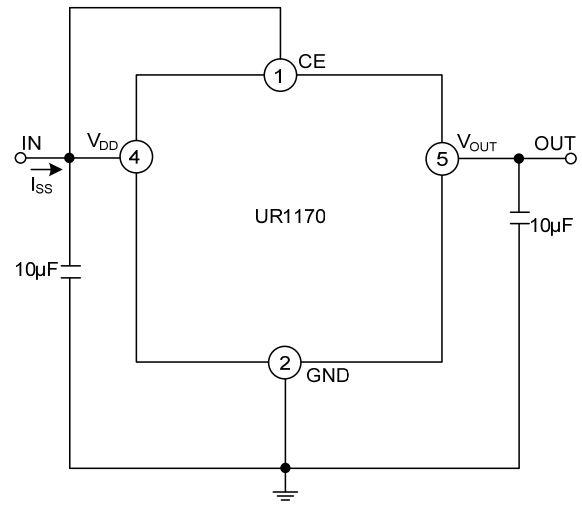
UR1170H

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage	$V_{IN}$				6.0	V
Supply Current	$I_{SS}$	$V_{IN}-V_{OUT}=1.0V, V_{CE}=V_{IN}$		80	160	$\mu A$
Standby Current	$I_{STB}$	$V_{IN}=6.0V, V_{CE}=GND$		0.1	1.0	$\mu A$
Output Voltage	$V_{OUT}$	$V_{IN}-V_{OUT}=1.0V, I_{OUT}=100mA$	x0.98		x1.02	V
Output Current	$I_{OUT}$	$V_{IN}-V_{OUT}=1.0V$	800			mA
Load Regulation	$\Delta V_{OUT}/\Delta I_{OUT}$	$V_{IN}-V_{OUT}=1.0V, 1mA \leq I_{OUT} \leq 300mA$		30	100	mV
Dropout Voltage	$V_{DIF}$	$I_{OUT}=300mA$	$V_{OUT}=1.5$	0.35	0.45	V
			$V_{OUT}=1.6$	0.30	0.35	V
			$V_{OUT}=1.7$	0.25	0.30	V
			$V_{OUT}=1.8 \leq V_{OUT} \leq 2.0$	0.20	0.25	V
			$V_{OUT}=2.1 \leq V_{OUT} \leq 2.4$	0.15	0.20	V
		$V_{OUT}=2.5 \leq V_{OUT} \leq 4.0$	0.12	0.18	V	
Line Regulation	$\Delta V_{OUT}/\Delta V_{IN}$	$I_{OUT}=100mA, V_{OUT}+0.5V \leq V_{IN} \leq 8.0V$		0.05	0.30	%/V
Ripple Rejection	RR	$f=1kHz, \text{Ripple } 0.5V_{p-p}$		50		dB
Output Voltage Temperature Coefficient	$\Delta V_{OUT}/\Delta T$	$-40^{\circ}C \leq T_{OPT} \leq 85^{\circ}C$		$\pm 100$		ppm/ $^{\circ}C$
Short Current Limit	$I_{LIM}$	$V_{OUT}=0V$		40		mA
Pull-down resistance for CE pin	$R_{PD}$		1.25	2.5	5	M $\Omega$
CE Input Voltage "H"	$V_{CEH}$		1.5			V
CE Input Voltage "L"	$V_{CEL}$				0.25	V
Thermal Shutdown Detector Threshold Temperature	$T_{TSD}$	Junction Temperature		150		$^{\circ}C$
Thermal Shutdown Released Temperature	$T_{TSR}$	Junction Temperature		120		$^{\circ}C$

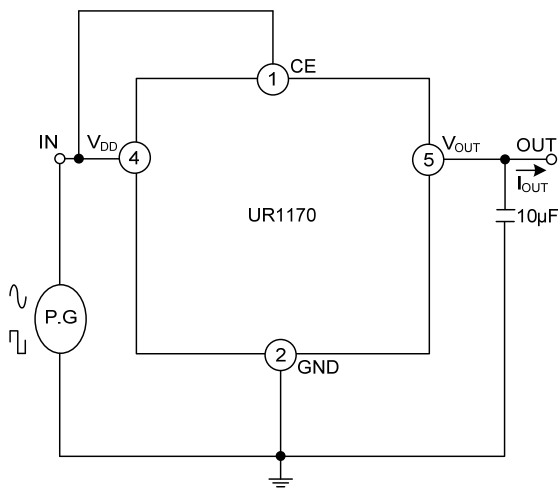
■ TEST CIRCUIT



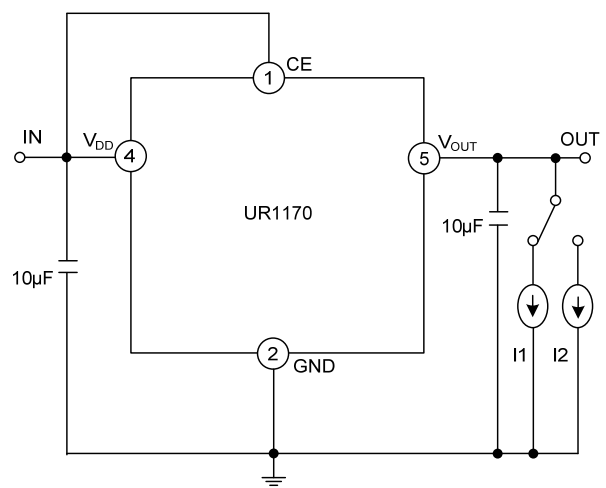
Standard Test Circuit



Supply Current Test Circuit

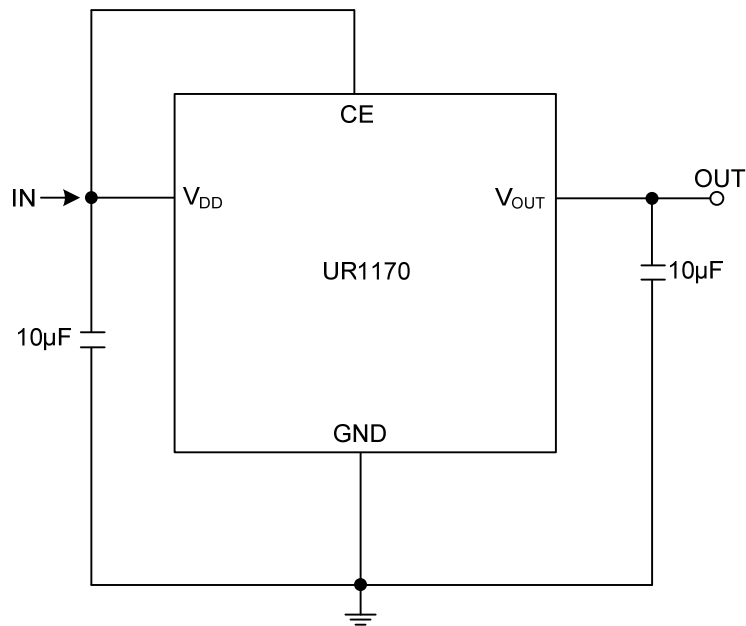


Test Circuit for Ripple Rejection, Input Transient Response



Test Circuit for Load Transient Response

## ■ TYPICAL APPLICATION CIRCUIT



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.