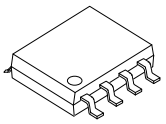
800MA LDO REGULATOR



SOP-8

■ 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 drop out 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_{IN}=V_{OUT}+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

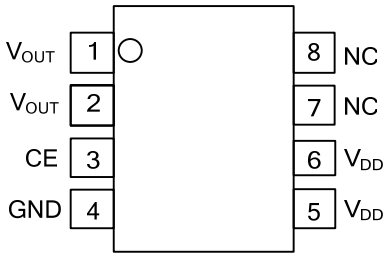
Ordering Number		Package Packing	
Lead Free	Halogen Free		
UR1170xL-S08-T	UR1170xG-S08-T	SOP-8	Tube
UR1170xL-S08-R	UR1170xG-S08-R	SOP-8	Tape Reel

UR1170xL-S08-R

(1)Packing Type
(2)Package Type
(3)Lead Free
(4)Enable Threshold Level

(1) T: Tube, R: Tape Reel
(2) S08: SOP-8
(3) L: Lead Free, G: Halogen Free
(4) L: Low, H: High

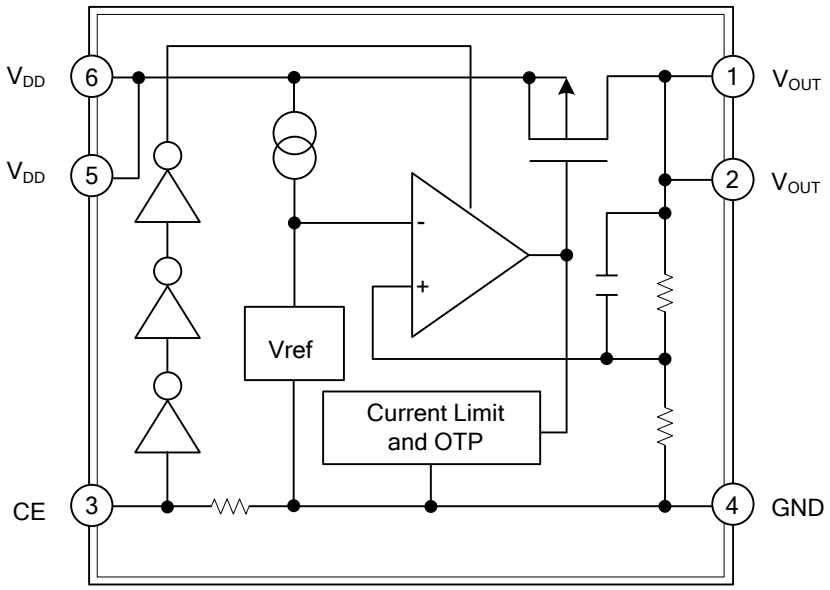
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1, 2	V_{OUT}	Voltage Regulator Output Pin
3	$\overline{CE}$ or CE	Chip Enable Pin Voltage Regulator Output Pin
4 GND		Ground Pin
5, 6	V_{DD} 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 Internal	ly 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°C, unless otherwise specified)

UR1170L

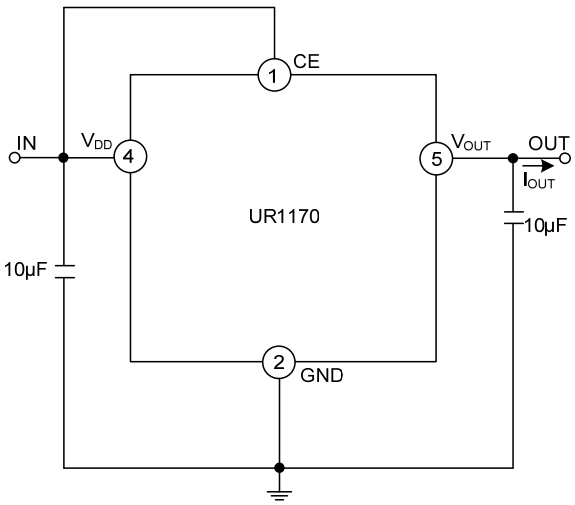
PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Input Voltage	V_{IN}					6.0	V
Supply Current1	I_{SS1}	V_{IN}-V_{OUT}=1.0V, V_{CE}=GND			80	160	μA
Standby Current	I_{STB}	V_{IN}=V_{CE}=6.0V			0.1	1.0	μA
Output Voltage	V_{OUT}	V_{IN}-V_{OUT}=1.0V, I_{OUT}=100mA x0.9		8		x1.02	V
Output Current	I_{OUT1}	V_{IN}-V_{OUT}=1.0V 800					mA
Load Regulation	$\Delta V_{OUT}/\Delta I_{OUT}$	V_{IN}-V_{OUT}=1.0V, 1mA≤I_{OUT}≤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≤V_{OUT}≤2.0		0.20	0.25	V
			V_{OUT}=2.1≤V_{OUT}≤2.4		0.15	0.20	V
			V_{OUT}=2.5≤V_{OUT}≤4.0		0.12	0.18	V
Line Regulation	$\Delta V_{OUT}/\Delta V_{IN}$	I_{OUT}=100mA, V_{OUT}+0.5V≤V_{IN}≤8.0V			0.05	0.30	%/V
Ripple Rejection	RR	f=1kHz,Ripple 0.5V_{P-P},V_{IN}-V_{OUT}=1.0V		50			dB
Output Voltage Temperature Coefficient	$\Delta V_{OUT}/\Delta T$ I	$_{OUT}$=10mA, -40°C ≤ T_A ≤ 85°C			±100		ppm /°C
Short Current Limit	I_{LIM}	V_{OUT}=0V			40		mA
Pull-up resistance for $\overline{CE}$ pin	R_{PU}			1.25	2.50	5.00	MΩ
$\overline{CE}$ Input Voltage “H”	V_{CEH}			1.50			V
$\overline{CE}$ 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.)

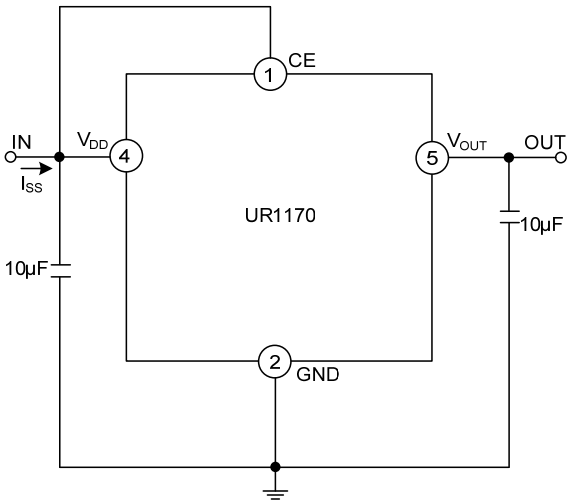
UR1170H

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	μA
Standby Current	I_{STB}	V_{IN}=6.0V, V_{CE}=GND			0.1	1.0	μA
Output Voltage	V_{OUT}	V_{IN}-V_{OUT}=1.0V, I_{OUT}=100mA x0.9		8		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≤IO_{UT}≤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≤V_{OUT}≤2.0		0.20	0.25	V
			V_{OUT}=2.1≤V_{OUT}≤2.4		0.15	0.20	V
			V_{OUT}=2.5≤V_{OUT}≤4.0		0.12	0.18	V
Line Regulation	$\Delta V_{OUT}/\Delta V_{IN}$	I_{OUT}=100mA, V_{OUT}+0.5V≤V_{IN}≤8.0V			0.05	0.30	%/V
Ripple Rejection	RR	f=1kHz,Ripple 0.5Vp-p			50		dB
Output Voltage Temperature Coefficient	$\Delta V_{OUT}/\Delta T$	-40°C ≤T_{OPT}≤ 85°C			±100		ppm /°C
Short Current Limit	I_{LIM}	V_{OUT}=0V			40		mA
Pull-down resistance for CE pin	R_{PD}			1.25	2.5	5	MΩ
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		°C
Thermal Shutdown Released Temperature	T_{TSR}	Junction Temperature			120		°C

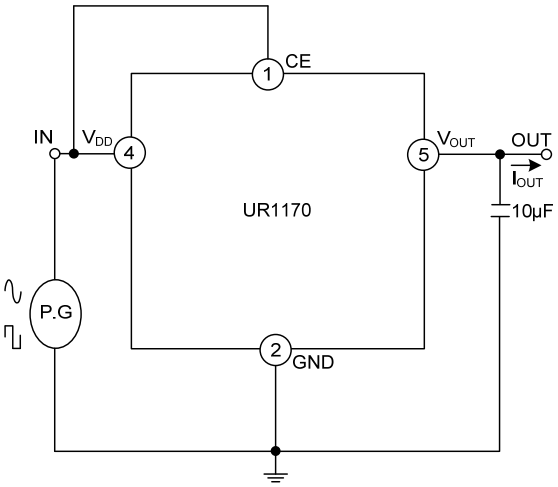
■ TEST CIRCUIT



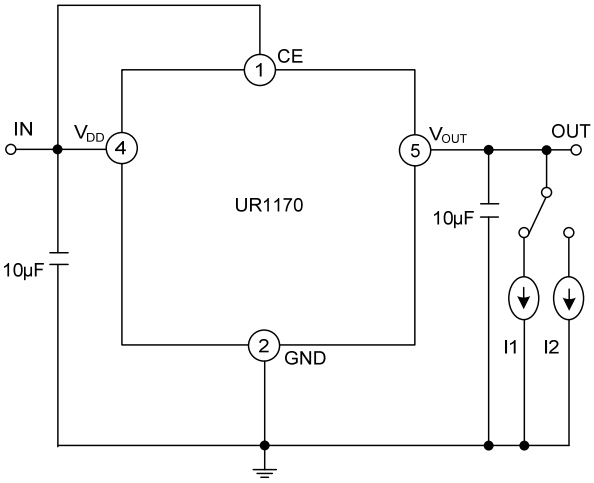
Standard Test Circuit



Supply Current Test Circuit



Test Circuit for Ripple Rejection, Input Transient Response



Test Circuit for Load Transient Response

■ TYPICAL APPLICATION CIRCUIT