



LR9270

CMOS IC

800mA LDO REGULATOR

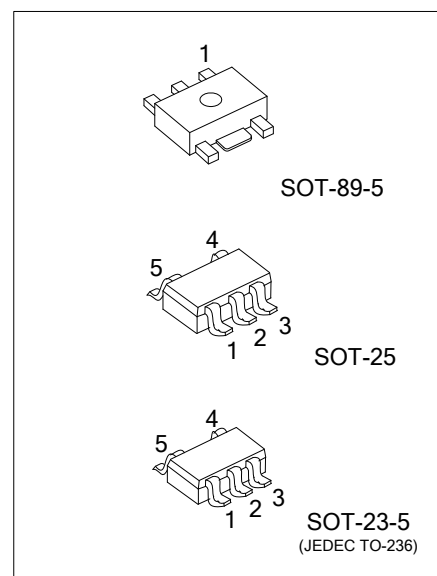
■ DESCRIPTION

The UTC **LR9270** 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 **LR9270**, 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 **LR9270** 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 **LR9270**.

The UTC **LR9270** 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

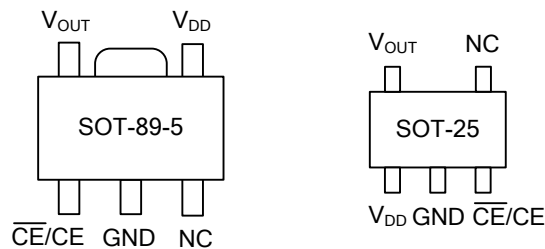
Ordering Number		Package	Packing
Lead Free	Halogen Free		
LR9270xL-xx-AB5-R	LR9270xG-xx-AB5-R	SOT-89-5	Tape Reel
LR9270xL-xx-AE5-R	LR9270xG-xx-AE5-R	SOT-23-5	Tape Reel
LR9270xL-xx-AF5-R	LR9270xG-xx-AF5-R	SOT-25	Tape Reel

LR9270xG-xx-AB5-R	(1)Packing Type (2)Package Type (3)Output Voltage Code (4)Green Package (5)Enable Threshold Level	(1) R: Tape Reel (2) AB5: SOT-89-5, AE5: SOT-23-5, AF5: SOT-25 (3) xx: refer to Marking Information (4) G: Halogen Free and Lead Free, L: Lead Free (5) H: High, L: Low
-------------------	---	---

MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-89-5	12: 1.2V 18: 1.8V 25: 2.5V 33: 3.3V	
SOT-23-5 SOT-25		

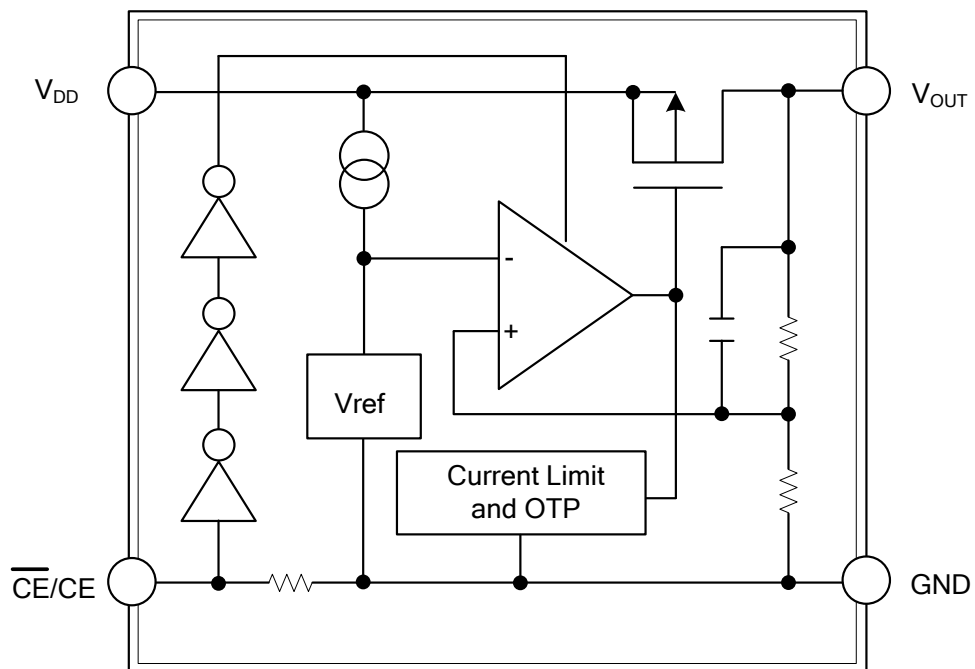
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO.		PIN NAME	DESCRIPTION
SOT-89-5	SOT-23-5 SOT-25		
1	3	$\overline{\text{CE}}$ or CE	Chip Enable Pin Voltage Regulator Output Pin
2	2	GND	Ground Pin
3	4	NC	No Connection
4	1	V _{DD}	Input Pin
5	5	V _{OUT}	Voltage Regulator Output Pin

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	7.0	V
Input Voltage($\overline{CE}$ 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}	0.8	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)

LR9270L-xx

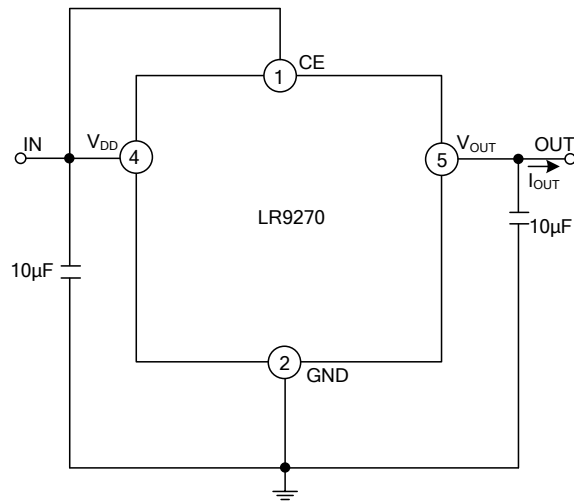
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage	V_{IN}				6.0	V
Supply Current1	I_{SS1}	$V_{IN}-V_{OUT}=1.0\text{V}$, $V_{CE}=\text{GND}$		80	160	μA
Standby Current	I_{STB}	$V_{IN}=V_{CE}=6.0\text{V}$		0.1	1.0	μA
Output Voltage	V_{OUT}	$V_{IN}-V_{OUT}=1.0\text{V}$, $I_{OUT}=100\text{mA}$	x0.98		x1.02	V
Current Limit	I_{LIMIT}	$V_{IN}-V_{OUT}=1.0\text{V}$	800			mA
Load Regulation	ΔV_{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}	$I_{OUT}=300\text{mA}$	$V_{OUT}=1.2$	0.60	0.70	V
			$V_{OUT}=1.5$	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	$\Delta V_{OUT}/\Delta V_{IN}$	$I_{OUT}=100\text{mA}$, $V_{OUT}+0.5\text{V} \leq V_{IN} \leq 6.0\text{V}$		0.05	0.30	%/V
Ripple Rejection	RR	$f=1\text{kHz}$, Ripple 0.5V _{P-P} , $V_{IN}-V_{OUT}=1.0\text{V}$		50		dB
Output Voltage Temperature Coefficient	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=10\text{mA}$, $-40^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$		± 100		ppm/°C
Short Current Limit	I_{LIM}	$V_{OUT}=0\text{V}$		40		mA
Pull-up resistance for $\overline{CE}$ pin	R_{PU}			5.0		M Ω
$\overline{CE}$ Input Voltage "H"	V_{CEH}		1.50			V
$\overline{CE}$ Input Voltage "L"	V_{CEL}				0.25	V

■ ELECTRICAL CHARACTERISTICS(Cont.)

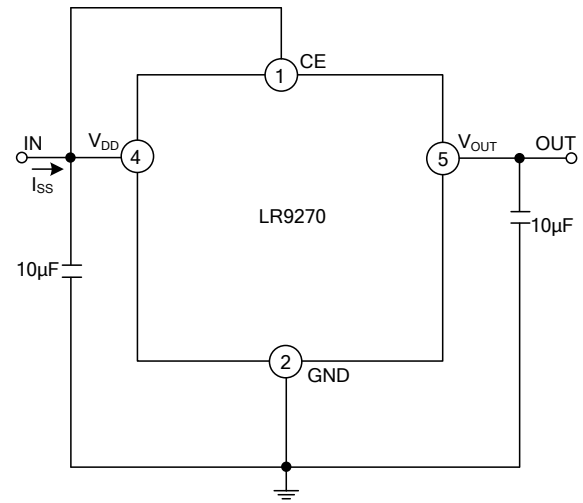
LR9270H-xx

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}	$V_{IN}-V_{OUT}=1.0V$, $I_{OUT}=100mA$	x0.98		x1.02	V
Current Limit	I_{LIMIT}	$V_{IN}-V_{OUT}=1.0V$	800			mA
Load Regulation	ΔV_{OUT}	$V_{IN}-V_{OUT}=1.0V$, $1mA \leq I_{OUT} \leq 300mA$		30	100	mV
Dropout Voltage	V_{DIF}	$I_{OUT}=300mA$	$V_{OUT}=1.2$	0.6	0.7	V
			$V_{OUT}=1.5$	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	$\Delta V_{OUT}/\Delta V_{IN}$	$I_{OUT}=100mA$, $V_{OUT}+0.5V \leq V_{IN} \leq 6.0V$		0.05	0.30	%/V
Ripple Rejection	RR	$f=1kHz$, Ripple 0.5Vp-p		50		dB
Output Voltage Temperature Coefficient	$\Delta V_{OUT}/\Delta T$	$-40^{\circ}C \leq T_{OPT} \leq 85^{\circ}C$		± 100		ppm/ $^{\circ}C$
Short Current Limit	I_{LIM}	$V_{OUT}=0V$		40		mA
Pull-down resistance for CE pin	R_{PD}			5.0		M Ω
CE Input Voltage "H"	V_{CEH}		1.5			V
CE Input Voltage "L"	V_{CEL}				0.25	V

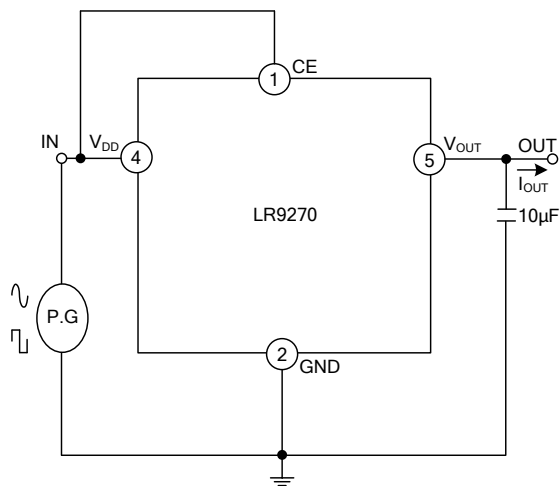
■ TEST CIRCUIT



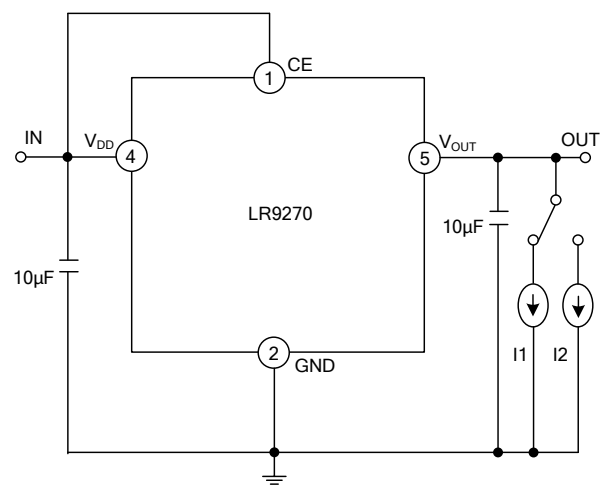
Standard Test Circuit



Supply Current Test Circuit

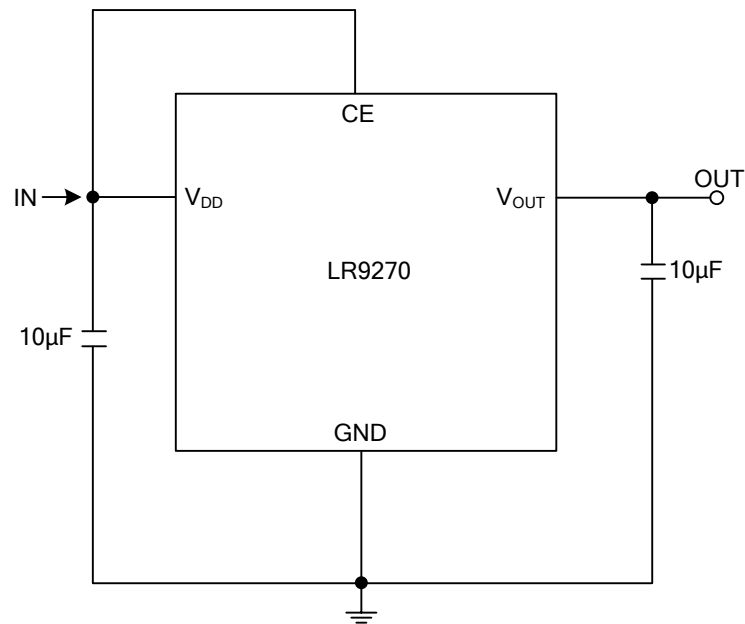


Test Circuit for Ripple Rejection, Input Transient Response



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. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.