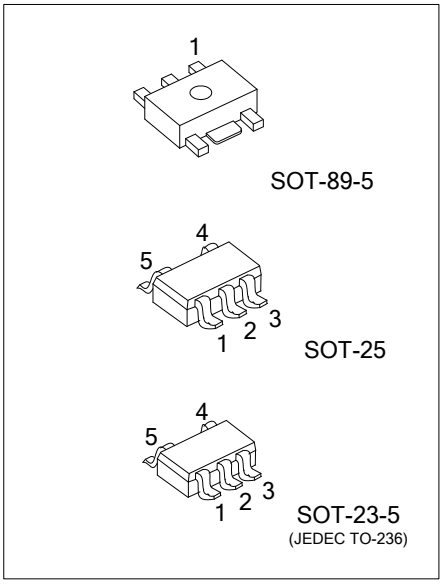
LR9270

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

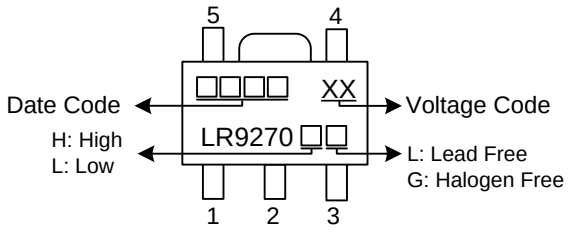
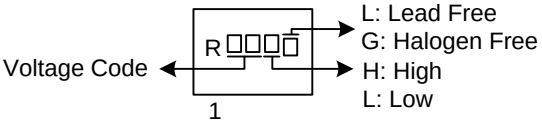
■ ORDERING INFORMATION

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

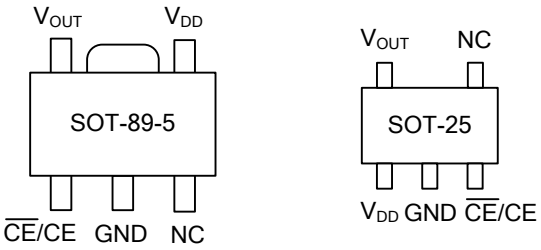
LR9270xG-xx-AB5-R
(1)Packing Type
(2)Package Type
(3)Output Voltage Code
(4)Green Package
(5)Enable Threshold Level

(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		

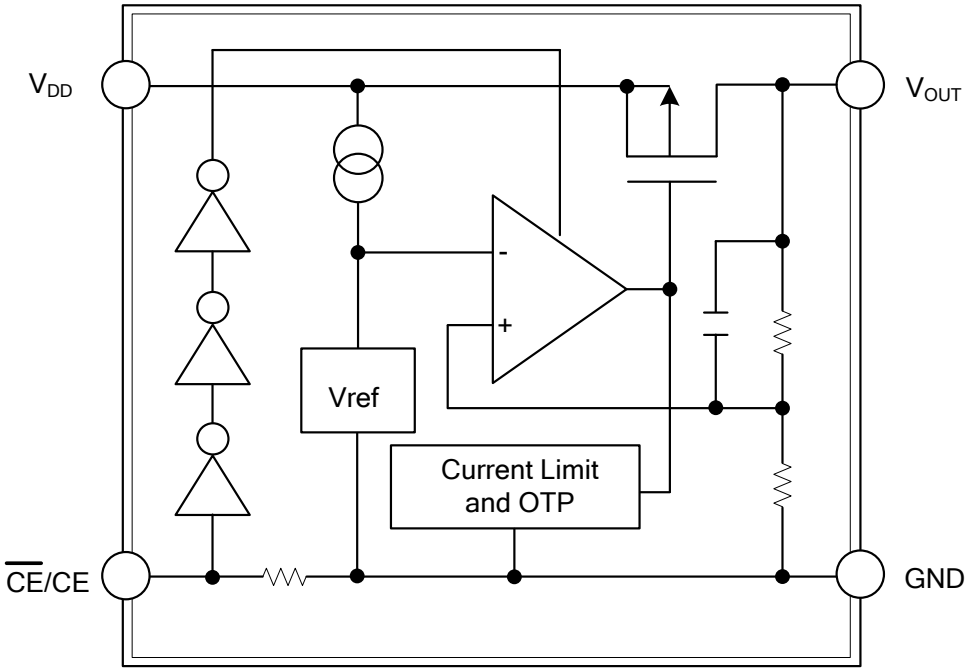
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.		PIN NAME	DESCRIPTION
SOT-89-5	SOT-23-5 SOT-25		
1	3	$\overline{CE}$ 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°C, unless otherwise specified)

LR9270L-xx

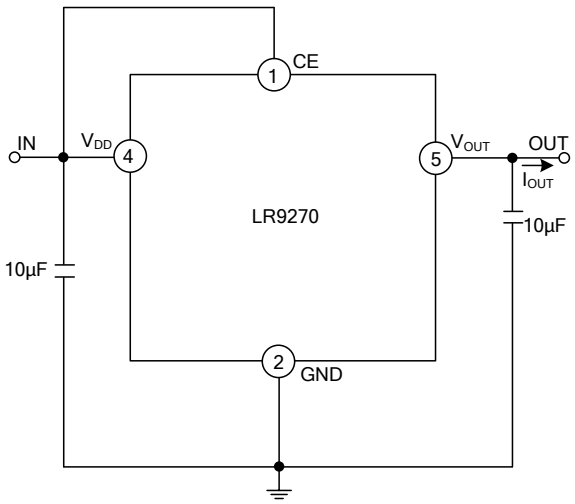
PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Input Voltage	V_{IN}					6.0	V
Supply Current1	I_{SS1}	V_{IN}-V_{OUT}=1.0V, V_{CE}=GND			80	160	μA
Standby Current	I_{STB}	V_{IN}=V_{CE}=6.0V			0.1	1.0	μA
Output Voltage	V_{OUT}	V_{IN}-V_{OUT}=1.0V, I_{OUT}=100mA		x0.98		x1.02	V
Current Limit	I_{LIMIT}	V_{IN}-V_{OUT}=1.0V		800			mA
Load Regulation	ΔV_{OUT}	V_{IN}-V_{OUT}=1.0V, 1mA≤I_{OUT}≤300mA			30	100	mV
Dropout Voltage	V_{DIF}	I_{OUT}=300mA	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≤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}≤6.0V			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}				5.0		MΩ
$\overline{CE}$ Input Voltage “H”	V_{CEH}			1.50			V
$\overline{CE}$ Input Voltage “L”	V_{CEL}					0.25	V

■ ELECTRICAL CHARACTERISTICS(Cont.)

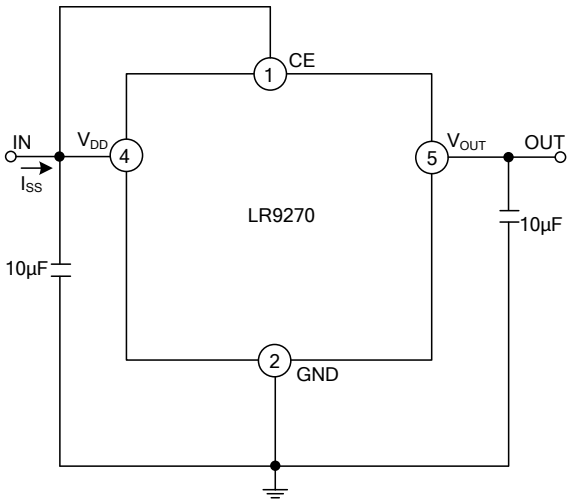
LR9270H-xx

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≤IO_{UT}≤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≤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}≤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°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}				5.0		MΩ
CE Input Voltage “H”	V_{CEH}			1.5			V
CE Input Voltage “L”	V_{CEL}					0.25	V

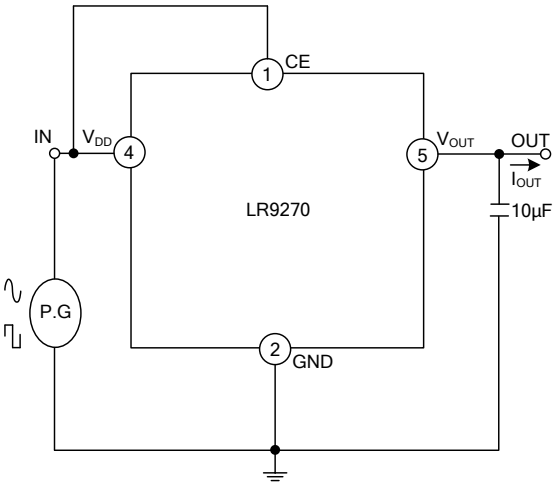
■ TEST CIRCUIT



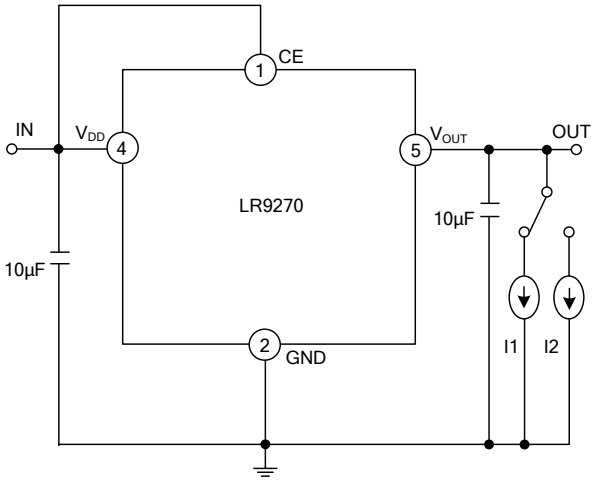
Standard Test Circuit



Supply Current Test Circuit



Test Circuit for Ripple Rejection, Input Transient Response



Test Circuit for Load Transient Response

■ TYPICAL APPLICATION CIRCUIT