



## LR9280

Preliminary

CMOS IC

### 150mA LDO REGULATOR

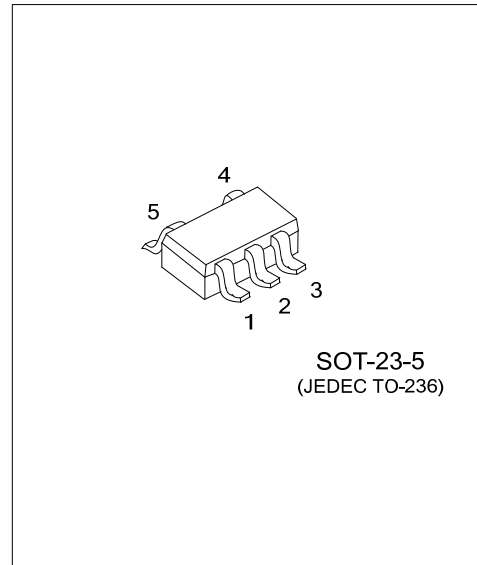
#### DESCRIPTION

The UTC **LR9280** is a typical LDO (linear regulator) with the features of high output voltage accuracy, low supply current, low ON-resistance. Internally, there're many functions of UTC **LR9280** 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 **LR9280**.

The output voltage of these ICs is fixed with high accuracy. B version has a chip enable pin, therefore ultra-low consumption current standby mode can be realized with the pin.

#### FEATURES

- \* Standby Mode (TYP=0.1μA)
- \* Supply current (TYP=1μA)  
(Except the current through CE pull-down circuit)
- \* Output voltage accuracy (±2.0%)
- \* Output voltage Range (1.2V~3.6V)
- \* Dropout voltage (TYP=0.25V )(I<sub>OUT</sub>=150mA 3.0V Output type)
- \* Line regulation (TYP=0.05%/V)
- \* Temperature-Drift Coefficient of Output Voltage (TYP=±100ppm/°C)
- \* Ceramic capacitors are recommended to be used with this IC (1μF)



#### ORDERING INFORMATION

Ordering Number	Package	Packing
Halogen Free		
LR9280xG-xx-AE5-R	SOT-23-5	Tape Reel

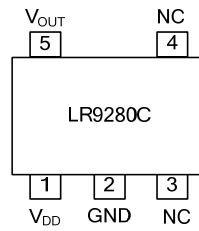
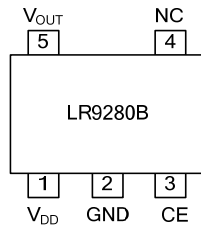
Note: xx: Output Voltage, refer to Marking Information.

<p>LR9280xG-xx-AE5-R</p> <ul style="list-style-type: none"> <li>(1)Packing Type</li> <li>(2)Package Type</li> <li>(3)Output Voltage Code</li> <li>(4)Green Package</li> <li>(5)Discharge Function</li> </ul>	<ul style="list-style-type: none"> <li>(1) R: Tape Reel</li> <li>(2) AE5: SOT-23-5</li> <li>(3) xx: refer to Marking Information</li> <li>(4) G: Halogen Free and Lead Free</li> <li>(5) B: Active high type</li> <li>C: Without chip enable circuit</li> </ul>
--	---

MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-23-5	12: 1.2V 15: 1.5V 18: 1.8V 28: 2.8V	

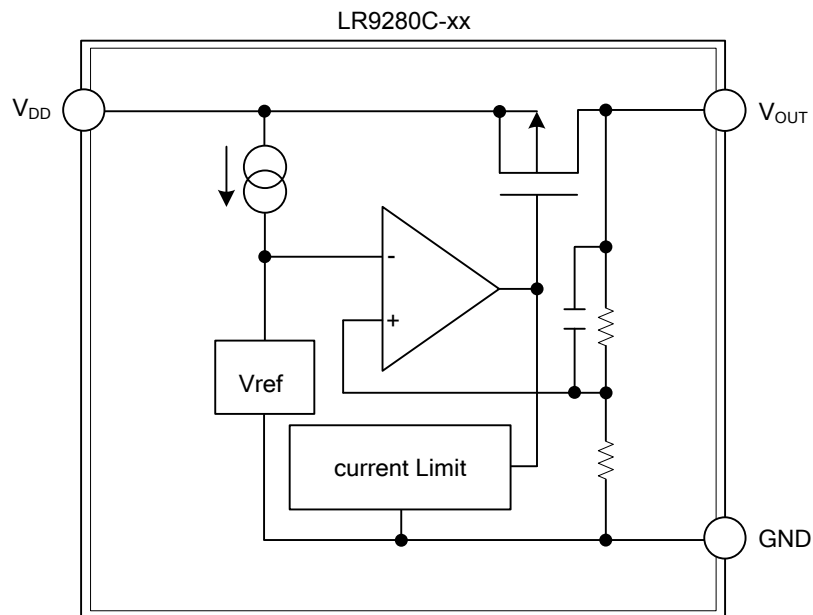
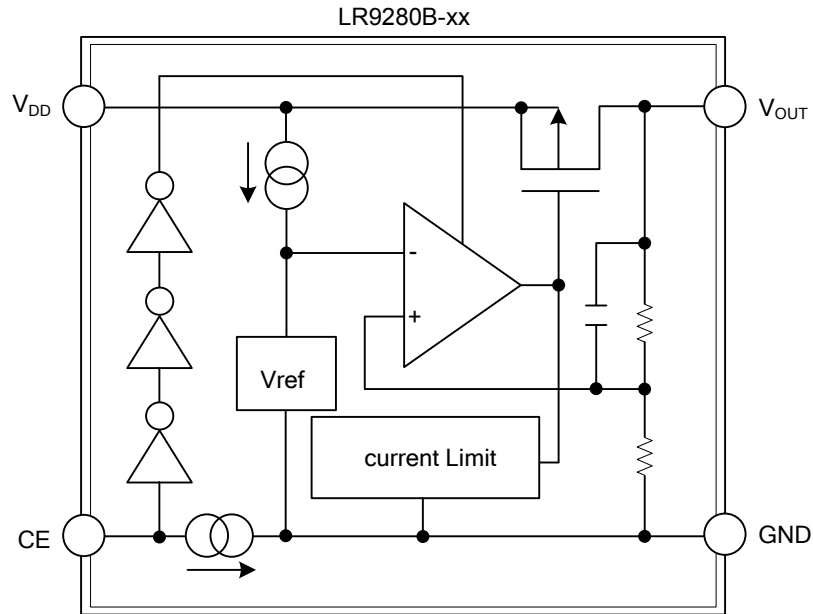
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO.		PIN NAME	DESCRIPTION
LR9280B	LR9280C		
1	1	V <sub>DD</sub>	Input pin
2	2	GND	Ground pin
3	-	CE	Chip Enable Pin
4	3, 4	NC	No Connection
5	5	V <sub>OUT</sub>	Output pin

■ BLOCK DIAGRAM



### ■ ABSOLUTE MAXIMUM RATING

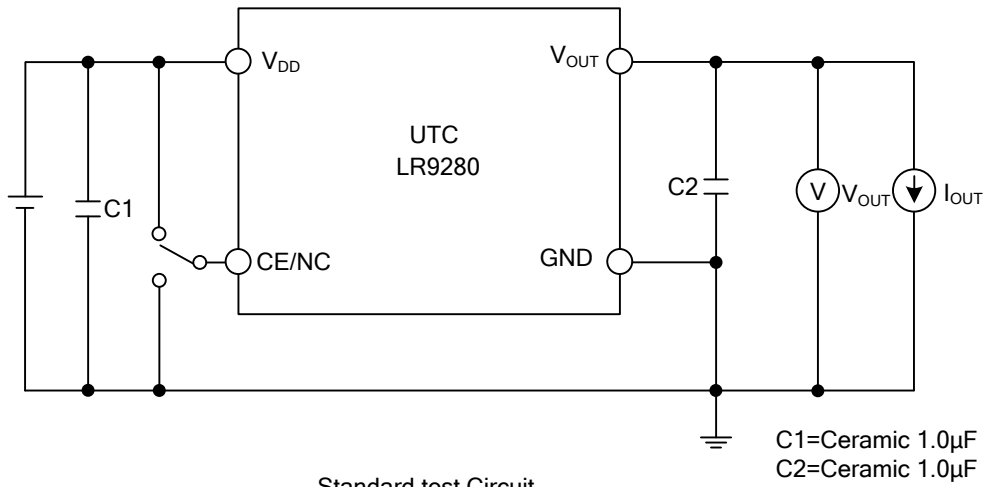
PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	$V_{IN}$	6.5	V
Input Voltage(CE Pin)	$V_{CE}$	6.5	V
Output Voltage	$V_{OUT}$	$-0.3 \sim V_{IN} + 0.3$	V
Output Current	$I_{OUT}$	180	mA
Power Dissipation	$P_D$	420	mW
Operating Temperature	$T_{OPR}$	-40~85	°C
Storage Temperature	$T_{STG}$	-55~125	°C

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.

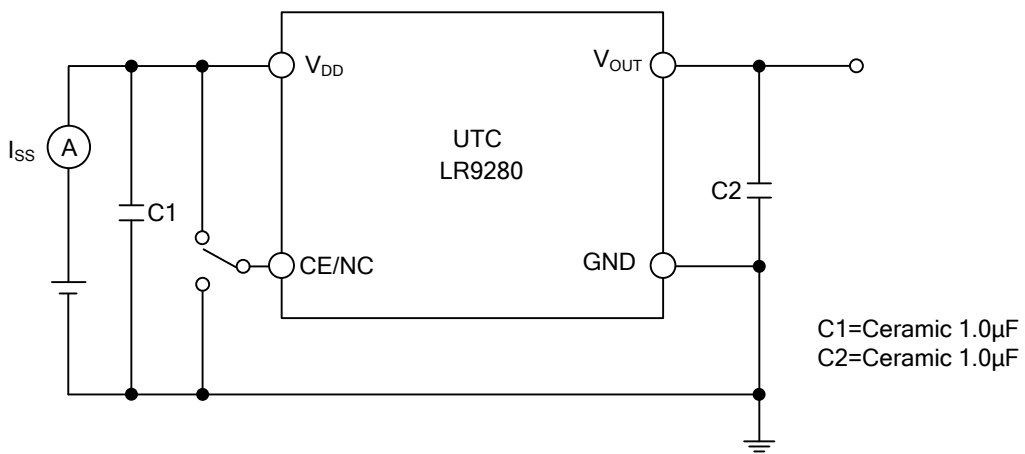
### ■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	$V_{OUT}$	$V_{IN} = \text{Set } V_{OUT} + 1\text{V}, 1\mu\text{A} \leq I_{OUT} \leq 30\text{mA}$	x0.980		x1.020	V
Output Current	$I_{OUT}$	$V_{IN} - V_{OUT} = 1.0\text{V} (V_{OUT} \geq 1.5\text{V})$ $V_{IN} = 2.4\text{V} (V_{OUT} < 1.5\text{V})$	150			mA
Dropout Voltage	$V_{DIF}$	$I_{OUT} = 150\text{mA}$		0.85	1.20	V
				0.75	1.10	V
				0.65	1.00	V
				0.60	0.90	V
				0.50	0.75	V
				0.40	0.65	V
				0.35	0.55	V
	0.25	0.40	V			
Input Voltage	$V_{IN}$		1.7		6.0	V
Supply Current	$I_{SS}$	$V_{IN} - V_{OUT} = 1.0\text{V}, I_{OUT} = 0\text{mA}$		9	15	$\mu\text{A}$
Standby Current	$I_{STB}$	$V_{IN} - V_{OUT} = 1.0\text{V}, V_{CE} = \text{GND}$		0.1	1.0	$\mu\text{A}$
Load Regulation	$\Delta V_{OUT} / \Delta I_{OUT}$	$V_{IN} - V_{OUT} = 1.0\text{V} (V_{OUT} \geq 1.5\text{V})$ $V_{IN} = 2.4\text{V} (V_{OUT} < 1.5\text{V})$ $1\mu\text{A} \leq I_{OUT} \leq 150\text{mA}$		20	40	mV
Dropout Voltage	$V_{DIF}$	Refer to the ELECTRICAL CHARACTERISTICS by OUTPUT VOLTAGE				
Line Regulation	$\Delta V_{OUT} / \Delta V_{IN}$	$I_{OUT} = 30\text{mA}$ $V_{OUT} + 0.5\text{V} \leq V_{IN} \leq 6.0\text{V}$ $(V_{OUT} \geq 1.5\text{V}), 2.0\text{V} \leq V_{IN} \leq 6.0\text{V}$ $(1.2\text{V} \leq V_{OUT} \leq 1.4\text{V})$		0.05	0.20	%/V
Output Voltage Temperature Coefficient	$\Delta V_{OUT} / \Delta T_{OPT}$	$I_{OUT} = 30\text{mA}, -40^\circ\text{C} \leq T_{OPT} \leq 85^\circ\text{C}$		$\pm 100$		ppm/°C
Short Current Limit	$I_{SC}$	$V_{OUT} = 0\text{V}$		500		mA
CE Pull-down Constant Current	$I_{PD}$	LR9280B		0.35		$\mu\text{A}$
CE Input Voltage "H"	$V_{CEH}$	LR9280B	1.2		6.0	V
CE Input Voltage "L"	$V_{CEL}$	LR9280B	0.0		0.3	V

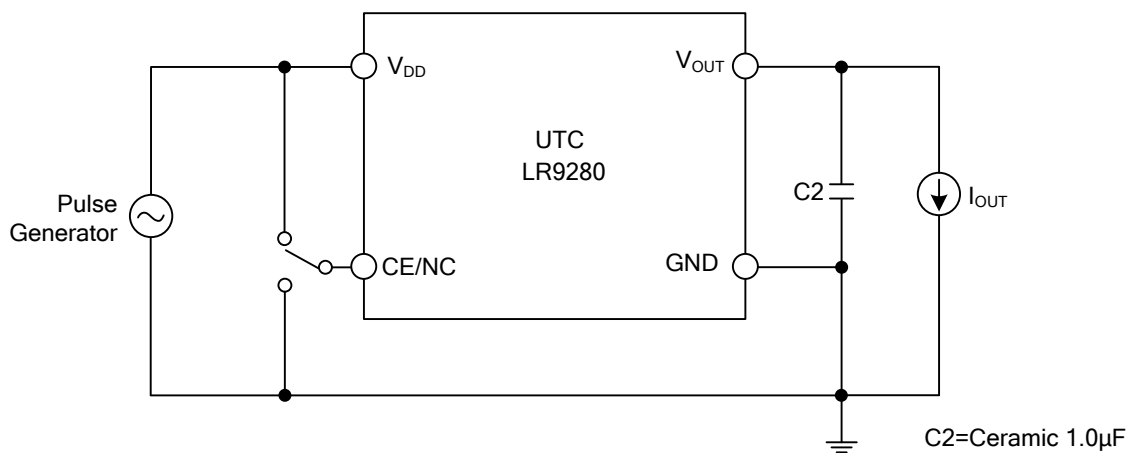
■ TEST CIRCUITS



Standard test Circuit

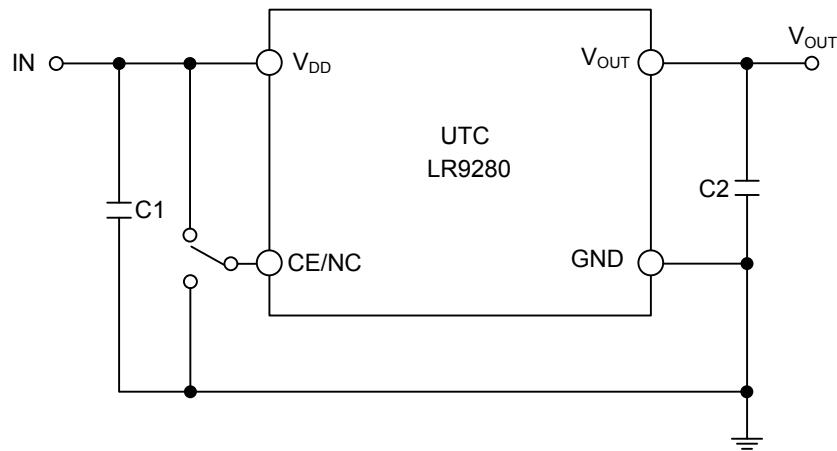


Supply Current Test Circuit



Ripple Rejection, Line Transient Response Test Circuit

## ■ TYPICAL APPLICATION CIRCUIT



(External Components)  
Output Capacitor  
Ceramic Capacitor 1 $\mu$ F

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.