



# L1131B

Preliminary

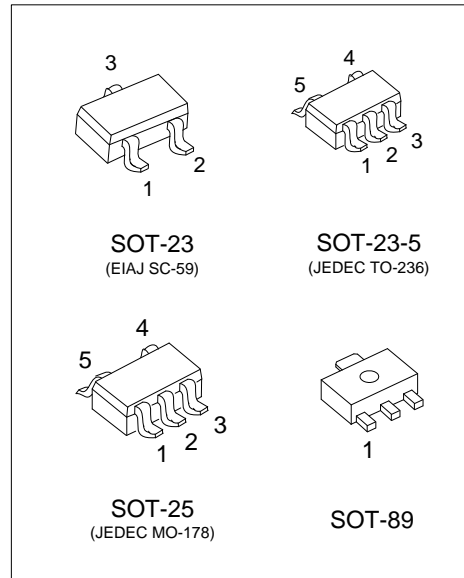
CMOS IC

## LOW NOISE 200mA LDO REGULATOR

### DESCRIPTION

The UTC **L1131B** is a COMS positive linear regulator. One of it's feature is the very low quiescent current typical as low as 1.5μA and its dropout voltage is extremely low with 200mA output current, and high ripple rejection. Each of these ICs consists of a voltage reference unit, an error amplifier, resistor-net for voltage setting, a short current limit circuit, a chip enable circuit, and so on.

These ICs perform with low dropout voltage and the chip-enable function. The supply current at no load of this IC is only 1.5μA, and the line transient response and the load transient response of the UTC **L1131B** Series are excellent, thus these ICs are very suitable for the power supply for hand-held communication equipment.



### FEATURES

- \* Low supply current Typ. 1.5μA
- \* Standby mode Typ. 0.1μA
- \* Output Voltage Range 1.2V~5.0V
- \* Excellent line regulation Typ. 0.02%/V
- \* Built-in fold back protection circuit
- \* Ceramic capacitors are recommended to be used with this IC  
C<sub>IN</sub>=C<sub>OUT</sub>=1μF

### ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
L1131BL-xx-AB3-R	L1131BG-xx-AB3-R	SOT-89	Tape Reel
L1131BL-xx-AE3-R	L1131BG-xx-AE3-R	SOT-23	Tape Reel
L1131BL-xx-AE5-R	L1131BG-xx-AE5-R	SOT-23-5	Tape Reel
L1131BL-xx-AF5-R	L1131BG-xx-AF5-R	SOT-25	Tape Reel

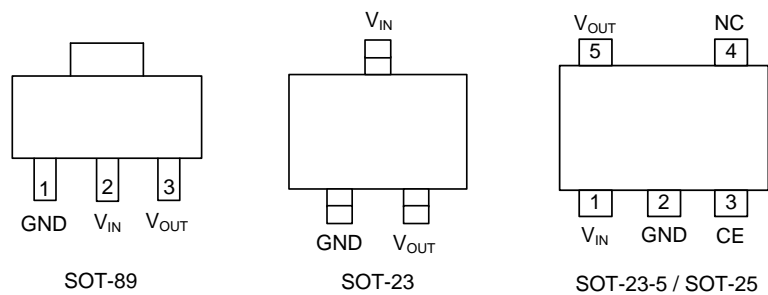
Note: xx: Output Voltage, refer to Marking Information.

<p>L1131BG-xx-AB3-R</p>	<p>(1) R: Tape Reel  (2) AB3: SOT-89, AE3: SOT-23, AE5: SOT-23-5, AF5: SOT-25  (3) xx: refer to Marking Information  (4) G: Halogen Free and Lead Free, L: Lead Free</p>
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### MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-23	15: 1.5V 20: 2.0V 25: 2.5V 28: 2.8V 30: 3.0V 33: 3.3V 50: 5.0V	
SOT-23-5 SOT-25		
SOT-89		

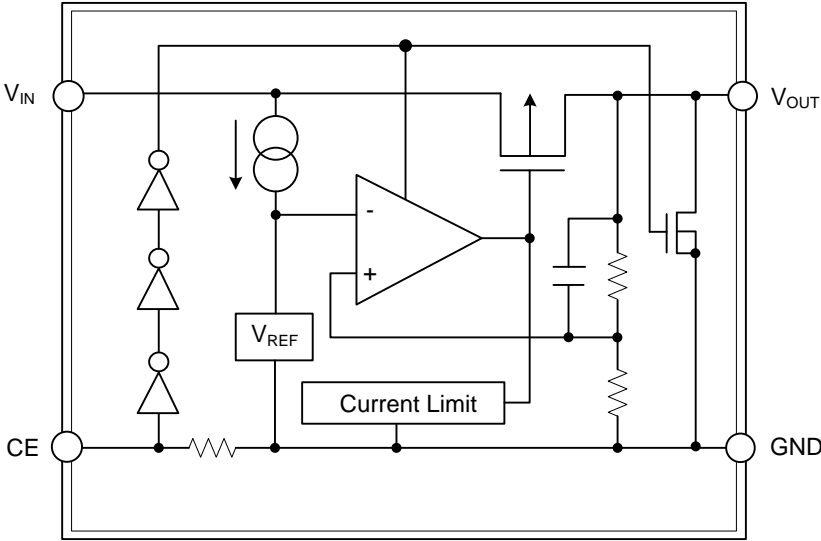
### PIN CONFIGURATION



### PIN DESCRIPTION

PIN NO.			PIN NAME	DESCRIPTION
SOT-23	SOT-23-5 SOT-25	SOT-89		
1	2	1	GND	Ground pin
2	5	3	V <sub>OUT</sub>	Output pin
3	1	2	V <sub>IN</sub>	Input pin
-	3	-	CE	Chip enable pin
-	4	-	NC	No connection

■ 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 ~ $V_{IN}+0.3$	V
Output Current		$I_{OUT}$	160	mA
Power Dissipation	SOT-23	$P_D$	280	mW
	SOT-23-5		300	mW
	SOT-25		360	mW
	SOT-89		500	mW
Operating Temperature Range		$T_{OPT}$	-40 ~ +85	°C
Storage Temperature Range		$T_{STG}$	-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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Output Voltage	$V_{OUT}$	$V_{IN} = \text{Set } V_{OUT}+1V, 1mA \leq I_{OUT} \leq 30mA$	$V_{OUT} \leq 3.0V$	$\times 0.985$	$\times 1.015$	V	
			$V_{OUT} > 3.0V$	$\times 0.980$	$\times 1.020$		
Output Current	$I_{OUT}$	$V_{IN} - V_{OUT} = 1.0V$	200			mA	
Load Regulation	$\Delta V_{OUT} / \Delta I_{OUT}$	$V_{IN} = \text{Set } V_{OUT}+1V, 1mA \leq I_{OUT} \leq 150mA, 1.2V \leq V_{OUT} < 2.0V,$		28	55	mV	
			$2.0V \leq V_{OUT} < 3.0V$		33	66	mV
			$3.0V \leq V_{OUT}$		35	80	mV
Dropout Voltage	$V_{DIF}$	refer to the ELECTRICAL CHARACTERISTICS by OUTPUT VOLTAGE					
Supply Current	$I_{SS}$	$V_{IN} = \text{Set } V_{OUT}+1V, I_{OUT} = 0mA$		1.5	2.5	$\mu A$	
Supply Current (Standby)	$I_{standby}$	$V_{IN} = \text{Set } V_{OUT}+1V, V_{CE} = GND$		0.1	1.0	$\mu A$	
Line Regulation	$\Delta V_{OUT} / \Delta V_{IN}$	$\text{Set } V_{OUT}+0.5V \leq V_{IN} \leq 6.0V, I_{OUT} = 30mA$		0.02	0.10	%/V	
Ripple Rejection	RR	$f = 1kHz$		50		dB	
Input Voltage	$V_{IN}$		1.8		6.0	V	
Short Current Limit	$I_{LIM}$	$V_{OUT} = 0V$		60		mA	
CE Pull-Down Resistance	$I_{PD}$			0.5		$\mu A$	
CE Input Voltage "H"	$V_{CEH}$		1.5		6.0	V	
CE Input Voltage "L"	$V_{CEL}$		0.0		0.3	V	
On Resistance of Nch Tr. for auto-discharge (Only for D version)	$R_{LOW}$	$V_{CE} = 0V$		70		$\Omega$	

### ■ ELECTRICAL CHARACTERISTICS BY OUTPUT VOLTAGE

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Dropout Voltage	$V_{DIF}$	$I_{OUT} = 150mA$	$V_{OUT} = 1.2V$		0.65		V
			$1.5V < V_{OUT} \leq 1.6V$		0.48		V
			$1.6V < V_{OUT} \leq 1.7V$		0.41		V
			$1.7V < V_{OUT} \leq 2.0V$		0.35		V
			$2.0V < V_{OUT} \leq 2.7V$		0.21		V
			$2.7V < V_{OUT} \leq 5.0V$		0.18		V

■ TEST CIRCUIT

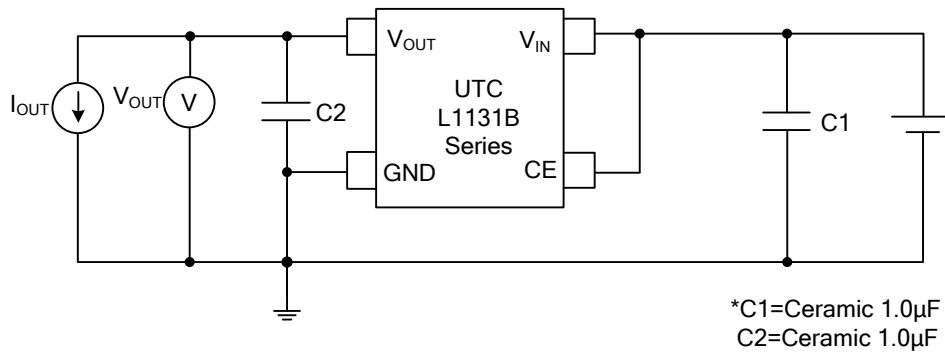


Fig.1 Standard test Circuit

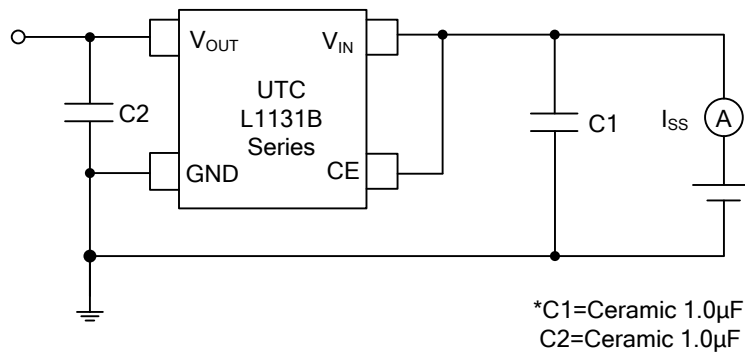


Fig.2 Supply Current Test Circuit

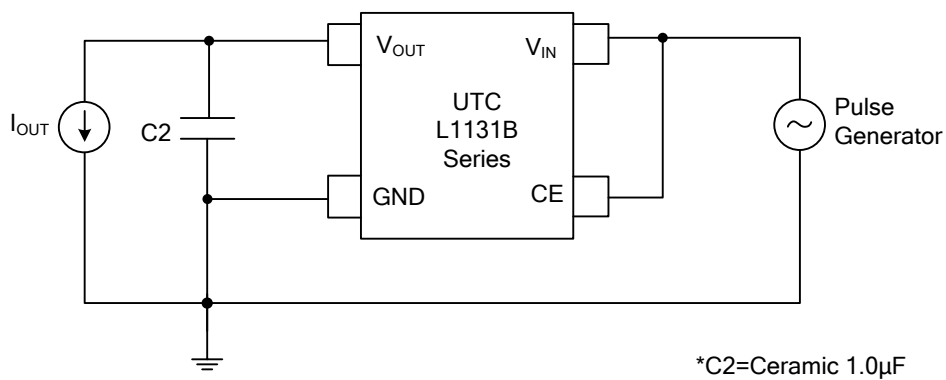
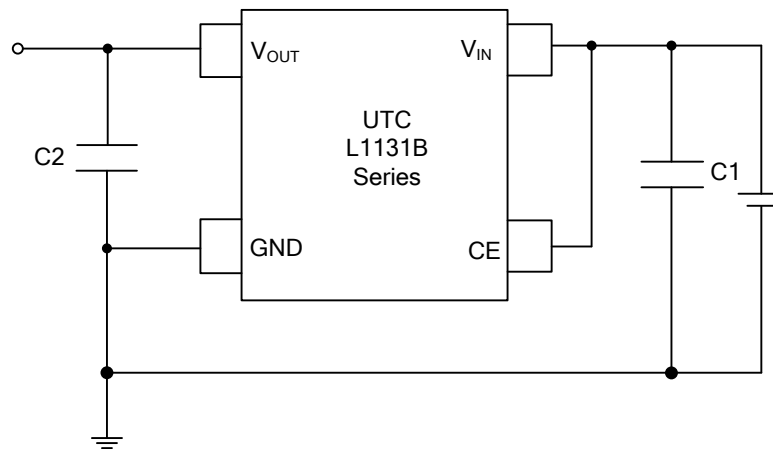


Fig.3 Ripple Rejection, Line Transient

## ■ TYPICAL APPLICATION CIRCUIT



(External Components)

C1 Ceramic 1.0 $\mu$ F

C2 Ceramic 1.0 $\mu$ F

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