



## L1131A

Preliminary

CMOS IC

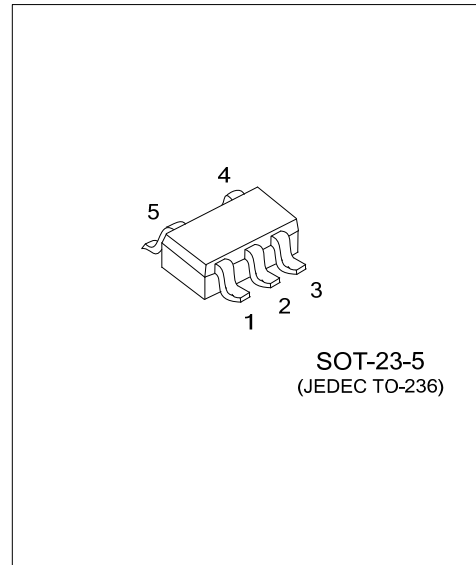
### LOW NOISE 150mA LDO REGULATOR

#### DESCRIPTION

The UTC **L1131A** is a COMS positive linear regulator. One of it's feature is the very low quiescent current typical as low as 10 $\mu$ A and its dropout voltage is extremely low with 150mA 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 4.3 $\mu$ A, and the line transient response and the load transient response of the UTC **L1131A** Series are excellent, thus these ICs are very suitable for the power supply for hand-held communication equipment.

The output voltage of these ICs is fixed with high accuracy. Since the packages for these ICs are SOT-23-5 therefore high density mounting of the ICs on boards is possible.



#### FEATURES

- \* Low supply current Typ. 4.3 $\mu$ A
- \* Standby mode Typ. 0.1 $\mu$ A
- \* 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  
 $C_{IN}=C_{OUT}=1\mu F$

#### ORDERING INFORMATION

Ordering Number	Package	Packing
L1131AG-xx-AE5-R	SOT-23-5	Tape Reel

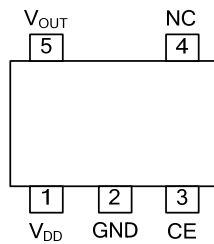
Note: xx: Output Voltage, refer to Marking Information.

<p>L1131AG-xx-AE5-R</p>	<p>(1) R: Tape Reel (2) AE5: SOT-23-5 (3) xx: refer to Marking Information (4) G: Halogen Free and Lead Free</p>
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MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-23-5	15: 1.5V 25: 2.5V 28: 2.8V 33: 3.3V	

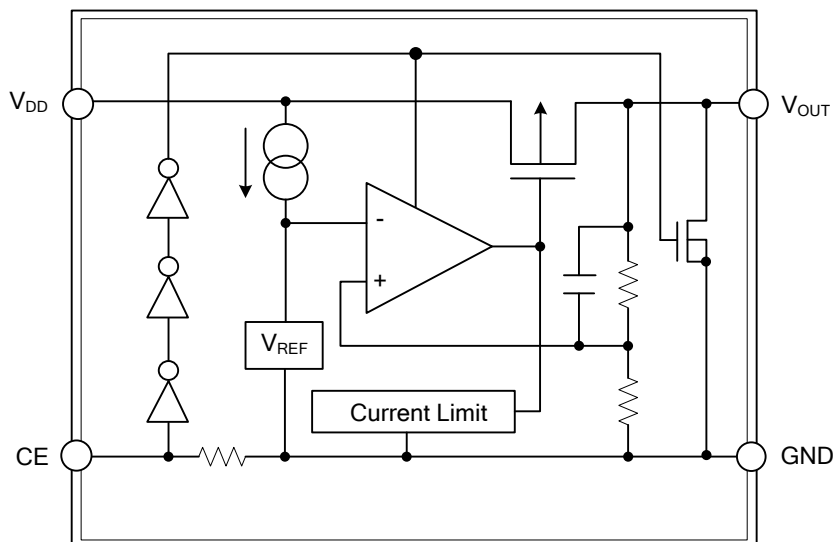
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V <sub>DD</sub>	Input pin
2	GND	Ground pin
3	CE	Chip enable pin
4	NC	No connection
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	$I_{OUT}$	160	mA
Power Dissipation	$P_D$	360	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	$V_{OUT}$	$V_{IN} = \text{Set } V_{OUT} + 1V,$ $1mA \leq I_{OUT} \leq 30mA$	$V_{OUT} \leq 3.0V$ $\times 0.985$		$V_{OUT} > 3.0V$ $\times 1.015$	V
Output Current	$I_{OUT}$	$V_{IN} - V_{OUT} = 1.0V$	150			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	$I_{SS}$	$V_{IN} = \text{Set } V_{OUT} + 1V, I_{OUT} = 0mA$		4.3	18	$\mu A$
Supply Current (Standby)	$I_{standby}$	$V_{IN} = \text{Set } V_{OUT} + 1V, V_{CE} = V_{DD}$		0.1	1.0	$\mu A$
Line Regulation	$\Delta V_{OUT} / \Delta V_{IN}$	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
		$f = 10kHz,$ Ripple 0.2Vp-p, $V_{IN} - V_{OUT} = 1.0V, I_{OUT} = 30mA$		45		dB
Input Voltage	$V_{IN}$		1.8		6.0	V
Output Voltage Temperature Coefficient	$\Delta V_{OUT} / \Delta T$	$I_{OUT} = 30mA$ $-40^\circ C \leq T_{OPT} \leq 85^\circ C$		$\pm 100$		ppm/°C
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
Output Noise	en	BW=10Hz~100kHz		30		$\mu V_{rms}$
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

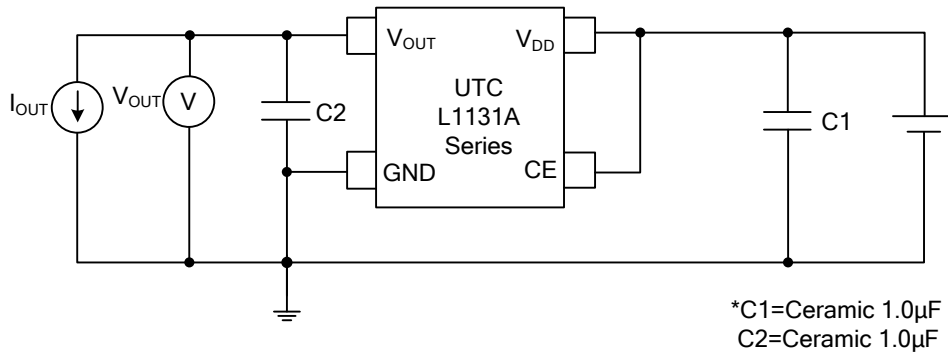


Fig.1 Standard test Circuit

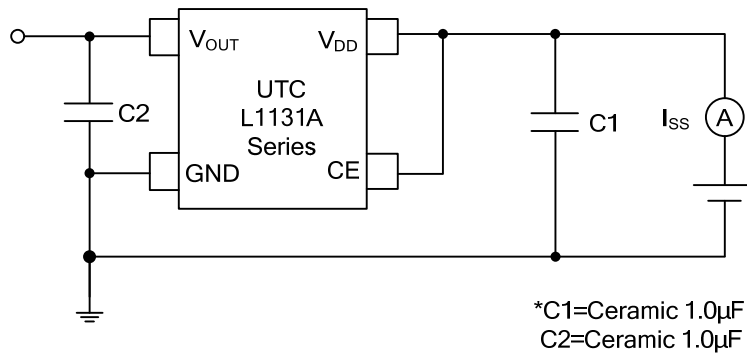


Fig.2 Supply Current Test Circuit

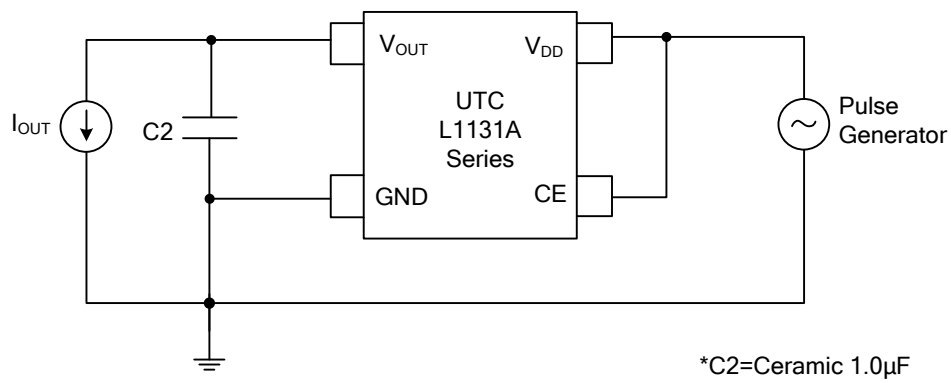
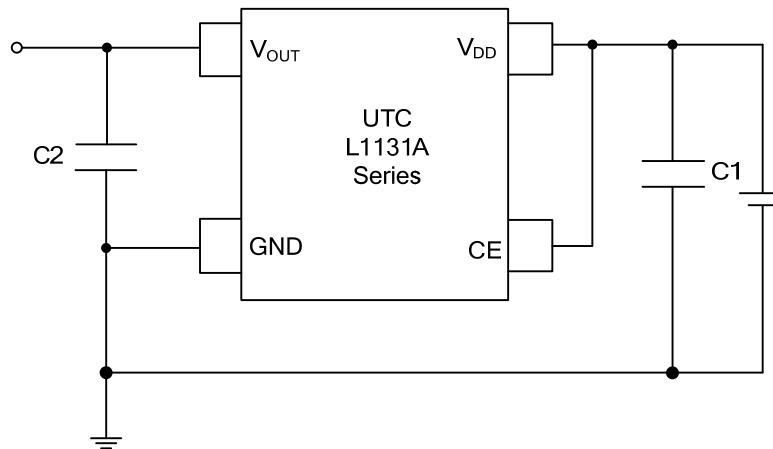


Fig.3 Ripple Rejection, Line Transient

## ■ TYPICAL APPLICATION CIRCUIT



(External Components)

C2 Ceramic 1.0 $\mu$ F      Ex. Murata GRM155B30J105KE18B  
Kyocera CM05X5R105K06AB

C1 Ceramic 1.0 $\mu$ F

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