



L1131A

Preliminary

CMOS IC

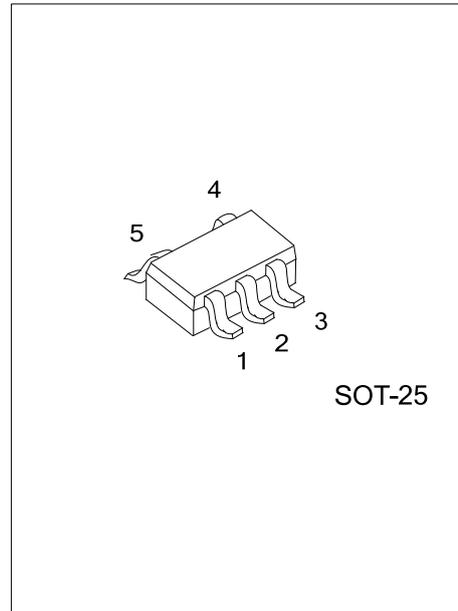
LOW NOISE 150mA LDO REGULATOR

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 10µA 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 10µA, 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. 10µA
- * 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_{IN}=C_{OUT}=1µF

ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
L1131AL-xx-AF5-R	L1131AG-xx-AF5-R	SOT-25	Tape Reel

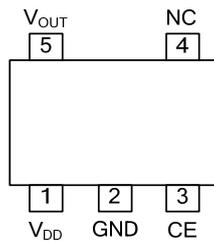
Note: xx: Output Voltage, refer to Marking Information.

<p>L1131AL-xx-AF5-R</p>	<p>(1) R: Tape Reel (2) AF5: SOT-25 (3) xx: refer to Marking Information (4) L: Lead Free, G: Halogen Free</p>
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MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-25	25: 2.5V 33: 3.3V	

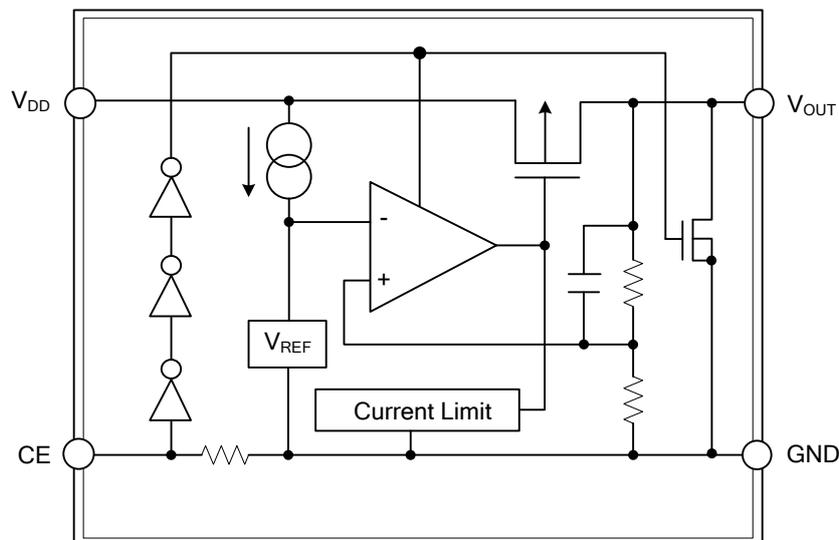
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V _{DD}	Input pin
2	GND	Ground pin
3	CE	Chip enable pin
4	NC	No connection
5	V _{OUT}	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}	$-40 \sim 85$	$^{\circ}C$
Storage Temperature Range	T_{STG}	$-55 \sim 125$	$^{\circ}C$

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}	$V_{IN} = \text{Set } V_{OUT} + 1V, I_{OUT} = 0mA$		10	18	μA
Supply Current (Standby)	$I_{standby}$	$V_{IN} = \text{Set } V_{OUT} + 1V, V_{CE} = V_{DD}$		0.1	1.0	μA
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 $0.2V_{p-p},$ $V_{IN} - V_{OUT} = 1.0V, I_{OUT} = 30mA$		45		dB
Input Voltage	V_{IN}		1.8		6.0	V
Output Voltage Temperature Coefficient	$\Delta V_{OUT} / \Delta T$	$I_{OUT} = 30mA$ $-40^{\circ}C \leq T_{OPT} \leq 85^{\circ}C$		± 100		ppm/ $^{\circ}C$
Short Current Limit	I_{LIM}	$V_{OUT} = 0V$		60		mA
CE Pull-Down Resistance	I_{PD}			0.5		μA
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	$BW = 10Hz \sim 100kHz$		30		μV_{rms}
On Resistance of Nch Tr. for auto-discharge (Only for D version)	R_{LOW}	$V_{CE} = 0V$		70		Ω

■ 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

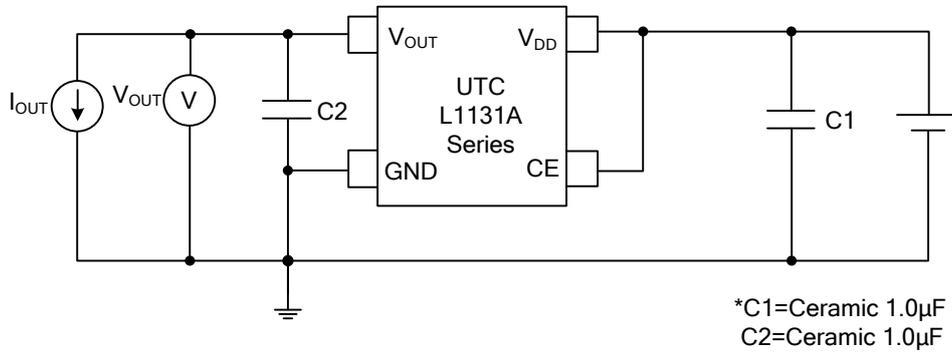


Fig.1 Standard test Circuit

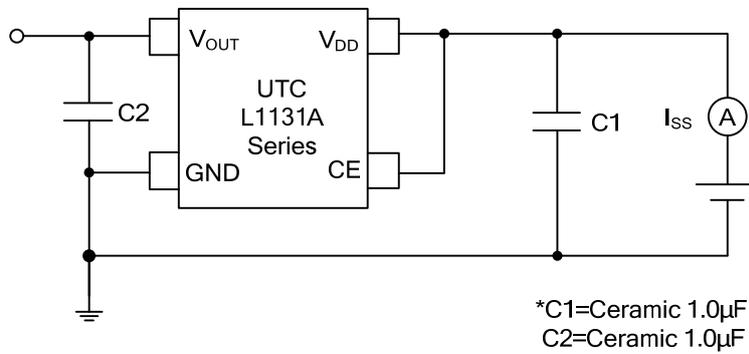


Fig.2 Supply Current Test Circuit

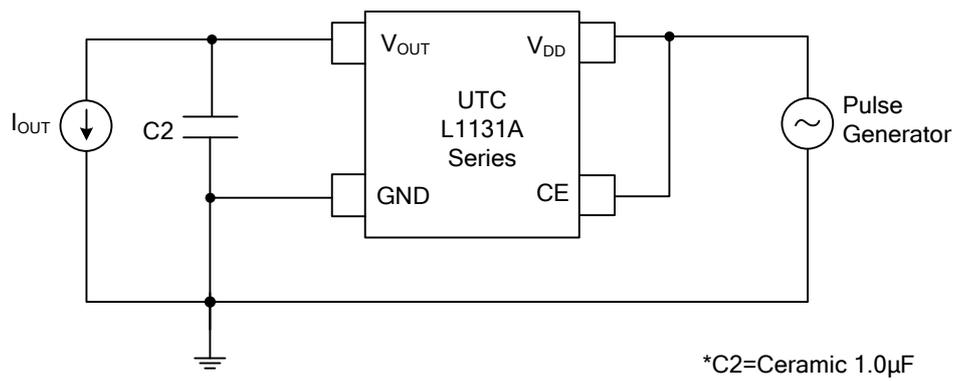
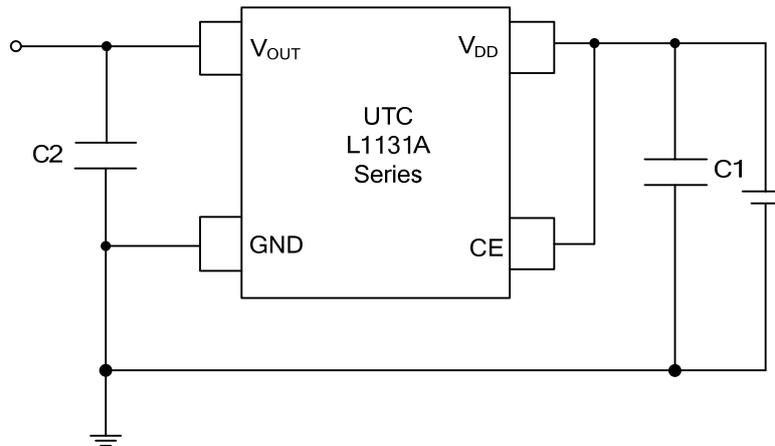


Fig.3 Ripple Rejection, Line Transient

■ TYPICAL APPLICATION CIRCUIT



(External Components)

C2 Ceramic 1.0 μ F Ex. Murata GRM155B30J105KE18B
Kyocera CM05X5R105K06AB

C1 Ceramic 1.0 μ F

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