

**L1131C**

Preliminary

CMOS IC

**LOW NOISE 150mA LDO
REGULATOR**

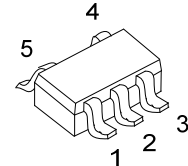
■ DESCRIPTION

The UTC **L1131C** 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 normal operation of UTC **L1131C**, the dropout voltage is very low, and the response of line transient and load transient are very well.

Inside each UTC **L1131C**, there're many functions which can be seen in the block figure, for example, a voltage reference unit, an error amplifier, resistor-net for voltage setting, a current limit circuit, and a chip enable circuit.

The UTC **L1131C** can be used as an ideal of power source for hand-held communication equipment, such as cameras, VCRs, camcorders and other battery-powered equipment.



SOT-25

■ FEATURES

- * Ultra Supply Current: 75 μ A(typ.)
- * Standby Mode: 0.1 μ A(typ.)
- * Very Low Dropout Voltage: 0.28V(typ.) @ $I_{OUT}=150mA$, $V_{OUT}=2.5V$
- * Ripple Rejection: 70dB(typ.) @ $f=1kHz$
60dB(typ.) @ $f=10kHz$
- * Temperature-Drift Coefficient
of Output Voltage: $\pm 100ppm/^{\circ}C$ (typ.)
- * Well Line Regulation: 0.02%/V(typ.)
- * Output Voltage Accuracy: $\pm 2.0\%$ (typ.)
- * Internal Fold Back Protection Circuit
- * $C_{IN}=C_{OUT}=1\mu F$ or more (Ceramic capacitors) are recommended to be used with this IC
- * Halogen Free

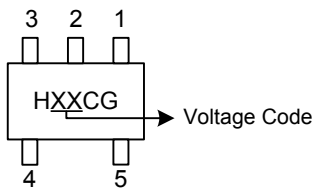
■ ORDERING INFORMATION

Ordering Number	Package	Pin Assignment					Packing
		1	2	3	4	5	
L1131CG-xx-AF5-R	SOT-25	I	G	C	N	O	Tape Reel

Note: Pin Assignment: I: V_{IN} O: V_{OUT} G: GND C: CE N: NC

L1131CG-xx-AF5-R	(1) R: Tape Reel (2) AF5: SOT-25 (3) xx: Refer to Marking Information (4) G: Halogen Free
-------------------------	---

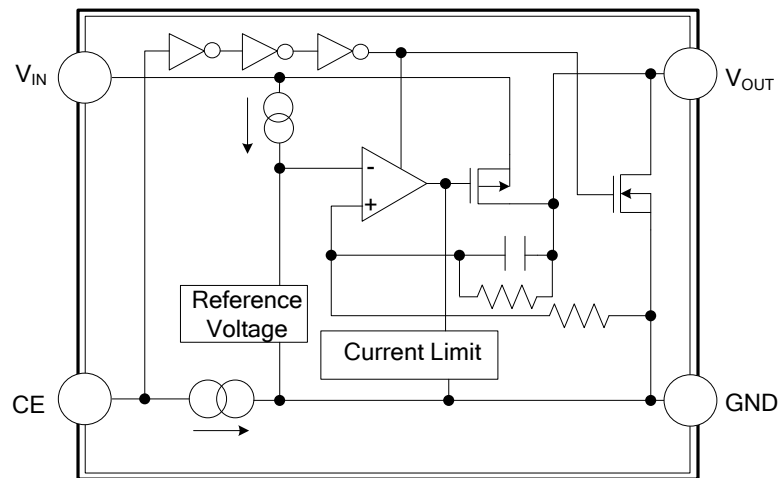
■ MARKING

PACKAGE	VOLTAGE CODE	MARKING
SOT-25	20:2.0V 25:2.5V	 The diagram shows a top-down view of a 5-pin SOT-25 package. The pins are numbered 1, 2, 3, 4, and 5. Pin 1 is at the top right, pin 2 is at the top center, pin 3 is at the top left, pin 4 is at the bottom left, and pin 5 is at the bottom right. The marking 'HXXCG' is located in the center of the package, with an arrow pointing from the 'X' to the text 'Voltage Code'.

■ PIN DESCRIPTION

PIN NO	PIN NAME	DESCRIPTION
1	V _{IN}	Input pin
2	GND	Ground pin
3	CE	Input pin for chip enable, "high" means enable the chip.
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}	200	mA
Power Dissipation	P_D	420	mW
Junction Temperature	T_J	+125	°C
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

L1131C-2.0V

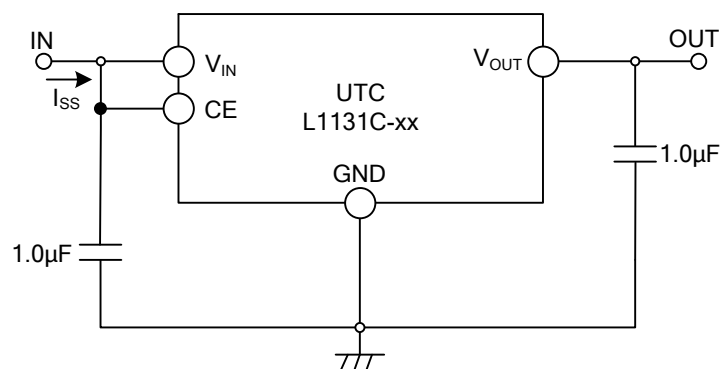
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	$V_{IN} = \text{Set } V_{OUT} + 1V$ $1mA \leq I_{OUT} \leq 30mA$	1.96		2.04	V
Input Voltage		V_{IN}				6.0	V
Load Regulation		$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$	$V_{IN} = \text{Set } V_{OUT} + 1V$ $1mA \leq I_{OUT} \leq 150mA$		22	40	mV
Output Current		I_{OUT}	$V_{IN} - V_{OUT} = 1.0V$	150			mA
Supply Current		I_{SS}	$V_{IN} = \text{Set } V_{OUT} + 1V, I_{OUT} = 0mA$		75	95	μA
Supply Current (Standby)		I_{ST-BY}	$V_{IN} = \text{Set } V_{OUT} + 1V, V_{CE} = GND$		0.1	1.0	μA
Short Current Limit		I_{LIMIT}	$V_{OUT} = 0V$		40		mA
CE Input Voltage	High	V_{CEH}		1.5		V_{IN}	V
	Low	V_{CEL}		0.0		0.3	V
Output Noise		eN	BW = 10Hz ~ 100kHz		30		μVrms
CE Pull-down Resistance		R_{PD}		0.7	2.0	8.0	MΩ
Ripple Rejection		RR	Ripple 0.5Vp-p $V_{IN} - V_{OUT} = 1.0V, I_{OUT} = 30mA$	f=1kHz	70		dB
				f=10kHz	60		dB
Dropout Voltage		V_D	$I_{OUT} = 150mA$		0.32	0.55	V
Line Regulation		$\frac{\Delta V_{OUT}}{\Delta V_{IN}}$	Set $V_{OUT} + 0.5V \leq V_{IN} \leq 6.0V, I_{OUT} = 30mA$		0.02	0.10	%/V
Output Voltage Temperature Coefficient		$\frac{\Delta V_{OUT}}{\Delta T}$	$I_{OUT} = 30mA$ $-40^\circ C \leq T_{OPR} \leq 85^\circ C$		±100		ppm/°C
On Resistance of Nch for Auto Discharge		R_{LOW}	$V_{CE} = 0V$		60		Ω

■ ELECTRICAL CHARACTERISTICS(Cont.)

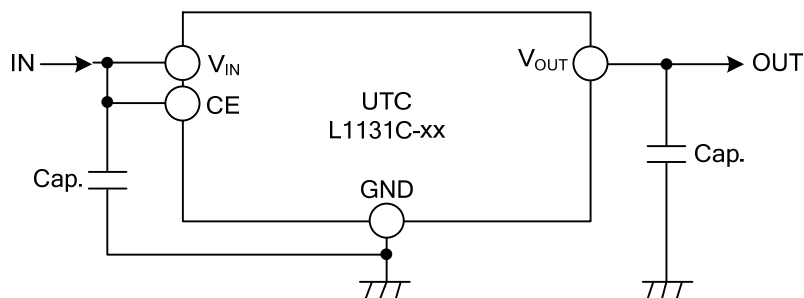
L1131C-2.5V

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V _{OUT}	V _{IN} = Set V _{OUT} +1V 1mA ≤ I _{OUT} ≤30mA	2.45		2.55	V
Input Voltage		V _{IN}				6.0	V
Load Regulation		$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$	V _{IN} = Set V _{OUT} +1V 1mA ≤ I _{OUT} ≤ 150mA		22	40	mV
Output Current		I _{OUT}	V _{IN} -V _{OUT} = 1.0V	150			mA
Supply Current		I _{SS}	V _{IN} = Set V _{OUT} +1V, I _{OUT} = 0mA		75	95	μA
Supply Current (Standby)		I _{ST-BY}	V _{IN} = Set V _{OUT} +1V V _{CE} = GND		0.1	1.0	μA
Short Current Limit		I _{LIMIT}	V _{OUT} = 0V		40		mA
CE Input Voltage	High	V _{CEH}		1.5		V _{IN}	V
	Low	V _{CEL}		0.0		0.3	V
Output Noise		eN	BW = 10Hz ~ 100kHz		30		μVrms
CE Pull-down Resistance		R _{PD}		0.7	2.0	8.0	MΩ
Ripple Rejection	RR	Ripple 0.5Vp-p V _{IN} -V _{OUT} = 1.0V, I _{OUT} = 30mA	f=1kHz		70		dB
			f=10kHz		60		dB
Dropout Voltage		V _D	I _{OUT} =150mA		0.28	0.50	V
Line Regulation		$\frac{\Delta V_{OUT}}{\Delta V_{IN}}$	Set V _{OUT} +0.5V ≤V _{IN} ≤6.0V I _{OUT} = 30mA		0.02	0.10	%/V
Output Voltage Temperature Coefficient		$\frac{\Delta V_{OUT}}{\Delta T}$	I _{OUT} = 30mA -40°C ≤ T _{OPR} ≤85°C		±100		ppm/°C
On Resistance of Nch for Auto Discharge		R _{LOW}	V _{CE} = 0V		60		Ω

■ TEST CIRCUIT



■ TYPICAL APPLICATION CIRCUIT



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.