



L1131C

Preliminary

CMOS IC

LOW NOISE 150mA LDO REGULATOR

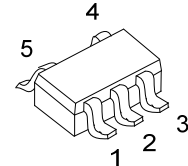
DESCRIPTION

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

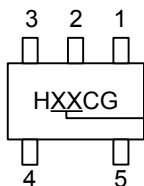
ORDERING INFORMATION

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

<p>L1131CG-xx-AF5-R</p>	<p>(1) R: Tape Reel</p> <p>(2) AF5: SOT-25</p> <p>(3) xx: Refer to Marking Information</p> <p>(4) G: Halogen Free</p>
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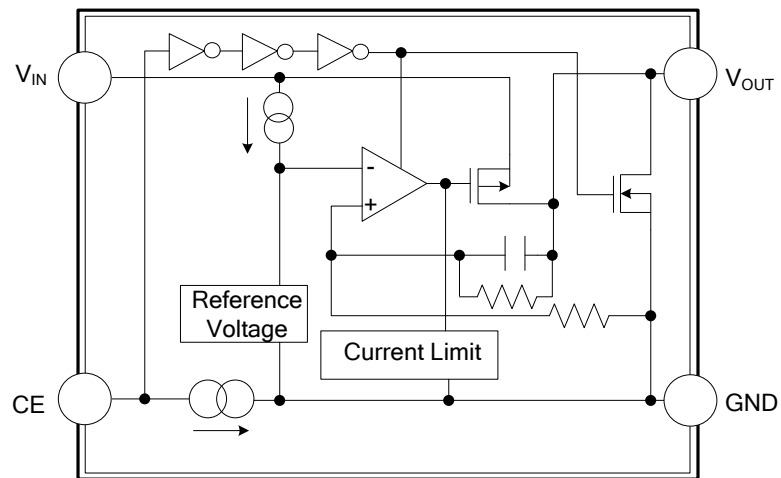
■ MARKING

PACKAGE	VOLTAGE CODE	MARKING
SOT-25	20:2.0V 25:2.5V	 The diagram shows a SOT-25 package with five pins numbered 1 to 5. Pin 1 is at the top right, pin 2 is at the top middle, 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 shown on the package, with an arrow pointing to the 'X' characters, labeled '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

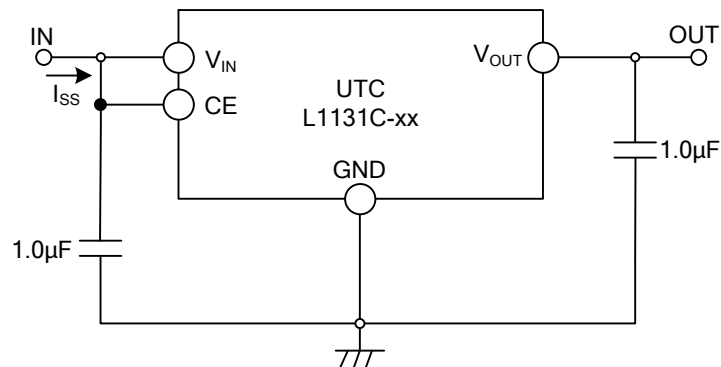
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	$V_{IN} = \text{Set } V_{OUT} + 1V$ $1mA \leq I_{OUT} \leq 30mA$	1.96		2.04	V
Input Voltage		V_{IN}				6.0	V
Load Regulation		$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$	$V_{IN} = \text{Set } V_{OUT} + 1V$ $1mA \leq I_{OUT} \leq 150mA$		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.)

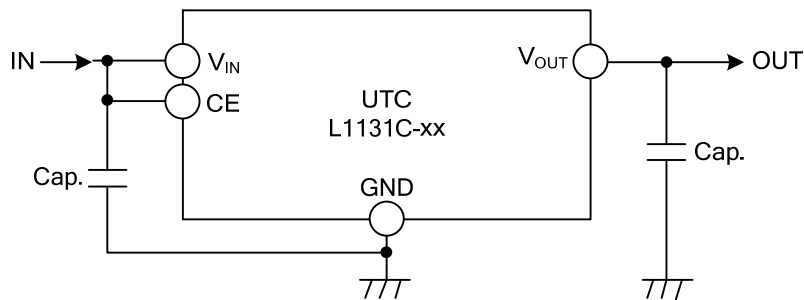
L1131C-2.5V

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



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