



## L1131C

Preliminary

CMOS IC

### LOW NOISE 150mA LDO REGULATOR

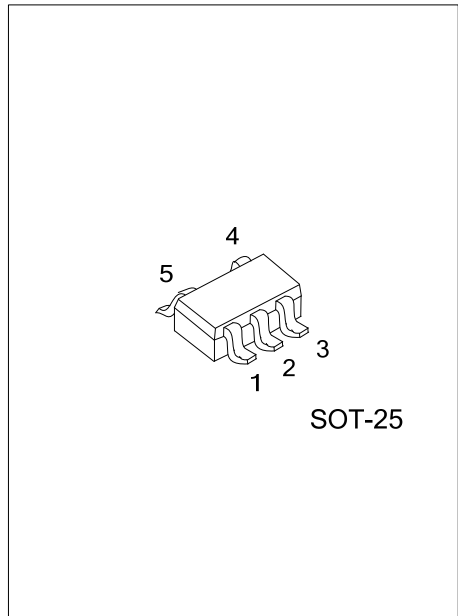
#### DESCRIPTION

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.



#### FEATURES

- \* Ultra Supply Current: 75 $\mu$ A(typ.)
- \* Standby Mode: 0.1 $\mu$ A(typ.)
- \* Very Low Dropout Voltage: 0.28V(typ.) @I<sub>OUT</sub>=150mA, V<sub>OUT</sub>=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<sub>IN</sub>=C<sub>OUT</sub>=1 $\mu$ F or more (Ceramic capacitors) are recommended to be used with this IC

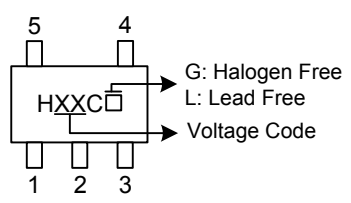
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment					Packing
Lead Free	Halogen Free		1	2	3	4	5	
L1131CL-xx-AF5-R	L1131CG-xx-AF5-R	SOT-25	I	G	C	N	O	Tape Reel

Note: Pin Assignment: I:V<sub>IN</sub> O:V<sub>OUT</sub> G:GND C:CE N:NC

<p>L1131CL-xx-AF5-R</p> <p>(1) Packing Type (2) Package Type (3) Output Voltage Code (4) Lead Free</p>	<p>(1) R: Tape Reel (2) AF5: SOT-25 (3) xx: Refer to Marking Information (4) G: Halogen Free, L: Lead Free</p>
--	--

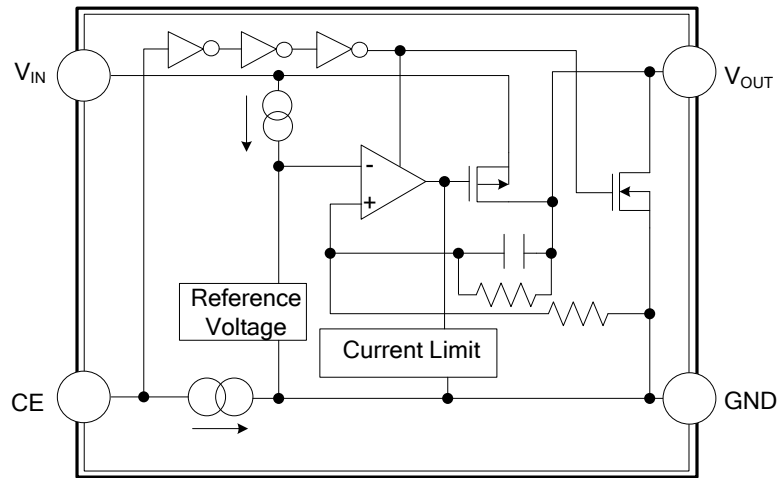
■ MARKING

PACKAGE	VOLTAGE CODE	MARKING
SOT-25	20:2.0V 25:2.5V	 <p>G: Halogen Free L: Lead Free Voltage Code</p>

■ PIN DESCRIPTION

PIN NO	PIN NAME	DESCRIPTION
1	V <sub>IN</sub>	Input pin
2	GND	Ground pin
3	CE	Input pin for chip enable, "high" means enable the chip.
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~ $V_{IN}+0.3$	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

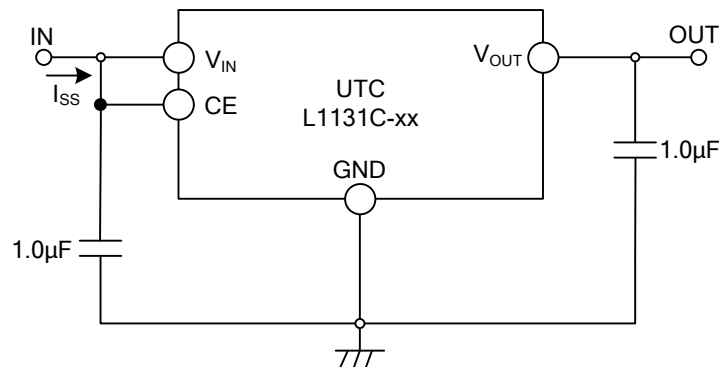
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		$V_{OUT}$	$V_{IN} = \text{Set } V_{OUT}+1V, I_{OUT} \leq 30mA$	1.96		2.04	V
Input Voltage		$V_{IN}$				6.0	V
Load Regulation		$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$	$V_{IN} = \text{Set } V_{OUT}+1V$ $1mA \leq I_{OUT} \leq 150mA$		22	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	$\mu A$
Supply Current (Standby)		$I_{ST-BY}$	$V_{IN} = \text{Set } V_{OUT}+1V, V_{CE} = GND$		0.1	1.0	$\mu A$
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		$\mu V_{rms}$
CE Pull-down Resistance		$R_{PD}$		0.7	2.0	8.0	M $\Omega$
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		$\frac{\Delta V_{OUT}}{\Delta T}$	$I_{OUT} = 30mA$ $-40^\circ C \leq T_{OPR} \leq 85^\circ C$		$\pm 100$		ppm/°C
On Resistance of Nch for Auto Discharge		$R_{LOW}$	$V_{CE} = 0V$		60		$\Omega$

■ ELECTRICAL CHARACTERISTICS(Cont.)

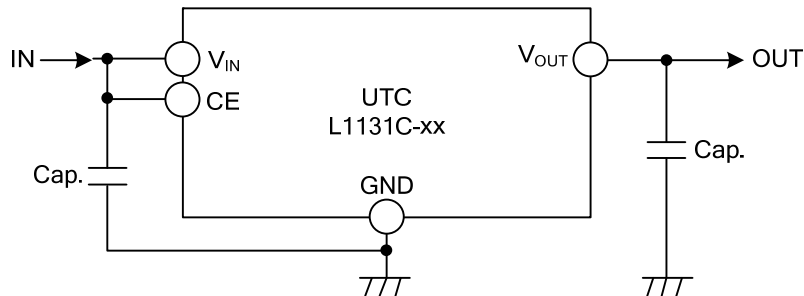
L1131C-2.5V

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		$V_{OUT}$	$V_{IN} = \text{Set } V_{OUT}+1V, 1mA \leq I_{OUT} \leq 30mA$	2.45		2.55	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	$\mu A$
Supply Current (Standby)		$I_{ST-BY}$	$V_{IN} = \text{Set } V_{OUT}+1V, V_{CE} = GND$		0.1	1.0	$\mu A$
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		$\mu V_{rms}$
CE Pull-down Resistance		$R_{PD}$		0.7	2.0	8.0	M $\Omega$
Ripple Rejection		RR	Ripple 0.5Vp-p		70		dB
			$V_{IN}-V_{OUT} = 1.0V, I_{OUT} = 30mA$	f=1kHz		60	
Dropout Voltage		$V_D$	$I_{OUT}=150mA$		0.28	0.50	V
Line Regulation		$\frac{\Delta V_{OUT}}{\Delta V_{IN}}$	Set $V_{OUT}+0.5V \leq V_{IN} \leq 6.0V, I_{OUT} = 30mA$		0.02	0.10	%/V
Output Voltage Temperature Coefficient		$\frac{\Delta V_{OUT}}{\Delta T}$	$I_{OUT} = 30mA, -40^{\circ}C \leq T_{OPR} \leq 85^{\circ}C$		$\pm 100$		ppm/ $^{\circ}C$
On Resistance of Nch for Auto Discharge		$R_{LOW}$	$V_{CE} = 0V$		60		$\Omega$

■ 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.