



L1131C

Preliminary

CMOS IC

LOW NOISE 150mA LDO REGULATOR

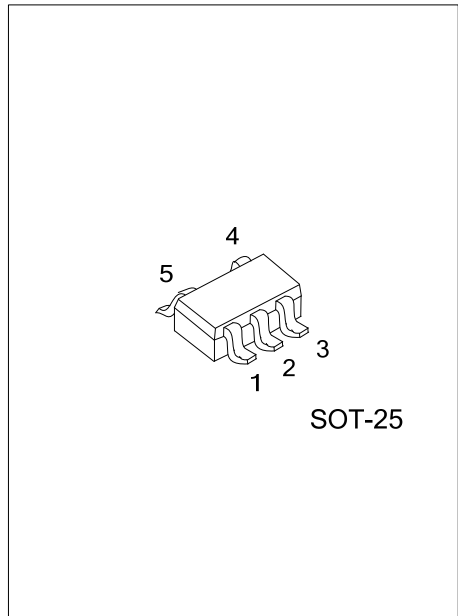
DESCRIPTION

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 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 μ F or more (Ceramic capacitors) are recommended to be used with this IC

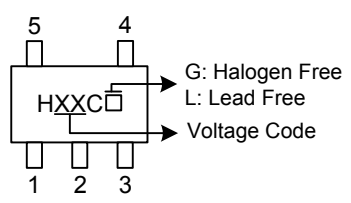
ORDERING INFORMATION

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_{IN} O:V_{OUT} G:GND C:CE N:NC

<p>L1131CL-xx-AF5-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Output Voltage Code</p> <p>(4) Lead Free</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, L: Lead Free</p>
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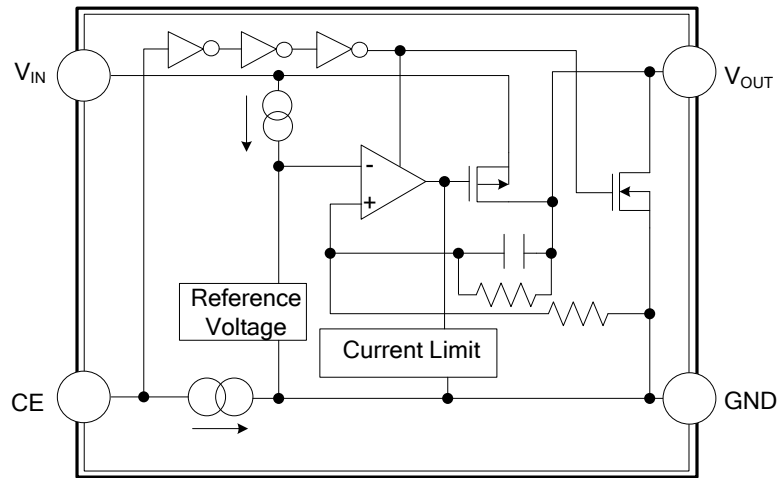
■ MARKING

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 _{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~ $V_{IN}+0.3$	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

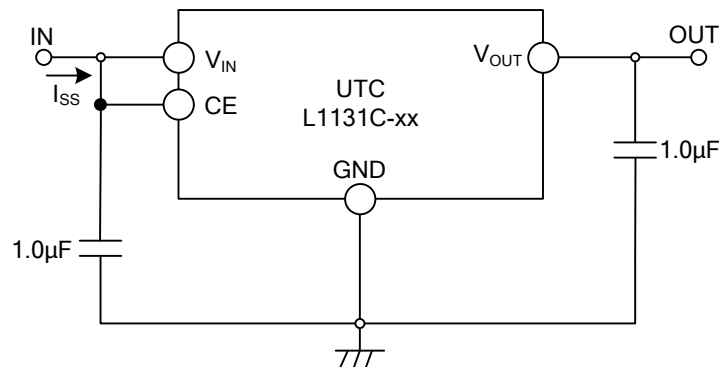
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	$V_{IN} = \text{Set } V_{OUT}+1V, I_{OUT} \leq 30mA$	1.96		2.04	V
Input Voltage		V_{IN}				6.0	V
Load Regulation		$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$	$V_{IN} = \text{Set } V_{OUT}+1V$ $1mA \leq I_{OUT} \leq 150mA$		22	40	mV
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	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		μV_{rms}
CE Pull-down Resistance		R_{PD}		0.7	2.0	8.0	M Ω
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.)

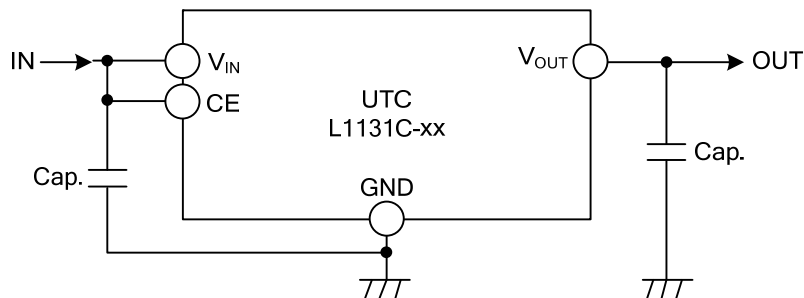
L1131C-2.5V

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	$V_{IN} = \text{Set } V_{OUT}+1V, 1mA \leq I_{OUT} \leq 30mA$	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	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		μV_{rms}
CE Pull-down Resistance		R_{PD}		0.7	2.0	8.0	M Ω
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		$\frac{\Delta V_{OUT}}{\Delta T}$	$I_{OUT} = 30mA, -40^{\circ}C \leq T_{OPR} \leq 85^{\circ}C$		± 100		ppm/ $^{\circ}C$
On Resistance of Nch for Auto Discharge		R_{LOW}	$V_{CE} = 0V$		60		Ω

■ TEST CIRCUIT



■ TYPICAL APPLICATION CIRCUIT



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