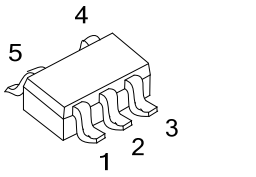
LOW NOISE 150mA LDO REGULATOR



SOT-25

■ 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: 75μA(typ.)
* Standby Mode: 0.1μA(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: ±100ppm/°C(typ.)
* Well Line Regulation: 0.02%/V(typ.)
* Output Voltage Accuracy: ±2.0%(typ.)
* Internal Fold Back Protection Circuit
* C_{IN}=C_{OUT}=1μF or more (Ceramic capacitors) are recommended to be used with this IC

■ ORDERING INFORMATION

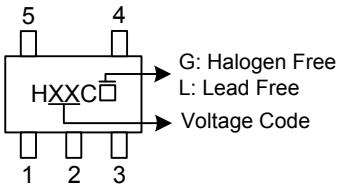
Ordering Number		Package	Pin Assignment					Packing
Lead Free	Halogen Free		1	2	3	4	5	
L1131CL-xx-AF5-R	L1131CG-xx-AF5-R	SOT-25	I	G	C	N	O	Tape Reel

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

L1131CL-xx-AF5-R
(1)Packing Type
(2)Package Type
(3)Output Voltage Code
(4)Lead Free

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

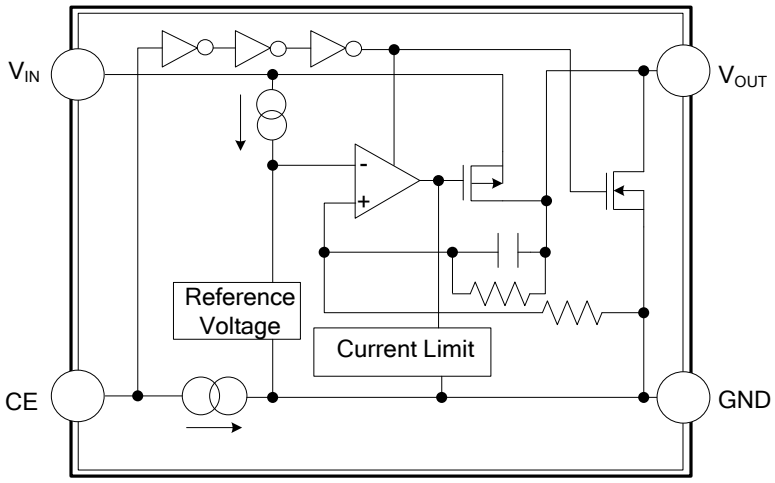
■ MARKING

PACKAGE	VOLTAGE CODE	MARKING
SOT-25	20:2.0V 25:2.5V	

■ 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

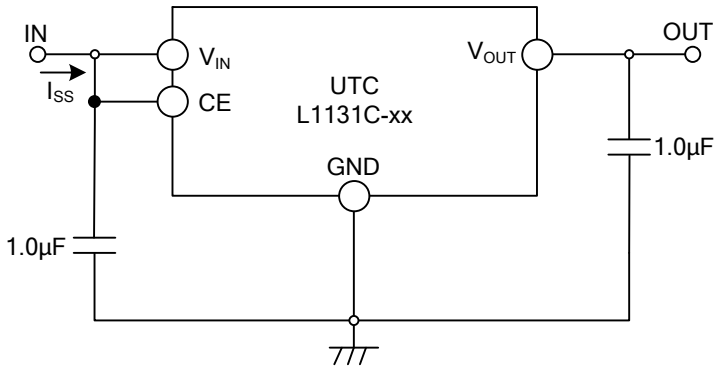
PARAMETER		SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	V_{IN} = Set V_{OUT}+1V, 1mA ≤ I_{OUT} ≤30mA		1.96		2.04	V
Input Voltage		V_{IN}					6.0	V
Load Regulation		$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$	V_{IN} = Set V_{OUT}+1V 1mA ≤ I_{OUT}≤ 150mA			22	40	mV
Output Current		I_{OUT}	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	f=1kHz		70		dB
			V_{IN}−V_{OUT} = 1.0V, I_{OUT} = 30mA	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 ≤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

■ 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	f=1kHz		70		dB
			V_{IN}−V_{OUT} = 1.0V, I_{OUT} = 30mA	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