

3A LOW DROPOUT LINEAR REGULATOR

■ DESCRIPTION

The UTC **L11830** belonged to low quiescent current, low dropout, linear regulators operated from 2.25V to 6V input and are guaranteed to deliver 3A. Wide range of preset output voltage options are available. Built-in low on-resistance transistor provides low dropout voltage and large output current. The UTC **L11830** is designed and optimized for battery-powered systems to work with low noise.

The UTC **L11830** consumes less than 2 μ A in shutdown mode. Other features include ultra low dropout voltage, current limiting protection, thermal shutdown protection and high ripple rejection ratio.

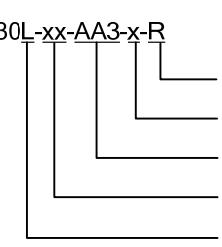
■ FEATURES

- * 3A Guaranteed Output Current
- * low quiescent current: 60 μ A (typ.)
- * 2 μ A Shutdown Current
- * Short Circuit Current Fold-back
- * Low Temperature Coefficient
- * Current Limiting Protection
- * Thermal Shutdown Protection
- * Excellent Line/Load Transient
- * SENSE Option Improves Load Regulation

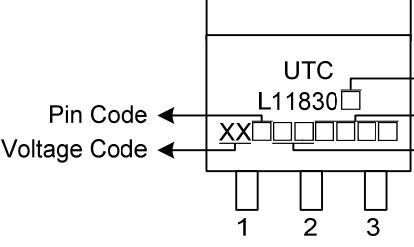
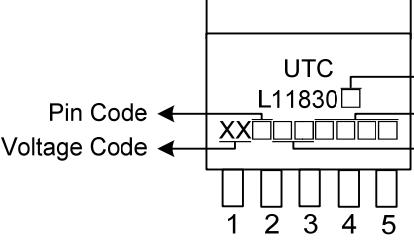
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment					Packing
Lead Free	Halogen Free		1	2	3	4	5	
L11830L-xx-TQ2-D-R	L11830G-xx-TQ2-D-R	TO-263	I	G	O	-	-	Tape Reel
L11830L-xx-TQ2-D-T	L11830G-xx-TQ2-D-T	TO-263	I	G	O	-	-	Tube
L11830L-xx-TQ3-A-R	L11830G-xx-TQ3-A-R	TO-263	G	O	I	-	-	Tape Reel
L11830L-xx-TQ3-A-T	L11830G-xx-TQ3-A-T	TO-263	G	O	I	-	-	Tube
L11830L-xx-TQ5-R	L11830G-xx-TQ5-R	TO-263-5	I	S	G	A	O	Tape Reel
L11830L-xx-TQ5-T	L11830G-xx-TQ5-T	TO-263-5	I	S	G	A	O	Tube

Note: Pin Assignment: I:V_{IN} O:V_{OUT} G:GND S: SHDN A: SENSE

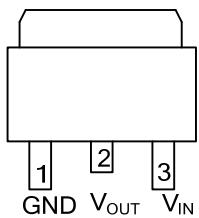
 (1)Packing Type (2)Pin Assignment (3)Package Type (4)Output Voltage Code (5)Lead Plating	(1) R: Tape Reel, T: Tube (2) refer to Pin Assignment (3) TQ2: TO-263, TQ3: TO-263, TQ5: TO-263-5 (4) xx: refer to Marking Information (5) G: Halogen Free, L: Lead Free
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■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
TO-263	15 :1.5V 18 :1.8V 25 :2.5V 33 :3.3V 50 :5.0V	 <p>Diagram illustrating the marking layout for the TO-263 package. The marking consists of: - Top row: UTC, L11830 (with a square box), Pin Code, Voltage Code. - Middle row: XX, followed by a series of squares representing the Date Code. - Bottom row: Pin numbers 1, 2, 3. Annotations indicate: - Pin Code: Points to the square between UTC and the date code. - Voltage Code: Points to the square immediately following the Pin Code. - Date Code: Points to the series of squares following the XX. - L: Lead Free: Points to the square following UTC. - G: Halogen Free: Points to the square following the date code.</p>
TO-263-5	15 :1.5V 18 :1.8V 25 :2.5V 33 :3.3V 50 :5.0V	 <p>Diagram illustrating the marking layout for the TO-263-5 package. The marking consists of: - Top row: UTC, L11830 (with a square box), Pin Code, Voltage Code. - Middle row: XX, followed by a series of squares representing the Date Code. - Bottom row: Pin numbers 1, 2, 3, 4, 5. Annotations indicate: - Pin Code: Points to the square between UTC and the date code. - Voltage Code: Points to the square immediately following the Pin Code. - Date Code: Points to the series of squares following the XX. - L: Lead Free: Points to the square following UTC. - G: Halogen Free: Points to the square following the date code.</p>

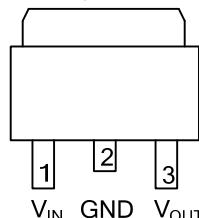
■ PIN CONFIGURATION

For A-type pinout

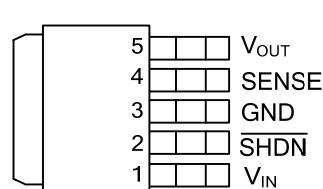


TO-263

For D-type pinout



TO-263

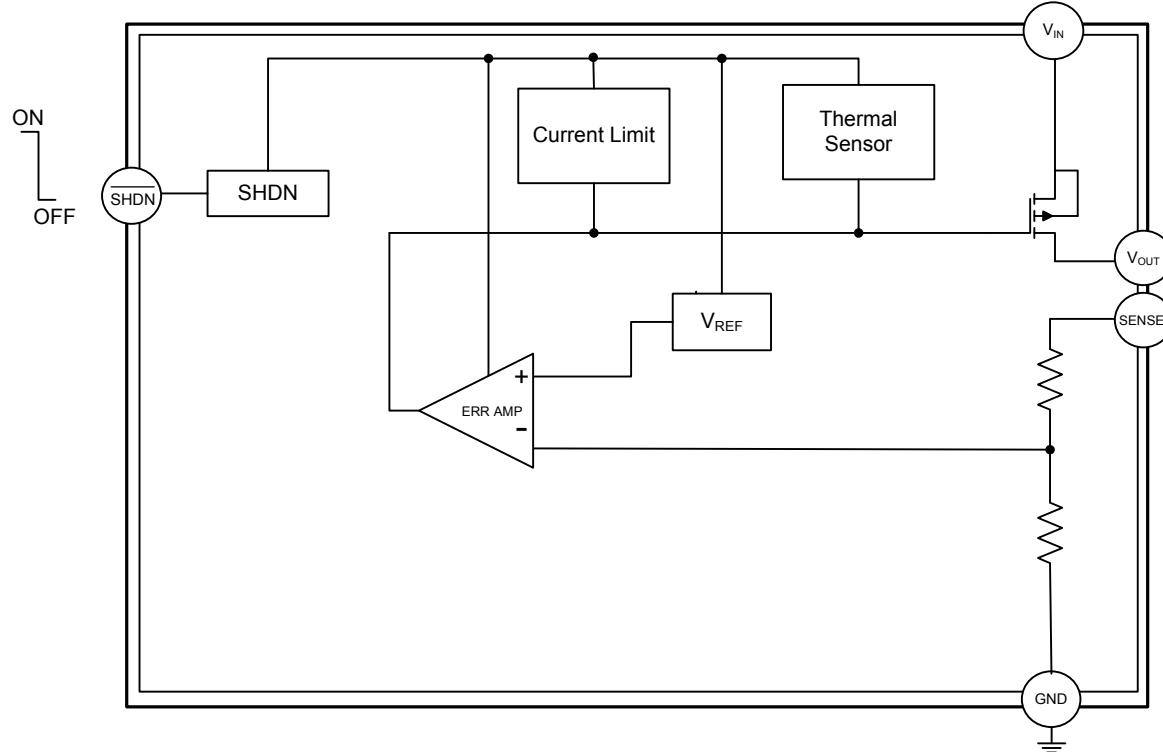


TO-263-5

■ PIN DESCRIPTION

PIN NAME	DESCRIPTION
V_{IN}	Power Input Voltage. Supply voltage can range from 2.25V to 6V. Bypass with a 0.1 μ F capacitor to GND.
GND	Ground
\overline{SHDN}	Active-Low Shutdown Input. A logic low at \overline{SHDN} reduces supply current to 0.01 μ A. Connect \overline{SHDN} to V_{IN} for normal operation.
V_{OUT}	Output Voltage
SENSE	Remote sense pin.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING ($T_A=25^\circ\text{C}$)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{IN}	7	V
Power Dissipation	P_D	Internally limited	mW
Junction Temperature	T_J	+150	$^\circ\text{C}$
Operation Temperature	T_{OPR}	-40 ~ +125	$^\circ\text{C}$
Storage Temperature	T_{STG}	-65 ~ +150	$^\circ\text{C}$

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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	64	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	4	$^\circ\text{C}/\text{W}$

■ ELECTRICAL CHARACTERISTICS

($V_{IN} = V_{OUT} + 1\text{V}$ whichever is greater, $C_{IN} = 0.1\mu\text{F}$, $C_{OUT} = 2.2\mu\text{F}$ (Ceramic), $T_A = 25^\circ\text{C}$, unless otherwise specified)

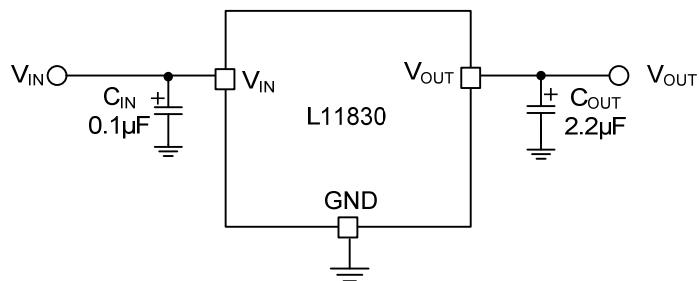
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage	V_{IN}				6	V
Output Voltage Accuracy	V_{OUT}	$T_A=25^\circ\text{C}$, $I_{OUT}=1\text{mA} \sim 3\text{A}$	-2		2	%
		$T_A=0 \sim 85^\circ\text{C}$, $I_{OUT}=1\text{mA} \sim 3\text{A}$	-3		3	
Maximum Output Current	I_{OUT}			3		A
Short-Circuit Current Limit	I_{LIMIT}	$V_{OUT}>1.2\text{V}$		4.5		A
Short-Circuit Current	I_{SC}	$V_{OUT}<0.4\text{V}$		1		A
Ground Pin Current	I_{GND}	$I_{OUT}=0\text{mA}$		60	350	μA
		$I_{OUT}=1\text{mA}$ to 3A		60		
Dropout Voltage (Note 2)	V_D	$I_{OUT}=3\text{A}$	1.5V $\leq V_{OUT} \leq$ 1.8V		1000	mV
			1.8V $< V_{OUT} <$ 2.5V		700	
			2.5 $\leq V_{OUT}$		600	
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	$V_{IN}=V_{OUT}+V_D \sim 6\text{V}$		0.08	0.18	%/V
Load Regulation	ΔV_{OUT}	$V_{IN}=V_{OUT}+1\text{V}$, $I_{OUT}=10\text{mA} \sim 3\text{A}$		0.25	1	%
Output Voltage Noise	e_N	$f=10\text{Hz}$ to 100kHz , $C_{OUT}=2.2\mu\text{F}$		30		μV_{RMS}
Shutdown Supply Current	I_{OFF}	$SHDN=GND$		2	10	μA
Power Supply Rejection	PSRR	$I_{OUT}=100\text{mA}$ $C_{OUT}=10\mu\text{F}$	$f=100\text{Hz}$	60		dB
			$f=1\text{kHz}$	45		
Shutdown Threshold	V_{IH}			2		V
	V_{IL}				0.4	
Thermal Shutdown Temperature	T_{SHDN}			160		$^\circ\text{C}$
Thermal Shutdown Hysteresis	DT_{SHDN}			50		

Note: 1. $V_{IN(\text{MIN})}=V_{OUT}+V_{\text{DROPOUT}}$

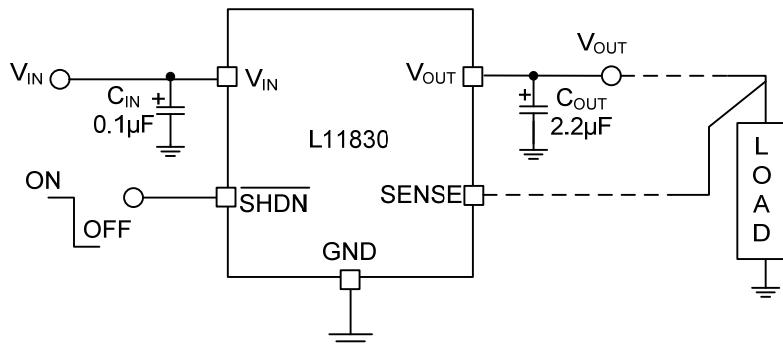
2. The dropout voltage is defined as $V_{IN}-V_{OUT}$, which is measured when V_{OUT} is $V_{OUT(\text{NORMAL})} \times 98\%$

■ TYPICAL APPLICATION CIRCUIT

For To-263



For TO-263-5



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