

**L11810**

Preliminary

CMOS IC

**1A CMOS LOW DROPOUT
VOLTAGE**

■ DESCRIPTION

As UTC LDO, the features of the UTC **L11810** include low quiescent current and very low dropout voltage.

In order to prevent from the bad operating conditions, there are internal thermal shutdown and current fold-back. For stably operation, the UTC **L11810** should be connected to an output capacitance of 2.2 μ F or larger.

The UTC **L11810** is ideal for battery applications, such as portable electronics, wireless devices, cordless phones, PC peripherals and battery powered widgets.

■ FEATURES

- * Extra low dropout voltage
- * Output current: 1A (guaranteed)
- * Output voltage accuracy: $\pm 1.5\%$
- * Quiescent current: 30 μ A
- * Internal Over-Temperature shutdown
- * With Current limiting
- * Internal short circuit current fold-back
- * Pre-set output voltages in factory
- * Very low temperature coefficient

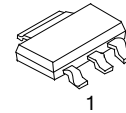
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
L11810L-xx-AA3-A-R	L11810G-xx-AA3-A-R	SOT-223	G	O	I	Tape Reel
L11810L-xx-AA3-D-R	L11810G-xx-AA3-D-R	SOT-223	I	G	O	Tape Reel

Note: Pin Assignment: G:GND O:V_{OUT} I:V_{IN}

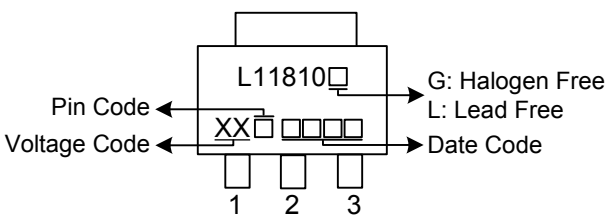
xx: Output Voltage, refer to Marking Information.

L11810L-xx-AA3-A-R	(1) Packing Type	(1) R: Tape Reel
	(2) Pin Code	(2) Pin Assignment
	(3) Package Type	(3) AA3: SOT-223
	(4) Output Voltage Code	(4) xx: Refer to Marking Information
	(5) Lead Free	(5) G: Halogen Free, L: Lead Free

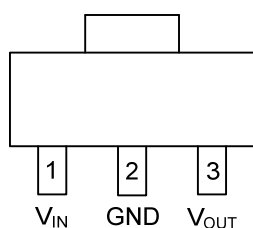


SOT-223

MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-223	28 :2.8V 33 :3.3V	 Pin Code Voltage Code G: Halogen Free L: Lead Free Date Code

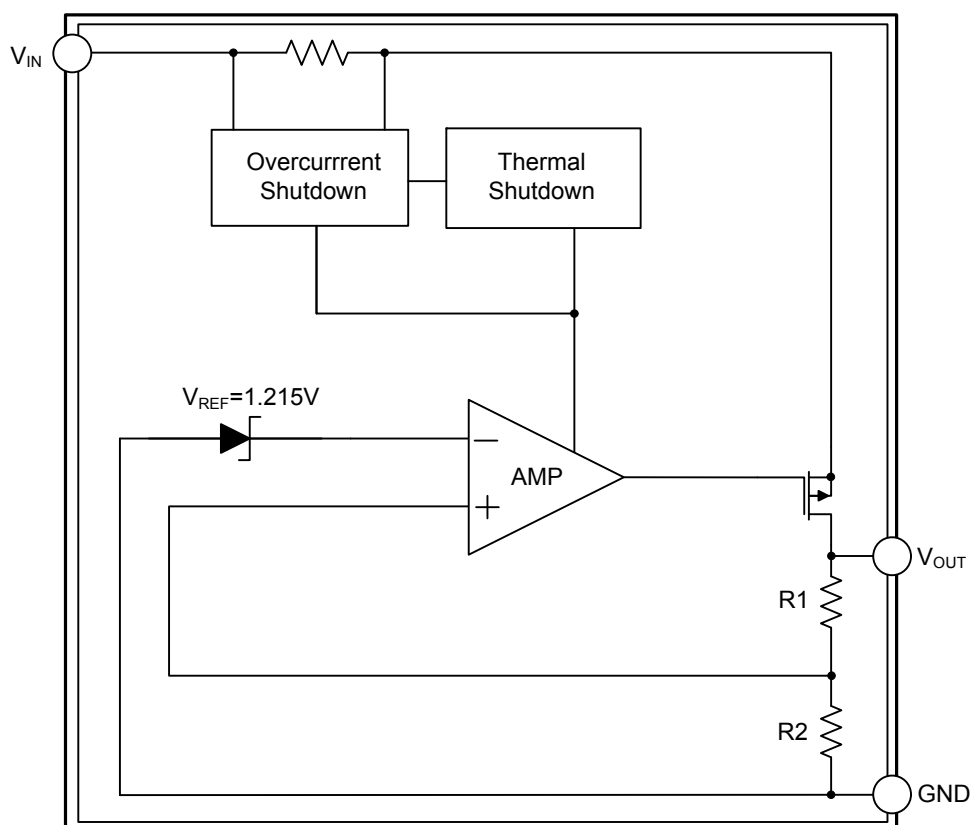
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO	PIN NAME	DESCRIPTION
1	V _{IN}	Input voltage pin which should be decoupled with 1μF or greater capacitor.
2	GND	Ground.
3	V _{OUT}	Output voltage pin which should be decoupled with a ceramic capacitor (value: 2.2μF or larger and low ESR).

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	8	V
Input ,Output Voltage		GND - 0.3 ~ $V_{IN} + 0.3$	V
Output Current	I_{OUT}	1.2	A
Power Dissipation	P_D	900	mW
Junction Temperature	T_J	125	°C
Operating Temperature	T_{OPR}	- 40 ~ +85	°C
Storage Temperature	T_{STG}	- 65 ~ +150	°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}	120	°C/W
Junction to Case (Note)	θ_{JC}	25	°C/W

Note: Measure θ_{JC} on backside center of tab

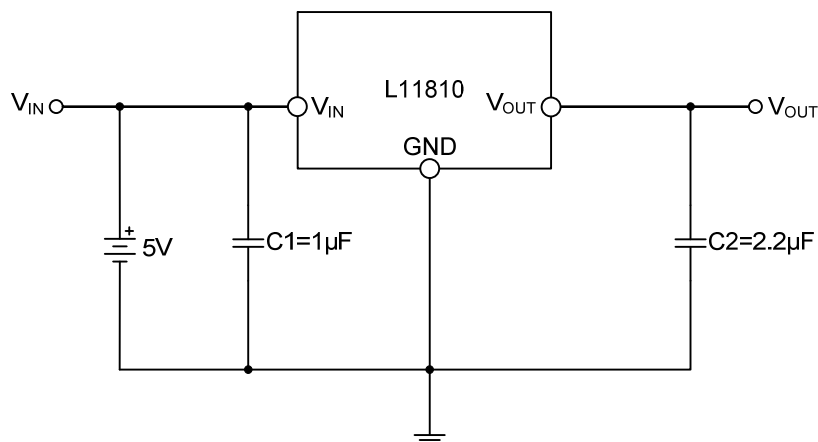
■ ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Input Voltage	V _{IN}			Note1		7	V
Output Voltage Accuracy	V _{OUT}	I _{OUT} = 1mA		-1.5		1.5	%
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}}$	I _{OUT} = 1mA, V _{IN} =V _{OUT} +1~V _{OUT} +2	1.8V≤V _{OUT} ≤2.0V	-0.15		0.15	%
			2.0V<V _{OUT} <4.0V	-0.1	0.02	0.1	%
			V _{OUT} ≥4.0V	-0.4	0.2	0.4	%
Load Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}}$	I _{OUT} = 1mA~1000mA			0.4	1.2	%
Output Current	I _{OUT}	V _{OUT} ≥1.8V		1000			mA
Current Limit	I _{LIMIT}	V _{OUT} ≥1.8V		1100			mA
Short Circuit Current	I _{SC}	V _{OUT} <0.8V			400	800	mA
Quiescent Current	I _Q	I _{OUT} =0mA			30	50	μA
Ground Pin Current	I _{GND}	I _{OUT} = 1mA~1000mA			35		μA
Dropout Voltage	V _D	I _{OUT} =1A V _{OUT} =V _{OUT(NOM)} -2.0%	1.8V≤V _{OUT(NOM)} ≤2.0V			1700	mV
			2.0V<V _{OUT(NOM)} ≤2.8V			1200	mV
			2.8V<V _{OUT(NOM)}			1000	mV
Over Temperature Shutdown	OTS				150		°C
Over Temperature Hysteresis	OTH				30		°C
Temperature Coefficient of Output Voltage	T _C V _O				30		ppm/°C
Power Supply Ripple Rejection	PSRR	I _{OUT} =100mA C _O = 2.2μF	f=100Hz		60		dB
			f=1kHz		50		dB
			f=10kHz		20		dB
Output Voltage Noise	e _N	I _{OUT} =10mA, C _{OUT} =2.2μF, f=10Hz~100kHz			30		μV _{RMS}

Notes: 1. $V_{IN(MIN)} = V_{OUT} + V_D$

2. To prevent the Short Circuit Current protection feature from being prematurely activated, the input voltage must be applied before a current source load is applied.

■ TYPICAL APPLICATION CIRCUIT



■ APPLICATION INFORMATION

1. Detailed Description

Internal circuits include: a PMOS pass transistor, voltage reference, error amplifier, over-current protection, and thermal shutdown.

The data through the error amplifier, over-current shutdown, and thermal protection circuits, then to the P-channel pass transistor.

As soon as the junction temperature exceeds 150°C or the current exceeds 1100mA, over-current and thermal shutdown circuits start working. When the junction temperature drops below 120°C, normal operation is restored.

When the load exceeds the rated output current, for preventing the over stress, the chip switches from voltage mode to current mode.

2. External Information

When considering the external capacitors, the **L11810** is stable with an output capacitor to ground of 2.2μF or greater. As we know, the ceramic capacitors have the lowest ESR but can offer the best AC performance; the aluminum electrolytic capacitors exhibit the highest ESR but offer the poorest AC response. And also large value ceramic capacitors are expensive. Consider all the situation, the best way is to parallel a 0.1μF ceramic capacitor with a 10μF Aluminum Electrolytic (low ESR, high capacitance, and low overall cost).

For better beneficial effecting, the input capacitor should be at least 0.1μF.

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.