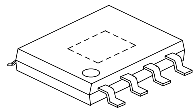
1A FAST ULTRA LOW DROPOUT LINEAR REGULATOR



HSOP-8

■ DESCRIPTION

The UTC **LR1811** operate from a +1.5V~+6V input supply as fast ultra low-dropout linear regulators. Wide output voltage range options are available. The fast response characteristic to make UTC **LR1811** suitable for low voltage microprocessor application. The low quiescent current operation and low dropout quality caused by the CMOS process.

The UTC **LR1811** has low dropout voltage. The ground pin current is typically 80μA.

Output Voltage Precision: Multiple output voltage options are available and ranging from 1.2V~5.0V at room temperature with a guaranteed accuracy of ±1.5%, and ±3.0% when varying line and load.

The output voltage types of UTC **LR1811** are fixed one in the IC.

■ FEATURES

* Low Dropout Voltage
* The Guaranteed Output Current is 1A DC
* Output Voltage Accuracy ± 1.5%
* Over temperature Protection And Over current Protection

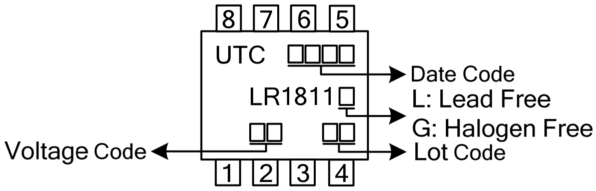
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
LR1811L-xx-SH2-R	LR1811G-xx-SH2-R	HSOP-8	Tape Reel

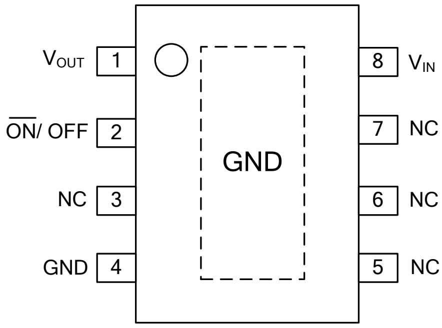
Note: xx: Output Voltage, refer to Marking Information

LR1811G-xx-SH2-R	
(1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) SH2: HSOP-8
(3)Output Voltage	(3) xx: Refer to Marking Information
(4)Green Package	(4) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
HSOP-8	12: 1.2V 15 : 1.5V 18: 1.8V 25: 2.5V 30: 3.0V 33: 3.3V 50: 5.0V	

■ PIN CONFIGURATION

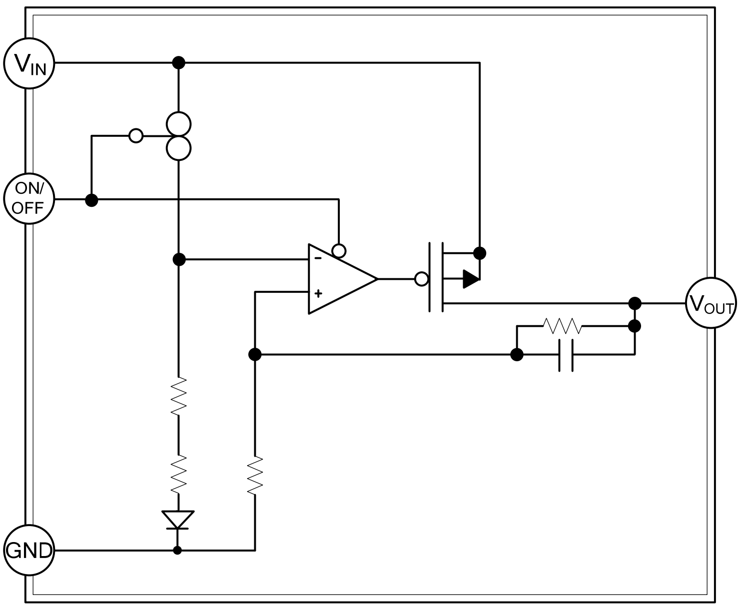


■ PIN DESCRIPTION

PIN NO.	PIN NAME	PIN DESCRIPTION
1	V_{OUT}	Output voltage
2	$\overline{ON}$/OFF	ON/OFF select pin, when connected to the ground the chip in operating normally.
3, 5,6,7	NC	No connection
4	GND	GND
8	V_{IN}	Input voltage
Exposed Pad	GND	Connect exposed pad to GND.

■ BLOCK DIAGRAM

Fixed Output Voltage



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	7	V
Shutdown Input Voltage	$V_{IN(SHDN)}$	-0.3 ~ V_{IN}	V
Maximum Operating Current (DC)		1	A
Power Dissipation (Note 3)	P_D	Internally Limited	
Junction Temperature	T_J	+125	°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}	143	°C/W
Junction to Case	θ_{JC}	45	°C/W

■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Input Voltage	V_{IN}			1.5		6	V
Output Voltage (Note 3)	$V_{OUT(E)}$	$V_{IN}=V_{OUT(S)}+1V$ $I_{OUT}=100mA$	$1.0V \le V_{OUT(S)} < 1.5V$	$V_{OUT(S)}$ − 0.015	$V_{OUT(S)}$	$V_{OUT(S)}$ + 0.015	V
			$1.5V \le V_{OUT(S)} \le 3.5V$	$V_{OUT(S)}$ x 0.99	$V_{OUT(S)}$	$V_{OUT(S)}$ x 1.01	V
Output Voltage Line Regulation	$\triangle V_{OUT1}/(\triangle V_{IN} \times V_{OUT})$	$V_{OUT(S)}+0.5V \le V_{IN} \le 5.5V, I_{OUT}=100mA$			0.05	0.2	%/V
Output Voltage Load Regulation	$\triangle V_{OUT2}$	$V_{IN}=V_{OUT(S)}+1V, 1mA \le I_{OUT} \le 300mA$		-20	-3	20	mV
Dropout Voltage(Note 4)	V_{drop}	$I_{OUT}=300mA$	$1.2V \le V_{OUT(S)} < 1.5V$		0.34	0.38	V
			$1.5V \le V_{OUT(S)} < 2.6V$		0.10	0.15	
			$2.6V \le V_{OUT(S)} \le 5.0V$		0.07	0.10	
		$I_{OUT}=1000mA$	$1.2V \le V_{OUT(S)} < 1.5V$		0.70		
			$1.5V \le V_{OUT(S)} < 2.0V$		0.40		
			$2.0V \le V_{OUT(S)} < 2.6V$		0.32		
			$2.6V \le V_{OUT(S)} \le 5.0V$		0.23		
Output Current(Note 5)	I_{OUT}	$V_{IN} \ge V_{OUT(S)}+1V$		1000 (Note 7)			mA
Ground Pin Current In Normal Operation Mode	I_{SS1}	$V_{IN}=V_{OUT(S)}+1V$, ON/OFF pin=ON, No Load		50	80	120	μA
Ground Pin Current In Power-off Mode	I_{SS2}	$V_{IN}=V_{OUT(S)}+1V$, ON/OFF pin=OFF, No Load			0.1	1.0	μA
Short Circuit Current	I_{SC}	$V_{IN}=V_{OUT(S)}+1V$, ON/OFF pin=ON, $V_{OUT}=0V$			2		A
Output Voltage Temperature Coefficient(Note 6)	$\triangle V_{OUT}/(\triangle T_A \times V_{OUT})$	$V_{IN}=V_{OUT(S)}+1V, I_{OUT}=100mA$, $-40°C \le T_A \le +85°C$			±100		ppm/°C
ON/OFF Pin Input Voltage "H"	V_{SH}	$V_{IN}=V_{OUT(S)}+1V$, $R_L=1.0K\Omega$		1.5			V
ON/OFF Pin Input Voltage "L"	V_{SL}	Determinied by V_{OUT} output level				0.3	V
ON/OFF Pin Input Current "H"	I_{SH}	$V_{IN}=V_{OUT(S)}+1V, V_{ON/OFF}=5.5V$		-0.1		0.1	μA
ON/OFF Pin Input Current "L"	I_{SL}	$V_{IN}=V_{OUT(S)}+1V, V_{ON/OFF}=0V$		-0.1		0.1	μA

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Ripple Rejection	|RR|	$V_{IN}=V_{OUT(S)}+1V$, f=1khz, $\triangle V_{rip}=0.5Vrms$, $I_{OUT}=100mA$	$1.2V \le V_{OUT(S)} < 3.0V$		65		dB
			$3.0V \le V_{OUT(S)} \le 3.5V$		60		
			$3.5V \le V_{OUT(S)} \le 5.0V$		55		
Thermal Shutdown detection temperature	T_{SD}	Junction temperature			150		°C
Thermal Shutdown release temperature	T_{SR}	Junction temperature			120		°C

Notes: 1. The UTC **LR1811** output must be diode-clamped to ground. If used in a dual-supply system where the regulator load is returned to a negative supply.

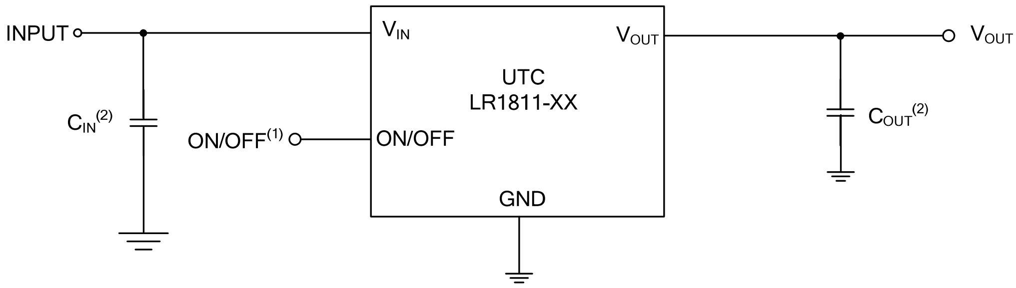
2. Devices must be derated based on package thermal resistance at elevated temperatures.
3. $V_{OUT(S)}$: Specified output voltage
   $V_{OUT(E)}$: Actual output voltage
   Output voltage when fixing I_{OUT}(=100mA) and inputting $V_{OUT(S)}$+1.0V
4. Vdrop=V_{IN1}-(V_{OUT3}×0.98)
   V_{OUT3} is the output voltage when $V_{IN}=V_{OUT(S)}+1.0V$ and I_{OUT}=300mA, 1000mA.
5. The output current at which the output voltage becomes 95% of $V_{OUT(E)}$ after gradually increasing the output current.
6. The change in temperature [mV/°C] is calculated using the following equation.

$$\frac{\Delta V_{OUT}}{\Delta T_A}\left[mV/°C\right] = V_{OUT(S)}\left[V\right] \times \frac{\Delta V_{OUT}}{\Delta T_A \times V_{OUT}}\left[ppm/°C\right] \div 1000$$

7. The output current can be at least this value.
   Due to restrictions on the package power dissipation, this value may not be satisfied. Attention should be paid to the power dissipation of the package when the output current is large.
   This specification is guaranteed by design.

■ TYPICAL APPLICATION CIRCUIT

Fixed Output Voltage



(1) ON/OFF pins must be pulled high through a 10kΩ pull-up resistor.

(2) Generally a series regulator may cause oscillation, depending on the selection of external parts. The following conditions are recommended for this IC. However, be sure to perform sufficient evaluation under the actual usage conditions for selection, including evaluation of temperature characteristics.

Input capacitor (C_{IN}): 2.2μF or more
Output capacitor (C_L): 2.2μF or more