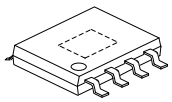
L11831A/B/C

CMOS IC

MAXIMUM 3A, ULTRA LOW DROPOUT REGULATOR WITH ENABLE



HSOP-8

DFN3030-10

■ DESCRIPTION

The UTC **L11831A/B/C** is a positive voltage regulator with high performance. It has low dropout voltage and low input voltage, besides its output voltage can be fixed at 1V,1.05V, 1.2V, 1.5V, 1.8V, or 2.5V depending on internal feedback resistors or ADJ (not connected to the ground) with external feedback resistors. There are two additional pin in the UTC **L11831A/B/C**. One is EN pin and the other is POK pin.

The UTC **L11831A/B/C** is specially made for applications with low input voltage, low dropout voltage, and low output voltage which is almost the same as the input voltage. Typical applications include motherboards, notebooks, set top boxes, network cards and peripheral cards.

■ FEATURES

* V_{DD} voltage 5V
* Maximum 3A low-dropout voltage regulator
* High accuracy output voltage ±2 %
* When disable V_O pull low resistance
* Internal over current and over temperature protection

■ ORDERING INFORMATION

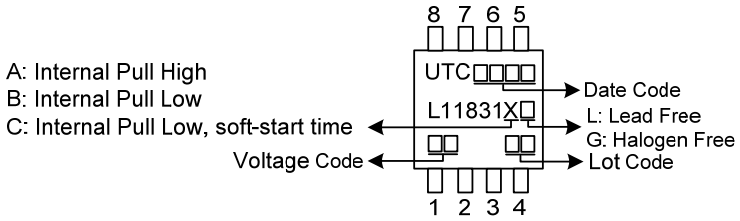
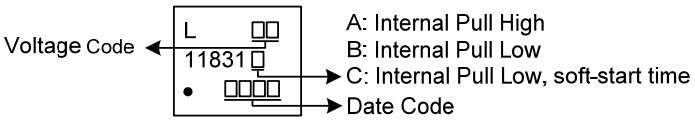
Ordering Number		Package	Packing
Lead Free	Halogen Free		
L11831XL-xx-SH2-R	L11831XG-xx-SH2-R	HSOP-8	Tape Reel
L11831XL-xx-K10-3030-R	L11831XG-xx-K10-3030-R	DFN3030-10	Tape Reel

Note: xx: Output Voltage, refer to Marking Information.

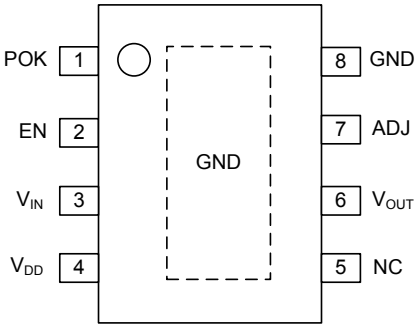
L11831XG-xx-SH2-R
- (1)Packing Type
- (2)Package Type
- (3)Output Voltage Code
- (4)Green Package
- (5)EN Pin Function

(1) R: Tape Reel
(2) SH2: HSOP-8, K10-3030: DFN3030-10
(3) xx: Refer to Marking Information
(4) G: Halogen Free and Lead Free, L: Lead Free
(5) A: Internal Pull High, B: Internal Pull Low
C: Internal Pull Low, soft-start time

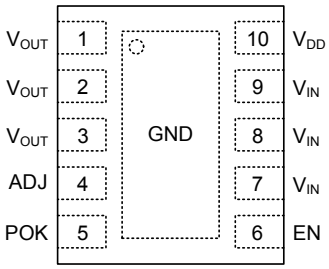
■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
HSOP-8	12: 1.2V 15 : 1.5V 18: 1.8V 25: 2.5V AD: ADJ	
DFN3030-10		

■ PIN CONFIGURATION



HSOP-8

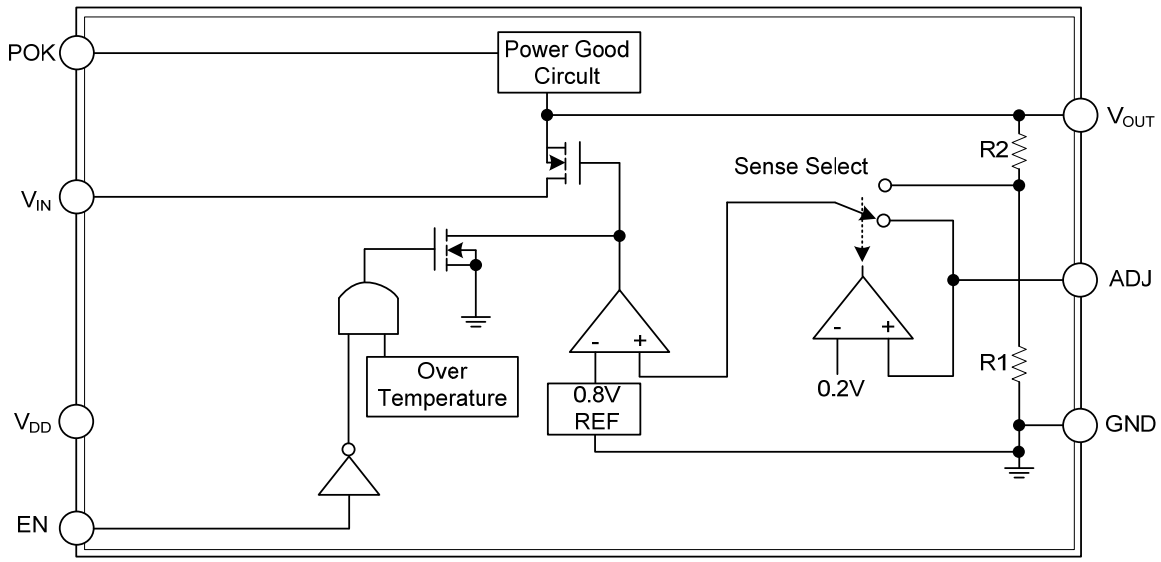


DFN3030-10
(Top View)

■ PIN DESCRIPTION

PIN NO.		PIN NAME	DESCRIPTION
HSOP-8	DFN3030-10		
1	5	POK	This pin will indicate high under this situation: V_O reaches 90% of its rating voltage. Open-drain output.
2	6	EN	Chip enable (active-high)
3	7 ~ 9	V_{IN}	The pin of input voltage.
4	10	V_{DD}	This pin is for input voltage to control circuit.
5	-	NC	No internal connection
6	1 ~ 3	V_{OUT}	Output voltage
7	4	ADJ	When this pin connected to the ground, V_{OUT} will be set by the internal feedback resistors. Otherwise, if using external feedback resistors to decide the V_{OUT}, V_{OUT} = 0.8(R1+R2)/R2 Volts.
8	Exposed Pad	GND	Ground.
Exposed Pad	-	GND	Connect exposed pad to GND.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{DD}, V_{IN}	6	V
Power Dissipation	P_D	Internally limited	
Junction Temperature	T_J	+150	°C
Operation 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.

■ RECOMMENDED OPERATING CONDITIONS (Note 1)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{IN}	2.5 ~ 5.5	V
Control Voltage (V_{DD}≥V_{OUT}+1.5V)	V_{DD}	3.0 ~ 5.5	V
Ambient Temperature Range	T_A	-40 ~ +85	°C
Junction Temperature Range	T_J	-40 ~ +125	°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	HSOP-8	θ_{JA}	143	°C/W
	DFN3030-10		60 (Note)	°C/W
Junction to Case	HSOP-8	θ_{JC}	14	°C/W
	DFN3030-10		12	°C/W

Note: The data tested by surface mounted on a 2 inch2 FR-4 board with 2OZ copper.

■ ELECTRICAL CHARACTERISTICS

(V_{IN}=V_{OUT}+500mV, V_{EN}=V_{DD}=5V, C_{IN}=C_{OUT}=10μF, T_A=T_J=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
POR Threshold				2.4	2.7	3.0	V
POR Hysteresis					0.2		V
Adjustable Pin Threshold		V_{TH_ADJ}	I_{OUT}=1mA		0.2	0.4	V
Reference Voltage (ADJ Pin Voltage)		V_{ADJ}	I_{OUT}=1mA	0.784	0.8	0.816	V
Fixed Output Voltage Range		ΔV_{OUT}		-2.0	0	2.0	%
Line Regulation (V_{IN})		ΔV_{LINE_IN}	V_{IN}=V_{OUT}+0.5V to 5V, I_{OUT}=1mA		0.2	0.6	%
Load Regulation (Note 2)		ΔV_{LOAD}	V_{IN}=V_{OUT}+1V, I_{OUT}=1mA~3A		0.4	1	%
Dropout Voltage (Note 3)		V_{DROP}	I_{OUT}=2A		200	250	mV
			I_{OUT}=3A		300	350	mV
Quiescent Current (Note 4)		I_Q	V_{DD}=5.5V		1.1		mA
Current Limit		I_{LIM}		3.2	5.5		A
Short Circuit Current			V_{OUT}<0.2V	0.5	1.8		A
V_{OUT} Pull Low Resistance			V_{EN}=0V		110		Ω
Soft-Start	L11831C	T_{SS}	V_{OUT}=10% to 90%		2.5		ms
CHIP ENABLE							
EN Input Bias Current	L11831A	I_{EN}	V_{EN}=0V		12		μA
	L11831B		V_{EN}=5V		12		μA
	L11831C		V_{EN}=5V		12		μA
V_{DD} Shutdown Current	L11831A	I_{SHDN}	V_{EN}=0V		10	20	μA
	L11831B					1	μA
	L11831C					1	μA
EN Threshold Voltage	Logic-High	V_{ENH}	V_{DD}=5V	1.2			V
	Logic-Low	V_{ENL}	V_{DD}=5V			0.7	V
POWER GOOD							
POK Rising Threshold					90		%
POK Hysteresis				3	10		%
POK Sink Capability			I_{POK}=10mA		0.2	0.4	V
POK Delay	L11831A/B	T_{POK}	V_{OUT}＞90% to Pok Rising		0.25		ms
	L11831C				0.55		ms
THERMAL PROTECTION							
Thermal Shutdown Temperature		T_{SD}			160		°C
Thermal Shutdown Hysteresis		ΔT_{SD}			30		°C

Notes: 1. The device is not guaranteed to function outside its operating conditions.

2. Regulation is measured at constant junction temperature by using a 2ms current pulse. Devices are tested for load regulation in the load range from 1mA to 3A.
3. The dropout voltage is defined as V_{IN}-V_{OUT}, which is measured when V_{OUT} is $V_{OUT(NORMAL)}$-100mV. Only to output voltages of 2.5V and above dropout voltage specification applies. For output voltages below 2.5V, since the minimum input voltage is 2.5V, the drop-out voltage is nothing but the input to output differential.
4. Quiescent, or ground current, is the difference between input and output currents. It is defined by I_Q=I_{IN}-I_{OUT} under no load condition (I_{OUT}=0mA). The total current drawn from the supply is the sum of the load current plus the ground pin current.

■ TYPICAL APPLICATION CIRCUIT

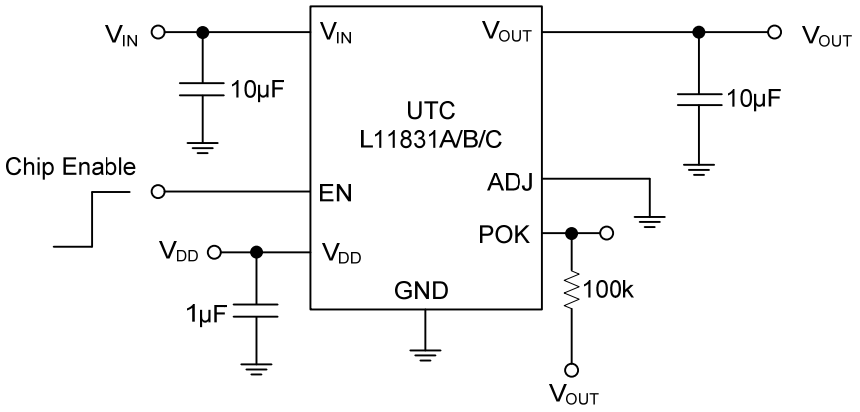


Figure 1. Fixed Voltage Regulator

$$V_{OUT}=0.8\times\frac{R1+R2}{R2}$$

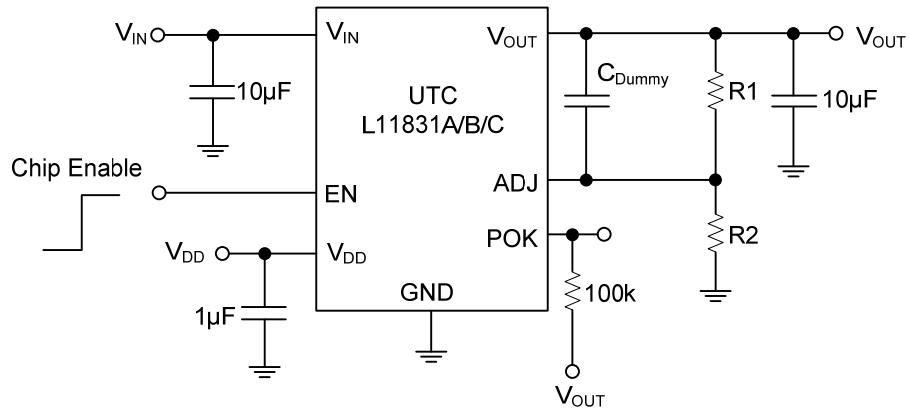


Figure 2. Adjustable Voltage Regulator