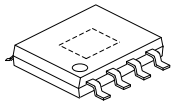
LR3865T

CMOS IC

2A LOW DROPOUT LINEAR REGULATOR



HSOP-8

■ DESCRIPTION

The UTC **LR3865T** belonged to low-dropout, linear regulators operate from 2.5V to 6V input and are guaranteed to deliver 2A. 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 **LR3865T** is designed and optimized for battery-powered systems to work with low noise.

The UTC **LR3865T** consumes less than 0.5μA in shutdown mode. Other features include ultra low dropout voltage, current limiting protection, thermal shutdown protection and high ripple rejection ratio.

■ FEATURES

* 2A Guaranteed Output Current
* 0.5μA Shutdown Current
* Current Limiting Protection
* Thermal Shutdown Protection
* Excellent Line/Load Transient

■ ORDERING INFORMATION

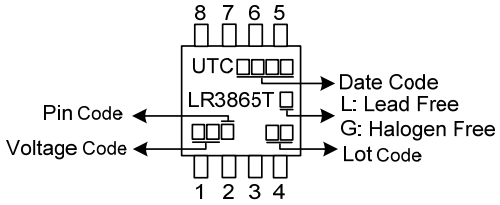
Ordering Number		Package	Packing
Lead Free	Halogen Free		
LR3865TL-xx-SH2-R	LR3865TG-xx-SH2-R	HSOP-8	Tape Reel

Notes: 1. xx: Output Voltage, refer to Marking Information.
2. Pin Assignment: G: GND O: OUT I: V_{IN}

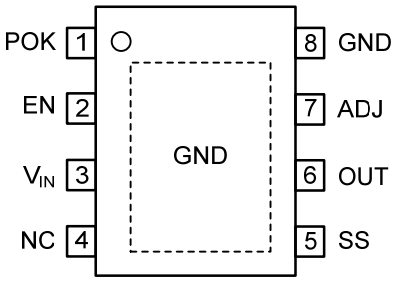
LR3865TG-xx-SH2-X-R

(1)Packing Type	(1) R: Tape Reel
(2)Pin Code	(2) refer to PIN CONFIGURATION
(3)Package Type	(3) SH2: HSOP-8
(4)Output Voltage Code	(4) xx: Refer to Marking Information
(5)Green Package	(5) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
HSOP-8	AD: ADJ	

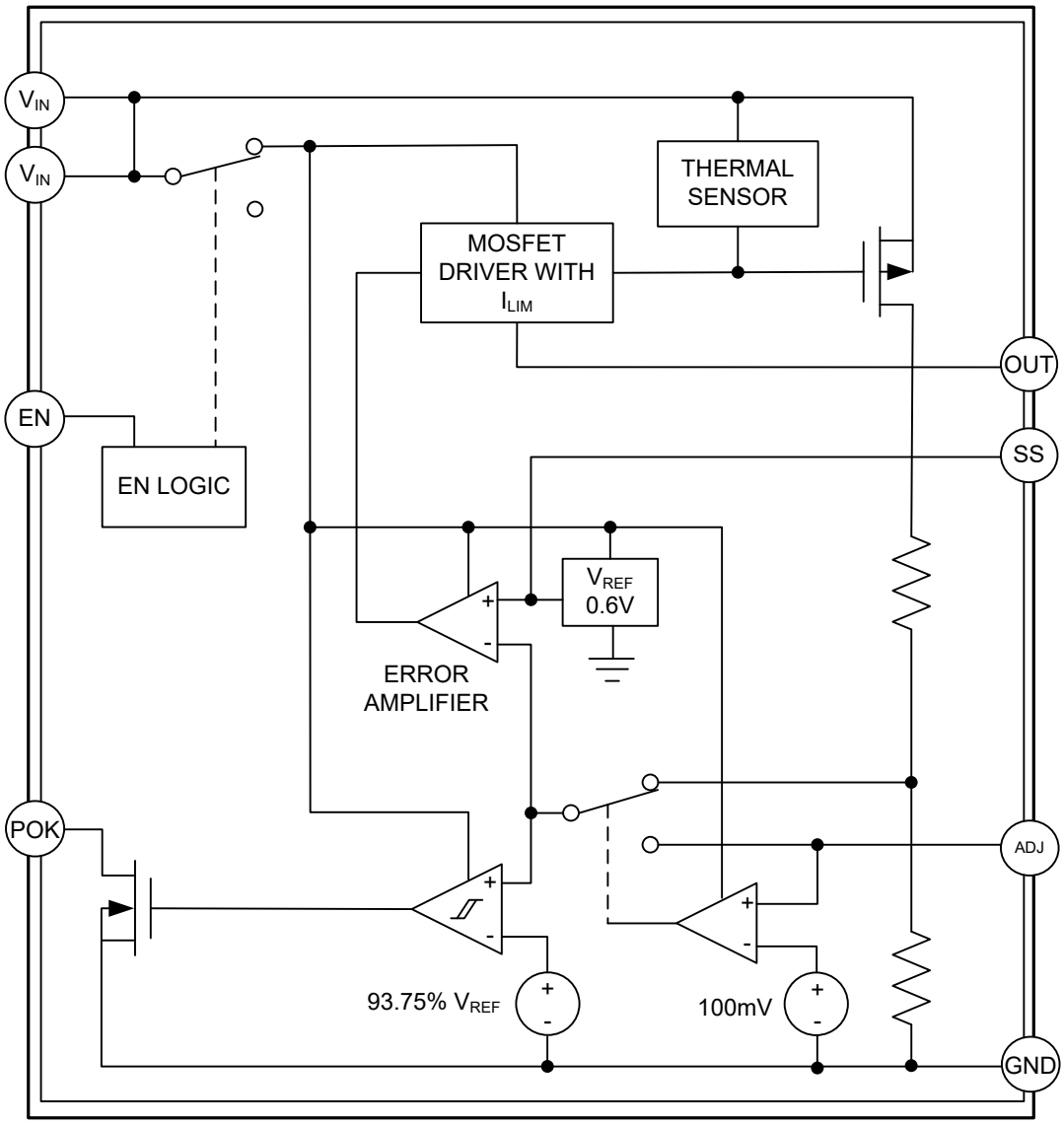
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	POK	Open-Drain Power-ok Output. POK Remains low while the output voltage is below the POK threshold. Connect a 100 kohm Pullup resistor from POK to OUT
2	EN	Active-High Enable Input. A logic low at EN reduces supply current to 0.5μA. In shutdown, the POK output is low. Connect $\overline{EN}$ to V_{IN} for normal operation.
3	V_{IN}	Power Input Voltage. Supply voltage can range from 2.5V to 6V. Bypass with a 10μF capacitor to GND.
5	SS	Soft start time setting. For adjustable soft start time version, connect a capacitor from SS to gnd to set the soft start time.
6	OUT	Output
7	ADJ	Voltage-adjust Input. Connect an external resistive voltage-divider from OUT to ADJ to set the output voltage between 0.6V and 4.5V. The ADJ regulation voltage is 600mV
8	GND	Ground
Exposed Pad	GND	Connect exposed pad to GND.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{IN}	6.5	V
Power Dissipation	P_D	2	W
Junction Temperature	T_J	+125	°C
Operating Temperature	T_{OPR}	-40 ~ +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}	50 (Note1)	°C/W
Junction to Case	θ_{JC}	15 (Note 2)	°C/W

Notes: 1. θ_{JA} is measured with the component mounted on a high effective thermal conductivity test board in free air. The exposed pad of HSOP-8 is soldered directly on the PCB.
2. The Thermal Pad Temperature is measured on the PCB copper area connected to the thermal pad of package.

■ ELECTRICAL CHARACTERISTICS

(T_A= 25°C, V_{IN} = OUT + 1V or V_{IN} =2.5V whichever is greater, C_{IN} = 10μF+0.1μF, C_{OUT} = 10μF + (0.1μF + 0.1μF), unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage	V_{IN}		Note1		6	V
Output Voltage Accuracy (Preset Mode)	OUT	T_A=25°C , I_{OUT}= 1mA ~2A	-2		2	%
Maximum Output Current	I_{OUT}			3.8		A
Short-Circuit Current Limit	I_{LIMIT}	OUT=0V		3.8		A
Ground Pin Current	I_Q	I_{OUT}=1mA		200		μA
	I_{OFF}	EN=GND		0.5	5	
Dropout Voltage (Note 2)	V_D	I_{OUT}=2.0A			500	mV
Line Regulation (Note 3)	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	V_{IN}=OUT+1V~6V		0.08	0.55	%/V
Load Regulation (Note 3, 4)	ΔOUT	V_{IN}=OUT+1V, OUT=2.5V, I_{OUT}=10mA~2.0A		0.3	1.0	%
Power Supply Rejection Ratio	PSRR	F=1Khz		45		dB
Shutdown Threshold	V_{IH}		1.8			V
	V_{IL}				0.5	V
Thermal Shutdown Temperature	T_{SHDN}			165		°C
Thermal Shutdown Hysteresis	DT_{SHDN}			30		°C
ADJ Voltage	V_{ADJ}	Measured on SET/ADJ, I_{OUT} =10mA	0.588	0.6	0.612	V
ADJ Mode Threshold				100		mV
Adjustable Output Voltage			0.8		4.5	V
SoftStart Current	I_{SS}	V_{SS}=0		0.55		μA
Power-OK Threshold	V_{pokth}	Referred to OUT (nominal)		93.75		%
Power-OK Hysteresis	V_{pokhys}			6.25		%
Power-OK output Low Voltage	V_{pokL}	Sinking 1mA			0.4	V

Notes: 1. The minimum operating value for V_{IN} is equal to either [$OUT_{(NOM)}$+V_D] or 2.5V, whichever is greater.
2. Dropout voltage is defined as the voltage from the input to output when output is 2% below the nominal value. Dropout voltage specification applies only to output voltage of 2.5V and above.
3. Output voltage line regulation is defined as the change in output voltage from the nominal value resulting from a change in the input line voltage. Output voltage load regulation is defined as the change in output voltage from the nominal value as the load current increases from no load to full load.
4. Regulation is measured at constant junction temperature by using a 10ms current pulse.

■ ELECTRICAL CHARACTERISTICS (Cont.)

Table 1

C_{SS} Calculated	Calculated Soft-Start Time
C_{SS}=220pF	0.22 ms
C_{SS}=470pF	0.46 ms
C_{SS}=1nF	1.00 ms
C_{SS}=2.7nF	2.45 ms
C_{SS}=5.6nF	5.38 ms
C_{SS}=10nF	9.54 ms

■ TYPICAL APPLICATION CIRCUIT