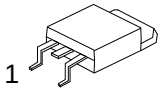
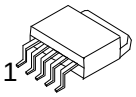
LR3866 **Preliminary** ***LINEAR INTEGRATED CIRCUIT***

3.0A LOW DROPOUT LINEAR REGULATOR



TO-263



TO-263-5

■ DESCRIPTION

The **LR3866** is a low-noise, low-dropout linear regulator operated from a 2.5V to 6V input voltage and is guaranteed to deliver 3A output current. Wide range of preset output voltage options are available. Built-in low on-resistance transistor provides low dropout voltage and large output current. The **LR3866** is designed and optimized for battery-powered systems to work with low noise.

The **LR3866** is developed on a CMOS process technology which allows low quiescent current operation independent of output load current. This CMOS process also allows the **LR3866** to operate under extremely low dropout conditions.

■ FEATURES

* 3A Guaranteed Output Current
* Ultra Low Dropout Voltage
* Low Ground Pin Current
* Low Temperature Coefficient
* Current Limiting Protection
* Thermal Shutdown Protection
* Excellent Line/Load Transient
* SENSE Option Improves Load Regulation

■ ORDERING INFORMATION

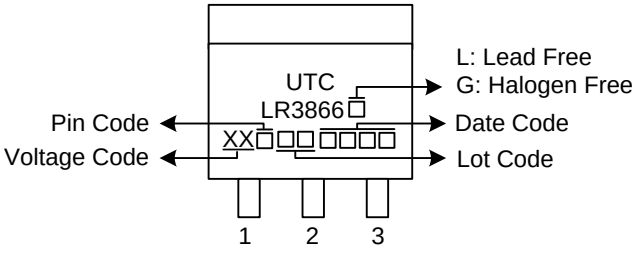
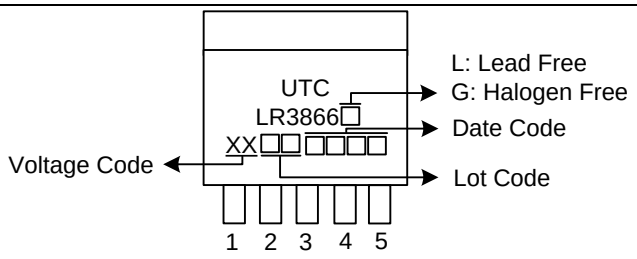
Ordering Number		Package	Pin Assignment					Packing
Lead Free	Halogen Free		1	2	3	4	5	
LR3866L-xx-TQ2-A-T	LR3866G-xx-TQ2-A-T	TO-263	G	O	I	-	-	Tube
LR3866L-xx-TQ2-A-R	LR3866G-xx-TQ2-A-R	TO-263	G	O	I	-	-	Tape Reel
LR3866L-xx-TQ2-D-T	LR3866G-xx-TQ2-D-T	TO-263	I	G	O	-	-	Tube
LR3866L-xx-TQ2-D-R	LR3866G-xx-TQ2-D-R	TO-263	I	G	O	-	-	Tape Reel
LR3866L-xx-TQ5-T	LR3866G-xx-TQ5-T	TO-263-5	E	I	G	O	S	Tube
LR3866L-xx-TQ5-R	LR3866G-xx-TQ5-R	TO-263-5	E	I	G	O	S	Tape Reel
LR3866L-AD-TQ5-T	LR3866G-AD-TQ5-T	TO-263-5	E	I	G	O	A	Tube
LR3866L-AD-TQ5-R	LR3866G-AD-TQ5-R	TO-263-5	E	I	G	O	A	Tape Reel

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

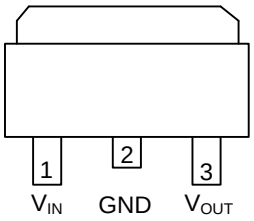
LR3866G-xx-TQ2-A-T

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

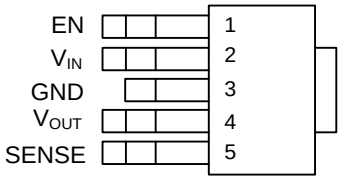
■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
TO-263	18 :1.8V 25: 2.5V 33 :3.3V	
TO-263-5	18 :1.8V 25: 2.5V 33 :3.3V AD: ADJ	

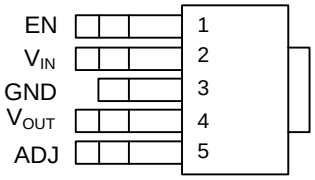
■ PIN CONFIGURATION



TO-263



LR3866-xx
TO-263-5



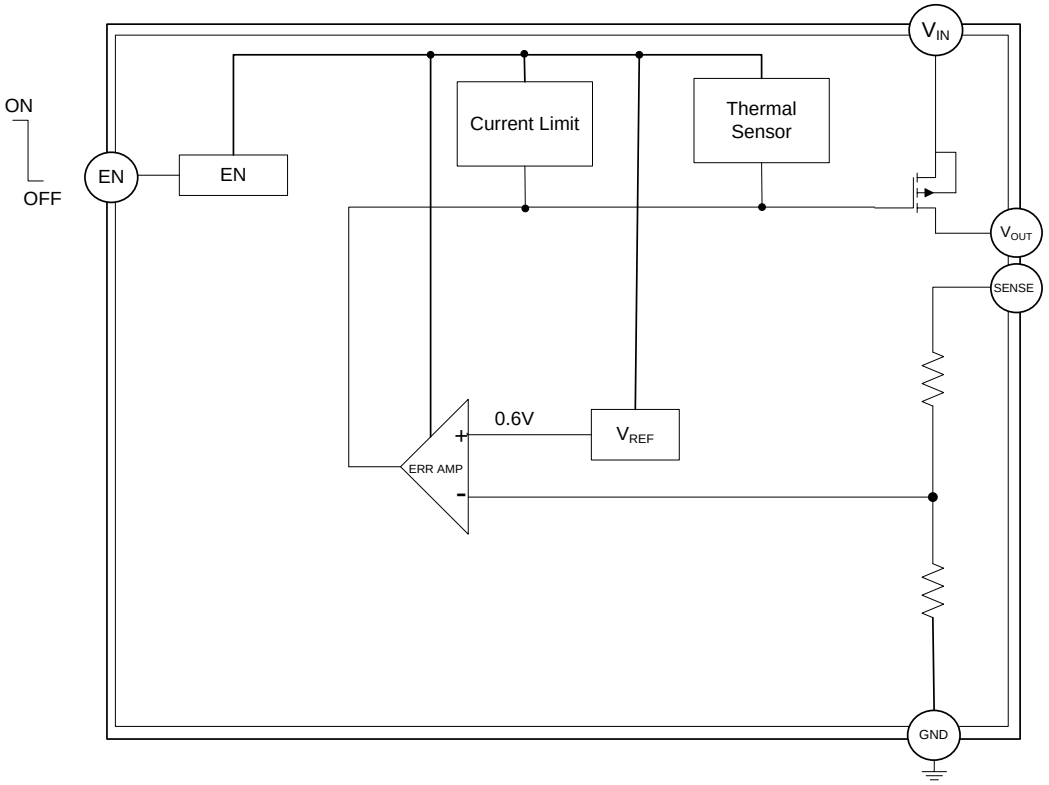
LR3866-AD
TO-263-5

■ PIN DESCRIPTION

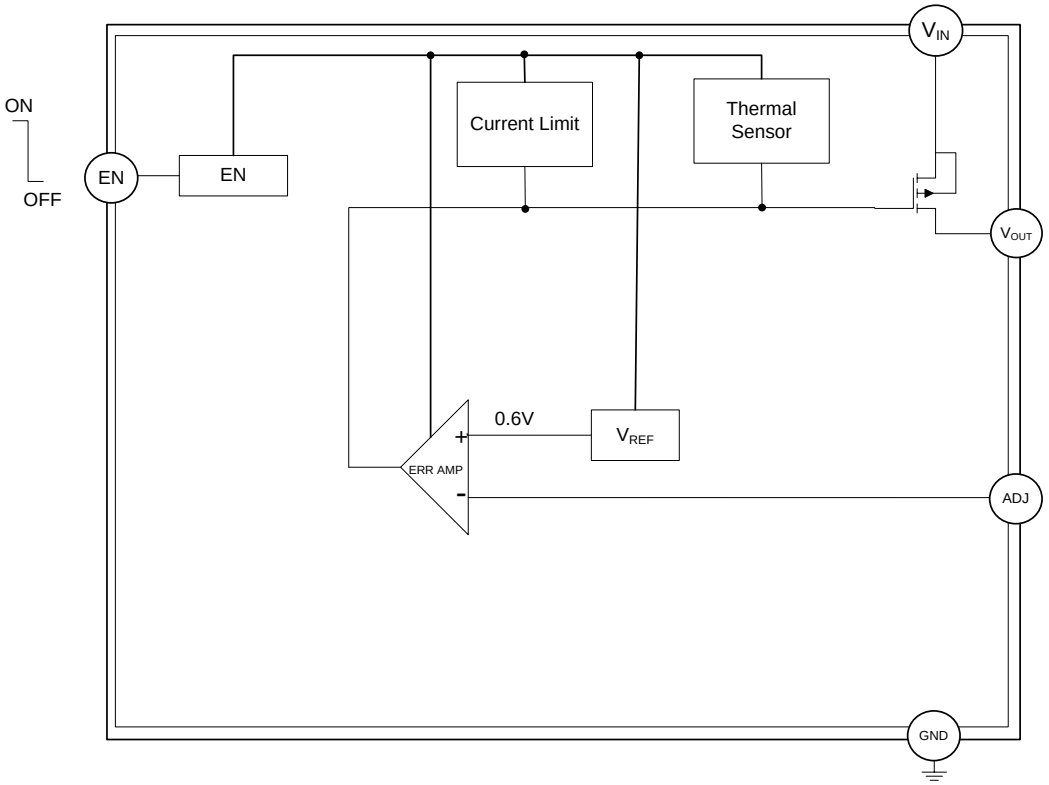
PIN NAME	DESCRIPTION
EN	Chip Enable (Active High). EN is internally pulled up by a resistor.It can be floating for normal operate.
V_{IN}	Power Input Voltage. Supply voltage can range from 2.5V to 6V. Bypass with a 68μF capacitor to GND.
GND	Ground
V_{OUT}	Output Voltage
ADJ	Voltage-adjust Input. Connect an external resistive voltage-divider from V_{OUT} to ADJ to set the output voltage between 0.6V and 5V.
SENSE	Remote sense pin.

■ BLOCK DIAGRAM

For LR3866-xx



For LR3866-ADJ



■ ABSOLUTE MAXIMUM RATING (T_A=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Supply Voltage(Survival)	V_{IN}	6	V
Enable Input Voltage(Survival)	V_{EN}	6	V
Power Dissipation	P_D	890	mW
Operation Junction 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.

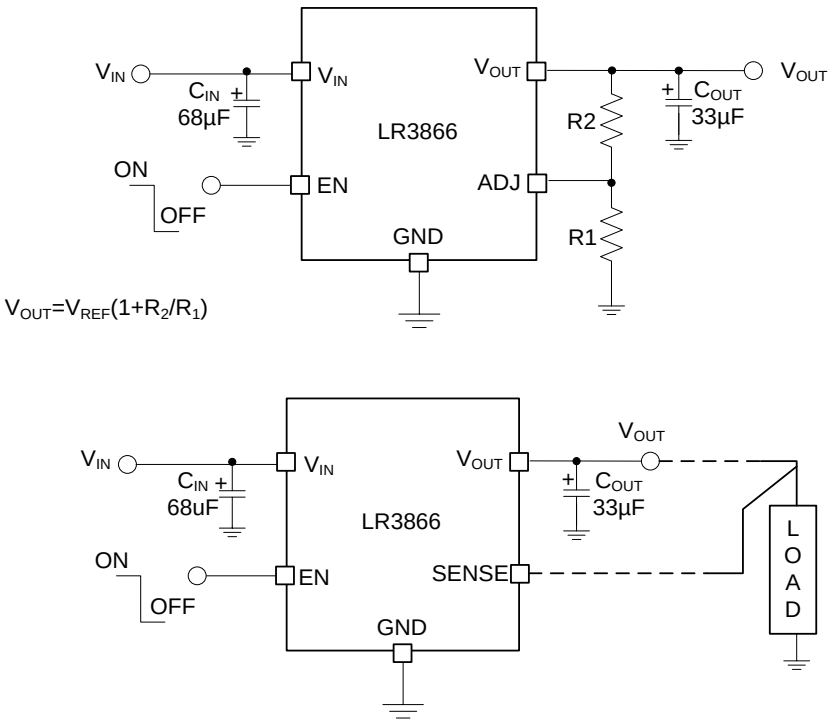
■ ELECTRICAL CHARACTERISTICS

(Unless otherwise specified: V_{IN}=$V_{O(NOM)}$+1V or V_{IN}=2.5V whichever is greater, I_L=10mA, C_{IN}=68μF, C_{OUT}=33μF, V_{EN}=V_{IN}-0.3V, T_J=25°C.)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
Output Voltage Tolerance	V_{OUT}	10mA<I_L<3A V_{OUT}+1V<V_{IN}<6V	-2		2	%
Adjustable Pin Voltage (ADJ version)	V_{ADJ}	10mA<I_L<1.5A V_{OUT}+1V<V_{IN}<6V	0.588	0.6	0.612	V
Line Regulation (Note 1)	REGLINE	V_{OUT}+1V≤V_{IN}≤6V		0.08	0.18	%/V
Load Regulation (Note 1, 2)	REGLOAD	10mA≤I_L≤3A		0.6	0.8	%/A
Dropout Voltage (Note 3)	V_{DROP}	I_L=3A		650	800	mV
Ground Pin Current	I_{GND1}	I_L=300mA		200	360	μA
		I_L=3A		200	360	
	I_{GND2}	V_{EN}<0.2V		0.1	5	μA
Output Peak Current	I_{PEAK}		3.5	4.5		A
Enable Threshold	V_{IH}	Output=High	1.8			V
	V_{IL}	Output=Low			0.5	
Enable Input Current	I_{ENH}	V_{EN}=V_{IN}		0.05	2	μA
	I_{ENL}	V_{EN}<0.2V		3	10	
Thermal Shutdown Temperature	T_{SD}			165		°C
Thermal Shutdown Hysteresis	DT_{SD}			30		°C

Notes: 1. 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.
2. Regulation is measured at constant junction temperature by using a 20ms current pulse. Devices are tested for load regulation in the load range from 10mA to 3.0A
3. 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 voltages of 2.5V and above.

■ TYPICAL APPLICATION CIRCUIT



* **LR3866** can deliver a continuous current of 3.0A over the full operating temperature. However, the output current is limited by the restriction of power dissipation which differs from packages. A heat sink may be required depending on the maximum power dissipation and maximum ambient temperature of application. With respect to the applied package, the maximum output current of 3.0A may be still undeliverable.

* When a Pull-Up resistor is connected between V_{EN} terminal and V_{EN} Signal (or V_{IN} line), the resistance of the Pull-Up resistor should be kept under 10kΩ.