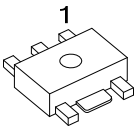
LR2126

CMOS IC

1A FAST ULTRA LOW DROPOUT LINEAR REGULATOR



SOT-89-5

■ DESCRIPTION

The UTC **LR2126** operate from a +2.5V ~ +6.0V input supply as fast ultra low-dropout linear regulators. Wide output voltage range options are available. The fast response characteristic to make UTC **LR2126** suitable for low voltage microprocessor application. The low quiescent current operation and low dropout quality caused by the CMOS process.

The UTC **LR2126** has ultra low dropout voltage 300mV at 1A load current typically.

The ground pin current is typically 60uA at 1mA load current.

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, load and temperature.

■ FEATURES

* Ultra Low Dropout Voltage
* Low Ground Pin Current
* 0.04% Load Regulation
* The Guaranteed Output Current is 1A DC
* Output Voltage Accuracy ± 1.5%
* Low Output Capacitor Required
* Over temperature Protection And Over current Protection

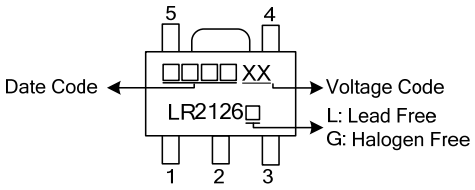
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
LR2126L-xx-AB5-R	LR2126G-xx-AB5-R	SOT-89-5	Tape Reel

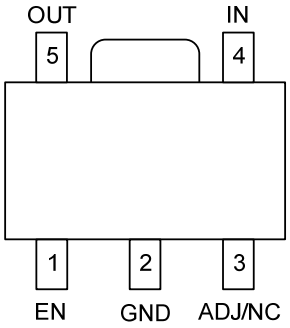
LR2126G-xx-AB5-R
- (1)Packing Type
- (2)Packing Type
- (3)Output Voltage Code
- (4)Green Package

(1) R: Tape Reel
(2) AB5: SOT-89-5
(3) xx: refer to Marking Information
(4) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT89-5	AD: ADJ	

■ PIN ASSIGNMENTS

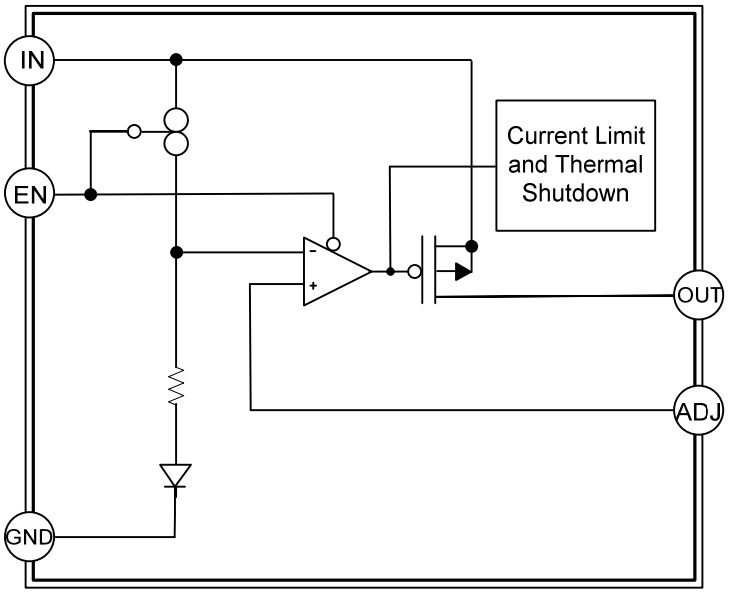


■ PIN DESCRIPTION

PIN NO	PIN NAME	DESCRIPTION
1	EN	Shutdown LR2126 enable; when the EN pin connects to GND will shutdown the LR2126; At normal operation, EN must be tied to V_{DD} through a 10KΩ pull up resistor.
2	GND	Ground.
3	ADJ	Adjustable voltage version only – a resistor divider from this pin to the OUT pin and ground sets the output voltage.
4	IN	Input voltage.
5	OUT	Output voltage.

Note: The NC pin is electrically open.
The NC pin can be connected to V_{IN} or GND.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage (Operating)	V_{IN}	2.5 ~ 7.0	V
Input Voltage (Survival)		-0.3 ~ +7.5	V
Shutdown Input Voltage	$V_{IN(SHDN)}$	-0.3 ~ V_{IN}+0.3	V
Output Voltage (Survival), (Note 1, 2)	V_{OUT}	-0.3 ~ +7.5	V
I_{OUT} (Survival)		Short Circuit Protected	
Maximum Operating Current (DC)		1	A
Power Dissipation (Note 3)	P_D	Internally Limited	
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}	160	°C/W

■ ELECTRICAL CHARACTERISTICS

T_J = 25°C, V_{IN} = $V_{OUT(NOM)}$ + 1V, I_{OUT} = 10mA, C_{IN} = 4.7μF ,C_{OUT} = 4.7μF, V_{EN} = V_{IN}-0.3V, unless otherwise specified.(Note 4)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage Tolerance (Note 5)	V_{OUT}	0mA ≤ I_{OUT} ≤ 1A V_{OUT} +1 ≤ V_{IN}≤ 6.0V	-1.5 -3	0	+1.5 +3	%
Output Voltage Line Regulation (Note 5)	△V_{OUT}	V_{OUT}+1V<V_{IN}<6.0V		0.05		%/V
Output Voltage Load Regulation (Note 5)	△V_{OUT}/△I_{OUT}	10mA < I_{OUT} < 1A		0.5		%
Dropout Voltage (Note 6)	V_D	I_{OUT} = 1A		300	500	mV
FB Reference Voltage	V_{REF}	I_{OUT}=10mA		0.8		V
Ground Pin Current In Normal Operation Mode	I_{GND}	I_{OUT} = 0mA		60		μA
		I_{OUT} = 1A		70		
Start-Up Time	t_{ST}	V_{OUT}=3V,R_L=30Ω		100		μs
SHORT CIRCUIT PROTECTION						
Short Circuit Current	I_{SC}			2		A
OVER TEMPERATURE PROTECTION						
Shutdown Threshold	$T_{SHDN(THR)}$			165		°C
Thermal Shutdown Hysteresis	$T_{SHDN(HYS)}$			10		°C
SHUTDOWN INPUT						
Shutdown Threshold	V_{EN}	Output = High	V_{IN}-0.3	V_{IN}		V
		Output = Low		0	0.3	
EN Input Current	I_{EN}	V_{EN} = V_{IN}		10		nA
AC PARAMETERS						
Ripple Rejection	PSRR	V_{IN} = V_{OUT} + 1.5V C_{OUT}=100uF, V_{OUT} = 3.3V		60		dB
		V_{IN} = V_{OUT} + 0.3V C_{OUT}=100uF, V_{OUT} = 3.3V		40		
Output Noise Density	$\rho_{N(L/F)}$	f = 120Hz		0.8		μV
Output Noise Voltage	e_N	BW = 10Hz ~ 100kHz		150		μV_{RMS}
		BW = 300Hz ~ 300kHz		100		

■ ELECTRICAL CHARACTERISTICS(Cont.)

Notes: 1. The **LR2126** 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. Between the V_{IN} and V_{OUT} terminals the output PMOS structure contains a diode. This diode is reverse biased normally. If the voltage at the output terminal is forced to be higher than the voltage at the input terminal this diode will get forward biased. This diode can withstand 1Amp of peak current and 200mA of DC current typically.

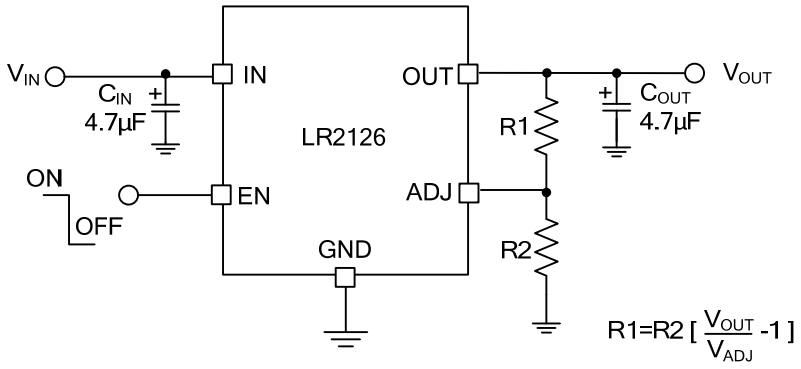
3. Devices must be derated based on package thermal resistance at elevated temperatures.

4. Conditions for which the device is intended to be functional is indicated by operating ratings, but specific performance limits isn't be guaranteed. To make sure of specifications and test conditions, read Electrical Characteristics. Only for the test conditions listed the guaranteed specifications can be applied. When the device is not operated under the listed test conditions some performance characteristics may degrade.

5. Output voltage line regulation is the change in output voltage from the nominal value which is due to change in the input line voltage. Which is defined as the change in output voltage from the nominal value due to change in load current is output voltage load regulation. The load regulation and line regulation specification include the typical number only. But, the limits for load and line regulation are included in the output voltage tolerance specification.

6. At which the output drops 2% below the normal value dropout voltage is defined as the minimum input to output differential voltage. 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.

■ TYPICAL APPLICATION CIRCUIT



■ TYPICAL CHARACTERISTICS