



LinearDimensions
SEMICONDUCTOR

LND1086/85

1.5 A / 3 A Low Dropout Voltage Regulators

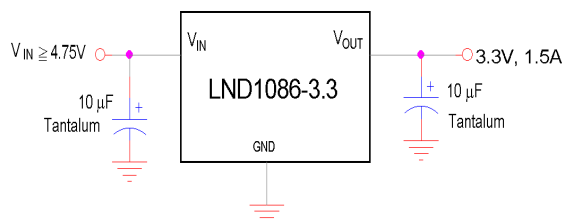
GENERAL DESCRIPTION

The LND1086/LND1085 Series 1.5/3.0A fixed and adjustable voltage regulators are monolithic integrated circuits designed to power the new generation of microprocessors for use in applications requiring a well regulated positive output voltage with low input-output differential voltage requirements and output voltage 3.3, 2.9V or 2.5V. Outstanding features include full power usage up to 1.5/3.0A of load current, internal current limiting and thermal shutdown. Other fixed versions are also available $V_{out}=2.0V$ to 4.0V. Please consult Linear Dimensions for more information.

DEVICE SELECTION GUIDE

Device	$V_{Out}(V)$	$I_{Out}(A)$
LND1086	3.3, 2.9, 2.5	1.5
LND1085	3.3, 2.9, 2.5	3.0

FIXEDVOLTAGE REGULATOR



FEATURES

- Fixed Output Voltage 3.3, 2.9V, 2.5V
- Low Dropout Performance, 1V at Full load
- Line Regulation Typically 0.015%
- Load Regulation Typically 0.1%
- Fast Transient Response
- TO-220 Packages

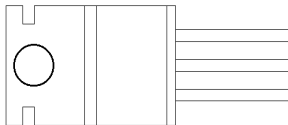
APPLICATIONS

- Microprocessor Supplies
- Post Regulators for Switching Supplies
- High Current Regulators
- 5V to 3.XXV for Pentium Processors
- 3.3V to 2.5V for Portable Pentium Processor
- Power PC Series Power Supplies

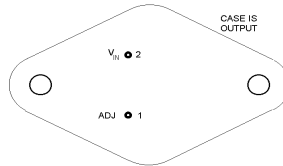


PACKAGE INFORMATION

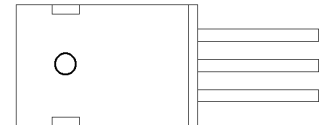
T Package TO-220 Plastic Front View



K Package TO-3 Metal Can Bottom View



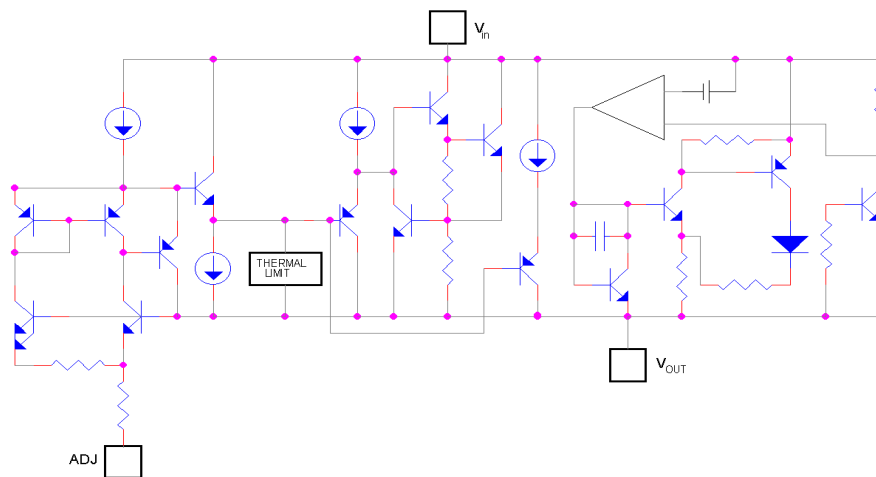
P Package TO-3P Plastic Front View



ABSOLUTE MAXIMUM RATING

SYMBOL	PARAMETER	MAXIMUM	UNITS
V_{IN}	Input Voltage	6	V
P_o	Power Dissipation	Internally Limited	W
θ_{JC}	Thermal resistance Junction to Case	3	°C/W
θ_{JA}	Thermal Resistance Junction to Ambient	50	
T_J	Operating Junction Temperature Range	0 to 125 0 to 150	°C
	Control Section		
	Power Transistor		
T_{STG}	Storage Temperature	-65 to 150	
T_{LEAD}	Lead Temperature(soldering, 10 sec)	260	

BLOCK DIAGRAM





ELECTRICAL CHARACTERISTICS

(V_{IN} = 4.75 V to 5.25 V; I_o = 10mA to 3.0A(LND1085) ; I_o = 10mA to 1.5 A(LND1086), Unless otherwise specified)

Parameter	Symbol	Test Conditions			Test Limits			Units	
		V_{in}	I_o	$T_j(3)$	Min	Typ	Max		
Output Voltage LND1086-3.3/LND1085-3.3	V_o	5V	10mA	25 °C	3.267	3.3	3.333	V	
				Over temp.	3.234		3.366		
LND1086-2.9/LND1085-2.9	V_o	5V	10mA	25 °C	2.871	2.9	2.929		
				Over temp.	2.842		2.958		
LND1086-2.5/LND1085-2.5	V_o	5V	10mA	25 °C	2.475	2.5	2.525		
				Over temp.	2.450		2.550		
Line Regulation(1)	$REG_{(Line)}$		10mA	25 °C			0.015	0.2	%
				Over temp.			0.035		
Load regulation(1)	$REG_{(Load)}$	5V		25 °C			0.1	0.3	
				Over temp.			0.2		
Dropout Voltage $\Delta V_{out}=2\%$	V_D			25 °C			1.0		V
				Over temp.			1.1		
Current surge Limit LND1085 LND1086	I_s						4.5 2.5		A
Quiescent current	I_Q	5V					10	16	mA
Temperature Coefficient	T_C						0.005		%/ °C
Temperature Stability	T_S	5V	0.5A				0.5		%
RMS Output Noise(2)	V_N			25°C			0.003		% V_o
Ripple Rejection ratio LND1085 LND1086	R_A	5V	3.0A 1.5A	Over temp.	60	72			dB

(1) Low duty cycle pulse testing

(2) Bandwidth of 10 Hz to 10kHz

(3) Over temp.= over specified operating junction temperature range.



APPLICATIONS INFORMATION

The LND1086 family of three-terminal adjustable regulators is easy to use and has all the protection features that are expected in high performance voltage regulators.

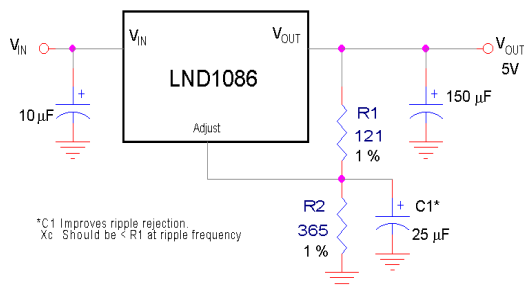
Stability

The circuit design used in the LND1086 series requires the use of an output capacitor as part of the device frequency compensation. The addition of 150 μF aluminum electrolytic or a 22 μF solid tantalum on the output will ensure stability for all operating conditions.

Output Voltage

The LND1086 develops a 1.25V reference voltage between the Output pin and the Adjust pin (Figure 1). Placing a resistor between these two terminals causes a constant current to flow through R1 and down through R2 to set the output voltage. In general R1 is chosen so that this current is the specified minimum load current of 10mA. The current out of the Adjust pin is small as compared to the current from R1 and can be ignored. For fixed voltage devices R1 and R2 are included in the device.

Figure 1. Output Voltage



Protection Diodes

In normal operation LND1086 family does not need any protection diodes between the adjustment pin and the output and from the output to the input to prevent die overstresses. Internal resistors are limiting the internal current paths on the ADJ pin. Therefore even with bypass capacitors on the adjust pin no protection diode is needed to ensure device safety under short-circuit conditions

Microsecond surge currents of 10A to 20A can be handled by the internal diode between the Output pin and the Input pin of the device. In normal operations it is difficult to get those values of surge currents even with the use of large output capacitance. Only with high value output capacitors, such as 1000 to 5000 μF and with the Input pin instantaneously shorted to ground, can damage occur. A diode from output to input is recommended (Figure 2).

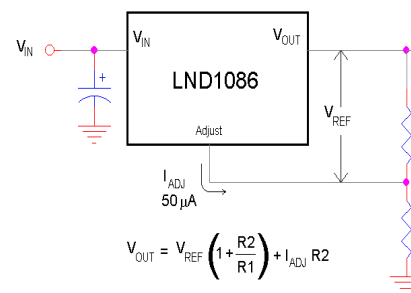


Figure 2. Protection Diodes

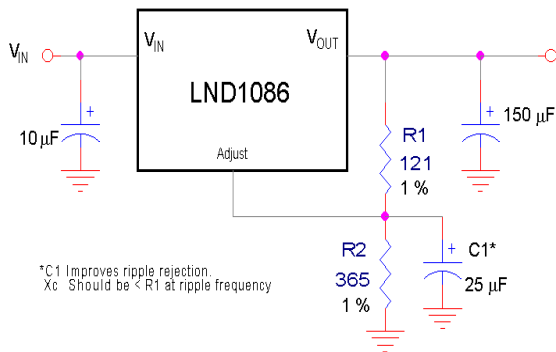
Thermal Considerations

The LND1086 series have internal power and thermal-limiting circuitry designed to protect the device under overload conditions. However, maximum junction temperature ratings should not be exceeded under continuous normal load conditions. Careful consideration must be given to all sources of thermal resistance from junction to ambient, including junction-to-case, case to-heat sink interface and heat sink resistance itself.

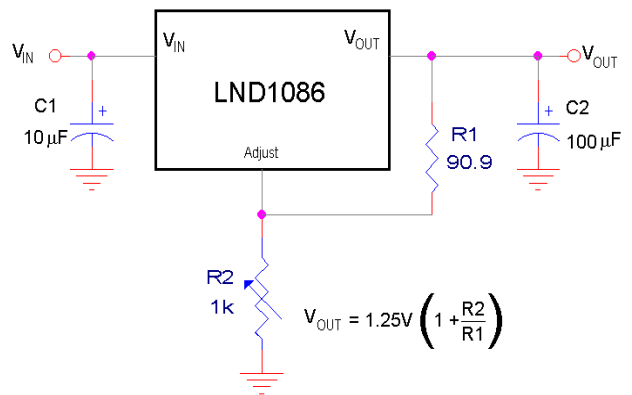


TYPICAL APPLICATIONS

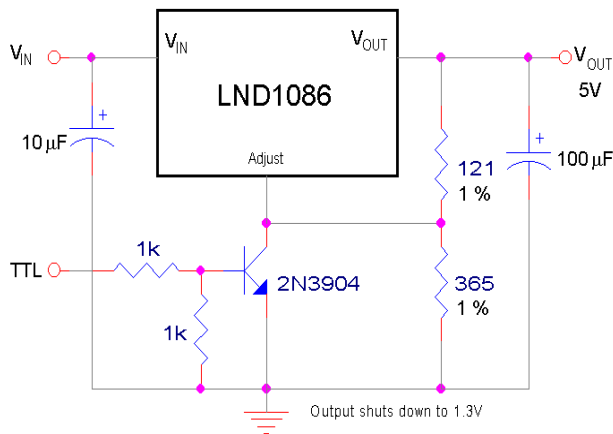
Improving ripple rejection



1.2V to 15v adjustable regulator



5V regulator with shutdown



Automatic light control

