Features:
- **Adjustable output current**
- **Adjustable output voltage**
- **Low quiescent current**
- **Short circuit protection**
- **Thermal overload protection**

Suggested applications:
- **Power supplies**
- **Battery chargers**
- **DC-DC converters**

Pin out diagram
as shown in module
8064

Introduction
The L200 is a monolithic IC designed for programmable voltage and current regulation. Voltage outputs between 2.85V and 36V may be accommodated, at currents of up to 2A. The device is supplied in a 5-pin package (see pin-out diagram). The L200 has internal protection to minimise the possibility of damage to the device; this comprises current limiting, power limiting, thermal shutdown and input over-voltage protection (up to 60V for 10mS).

General Description
The L200 uses a relatively sophisticated design and may be used in several different configurations to provide voltage or current regulation. Current limiting is controlled by connecting a resistor between pin 2 and pin 5 of the L200. The current limit threshold is approximated by the expression:

$$I_o - V_{sc} / R_{sc}$$

Where
I_o = Output current (A)
V_{sc} = Current limit sense voltage (V)
R_{sc} = Resistance between pin 5 and pin 2 (¿)

The current limit sense voltage is variable depending on several factors including load and temperature but is typically 0.45V.

Power dissipation is controlled by the internal safe operating area (SOA) protection circuitry of the L200. The device can supply a current of up to 2A as long as the input / output differential voltage is less than 20V. With differential voltages above 20V, the maximum current output drops considerably; if this value is exceeded then the SOA protection limits the output current so as to reduce power dissipation and prevent damage to the device.

Output voltage is determined by the value of the resistors connected between pin 3 & pin 4 and pin 4 & pin 2 of the device. The final output voltage can be approximated by the expression:

$$V_o = V_{ref}(1+(R2 / R1))$$

Where:
V_o = Output Voltage (V)
V_{ref} = Reference voltage on pin 4 (V)
R1 = Resistance between pin 4 & pin 3 (¿)
R2 = Resistance between pin 2 & pin 4 (¿).

For the purpose of approximate calculation, V_{ref} may be taken at a typical value of 2.77V although in practice this figure may vary slightly.

Heatsink
At higher power levels, it is necessary to use a suitable heatsink to prevent the L200 from reaching excessive temperatures. The type of heatsink used is dependable on the individual application. In some cases, a large area of metal such as the side of an enclosure may already be available. The tab of the L200 is at 0V potential an will bolt directly to a heatsink if this is also at 0V potential; however, in some cases it may be necessary to isolate the tab of the L200.
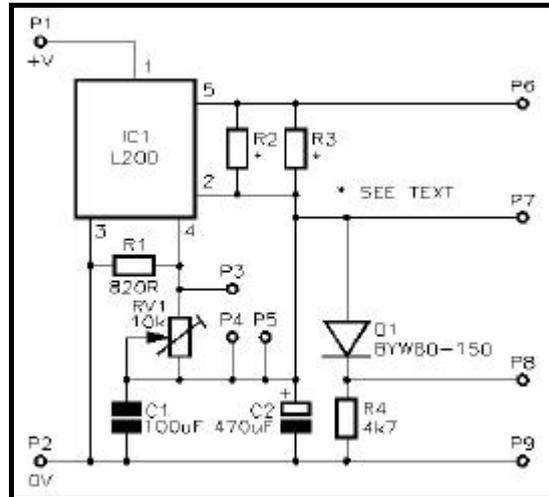
Connection information:
Input connections are made to P1 (input +V) and P2 (input 0V).
Output connections are made to P8 (output +V) and P9 (0V).
Output voltage is controlled via RV1, however an external potentiometer may be connected to P3, P4 & P5. If the external control is used then RV1 should NOT be fitted. If a fixed output is required, then a fixed value resistor may be connectred between P3 & P4 – again RV1 should NOT be fitted. The current limit threshold of the circuit is set by resistors R2 & R3. Provision is also provided for an external current limiting resistor which may be connected between P6 & P7. A low value variable resistor may be used for variable current limit control but at higher current levels, the resolution will become increasingly poor.

The approximate current limit threshold may be calculated using the following method, assuming a typical voltage of 0.45V between P6 & P7 (pin 5 and pin 2 of the IC):

$$I_o = 0.45 / R_{sc}$$

Where I_o is the output current and Rsc is the total parallel resistance between P6 & P7 (R2, R3 and any external current limit resistor in parallel) in ohms.

L200 Application Parts List

Resistors: All 0.6W 1% Metal film (unless specified)

R1	820¿	1	(M820R)
R2	See Text	1	
R3	See Text	1	
R4	4K7	1	(M4K7)
RV1	Ver Encl Preset 10K	1	(UH16S)

Capacitors

C1	Monores Cap 100nF	1	(RA49D)
C2	PC Elect 470uF 35V	1	(VH47B)

Semiconductors

IC1	L200	1	(YY74R)
D1	BYW80-150	1	(UK63T)