

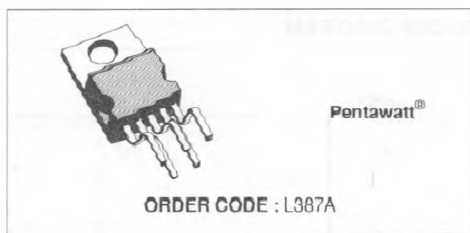
## VERY LOW DROP 5V REGULATOR

- PRECISE OUTPUT VOLTAGE ( $5\text{ V} \pm 4\%$ )
- VERY LOW DROPOUT VOLTAGE
- OUTPUT CURRENT IN EXCESS OF 500mA
- POWER-ON, POWER-OFF INFORMATION (RESET FUNCTION)
- HIGH NOISE IMMUNITY ON RESET DELAY CAPACITOR

L387A particularly suitable for microprocessor systems. This output provides a reset signal when power is applied (after an external programmable delay) and goes low when power is removed, inhibiting the microprocessor. An hysteresis on reset delay capacitor raises the immunity to the ground noise.

### DESCRIPTION

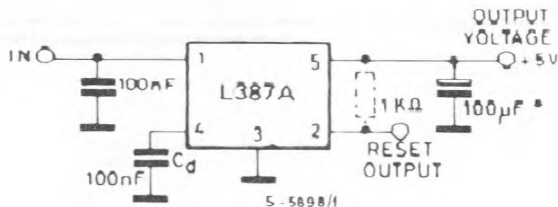
The L387A is a very low drop voltage regulator in a Pentawatt<sup>®</sup> package specially designed to provide stabilized 5V supplies in consumer and industrial applications. Thanks to its very low input/output voltage drop this device is very useful in battery powered equipment, reducing consumption and prolonging battery life. A reset output makes the



### ABSOLUTE MAXIMUM RATINGS

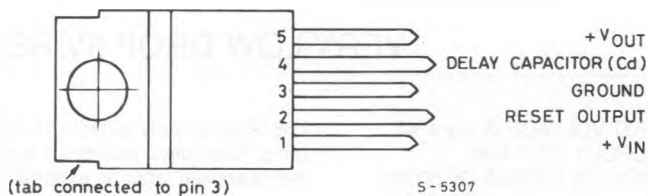
| Symbol         | Parameter                        | Value           | Unit               |
|----------------|----------------------------------|-----------------|--------------------|
| $V_i$          | Forward Input Voltage            | 35              | V                  |
| $T_{OD}$       | Operating Temperature Range      | $-40$ to $+125$ | $^{\circ}\text{C}$ |
| $T_{stg}, T_J$ | Storage and Junction Temperature | $-40$ to $+150$ | $^{\circ}\text{C}$ |

### APPLICATION CIRCUIT

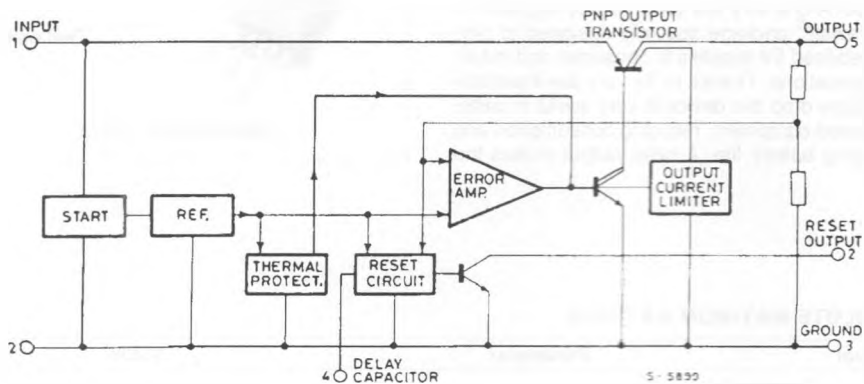


\* Min 33  $\mu\text{F}$  and max. ESR  $\leq 3\Omega$  over temperature range.

## CONNECTION DIAGRAM (top views)



## BLOCK DIAGRAM



## THERMAL DATA

|                  |                                  |     |   |               |
|------------------|----------------------------------|-----|---|---------------|
| $R_{th\ j-case}$ | Thermal Resistance Junction-case | Max | 4 | $^{\circ}C/W$ |
|------------------|----------------------------------|-----|---|---------------|

**ELECTRICAL CHARACTERISTICS** (refer to the test circuit,  $V_i = 14.4\text{ V}$ ,  $T_j = 25\text{ }^\circ\text{C}$ ,  $C_o = 100\text{ }\mu\text{F}$ ; unless otherwise specified)

| Symbol                        | Parameter                            | Test Conditions                                                                                                                                                                          | Min.         | Typ.                                  | Max.                   | Unit                 |
|-------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------------------------|------------------------|----------------------|
| $V_o$                         | Output Voltage                       | $I_o = 5\text{ mA}$ to $500\text{ mA}$ $T_j = 25\text{ }^\circ\text{C}$<br>$-40 \leq T_j \leq 125\text{ }^\circ\text{C}$                                                                 | 4.80<br>4.75 | 5.00<br>5.00                          | 5.20<br>5.25           | V                    |
| $V_i$                         | Operating Input Voltage              | (*), Over Full T Range ( $-40$ to $125\text{ }^\circ\text{C}$ )<br>(see note **)                                                                                                         |              |                                       | 26                     | V                    |
| $\Delta V_o$                  | Line Regulation                      | $V_i = 6\text{ V}$ to $26\text{ V}$ $I_o = 5\text{ mA}$                                                                                                                                  |              | 5                                     | 50                     | mV                   |
| $\Delta V_o$                  | Load Regulation                      | $I_o = 5\text{ mA}$ to $500\text{ mA}$                                                                                                                                                   |              | 15                                    | 60                     | mV                   |
| $V_i - V_o$                   | Dropout Voltage                      | $I_o = 350\text{ mA}$ $V_o = V_{o\text{ NOM}} - 100\text{ mV}$<br>$I_o = 500\text{ mA}$                                                                                                  |              | 0.40<br>0.60                          | 0.65<br>0.8            | V                    |
| $I_q$                         | Quiescent Current                    | $I_o = 0\text{ mA}$<br>$I_o = 150\text{ mA}$<br>$I_o = 350\text{ mA}$<br>$I_o = 500\text{ mA}$                                                                                           |              | 5<br>20<br>60<br>100                  | 15<br>35<br>100<br>160 | mA                   |
|                               |                                      | $V_i = 6.2\text{ V}$ $I_o = 500\text{ mA}$                                                                                                                                               |              | 160                                   | 180                    |                      |
| $\frac{\Delta V_o}{\Delta T}$ | Temperature Output Voltage Drift     |                                                                                                                                                                                          |              | - 0.5                                 |                        | mV/ $^\circ\text{C}$ |
| SVR                           | Supply Voltage Rejection             | $I_o = 350\text{ mA}$ $f = 120\text{ Hz}$<br>$C_o = 100\text{ }\mu\text{F}$ $V_i = 12\text{ V} \pm 5\text{ V}_{pp}$                                                                      |              | 60                                    |                        | dB                   |
| $I_{SC}$                      | Output Short Circuit Current         |                                                                                                                                                                                          |              | 1.2                                   | 1.6                    | A                    |
| $V_R$                         | Reset Output Voltage                 | $I_R = 3\text{ mA}$ $1 < V_o < 4.75\text{ V}$<br>$I_R = 16\text{ mA}$ $1.5 < V_o < 4.75\text{ V}$<br>Over Full T ( $-40\text{ }^\circ\text{C} \leq T_j \leq 125\text{ }^\circ\text{C}$ ) |              |                                       | 0.5<br>0.8             | V                    |
| $I_R$                         | Reset Output Leakage Current         | $V_o$ in Regulation<br>Over Full T Range                                                                                                                                                 |              |                                       | 50                     | $\mu\text{A}$        |
| $t_d$                         | Delay Time for Reset Output          | $C_d = 100\text{ nF}$<br>Over Full T Range                                                                                                                                               |              | 25                                    |                        | ms                   |
| $V_{RT\text{ (off)}}$         |                                      | $V_o$ @ Reset out H to L Transition, Over Full T Range                                                                                                                                   | 4.75         | $V_o - 0.15$                          |                        | V                    |
| $I_{C4}$                      | Charging Current (current generator) | $V_4 = 3\text{ V}$                                                                                                                                                                       | 10           | 20                                    | 30                     | $\mu\text{A}$        |
| $V_{RT\text{ (on)}}$          | Power on $V_o$ Threshold             | $V_o$ @ Reset out L to H Transition, Over Full T Range                                                                                                                                   |              | $V_{RT\text{ (off)}} + 0.05\text{ V}$ | $V_o - 0.04\text{ V}$  | V                    |
| $V_4$                         | Comparator Threshold (pin 4)         | $V_4$ @ Reset out H to L Transition                                                                                                                                                      | 3.2          |                                       | 3.9                    | V                    |
|                               |                                      | $V_4$ @ Reset out L to H Transition                                                                                                                                                      | 3.7          |                                       | 4.3                    | V                    |
| $V_H$                         | Hysteresis Voltage                   | Over Full T Range                                                                                                                                                                        |              | 450                                   |                        | mV                   |

(\*) For a DC voltage  $26 < V_i < 35\text{ V}$  the device is not operating.

(\*\*) Design limits are guaranteed (but not 100 % production tested) over the indicated temperature and supply voltage ranges. These limits are not used to calculate outgoing quality levels.

Figure 1 : Dropout Voltage vs. Output Current.

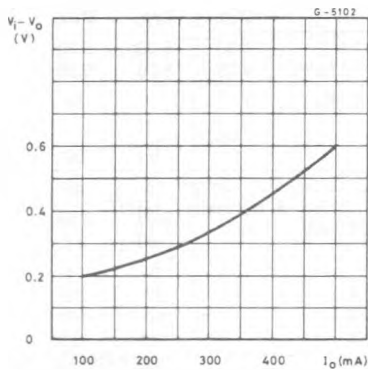


Figure 2 : Quiescent Current vs. Output Current.

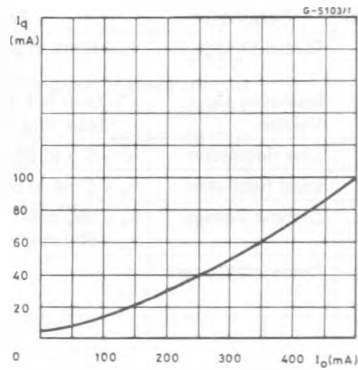


Figure 3 : Output Voltage vs. Temperature.

