



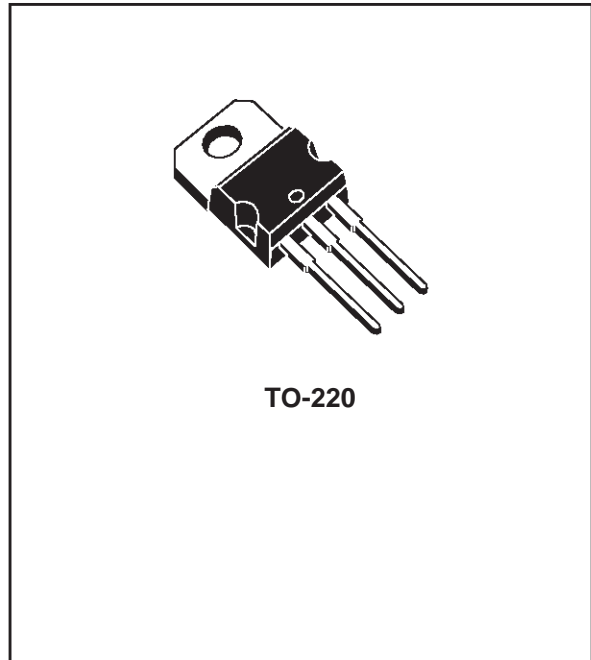
PB137

POSITIVE VOLTAGE REGULATOR FOR BATTERY CHARGER

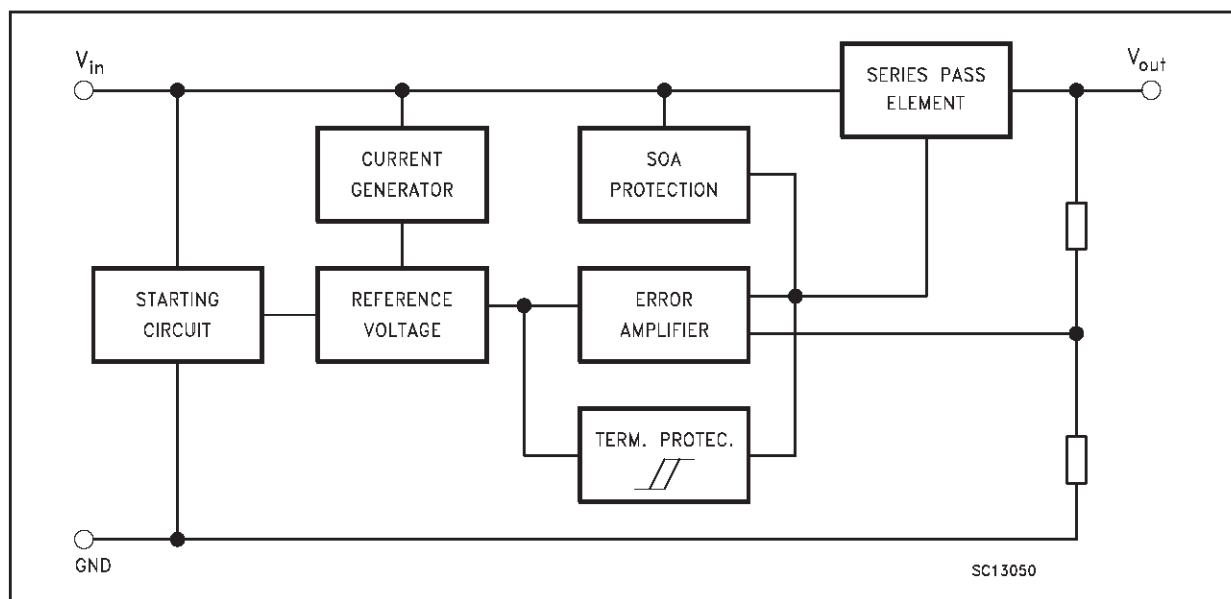
- REVERSE LEAKAGE CURRENT LESS THAN 10 μ A
- THREE TERMINAL FIXED VERSION (13.7V) OUTPUT CURRENT IN EXCESS OF 1.5A
- AVAILABLE IN $\pm 1\%$ (AC) SELECTION AT 25°C
- TYPICAL DROPOUT VOLTAGE 2V
- TEMPERATURE RANGE 0°C TO 150°C

DESCRIPTION

The PB137 is a positive voltage regulator able to provide 1.5A, at $V_{OUT}=13.7V$ and is intended as a charger for lead acid battery. The main feature is a reverse leakage current (Max 10 μ A at $T_J = 0$ to 40°C V_{IN} = floating and $V_{OUT} = 13.7V$). It is available in TO-220 and it employs internal current limiting, thermal shut-down and safe area protection, making it essentially indestructible. If adequate heat-sinking is provided, they can deliver over 1A output current.



SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

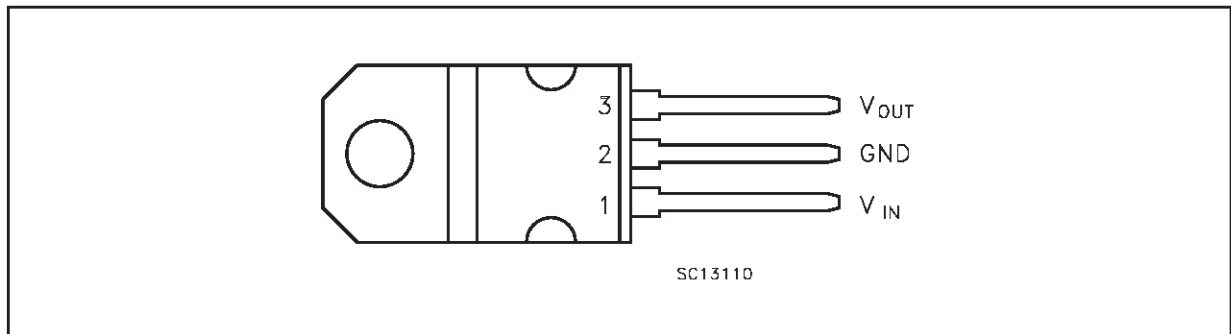
| Symbol | Parameter | Value | Unit |
|-----------|--------------------------------------|--------------------|------|
| V_i | DC Input Voltage | 40 | V |
| I_o | Output Current | Internally limited | mA |
| P_{tot} | Power Dissipation | Internally limited | mW |
| T_{stg} | Storage Temperature Range | - 65 to 150 | °C |
| T_{op} | Operating Junction Temperature Range | 0 to 150 | °C |

Absolute Maximum Rating are those values beyond wick damage to the device may occur. Functional operation under these conditions is not implied.

THERMAL DATA

| Symbol | Parameter | Value | Unit |
|----------------|-------------------------------------|-------|------|
| $R_{thj-case}$ | Thermal Resistance Junction-case | 3 | °C/W |
| $R_{thj-amb}$ | Thermal Resistance Junction-ambient | 50 | °C/W |

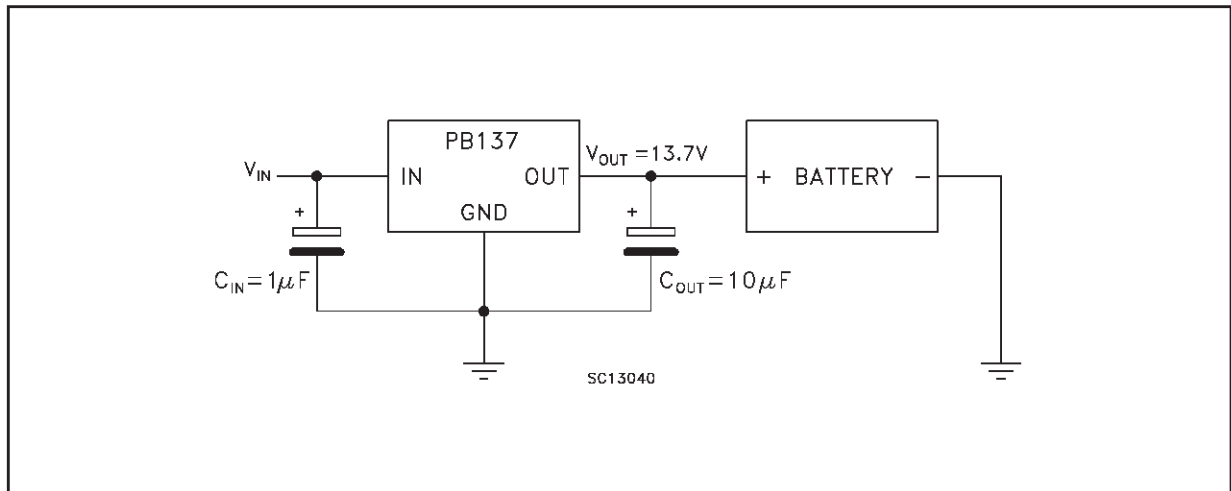
CONNECTION DIAGRAM (top view)



ORDERING NUMBERS

| Type | Output Voltage |
|----------|----------------|
| PB137ACV | 13.7 V |

APPLICATION CIRCUIT

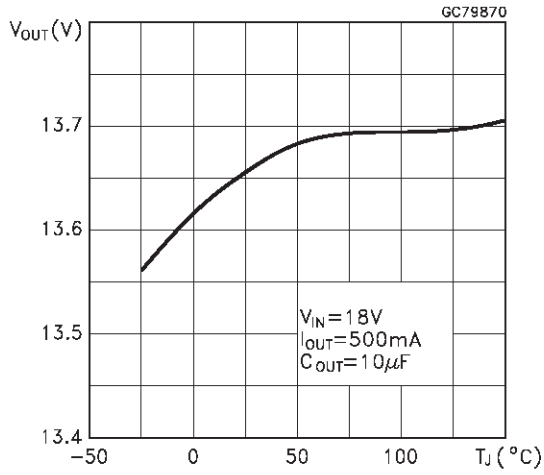


ELECTRICAL CHARACTERISTICS FOR PB137 (refer to the test circuits, $V_I = 18\text{ V}$, $I_{OUT} = 500\text{ mA}$, $T_j = 0\text{ to }150\text{ }^\circ\text{C}$, $C_{OUT} = 10\text{ }\mu\text{F}$ unless otherwise specified)

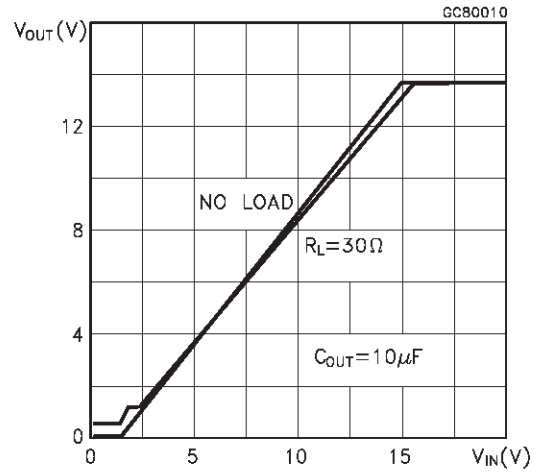
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|--------------|---------------------------------|--|-------|------|-------|------------------|
| V_o | Output Voltage | $T_j = 25\text{ }^\circ\text{C}$ | 13.56 | 13.7 | 13.84 | V |
| | | | 13.43 | 13.7 | 13.97 | V |
| ΔV_o | Line Regulation | $V_i = 16\text{ to }28.7\text{ V}$, $T_j = 25\text{ }^\circ\text{C}$ | | 60 | 150 | mV |
| ΔV_o | Load Regulation | $I_o = 5\text{ to }1500\text{ mA}$, $T_j = 25\text{ }^\circ\text{C}$ | | 65 | 100 | mV |
| I_d | Quiescent Current | $T_j = 25\text{ }^\circ\text{C}$ | | 4 | 8 | mA |
| ΔI_d | Delta Quiescent Current vs Line | $V_i = 16\text{ to }28.7\text{ V}$ | | | 4 | mA |
| ΔI_d | Delta Quiescent Current vs Load | $I_o = 5\text{ to }1000\text{ mA}$ | | | 1.2 | mA |
| V_d | Dropout Voltage | $I_o = 1\text{ A}$, $T_j = 25\text{ }^\circ\text{C}$ | | 2.1 | 2.6 | V |
| I_{SC} | Short Circuit Current | $V_i - V_o = 5\text{ V}$, $T_j = 25\text{ }^\circ\text{C}$ | | 2.2 | | A |
| eN | Output Noise Voltage | $B = 10\text{ Hz to }10\text{ KHz}$, $T_j = 25\text{ }^\circ\text{C}$ | | 300 | | μVrms |
| SVR | Supply Voltage Rejection | $f = 120\text{ Hz}$, $T_j = 25\text{ }^\circ\text{C}$ | | 58 | | dB |
| I_{REV} | Reverse Leakage Current | $V_{OUT} = 13.7\text{ V}$, $V_{IN} = \text{floating}$, $T_j = 0\text{ to }40\text{ }^\circ\text{C}$ | | 0.1 | 10 | μA |
| S | Long Term Stability | $T_j = 125\text{ }^\circ\text{C}$, 1000hrs | | | 0.5 | % |

TYPICAL PERFORMANCE CHARACTERISTICS ($T_J=25^{\circ}\text{C}$)

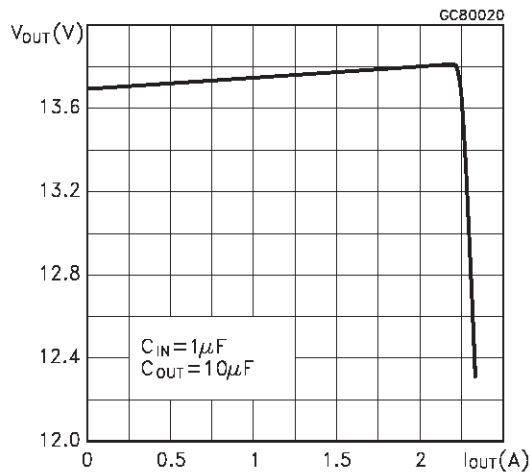
Output Voltage vs Temperature



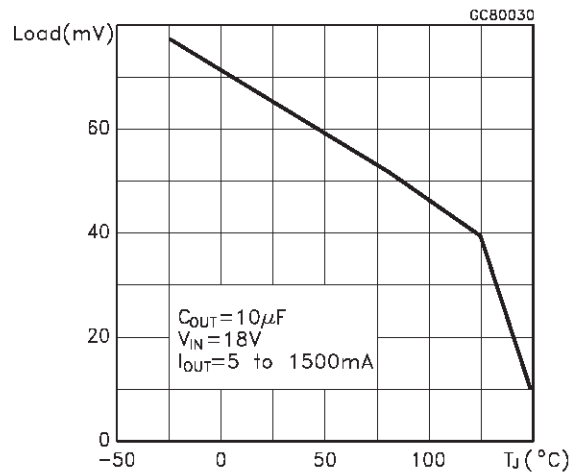
Output Voltage vs Input Voltage



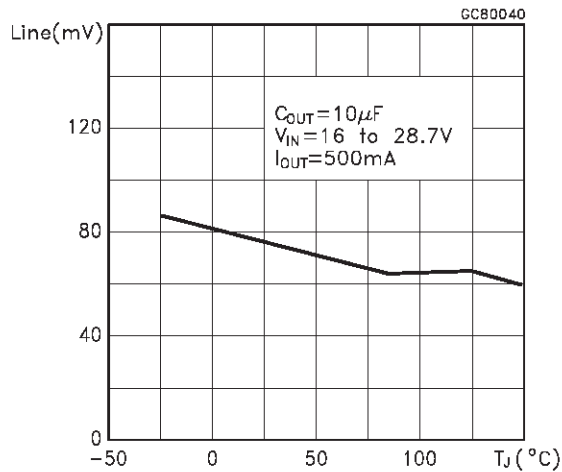
Output Voltage vs Output Current



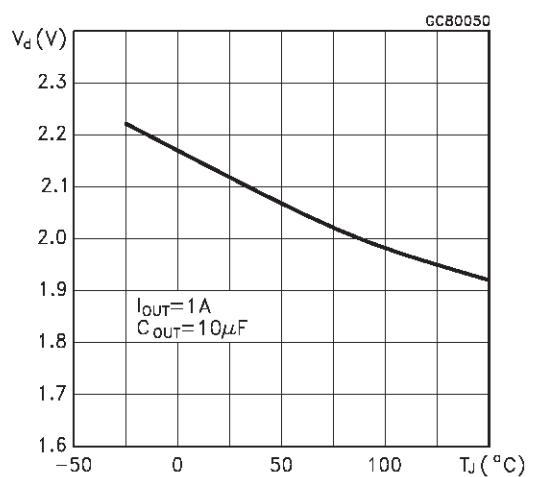
Load Regulation vs Temperature



Line Regulation vs Temperature

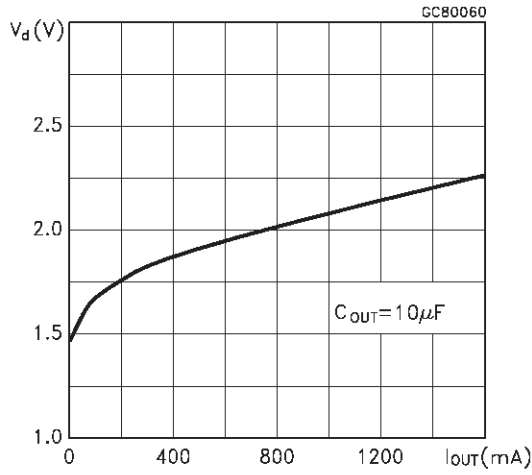


Dropout Voltage vs Temperature

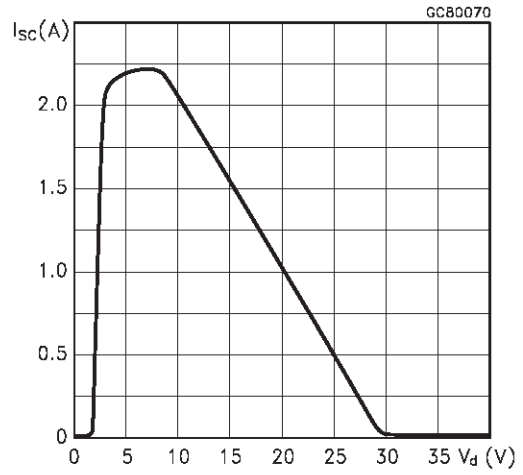


TYPICAL PERFORMANCE CHARACTERISTICS (continued)

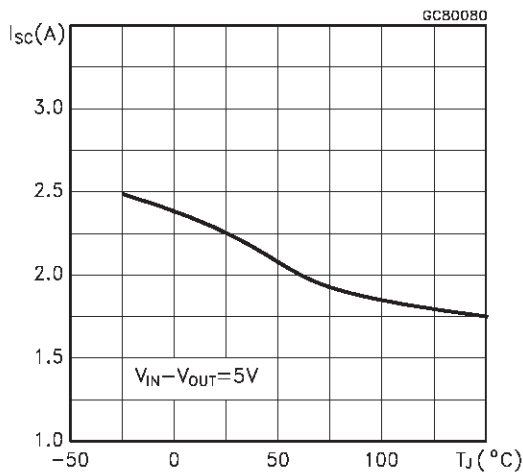
Dropout Voltage vs Output Current



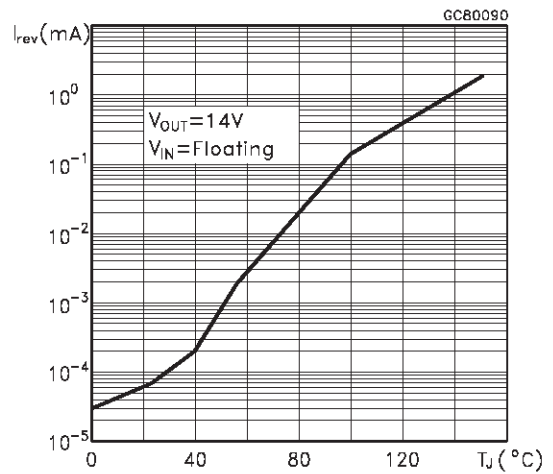
Short Circuit Current vs Dropout Voltage



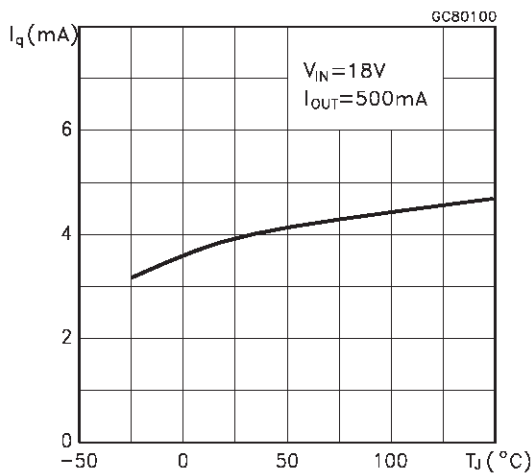
Short Circuit Current vs Temperature



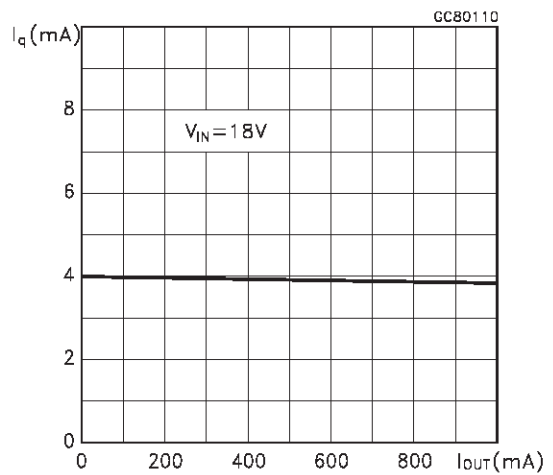
Reverse Leakage Current vs Temperature



Quiescent Current vs Temperature

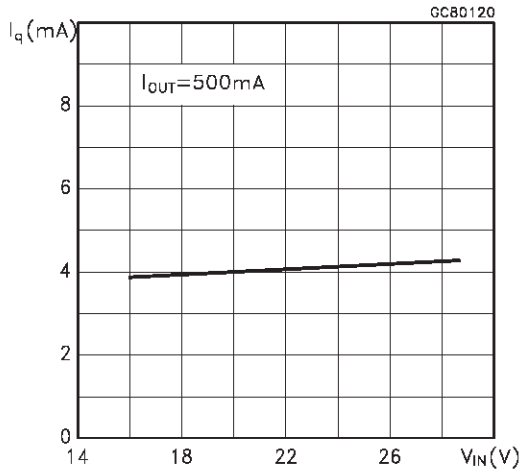


Quiescent Current vs Output Current

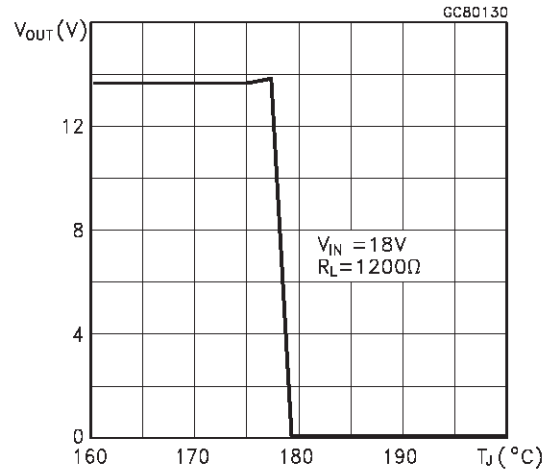


TYPICAL PERFORMANCE CHARACTERISTICS (continued)

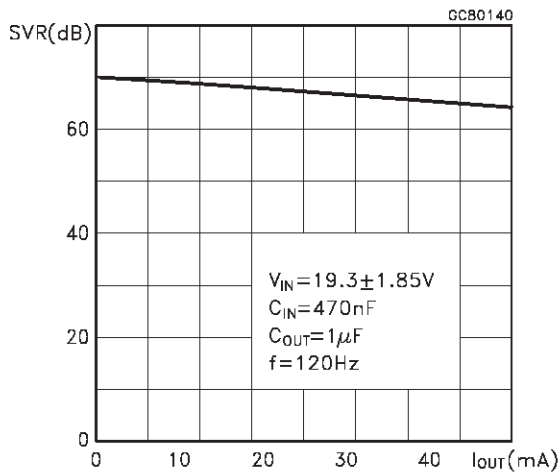
Quiescent Current vs Input Voltage



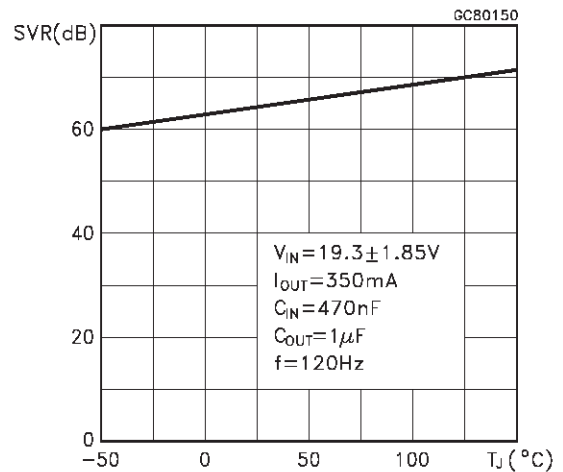
Thermal Protection



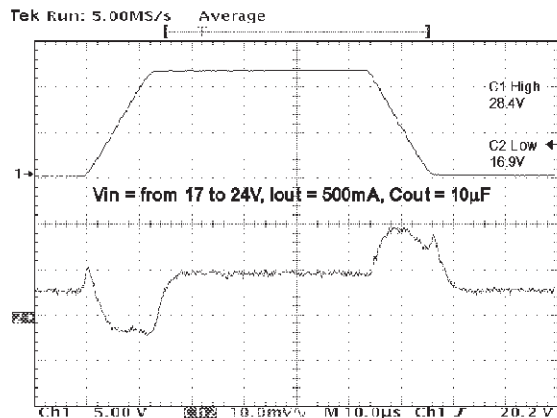
Supply Voltage Rejection vs Output Current



Supply Voltage Rejection vs Temperature

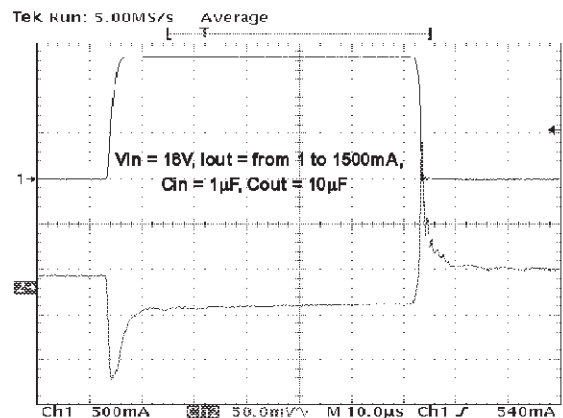


Line Transient Response



$V_{IN} = 17 \text{ to } 28.4\text{V}, I_{OUT} = 0.5\text{A}, C_{OUT} = 10\mu\text{F}$

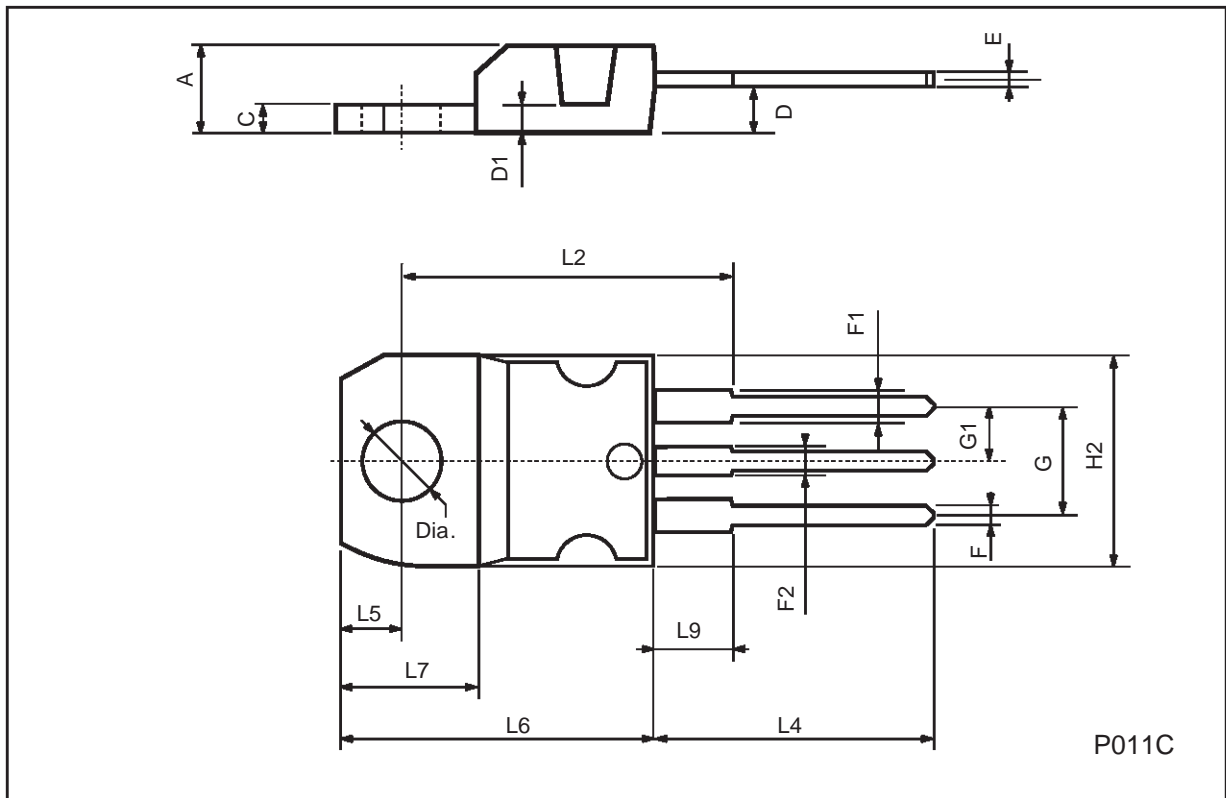
Load Transient Response



$V_{IN} = 18\text{V}, I_{OUT} = 5 \text{ to } 1.5\text{A}, C_{IN} = 1\mu\text{F}, C_{OUT} = 10\mu\text{F}$

TO-220 MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|-------|------|-------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 4.40 | | 4.60 | 0.173 | | 0.181 |
| C | 1.23 | | 1.32 | 0.048 | | 0.051 |
| D | 2.40 | | 2.72 | 0.094 | | 0.107 |
| D1 | | 1.27 | | | 0.050 | |
| E | 0.49 | | 0.70 | 0.019 | | 0.027 |
| F | 0.61 | | 0.88 | 0.024 | | 0.034 |
| F1 | 1.14 | | 1.70 | 0.044 | | 0.067 |
| F2 | 1.14 | | 1.70 | 0.044 | | 0.067 |
| G | 4.95 | | 5.15 | 0.194 | | 0.203 |
| G1 | 2.4 | | 2.7 | 0.094 | | 0.106 |
| H2 | 10.0 | | 10.40 | 0.393 | | 0.409 |
| L2 | | 16.4 | | | 0.645 | |
| L4 | 13.0 | | 14.0 | 0.511 | | 0.551 |
| L5 | 2.65 | | 2.95 | 0.104 | | 0.116 |
| L6 | 15.25 | | 15.75 | 0.600 | | 0.620 |
| L7 | 6.2 | | 6.6 | 0.244 | | 0.260 |
| L9 | 3.5 | | 3.93 | 0.137 | | 0.154 |
| DIA. | 3.75 | | 3.85 | 0.147 | | 0.151 |



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