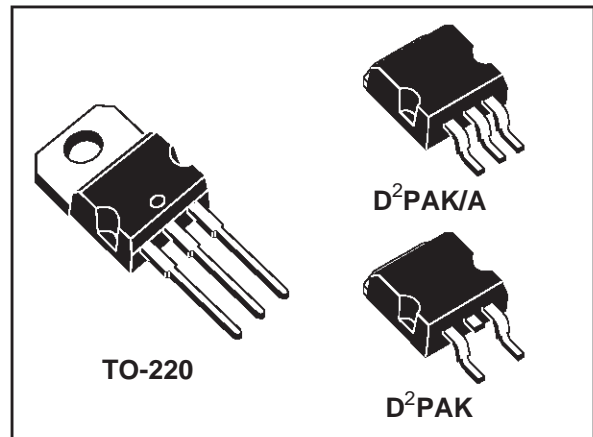




# LD1085 SERIES

## 3A LOW DROP FIXED AND ADJUSTABLE POSITIVE VOLTAGE REGULATORS

- TYPICAL DROPOUT VOLTAGE 1.3V AT 3A
- THREE TERMINAL ADJUSTABLE OR FIXED OUTPUT VOLTAGE 1.8V, 2.5V, 2.85V, 3.3V, 3.6V, 5V, 8V, 9V, 12V
- GUARANTEED OUTPUT CURRENT UP TO 3A
- OUTPUT TOLERANCE  $\pm 1\%$  AT  $25^{\circ}\text{C}$  AND  $\pm 2\%$  IN FULL TEMPERATURE RANGE
- INTERNAL POWER AND THERMAL LIMIT
- WIDE OPERATING TEMPERATURE RANGE  $-40^{\circ}\text{C}$  TO  $125^{\circ}\text{C}$
- PACKAGE AVAILABLE: TO-220 D<sup>2</sup>PAK
- PINOUT COMPATIBILITY WITH STANDARD ADJUSTABLE VOLTAGE REGULATORS

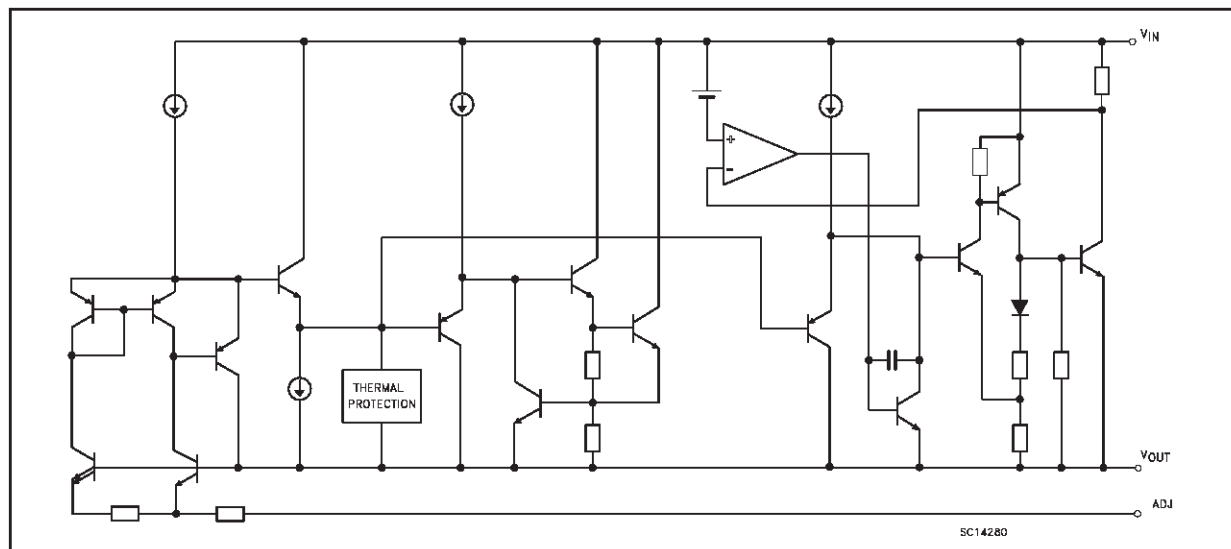


### DESCRIPTION

The LD1085 is a LOW DROP Voltage Regulator able to provide up to 3A of Output Current. Dropout is guaranteed at a maximum of 1.5V at the maximum output current, decreasing at lower loads. The LD1085 is pin compatible with older 3-terminal adjustable regulators, but has better performances in term of drop and output tolerance. A 2.85V output version is suitable for SCSI-2 active termination. Unlike PNP

regulators, where a part of the output current is wasted as quiescent current, the LD1085 quiescent current flow into the load, so increase efficiency. Only a 10  $\mu\text{F}$  minimum capacitor is need for stability. The device is supplied in TO-220, D<sup>2</sup>PAK and D<sup>2</sup>PAK/A packages. On chip trimming allows the regulator to reach a very tight output voltage tolerance, within  $\pm 1\%$  at  $25^{\circ}\text{C}$ .

### BLOCK DIAGRAM



# LD1085 SERIES

## ABSOLUTE MAXIMUM RATINGS

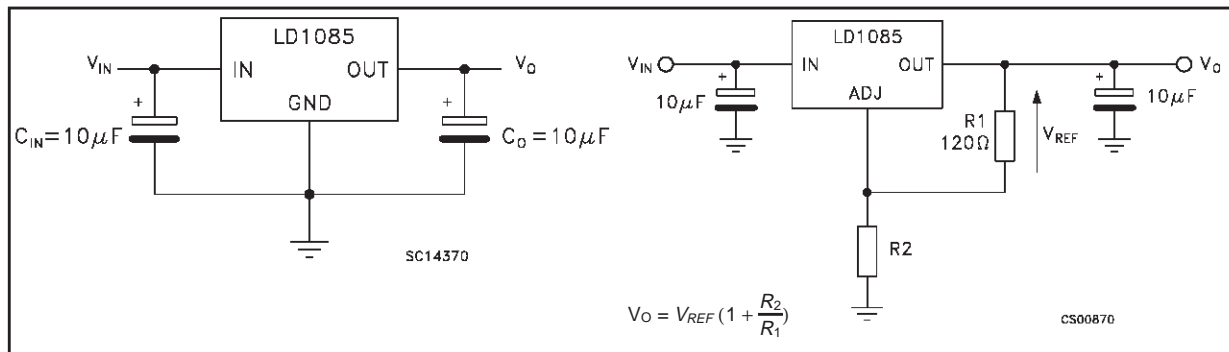
| Symbol           | Parameter                            | Value              | Unit |
|------------------|--------------------------------------|--------------------|------|
| V <sub>IN</sub>  | DC Input Voltage                     | 30                 | V    |
| I <sub>OUT</sub> | Output Current                       | Internally Limited | mA   |
| P <sub>tot</sub> | Power Dissipation                    | Internally Limited | mW   |
| T <sub>stg</sub> | Storage Temperature Range            | -50 to 150         | °C   |
| T <sub>op</sub>  | Operating Junction Temperature Range | -40 to 125         | °C   |

Absolute Maximum Ratings are those value beyond which damage to the device may occur. Functional operation under these condition is not implied. Over the above suggested Max Power Dissipation a Short Circuit could definitively damage the device.

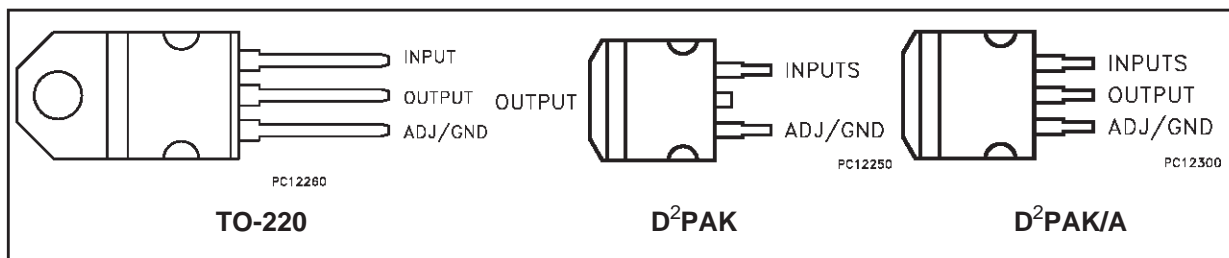
## THERMAL DATA

| Symbol                | Parameter                           | TO-220 | D <sup>2</sup> PAK | Unit |
|-----------------------|-------------------------------------|--------|--------------------|------|
| R <sub>thj-case</sub> | Thermal Resistance Junction-case    | 3      | 3                  | °C/W |
| R <sub>thj-amb</sub>  | Thermal Resistance Junction-ambient | 50     | 62.5               | °C/W |

## APPLICATION CIRCUIT FOR FIXED AND ADJUSTABLE VERSION



## CONNECTION DIAGRAM AND ORDERING NUMBERS (top view)



| TO-220     | D <sup>2</sup> PAK (**) | D <sup>2</sup> PAK/A (**) | Output Voltage |
|------------|-------------------------|---------------------------|----------------|
| LD1085V18  | LD1085D2T18             | LD1085D2M18               | 1.8V           |
| LD1085V25  | LD1085D2T25             | LD1085D2M25               | 2.5V           |
| LD1085V28  | LD1085D2T28             | LD1085D2M28               | 2.85V          |
| LD1085V33  | LD1085D2T33             | LD1085D2M33               | 3.3V           |
| LD1085V36  | LD1085D2T36             | LD1085D2M36               | 3.6V           |
| LD1085V50  | LD1085D2T50             | LD1085D2M50               | 5V             |
| LD1085V80  | LD1085D2T80             | LD1085D2M80               | 8V             |
| LD1085V90  | LD1085D2T90             | LD1085D2M90               | 9V             |
| LD1085V120 | LD1085D2T120            | LD1085D2M120              | 12V            |
| LD1085V    | LD1085D2T               | LD1085D2M                 | 1.25 to 28V    |

(\*\*) Available in Tape & Reel with the suffix "R" for fixed version and "-R" for adjustable version.

**ELECTRICAL CHARACTERISTICS FOR LD1086#18** (refer to the test circuits,  
 $T_j = -40$  to  $125$  °C,  $V_{IN} = 4.8$  V,  $C_{IN} = C_O = 10$   $\mu$ F unless otherwise specified)

| Symbol       | Parameter                | Test Conditions  | Min.  | Typ.  | Max.  | Unit |
|--------------|--------------------------|--|-------|-------|-------|------|
| $V_O$        | Output Voltage           | $I_O = 0$ mA $T_j = 25$ °C   | 1.782 | 1.8   | 1.818 | V    |
| $V_O$        | Output Voltage (Note 1)  | $I_O = 0$ to 3 A $V_{IN} = 3.4$ to 30 V                            | 1.764 | 1.8   | 1.836 | V    |
| $\Delta V_O$ | Line Regulation          | $V_{IN} = 3.4$ to 18 V $I_O = 0$ mA $T_j = 25$ °C                  |       | 0.2   | 4     | mV   |
| $\Delta V_O$ | Line Regulation          | $V_{IN} = 3.4$ to 18 V $I_O = 0$ mA                                |       | 0.4   | 4     | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A $T_j = 25$ °C                                     |       | 2     | 10    | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A   |       | 4     | 20    | mV   |
| $V_d$        | Dropout Voltage          | $I_O = 3$ A  |       | 1.3   | 1.5   | V    |
| $I_d$        | Quiescent Current        | $V_{IN} \leq 30$ V   |       | 5     | 10    | mA   |
| $I_{sc}$     | Short Circuit Current    | $V_{IN} - V_O = 5$ V   | 3.2   | 4.5   |       | A    |
|              |                          | $V_{IN} - V_O = 25$ V  | 0.2   | 0.5   |       |      |
|              | Thermal Regulation       | $T_a = 25$ °C 30ms Pulse   |       | 0.008 | 0.04  | %/W  |
| SVR          | Supply Voltage Rejection | $I_O = 3$ A $f = 120$ Hz $C_O = 25\mu$ F<br>$V_{IN} = 5.3 \pm 1$ V | 60    | 75    |       | dB   |
| eN           | Output Noise Voltage     | $B = 10$ Hz to 10KHz $T_a = 25$ °C                                 |       | 0.003 |       | %    |
| S            | Temperature Stability    |  |       | 0.5   |       | %    |
| S            | Long Term Stability      | 1000 hrs $T_a = 125$ °C  |       | 0.5   |       | %    |

Note1: See short-circuit curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS FOR LD1085#25** (refer to the test circuits,  
 $T_j = -40$  to  $125$  °C,  $V_{IN} = 5.5$  V,  $C_{IN} = C_O = 10$   $\mu$ F unless otherwise specified)

| Symbol       | Parameter                | Test Conditions  | Min.  | Typ.  | Max.  | Unit |
|--------------|--------------------------|--|-------|-------|-------|------|
| $V_O$        | Output Voltage           | $I_O = 0$ mA $T_j = 25$ °C   | 2.475 | 2.5   | 2.525 | V    |
| $V_O$        | Output Voltage (Note 1)  | $I_O = 0$ to 3 A $V_{in} = 4.1$ to 30 V                            | 2.45  | 2.5   | 2.55  | V    |
| $\Delta V_O$ | Line Regulation          | $V_{in} = 4.1$ to 18 V $I_O = 0$ mA $T_j = 25$ °C                  |       | 0.2   | 5     | mV   |
| $\Delta V_O$ | Line Regulation          | $V_{in} = 4.1$ to 18 V $I_O = 0$ mA                                |       | 0.4   | 5     | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A $T_j = 25$ °C                                     |       | 2     | 10    | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A   |       | 4     | 20    | mV   |
| $V_d$        | Dropout Voltage          | $I_O = 3$ A  |       | 1.3   | 1.5   | V    |
| $I_d$        | Quiescent Current        | $V_{in} \leq 30$ V   |       | 5     | 10    | mA   |
| $I_{sc}$     | Short Circuit Current    | $V_{IN} - V_O = 5$ V   | 3.2   | 4.5   |       | A    |
|              |                          | $V_{IN} - V_O = 25$ V  | 0.2   | 0.5   |       |      |
|              | Thermal Regulation       | $T_a = 25$ °C 30ms Pulse   |       | 0.008 | 0.04  | %/W  |
| SVR          | Supply Voltage Rejection | $I_O = 3$ A $f = 120$ Hz $C_O = 25\mu$ F<br>$V_{in} = 7.5 \pm 3$ V | 60    | 72    |       | dB   |
| eN           | Output Noise Voltage     | $B = 10$ Hz to 10KHz $T_a = 25$ °C                                 |       | 0.003 |       | %    |
| S            | Temperature Stability    |  |       | 0.5   |       | %    |
| S            | Long Term Stability      | 1000 hrs $T_a = 125$ °C  |       | 0.5   |       | %    |

Note1: See short-circuit curve for available output current at fixed dropout.

## LD1085 SERIES

**ELECTRICAL CHARACTERISTICS FOR LD1085#285** (refer to the test circuits,  
 $T_j = -40$  to  $125$  °C,  $V_{IN} = 5.85$  V,  $C_{IN} = C_O = 10$   $\mu$ F unless otherwise specified)

| Symbol       | Parameter                | Test Conditions   | Min.  | Typ.  | Max.  | Unit |
|--------------|--------------------------|---|-------|-------|-------|------|
| $V_O$        | Output Voltage           | $I_O = 0$ mA $T_j = 25$ °C  | 2.821 | 2.85  | 2.879 | V    |
| $V_O$        | Output Voltage (Note 1)  | $I_O = 0$ to 3 A $V_{IN} = 4.5$ to 30 V                             | 2.793 | 2.85  | 2.907 | V    |
| $\Delta V_O$ | Line Regulation          | $V_{IN} = 4.5$ to 18 V $I_O = 0$ mA $T_j = 25$ °C                   |       | 0.2   | 6     | mV   |
| $\Delta V_O$ | Line Regulation          | $V_{IN} = 4.5$ to 18 V $I_O = 0$ mA                                 |       | 0.5   | 6     | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A $T_j = 25$ °C                                      |       | 3     | 15    | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A  |       | 7     | 20    | mV   |
| $V_d$        | Dropout Voltage          | $I_O = 3$ A   |       | 1.3   | 1.5   | V    |
| $I_d$        | Quiescent Current        | $V_{IN} \leq 30$ V  |       | 5     | 10    | mA   |
| $I_{SC}$     | Short Circuit Current    | $V_{IN} - V_O = 5$ V  | 3.2   | 4.5   |       | A    |
|              |                          | $V_{IN} - V_O = 25$ V   | 0.2   | 0.5   |       |      |
|              | Thermal Regulation       | $T_a = 25$ °C 30ms Pulse  |       | 0.008 | 0.04  | %/W  |
| SVR          | Supply Voltage Rejection | $I_O = 3$ A $f = 120$ Hz $C_O = 25\mu$ F<br>$V_{IN} = 7.85 \pm 3$ V | 60    | 72    |       | dB   |
| eN           | Output Noise Voltage     | $B = 10$ Hz to 10KHz $T_a = 25$ °C                                  |       | 0.003 |       | %    |
| S            | Temperature Stability    |   |       | 0.5   |       | %    |
| S            | Long Term Stability      | 1000 hrs $T_a = 125$ °C   |       | 0.5   |       | %    |

Note1: See short-circuit curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS FOR LD1085#33** (refer to the test circuits,  
 $T_j = -40$  to  $125$  °C,  $V_{IN} = 6.3$  V,  $C_{IN} = C_O = 10$   $\mu$ F unless otherwise specified)

| Symbol       | Parameter                | Test Conditions  | Min.  | Typ.  | Max.  | Unit |
|--------------|--------------------------|--|-------|-------|-------|------|
| $V_O$        | Output Voltage           | $I_O = 0$ mA $T_j = 25$ °C   | 3.267 | 3.3   | 3.333 | V    |
| $V_O$        | Output Voltage (Note 1)  | $I_O = 0$ to 3 A $V_{IN} = 4.9$ to 30 V                            | 3.234 | 3.3   | 3.366 | V    |
| $\Delta V_O$ | Line Regulation          | $V_{IN} = 4.9$ to 18 V $I_O = 0$ mA $T_j = 25$ °C                  |       | 0.5   | 6     | mV   |
| $\Delta V_O$ | Line Regulation          | $V_{IN} = 4.9$ to 18 V $I_O = 0$ mA                                |       | 1     | 6     | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A $T_j = 25$ °C                                     |       | 3     | 15    | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A   |       | 7     | 20    | mV   |
| $V_d$        | Dropout Voltage          | $I_O = 3$ A  |       | 1.3   | 1.5   | V    |
| $I_d$        | Quiescent Current        | $V_{IN} \leq 30$ V   |       | 5     | 10    | mA   |
| $I_{SC}$     | Short Circuit Current    | $V_{IN} - V_O = 5$ V   | 3.2   | 4.5   |       | A    |
|              |                          | $V_{IN} - V_O = 25$ V  | 0.2   | 0.5   |       |      |
|              | Thermal Regulation       | $T_a = 25$ °C 30ms Pulse   |       | 0.008 | 0.04  | %/W  |
| SVR          | Supply Voltage Rejection | $I_O = 3$ A $f = 120$ Hz $C_O = 25\mu$ F<br>$V_{IN} = 8.3 \pm 3$ V | 60    | 72    |       | dB   |
| eN           | Output Noise Voltage     | $B = 10$ Hz to 10KHz $T_a = 25$ °C                                 |       | 0.003 |       | %    |
| S            | Temperature Stability    |  |       | 0.5   |       | %    |
| S            | Long Term Stability      | 1000 hrs $T_a = 125$ °C  |       | 0.5   |       | %    |

Note1: See short-circuit curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS FOR LD1085#36** (refer to the test circuits,  
 $T_j = -40$  to  $125$  °C,  $V_{IN} = 5.85$  V,  $C_{IN} = C_O = 10$   $\mu$ F unless otherwise specified)

| Symbol       | Parameter                | Test Conditions   | Min.  | Typ.  | Max.  | Unit |
|--------------|--------------------------|---|-------|-------|-------|------|
| $V_O$        | Output Voltage           | $I_O = 0$ mA $T_j = 25$ °C  | 3.564 | 3.6   | 3.636 | V    |
| $V_O$        | Output Voltage (Note 1)  | $I_O = 0$ to 3 A $V_{IN} = 5.2$ to 30 V                               | 3.528 | 3.6   | 3.672 | V    |
| $\Delta V_O$ | Line Regulation          | $V_{IN} = 5.2$ to 18 V $I_O = 0$ mA $T_j = 25$ °C                     |       | 0.5   | 10    | mV   |
| $\Delta V_O$ | Line Regulation          | $V_{IN} = 5.2$ to 18 V $I_O = 0$ mA                                   |       | 1     | 10    | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A $T_j = 25$ °C  |       | 3     | 15    | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A  |       | 7     | 20    | mV   |
| $V_d$        | Dropout Voltage          | $I_O = 3$ A   |       | 1.3   | 1.5   | V    |
| $I_d$        | Quiescent Current        | $V_{IN} \leq 30$ V  |       | 5     | 10    | mA   |
| $I_{SC}$     | Short Circuit Current    | $V_{IN} - V_O = 5$ V  | 3.2   | 4.5   |       | A    |
|              |                          | $V_{IN} - V_O = 25$ V   | 0.2   | 0.5   |       |      |
|              | Thermal Regulation       | $T_a = 25$ °C 30ms Pulse  |       | 0.008 | 0.04  | %/W  |
| SVR          | Supply Voltage Rejection | $I_O = 3$ A $f = 120$ Hz $C_O = 25$ $\mu$ F<br>$V_{IN} = 8.6 \pm 3$ V | 60    | 72    |       | dB   |
| eN           | Output Noise Voltage     | $B = 10$ Hz to 10KHz $T_a = 25$ °C                                    |       | 0.003 |       | %    |
| S            | Temperature Stability    |   |       | 0.5   |       | %    |
| S            | Long Term Stability      | 1000 hrs $T_a = 125$ °C   |       | 0.5   |       | %    |

Note1: See short-circuit curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS FOR LD1085#50** (refer to the test circuits,  
 $T_j = -40$  to  $125$  °C,  $V_{IN} = 8$  V,  $C_{IN} = C_O = 10$   $\mu$ F unless otherwise specified)

| Symbol       | Parameter                | Test Conditions  | Min. | Typ.  | Max. | Unit |
|--------------|--------------------------|--|------|-------|------|------|
| $V_O$        | Output Voltage           | $I_O = 0$ mA $T_j = 25$ °C   | 4.95 | 5     | 5.05 | V    |
| $V_O$        | Output Voltage (Note 1)  | $I_O = 0$ to 3 A $V_{IN} = 6.6$ to 30 V                              | 4.9  | 5     | 5.1  | V    |
| $\Delta V_O$ | Line Regulation          | $V_{IN} = 6.6$ to 20 V $I_O = 0$ mA $T_j = 25$ °C                    |      | 0.5   | 10   | mV   |
| $\Delta V_O$ | Line Regulation          | $V_{IN} = 6.6$ to 20 V $I_O = 0$ mA                                  |      | 1     | 10   | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A $T_j = 25$ °C                                       |      | 5     | 20   | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A   |      | 10    | 35   | mV   |
| $V_d$        | Dropout Voltage          | $I_O = 3$ A  |      | 1.3   | 1.5  | V    |
| $I_d$        | Quiescent Current        | $V_{IN} \leq 30$ V   |      | 5     | 10   | mA   |
| $I_{SC}$     | Short Circuit Current    | $V_{IN} - V_O = 5$ V   | 3.2  | 4.5   |      | A    |
|              |                          | $V_{IN} - V_O = 25$ V  | 0.2  | 0.5   |      |      |
|              | Thermal Regulation       | $T_a = 25$ °C 30ms Pulse   |      | 0.008 | 0.04 | %/W  |
| SVR          | Supply Voltage Rejection | $I_O = 3$ A $f = 120$ Hz $C_O = 25$ $\mu$ F<br>$V_{IN} = 10 \pm 3$ V | 60   | 72    |      | dB   |
| eN           | Output Noise Voltage     | $B = 10$ Hz to 10KHz $T_a = 25$ °C                                   |      | 0.003 |      | %    |
| S            | Temperature Stability    |  |      | 0.5   |      | %    |
| S            | Long Term Stability      | 1000 hrs $T_a = 125$ °C  |      | 0.5   |      | %    |

Note1: See short-circuit curve for available output current at fixed dropout.

## LD1085 SERIES

**ELECTRICAL CHARACTERISTICS FOR LD1085#80** (refer to the test circuits,  
 $T_j = -40$  to  $125$  °C,  $V_{IN} = 11$  V,  $C_{IN} = C_O = 10$   $\mu$ F unless otherwise specified)

| Symbol       | Parameter                | Test Conditions  | Min. | Typ.  | Max. | Unit |
|--------------|--------------------------|--|------|-------|------|------|
| $V_O$        | Output Voltage           | $I_O = 0$ mA $T_j = 25$ °C   | 7.92 | 8     | 8.08 | V    |
| $V_O$        | Output Voltage (Note 1)  | $I_O = 0$ to 3 A $V_{IN} = 9.8$ to 30 V                              | 7.84 | 8     | 8.16 | V    |
| $\Delta V_O$ | Line Regulation          | $V_{IN} = 9.8$ to 20 V $I_O = 0$ mA $T_j = 25$ °C                    |      | 1     | 18   | mV   |
| $\Delta V_O$ | LINE Regulation          | $V_{IN} = 9.8$ to 20 V $I_O = 0$ mA                                  |      | 2     | 18   | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A $T_j = 25$ °C                                       |      | 8     | 30   | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A   |      | 12    | 60   | mV   |
| $V_d$        | Dropout Voltage          | $I_O = 3$ A  |      | 1.3   | 1.5  | V    |
| $I_d$        | Quiescent Current        | $V_{IN} \leq 30$ V   |      | 5     | 10   | mA   |
| $I_{SC}$     | Short Circuit Current    | $V_{IN} - V_O = 5$ V   | 3.2  | 4.5   |      | A    |
|              |                          | $V_{IN} - V_O = 25$ V  | 0.2  | 0.5   |      |      |
|              | Thermal Regulation       | $T_a = 25$ °C 30ms Pulse   |      | 0.008 | 0.04 | %/W  |
| SVR          | Supply Voltage Rejection | $I_O = 3$ A $f = 120$ Hz $C_O = 25$ $\mu$ F<br>$V_{IN} = 13 \pm 3$ V | 54   | 71    |      | dB   |
| eN           | Output Noise Voltage     | $B = 10$ Hz to 10KHz $T_a = 25$ °C                                   |      | 0.003 |      | %    |
| S            | Temperature Stability    |  |      | 0.5   |      | %    |
| S            | Long Term Stability      | 1000 hrs $T_a = 125$ °C  |      | 0.5   |      | %    |

Note1: See short-circuit curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS FOR LD1085#90** (refer to the test circuits,  
 $T_j = -40$  to  $125$  °C,  $V_{IN} = 12$  V,  $C_{IN} = C_O = 10$   $\mu$ F unless otherwise specified)

| Symbol       | Parameter                | Test Conditions  | Min. | Typ.  | Max. | Unit |
|--------------|--------------------------|--|------|-------|------|------|
| $V_O$        | Output Voltage           | $I_O = 0$ mA $T_j = 25$ °C   | 8.91 | 9     | 9.09 | V    |
| $V_O$        | Output Voltage (Note 1)  | $I_O = 0$ to 3 A $V_{IN} = 11$ to 30 V                               | 8.82 | 9     | 9.18 | V    |
| $\Delta V_O$ | Line Regulation          | $V_{IN} = 11$ to 20 V $I_O = 0$ mA $T_j = 25$ °C                     |      | 1     | 20   | mV   |
| $\Delta V_O$ | Line Regulation          | $V_{IN} = 11$ to 20 V $I_O = 0$ mA                                   |      | 2     | 20   | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A $T_j = 25$ °C                                       |      | 8     | 30   | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A   |      | 12    | 60   | mV   |
| $V_d$        | Dropout Voltage          | $I_O = 3$ A  |      | 1.3   | 1.5  | V    |
| $I_d$        | Quiescent Current        | $V_{IN} \leq 30$ V   |      | 5     | 10   | mA   |
| $I_{SC}$     | Short Circuit Current    | $V_{IN} - V_O = 5$ V   | 3.2  | 4.5   |      | A    |
|              |                          | $V_{IN} - V_O = 25$ V  | 0.2  | 0.5   |      |      |
|              | Thermal Regulation       | $T_a = 25$ °C 30ms Pulse   |      | 0.008 | 0.04 | %/W  |
| SVR          | Supply Voltage Rejection | $I_O = 3$ A $f = 120$ Hz $C_O = 25$ $\mu$ F<br>$V_{IN} = 14 \pm 3$ V | 54   | 70    |      | dB   |
| eN           | Output Noise Voltage     | $B = 10$ Hz to 10KHz $T_a = 25$ °C                                   |      | 0.003 |      | %    |
| S            | Temperature Stability    |  |      | 0.5   |      | %    |
| S            | Long Term Stability      | 1000 hrs $T_a = 125$ °C  |      | 0.5   |      | %    |

Note1: See short-circuit curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS FOR LD1085#120** (refer to the test circuits,  
 $T_j = -40$  to  $125$  °C,  $V_{IN} = 15$  V,  $C_{IN} = C_O = 10$   $\mu$ F unless otherwise specified)

| Symbol       | Parameter                | Test Conditions  | Min.  | Typ.  | Max.  | Unit |
|--------------|--------------------------|--|-------|-------|-------|------|
| $V_O$        | Output Voltage           | $I_O = 0$ mA $T_j = 25$ °C   | 11.88 | 12    | 12.12 | V    |
| $V_O$        | Output Voltage (Note 1)  | $I_O = 0$ to 3 A $V_{IN} = 13.8$ to 30 V                             | 11.76 | 12    | 12.24 | V    |
| $\Delta V_O$ | Line Regulation          | $V_{IN} = 13.8$ to 25 V $I_O = 0$ mA $T_j = 25$ °C                   |       | 1     | 25    | mV   |
| $\Delta V_O$ | Line Regulation          | $V_{IN} = 13.8$ to 25 V $I_O = 0$ mA                                 |       | 2     | 25    | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A $T_j = 25$ °C                                       |       | 12    | 36    | mV   |
| $\Delta V_O$ | Load Regulation          | $I_O = 0$ to 3 A   |       | 24    | 72    | mV   |
| $V_d$        | Dropout Voltage          | $I_O = 3$ A  |       | 1.3   | 1.5   | V    |
| $I_d$        | Quiescent Current        | $V_{IN} \leq 30$ V   |       | 5     | 10    | mA   |
| $I_{SC}$     | Short Circuit Current    | $V_{IN} - V_O = 5$ V   | 3.2   | 4.5   |       | A    |
|              |                          | $V_{IN} - V_O = 25$ V  | 0.2   | 0.5   |       |      |
|              | Thermal Regulation       | $T_a = 25$ °C 30ms Pulse   |       | 0.008 | 0.04  | %/W  |
| SVR          | Supply Voltage Rejection | $I_O = 3$ A $f = 120$ Hz $C_O = 25$ $\mu$ F<br>$V_{IN} = 17 \pm 3$ V | 54    | 66    |       | dB   |
| eN           | Output Noise Voltage     | $B = 10$ Hz to 10KHz $T_a = 25$ °C                                   |       | 0.003 |       | %    |
| S            | Temperature Stability    |  |       | 0.5   |       | %    |
| S            | Long Term Stability      | 1000 hrs $T_a = 125$ °C  |       | 0.5   |       | %    |

Note1: See short-circuit curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS FOR LD1085** (refer to the test circuits,  
 $T_j = -40$  to  $125$  °C,  $V_{IN} = 4.25$  V,  $C_{IN} = C_O = 10$   $\mu$ F unless otherwise specified)

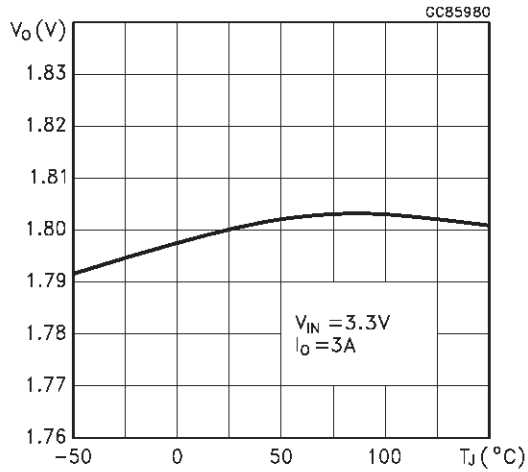
| Symbol           | Parameter                 | Test Conditions   | Min.  | Typ.  | Max.  | Unit    |
|------------------|---------------------------|---|-------|-------|-------|---------|
| $V_O$            | Output Voltage            | $I_O = 10$ mA $T_j = 25$ °C   | 1.237 | 1.25  | 1.263 | V       |
| $V_O$            | Output Voltage (Note 1)   | $I_O = 0.01$ to 3 A $V_{IN} = 2.8$ to 30 V  | 1.225 | 1.25  | 1.275 | V       |
| $\Delta V_O$     | Line Regulation           | $V_{IN} = 2.75$ to 16.5V $I_O = 10$ mA $T_j = 25$ °C  |       | 0.015 | 0.2   | %       |
| $\Delta V_O$     | Line Regulation           | $V_{IN} = 2.75$ to 16.5V $I_O = 10$ mA  |       | 0.035 | 0.2   | %       |
| $\Delta V_O$     | Load Regulation           | $I_O = 0.01$ to 3 A $T_j = 25$ °C   |       | 0.1   | 0.3   | %       |
| $\Delta V_O$     | Load Regulation           | $I_O = 0.01$ to 3 A   |       | 0.2   | 0.4   | %       |
| $V_d$            | Dropout Voltage           | $I_O = 3$ A   |       | 1.3   | 1.5   | V       |
| $I_{O(min)}$     | Minimum Load Current      | $V_{IN} = 30$ V   |       | 3     | 10    | mA      |
| $I_{SC}$         | Short Circuit Current     | $V_{IN} - V_O = 5$ V  | 3.2   | 4.5   |       | A       |
|                  |                           | $V_{IN} - V_O = 25$ V   | 0.2   | 0.5   |       |         |
|                  | Thermal Regulation        | $T_a = 25$ °C 30ms Pulse  |       | 0.01  | 0.04  | %/W     |
| SVR              | Supply Voltage Rejection  | $I_O = 3$ A $f = 120$ Hz $C_O = 25$ $\mu$ F<br>$C_{ADJ} = 25$ $\mu$ F $V_{IN} = 6.25 \pm 3$ V | 60    | 75    |       | dB      |
| $I_{ADJ}$        | Adjust pin Current        | $I_O = 10$ mA $V_{IN} = 4.25$ V   |       | 55    | 120   | $\mu$ A |
| $\Delta I_{ADJ}$ | Adjust pin Current Change | $V_{IN} = 2.75$ to 16.5 V $I_O = 0.01$ to 3A  |       | 0.2   | 5     | $\mu$ A |
| eN               | Output Noise Voltage      | $B = 10$ Hz to 10KHz $T_a = 25$ °C  |       | 0.003 |       | %       |
| S                | Temperature Stability     |   |       | 0.5   |       | %       |
| S                | Long Term Stability       | 1000 hrs $T_a = 125$ °C   |       | 0.5   |       | %       |

Note1: See short-circuit curve for available output current at fixed dropout.

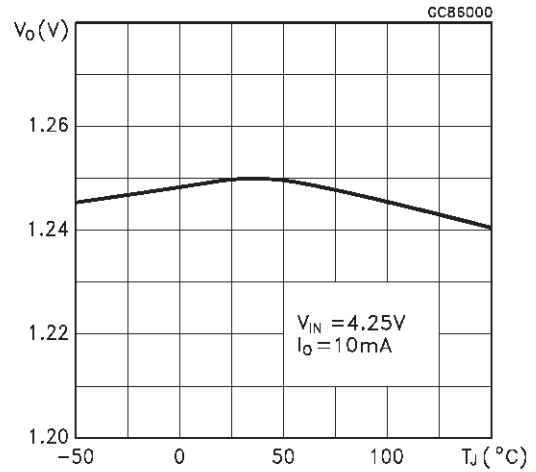
# LD1085 SERIES

**TYPICAL CHARACTERISTICS** (unless otherwise specified  $T_J=125^\circ\text{C}$ ,  $C_{IN}=C_O=10\mu\text{F}$ )

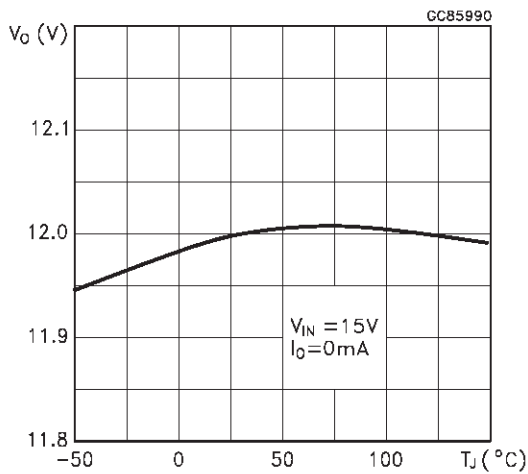
Output Voltage vs Temperature



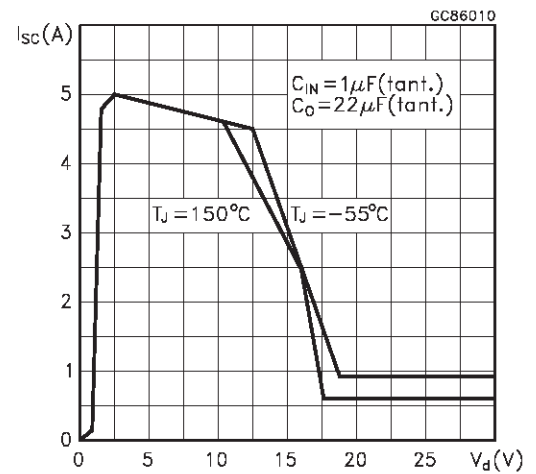
Output Voltage vs Temperature



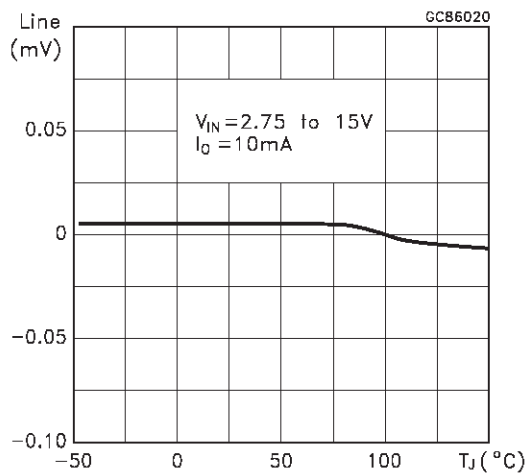
Output Voltage vs Temperature



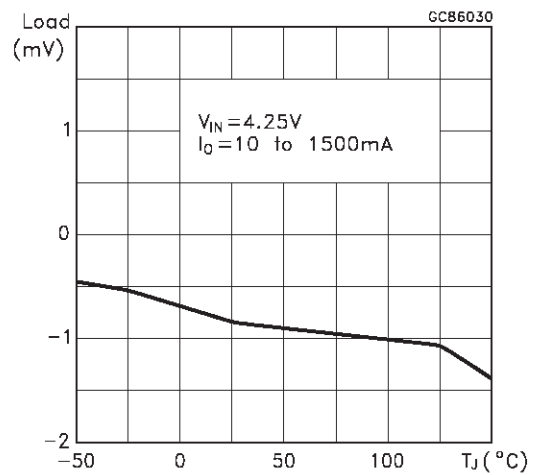
Short Circuit Current vs Dropout Voltage



Line Regulation vs Temperature



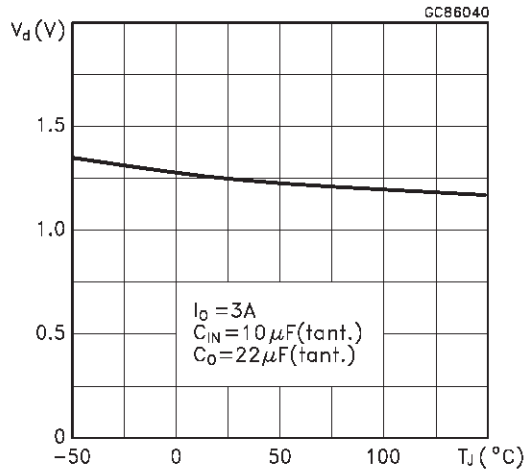
Load Regulation vs Temperature



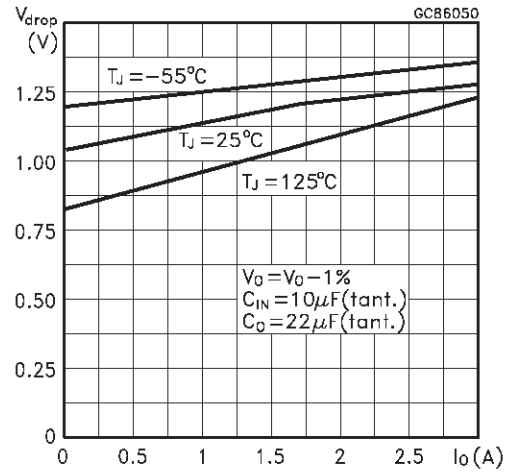


TYPICAL CHARACTERISTICS (Continued)

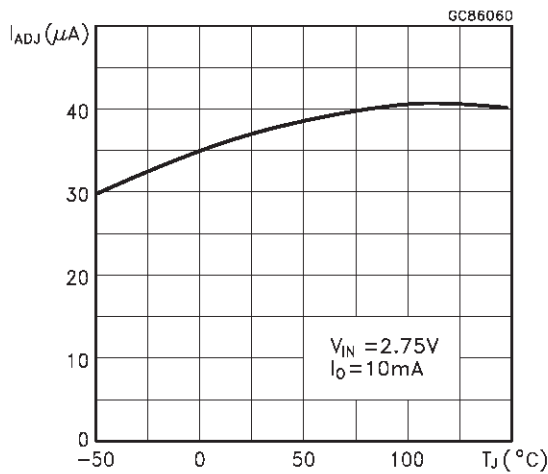
Dropout Voltage vs Temperature



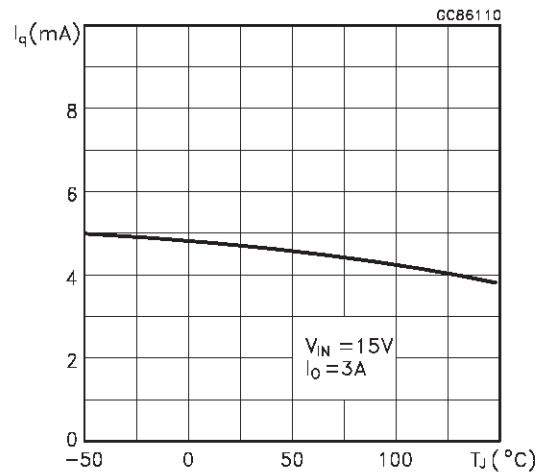
Dropout Voltage vs Output Current



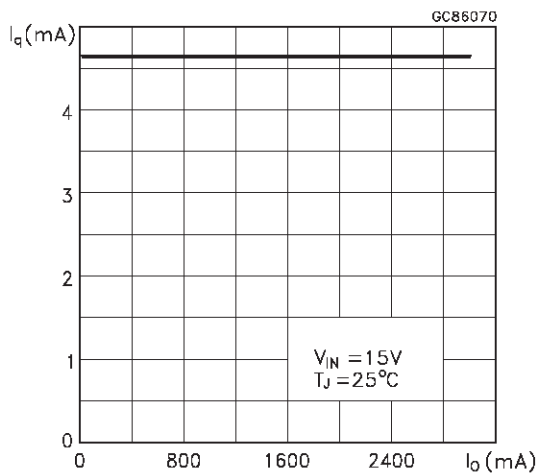
Adjust Pin Current vs Temperature



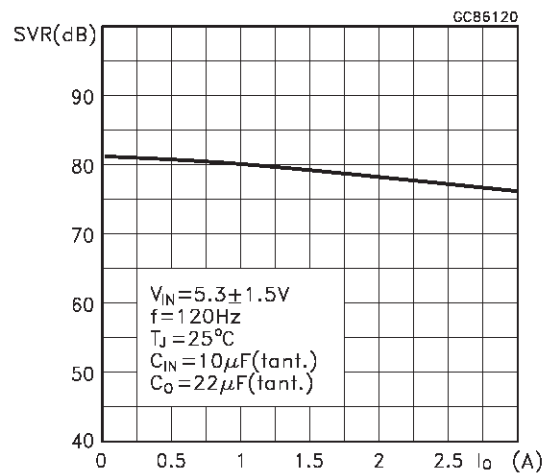
Quiescent Current vs Temperature



Quiescent Current vs Output Current



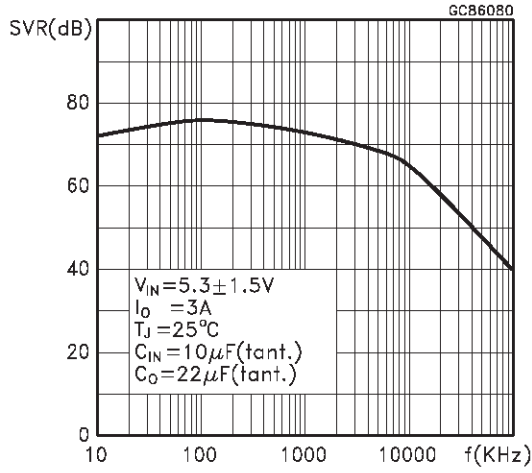
Supply Voltage Rejection vs Output Current



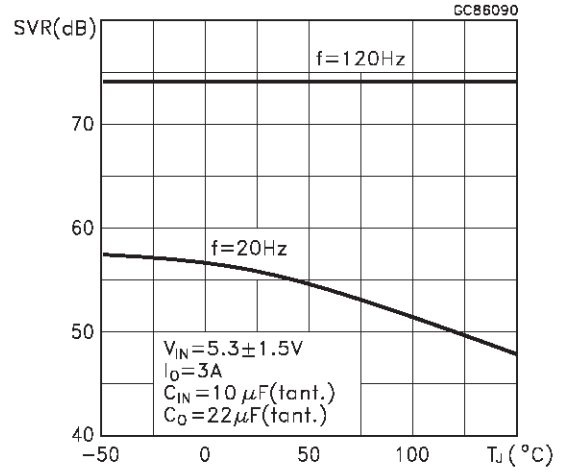
# LD1085 SERIES

## TYPICAL CHARACTERISTICS (Continued)

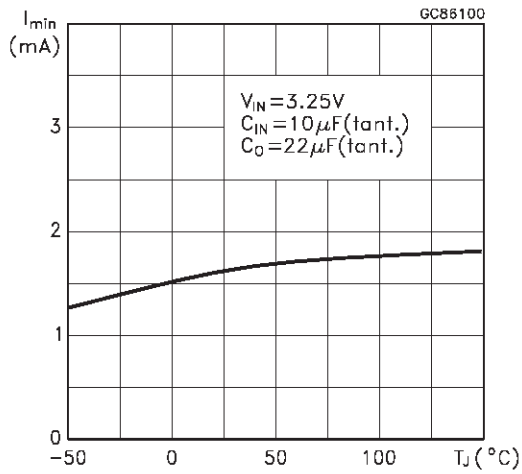
### Supply Voltage Rejection vs Frequency



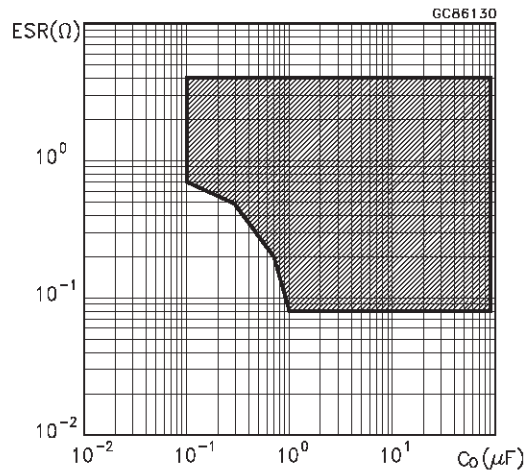
### Supply Voltage Rejection vs Temperature



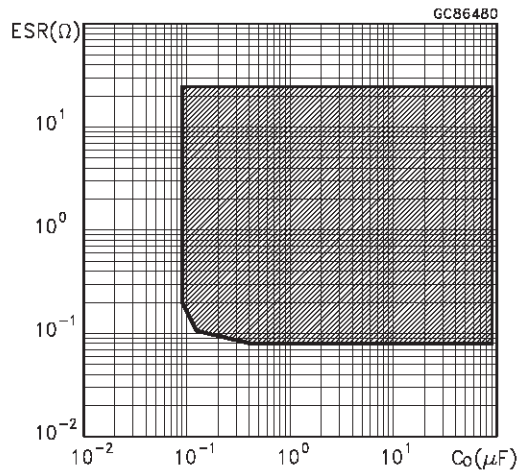
### Minimum Load Current vs Temperature



### Stability

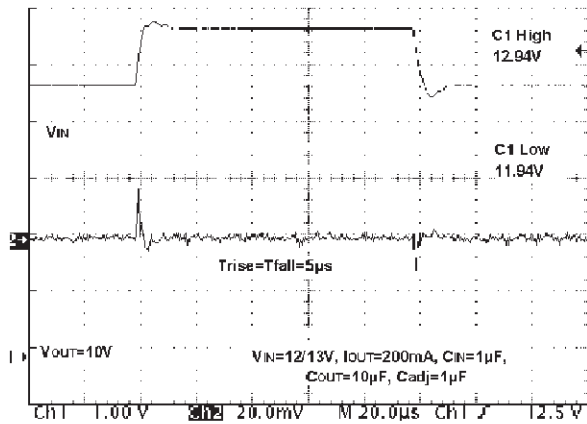


### Stability

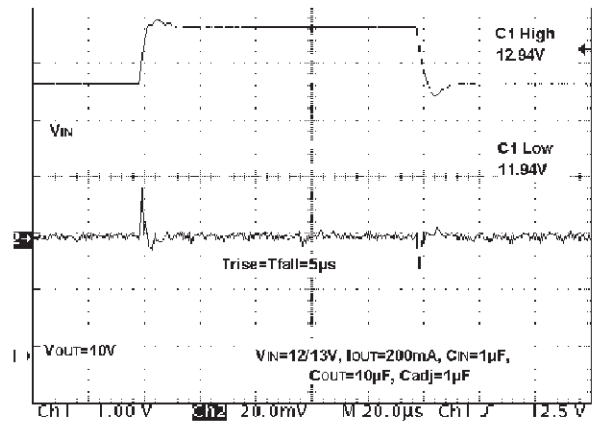


TYPICAL CHARACTERISTICS (Continued)

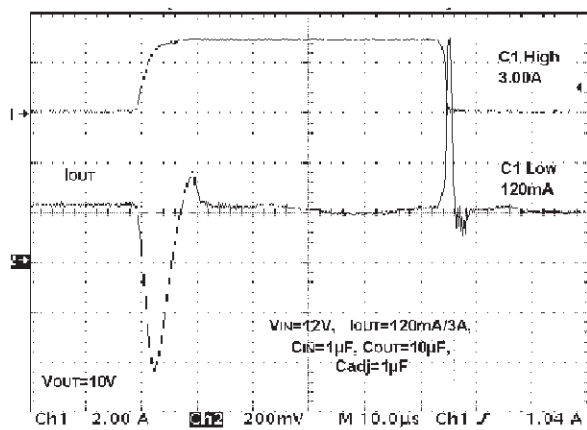
Line Transient



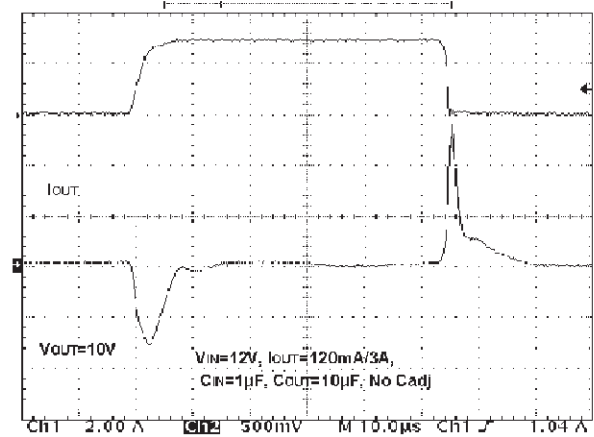
Line Transient



Load Transient

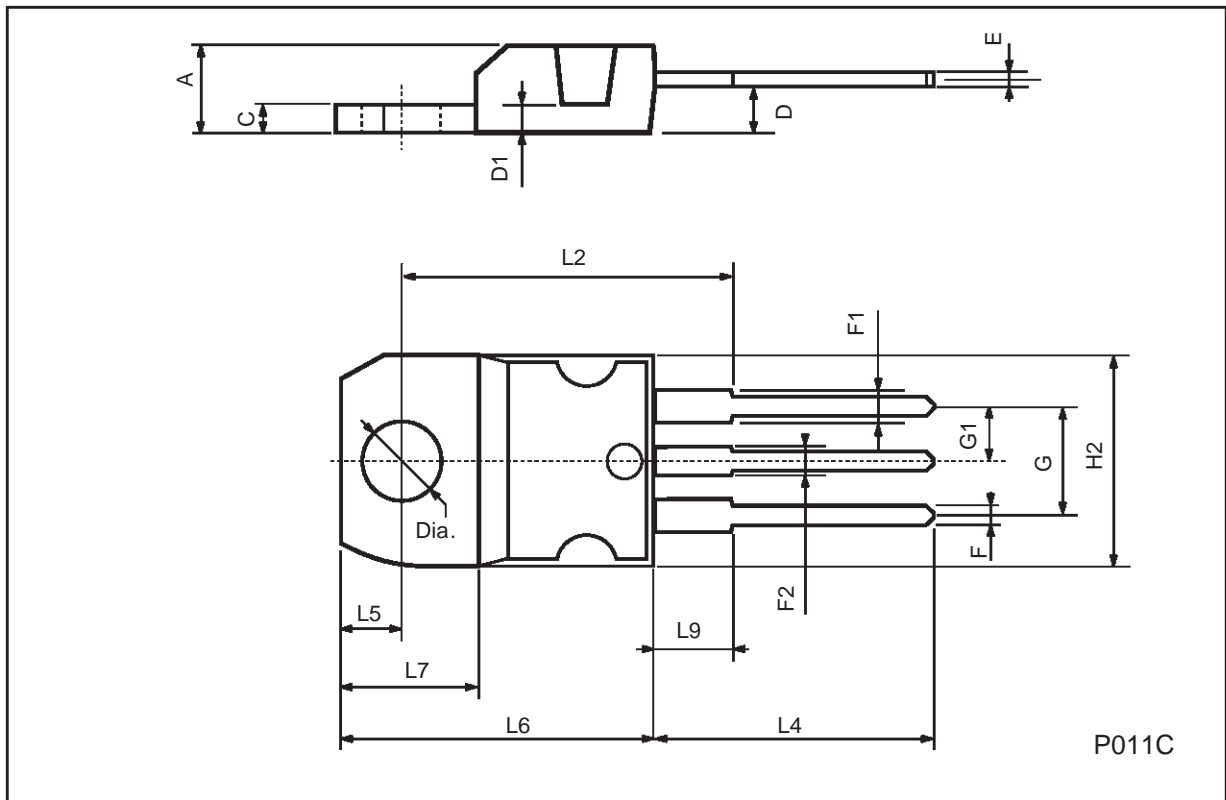


Load Transient



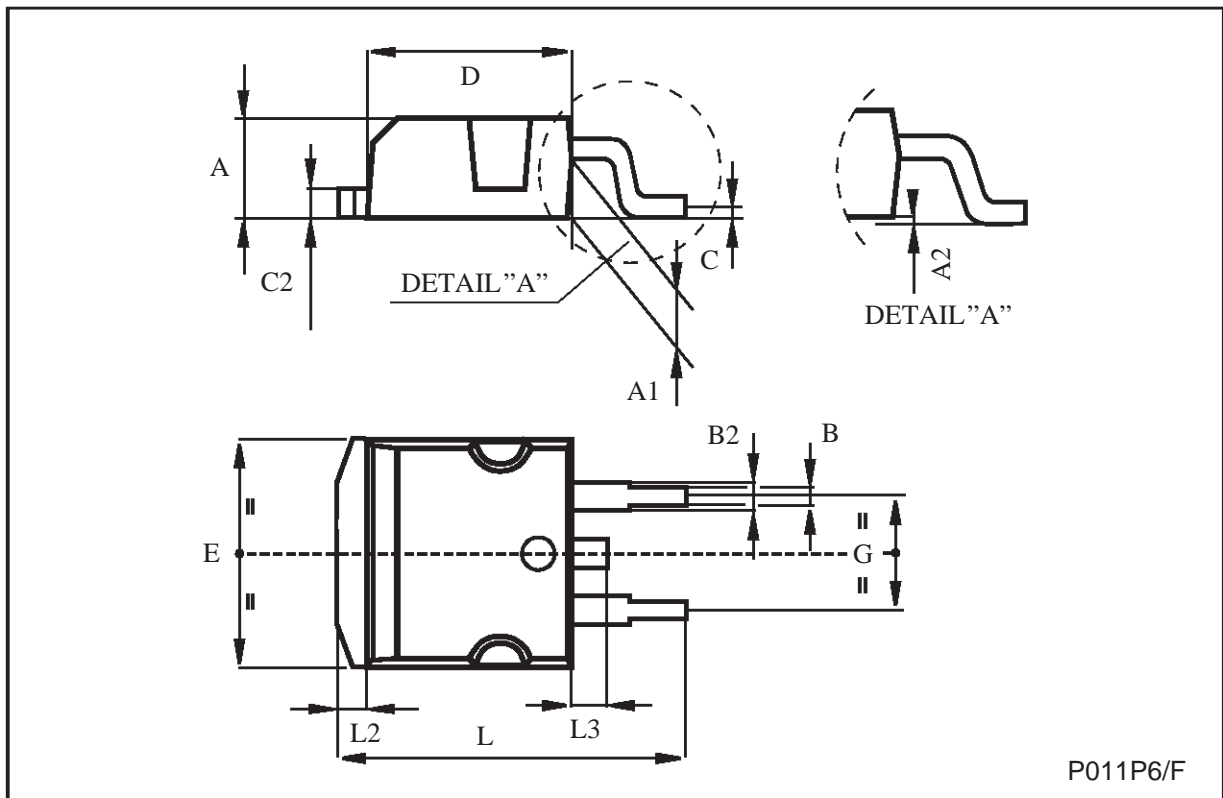
TO-220 MECHANICAL DATA

| 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 |



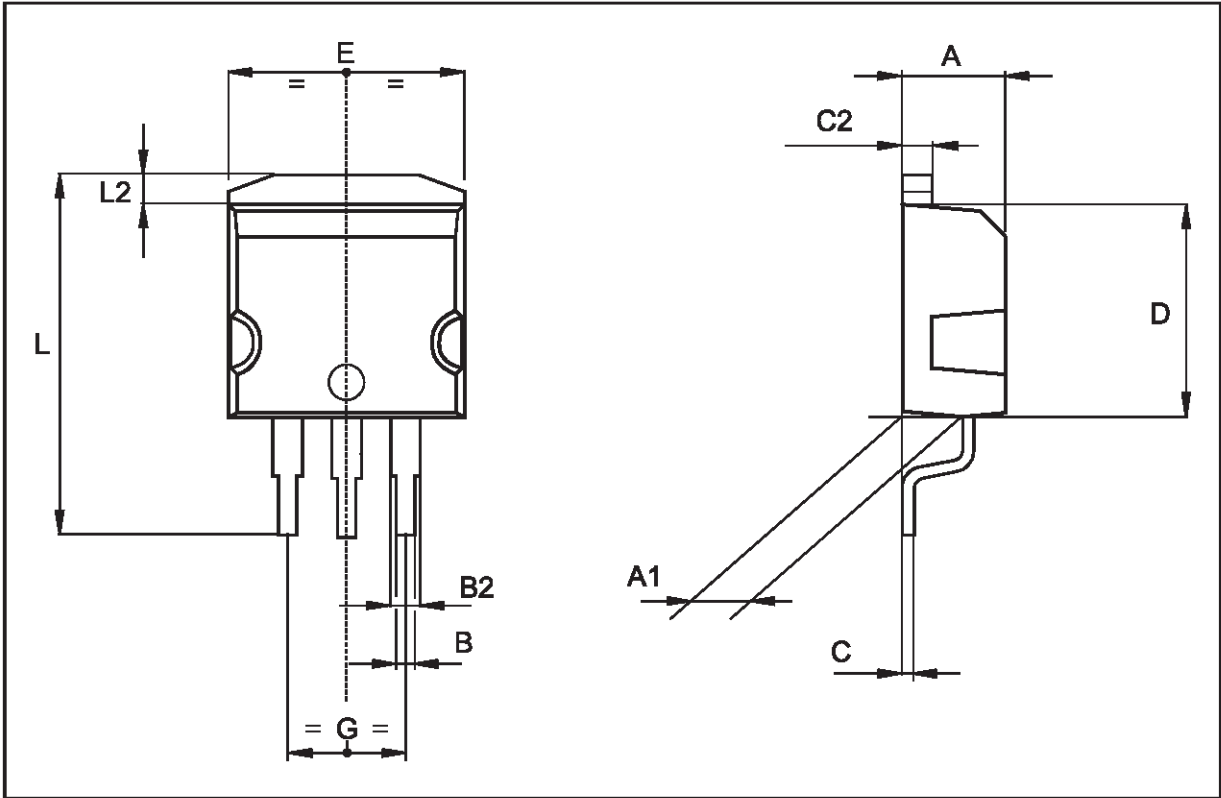
TO-263 (D<sup>2</sup>PAK) MECHANICAL DATA

| DIM. | mm   |      |       | inch  |      |       |
|------|------|------|-------|-------|------|-------|
|      | MIN. | TYP. | MAX.  | MIN.  | TYP. | MAX.  |
| A    | 4.4  |      | 4.6   | 0.173 |      | 0.181 |
| A1   | 2.49 |      | 2.69  | 0.098 |      | 0.106 |
| B    | 0.7  |      | 0.93  | 0.027 |      | 0.036 |
| B2   | 1.14 |      | 1.7   | 0.044 |      | 0.067 |
| C    | 0.45 |      | 0.6   | 0.017 |      | 0.023 |
| C2   | 1.23 |      | 1.36  | 0.048 |      | 0.053 |
| D    | 8.95 |      | 9.35  | 0.352 |      | 0.368 |
| E    | 10   |      | 10.4  | 0.393 |      | 0.409 |
| G    | 4.88 |      | 5.28  | 0.192 |      | 0.208 |
| L    | 15   |      | 15.85 | 0.590 |      | 0.624 |
| L2   | 1.27 |      | 1.4   | 0.050 |      | 0.055 |
| L3   | 1.4  |      | 1.75  | 0.055 |      | 0.068 |



**D<sup>2</sup>PAK/A MECHANICAL DATA**

| DIM. | mm   |      |       | inch  |      |       |
|------|------|------|-------|-------|------|-------|
|      | MIN. | TYP. | MAX.  | MIN.  | TYP. | MAX.  |
| A    | 4.4  |      | 4.6   | 0.173 |      | 0.181 |
| A1   | 2.49 |      | 2.69  | 0.098 |      | 0.106 |
| B    | 0.7  |      | 0.93  | 0.027 |      | 0.036 |
| B2   | 1.14 |      | 1.7   | 0.044 |      | 0.067 |
| C    | 0.45 |      | 0.6   | 0.017 |      | 0.023 |
| C2   | 1.21 |      | 1.36  | 0.047 |      | 0.053 |
| D    | 8.95 |      | 9.35  | 0.352 |      | 0.368 |
| E    | 10   |      | 10.4  | 0.393 |      | 0.409 |
| G    | 4.88 |      | 5.28  | 0.192 |      | 0.208 |
| L    | 15   |      | 15.85 | 0.590 |      | 0.624 |
| L2   | 1.27 |      | 1.4   | 0.050 |      | 0.055 |



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