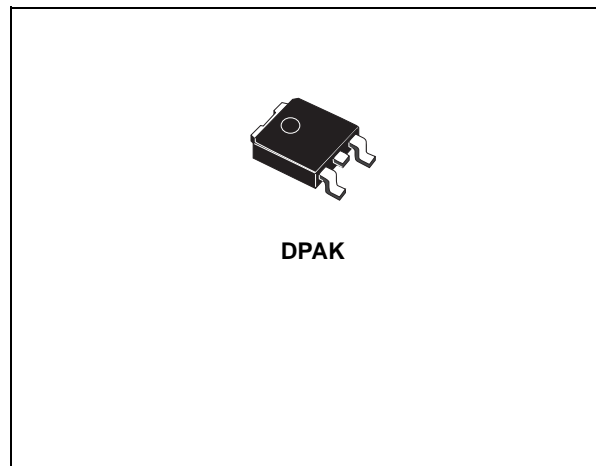




# LD1085C SERIES

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

- TYPICAL DROPOUT 1.3V (AT 3A)
- THREE TERMINAL ADJUSTABLE OR FIXED OUTPUT VOLTAGE 1.5V, 1.8V, 2.5V, 2.85V, 3.3V, 3.6V, 5V, 8V, 9V, 12V.
- GUARANTEED OUTPUT CURRENT UP TO 3A
- OUTPUT TOLERANCE  $\pm 2\%$  AT 25°C AND  $\pm 3\%$  IN FULL TEMPERATURE RANGE
- INTERNAL POWER AND THERMAL LIMIT
- WIDE OPERATING TEMPERATURE RANGE -40°C TO 125°C
- PACKAGE AVAILABLE : DPAK
- PINOUT COMPATIBILITY WITH STANDARD ADJUSTABLE VREG

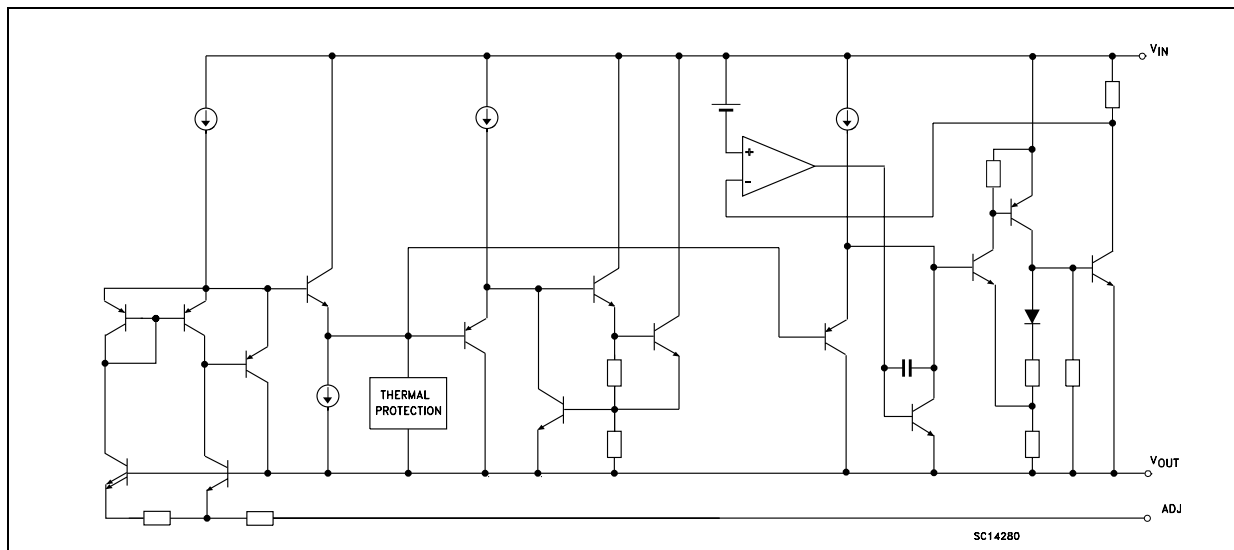


### DESCRIPTION

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 to pin compatible with the 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 flows into the load, so increase efficiency. Only a 10 $\mu$ F minimum capacitor is need for stability. The device is supplied in DPAK. On chip trimming allows the regulator to reach a very tight output voltage tolerance, within  $\pm 2\%$  at 25°C.

### SCHEMATIC DIAGRAM



## LD1085C SERIES

### ABSOLUTE MAXIMUM RATINGS

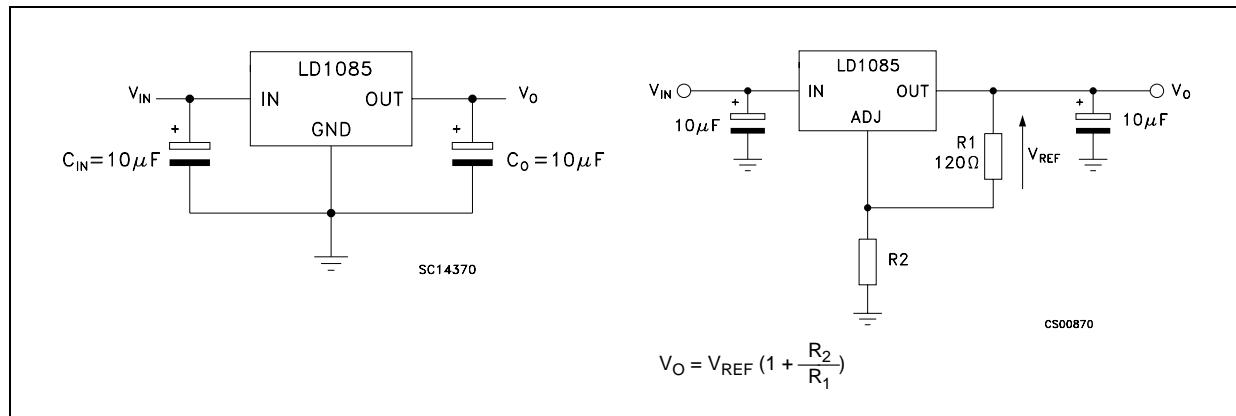
| Symbol    | Parameter <sup>2</sup>               | Value              | Unit |
|-----------|--------------------------------------|--------------------|------|
| $V_I$     | DC Input Voltage                     | 30                 | V    |
| $I_O$     | Output Current                       | Internally Limited | mA   |
| $P_D$     | Power Dissipation                    | Internally Limited | mW   |
| $T_{stg}$ | Storage Temperature Range            | -55 to +150        | °C   |
| $T_{op}$  | Operating Junction Temperature Range | -40 to +125        | °C   |

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

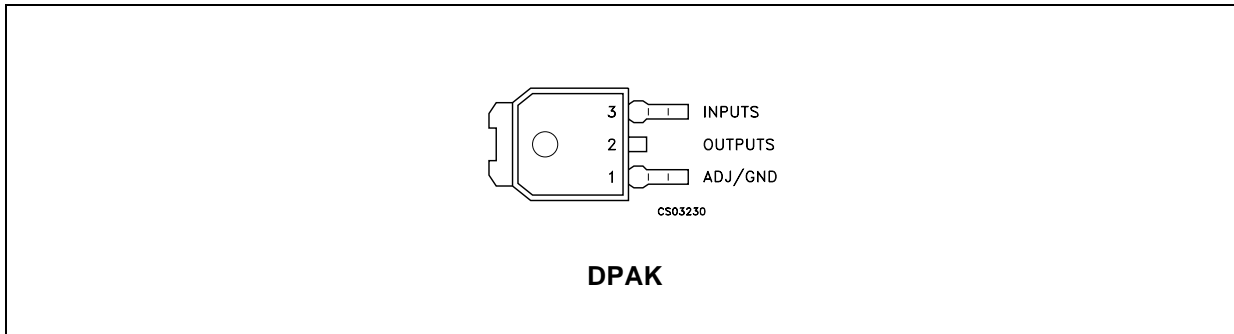
### THERMAL DATA

| Symbol         | Parameter                           | DPAK | Unit |
|----------------|-------------------------------------|------|------|
| $R_{thj-case}$ | Thermal Resistance Junction-case    | 3    | °C/W |
| $R_{thj-amb}$  | Thermal Resistance Junction-ambient | 62.5 | °C/W |

### APPLICATION CIRCUITS



CONNECTION DIAGRAM (top view)



ORDERING CODES

| DPAK (*)     | OUTPUT VOLTAGE |
|--------------|----------------|
| LD1085CDT15  | 1.5 V          |
| LD1085CDT18  | 1.8 V          |
| LD1085CDT25  | 2.5 V          |
| LD1085CDT28  | 2.85 V         |
| LD1085CDT33  | 3.3 V          |
| LD1085CDT36  | 3.6 V          |
| LD1085CDT50  | 5.0 V          |
| LD1085CDT80  | 8.0 V          |
| LD1085CDT90  | 9.0 V          |
| LD1085CDT120 | 12.0 V         |
| LD1085CDT    | ADJ            |

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

## LD1085C SERIES

**ELECTRICAL CHARACTERISTICS OF LD1085CDT15** ( $V_I=4.5V$ ,  $C_I = C_O = 10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                              | Test Conditions   | Min.  | Typ.  | Max.  | Unit |
|--------------|--|---|-------|-------|-------|------|
| $V_O$        | Output Voltage                         | $I_O = 0$ mA $T_J = 25^\circ C$                                     | 1.47  | 1.5   | 1.53  | V    |
|              |  | $I_O = 0$ to 3A $V_I = 3.1$ to 30V (note 1)                         | 1.455 | 1.5   | 1.545 | V    |
| $\Delta V_O$ | Line Regulation                        | $I_O = 0$ mA $V_I = 3.1$ to 18V $T_J = 25^\circ C$                  |       | 0.2   | 4     | mV   |
|              |  | $I_O = 0$ mA $V_I = 3.1$ to 15V                                     |       | 0.4   | 4     | mV   |
| $\Delta V_O$ | Load Regulation                        | $I_O = 0$ to 3A $T_J = 25^\circ C$                                  |       | 2     | 10    | mV   |
|              |  | $I_O = 0$ to 3A   |       | 4     | 20    | V    |
| $V_d$        | Dropout Voltage                        | $I_O = 3$ A   |       | 1.3   | 1.5   | V    |
| $I_q$        | Quiescent Current                      | $V_I \leq 30V$  |       | 5     | 10    | mA   |
| $I_{sc}$     | Short Circuit Current                  | $V_I - V_O = 5V$  | 3.2   | 4.5   |       | A    |
|              |  | $V_I - V_O = 25V$   | 0.2   | 0.5   |       | A    |
|              | Thermal Regulation                     | $T_A = 25^\circ C$ , 30ms pulse                                     |       | 0.003 | 0.015 | %/W  |
| SVR          | Supply Voltage Rejection               | $f = 120$ Hz, $C_O = 25$ $\mu F$ , $I_O = 3A$<br>$V_I = 7.5 \pm 3V$ | 60    | 75    |       | dB   |
| eN           | RMS Output Noise Voltage (% of $V_O$ ) | $T_A = 25^\circ C$ $f = 10$ Hz to 10KHz                             |       | 0.003 |       | %    |
| S            | Temperature Stability                  |   |       | 0.5   |       | %    |
| S            | Long Term Stability                    | $T_A = 125^\circ C$ 1000Hrs   |       | 0.5   |       | %    |

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS OF LD1085CDT18** ( $V_I=4.8V$ ,  $C_I = C_O = 10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                              | Test Conditions   | Min.  | Typ.  | Max.  | Unit |
|--------------|--|---|-------|-------|-------|------|
| $V_O$        | Output Voltage                         | $I_O = 0$ mA $T_J = 25^\circ C$                                     | 1.764 | 1.8   | 1.836 | V    |
|              |  | $I_O = 0$ to 3A $V_I = 3.4$ to 30V (note 1)                         | 1.746 | 1.8   | 1.854 | V    |
| $\Delta V_O$ | Line Regulation                        | $I_O = 0$ mA $V_I = 3.4$ to 18V $T_J = 25^\circ C$                  |       | 0.2   | 4     | mV   |
|              |  | $I_O = 0$ mA $V_I = 3.4$ to 15V                                     |       | 0.4   | 4     | mV   |
| $\Delta V_O$ | Load Regulation                        | $I_O = 0$ to 3A $T_J = 25^\circ C$                                  |       | 2     | 10    | mV   |
|              |  | $I_O = 0$ to 3A   |       | 4     | 20    | V    |
| $V_d$        | Dropout Voltage                        | $I_O = 3$ A   |       | 1.3   | 1.5   | V    |
| $I_q$        | Quiescent Current                      | $V_I \leq 30V$  |       | 5     | 10    | mA   |
| $I_{sc}$     | Short Circuit Current                  | $V_I - V_O = 5V$  | 3.2   | 4.5   |       | A    |
|              |  | $V_I - V_O = 25V$   | 0.2   | 0.5   |       | A    |
|              | Thermal Regulation                     | $T_A = 25^\circ C$ , 30ms pulse                                     |       | 0.003 | 0.015 | %/W  |
| SVR          | Supply Voltage Rejection               | $f = 120$ Hz, $C_O = 25$ $\mu F$ , $I_O = 3A$<br>$V_I = 7.5 \pm 3V$ | 60    | 75    |       | dB   |
| eN           | RMS Output Noise Voltage (% of $V_O$ ) | $T_A = 25^\circ C$ $f = 10$ Hz to 10KHz                             |       | 0.003 |       | %    |
| S            | Temperature Stability                  |   |       | 0.5   |       | %    |
| S            | Long Term Stability                    | $T_A = 125^\circ C$ 1000Hrs   |       | 0.5   |       | %    |

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS OF LD1085CDT25** ( $V_I=5.5V$ ,  $C_I = C_O = 10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                              | Test Conditions   | Min.  | Typ.  | Max.  | Unit |
|--------------|--|---|-------|-------|-------|------|
| $V_O$        | Output Voltage                         | $I_O = 0$ mA $T_J = 25^\circ C$                                   | 2.45  | 2.5   | 2.55  | V    |
|              |  | $I_O = 0$ to 3A $V_I = 4.1$ to 30V (note 1)                       | 2.425 | 2.5   | 2.575 | V    |
| $\Delta V_O$ | Line Regulation                        | $I_O = 0$ mA $V_I = 4.1$ to 18V $T_J = 25^\circ C$                |       | 0.2   | 5     | mV   |
|              |  | $I_O = 0$ mA $V_I = 4.1$ to 18V                                   |       | 0.4   | 5     | mV   |
| $\Delta V_O$ | Load Regulation                        | $I_O = 0$ to 3A $T_J = 25^\circ C$                                |       | 2     | 10    | mV   |
|              |  | $I_O = 0$ to 3A   |       | 4     | 20    | V    |
| $V_d$        | Dropout Voltage                        | $I_O = 3$ A   |       | 1.3   | 1.5   | V    |
| $I_q$        | Quiescent Current                      | $V_I \leq 30V$  |       | 5     | 10    | mA   |
| $I_{sc}$     | Short Circuit Current                  | $V_I - V_O = 5V$  | 3.2   | 4.5   |       | A    |
|              |  | $V_I - V_O = 25V$   | 0.2   | 0.5   |       | A    |
|              | Thermal Regulation                     | $T_A = 25^\circ C$ , 30ms pulse                                   |       | 0.008 | 0.04  | %/W  |
| SVR          | Supply Voltage Rejection               | $f = 120$ Hz, $C_O = 25 \mu F$ , $I_O = 3A$<br>$V_I = 7.5 \pm 3V$ | 60    | 72    |       | dB   |
| eN           | RMS Output Noise Voltage (% of $V_O$ ) | $T_A = 25^\circ C$ $f = 10$ Hz to 10KHz                           |       | 0.003 |       | %    |
| S            | Temperature Stability                  |   |       | 0.5   |       | %    |
| S            | Long Term Stability                    | $T_A = 125^\circ C$ 1000Hrs                                       |       | 0.5   |       | %    |

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS OF LD1085CDT285** ( $V_I=5.85V$ ,  $C_I = C_O = 10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                              | Test Conditions  | Min.  | Typ.  | Max.  | Unit |
|--------------|--|--|-------|-------|-------|------|
| $V_O$        | Output Voltage                         | $I_O = 0$ mA $T_J = 25^\circ C$                                    | 2.793 | 2.85  | 2.907 | V    |
|              |  | $I_O = 0$ to 3A $V_I = 4.5$ to 30V (note 1)                        | 2.765 | 2.85  | 2.935 | V    |
| $\Delta V_O$ | Line Regulation                        | $I_O = 0$ mA $V_I = 4.5$ to 18V $T_J = 25^\circ C$                 |       | 0.2   | 6     | mV   |
|              |  | $I_O = 0$ mA $V_I = 4.5$ to 18V                                    |       | 0.5   | 6     | mV   |
| $\Delta V_O$ | Load Regulation                        | $I_O = 0$ to 3A $T_J = 25^\circ C$                                 |       | 3     | 15    | mV   |
|              |  | $I_O = 0$ to 3A  |       | 7     | 20    | V    |
| $V_d$        | Dropout Voltage                        | $I_O = 3$ A  |       | 1.3   | 1.5   | V    |
| $I_q$        | Quiescent Current                      | $V_I \leq 30V$   |       | 5     | 10    | mA   |
| $I_{sc}$     | Short Circuit Current                  | $V_I - V_O = 5V$   | 3.2   | 4.5   |       | A    |
|              |  | $V_I - V_O = 25V$  | 0.2   | 0.5   |       | A    |
|              | Thermal Regulation                     | $T_A = 25^\circ C$ , 30ms pulse                                    |       | 0.008 | 0.04  | %/W  |
| SVR          | Supply Voltage Rejection               | $f = 120$ Hz, $C_O = 25 \mu F$ , $I_O = 3A$<br>$V_I = 7.85 \pm 3V$ | 60    | 72    |       | dB   |
| eN           | RMS Output Noise Voltage (% of $V_O$ ) | $T_A = 25^\circ C$ $f = 10$ Hz to 10KHz                            |       | 0.003 |       | %    |
| S            | Temperature Stability                  |  |       | 0.5   |       | %    |
| S            | Long Term Stability                    | $T_A = 125^\circ C$ 1000Hrs  |       | 0.5   |       | %    |

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

## LD1085C SERIES

**ELECTRICAL CHARACTERISTICS OF LD1085CDT33** ( $V_I=6.3V$ ,  $C_I = C_O = 10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                              | Test Conditions   | Min.  | Typ.  | Max.  | Unit |
|--------------|--|---|-------|-------|-------|------|
| $V_O$        | Output Voltage                         | $I_O = 0$ mA $T_J = 25^\circ C$                                   | 3.234 | 3.35  | 3.366 | V    |
|              |  | $I_O = 0$ to 3A $V_I = 4.9$ to 30V (note 1)                       | 3.201 | 3.35  | 3.399 | V    |
| $\Delta V_O$ | Line Regulation                        | $I_O = 0$ mA $V_I = 4.9$ to 18V $T_J = 25^\circ C$                |       | 0.5   | 6     | mV   |
|              |  | $I_O = 0$ mA $V_I = 4.9$ to 18V                                   |       | 1     | 6     | mV   |
| $\Delta V_O$ | Load Regulation                        | $I_O = 0$ to 3A $T_J = 25^\circ C$                                |       | 3     | 15    | mV   |
|              |  | $I_O = 0$ to 3A   |       | 7     | 20    | V    |
| $V_d$        | Dropout Voltage                        | $I_O = 3$ A   |       | 1.3   | 1.5   | V    |
| $I_q$        | Quiescent Current                      | $V_I \leq 30V$  |       | 5     | 10    | mA   |
| $I_{sc}$     | Short Circuit Current                  | $V_I - V_O = 5V$  | 3.2   | 4.5   |       | A    |
|              |  | $V_I - V_O = 25V$   | 0.2   | 0.5   |       | A    |
|              | Thermal Regulation                     | $T_A = 25^\circ C$ , 30ms pulse                                   |       | 0.008 | 0.04  | %/W  |
| SVR          | Supply Voltage Rejection               | $f = 120$ Hz, $C_O = 25 \mu F$ , $I_O = 5A$<br>$V_I = 8.3 \pm 3V$ | 60    | 72    |       | dB   |
| eN           | RMS Output Noise Voltage (% of $V_O$ ) | $T_A = 25^\circ C$ $f = 10Hz$ to 10KHz                            |       | 0.003 |       | %    |
| S            | Temperature Stability                  |   |       | 0.5   |       | %    |
| S            | Long Term Stability                    | $T_A = 125^\circ C$ 1000Hrs                                       |       | 0.5   |       | %    |

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS OF LD1085CDT36** ( $V_I=6.6V$ ,  $C_I = C_O = 10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                              | Test Conditions   | Min.  | Typ.  | Max.  | Unit |
|--------------|--|---|-------|-------|-------|------|
| $V_O$        | Output Voltage                         | $I_O = 0$ mA $T_J = 25^\circ C$                                   | 3.528 | 3.6   | 3.672 | V    |
|              |  | $I_O = 0$ to 3A $V_I = 5.2$ to 30V (note 1)                       | 3.492 | 3.6   | 3.708 | V    |
| $\Delta V_O$ | Line Regulation                        | $I_O = 0$ mA $V_I = 5.2$ to 18V $T_J = 25^\circ C$                |       | 0.5   | 10    | mV   |
|              |  | $I_O = 0$ mA $V_I = 5.2$ to 18V                                   |       | 1     | 10    | mV   |
| $\Delta V_O$ | Load Regulation                        | $I_O = 0$ to 3A $T_J = 25^\circ C$                                |       | 3     | 15    | mV   |
|              |  | $I_O = 0$ to 3A   |       | 7     | 20    | V    |
| $V_d$        | Dropout Voltage                        | $I_O = 3$ A   |       | 1.3   | 1.5   | V    |
| $I_q$        | Quiescent Current                      | $V_I \leq 30V$  |       | 5     | 10    | mA   |
| $I_{sc}$     | Short Circuit Current                  | $V_I - V_O = 5V$  | 3.2   | 4.5   |       | A    |
|              |  | $V_I - V_O = 25V$   | 0.2   | 0.5   |       | A    |
|              | Thermal Regulation                     | $T_A = 25^\circ C$ , 30ms pulse                                   |       | 0.008 | 0.04  | %/W  |
| SVR          | Supply Voltage Rejection               | $f = 120$ Hz, $C_O = 25 \mu F$ , $I_O = 3A$<br>$V_I = 8.6 \pm 3V$ | 60    | 72    |       | dB   |
| eN           | RMS Output Noise Voltage (% of $V_O$ ) | $T_A = 25^\circ C$ $f = 10Hz$ to 10KHz                            |       | 0.003 |       | %    |
| S            | Temperature Stability                  |   |       | 0.5   |       | %    |
| S            | Long Term Stability                    | $T_A = 125^\circ C$ 1000Hrs                                       |       | 0.5   |       | %    |

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS OF LD1085CDT50** ( $V_I=8V$ ,  $C_I = C_O=10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                              | Test Conditions  | Min. | Typ.  | Max. | Unit |
|--------------|--|--|------|-------|------|------|
| $V_O$        | Output Voltage                         | $I_O = 0$ mA $T_J = 25^\circ C$                                  | 4.9  | 5     | 5.1  | V    |
|              |  | $I_O = 0$ to 3A $V_I = 6.6$ to 30V (note 1)                      | 4.85 | 5     | 5.15 | V    |
| $\Delta V_O$ | Line Regulation                        | $I_O = 0$ mA $V_I = 6.6$ to 20V $T_J = 25^\circ C$               |      | 0.5   | 10   | mV   |
|              |  | $I_O = 0$ mA $V_I = 6.6$ to 20V                                  |      | 1     | 10   | mV   |
| $\Delta V_O$ | Load Regulation                        | $I_O = 0$ to 3A $T_J = 25^\circ C$                               |      | 5     | 20   | mV   |
|              |  | $I_O = 0$ to 3A  |      | 10    | 35   | V    |
| $V_d$        | Dropout Voltage                        | $I_O = 3$ A  |      | 1.3   | 1.5  | V    |
| $I_q$        | Quiescent Current                      | $V_I \leq 30V$   |      | 5     | 10   | mA   |
| $I_{sc}$     | Short Circuit Current                  | $V_I - V_O = 5V$   | 3.2  | 4.5   |      | A    |
|              |  | $V_I - V_O = 25V$  | 0.2  | 0.5   |      | A    |
|              | Thermal Regulation                     | $T_A = 25^\circ C$ , 30ms pulse                                  |      | 0.008 | 0.04 | %/W  |
| SVR          | Supply Voltage Rejection               | $f = 120$ Hz, $C_O = 25 \mu F$ , $I_O = 3A$<br>$V_I = 10 \pm 3V$ | 60   | 72    |      | dB   |
| eN           | RMS Output Noise Voltage (% of $V_O$ ) | $T_A = 25^\circ C$ $f = 10$ Hz to 10KHz                          |      | 0.003 |      | %    |
| S            | Temperature Stability                  |  |      | 0.5   |      | %    |
| S            | Long Term Stability                    | $T_A = 125^\circ C$ 1000Hrs                                      |      | 0.5   |      | %    |

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS OF LD1085CDT80** ( $V_I=11V$ ,  $C_I = C_O=10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                              | Test Conditions  | Min. | Typ.  | Max. | Unit |
|--------------|--|--|------|-------|------|------|
| $V_O$        | Output Voltage                         | $I_O = 0$ mA $T_J = 25^\circ C$                                  | 7.84 | 8     | 8.16 | V    |
|              |  | $I_O = 0$ to 3A $V_I = 9.8$ to 30V (note 1)                      | 7.76 | 8     | 8.24 | V    |
| $\Delta V_O$ | Line Regulation                        | $I_O = 0$ mA $V_I = 9.8$ to 20V $T_J = 25^\circ C$               |      | 1     | 18   | mV   |
|              |  | $I_O = 0$ mA $V_I = 9.8$ to 20V                                  |      | 2     | 18   | mV   |
| $\Delta V_O$ | Load Regulation                        | $I_O = 0$ to 3A $T_J = 25^\circ C$                               |      | 8     | 30   | mV   |
|              |  | $I_O = 0$ to 3A  |      | 12    | 60   | V    |
| $V_d$        | Dropout Voltage                        | $I_O = 3$ A  |      | 1.3   | 1.5  | V    |
| $I_q$        | Quiescent Current                      | $V_I \leq 30V$   |      | 5     | 10   | mA   |
| $I_{sc}$     | Short Circuit Current                  | $V_I - V_O = 5V$   | 3.2  | 4.5   |      | A    |
|              |  | $V_I - V_O = 25V$  | 0.2  | 0.5   |      | A    |
|              | Thermal Regulation                     | $T_A = 25^\circ C$ , 30ms pulse                                  |      | 0.008 | 0.04 | %/W  |
| SVR          | Supply Voltage Rejection               | $f = 120$ Hz, $C_O = 25 \mu F$ , $I_O = 3A$<br>$V_I = 13 \pm 3V$ | 54   | 71    |      | dB   |
| eN           | RMS Output Noise Voltage (% of $V_O$ ) | $T_A = 25^\circ C$ $f = 10$ Hz to 10KHz                          |      | 0.003 |      | %    |
| S            | Temperature Stability                  |  |      | 0.5   |      | %    |
| S            | Long Term Stability                    | $T_A = 125^\circ C$ 1000Hrs                                      |      | 0.5   |      | %    |

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

## LD1085C SERIES

**ELECTRICAL CHARACTERISTICS OF LD1085CDT90** ( $V_I=12V$ ,  $C_I = C_O = 10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                              | Test Conditions   | Min. | Typ.  | Max. | Unit |
|--------------|--|---|------|-------|------|------|
| $V_O$        | Output Voltage                         | $I_O = 0 \text{ mA}$ $T_J = 25^\circ C$                                   | 8.82 | 9     | 9.18 | V    |
|              |  | $I_O = 0$ to $3A$ $V_I = 11$ to $30V$ (note 1)                            | 8.73 | 9     | 9.27 | V    |
| $\Delta V_O$ | Line Regulation                        | $I_O = 0 \text{ mA}$ $V_I = 11$ to $20V$ $T_J = 25^\circ C$               |      | 1     | 20   | mV   |
|              |  | $I_O = 0 \text{ mA}$ $V_I = 11$ to $20V$                                  |      | 2     | 20   | mV   |
| $\Delta V_O$ | Load Regulation                        | $I_O = 0$ to $3A$ $T_J = 25^\circ C$                                      |      | 8     | 30   | mV   |
|              |  | $I_O = 0$ to $3A$   |      | 12    | 60   | V    |
| $V_d$        | Dropout Voltage                        | $I_O = 3 \text{ A}$   |      | 1.3   | 1.5  | V    |
| $I_q$        | Quiescent Current                      | $V_I \leq 30V$  |      | 5     | 10   | mA   |
| $I_{sc}$     | Short Circuit Current                  | $V_I - V_O = 5V$  | 5.5  | 6.5   |      | A    |
|              |  | $V_I - V_O = 25V$   | 0.5  | 0.7   |      | A    |
|              | Thermal Regulation                     | $T_A = 25^\circ C$ , 30ms pulse   |      | 0.008 | 0.04 | %/W  |
| SVR          | Supply Voltage Rejection               | $f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $I_O = 3A$<br>$V_I = 14 \pm 3V$ | 54   | 70    |      | dB   |
| eN           | RMS Output Noise Voltage (% of $V_O$ ) | $T_A = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$                    |      | 0.003 |      | %    |
| S            | Temperature Stability                  |   |      | 0.5   |      | %    |
| S            | Long Term Stability                    | $T_A = 125^\circ C$ 1000Hrs   |      | 0.5   |      | %    |

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

**ELECTRICAL CHARACTERISTICS OF LD1085CDT120** ( $V_I=15V$ ,  $C_I = C_O = 10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                              | Test Conditions   | Min.  | Typ.  | Max.  | Unit |
|--------------|--|---|-------|-------|-------|------|
| $V_O$        | Output Voltage                         | $I_O = 0 \text{ mA}$ $T_J = 25^\circ C$                                   | 11.76 | 12    | 12.24 | V    |
|              |  | $I_O = 0$ to $3A$ $V_I = 13.8$ to $30V$ (note 1)                          | 11.64 | 12    | 12.36 | V    |
| $\Delta V_O$ | Line Regulation                        | $I_O = 0 \text{ mA}$ $V_I = 13.8$ to $25V$ $T_J = 25^\circ C$             |       | 1     | 25    | mV   |
|              |  | $I_O = 0 \text{ mA}$ $V_I = 13.8$ to $25V$                                |       | 2     | 25    | mV   |
| $\Delta V_O$ | Load Regulation                        | $I_O = 0$ to $3A$ $T_J = 25^\circ C$                                      |       | 12    | 36    | mV   |
|              |  | $I_O = 0$ to $3A$   |       | 24    | 72    | V    |
| $V_d$        | Dropout Voltage                        | $I_O = 3 \text{ A}$   |       | 1.3   | 1.5   | V    |
| $I_q$        | Quiescent Current                      | $V_I \leq 30V$  |       | 5     | 10    | mA   |
| $I_{sc}$     | Short Circuit Current                  | $V_I - V_O = 5V$  | 3.2   | 4.5   |       | A    |
|              |  | $V_I - V_O = 25V$   | 0.2   | 0.5   |       | A    |
|              | Thermal Regulation                     | $T_A = 25^\circ C$ , 30ms pulse   |       | 0.008 | 0.04  | %/W  |
| SVR          | Supply Voltage Rejection               | $f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $I_O = 3A$<br>$V_I = 17 \pm 3V$ | 54    | 66    |       | dB   |
| eN           | RMS Output Noise Voltage (% of $V_O$ ) | $T_A = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$                    |       | 0.003 |       | %    |
| S            | Temperature Stability                  |   |       | 0.5   |       | %    |
| S            | Long Term Stability                    | $T_A = 125^\circ C$ 1000Hrs   |       | 0.5   |       | %    |

NOTE 1: See short-circuit current curve for available output current at fixed dropout.



**ELECTRICAL CHARACTERISTICS OF LD1085CDT** ( $V_I=4.25V$ ,  $C_I = C_O = 10\mu F$ ,  $T_A = -40$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol           | Parameter                                 | Test Conditions   | Min.  | Typ.  | Max.  | Unit    |
|------------------|---|---|-------|-------|-------|---------|
| $V_O$            | Output Voltage                            | $I_O = 10mA$ $T_J = 25^\circ C$   | 1.225 | 1.25  | 1.275 | V       |
|                  |   | $I_O = 10mA$ to $5A$ $V_I = 2.85$ to $30V$ (note 1)                                       | 1.213 | 1.25  | 1.288 | V       |
| $\Delta V_O$     | Line Regulation                           | $I_O = 10mA$ $V_I = 2.85$ to $16.5V$ $T_J = 25^\circ C$                                   |       | 0.015 | 0.2   | %       |
|                  |   | $I_O = 10mA$ $V_I = 2.85$ to $16.5V$  |       | 0.035 | 0.2   | %       |
| $\Delta V_O$     | Load Regulation                           | $I_O = 10mA$ to $5A$ $T_J = 25^\circ C$   |       | 0.1   | 0.3   | %       |
|                  |   | $I_O = 0$ to $5A$   |       | 0.2   | 0.4   | %       |
| $V_d$            | Dropout Voltage                           | $I_O = 5A$  |       | 1.3   | 1.5   | V       |
| $I_{O(min)}$     | Minimum Load Current                      | $V_I = 30V$   |       | 3     | 10    | mA      |
| $I_{sc}$         | Short Circuit Current                     | $V_I - V_O = 5V$  | 3.2   | 4.5   |       | A       |
|                  |   | $V_I - V_O = 25V$   | 0.2   | 0.5   |       | A       |
|                  | Thermal Regulation                        | $T_A = 25^\circ C$ , 30ms pulse   |       | 0.003 | 0.015 | %/W     |
| SVR              | Supply Voltage Rejection                  | $f = 120$ Hz, $C_O = 25 \mu F$ , $C_{ADJ} = 25 \mu F$ ,<br>$I_O = 5A$ $V_I = 6.25 \pm 3V$ | 60    | 75    |       | dB      |
| $I_{ADJ}$        | Adjust Pin Current                        | $V_I = 4.25V$ $I_O = 10$ mA   |       | 55    | 120   | $\mu A$ |
| $\Delta I_{ADJ}$ | Adjust Pin Current Change                 | $I_O = 10mA$ to $5A$ $V_I = 2.75$ to $16.5V$<br>(note 1)                                  |       | 0.2   | 5     | $\mu A$ |
| eN               | RMS Output Noise Voltage<br>(% of $V_O$ ) | $T_A = 25^\circ C$ $f = 10Hz$ to $10KHz$  |       | 0.003 |       | %       |
| S                | Temperature Stability                     |   |       | 0.5   |       | %       |
| S                | Long Term Stability                       | $T_A = 125^\circ C$ 1000Hrs   |       | 0.5   |       | %       |

NOTE 1: See short-circuit current curve for available output current at fixed dropout.

TYPICAL CHARACTERISTICS (unless otherwise specified  $T_j = 25^\circ\text{C}$ ,  $C_i=C_o=10\mu\text{F}$ )

Figure 1 : Output Voltage vs Temperature

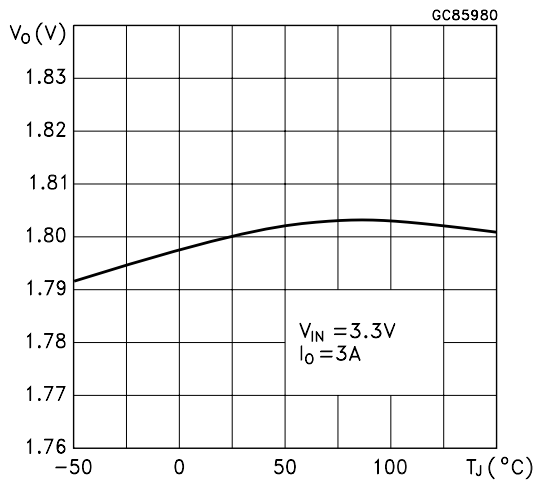


Figure 2 : Output Voltage vs Temperature

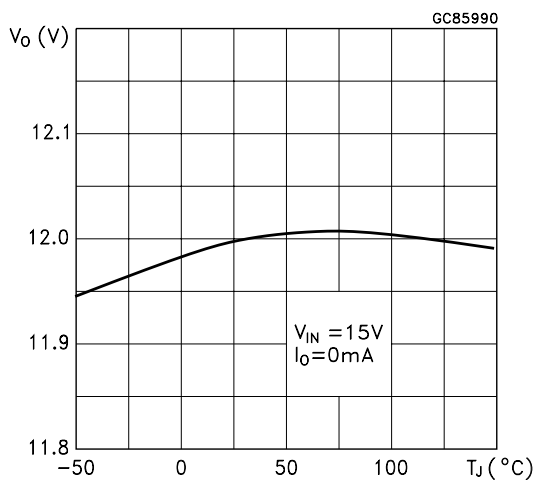


Figure 3 : Output Voltage vs Temperature

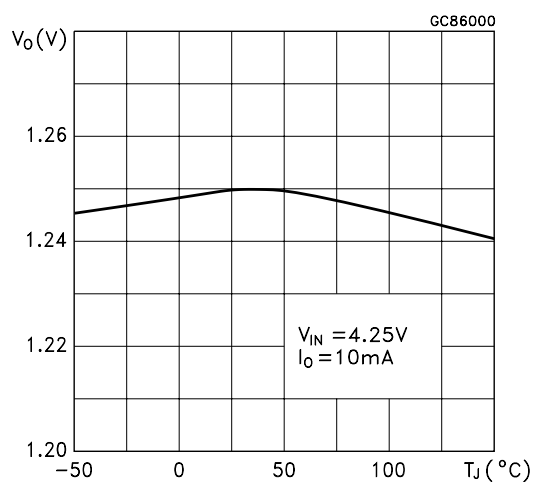


Figure 4 : Short Circuit Current vs Dropout Voltage

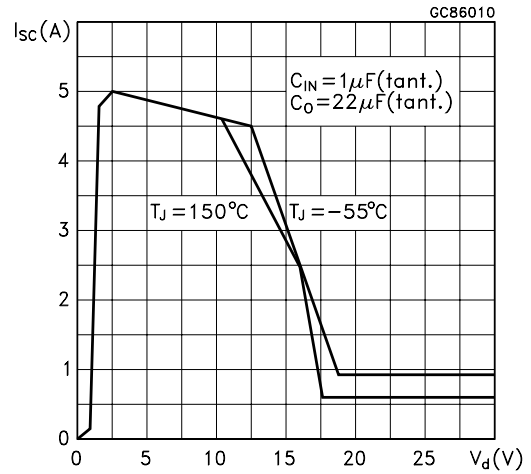


Figure 5 : Line Regulation vs Temperature

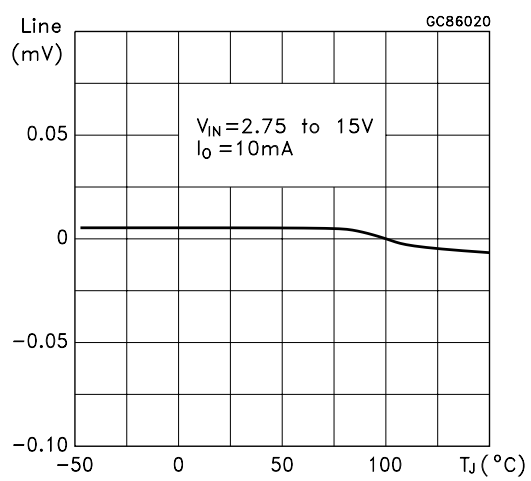


Figure 6 : Load Regulation vs Temperature

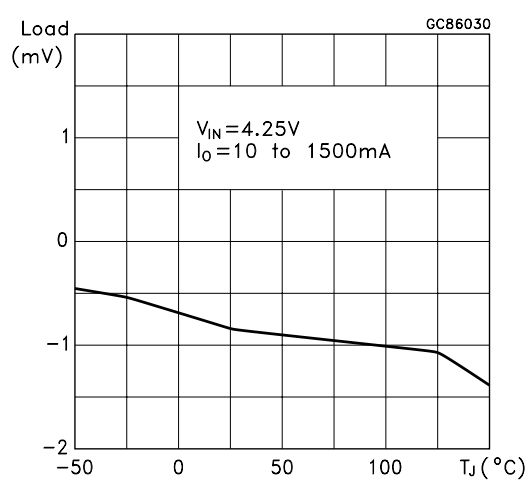


Figure 7 : Dropout Voltage vs Temperature

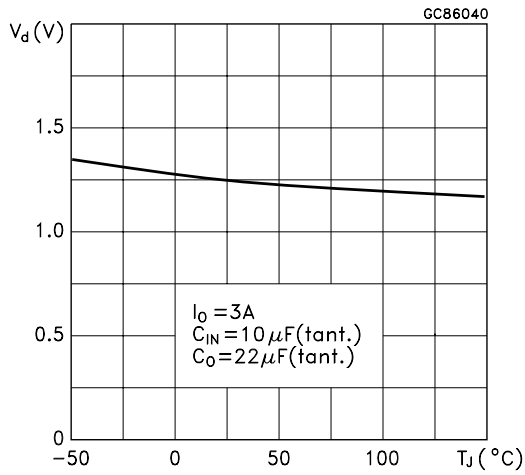


Figure 10 : Quiescent Current vs Temperature

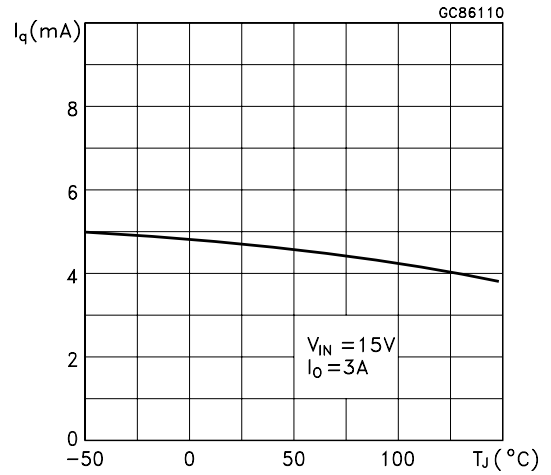


Figure 8 : Dropout Voltage vs Output Current

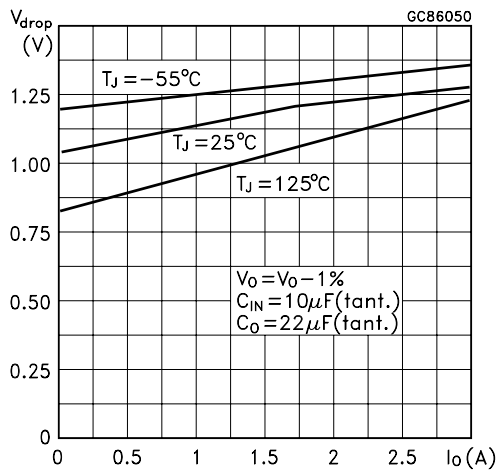


Figure 11 : Dropout Voltage vs Output Current

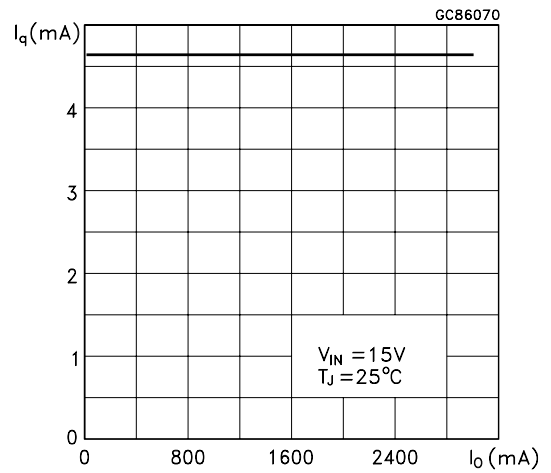


Figure 9 : Adjust Pin Current vs Temperature

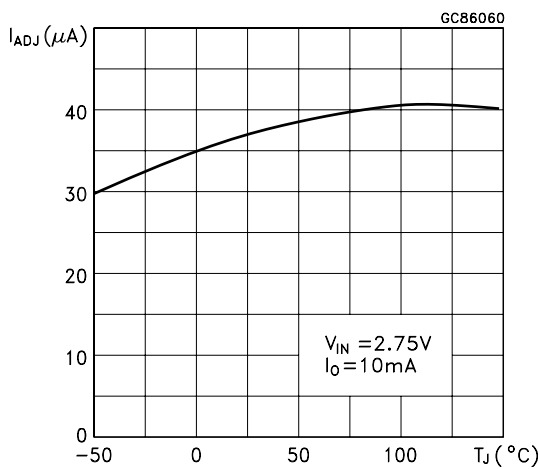
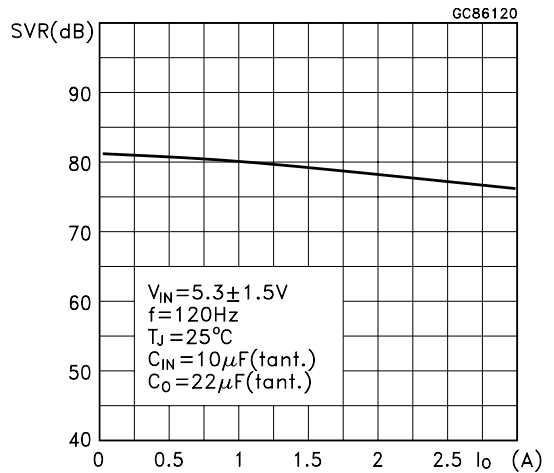
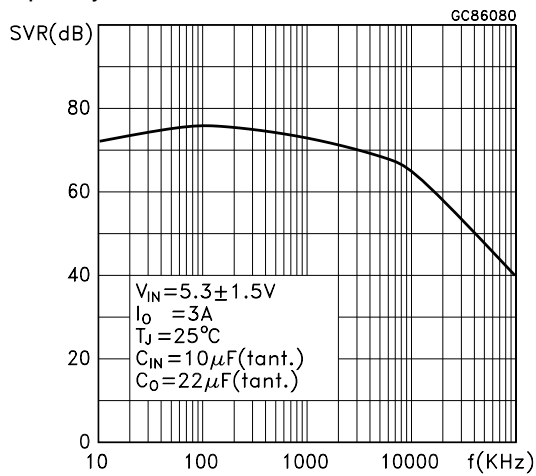


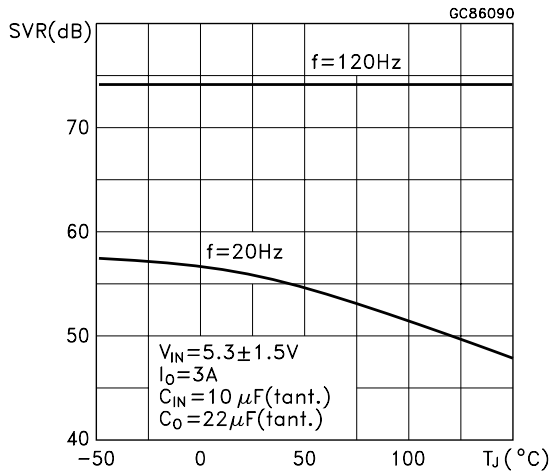
Figure 12 : Supply Voltage Rejection vs Output Current



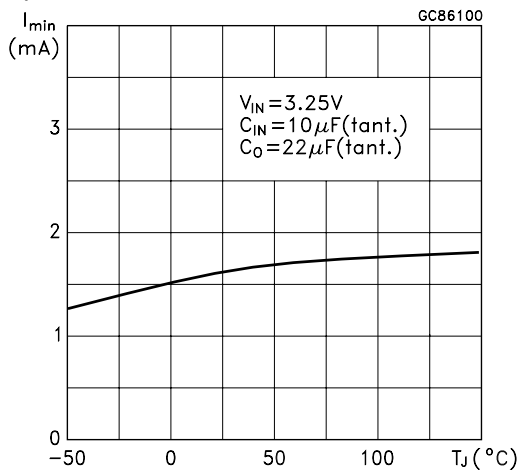
**Figure 13 : Supply Voltage Rejection vs Frequency**



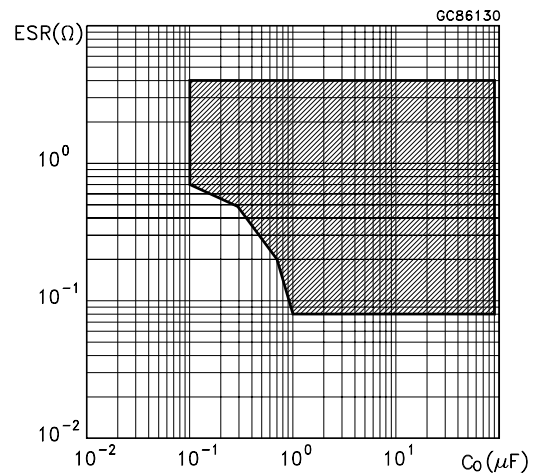
**Figure 14 : Supply Voltage Rejection vs Temperature**



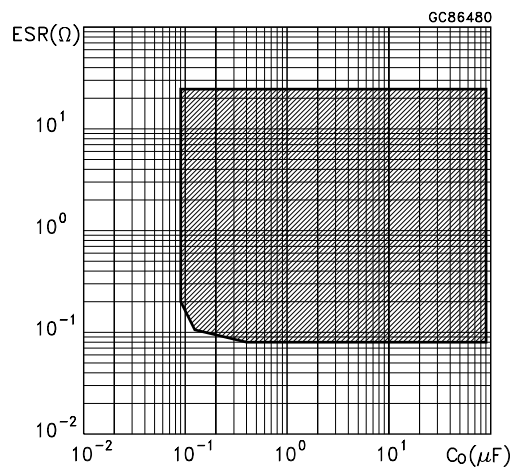
**Figure 15 : Minimum Load Current vs Temperature**



**Figure 16 : Stability**



**Figure 17 : Stability**



**Figure 18 : Line Transient**

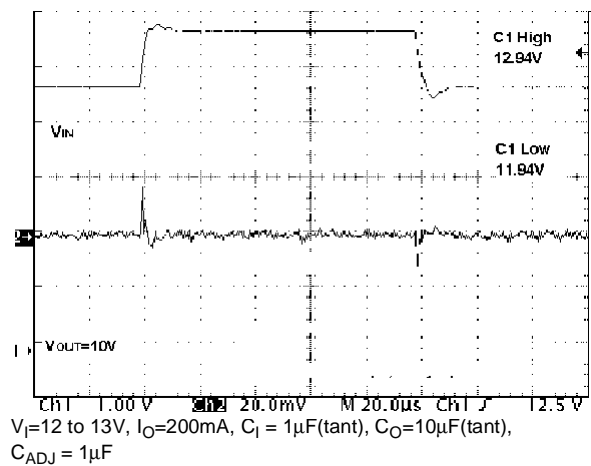
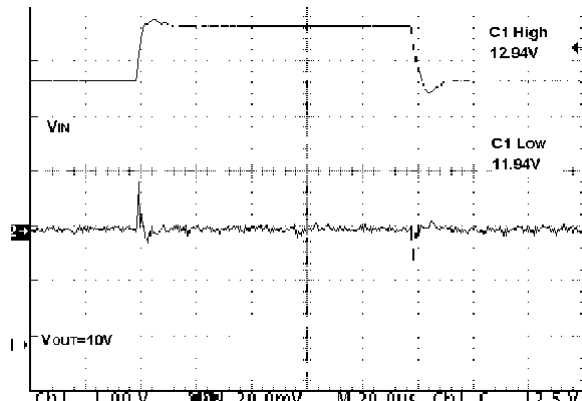
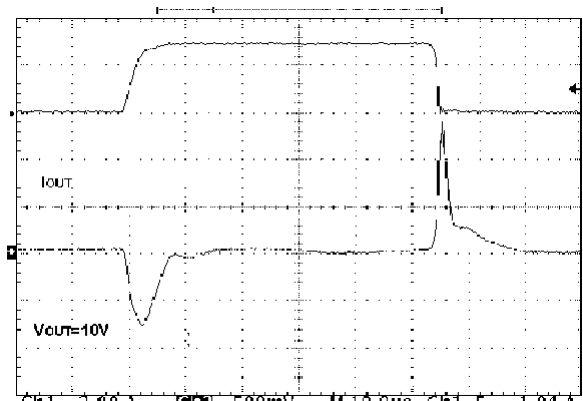


Figure 19 : Line Transient



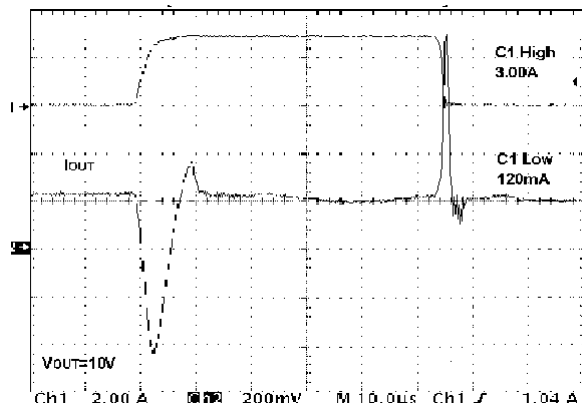
$V_I=12$  to  $13$ V,  $I_O=200$ mA,  $C_I = 1\mu$ F(tant),  $C_O=10\mu$ F(tant),  $C_{ADJ}=1\mu$ F

Figure 21 : Load Transient



$V_I=12$  V,  $I_O=0.12$  to  $3$  A,  $C_I = 1\mu$ F(tant),  $C_O=10\mu$ F(tant),  $C_{ADJ}=1\mu$ F

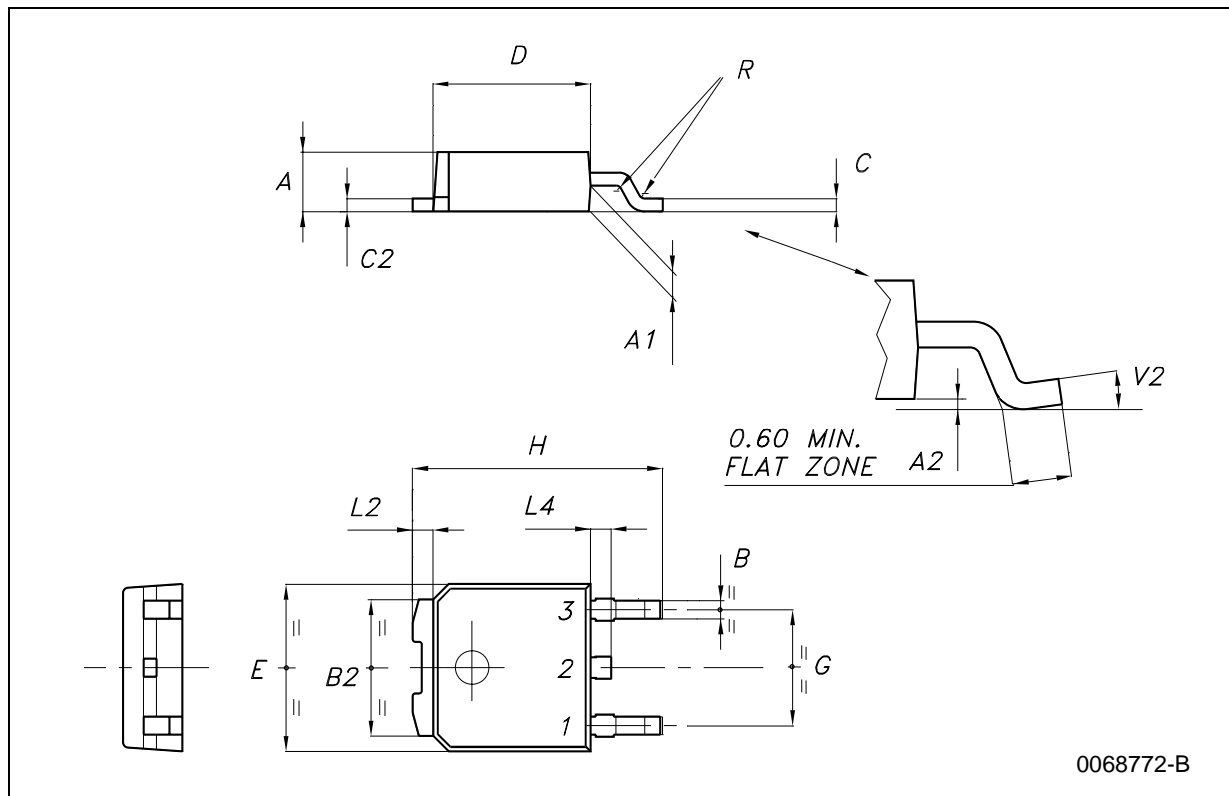
Figure 20 : Load Transient



$V_I=12$  V,  $I_O=0.12$  to  $3$  A,  $C_I = 1\mu$ F(tant),  $C_O=10\mu$ F(tant),  $C_{ADJ}=1\mu$ F

**DPAK MECHANICAL DATA**

| DIM. | mm.  |     |      | inch  |       |       |
|------|------|-----|------|-------|-------|-------|
|      | MIN. | TYP | MAX. | MIN.  | TYP.  | MAX.  |
| A    | 2.2  |     | 2.4  | 0.086 |       | 0.094 |
| A1   | 0.9  |     | 1.1  | 0.035 |       | 0.043 |
| A2   | 0.03 |     | 0.23 | 0.001 |       | 0.009 |
| B    | 0.64 |     | 0.9  | 0.025 |       | 0.035 |
| B2   | 5.2  |     | 5.4  | 0.204 |       | 0.212 |
| C    | 0.45 |     | 0.6  | 0.017 |       | 0.023 |
| C2   | 0.48 |     | 0.6  | 0.019 |       | 0.023 |
| D    | 6    |     | 6.2  | 0.236 |       | 0.244 |
| E    | 6.4  |     | 6.6  | 0.252 |       | 0.260 |
| G    | 4.4  |     | 4.6  | 0.173 |       | 0.181 |
| H    | 9.35 |     | 10.1 | 0.368 |       | 0.397 |
| L2   |      | 0.8 |      |       | 0.031 |       |
| L4   | 0.6  |     | 1    | 0.023 |       | 0.039 |



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