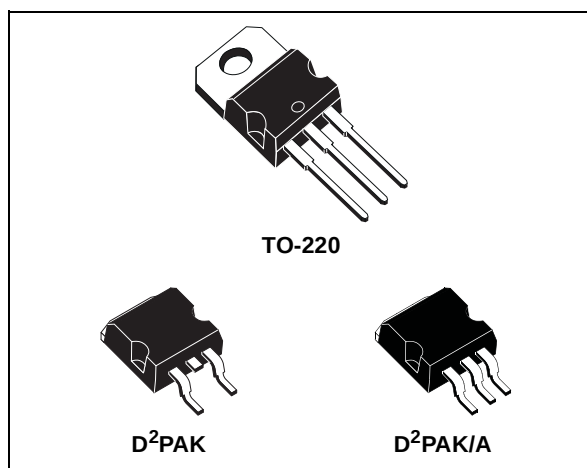




## 5A LOW DROPOUT FAST RESPONSE POSITIVE VOLTAGE REGULATOR ADJUSTABLE AND FIXED

- TYPICAL DROPOUT 1.2V
- FAST TRANSIENT RESPONSE
- THREE TERMINAL ADJUSTABLE OR FIXED OUTPUT VOLTAGE 1.5V, 1.8V, 2.5V, 2.85V, 3.3V, 5V, 8V, 9V, 12V.
- GUARANTEED OUTPUT CURRENT UP TO 5A
- 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  $0^{\circ}\text{C}$  TO  $125^{\circ}\text{C}$
- PACKAGE AVAILABLE : TO-220, D<sup>2</sup>PAK, D<sup>2</sup>PAK/A
- PINOUT COMPATIBILITY WITH STANDARD ADJUSTABLE VREG

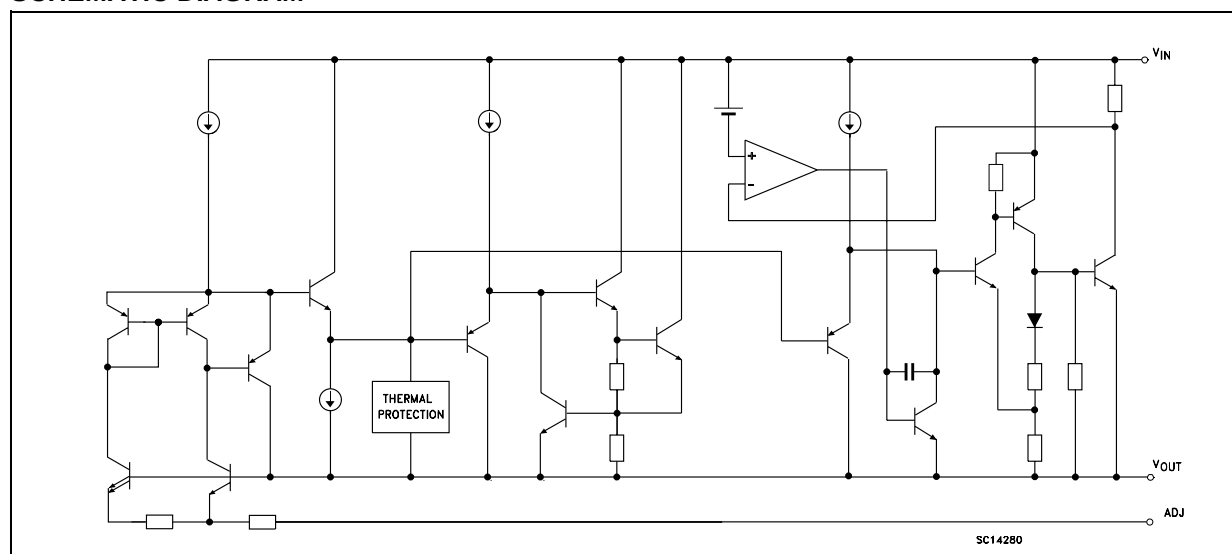


### DESCRIPTION

The LD1585C is a LOW DROP Voltage Regulator able to provide up to 5A of Output Current. Dropout is guaranteed at a maximum of 1.4V at the maximum output current, decreasing at lower loads. The device has been improved to be utilized in low voltage applications where transient response and minimum input voltage are critical. The most important feature of the device consist in lower dropout voltage and very fast transient

response. 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 LD1585C quiescent current flows 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. On chip trimming allows the regulator to reach a very tight output voltage tolerance, within  $\pm 1\%$  at  $25^{\circ}\text{C}$ .

### SCHEMATIC DIAGRAM



## LD1585C SERIES

### ABSOLUTE MAXIMUM RATINGS

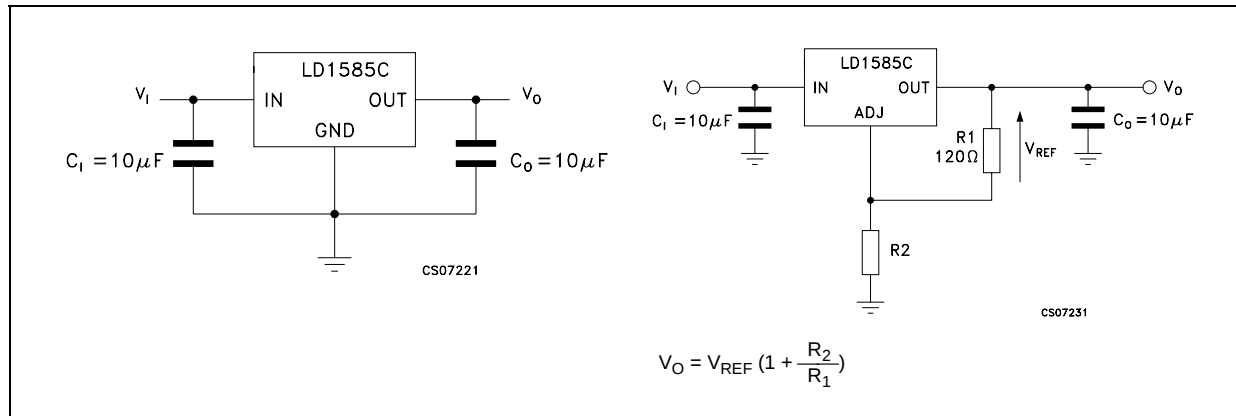
| Symbol           | Parameter <sup>2</sup>               | Value              | Unit |
|------------------|--------------------------------------|--------------------|------|
| V <sub>I</sub>   | DC Input Voltage                     | 30                 | V    |
| I <sub>O</sub>   | Output Current                       | Internally Limited | mA   |
| P <sub>D</sub>   | Power Dissipation                    | Internally Limited | mW   |
| T <sub>stg</sub> | Storage Temperature Range            | -55 to +150        | °C   |
| T <sub>op</sub>  | Operating Junction Temperature Range | 0 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.

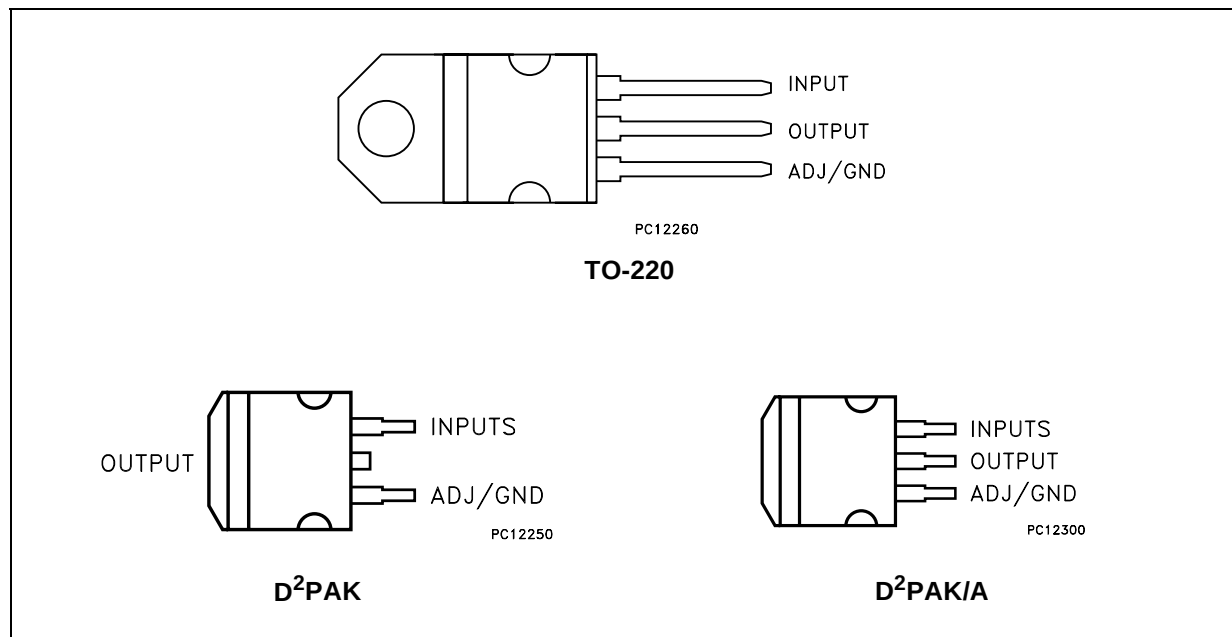
### THERMAL DATA

| Symbol                | Parameter                           | 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 CIRCUITS



## CONNECTION DIAGRAM (top view)



## ORDERING CODES

| TO-220     | D²PAK (*)     | D²PAK/A (*)   | OUTPUT VOLTAGE |
|------------|---------------|---------------|----------------|
| LD1585CV15 | LD1585CD2T15  | LD1585CD2M15  | 1.5 V          |
| LD1585CV18 | LD1585CD2T18  | LD1585CD2M18  | 1.8 V          |
| LD1585CV25 | LD1585CD2T25  | LD1585CD2M25  | 2.5 V          |
| LD1585CV28 | LD1585CD2T28  | LD1585CD2M28  | 2.85 V         |
| LD1585CV33 | LD1585CD2T33  | LD1585CD2M33  | 3.3 V          |
| LD1585CV50 | LD1585CD2T50  | LD1585CD2M50  | 5.0 V          |
| LD1585CV80 | LD1585CD2T80  | LD1585CD2M80  | 8.0 V          |
| LD1585CV90 | LD1585CD2T90  | LD1585CD2M90  | 9.0 V          |
| LD1585CV12 | LD1585CD2T120 | LD1585CD2M120 | 12.0 V         |
| LD1585CV   | LD1585CD2T    | LD1585CD2M    | ADJ            |

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

## LD1585C SERIES

**ELECTRICAL CHARACTERISTICS OF LD1585#15** ( $V_I=4.5V$ ,  $C_I = C_O = 10\mu F$ ,  $T_J = 0$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                                 | Test Conditions                                                                | Min.  | Typ.  | Max.  | Unit |
|--------------|-------------------------------------------|--------------------------------------------------------------------------------|-------|-------|-------|------|
| $V_O$        | Output Voltage                            | $I_O = 0 \text{ mA}$ $T_J = 25^\circ C$                                        | 1.485 | 1.5   | 1.515 | V    |
|              |                                           | $I_O = 0$ to $5A$ $V_I = 3$ to $25V$ (note 1)                                  | 1.47  | 1.5   | 1.53  | V    |
| $\Delta V_O$ | Line Regulation                           | $I_O = 0 \text{ mA}$ $V_I = 3$ to $15V$ $T_J = 25^\circ C$                     |       | 0.005 | 0.2   | %    |
|              |                                           | $I_O = 0 \text{ mA}$ $V_I = 3$ to $15V$                                        |       | 0.005 | 0.2   | %    |
| $\Delta V_O$ | Load Regulation                           | $I_O = 0$ to $5A$ $T_J = 25^\circ C$                                           |       | 0.05  | 0.3   | %    |
|              |                                           | $I_O = 0$ to $5A$                                                              |       | 0.05  | 0.5   | %    |
| $V_d$        | Dropout Voltage                           | $I_O = 5A$                                                                     |       | 1.2   | 1.4   | V    |
| $I_q$        | Quiescent Current                         | $V_I \leq 25V$                                                                 |       | 5     | 10    | mA   |
| $I_{sc}$     | Short Circuit Current                     | $V_I - V_O = 5V$                                                               | 5.5   | 7     |       | A    |
|              | Thermal Regulation                        | $T_J = 25^\circ C$ , 30ms pulse                                                |       | 0.004 | 0.02  | %/W  |
| SVR          | Supply Voltage Rejection                  | $f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $I_O = 5A$<br>$V_I - V_O = 3 \pm 1V$ | 60    | 75    |       | dB   |
| eN           | RMS Output Noise Voltage<br>(% of $V_O$ ) | $T_J = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$                         |       | 0.003 |       | %    |
| S            | Temperature Stability                     |                                                                                |       | 0.5   |       | %    |
| S            | Long Term Stability                       | $T_J = 125^\circ C$ 1000Hrs                                                    |       | 0.03  | 1     | %    |

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

**ELECTRICAL CHARACTERISTICS OF LD1585#18** ( $V_I=4.8V$ ,  $C_I = C_O = 10\mu F$ ,  $T_J = 0$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                                 | Test Conditions                                                                | Min.  | Typ.  | Max.  | Unit |
|--------------|-------------------------------------------|--------------------------------------------------------------------------------|-------|-------|-------|------|
| $V_O$        | Output Voltage                            | $I_O = 0 \text{ mA}$ $T_J = 25^\circ C$                                        | 1.782 | 1.8   | 1.818 | V    |
|              |                                           | $I_O = 0$ to $5A$ $V_I = 3.3$ to $25V$ (note 1)                                | 1.764 | 1.8   | 1.836 | V    |
| $\Delta V_O$ | Line Regulation                           | $I_O = 0 \text{ mA}$ $V_I = 3.3$ to $15V$ $T_J = 25^\circ C$                   |       | 0.005 | 0.2   | mV   |
|              |                                           | $I_O = 0 \text{ mA}$ $V_I = 3.3$ to $15V$                                      |       | 0.005 | 0.2   | mV   |
| $\Delta V_O$ | Load Regulation                           | $I_O = 0$ to $5A$ $T_J = 25^\circ C$                                           |       | 0.05  | 0.3   | mV   |
|              |                                           | $I_O = 0$ to $5A$                                                              |       | 0.05  | 0.5   | mV   |
| $V_d$        | Dropout Voltage                           | $I_O = 5A$                                                                     |       | 1.2   | 1.4   | V    |
| $I_q$        | Quiescent Current                         | $V_I \leq 25V$                                                                 |       | 5     | 10    | mA   |
| $I_{sc}$     | Short Circuit Current                     | $V_I - V_O = 5.5V$                                                             | 5.5   | 7     |       | A    |
|              | Thermal Regulation                        | $T_J = 25^\circ C$ , 30ms pulse                                                |       | 0.004 | 0.02  | %/W  |
| SVR          | Supply Voltage Rejection                  | $f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $I_O = 5A$<br>$V_I - V_O = 3 \pm 1V$ | 60    | 75    |       | dB   |
| eN           | RMS Output Noise Voltage<br>(% of $V_O$ ) | $T_J = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$                         |       | 0.003 |       | %    |
| S            | Temperature Stability                     |                                                                                |       | 0.5   |       | %    |
| S            | Long Term Stability                       | $T_J = 125^\circ C$ 1000Hrs                                                    |       | 0.03  | 1     | %    |

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

**ELECTRICAL CHARACTERISTICS OF LD1585#25** ( $V_I=5.5V$ ,  $C_I = C_O = 10\mu F$ ,  $T_J = 0$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                                 | Test Conditions                                                                | Min.  | Typ.  | Max.  | Unit |
|--------------|-------------------------------------------|--------------------------------------------------------------------------------|-------|-------|-------|------|
| $V_O$        | Output Voltage                            | $I_O = 0 \text{ mA}$ $T_J = 25^\circ C$                                        | 2.475 | 2.5   | 2.525 | V    |
|              |                                           | $I_O = 0$ to $5A$ $V_I = 4$ to $25V$ (note 1)                                  | 2.45  | 2.5   | 2.55  | V    |
| $\Delta V_O$ | Line Regulation                           | $I_O = 0 \text{ mA}$ $V_I = 4$ to $16V$ $T_J = 25^\circ C$                     |       | 0.005 | 0.2   | mV   |
|              |                                           | $I_O = 0 \text{ mA}$ $V_I = 4$ to $16V$                                        |       | 0.005 | 0.2   |      |
| $\Delta V_O$ | Load Regulation                           | $I_O = 0$ to $5A$ $T_J = 25^\circ C$                                           |       | 0.05  | 0.3   | mV   |
|              |                                           | $I_O = 0$ to $5A$                                                              |       | 0.05  | 0.5   |      |
| $V_d$        | Dropout Voltage                           | $I_O = 5A$                                                                     |       | 1.2   | 1.4   | V    |
| $I_q$        | Quiescent Current                         | $V_I \leq 25V$                                                                 |       | 5     | 10    | mA   |
| $I_{sc}$     | Short Circuit Current                     | $V_I - V_O = 5.5V$                                                             | 5.5   | 7     |       | A    |
|              | Thermal Regulation                        | $T_J = 25^\circ C$ , 30ms pulse                                                |       | 0.004 | 0.02  | %/W  |
| SVR          | Supply Voltage Rejection                  | $f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $I_O = 5A$<br>$V_I - V_O = 3 \pm 1V$ | 60    | 75    |       | dB   |
| eN           | RMS Output Noise Voltage<br>(% of $V_O$ ) | $T_J = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$                         |       | 0.003 |       | %    |
| S            | Temperature Stability                     |                                                                                |       | 0.5   |       | %    |
| S            | Long Term Stability                       | $T_J = 125^\circ C$ 1000Hrs                                                    |       | 0.03  | 1     | %    |

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

**ELECTRICAL CHARACTERISTICS OF LD1585#285** ( $V_I=5.85V$ ,  $C_I = C_O = 10\mu F$ ,  $T_J = 0$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                                 | Test Conditions                                                                | Min.  | Typ.  | Max.  | Unit |
|--------------|-------------------------------------------|--------------------------------------------------------------------------------|-------|-------|-------|------|
| $V_O$        | Output Voltage                            | $I_O = 0 \text{ mA}$ $T_J = 25^\circ C$                                        | 2.821 | 2.85  | 2.879 | V    |
|              |                                           | $I_O = 0$ to $5A$ $V_I = 4.5$ to $30V$ (note 1)                                | 2.793 | 2.85  | 2.907 | V    |
| $\Delta V_O$ | Line Regulation                           | $I_O = 0 \text{ mA}$ $V_I = 4.5$ to $18V$ $T_J = 25^\circ C$                   |       | 0.005 | 0.2   | mV   |
|              |                                           | $I_O = 0 \text{ mA}$ $V_I = 4.5$ to $18V$                                      |       | 0.005 | 0.2   |      |
| $\Delta V_O$ | Load Regulation                           | $I_O = 0$ to $5A$ $T_J = 25^\circ C$                                           |       | 0.05  | 0.3   | mV   |
|              |                                           | $I_O = 0$ to $5A$                                                              |       | 0.05  | 0.5   |      |
| $V_d$        | Dropout Voltage                           | $I_O = 5A$                                                                     |       | 1.2   | 1.4   | V    |
| $I_q$        | Quiescent Current                         | $V_I \leq 25V$                                                                 |       | 5     | 10    | mA   |
| $I_{sc}$     | Short Circuit Current                     | $V_I - V_O = 5.5V$                                                             | 5.5   | 7     |       | A    |
|              | Thermal Regulation                        | $T_J = 25^\circ C$ , 30ms pulse                                                |       | 0.004 | 0.02  | %/W  |
| SVR          | Supply Voltage Rejection                  | $f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $I_O = 5A$<br>$V_I - V_O = 3 \pm 1V$ | 60    | 75    |       | dB   |
| eN           | RMS Output Noise Voltage<br>(% of $V_O$ ) | $T_J = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$                         |       | 0.003 |       | %    |
| S            | Temperature Stability                     |                                                                                |       | 0.5   |       | %    |
| S            | Long Term Stability                       | $T_J = 125^\circ C$ 1000Hrs                                                    |       | 0.03  | 1     | %    |

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

## LD1585C SERIES

**ELECTRICAL CHARACTERISTICS OF LD1585#33** ( $V_I=6.3V$ ,  $C_I = C_O = 10\mu F$ ,  $T_J = 0$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                                 | Test Conditions                                                                | Min.  | Typ.  | Max.  | Unit |
|--------------|-------------------------------------------|--------------------------------------------------------------------------------|-------|-------|-------|------|
| $V_O$        | Output Voltage                            | $I_O = 0 \text{ mA}$ $T_J = 25^\circ C$                                        | 3.267 | 3.3   | 3.333 | V    |
|              |                                           | $I_O = 0$ to $5A$ $V_I = 4.8$ to $25V$ (note 1)                                | 3.234 | 3.35  | 3.366 | V    |
| $\Delta V_O$ | Line Regulation                           | $I_O = 0 \text{ mA}$ $V_I = 4.8$ to $18V$ $T_J = 25^\circ C$                   |       | 0.005 | 0.2   | mV   |
|              |                                           | $I_O = 0 \text{ mA}$ $V_I = 4.9$ to $18V$                                      |       | 0.005 | 0.2   |      |
| $\Delta V_O$ | Load Regulation                           | $I_O = 0$ to $5A$ $T_J = 25^\circ C$                                           |       | 0.05  | 0.3   | mV   |
|              |                                           | $I_O = 0$ to $5A$                                                              |       | 0.05  | 0.5   |      |
| $V_d$        | Dropout Voltage                           | $I_O = 5A$                                                                     |       | 1.2   | 1.4   | V    |
| $I_q$        | Quiescent Current                         | $V_I \leq 25V$                                                                 |       | 5     | 10    | mA   |
| $I_{sc}$     | Short Circuit Current                     | $V_I - V_O = 5.5V$                                                             | 5.5   | 7     |       | A    |
|              | Thermal Regulation                        | $T_J = 25^\circ C$ , 30ms pulse                                                |       | 0.004 | 0.02  | %/W  |
| SVR          | Supply Voltage Rejection                  | $f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $I_O = 5A$<br>$V_I - V_O = 3 \pm 1V$ | 60    | 75    |       | dB   |
| eN           | RMS Output Noise Voltage<br>(% of $V_O$ ) | $T_J = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$                         |       | 0.003 |       | %    |
| S            | Temperature Stability                     |                                                                                |       | 0.5   |       | %    |
| S            | Long Term Stability                       | $T_J = 125^\circ C$ 1000Hrs                                                    |       | 0.03  | 1     | %    |

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

**ELECTRICAL CHARACTERISTICS OF LD1585#50** ( $V_I=8V$ ,  $C_I = C_O = 10\mu F$ ,  $T_J = 0$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                                 | Test Conditions                                                                | Min. | Typ.  | Max. | Unit |
|--------------|-------------------------------------------|--------------------------------------------------------------------------------|------|-------|------|------|
| $V_O$        | Output Voltage                            | $I_O = 0 \text{ mA}$ $T_J = 25^\circ C$                                        | 4.95 | 5     | 5.05 | V    |
|              |                                           | $I_O = 0$ to $5A$ $V_I = 6.5$ to $30V$ (note 1)                                | 4.9  | 5     | 5.1  | V    |
| $\Delta V_O$ | Line Regulation                           | $I_O = 0 \text{ mA}$ $V_I = 6.5$ to $20V$ $T_J = 25^\circ C$                   |      | 0.005 | 0.2  | mV   |
|              |                                           | $I_O = 0 \text{ mA}$ $V_I = 6.5$ to $20V$                                      |      | 0.005 | 0.2  |      |
| $\Delta V_O$ | Load Regulation                           | $I_O = 0$ to $5A$ $T_J = 25^\circ C$                                           |      | 0.05  | 0.3  | mV   |
|              |                                           | $I_O = 0$ to $5A$                                                              |      | 0.05  | 0.5  |      |
| $V_d$        | Dropout Voltage                           | $I_O = 5A$                                                                     |      | 1.2   | 1.4  | V    |
| $I_q$        | Quiescent Current                         | $V_I \leq 25V$                                                                 |      | 5     | 10   | mA   |
| $I_{sc}$     | Short Circuit Current                     | $V_I - V_O = 5.5V$                                                             | 5.5  | 7     |      | A    |
|              | Thermal Regulation                        | $T_J = 25^\circ C$ , 30ms pulse                                                |      | 0.004 | 0.02 | %/W  |
| SVR          | Supply Voltage Rejection                  | $f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $I_O = 5A$<br>$V_I - V_O = 3 \pm 1V$ | 60   | 75    |      | dB   |
| eN           | RMS Output Noise Voltage<br>(% of $V_O$ ) | $T_J = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$                         |      | 0.003 |      | %    |
| S            | Temperature Stability                     |                                                                                |      | 0.5   |      | %    |
| S            | Long Term Stability                       | $T_J = 125^\circ C$ 1000Hrs                                                    |      | 0.03  | 1    | %    |

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

**ELECTRICAL CHARACTERISTICS OF LD1585#80** ( $V_I=11V$ ,  $C_I = C_O = 10\mu F$ ,  $T_J = 0$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                                 | Test Conditions                                                                | Min. | Typ.  | Max. | Unit |
|--------------|-------------------------------------------|--------------------------------------------------------------------------------|------|-------|------|------|
| $V_O$        | Output Voltage                            | $I_O = 0 \text{ mA}$ $T_J = 25^\circ C$                                        | 7.92 | 8     | 8.08 | V    |
|              |                                           | $I_O = 0$ to $5A$ $V_I = 9.5$ to $30V$ (note 1)                                | 7.84 | 8     | 8.16 | V    |
| $\Delta V_O$ | Line Regulation                           | $I_O = 0 \text{ mA}$ $V_I = 9.5$ to $20V$ $T_J = 25^\circ C$                   |      | 0.005 | 0.2  | mV   |
|              |                                           | $I_O = 0 \text{ mA}$ $V_I = 9.5$ to $20V$                                      |      | 0.005 | 0.2  |      |
| $\Delta V_O$ | Load Regulation                           | $I_O = 0$ to $5A$ $T_J = 25^\circ C$                                           |      | 0.05  | 0.3  | mV   |
|              |                                           | $I_O = 0$ to $5A$                                                              |      | 0.05  | 0.5  |      |
| $V_d$        | Dropout Voltage                           | $I_O = 5A$                                                                     |      | 1.2   | 1.4  | V    |
| $I_q$        | Quiescent Current                         | $V_I \leq 25V$                                                                 |      | 5     | 10   | mA   |
| $I_{sc}$     | Short Circuit Current                     | $V_I - V_O = 5.5V$                                                             | 5.5  | 7     |      | A    |
|              | Thermal Regulation                        | $T_J = 25^\circ C$ , 30ms pulse                                                |      | 0.004 | 0.02 | %/W  |
| SVR          | Supply Voltage Rejection                  | $f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $I_O = 5A$<br>$V_I - V_O = 3 \pm 1V$ | 60   | 75    |      | dB   |
| eN           | RMS Output Noise Voltage<br>(% of $V_O$ ) | $T_J = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$                         |      | 0.003 |      | %    |
| S            | Temperature Stability                     |                                                                                |      | 0.5   |      | %    |
| S            | Long Term Stability                       | $T_J = 125^\circ C$ 1000Hrs                                                    |      | 0.03  | 1    | %    |

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

**ELECTRICAL CHARACTERISTICS OF LD1585#90** ( $V_I=12V$ ,  $C_I = C_O = 10\mu F$ ,  $T_J = 0$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                                 | Test Conditions                                                                | Min. | Typ.  | Max. | Unit |
|--------------|-------------------------------------------|--------------------------------------------------------------------------------|------|-------|------|------|
| $V_O$        | Output Voltage                            | $I_O = 0 \text{ mA}$ $T_J = 25^\circ C$                                        | 8.91 | 9     | 9.09 | V    |
|              |                                           | $I_O = 0$ to $5A$ $V_I = 10.5$ to $30V$ (note 1)                               | 8.82 | 9     | 9.18 | V    |
| $\Delta V_O$ | Line Regulation                           | $I_O = 0 \text{ mA}$ $V_I = 10.5$ to $20V$ $T_J = 25^\circ C$                  |      | 0.005 | 0.2  | mV   |
|              |                                           | $I_O = 0 \text{ mA}$ $V_I = 10.5$ to $20V$                                     |      | 0.005 | 0.2  |      |
| $\Delta V_O$ | Load Regulation                           | $I_O = 0$ to $5A$ $T_J = 25^\circ C$                                           |      | 0.05  | 0.3  | mV   |
|              |                                           | $I_O = 0$ to $5A$                                                              |      | 0.05  | 0.5  |      |
| $V_d$        | Dropout Voltage                           | $I_O = 5A$                                                                     |      | 1.2   | 1.4  | V    |
| $I_q$        | Quiescent Current                         | $V_I \leq 25V$                                                                 |      | 5     | 10   | mA   |
| $I_{sc}$     | Short Circuit Current                     | $V_I - V_O = 5.5V$                                                             | 5.5  | 7     |      | A    |
|              | Thermal Regulation                        | $T_J = 25^\circ C$ , 30ms pulse                                                |      | 0.004 | 0.02 | %/W  |
| SVR          | Supply Voltage Rejection                  | $f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $I_O = 5A$<br>$V_I - V_O = 3 \pm 1V$ | 60   | 75    |      | dB   |
| eN           | RMS Output Noise Voltage<br>(% of $V_O$ ) | $T_J = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$                         |      | 0.003 |      | %    |
| S            | Temperature Stability                     |                                                                                |      | 0.5   |      | %    |
| S            | Long Term Stability                       | $T_J = 125^\circ C$ 1000Hrs                                                    |      | 0.03  | 1    | %    |

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

## LD1585C SERIES

**ELECTRICAL CHARACTERISTICS OF LD1585#120** ( $V_I=15V$ ,  $C_I = C_O = 10\mu F$ ,  $T_J = 0$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol       | Parameter                                 | Test Conditions                                                                | Min.  | Typ.  | Max.  | Unit |
|--------------|-------------------------------------------|--------------------------------------------------------------------------------|-------|-------|-------|------|
| $V_O$        | Output Voltage                            | $I_O = 0 \text{ mA}$ $T_J = 25^\circ C$                                        | 11.88 | 12    | 12.12 | V    |
|              |                                           | $I_O = 0$ to $5A$ $V_I = 13.5$ to $30V$ (note 1)                               | 11.76 | 12    | 12.24 | V    |
| $\Delta V_O$ | Line Regulation                           | $I_O = 0 \text{ mA}$ $V_I = 13.5$ to $25V$ $T_J = 25^\circ C$                  |       | 0.005 | 0.2   | mV   |
|              |                                           | $I_O = 0 \text{ mA}$ $V_I = 13.5$ to $25V$                                     |       | 0.005 | 0.2   |      |
| $\Delta V_O$ | Load Regulation                           | $I_O = 0$ to $5A$ $T_J = 25^\circ C$                                           |       | 0.05  | 0.3   | mV   |
|              |                                           | $I_O = 0$ to $5A$                                                              |       | 0.05  | 0.5   |      |
| $V_d$        | Dropout Voltage                           | $I_O = 5A$                                                                     |       | 1.2   | 1.4   | V    |
| $I_q$        | Quiescent Current                         | $V_I \leq 25V$                                                                 |       | 5     | 10    | mA   |
| $I_{sc}$     | Short Circuit Current                     | $V_I - V_O = 5.5V$                                                             | 5.5   | 7     |       | A    |
|              | Thermal Regulation                        | $T_J = 25^\circ C$ , 30ms pulse                                                |       | 0.004 | 0.02  | %/W  |
| SVR          | Supply Voltage Rejection                  | $f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $I_O = 5A$<br>$V_I - V_O = 3 \pm 1V$ | 60    | 75    |       | dB   |
| eN           | RMS Output Noise Voltage<br>(% of $V_O$ ) | $T_J = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$                         |       | 0.003 |       | %    |
| S            | Temperature Stability                     |                                                                                |       | 0.5   |       | %    |
| S            | Long Term Stability                       | $T_J = 125^\circ C$ 1000Hrs                                                    |       | 0.03  | 1     | %    |

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

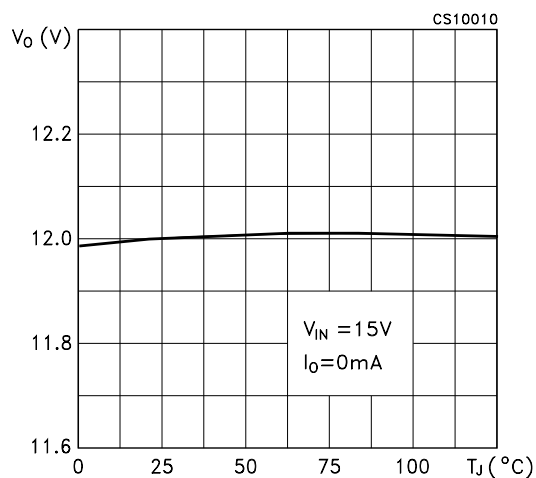
**ELECTRICAL CHARACTERISTICS OF LD1585#** ( $V_I=4.25V$ ,  $C_I = C_O = 10\mu F$ ,  $T_J = 0$  to  $125^\circ C$ , unless otherwise specified.)

| Symbol           | Parameter                                 | Test Conditions                                                                                       | Min.  | Typ.  | Max.  | Unit    |
|------------------|-------------------------------------------|-------------------------------------------------------------------------------------------------------|-------|-------|-------|---------|
| $V_O$            | Output Voltage                            | $I_O = 10\text{mA}$ $V_I - V_O = 3V$ $T_J = 25^\circ C$                                               | 1.237 | 1.25  | 1.263 | V       |
|                  |                                           | $I_O = 10\text{mA}$ to $5A$ $V_I - V_O = 1.5$ to $25V$<br>(note 1)                                    | 1.225 | 1.25  | 1.275 | V       |
| $\Delta V_O$     | Line Regulation                           | $I_O = 10\text{mA}$ $V_I = 2.75$ to $15V$ $T_J = 25^\circ C$                                          |       | 0.015 | 0.2   | %       |
|                  |                                           | $I_O = 10\text{mA}$ $V_I = 2.75$ to $15V$                                                             |       | 0.1   | 0.2   | %       |
| $\Delta V_O$     | Load Regulation                           | $I_O = 10\text{mA}$ to $5A$ $T_J = 25^\circ C$                                                        |       | 0.1   | 0.3   | %       |
|                  |                                           | $I_O = 0$ to $5A$                                                                                     |       | 0.25  | 0.5   | %       |
| $V_d$            | Dropout Voltage                           | $I_O = 5A$                                                                                            |       | 1.2   | 1.4   | V       |
| $I_{O(\min)}$    | Minimum Load Current                      | $V_I = 25V$                                                                                           |       | 3     | 10    | mA      |
| $I_{sc}$         | Short Circuit Current                     | $V_I - V_O = 5.5V$                                                                                    | 5.5   | 7     |       | A       |
|                  | Thermal Regulation                        | $T_J = 25^\circ C$ , 30ms pulse                                                                       |       | 0.004 | 0.02  | %/W     |
| SVR              | Supply Voltage Rejection                  | $f = 120 \text{ Hz}$ , $C_O = 25 \mu F$ , $C_{ADJ} = 25 \mu F$ ,<br>$I_O = 5A$ $V_I - V_O = 3 \pm 1V$ | 60    | 75    |       | dB      |
| $I_{ADJ}$        | Adjust Pin Current                        | $I_O = 10 \text{ mA}$                                                                                 |       | 50    | 100   | $\mu A$ |
| $\Delta I_{ADJ}$ | Adjust Pin Current Change                 | $I_O = 10\text{mA}$ to $5A$ $V_I = 3$ to $25V$ (note 1)                                               |       | 0.2   | 5     | $\mu A$ |
| eN               | RMS Output Noise Voltage<br>(% of $V_O$ ) | $T_J = 25^\circ C$ $f = 10\text{Hz}$ to $10\text{KHz}$                                                |       | 0.003 |       | %       |
| S                | Temperature Stability                     |                                                                                                       |       | 0.5   |       | %       |
| S                | Long Term Stability                       | $T_J = 125^\circ C$ 1000Hrs                                                                           |       | 0.5   |       | %       |

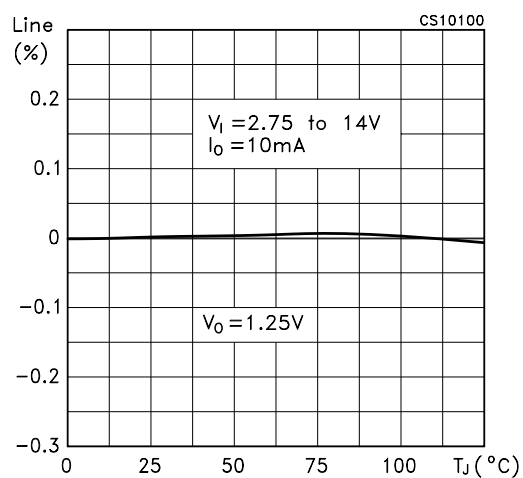
NOTE 1: See short-circuit current curve for available output current at fixed dropout.

**TYPICAL CHARACTERISTICS** (unless otherwise specified  $T_J = 25^\circ\text{C}$ ,  $C_I=C_O=10\mu\text{F}$  tant)

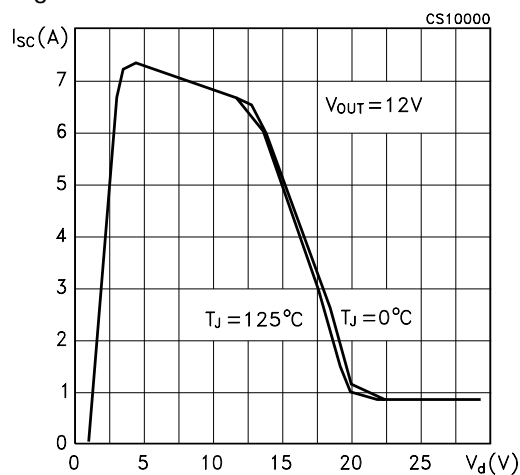
**Figure 1 : Output Voltage vs Temperature**



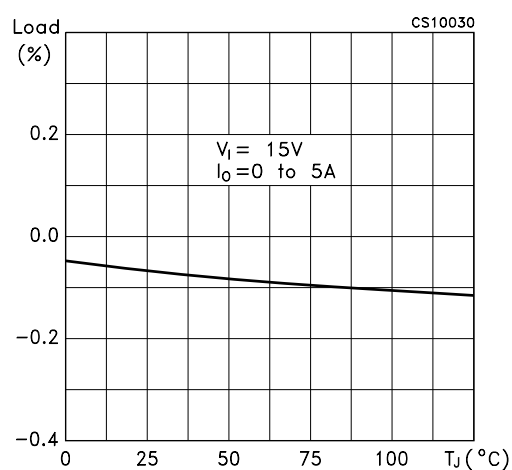
**Figure 4 : Line Regulation vs Temperature**



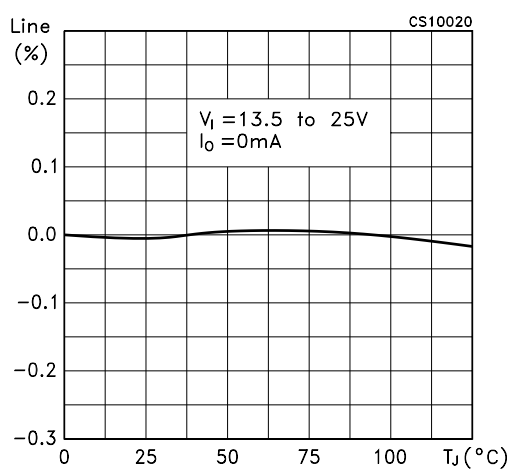
**Figure 2 : Short Circuit Current vs Dropout Voltage**



**Figure 5 : Load Regulation vs Temperature**



**Figure 3 : Line Regulation vs Temperature**



**Figure 6 : Load Regulation vs Temperature**

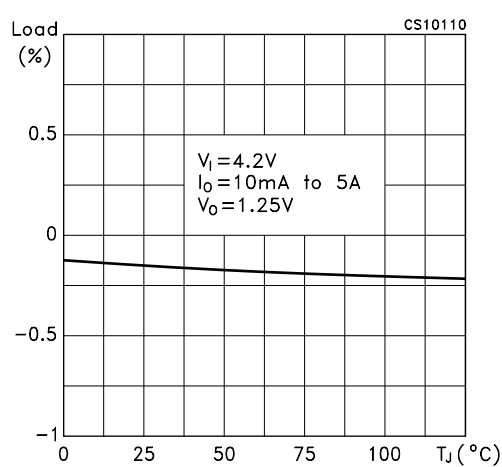


Figure 7 : Dropout Voltage vs Temperature

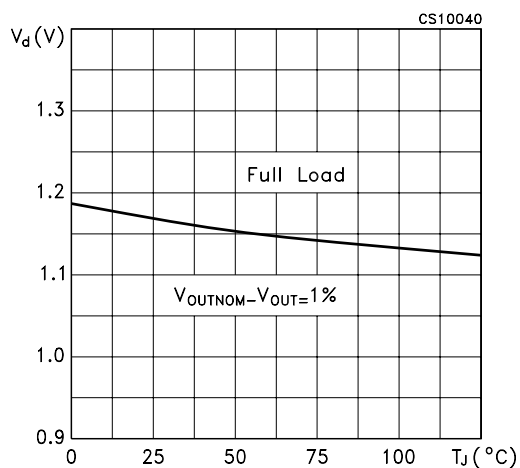


Figure 10 : Adjust Pin Current vs Temperature

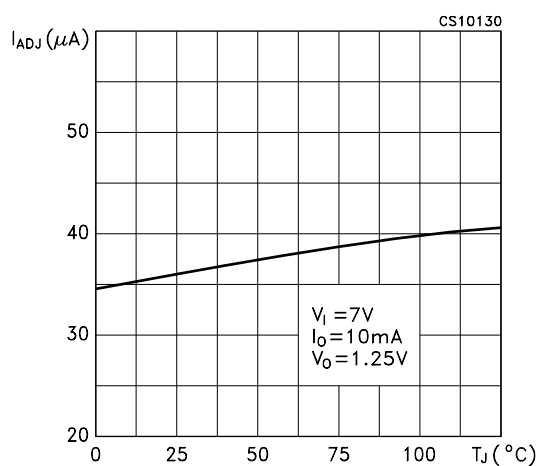


Figure 8 : Dropout Voltage vs Output Current

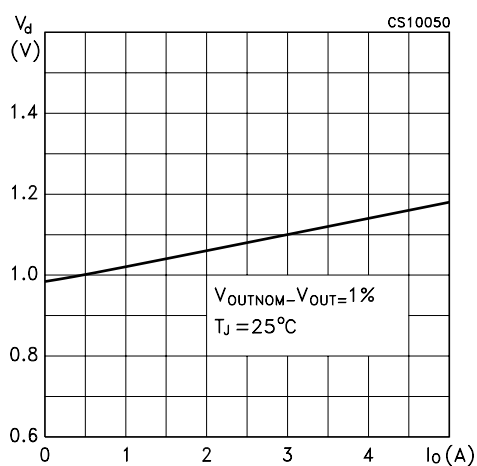


Figure 11 : Adjust Pin Current Change vs Temperature

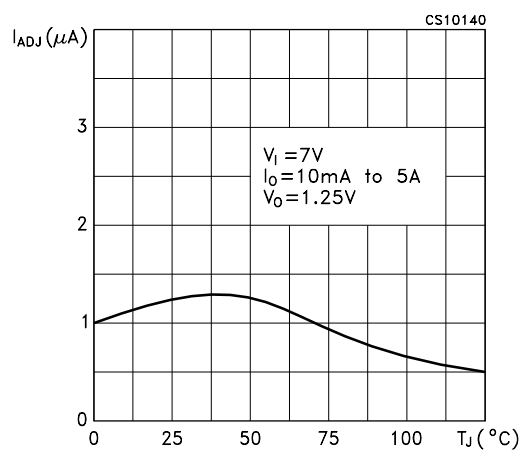


Figure 9 : Adjust Pin Current vs Input Voltage

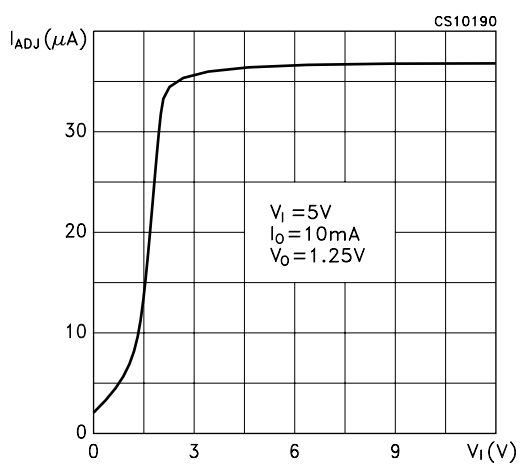
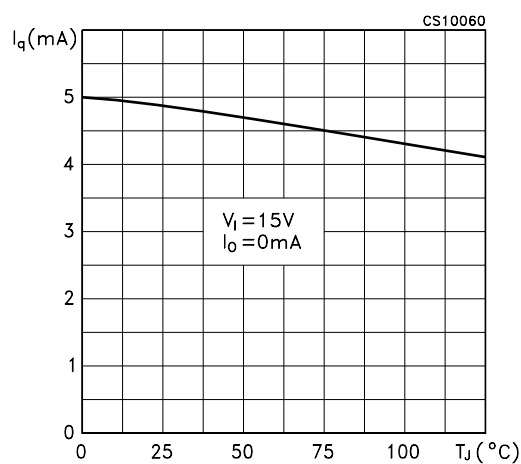
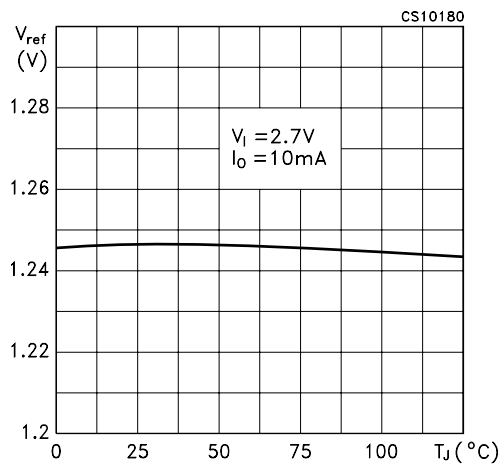
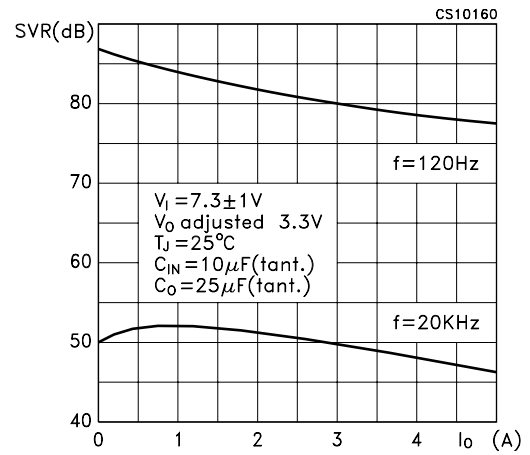
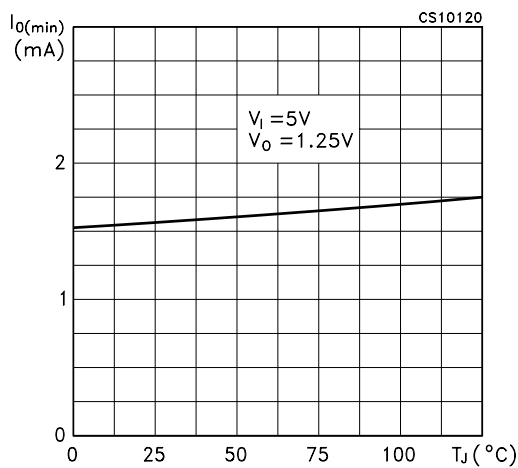
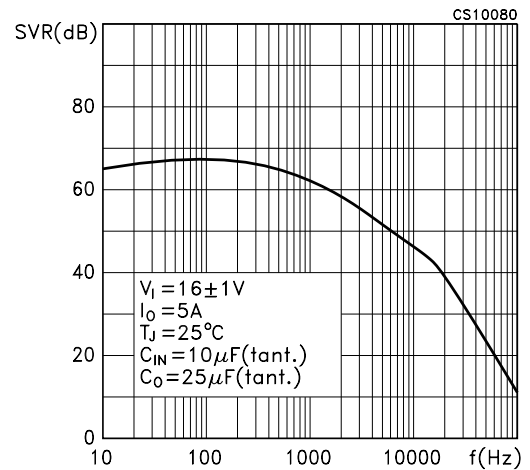
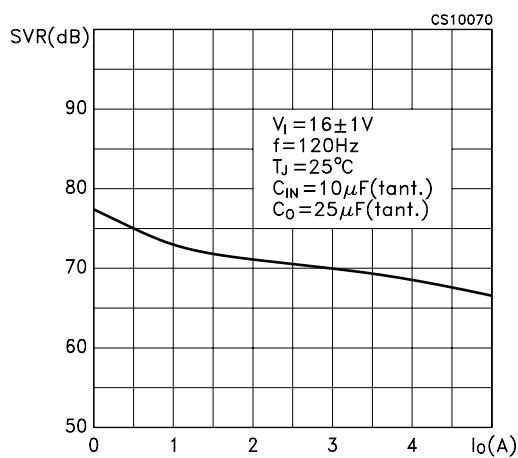
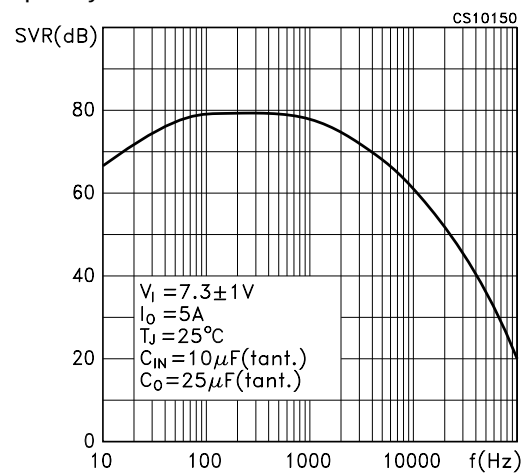
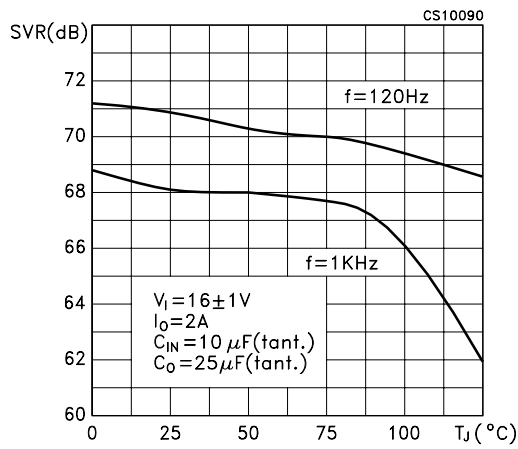


Figure 12 : Quiescent Current vs Temperature

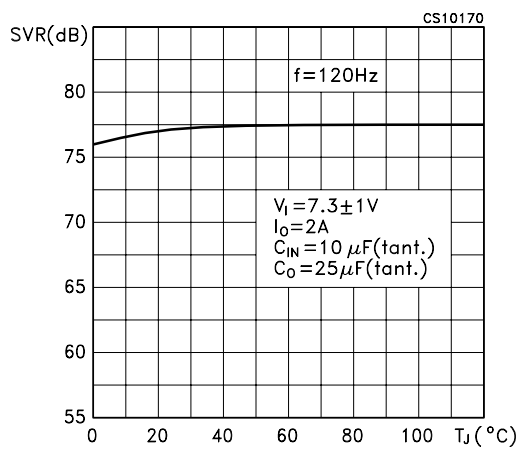


**Figure 13 : Reference Voltage vs Temperature****Figure 16 : Supply Voltage Rejection vs Output Current****Figure 14 : Minimum Load Current vs Temperature****Figure 17 : Supply Voltage Rejection vs Frequency****Figure 15 : Supply Voltage Rejection vs Output Current****Figure 18 : Supply Voltage Rejection vs Frequency**

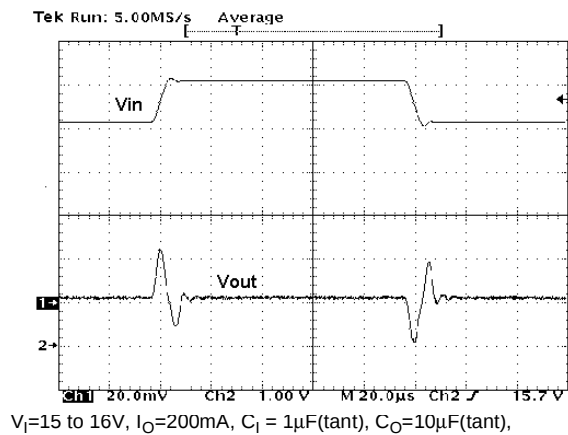
**Figure 19 : Supply Voltage Rejection vs Temperature**



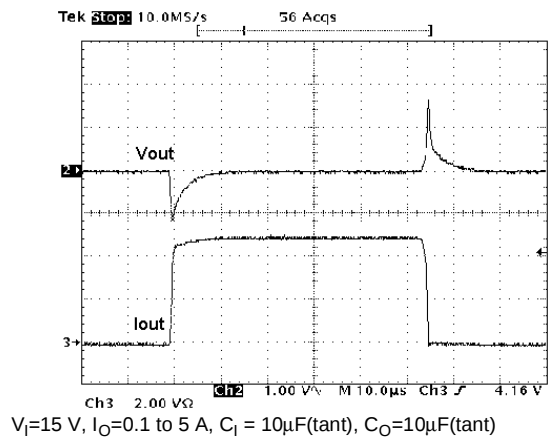
**Figure 20 : Supply Voltage Rejection vs Temperature**



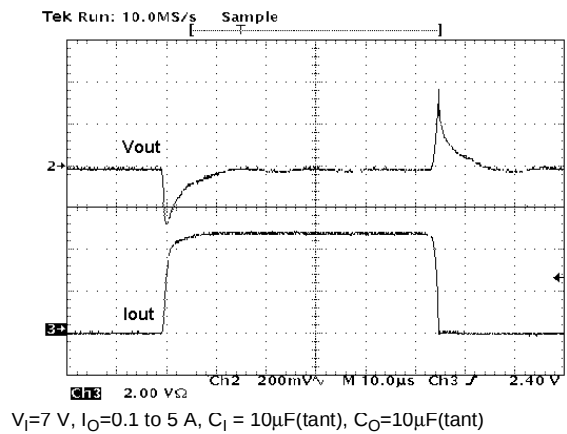
**Figure 21 : Line Transient**



**Figure 22 : Load Transient**

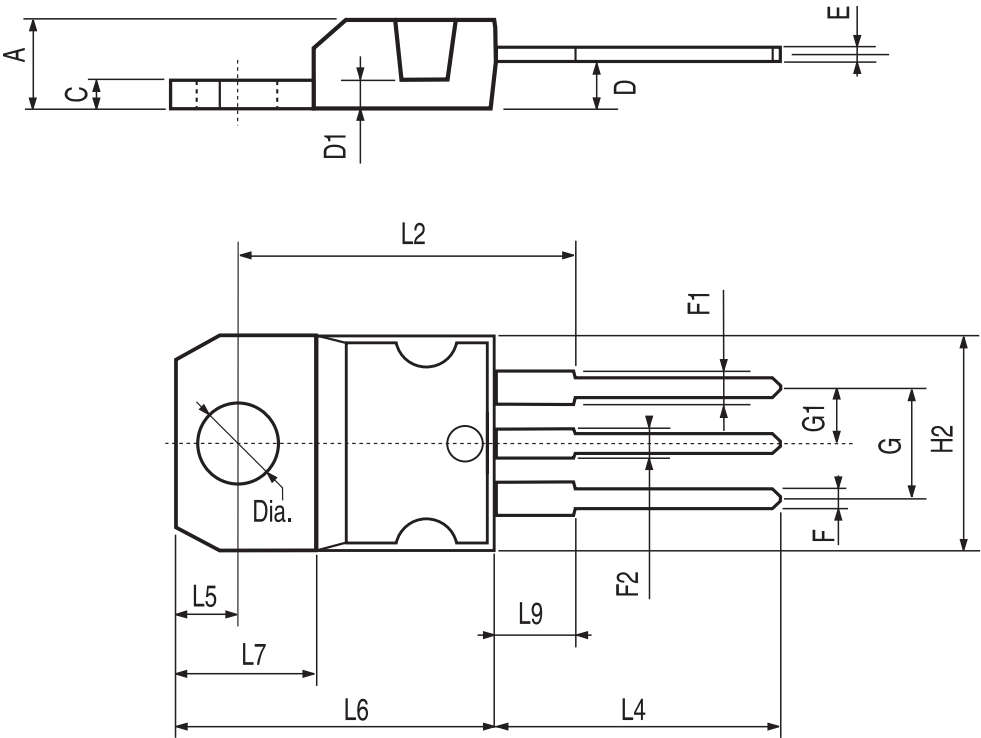


**Figure 23 : Load Transient**



TO-220 MECHANICAL DATA

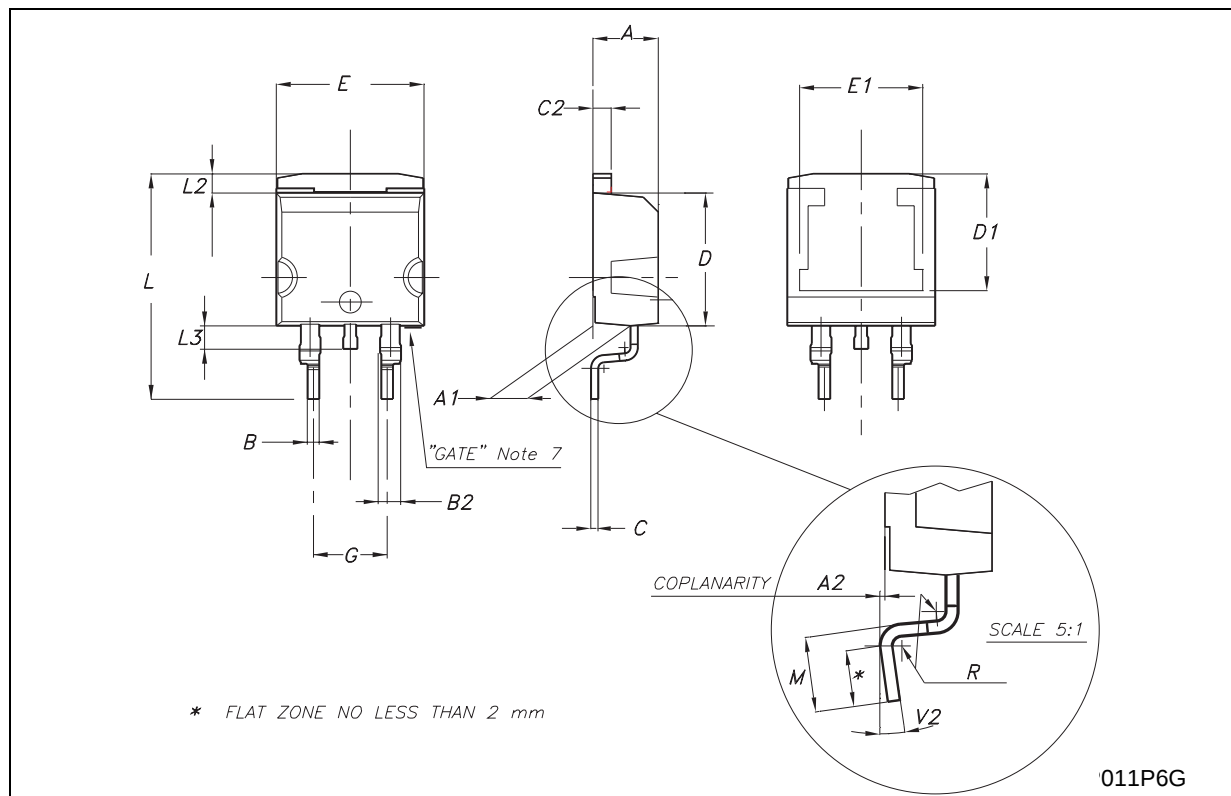
| DIM. | mm.   |      |       | inch  |       |       |
|------|-------|------|-------|-------|-------|-------|
|      | MIN.  | TYP  | MAX.  | MIN.  | TYP.  | MAX.  |
| A    | 4.40  |      | 4.60  | 0.173 |       | 0.181 |
| C    | 1.23  |      | 1.32  | 0.048 |       | 0.051 |
| D    | 2.40  |      | 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 |



P011C

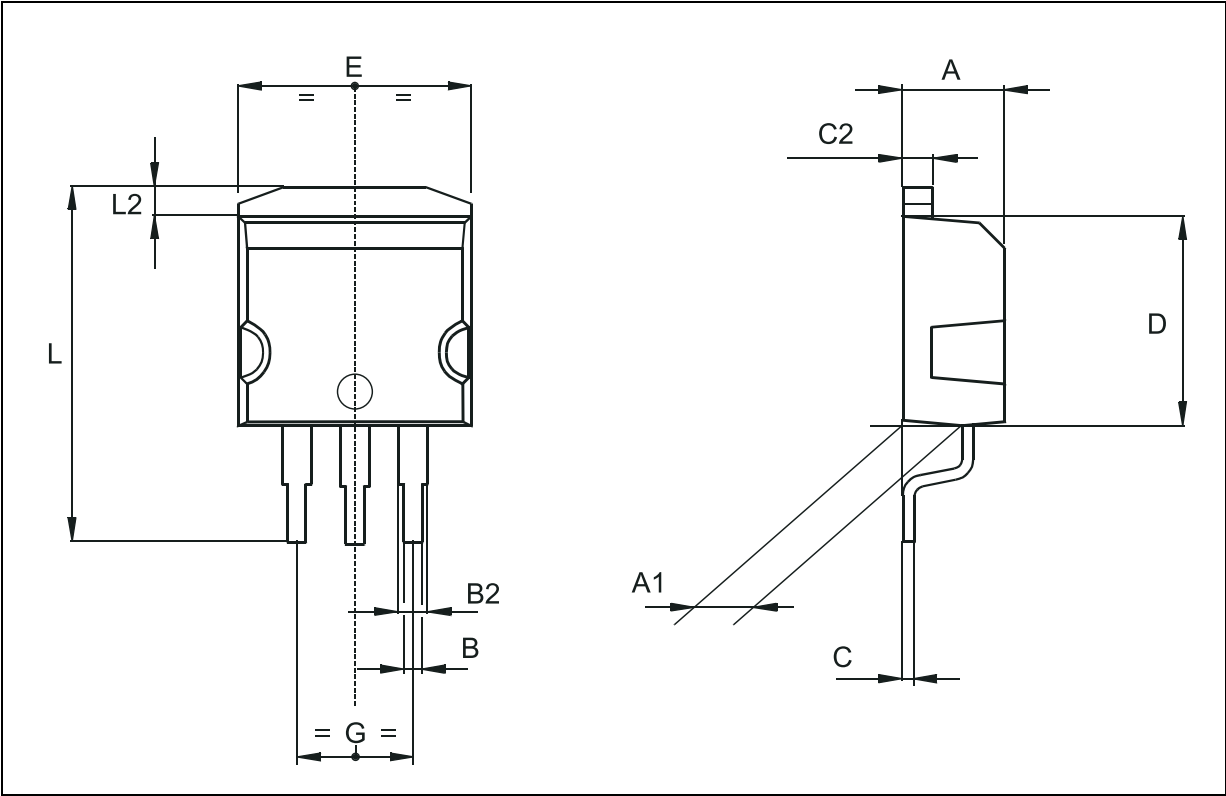
D<sup>2</sup>PAK MECHANICAL DATA

| 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 |
| A2   | 0.03 |     | 0.23  | 0.001 |       | 0.009 |
| 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 |
| D1   |      | 8   |       |       | 0.315 |       |
| E    | 10   |     | 10.4  | 0.393 |       | 0.409 |
| E1   |      | 8.5 |       |       | 0.335 |       |
| 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 |
| M    | 2.4  |     | 3.2   | 0.094 |       | 0.126 |
| R    |      | 0.4 |       |       | 0.016 |       |
| V2   | 0°   |     | 8°    | 0°    |       | 8°    |



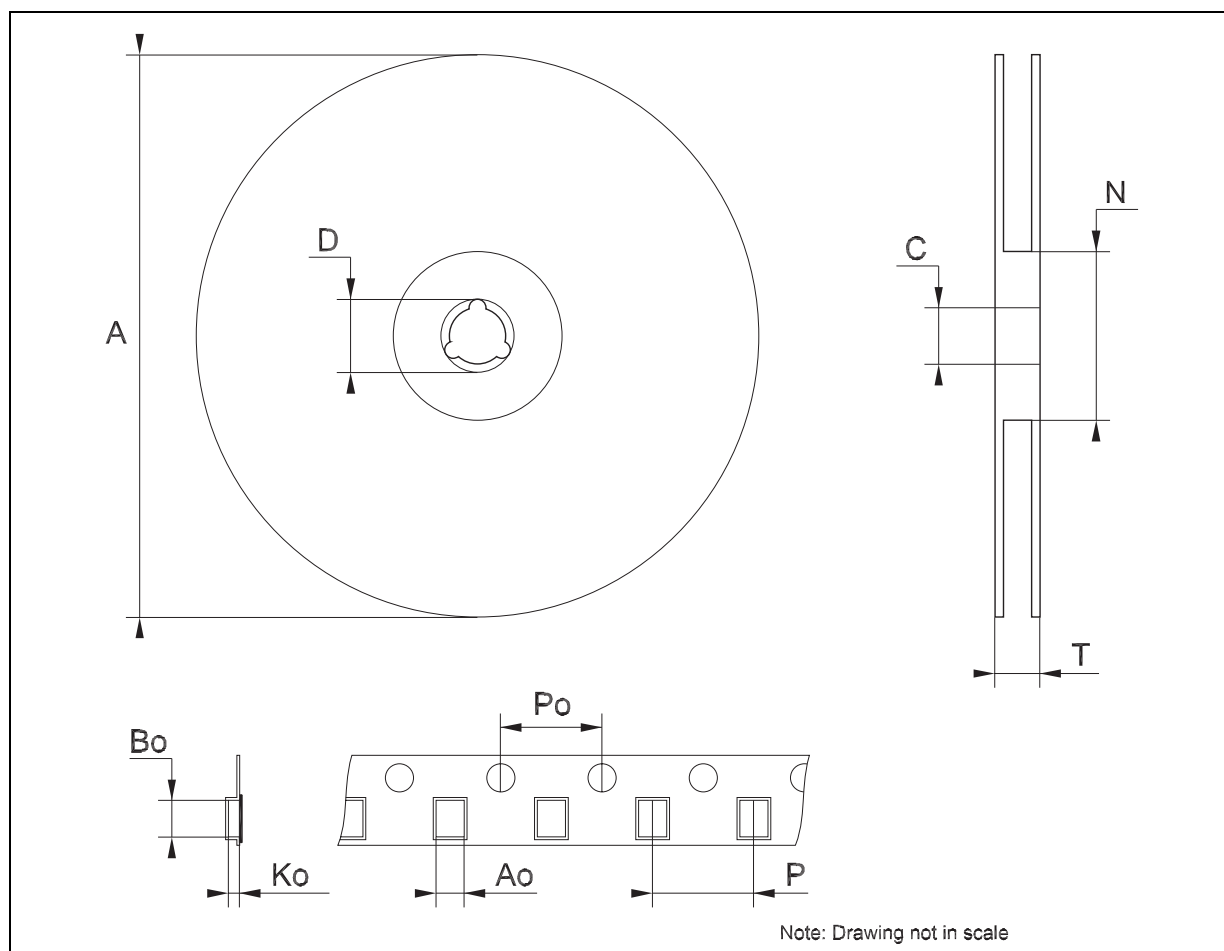
D<sup>2</sup>PAK/A MECHANICAL DATA

| DIM. | mm.  |     |       | inch  |      |       |
|------|------|-----|-------|-------|------|-------|
|      | MIN. | TYP | MAX.  | MIN.  | TYP. | MAX.  |
| A    | 4.40 |     | 4.60  | 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 |     | 0.60  | 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 |      | 0.106 |
| L2   | 1.27 |     | 1.4   | 0.050 |      | 0.055 |



Tape & Reel D<sup>2</sup>PAK-P<sup>2</sup>PAK-D<sup>2</sup>PAK/A-P<sup>2</sup>PAK/A MECHANICAL DATA

| DIM. | mm.   |       |       | inch  |       |       |
|------|-------|-------|-------|-------|-------|-------|
|      | MIN.  | TYP   | MAX.  | MIN.  | TYP.  | MAX.  |
| A    |       |       | 180   |       |       | 7.086 |
| C    | 12.8  | 13.0  | 13.2  | 0.504 | 0.512 | 0.519 |
| D    | 20.2  |       |       | 0.795 |       |       |
| N    | 60    |       |       | 2.362 |       |       |
| T    |       |       | 14.4  |       |       | 0.567 |
| Ao   | 10.50 | 10.6  | 10.70 | 0.413 | 0.417 | 0.421 |
| Bo   | 15.70 | 15.80 | 15.90 | 0.618 | 0.622 | 0.626 |
| Ko   | 4.80  | 4.90  | 5.00  | 0.189 | 0.193 | 0.197 |
| Po   | 3.9   | 4.0   | 4.1   | 0.153 | 0.157 | 0.161 |
| P    | 11.9  | 12.0  | 12.1  | 0.468 | 0.472 | 0.476 |



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