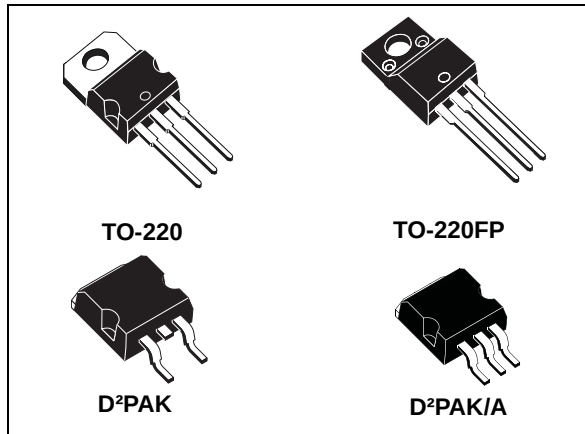


## 3 A low drop positive voltage regulator: adjustable and fixed

Datasheet - production data



Unlike PNP regulators, where a part of the output current is wasted as quiescent current, the LD1085 quiescent current flows into the load, thus increase efficiency. Only a 10  $\mu$ F minimum capacitor is need for stability.

The device is supplied in TO-220, TO-220FP, D²PAK and D²PAK/A packages. On-chip trimming allows the regulator to reach a very tight output voltage tolerance, within  $\pm 1\%$  at 25 °C.

### Features

- Typical dropout 1.3 V (at 3 A)
- Three terminal adjustable or fixed output voltage 1.8 V, 2.5 V, 3.3 V, 5 V
- Guaranteed output current up to 3 A
- Output tolerance  $\pm 1\%$  at 25 °C and  $\pm 2\%$  in full temperature range
- Internal power and thermal limit
- Wide operating temperature range -40 °C to 125 °C
- Package available: TO-220, TO-220FP, D²PAK, D²PAK/A
- Pinout compatibility with standard adjustable VREG

### Description

The LD1085 is a low drop voltage regulator able to provide up to 3 A of output current. Dropout is guaranteed at a maximum of 1.2 V at the maximum output current, decreasing at lower loads. The LD1085 is pin-to-pin compatible with the older 3-terminal adjustable regulators, but offers better performance in terms of drop and output tolerance.

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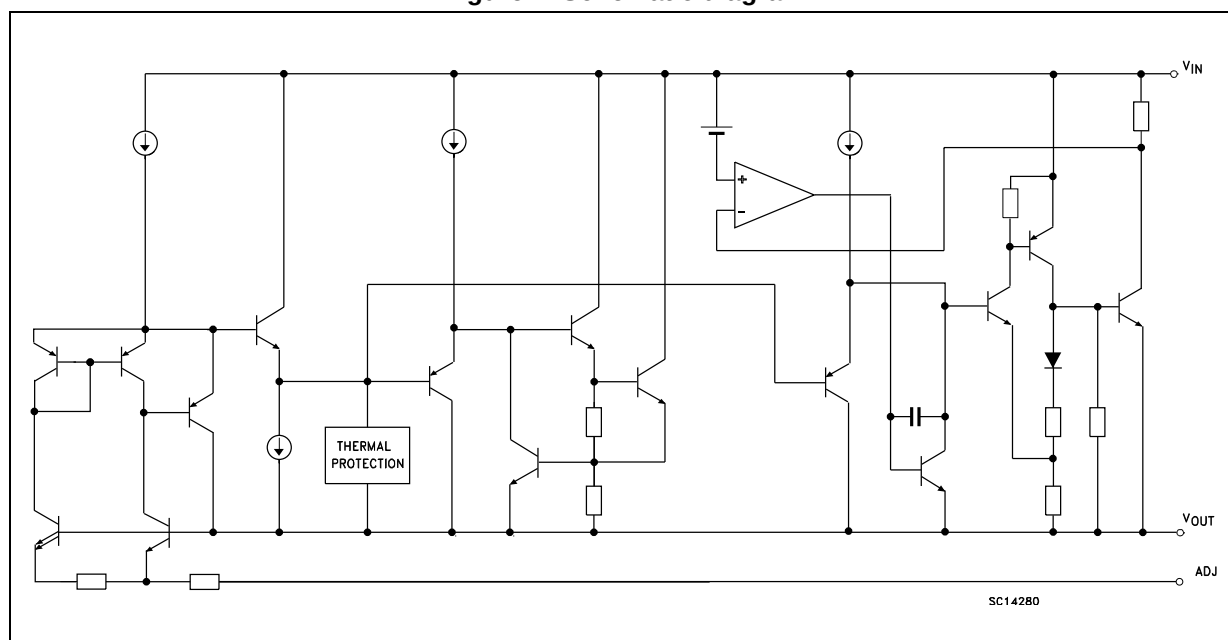
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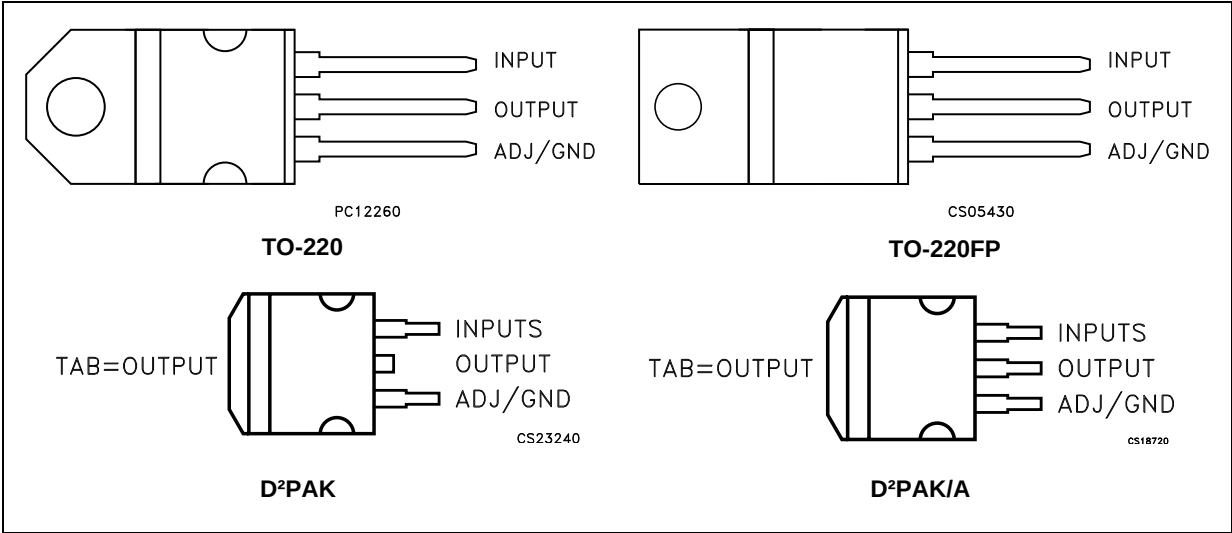
# 1 Diagram

Figure 1. Schematic diagram



## 2 Pin configuration

Figure 2. Pin connections (top view)



### 3 Maximum ratings

**Table 1. Absolute maximum ratings**

| Symbol    | Parameter                            | 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   |

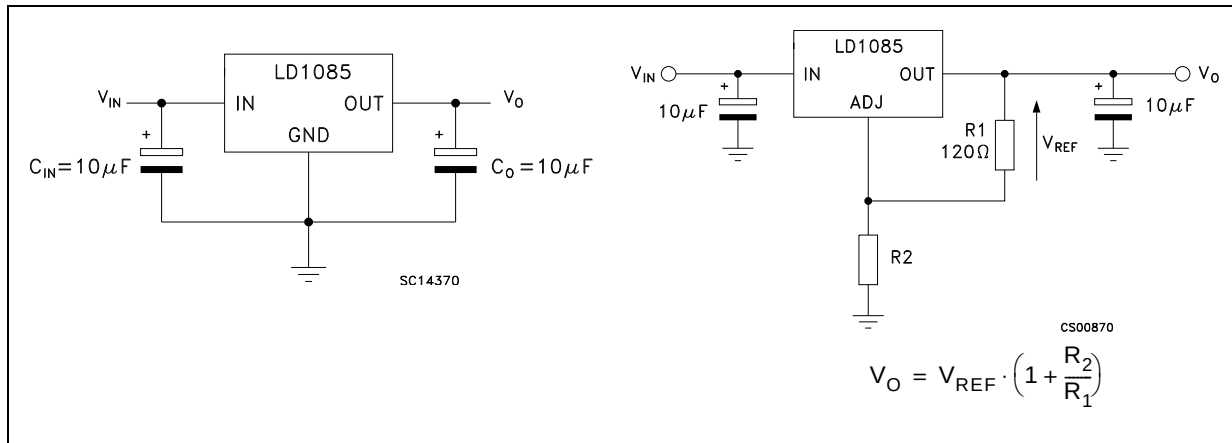
*Note: Absolute maximum ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied*

**Table 2. Thermal data**

| Symbol     | Parameter                           | TO-220 | TO-220FP | D <sup>2</sup> PAK<br>D <sup>2</sup> PAK/A | Unit |
|------------|-------------------------------------|--------|----------|--------------------------------------------|------|
| $R_{thJC}$ | Thermal resistance junction-case    | 3      | 5        | 3                                          | °C/W |
| $R_{thJA}$ | Thermal resistance junction-ambient | 50     | 60       | 62.5                                       | °C/W |

## 4 Application schematic

Figure 3. Application circuit



## 5 Electrical characteristics

$V_I = 4.8\text{ V}$ ,  $C_I = C_O = 10\text{ }\mu\text{F}$ ,  $T_A = -40\text{ to }125\text{ }^\circ\text{C}$ , unless otherwise specified.

**Table 3. Electrical characteristics of LD1085#18**

| Symbol       | Parameter                              | Test condition                                                                                         | Min.  | Typ.  | Max.  | Unit |
|--------------|----------------------------------------|--------------------------------------------------------------------------------------------------------|-------|-------|-------|------|
| $V_O$        | Output voltage <sup>(1)</sup>          | $I_O = 0\text{ mA}$ , $T_J = 25^\circ\text{C}$                                                         | 1.782 | 1.8   | 1.818 | V    |
|              |                                        | $I_O = 0\text{ to }3\text{ A}$ , $V_I = 3.4\text{ to }30\text{ V}$                                     | 1.764 | 1.8   | 1.836 | V    |
| $\Delta V_O$ | Line regulation                        | $I_O = 0\text{ mA}$ , $V_I = 3.4\text{ to }18\text{ V}$ , $T_J = 25^\circ\text{C}$                     |       | 0.2   | 4     | mV   |
|              |                                        | $I_O = 0\text{ mA}$ , $V_I = 3.4\text{ to }15\text{ V}$                                                |       | 0.4   | 4     | mV   |
| $\Delta V_O$ | Load regulation                        | $I_O = 0\text{ to }3\text{ A}$ , $T_J = 25^\circ\text{C}$                                              |       | 2     | 10    | mV   |
|              |                                        | $I_O = 0\text{ to }3\text{ A}$                                                                         |       | 4     | 20    | mV   |
| $V_d$        | Dropout voltage                        | $I_O = 3\text{ A}$                                                                                     |       | 1.3   | 1.5   | V    |
| $I_q$        | Quiescent current                      | $V_I \leq 30\text{ V}$                                                                                 |       | 5     | 10    | mA   |
| $I_{sc}$     | Short-circuit current                  | $V_I - V_O = 5\text{ V}$                                                                               | 3.2   | 4.5   |       | A    |
|              |                                        | $V_I - V_O = 25\text{ V}$                                                                              | 0.2   | 0.5   |       | A    |
|              | Thermal regulation                     | $T_A = 25^\circ\text{C}$ , 30 ms pulse                                                                 |       | 0.008 | 0.04  | %/W  |
| SVR          | Supply voltage rejection               | $f = 120\text{ Hz}$ , $C_O = 25\text{ }\mu\text{F}$ , $I_O = 3\text{ A}$<br>$V_I = 7.5 \pm 3\text{ V}$ | 60    | 72    |       | dB   |
| eN           | RMS output noise voltage (% of $V_O$ ) | $T_A = 25^\circ\text{C}$ , $f = 10\text{ Hz to }10\text{ kHz}$                                         |       | 0.003 |       | %    |
| S            | Temperature stability                  |                                                                                                        |       | 0.5   |       | %    |
| S            | Long term stability                    | $T_A = 125^\circ\text{C}$ , 1000 Hrs                                                                   |       | 0.5   |       | %    |

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

$V_I = 5.5\text{ V}$ ,  $C_I = C_O = 10\text{ }\mu\text{F}$ ,  $T_A = -40\text{ to }125\text{ }^\circ\text{C}$ , unless otherwise specified.

**Table 4. Electrical characteristics of LD1085#25**

| Symbol       | Parameter                              | Test condition                                                                                 | Min.  | Typ.  | Max.  | Unit |
|--------------|----------------------------------------|------------------------------------------------------------------------------------------------|-------|-------|-------|------|
| $V_O$        | Output voltage <sup>(1)</sup>          | $I_O = 0\text{ mA}$ , $T_J = 25^\circ\text{C}$                                                 | 2.475 | 2.5   | 2.525 | V    |
|              |                                        | $I_O = 0\text{ to }3\text{ A}$ , $V_I = 4.1\text{ to }30\text{ V}$                             | 2.45  | 2.5   | 2.55  | V    |
| $\Delta V_O$ | Line regulation                        | $I_O = 0\text{ mA}$ , $V_I = 4.1\text{ to }18\text{ V}$ , $T_J = 25^\circ\text{C}$             |       | 0.2   | 4     | mV   |
|              |                                        | $I_O = 0\text{ mA}$ , $V_I = 4.1\text{ to }18\text{ V}$                                        |       | 0.4   | 4     | mV   |
| $\Delta V_O$ | Load regulation                        | $I_O = 0\text{ to }3\text{ A}$ , $T_J = 25^\circ\text{C}$                                      |       | 2     | 10    | mV   |
|              |                                        | $I_O = 0\text{ to }3\text{ A}$                                                                 |       | 4     | 20    | mV   |
| $V_d$        | Dropout voltage                        | $I_O = 3\text{ A}$                                                                             |       | 1.3   | 1.5   | V    |
| $I_q$        | Quiescent current                      | $V_I \leq 30\text{ V}$                                                                         |       | 5     | 10    | mA   |
| $I_{sc}$     | Short-circuit current                  | $V_I - V_O = 5\text{ V}$                                                                       | 3.2   | 4.5   |       | A    |
|              |                                        | $V_I - V_O = 25\text{ V}$                                                                      | 0.2   | 0.5   |       | A    |
|              | Thermal regulation                     | $T_A = 25^\circ\text{C}$ , 30ms pulse                                                          |       | 0.008 | 0.04  | %/W  |
| SVR          | Supply voltage rejection               | $f = 120\text{ Hz}$ , $C_O = 25\mu\text{F}$ , $I_O = 3\text{ A}$<br>$V_I = 7.5 \pm 3\text{ V}$ | 60    | 72    |       | dB   |
| eN           | RMS output noise voltage (% of $V_O$ ) | $T_A = 25^\circ\text{C}$ , $f = 10\text{ Hz to }10\text{ kHz}$                                 |       | 0.003 |       | %    |
| S            | Temperature stability                  |                                                                                                |       | 0.5   |       | %    |
| S            | Long term stability                    | $T_A = 125^\circ\text{C}$ , 1000 Hrs                                                           |       | 0.5   |       | %    |

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



$V_I = 6.3 \text{ V}$ ,  $C_I = C_O = 10 \mu\text{F}$ ,  $T_A = -40 \text{ to } 125 \text{ }^\circ\text{C}$ , unless otherwise specified.

**Table 5. Electrical characteristics of LD1085#33**

| Symbol       | Parameter                              | Test condition                                                                                     | Min.  | Typ.  | Max.  | Unit |
|--------------|----------------------------------------|----------------------------------------------------------------------------------------------------|-------|-------|-------|------|
| $V_O$        | Output voltage <sup>(1)</sup>          | $I_O = 0 \text{ mA}$ , $T_J = 25^\circ\text{C}$                                                    | 3.267 | 3.3   | 3.333 | V    |
|              |                                        | $I_O = 0 \text{ to } 3 \text{ A}$ , $V_I = 4.9 \text{ to } 30 \text{ V}$                           | 3.234 | 3.35  | 3.366 | V    |
| $\Delta V_O$ | Line regulation                        | $I_O = 0 \text{ mA}$ , $V_I = 4.9 \text{ to } 18 \text{ V}$ , $T_J = 25^\circ\text{C}$             |       | 0.5   | 6     | mV   |
|              |                                        | $I_O = 0 \text{ mA}$ , $V_I = 4.9 \text{ to } 18 \text{ V}$                                        |       | 1     | 6     | mV   |
| $\Delta V_O$ | Load regulation                        | $I_O = 0 \text{ to } 3 \text{ A}$ , $T_J = 25^\circ\text{C}$                                       |       | 3     | 15    | mV   |
|              |                                        | $I_O = 0 \text{ to } 3 \text{ A}$                                                                  |       | 7     | 20    | mV   |
| $V_d$        | Dropout voltage                        | $I_O = 3 \text{ A}$                                                                                |       | 1.3   | 1.5   | V    |
| $I_q$        | Quiescent current                      | $V_I \leq 30 \text{ V}$                                                                            |       | 5     | 10    | mA   |
| $I_{sc}$     | Short-circuit current                  | $V_I - V_O = 5 \text{ V}$                                                                          | 3.2   | 4.5   |       | A    |
|              |                                        | $V_I - V_O = 25 \text{ V}$                                                                         | 0.2   | 0.5   |       | A    |
|              | Thermal regulation                     | $T_A = 25^\circ\text{C}$ , 30 ms pulse                                                             |       | 0.008 | 0.04  | %/W  |
| SVR          | Supply voltage rejection               | $f = 120 \text{ Hz}$ , $C_O = 25 \mu\text{F}$ , $I_O = 3 \text{ A}$<br>$V_I = 8.3 \pm 3 \text{ V}$ | 60    | 72    |       | dB   |
| eN           | RMS output noise voltage (% of $V_O$ ) | $T_A = 25^\circ\text{C}$ , $f = 10 \text{ Hz to } 10 \text{ kHz}$                                  |       | 0.003 |       | %    |
| S            | Temperature stability                  |                                                                                                    |       | 0.5   |       | %    |
| S            | Long term stability                    | $T_A = 125^\circ\text{C}$ , 1000 Hrs                                                               |       | 0.5   |       | %    |

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

$V_I = 8\text{ V}$ ,  $C_I = C_O = 10\text{ }\mu\text{F}$ ,  $T_A = -40\text{ to }125\text{ }^\circ\text{C}$ , unless otherwise specified.

**Table 6. Electrical characteristics of LD1085#50**

| Symbol       | Parameter                              | Test condition                                                                                        | Min. | Typ.  | Max. | Unit |
|--------------|----------------------------------------|-------------------------------------------------------------------------------------------------------|------|-------|------|------|
| $V_O$        | Output voltage <sup>(1)</sup>          | $I_O = 0\text{ mA}$ , $T_J = 25^\circ\text{C}$                                                        | 4.95 | 5     | 5.05 | V    |
|              |                                        | $I_O = 0\text{ to }3\text{ A}$ , $V_I = 6.6\text{ to }30\text{ V}$                                    | 4.9  | 5     | 5.1  | V    |
| $\Delta V_O$ | Line regulation                        | $I_O = 0\text{ mA}$ , $V_I = 6.6\text{ to }20\text{ V}$ , $T_J = 25^\circ\text{C}$                    |      | 0.5   | 10   | mV   |
|              |                                        | $I_O = 0\text{ mA}$ , $V_I = 6.6\text{ to }20\text{ V}$                                               |      | 1     | 10   | mV   |
| $\Delta V_O$ | Load regulation                        | $I_O = 0\text{ to }3\text{ A}$ , $T_J = 25^\circ\text{C}$                                             |      | 5     | 10   | mV   |
|              |                                        | $I_O = 0\text{ to }3\text{ A}$                                                                        |      | 10    | 35   | mV   |
| $V_d$        | Dropout voltage                        | $I_O = 3\text{ A}$                                                                                    |      | 1.3   | 1.5  | V    |
| $I_q$        | Quiescent current                      | $V_I \leq 30\text{ V}$                                                                                |      | 5     | 10   | mA   |
| $I_{sc}$     | Short-circuit current                  | $V_I - V_O = 5\text{ V}$                                                                              | 3.2  | 4.5   |      | A    |
|              |                                        | $V_I - V_O = 25\text{ V}$                                                                             | 0.2  | 0.5   |      | A    |
|              | Thermal regulation                     | $T_A = 25^\circ\text{C}$ , 30 ms pulse                                                                |      | 0.008 | 0.04 | %/W  |
| SVR          | Supply voltage rejection               | $f = 120\text{ Hz}$ , $C_O = 25\text{ }\mu\text{F}$ , $I_O = 3\text{ A}$<br>$V_I = 10 \pm 3\text{ V}$ | 60   | 72    |      | dB   |
| eN           | RMS output noise voltage (% of $V_O$ ) | $T_A = 25^\circ\text{C}$ , $f = 10\text{ Hz to }10\text{ kHz}$                                        |      | 0.003 |      | %    |
| S            | Temperature stability                  |                                                                                                       |      | 0.5   |      | %    |
| S            | Long term stability                    | $T_A = 125^\circ\text{C}$ , 1000 Hrs                                                                  |      | 0.5   |      | %    |

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

$V_I = 4.25\text{ V}$ ,  $C_I = C_O = 10\text{ }\mu\text{F}$ ,  $T_A = -40\text{ to }125\text{ }^\circ\text{C}$ , unless otherwise specified.

**Table 7. Electrical characteristics of LD1085#**

| Symbol                  | Parameter                                | Test condition                                                                                                                                    | Min.  | Typ.  | Max.  | Unit          |
|-------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|---------------|
| $V_{\text{ref}}$        | Reference voltage <sup>(1)</sup>         | $I_O = 10\text{ mA}$ , $T_J = 25^\circ\text{C}$                                                                                                   | 1.237 | 1.25  | 1.263 | V             |
|                         |                                          | $I_O = 10\text{ mA}$ to $3\text{ A}$ , $V_I = 2.85\text{ to }30\text{ V}$                                                                         | 1.225 | 1.25  | 1.275 | V             |
| $\Delta V_O$            | Line regulation                          | $I_O = 10\text{ mA}$ , $V_I = 2.85\text{ to }16.5\text{ V}$ , $T_J = 25^\circ\text{C}$                                                            |       | 0.015 | 0.2   | %             |
|                         |                                          | $I_O = 10\text{ mA}$ , $V_I = 2.85\text{ to }16.5\text{ V}$                                                                                       |       | 0.035 | 0.2   | %             |
| $\Delta V_O$            | Load regulation                          | $I_O = 10\text{ mA}$ to $3\text{ A}$ , $T_J = 25^\circ\text{C}$                                                                                   |       | 0.1   | 0.3   | %             |
|                         |                                          | $I_O = 0\text{ to }3\text{ A}$                                                                                                                    |       | 0.2   | 0.4   | %             |
| $V_d$                   | Dropout voltage                          | $I_O = 3\text{ A}$                                                                                                                                |       | 1.3   | 1.5   | V             |
| $I_{O(\text{min})}$     | Minimum load current                     | $V_I = 30\text{ V}$                                                                                                                               |       | 3     | 10    | mA            |
| $I_{\text{sc}}$         | Short-circuit current                    | $V_I - V_O = 5\text{ V}$                                                                                                                          | 5.5   | 6.5   |       | A             |
|                         |                                          | $V_I - V_O = 25\text{ V}$                                                                                                                         | 0.5   | 0.7   |       | A             |
|                         | Thermal regulation                       | $T_A = 25^\circ\text{C}$ , 30ms pulse                                                                                                             |       | 0.003 | 0.015 | %/W           |
| SVR                     | Supply voltage rejection                 | $f = 120\text{ Hz}$ , $C_O = 25\text{ }\mu\text{F}$ , $C_{\text{ADJ}} = 25\text{ }\mu\text{F}$ , $I_O = 3\text{ A}$ , $V_I = 6.25 \pm 3\text{ V}$ | 60    | 72    |       | dB            |
| $I_{\text{ADJ}}$        | Adjust pin current                       | $V_I = 4.25\text{ V}$ , $I_O = 10\text{ mA}$                                                                                                      |       | 55    | 120   | $\mu\text{A}$ |
| $\Delta I_{\text{ADJ}}$ | Adjust pin current change <sup>(1)</sup> | $I_O = 10\text{ mA}$ to $3\text{ A}$ , $V_I = 2.85\text{ to }16.5\text{ V}$                                                                       |       | 0.2   | 5     | $\mu\text{A}$ |
| eN                      | RMS output noise voltage (% of $V_O$ )   | $T_A = 25^\circ\text{C}$ , $f = 10\text{ Hz to }10\text{ kHz}$                                                                                    |       | 0.003 |       | %             |
| S                       | Temperature stability                    |                                                                                                                                                   |       | 0.5   |       | %             |
| S                       | Long term stability                      | $T_A = 125^\circ\text{C}$ , 1000 Hrs                                                                                                              |       | 0.5   |       | %             |

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

## 6 Typical characteristics

Unless otherwise specified  $T_J = 25\text{ }^{\circ}\text{C}$ ,  $C_I = C_O = 10\text{ }\mu\text{F}$ .

Figure 4. Output voltage vs. temp. ( $I_O = 3\text{ A}$ )

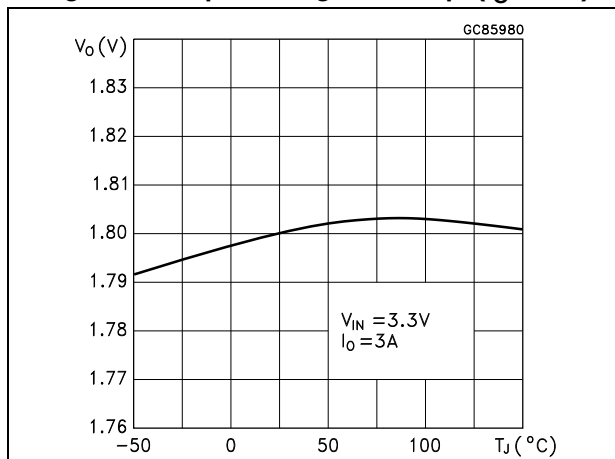


Figure 5. Output voltage vs. temp. ( $I_O = 0\text{ mA}$ )

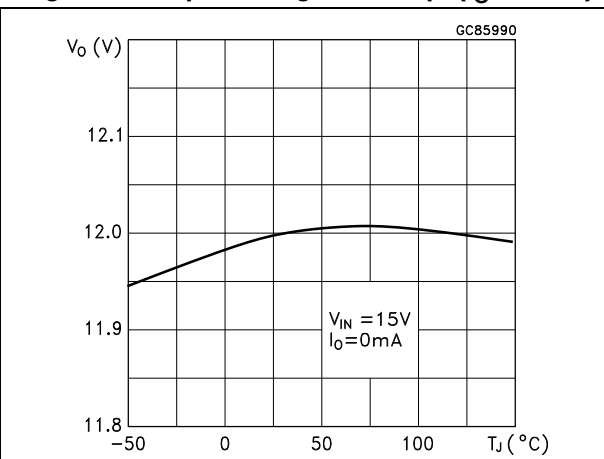


Figure 6. Output voltage vs. temp. ( $I_O = 10\text{ mA}$ )

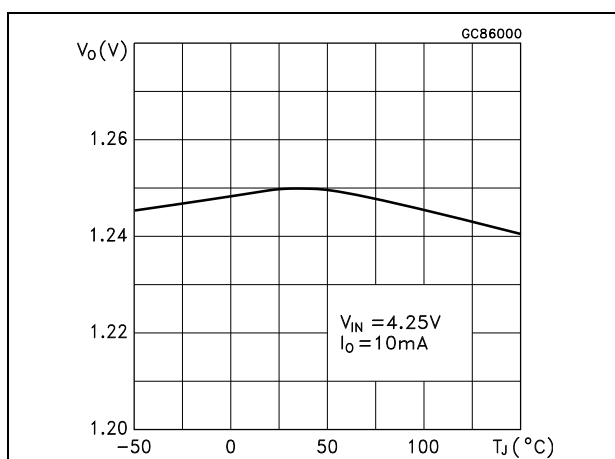


Figure 7. Short-circuit current vs. dropout voltage

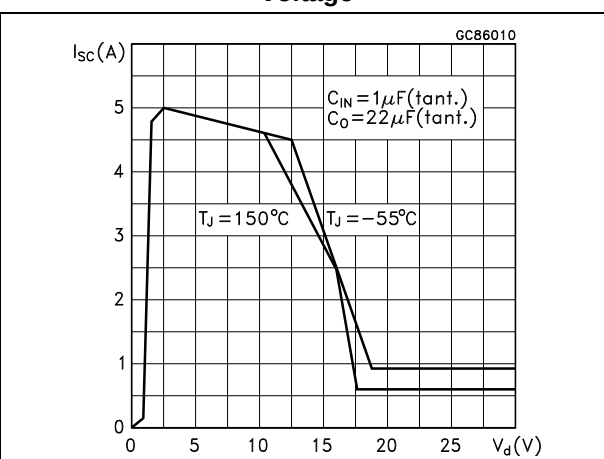


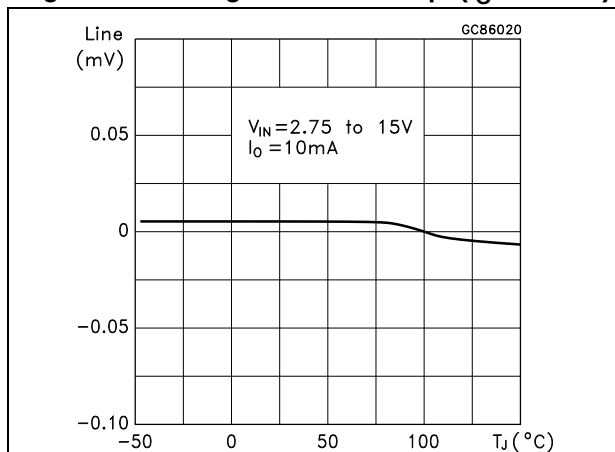
Figure 8. Line regulation vs. temp. ( $I_O = 10\text{ mA}$ )

Figure 9. Load regulation vs. temperature

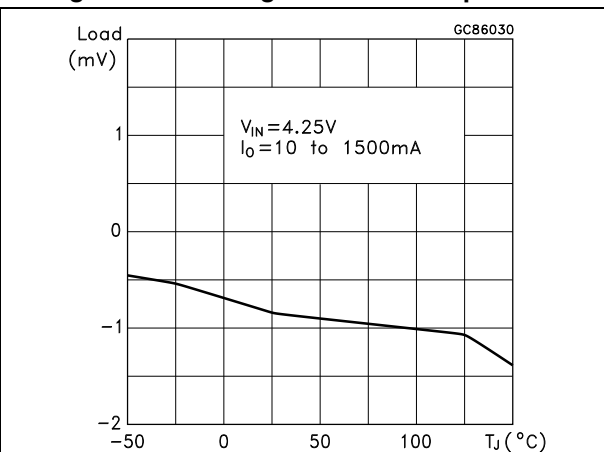


Figure 10. Dropout voltage vs. temperature

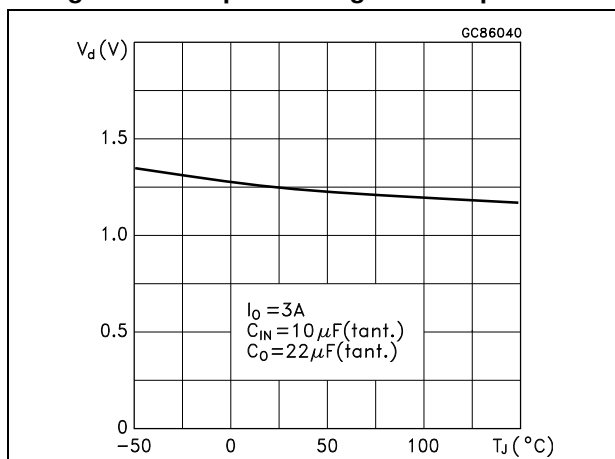


Figure 11. Dropout voltage vs. output current

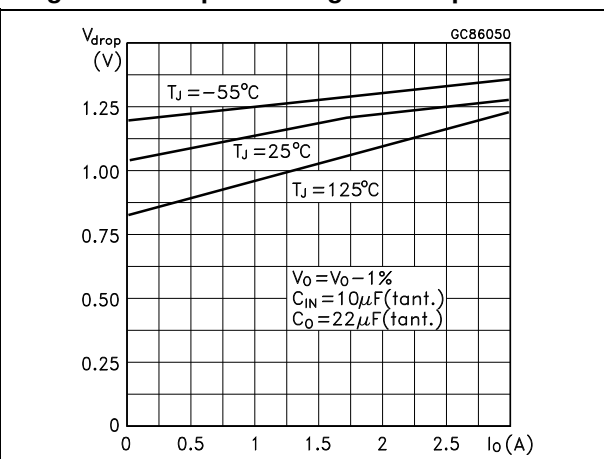


Figure 12. Adjust pin current vs. temperature

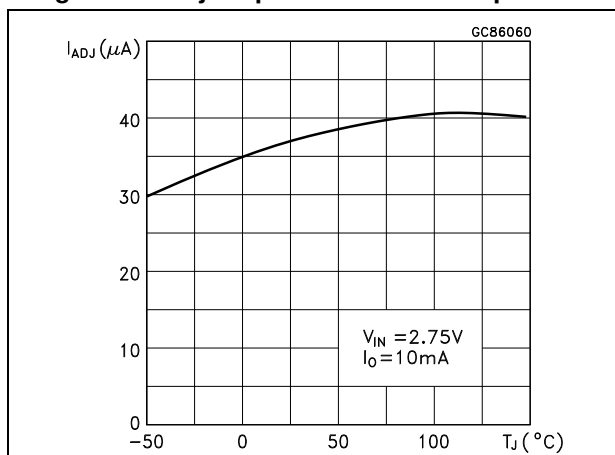


Figure 13. Quiescent current vs. temperature

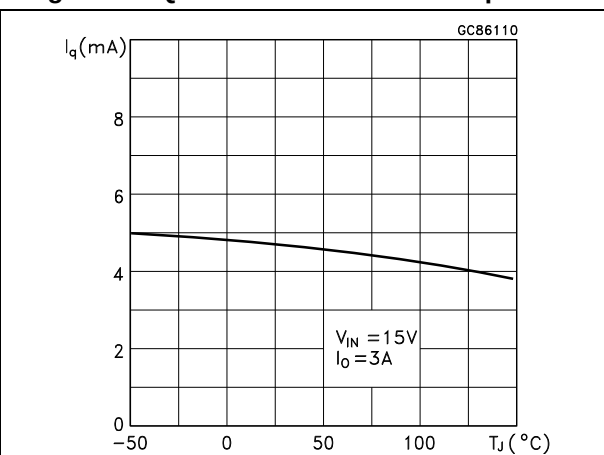


Figure 14. Line regulation vs. temperature  
( $V_{IN} = 15\text{ V}$ )

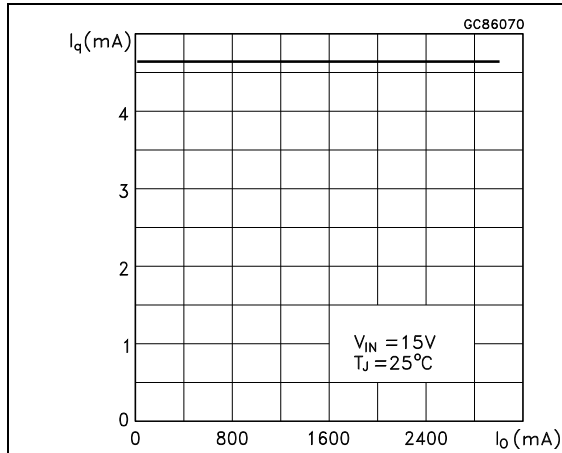


Figure 15. Supply voltage rejection vs. output current

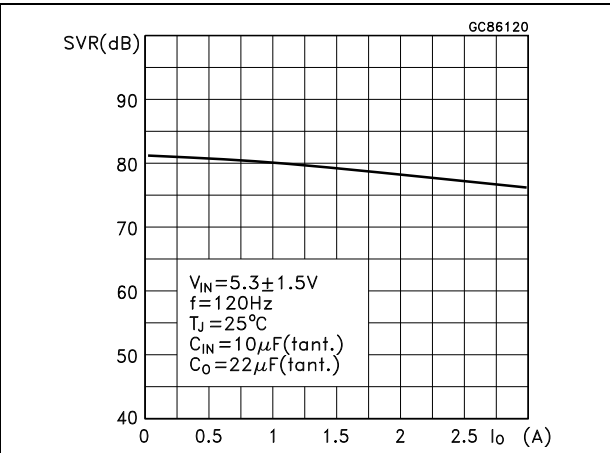


Figure 16. Supply voltage rejection vs. frequency

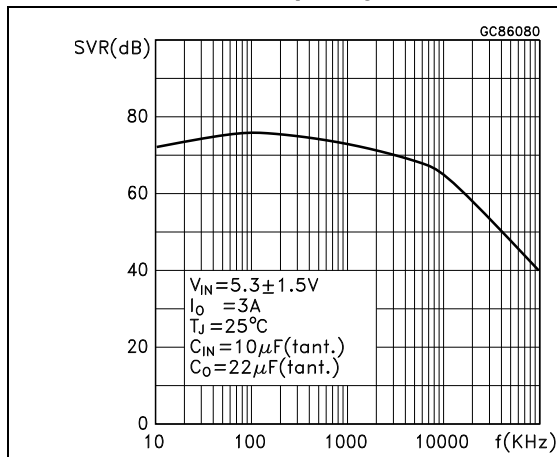


Figure 17. Supply voltage rejection vs. temperature

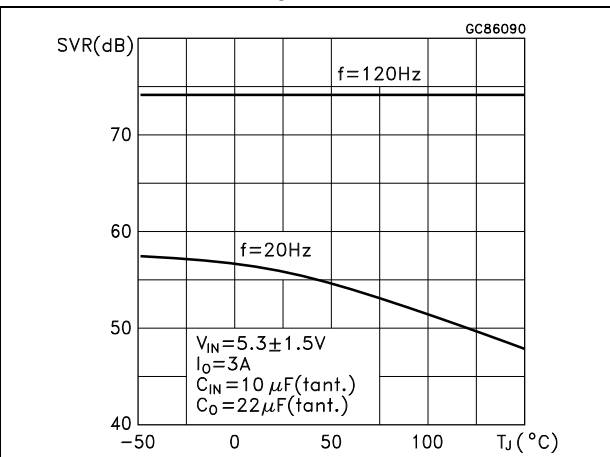


Figure 18. Minimum load current vs. temperature

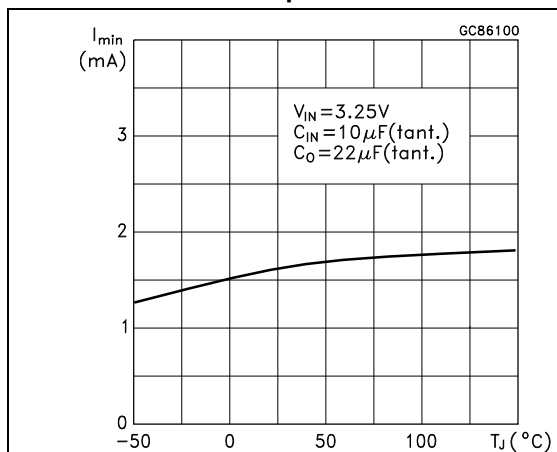


Figure 19. Stability,  $V_O = 1.8\text{ V}$

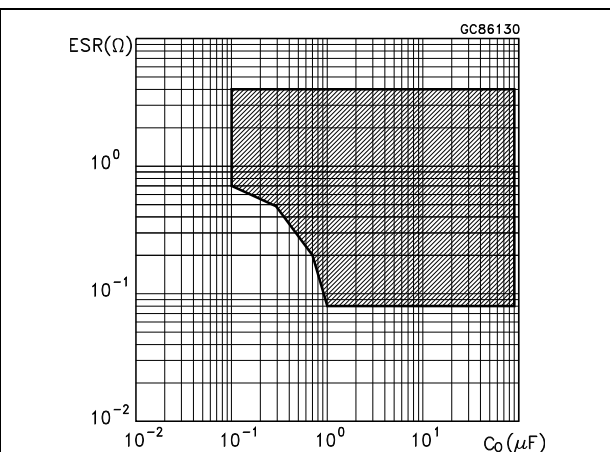


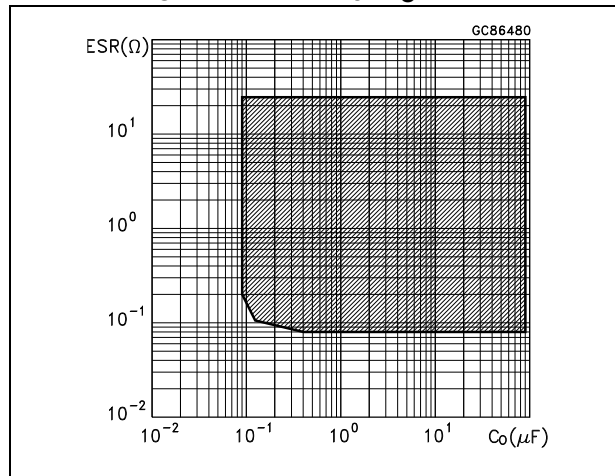
Figure 20. Stability,  $V_O = 12\text{ V}$ 

Figure 21. Line transient

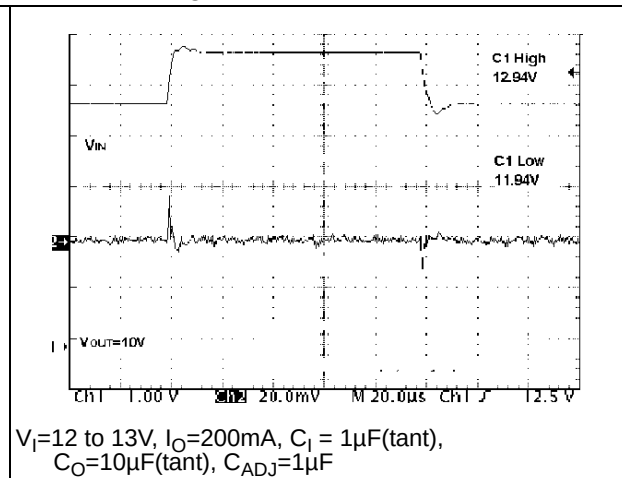
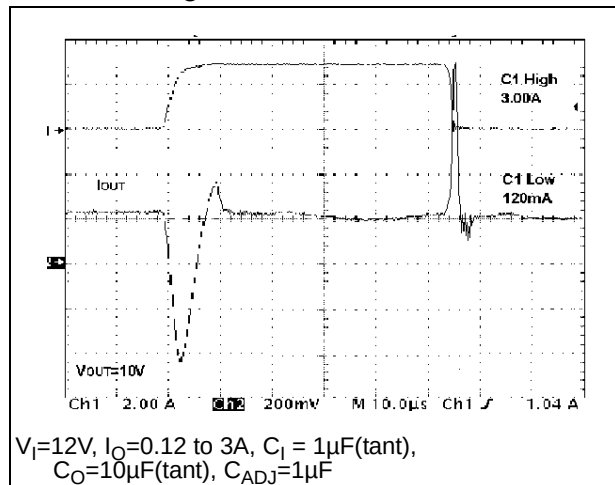
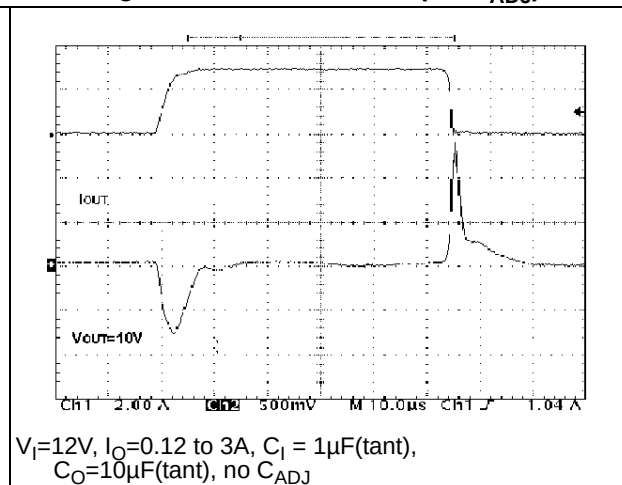


Figure 22. Load transient

Figure 23. Load transient (No  $C_{ADJ}$ )

## 7 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK® is an ST trademark.

**Table 8. TO-220 mechanical data**

| Dim. | mm    |       |       |
|------|-------|-------|-------|
|      | Min.  | Typ.  | Max.  |
| A    | 4.40  |       | 4.60  |
| b    | 0.61  |       | 0.88  |
| b1   | 1.14  |       | 1.70  |
| c    | 0.48  |       | 0.70  |
| D    | 15.25 |       | 15.75 |
| E    | 10    |       | 10.40 |
| e    | 2.40  |       | 2.70  |
| e1   | 4.95  |       | 5.15  |
| F    | 0.51  |       | 0.60  |
| H1   | 6.20  |       | 6.60  |
| J1   | 2.40  |       | 2.72  |
| L    | 13    |       | 14    |
| L1   | 3.50  |       | 3.93  |
| L20  |       | 16.40 |       |
| L30  |       | 28.90 |       |
| ØP   | 3.75  |       | 3.85  |
| Q    | 2.65  |       | 2.95  |



Figure 24. TO-220 drawing

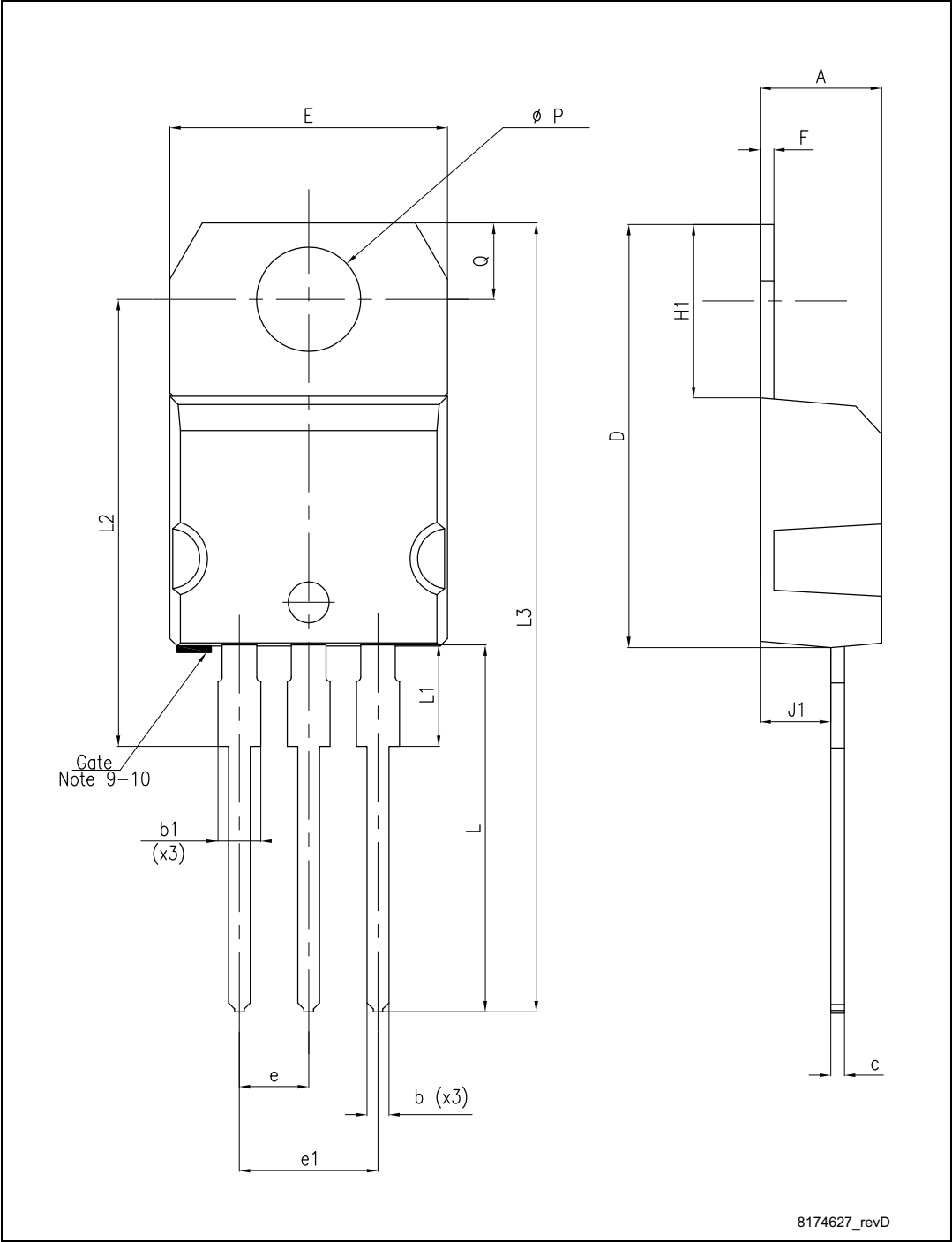
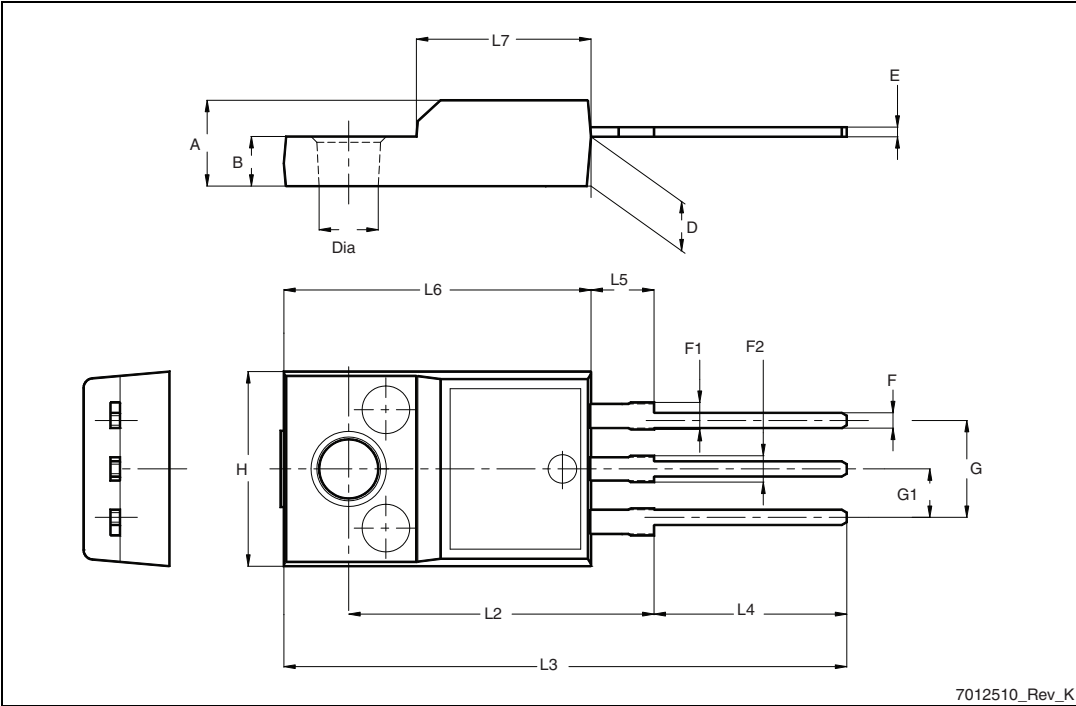


Table 9. TO-220FP mechanical data

| Dim. | mm   |      |      |
|------|------|------|------|
|      | Min. | Typ. | Max. |
| A    | 4.4  |      | 4.6  |
| B    | 2.5  |      | 2.7  |
| D    | 2.5  |      | 2.75 |
| E    | 0.45 |      | 0.7  |
| F    | 0.75 |      | 1    |
| F1   | 1.15 |      | 1.70 |
| F2   | 1.15 |      | 1.70 |
| G    | 4.95 |      | 5.2  |
| G1   | 2.4  |      | 2.7  |
| H    | 10   |      | 10.4 |
| L2   |      | 16   |      |
| L3   | 28.6 |      | 30.6 |
| L4   | 9.8  |      | 10.6 |
| L5   | 2.9  |      | 3.6  |
| L6   | 15.9 |      | 16.4 |
| L7   | 9    |      | 9.3  |
| Dia  | 3    |      | 3.2  |

Figure 25. TO-220FP drawing



7012510\_Rev\_K

Table 10. D<sup>2</sup>PAK mechanical data

| Dim. | mm   |      |       |
|------|------|------|-------|
|      | Min. | Typ. | Max.  |
| A    | 4.40 |      | 4.60  |
| A1   | 0.03 |      | 0.23  |
| b    | 0.70 |      | 0.93  |
| b2   | 1.14 |      | 1.70  |
| c    | 0.45 |      | 0.60  |
| c2   | 1.23 |      | 1.36  |
| D    | 8.95 |      | 9.35  |
| D1   | 7.50 |      |       |
| E    | 10   |      | 10.40 |
| E1   | 8.50 |      |       |
| e    |      | 2.54 |       |
| e1   | 4.88 |      | 5.28  |
| H    | 15   |      | 15.85 |
| J1   | 2.49 |      | 2.69  |
| L    | 2.29 |      | 2.79  |
| L1   | 1.27 |      | 1.40  |
| L2   | 1.30 |      | 1.75  |
| R    |      | 0.4  |       |
| V2   | 0°   |      | 8°    |

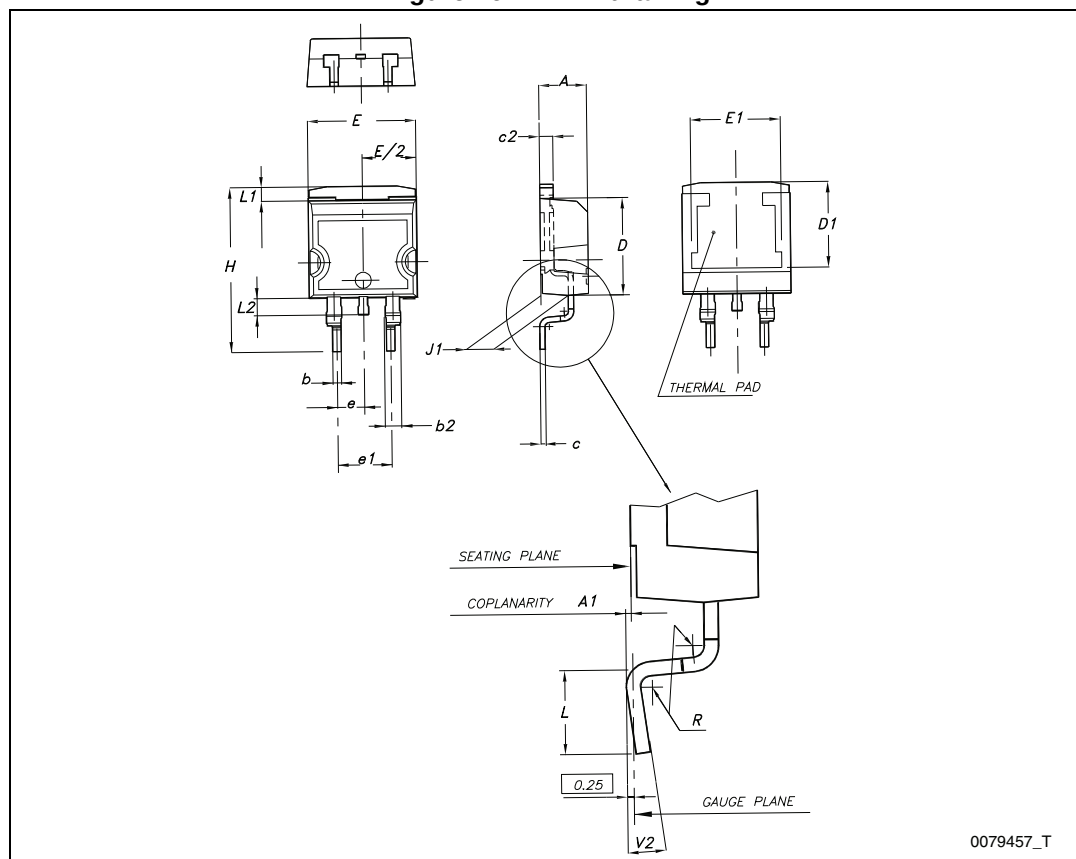
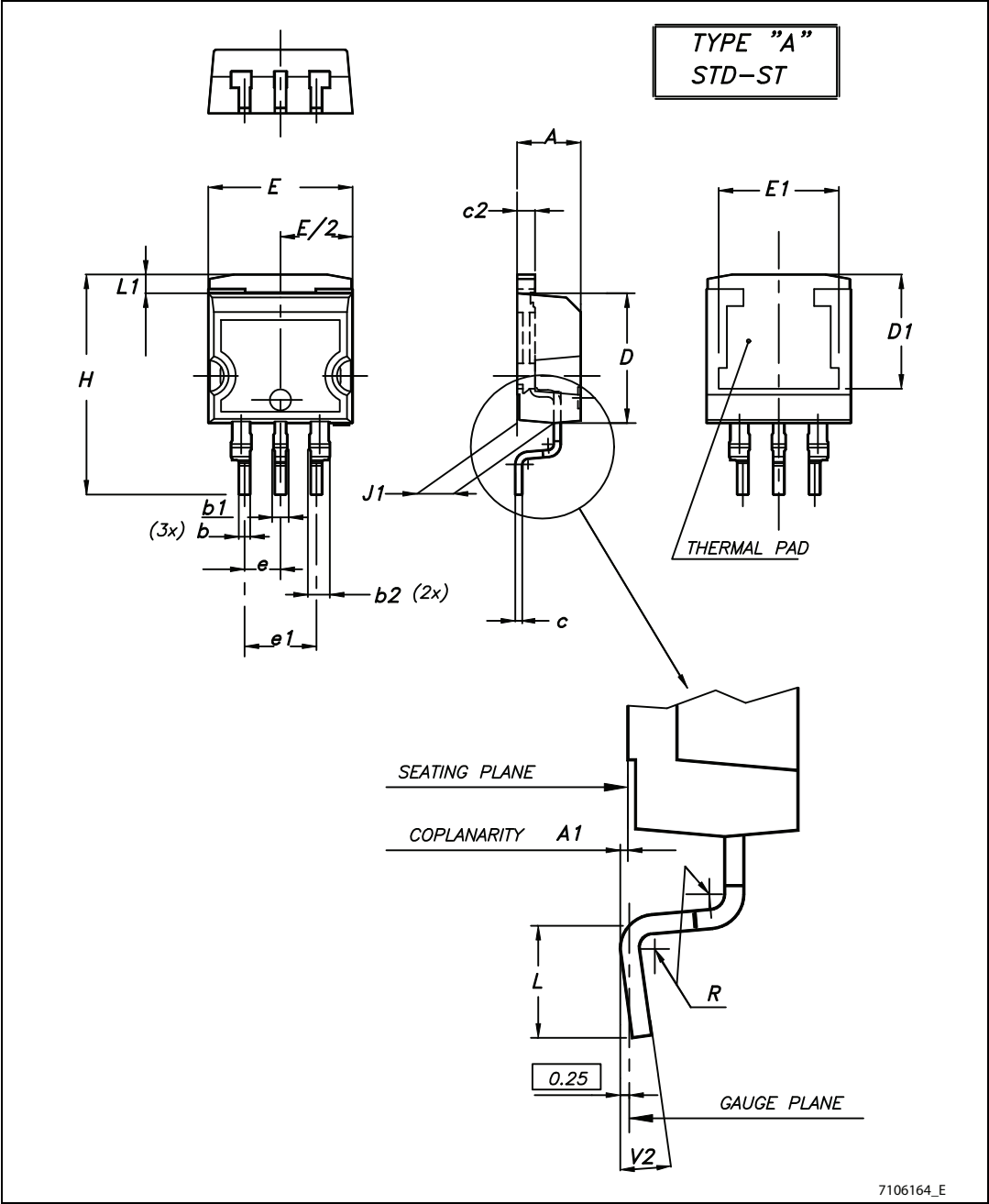
Figure 26. D<sup>2</sup>PAK drawing

Table 11. D<sup>2</sup>PAK/A mechanical data

| Dim. | mm   |      |       |
|------|------|------|-------|
|      | Min. | Typ. | Max.  |
| A    | 4.40 |      | 4.60  |
| A1   | 0.03 |      | 0.23  |
| b    | 0.70 |      | 0.93  |
| b2   | 1.14 |      | 1.70  |
| c    | 0.45 |      | 0.60  |
| c2   | 1.23 |      | 1.36  |
| D    | 8.95 |      | 9.35  |
| D1   | 7.50 |      |       |
| E    | 10   |      | 10.40 |
| E1   | 8.50 |      |       |
| e    |      | 2.54 |       |
| e1   | 4.88 |      | 5.28  |
| H    | 15   |      | 15.85 |
| J1   | 2.49 |      | 2.69  |
| L    | 2.29 |      | 2.79  |
| L1   | 1.27 |      | 1.40  |
| R    |      | 0.4  |       |
| V2   | 0°   |      | 8°    |

Figure 27. D<sup>2</sup>PAK/A mechanical data

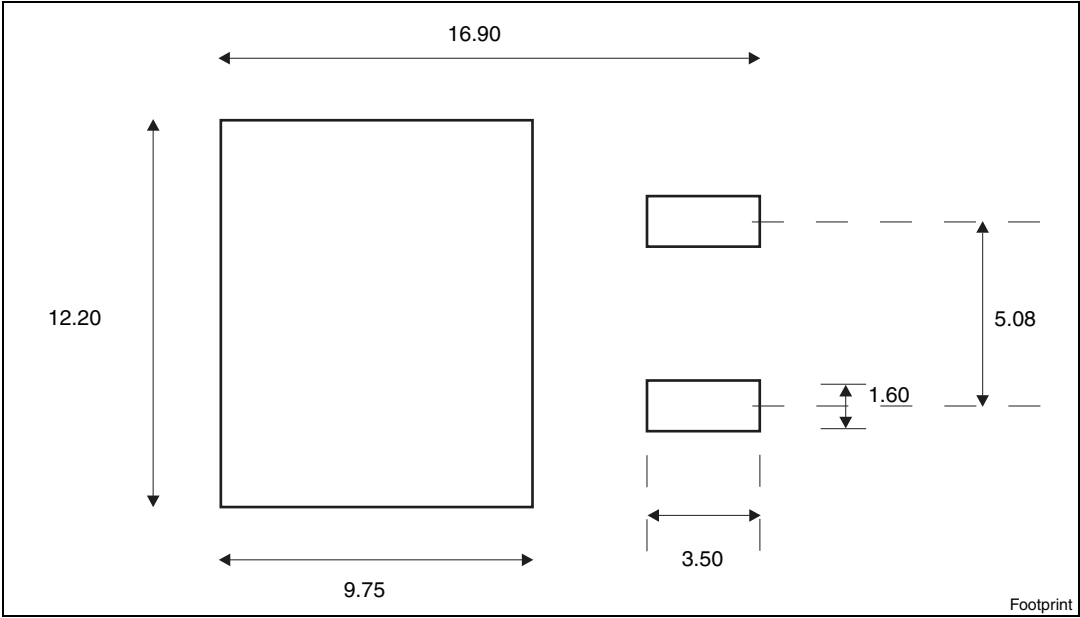


# 8 Packaging mechanical data

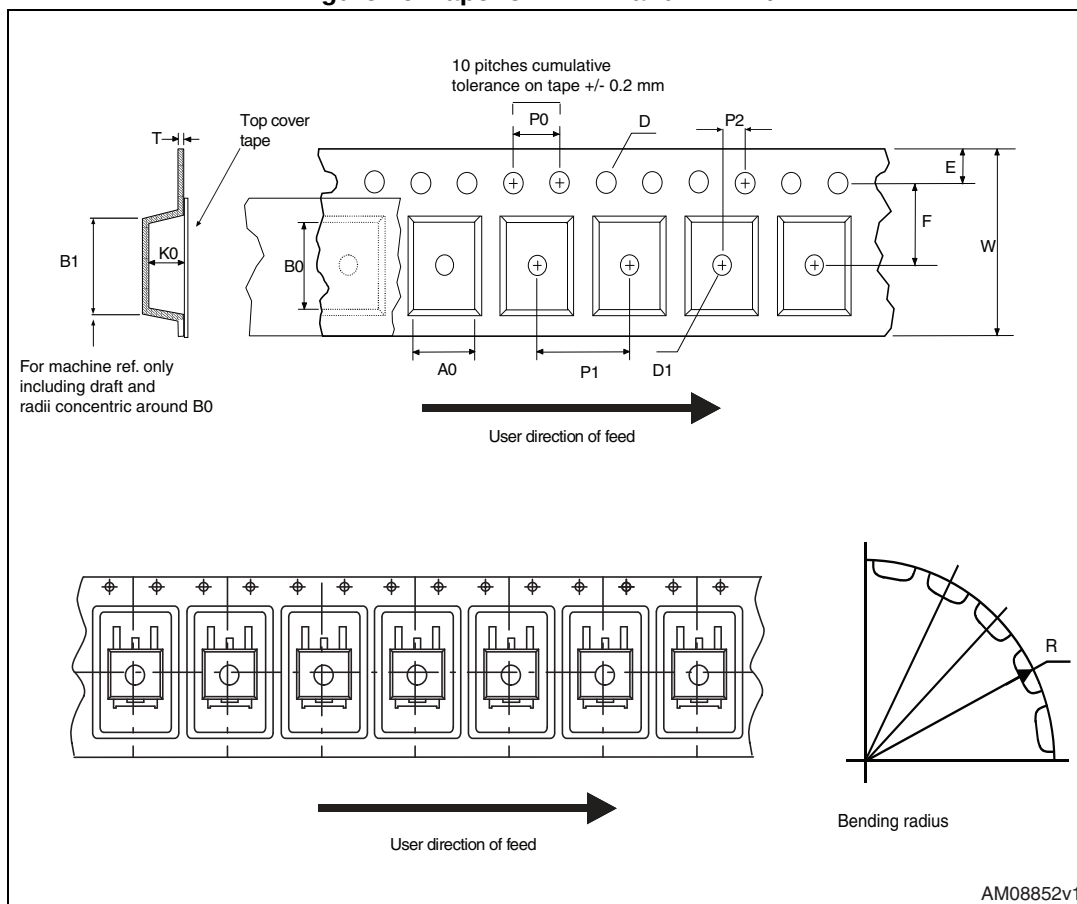
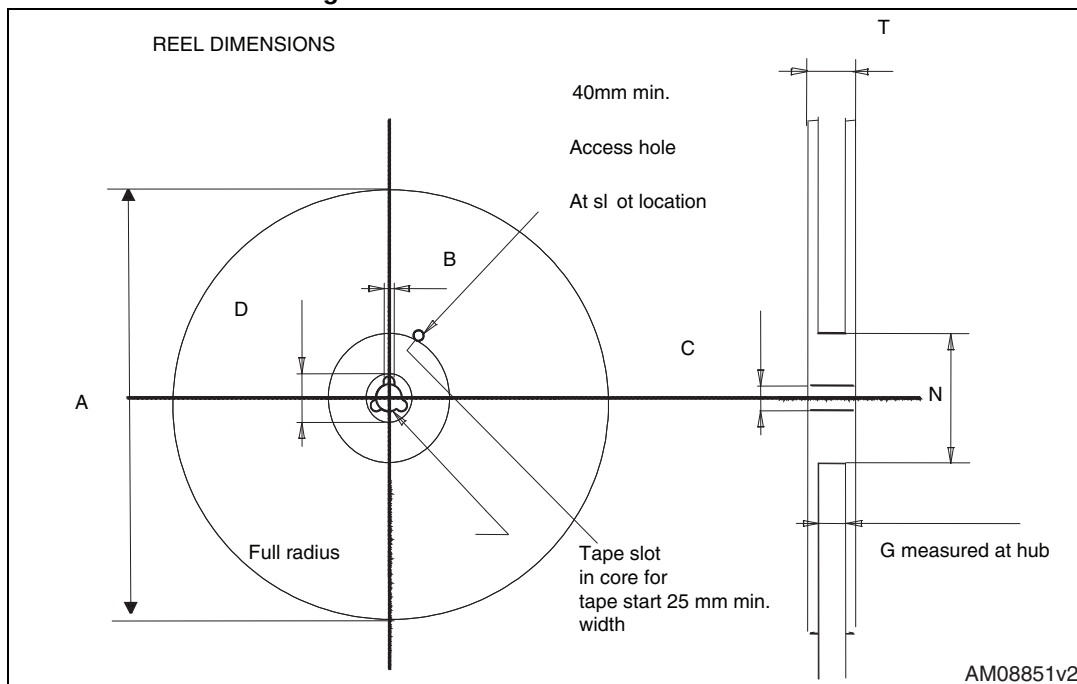
Table 12. D<sup>2</sup>PAK, D<sup>2</sup>PAK/A tape and reel mechanical data

| Tape |      |      | Reel     |      |      |
|------|------|------|----------|------|------|
| Dim. | mm   |      | Dim.     | mm   |      |
|      | Min. | Max. |          | Min. | Max. |
| A0   | 10.5 | 10.7 | A        |      | 330  |
| B0   | 15.7 | 15.9 | B        | 1.5  |      |
| D    | 1.5  | 1.6  | C        | 12.8 | 13.2 |
| D1   | 1.59 | 1.61 | D        | 20.2 |      |
| E    | 1.65 | 1.85 | G        | 24.4 | 26.4 |
| F    | 11.4 | 11.6 | N        | 100  |      |
| K0   | 4.8  | 5.0  | T        |      | 30.4 |
| P0   | 3.9  | 4.1  |          |      |      |
| P1   | 11.9 | 12.1 | Base qty |      | 1000 |
| P2   | 1.9  | 2.1  | Bulk qty |      | 1000 |
| R    | 50   |      |          |      |      |
| T    | 0.25 | 0.35 |          |      |      |
| W    | 23.7 | 24.3 |          |      |      |

Figure 28. D<sup>2</sup>PAK, D<sup>2</sup>PAK/A footprint<sup>(a)</sup>



a. All dimensions are in millimeters

Figure 29. Tape for D<sup>2</sup>PAK and D<sup>2</sup>PAK/AFigure 30. Reel for D<sup>2</sup>PAK and D<sup>2</sup>PAK/A



## 9 Order codes

Table 13. Order codes

| Packages  |          |                    |                            | Output voltage |
|-----------|----------|--------------------|----------------------------|----------------|
| TO-220    | TO-220FP | D <sup>2</sup> PAK | D <sup>2</sup> PAK/A (T&R) |                |
|           |          |                    | LD1085D2M18R               | 1.8 V          |
|           |          |                    | LD1085D2M25R               | 2.5 V          |
|           |          | LD1085D2T33R       | LD1085D2M33R               | 3.3 V          |
| LD1085V50 |          |                    |                            | 5.0 V          |
| LD1085V   | LD1085P  | LD1085D2T-R        | LD1085D2M-R                | ADJ            |

## 10 Revision history

**Table 14. Document revision history**

| Date        | Revision | Changes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 07-Oct-2004 | 12       | Mistake order codes - Table 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 08-Feb-2005 | 13       | Mistake U.M. load regulation - $V \Rightarrow$ mV.                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 01-Mar-2005 | 14       | Version 1.2 V removed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 22-May-2006 | 15       | Order codes has been updated and new template.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 10-Nov-2006 | 16       | Add package DPAK, typo on $V_O$ test value in tables 3, 4 and 11.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 04-Apr-2007 | 17       | Order codes updated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 07-Jun-2007 | 18       | Order codes updated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 05-Dec-2007 | 19       | Modified: <a href="#">Table 13</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 29-Jan-2008 | 20       | Added new order codes for Automotive grade products see <a href="#">Table 13 on page 25</a> .                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 18-Feb-2008 | 21       | Modified: <a href="#">Table 13 on page 25</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 09-Apr-2008 | 22       | Modified: <a href="#">Table 13 on page 25</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 14-Jul-2008 | 23       | Modified: <a href="#">Table 13 on page 25</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 22-Aug-2008 | 24       | Modified: <a href="#">Table 2 on page 5</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 28-Jul-2009 | 25       | Modified: <a href="#">Table 13 on page 25</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 18-Feb-2013 | 26       | <ul style="list-style-type: none"> <li>– Modified Output voltage in Voltage reference parameter <a href="#">Table 7 on page 11</a> and <a href="#">Table 8 on page 12</a>.</li> <li>– Minor text changes throughout the document.</li> </ul>                                                                                                                                                                                                                                                                             |
| 08-Oct-2013 | 27       | <p>RPN LD1085xx changed to LD1085.</p> <p>Updated the Features and the Description in cover page.</p> <p>Cancelled Table1: Device summary, Table 9: Electrical characteristics of LD1085PY (Automotive Grade).</p> <p>Modified <a href="#">Figure 2: Pin connections (top view)</a>, <a href="#">Table 2: Thermal data</a>, <a href="#">Table 13: Order codes</a>, <a href="#">Section 7: Package mechanical data</a>.</p> <p>Added <a href="#">Section 8: Packaging mechanical data</a>.</p> <p>Minor text changes.</p> |

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