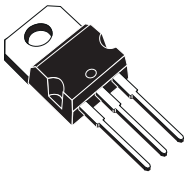
# LD1117xx

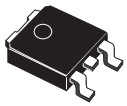
## Adjustable and fixed low drop positive voltage regulator

## Features

- Low dropout voltage (1 V typ.)
- 2.85 V device performances are suitable for SCSI-2 active termination
- Output current up to 800 mA
- Fixed output voltage of: 1.2 V, 1.8 V, 2.5 V, 3.0 V, 3.3 V, 5.0 V
- Adjustable version availability ($V_{ref}$ = 1.25 V)
- Internal current and thermal limit
- Available in ± 1% (at 25 °C) and 2% in full temperature range
- Supply voltage rejection: 75 dB (typ.)

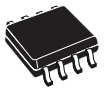


TO-220



DPAK

SOT-223



SO-8

## Description

The LD1117 is a low drop voltage regulator able to provide up to 800 mA of output current, available even in adjustable version ($V_{REF}$ = 1.25 V). Concerning fixed versions, are offered the following output voltages: 1.2 V, 1.8 V, 2.5 V, 2.85 V, 3.0 V, 3.3 V and 5.0 V. The 2.85 V type is ideal for SCSI-2 lines active termination. The device is supplied in: SOT-223, DPAK, SO-8 and TO-220.

The SOT-223 and DPAK surface mount packages optimize the thermal characteristics even offering a relevant space saving effect.

High efficiency is assured by NPN pass transistor. In fact in this case, unlike than PNP one, the quiescent current flows mostly into the load. Only a very common 10 µF minimum capacitor is needed for stability. On chip trimming allows the regulator to reach a very tight output voltage tolerance, within ± 1% at 25°C. The adjustable LD1117 is pin to pin compatible with the other standard. Adjustable voltage regulators maintaining the better performances in terms of drop and tolerance.

**Table 1. Device summary**

| Part numbers | | |
|---|---|---|
| LD1117XX12 | LD1117XX25C | LD1117XX50C |
| LD1117XX12C | LD1117XX30 | LD1117XX |
| LD1117XX18 | LD1117XX33 | LD1117XXC |
| LD1117XX18C | LD1117XX33C | |
| LD1117XX25 | LD1117XX50 | |

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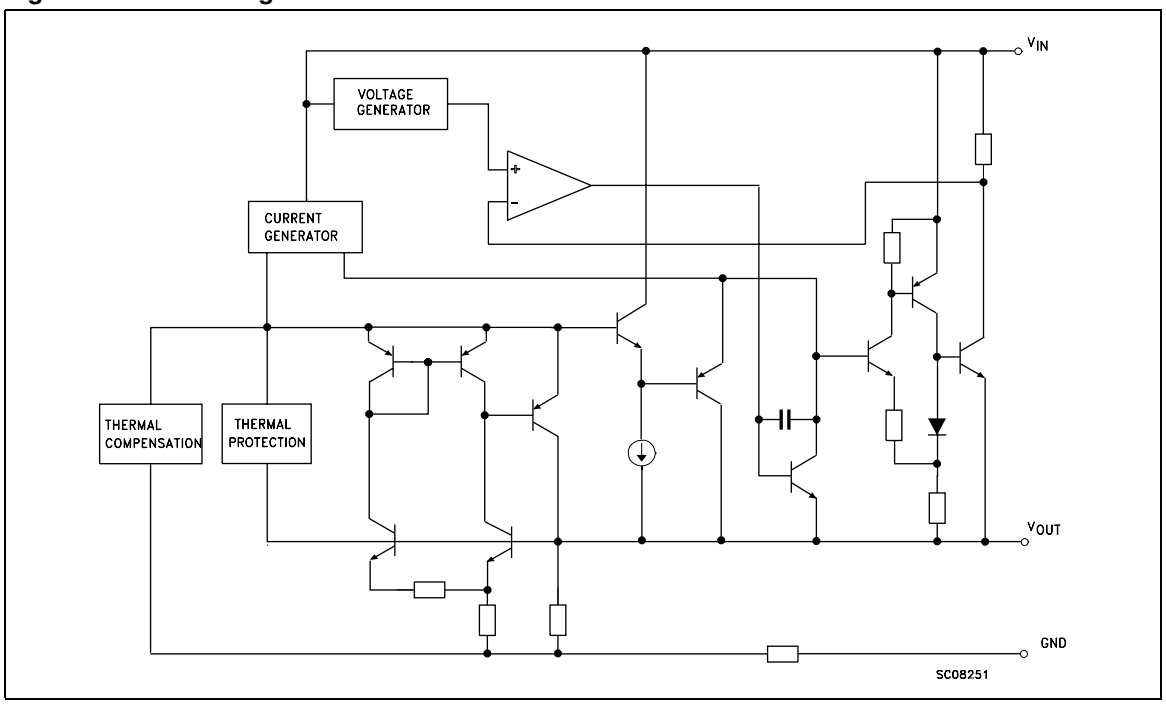
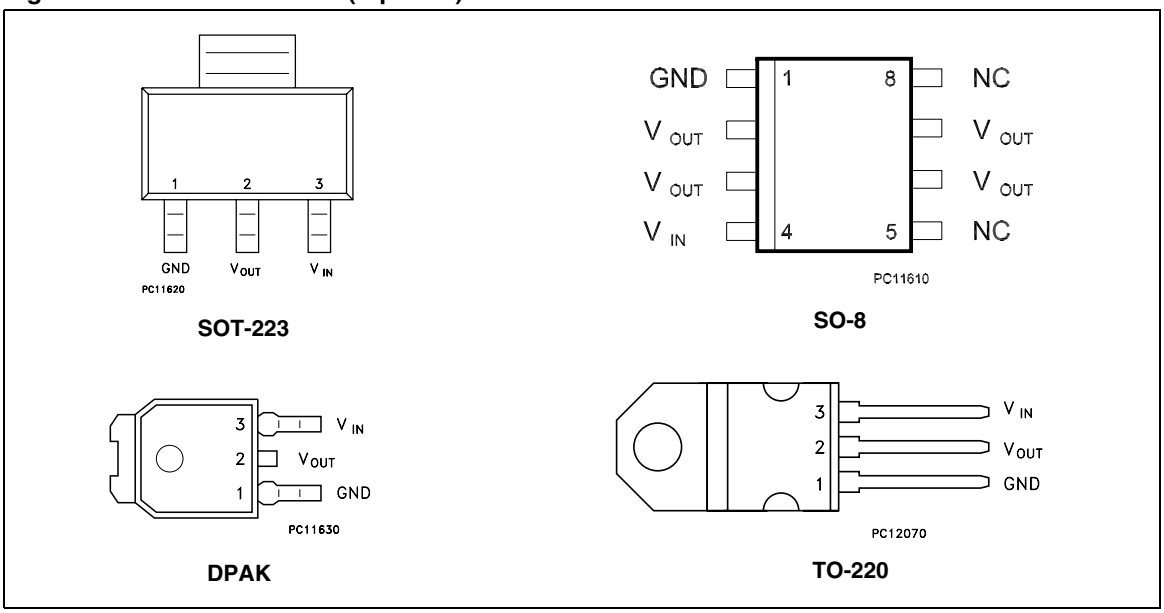
# 1 Diagram

**Figure 1. Block diagram**



# 2 Pin configuration

**Figure 2. Pin connections (top view)**




*Note: The TAB is connected to the $V_{OUT}$.*

# 3 Maximum ratings

**Table 2. Absolute maximum ratings**

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{IN}$ (1) | DC input voltage | | 15 | V |
| $P_{TOT}$ | Power dissipation | | 12 | W |
| $T_{STG}$ | Storage temperature range | | -40 to +150 | °C |
| $T_{OP}$ | Operating junction temperature range | for C Version | -40 to +125 | °C |
| | | for standard Version | 0 to +125 | °C |

1. Absolute maximum rating of $V_{IN}$ = 18 V, when $I_{OUT}$ is lower than 20 mA.

**Table 3. Thermal data**

| Symbol | Parameter | SOT-223 | SO-8 | DPAK | TO-220 | Unit |
|---|---|---|---|---|---|---|
| $R_{thJC}$ | Thermal resistance junction-case | 15 | 20 | 8 | 3 | °C/W |
| $R_{thJA}$ | Thermal resistance junction-ambient | | | | 50 | °C/W |

# 4 Schematic application

**Figure 3. Application circuit (for 1.2 V)**

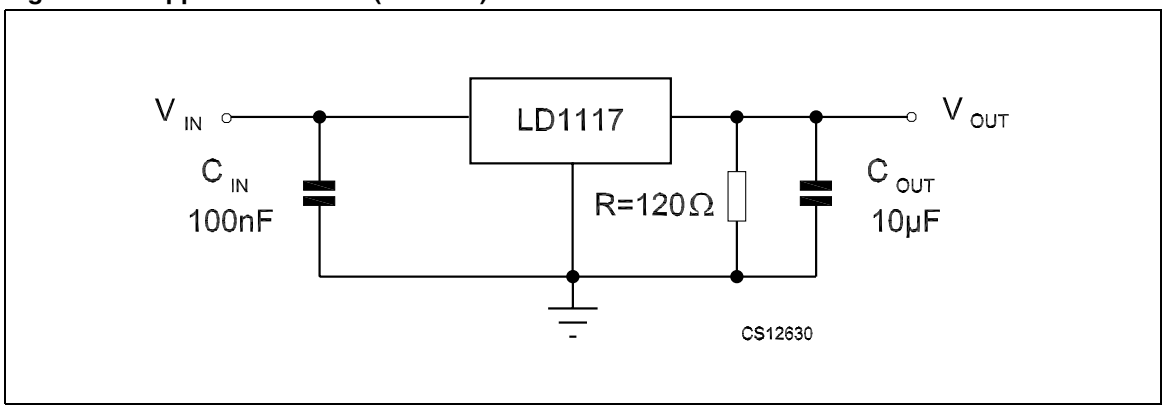
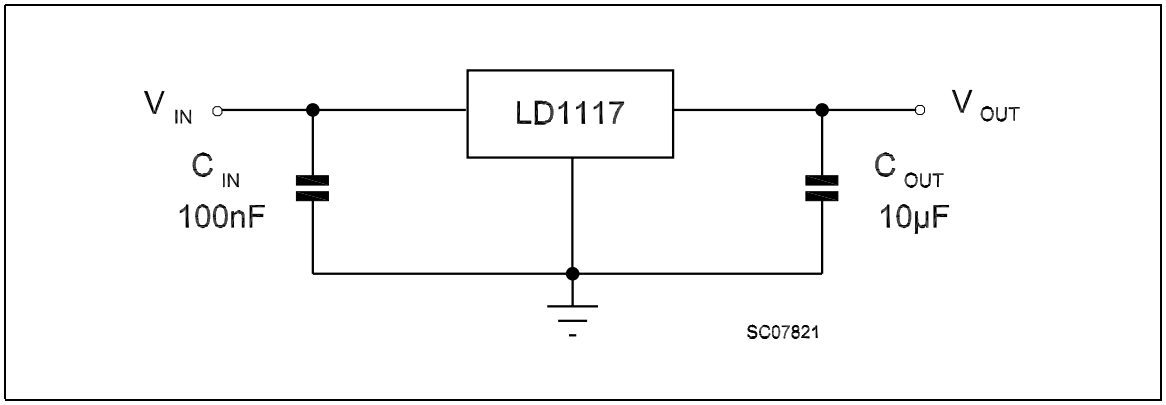



**Figure 4. Application circuit (for other fixed output voltages)**



# 5 Electrical characteristics

Refer to the test circuits, $T_J$ = 0 to 125 °C, $C_O$ = 10 µF, R = 120 Ω between GND and OUT pins, unless otherwise specified.

**Table 4. Electrical characteristics of LD1117#12**

| Symbol | Parameter | Test condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_O$ | Output voltage | $V_{in}$ = 3.2 V, $I_O$ = 10 mA, $T_J$ = 25 °C | 1.188 | 1.20 | 1.212 | V |
| $V_O$ | Reference voltage | $I_O$ = 10 to 800 mA<br>$V_{in}$ - $V_O$ = 1.4 to 10 V | 1.140 | 1.20 | 1.260 | V |
| $\Delta V_O$ | Line regulation | $V_{in}$ - $V_O$ = 1.5 to 13.75 V, $I_O$ = 10 mA | | 0.035 | 0.2 | % |
| $\Delta V_O$ | Load regulation | $V_{in}$ - $V_O$ = 3 V, $I_O$ = 10 to 800 mA | | 0.1 | 0.4 | % |
| $\Delta V_O$ | Temperature stability | | | 0.5 | | % |
| $\Delta V_O$ | Long term stability | 1000 hrs, $T_J$ = 125 °C | | 0.3 | | % |
| $V_{in}$ | Operating input voltage | | | | 15 | V |
| $I_{adj}$ | Adjustment pin current | $V_{in} \leq$ 15 V | | 60 | 120 | µA |
| $\Delta I_{adj}$ | Adjustment pin current change | $V_{in}$ - $V_O$ = 1.4 to 10 V<br>$I_O$ = 10 to 800 mA | | 1 | 5 | µA |
| $I_{O(min)}$ | Minimum load current | $V_{in}$ = 15 V | | 2 | 5 | mA |
| $I_O$ | Output current | $V_{in}$ - $V_O$ = 5 V, $T_J$ = 25 °C | 800 | 950 | 1300 | mA |
| eN | Output noise (%$V_O$) | B = 10 Hz to 10 kHz, $T_J$ = 25 °C | | 0.003 | | % |
| SVR | Supply voltage rejection | $I_O$ = 40 mA, f = 120 Hz, $T_J$ = 25 °C<br>$V_{in}$ - $V_O$ = 3 V, $V_{ripple}$ = 1 $V_{PP}$ | 60 | 75 | | dB |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA | | 1 | 1.1 | V |
| | | $I_O$ = 500 mA | | 1.05 | 1.15 | |
| | | $I_O$ = 800 mA | | 1.10 | 1.2 | |
| | Thermal regulation | $T_a$ = 25 °C, 30 ms Pulse | | 0.01 | 0.1 | %/W |

Refer to the test circuits, $T_J$ = 0 to 125 °C, $C_O$ = 10 µF, unless otherwise specified.

**Table 5. Electrical characteristics of LD1117#18**

| Symbol | Parameter | Test condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_O$ | Output voltage | $V_{in}$ = 3.8 V, $I_O$ = 10 mA, $T_J$ = 25 °C | 1.78 | 1.8 | 1.82 | V |
| $V_O$ | Output voltage | $I_O$ = 0 to 800 mA, $V_{in}$ = 3.3 to 8 V | 1.76 | | 1.84 | V |
| $\Delta V_O$ | Line regulation | $V_{in}$ = 3.3 to 8 V, $I_O$ = 0 mA | | 1 | 6 | mV |
| $\Delta V_O$ | Load regulation | $V_{in}$ = 3.3 V, $I_O$ = 0 to 800 mA | | 1 | 10 | mV |
| $\Delta V_O$ | Temperature stability | | | 0.5 | | % |
| $\Delta V_O$ | Long term stability | 1000 hrs, $T_J$ = 125 °C | | 0.3 | | % |
| $V_{in}$ | Operating input voltage | $I_O$ = 100 mA | | | 15 | V |
| $I_d$ | Quiescent current | $V_{in} \leq 8$ V | | 5 | 10 | mA |
| $I_O$ | Output current | $V_{in}$ = 6.8 V, $T_J$ = 25 °C | 800 | 950 | 1300 | mA |
| eN | Output noise voltage | B = 10 Hz to 10 kHz, $T_J$ = 25 °C | | 100 | | µV |
| SVR | Supply voltage rejection | $I_O$ = 40 mA, f = 120 Hz, $T_J$ = 25 °C<br>$V_{in}$ = 5.5 V, $V_{ripple}$ = 1 $V_{PP}$ | 60 | 75 | | dB |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA | | 1 | 1.1 | V |
| | | $I_O$ = 500 mA | | 1.05 | 1.15 | |
| | | $I_O$ = 800 mA | | 1.10 | 1.2 | |
| | Thermal regulation | $T_a$ = 25 °C, 30 ms Pulse | | 0.01 | 0.1 | %/W |

Refer to the test circuits, $T_J$ = 0 to 125 °C, $C_O$ = 10 µF, unless otherwise specified.

**Table 6. Electrical characteristics of LD1117#25**

| Symbol | Parameter | Test condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_O$ | Output voltage | $V_{in}$ = 4.5 V, $I_O$ = 10 mA, $T_J$ = 25 °C | 2.475 | 2.5 | 2.525 | V |
| $V_O$ | Output voltage | $I_O$ = 0 to 800 mA, $V_{in}$ = 3.9 to 10 V | 2.45 | | 2.55 | V |
| $\Delta V_O$ | Line regulation | $V_{in}$ = 3.9 to 10 V, $I_O$ = 0 mA | | 1 | 6 | mV |
| $\Delta V_O$ | Load regulation | $V_{in}$ = 3.9 V, $I_O$ = 0 to 800 mA | | 1 | 10 | mV |
| $\Delta V_O$ | Temperature stability | | | 0.5 | | % |
| $\Delta V_O$ | Long term stability | 1000 hrs, $T_J$ = 125 °C | | 0.3 | | % |
| $V_{in}$ | Operating input voltage | $I_O$ = 100 mA | | | 15 | V |
| $I_d$ | Quiescent current | $V_{in} \leq$ 10 V | | 5 | 10 | mA |
| $I_O$ | Output current | $V_{in}$ = 7.5 V $T_J$ = 25 °C | 800 | 950 | 1300 | mA |
| eN | Output noise voltage | B = 10 Hz to 10 kHz, $T_J$ = 25 °C | | 100 | | µV |
| SVR | Supply voltage rejection | $I_O$ = 40 mA, f = 120 Hz, $T_J$ = 25 °C<br>$V_{in}$ = 5.5 V, $V_{ripple}$ = 1 $V_{PP}$ | 60 | 75 | | dB |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA | | 1 | 1.1 | V |
| | | $I_O$ = 500 mA | | 1.05 | 1.15 | |
| | | $I_O$ = 800 mA | | 1.10 | 1.2 | |
| | Thermal regulation | $T_a$ = 25 °C, 30 ms Pulse | | 0.01 | 0.1 | %/W |

Refer to the test circuits, $T_J$ = 0 to 125 °C, $C_O$ = 10 µF, unless otherwise specified.

**Table 7. Electrical characteristics of LD1117#30**

| Symbol | Parameter | Test condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_O$ | Output voltage | $V_{in}$ = 5 V, $I_O$ = 10 mA, $T_J$ = 25 °C | 2.97 | 3 | 3.03 | V |
| $V_O$ | Output voltage | $I_O$ = 0 to 800 mA, $V_{in}$ = 4.5 to 10 V | 2.94 | | 3.06 | V |
| $\Delta V_O$ | Line regulation | $V_{in}$ = 4.5 to 12 V, $I_O$ = 0 mA | | 1 | 6 | mV |
| $\Delta V_O$ | Load regulation | $V_{in}$ = 4.5 V, $I_O$ = 0 to 800 mA | | 1 | 10 | mV |
| $\Delta V_O$ | Temperature stability | | | 0.5 | | % |
| $\Delta V_O$ | Long term stability | 1000 hrs, $T_J$ = 125 °C | | 0.3 | | % |
| $V_{in}$ | Operating input voltage | $I_O$ = 100 mA | | | 15 | V |
| $I_d$ | Quiescent current | $V_{in} \leq$ 12 V | | 5 | 10 | mA |
| $I_O$ | Output current | $V_{in}$ = 8 V, $T_J$ = 25 °C | 800 | 950 | 1300 | mA |
| eN | Output noise voltage | B = 10 Hz to 10 kHz, $T_J$ = 25 °C | | 100 | | µF |
| SVR | Supply voltage rejection | $I_O$ = 40 mA, f = 120 Hz, $T_J$ = 25 °C<br>$V_{in}$ = 6 V, $V_{ripple}$ = 1 $V_{PP}$ | 60 | 75 | | dB |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA | | 1 | 1.1 | V |
| | | $I_O$ = 500 mA | | 1.05 | 1.15 | |
| | | $I_O$ = 800 mA | | 1.10 | 1.2 | |
| | Thermal regulation | $T_a$ = 25 °C, 30 ms Pulse | | 0.01 | 0.1 | %/W |

Refer to the test circuits, $T_J$ = 0 to 125 °C, $C_O$ = 10 µF, unless otherwise specified.

**Table 8. Electrical characteristics of LD1117#33**

| Symbol | Parameter | Test condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_O$ | Output voltage | $V_{in}$ = 5.3 V, $I_O$ = 10 mA, $T_J$ = 25 °C | 3.267 | 3.3 | 3.333 | V |
| $V_O$ | Output voltage | $I_O$ = 0 to 800 mA, $V_{in}$ = 4.75 to 10 V | 3.235 | | 3.365 | V |
| $\Delta V_O$ | Line regulation | $V_{in}$ = 4.75 to 15 V, $I_O$ = 0 mA | | 1 | 6 | mV |
| $\Delta V_O$ | Load regulation | $V_{in}$ = 4.75 V, $I_O$ = 0 to 800 mA | | 1 | 10 | mV |
| $\Delta V_O$ | Temperature stability | | | 0.5 | | % |
| $\Delta V_O$ | Long term stability | 1000 hrs, $T_J$ = 125 °C | | 0.3 | | % |
| $V_{in}$ | Operating input voltage | $I_O$ = 100 mA | | | 15 | V |
| $I_d$ | Quiescent current | $V_{in} \leq$ 15 V | | 5 | 10 | mA |
| $I_O$ | Output current | $V_{in}$ = 8.3 V, $T_J$ = 25 °C | 800 | 950 | 1300 | mA |
| eN | Output noise voltage | B = 10 Hz to 10 kHz, $T_J$ = 25 °C | | 100 | | µV |
| SVR | Supply voltage rejection | $I_O$ = 40 mA, f = 120 Hz, $T_J$ = 25 °C<br>$V_{in}$ = 6.3 V, $V_{ripple}$ = 1 $V_{PP}$ | 60 | 75 | | dB |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA | | 1 | 1.1 | V |
| | | $I_O$ = 500 mA | | 1.05 | 1.15 | |
| | | $I_O$ = 800 mA | | 1.10 | 1.2 | |
| | Thermal regulation | $T_a$ = 25 °C, 30 ms Pulse | | 0.01 | 0.1 | %/W |

Refer to the test circuits, $T_J$ = 0 to 125 °C, $C_O$ = 10 µF, unless otherwise specified.

**Table 9. Electrical characteristics of LD1117#50**

| Symbol | Parameter | Test condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_O$ | Output voltage | $V_{in}$ = 7 V, $I_O$ = 10 mA, $T_J$ = 25 °C | 4.95 | 5 | 5.05 | V |
| $V_O$ | Output voltage | $I_O$ = 0 to 800 mA, $V_{in}$ = 6.5 to 15 V | 4.9 | | 5.1 | V |
| $\Delta V_O$ | Line regulation | $V_{in}$ = 6.5 to 15 V, $I_O$ = 0 mA | | 1 | 10 | mV |
| $\Delta V_O$ | Load regulation | $V_{in}$ = 6.5 V, $I_O$ = 0 to 800 mA | | 1 | 15 | mV |
| $\Delta V_O$ | Temperature stability | | | 0.5 | | % |
| $\Delta V_O$ | Long term stability | 1000 hrs, $T_J$ = 125 °C | | 0.3 | | % |
| $V_{in}$ | Operating input voltage | $I_O$ = 100 mA | | | 15 | V |
| $I_d$ | Quiescent current | $V_{in} \leq$ 15 V | | 5 | 10 | mA |
| $I_O$ | Output current | $V_{in}$ = 10 V, $T_J$ = 25 °C | 800 | 950 | 1300 | mA |
| eN | Output noise voltage | B = 10 Hz to 10 kHz, $T_J$ = 25 °C | | 100 | | µV |
| SVR | Supply voltage rejection | $I_O$ = 40 mA, f = 120 Hz, $T_J$ = 25 °C<br>$V_{in}$ = 8 V, $V_{ripple}$ = 1 $V_{PP}$ | 60 | 75 | | dB |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA | | 1 | 1.1 | V |
| | | $I_O$ = 500 mA | | 1.05 | 1.15 | |
| | | $I_O$ = 800 mA | | 1.10 | 1.2 | |
| | Thermal regulation | $T_a$ = 25 °C, 30 ms Pulse | | 0.01 | 0.1 | %/W |

Refer to the test circuits, $T_J$ = 0 to 125 °C, $C_O$ = 10 µF, unless otherwise specified.

**Table 10. Electrical characteristics of LD1117 (adjustable)**

| Symbol | Parameter | Test condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_{ref}$ | Reference voltage | $V_{in}$ - $V_O$ = 2 V, $I_O$ = 10 mA, $T_J$ = 25 °C | 1.238 | 1.25 | 1.262 | V |
| $V_{ref}$ | Reference voltage | $I_O$ = 10 to 800 mA, $V_{in}$ - $V_O$ = 1.4 to 10 V | 1.225 | | 1.275 | V |
| $\Delta V_O$ | Line regulation | $V_{in}$ - $V_O$ = 1.5 to 13.75 V, $I_O$ = 10 mA | | 0.035 | 0.2 | % |
| $\Delta V_O$ | Load regulation | $V_{in}$ - $V_O$ = 3 V, $I_O$ = 10 to 800 mA | | 0.1 | 0.4 | % |
| $\Delta V_O$ | Temperature stability | | | 0.5 | | % |
| $\Delta V_O$ | Long term stability | 1000 hrs, $T_J$ = 125 °C | | 0.3 | | % |
| $V_{in}$ | Operating input voltage | | | | 15 | V |
| $I_{adj}$ | Adjustment pin current | $V_{in} \leq$ 15 V | | 60 | 120 | µA |
| $\Delta I_{adj}$ | Adjustment pin current change | $V_{in}$ - $V_O$ = 1.4 to 10 V, $I_O$ = 10 to 800 mA | | 1 | 5 | µA |
| $I_{O(min)}$ | Minimum load current | $V_{in}$ = 15 V | | 2 | 5 | mA |
| $I_O$ | Output current | $V_{in}$ - $V_O$ = 5 V, $T_J$ = 25 °C | 800 | 950 | 1300 | mA |
| eN | Output noise (%$V_O$) | B = 10 Hz to 10 kHz, $T_J$ = 25 °C | | 0.003 | | % |
| SVR | Supply voltage rejection | $I_O$ = 40 mA, f = 120 Hz, $T_J$ = 25 °C<br>$V_{in}$ - $V_O$ = 3 V, $V_{ripple}$ = 1 $V_{PP}$ | 60 | 75 | | dB |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA | | 1 | 1.1 | V |
| | | $I_O$ = 500 mA | | 1.05 | 1.15 | |
| | | $I_O$ = 800 mA | | 1.10 | 1.2 | |
| | Thermal regulation | $T_a$ = 25 °C, 30 ms Pulse | | 0.01 | 0.1 | %/W |

Refer to the test circuits, $T_J$ = -40 to 125 °C, $C_O$ = 10 µF, R = 120 Ω between GND and OUT pins, unless otherwise specified.

**Table 11. Electrical characteristics of LD1117#12C**

| Symbol | Parameter | Test condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_{ref}$ | Reference voltage | $V_{in}$ - $V_O$ = 2 V, $I_O$ = 10 mA, $T_J$ = 25 °C | 1.176 | 1.20 | 1.224 | V |
| $V_{ref}$ | Reference voltage | $I_O$ = 10 to 800 mA, $V_{in}$ - $V_O$ = 1.4 to 10 V | 1.120 | 1.20 | 1.280 | V |
| $\Delta V_O$ | Line regulation | $V_{in}$ - $V_O$ = 1.5 to 13.75 V, $I_O$ = 10 mA | | | 1 | % |
| $\Delta V_O$ | Load regulation | $V_{in}$ - $V_O$ = 3 V, $I_O$ = 10 to 800 mA | | | 1 | % |
| $\Delta V_O$ | Temperature stability | | | 0.5 | | % |
| $\Delta V_O$ | Long term stability | 1000 hrs, $T_J$ = 125 °C | | 0.3 | | % |
| $V_{in}$ | Operating input voltage | | | | 15 | V |
| $I_{adj}$ | Adjustment pin current | $V_{in} \leq$ 15 V | | 60 | 120 | µA |
| $\Delta I_{adj}$ | Adjustment pin current change | $V_{in}$ - $V_O$ = 1.4 to 10 V<br>$I_O$ = 10 to 800 mA | | 1 | 5 | µA |
| $I_{O(min)}$ | Minimum load current | $V_{in}$ = 15 V | | 2 | 5 | mA |
| $I_O$ | Output current | $V_{in}$ - $V_O$ = 5 V, $T_J$ = 25 °C | 800 | 950 | 1300 | mA |
| eN | Output noise (%$V_O$) | B = 10 Hz to 10 kHz, $T_J$ = 25 °C | | 0.003 | | % |
| SVR | Supply voltage rejection | $I_O$ = 40 mA, f = 120 Hz, $T_J$ = 25 °C<br>$V_{in}$ - $V_O$ = 3 V, $V_{ripple}$ = 1 $V_{PP}$ | 60 | 75 | | dB |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA, $T_J$ = 0 to 125 °C | | 1 | 1.1 | V |
| | | $I_O$ = 500 mA, $T_J$ = 0 to 125 °C | | 1.05 | 1.2 | |
| | | $I_O$ = 800 mA, $T_J$ = 0 to 125 °C | | 1.10 | 1.3 | |
| | Thermal regulation | $T_a$ = 25 °C, 30 ms Pulse | | 0.01 | 0.1 | %/W |

Refer to the test circuits, $T_J$ = -40 to 125 °C, $C_O$ = 10 µF, unless otherwise specified.

**Table 12. Electrical characteristics of LD1117#18C**

| Symbol | Parameter | Test condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_O$ | Output voltage | $V_{in}$ = 3.8 V, $I_O$ = 10 mA, $T_J$ = 25 °C | 1.76 | 1.8 | 1.84 | V |
| $V_O$ | Output voltage | $I_O$ = 0 to 800 mA, $V_{in}$ = 3.9 to 10 V | 1.73 | | 1.87 | V |
| $\Delta V_O$ | Line regulation | $V_{in}$ = 3.3 to 8 V, $I_O$ = 0 mA | | 1 | 30 | mV |
| $\Delta V_O$ | Load regulation | $V_{in}$ = 3.3 V, $I_O$ = 0 to 800 mA | | 1 | 30 | mV |
| $\Delta V_O$ | Temperature stability | | | 0.5 | | % |
| $\Delta V_O$ | Long term stability | 1000 hrs, $T_J$ = 125 °C | | 0.3 | | % |
| $V_{in}$ | Operating input voltage | $I_O$ = 100 mA | | | 15 | V |
| $I_d$ | Quiescent current | $V_{in} \leq 8$ V | | 5 | 10 | mA |
| $I_O$ | Output current | $V_{in}$ = 6.8 V $T_J$ = 25 °C | 800 | 950 | 1300 | mA |
| eN | Output noise voltage | B = 10 Hz to 10 kHz, $T_J$ = 25 °C | | 100 | | µV |
| SVR | Supply voltage rejection | $I_O$ = 40 mA, f = 120 Hz, $T_J$ = 25 °C<br>$V_{in}$ = 5.5 V, $V_{ripple}$ = 1 $V_{PP}$ | 60 | 75 | | dB |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA, $T_J$ = 0 to 125 °C | | 1 | 1.1 | V |
| | | $I_O$ = 500 mA, $T_J$ = 0 to 125 °C | | 1.05 | 1.15 | |
| | | $I_O$ = 800 mA, $T_J$ = 0 to 125 °C | | 1.10 | 1.2 | |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA | | | 1.1 | V |
| | | $I_O$ = 500 mA | | | 1.2 | |
| | | $I_O$ = 800 mA | | | 1.3 | |
| | Thermal regulation | $T_a$ = 25 °C, 30 ms Pulse | | 0.01 | 0.1 | %/W |

Refer to the test circuits, $T_J$ = -40 to 125 °C, $C_O$ = 10 µF, unless otherwise specified.

**Table 13. Electrical characteristics of LD1117#25C**

| Symbol | Parameter | Test condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_O$ | Output voltage | $V_{in}$ = 4.5 V, $I_O$ = 10 mA, $T_J$ = 25 °C | 2.45 | 2.5 | 2.55 | V |
| $V_O$ | Output voltage | $I_O$ = 0 to 800 mA, $V_{in}$ = 3.9 to 10 V | 2.4 | | 2.6 | V |
| $\Delta V_O$ | Line regulation | $V_{in}$ = 3.9 to 10 V, $I_O$ = 0 mA | | 1 | 30 | mV |
| $\Delta V_O$ | Load regulation | $V_{in}$ = 3.9 V, $I_O$ = 0 to 800 mA | | 1 | 30 | mV |
| $\Delta V_O$ | Temperature stability | | | 0.5 | | % |
| $\Delta V_O$ | Long term stability | 1000 hrs, $T_J$ = 125 °C | | 0.3 | | % |
| $V_{in}$ | Operating input voltage | $I_O$ = 100 mA | | | 15 | V |
| $I_d$ | Quiescent current | $V_{in} \leq$ 10 V | | 5 | 10 | mA |
| $I_O$ | Output current | $V_{in}$ = 7.5 V $T_J$ = 25 °C | 800 | 950 | 1300 | mA |
| eN | Output noise voltage | B = 10 Hz to 10 kHz, $T_J$ = 25 °C | | 100 | | µV |
| SVR | Supply voltage rejection | $I_O$ = 40 mA, f = 120 Hz, $T_J$ = 25 °C<br>$V_{in}$ = 5.5 V, $V_{ripple}$ = 1 $V_{PP}$ | 60 | 75 | | dB |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA, $T_J$ = 0 to 125 °C | | 1 | 1.1 | V |
| | | $I_O$ = 500 mA, $T_J$ = 0 to 125 °C | | 1.05 | 1.15 | |
| | | $I_O$ = 800 mA, $T_J$ = 0 to 125 °C | | 1.10 | 1.2 | |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA | | | 1.1 | V |
| | | $I_O$ = 500 mA | | | 1.2 | |
| | | $I_O$ = 800 mA | | | 1.3 | |
| | Thermal regulation | $T_a$ = 25 °C, 30 ms Pulse | | 0.01 | 0.1 | %/W |

Refer to the test circuits, $T_J$ = -40 to 125 °C, $C_O$ = 10 µF, unless otherwise specified.

**Table 14. Electrical characteristics of LD1117#33C**

| Symbol | Parameter | Test condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_O$ | Output voltage | $V_{in}$ = 5.3 V, $I_O$ = 10 mA, $T_J$ = 25 °C | 3.24 | 3.3 | 3.36 | V |
| $V_O$ | Output voltage | $I_O$ = 0 to 800 mA, $V_{in}$ = 4.75 to 10 V | 3.16 | | 3.44 | V |
| $\Delta V_O$ | Line regulation | $V_{in}$ = 4.75 to 15 V, $I_O$ = 0 mA | | 1 | 30 | mV |
| $\Delta V_O$ | Load regulation | $V_{in}$ = 4.75 V, $I_O$ = 0 to 800 mA | | 1 | 30 | mV |
| $\Delta V_O$ | Temperature stability | | | 0.5 | | % |
| $\Delta V_O$ | Long term stability | 1000 hrs, $T_J$ = 125 °C | | 0.3 | | % |
| $V_{in}$ | Operating input voltage | $I_O$ = 100 mA | | | 15 | V |
| $I_d$ | Quiescent current | $V_{in} \leq$ 15 V | | 5 | 10 | mA |
| $I_O$ | Output current | $V_{in}$ = 8.3 V, $T_J$ = 25 °C | 800 | 950 | 1300 | mA |
| eN | Output noise voltage | B = 10 Hz to 10 kHz, $T_J$ = 25 °C | | 100 | | µV |
| SVR | Supply voltage rejection | $I_O$ = 40 mA, f = 120 Hz, $T_J$ = 25 °C<br>$V_{in}$ = 6.3 V, $V_{ripple}$ = 1 $V_{PP}$ | 60 | 75 | | dB |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA, $T_J$ = 0 to 125 °C | | 1 | 1.1 | V |
| | | $I_O$ = 500 mA, $T_J$ = 0 to 125 °C | | 1.05 | 1.15 | |
| | | $I_O$ = 800 mA, $T_J$ = 0 to 125 °C | | 1.10 | 1.2 | |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA | | | 1.1 | V |
| | | $I_O$ = 500 mA | | | 1.2 | |
| | | $I_O$ = 800 mA | | | 1.3 | |
| | Thermal regulation | $T_a$ = 25 °C, 30 ms Pulse | | 0.01 | 0.1 | %/W |

Refer to the test circuits, $T_J$ = -40 to 125 °C, $C_O$ = 10 µF, unless otherwise specified.

**Table 15. Electrical characteristics of LD1117#50C**

| Symbol | Parameter | Test condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_O$ | Output voltage | $V_{in}$ = 7 V, $I_O$ = 10 mA, $T_J$ = 25 °C | 4.9 | 5 | 5.1 | V |
| $V_O$ | Output voltage | $I_O$ = 0 to 800 mA, $V_{in}$ = 6.5 to 15 V | 4.8 | | 5.2 | V |
| $\Delta V_O$ | Line regulation | $V_{in}$ = 6.5 to 15 V, $I_O$ = 0 mA | | 1 | 50 | mV |
| $\Delta V_O$ | Load regulation | $V_{in}$ = 6.5 V, $I_O$ = 0 to 800 mA | | 1 | 50 | mV |
| $\Delta V_O$ | Temperature stability | | | 0.5 | | % |
| $\Delta V_O$ | Long term stability | 1000 hrs, $T_J$ = 125 °C | | 0.3 | | % |
| $V_{in}$ | Operating input voltage | $I_O$ = 100 mA | | | 15 | V |
| $I_d$ | Quiescent current | $V_{in} \leq$ 15 V | | 5 | 10 | mA |
| $I_O$ | Output current | $V_{in}$ = 10 V, $T_J$ = 25 °C | 800 | 950 | 1300 | mA |
| eN | Output noise voltage | B = 10 Hz to 10 kHz, $T_J$ = 25 °C | | 100 | | µV |
| SVR | Supply voltage rejection | $I_O$ = 40 mA, f = 120 Hz, $T_J$ = 25 °C<br>$V_{in}$ = 8 V, $V_{ripple}$ = 1 $V_{PP}$ | 60 | 75 | | dB |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA, $T_J$ = 0 to 125 °C | | 1 | 1.1 | V |
| | | $I_O$ = 500 mA, $T_J$ = 0 to 125 °C | | 1.05 | 1.15 | |
| | | $I_O$ = 800 mA, $T_J$ = 0 to 125 °C | | 1.10 | 1.2 | |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA | | | 1.1 | V |
| | | $I_O$ = 500 mA | | | 1.2 | |
| | | $I_O$ = 800 mA | | | 1.3 | |
| | Thermal regulation | $T_a$ = 25 °C, 30 ms Pulse | | 0.01 | 0.1 | %/W |

Refer to the test circuits, $T_J$ = -40 to 125 °C, $C_O$ = 10 µF, unless otherwise specified.

**Table 16. Electrical characteristics of LD1117C (adjustable)**

| Symbol | Parameter | Test condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_{ref}$ | Reference voltage | $V_{in}$ - $V_O$ = 2 V, $I_O$ = 10 mA, $T_J$ = 25 °C | 1.225 | 1.25 | 1.275 | V |
| $V_{ref}$ | Reference voltage | $I_O$ = 10 to 800 mA, $V_{in}$ - $V_O$= 1.4 to 10 V | 1.2 | | 1.3 | V |
| $\Delta V_O$ | Line regulation | $V_{in}$ - $V_O$ = 1.5 to 13.75 V, $I_O$ = 10 mA | | | 1 | % |
| $\Delta V_O$ | Load regulation | $V_{in}$ - $V_O$ = 3 V, $I_O$ = 10 to 800 mA | | | 1 | % |
| $\Delta V_O$ | Temperature stability | | | 0.5 | | % |
| $\Delta V_O$ | Long term stability | 1000 hrs, $T_J$ = 125 °C | | 0.3 | | % |
| $V_{in}$ | Operating input voltage | | | | 15 | V |
| $I_{adj}$ | Adjustment pin current | $V_{in} \leq$ 15 V | | 60 | 120 | µA |
| $\Delta I_{adj}$ | Adjustment pin current change | $V_{in}$ - $V_O$ = 1.4 to 10 V, $I_O$ = 10 to 800 mA | | 1 | 10 | µA |
| $I_{O(min)}$ | Minimum load current | $V_{in}$ = 15 V | | 2 | 5 | mA |
| $I_O$ | Output current | $V_{in}$ - $V_O$ = 5 V, $T_J$ = 25 °C | 800 | 950 | 1300 | mA |
| eN | Output noise (%$V_O$) | B = 10 Hz to 10 kHz, $T_J$ = 25 °C | | 0.003 | | % |
| SVR | Supply voltage rejection | $I_O$ = 40 mA, f = 120 Hz, $T_J$ = 25 °C<br>$V_{in}$ - $V_O$ = 3 V, $V_{ripple}$ = 1 $V_{PP}$ | 60 | 75 | | dB |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA, $T_J$ = 0 to 125 °C | | 1 | 1.1 | V |
| | | $I_O$ = 500 mA, $T_J$ = 0 to 125 °C | | 1.05 | 1.15 | |
| | | $I_O$ = 800 mA, $T_J$ = 0 to 125 °C | | 1.10 | 1.2 | |
| $V_d$ | Dropout voltage | $I_O$ = 100 mA | | | 1.1 | V |
| | | $I_O$ = 500 mA | | | 1.2 | |
| | | $I_O$ = 800 mA | | | 1.3 | |
| | Thermal regulation | $T_a$ = 25 °C, 30 ms Pulse | | 0.01 | 0.1 | %/W |

# 6 Typical application

**Figure 5. Negative supply**

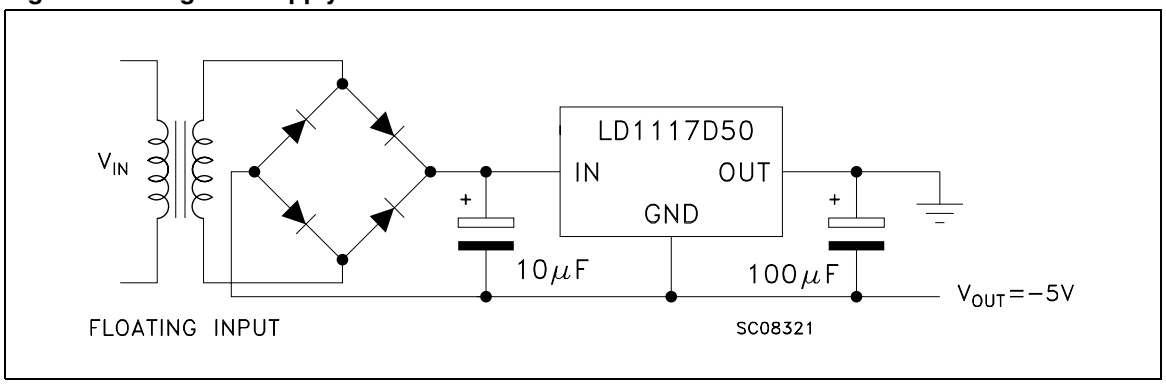



**Figure 6. Active terminator for SCSI-2 bus**

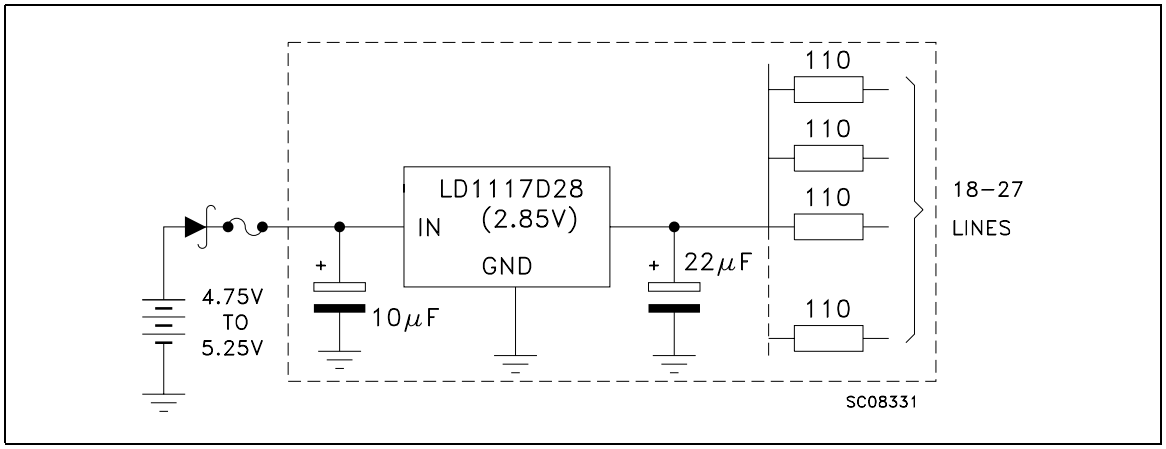



**Figure 7. Circuit for increasing output voltage**

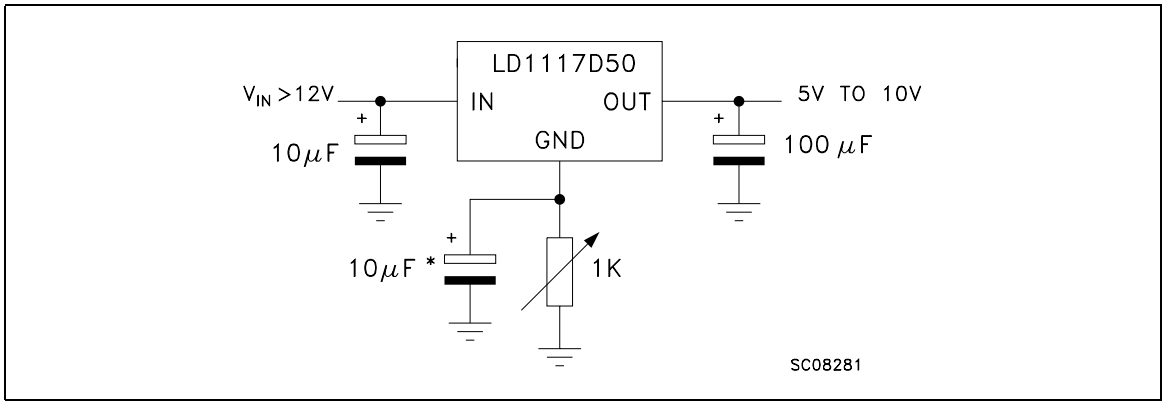


**Figure 8. Voltage regulator with reference**

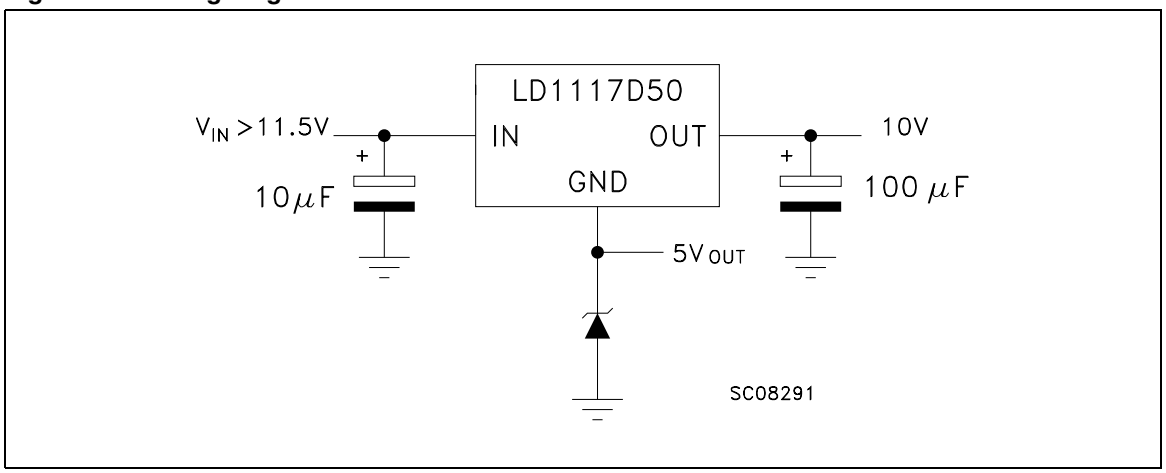



**Figure 9. Battery backed-up regulated supply**

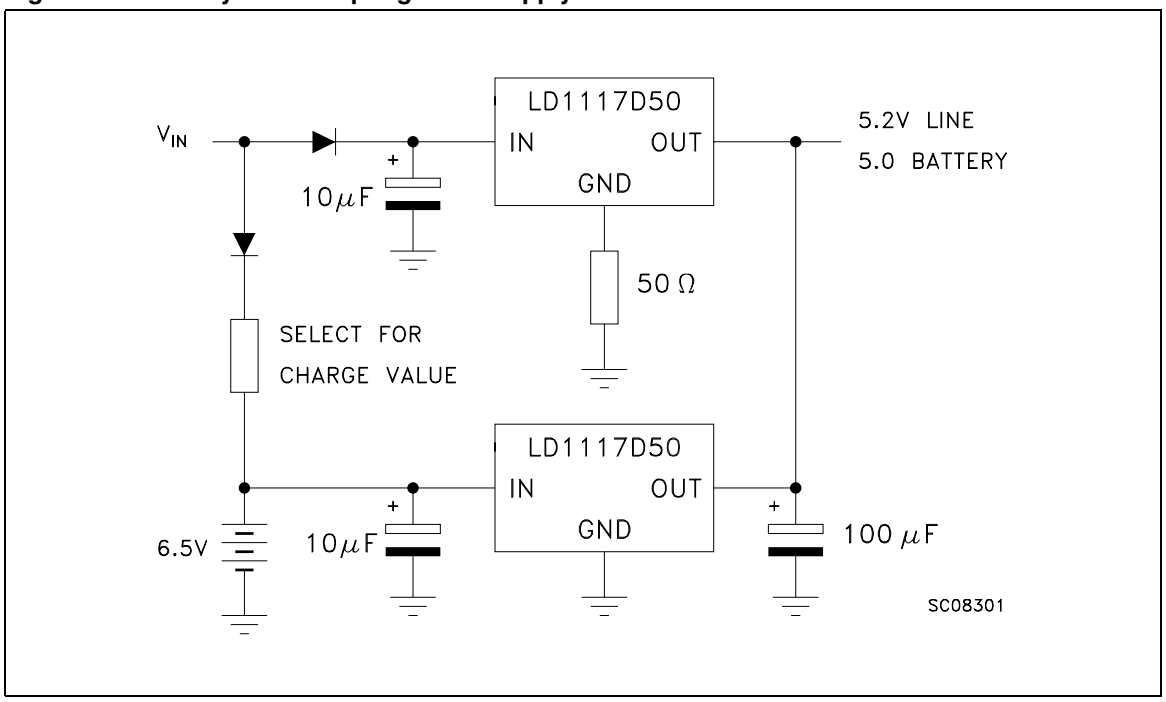
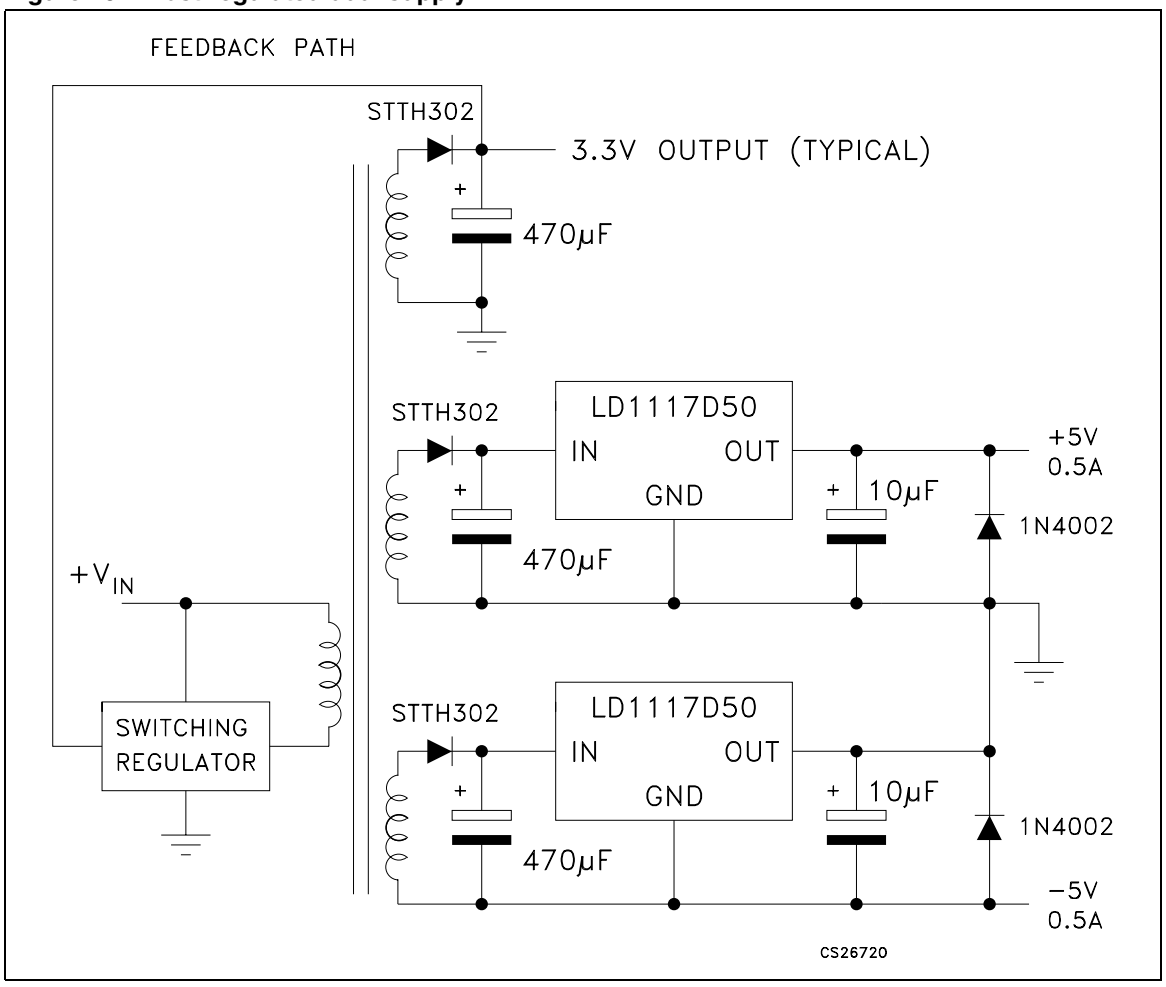


**Figure 10. Post-regulated dual supply**



# 7 LD1117 adjustable: application note

The LD1117 adjustable has a thermal stabilized 1.25 ± 0.012 V reference voltage between the OUT and ADJ pins. $I_{ADJ}$ is 60 µA typ. (120 µA max.) and $\Delta I_{ADJ}$ is 1 µA typ. (5 µA max.).

$R_1$ is normally fixed to 120 Ω. From *Figure 10* we obtain:

$V_{OUT} = V_{REF} + R_2 (I_{ADJ} + I_{R1}) = V_{REF} + R_2 (I_{ADJ} + V_{REF} / R_1) = V_{REF} (1 + R_2 / R_1) + R_2 \times I_{ADJ}$.

In normal application $R_2$ value is in the range of few kΩ, so the $R_2 \times I_{ADJ}$ product could not be considered in the $V_{OUT}$ calculation; then the above expression becomes:

$V_{OUT} = V_{REF} (1 + R_2 / R_1)$.

In order to have the better load regulation it is important to realize a good Kelvin connection of $R_1$ and $R_2$ resistors. In particular $R_1$ connection must be realized very close to OUT and ADJ pin, while $R_2$ ground connection must be placed as near as possible to the negative Load pin. Ripple rejection can be improved by introducing a 10 µF electrolytic capacitor placed in parallel to the $R_2$ resistor (see *Figure 11*).

**Figure 11. Adjustable output voltage application**

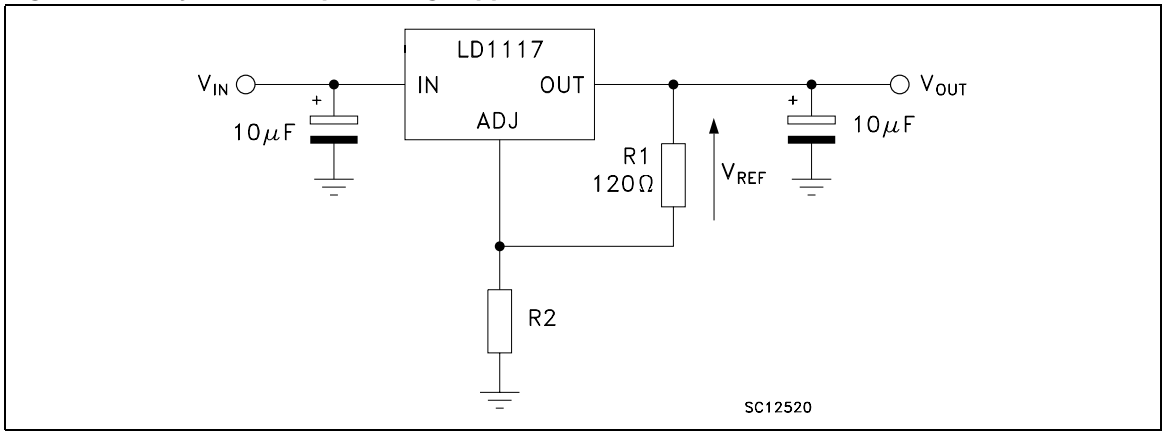
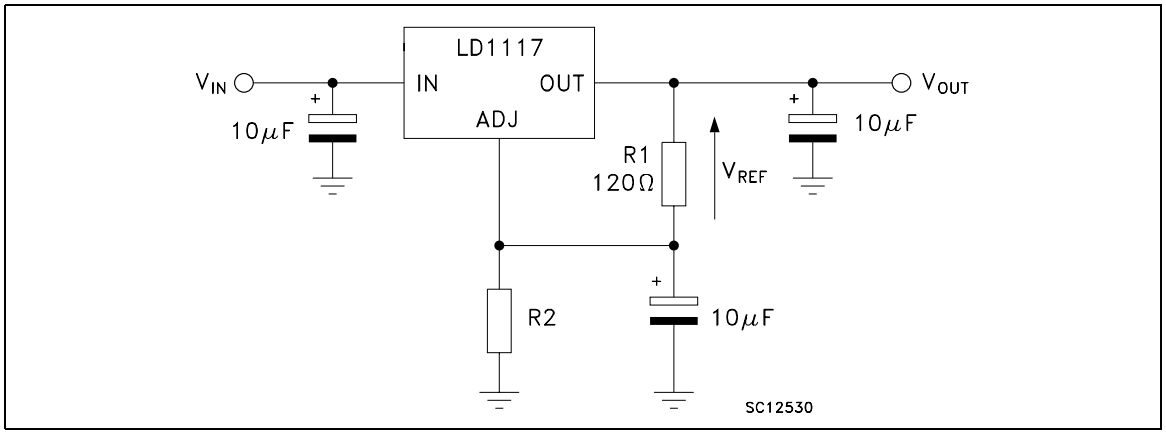



**Figure 12. Adjustable output voltage application with improved ripple rejection**



# 8 Package mechanical data

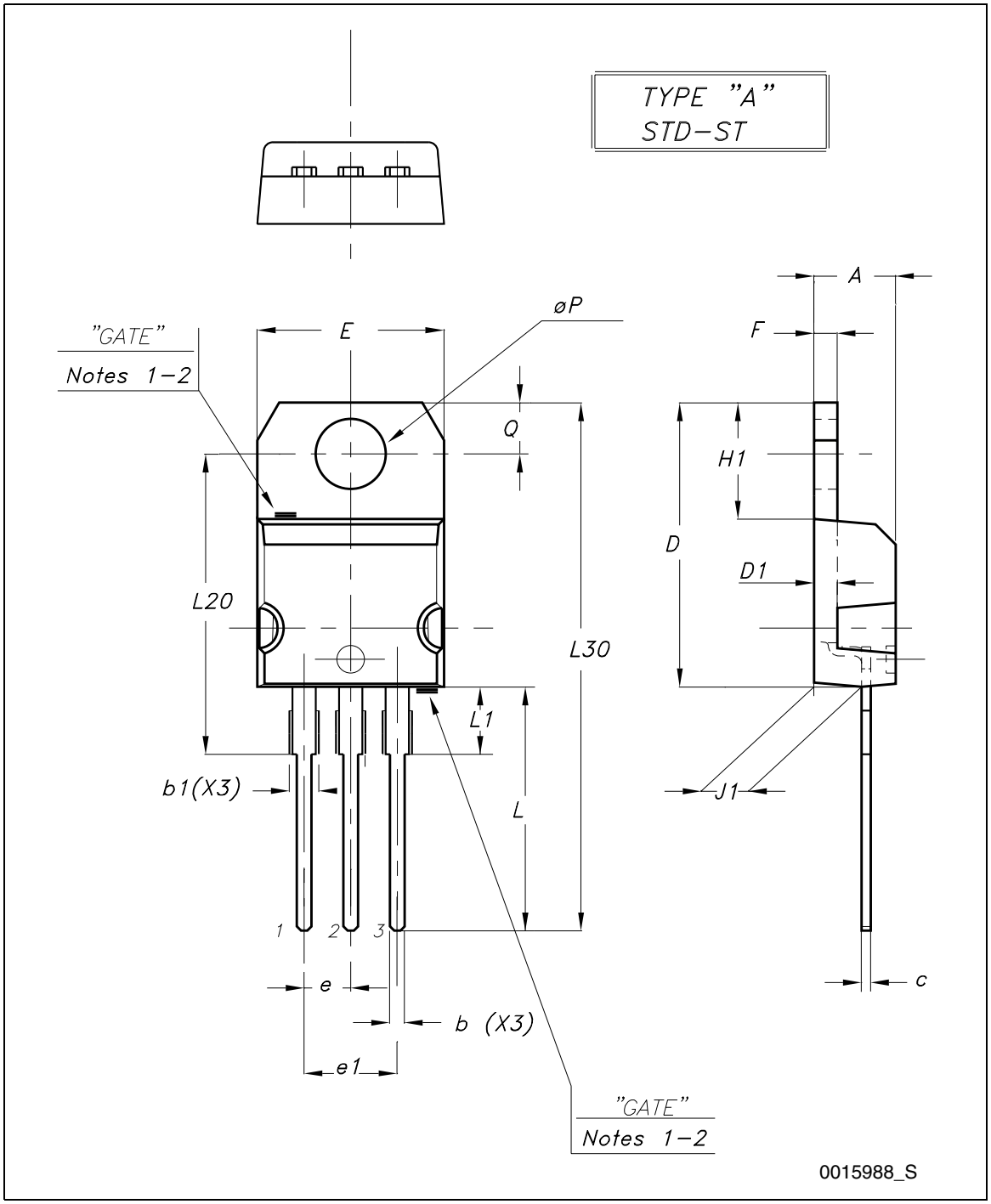
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK® is an ST trademark.

**Table 17. TO-220 mechanical data**

| Dim. | Type STD - ST Dual Gauge | | | Type STD - ST Single Gauge | | |
|---|---|---|---|---|---|---|
| | mm. | | | mm. | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 4.40 | | 4.60 | 4.40 | | 4.60 |
| b | 0.61 | | 0.88 | 0.61 | | 0.88 |
| b1 | 1.14 | | 1.70 | 1.14 | | 1.70 |
| c | 0.48 | | 0.70 | 0.48 | | 0.70 |
| D | 15.25 | | 15.75 | 15.25 | | 15.75 |
| D1 | | 1.27 | | | | |
| E | 10.00 | | 10.40 | 10.00 | | 10.40 |
| e | 2.40 | | 2.70 | 2.40 | | 2.70 |
| e1 | 4.95 | | 5.15 | 4.95 | | 5.15 |
| F | 1.23 | | 1.32 | 0.51 | | 0.60 |
| H1 | 6.20 | | 6.60 | 6.20 | | 6.60 |
| J1 | 2.40 | | 2.72 | 2.40 | | 2.72 |
| L | 13.00 | | 14.00 | 13.00 | | 14.00 |
| L1 | 3.50 | | 3.93 | 3.50 | | 3.93 |
| L20 | | 16.40 | | | 16.40 | |
| L30 | | 28.90 | | | 28.90 | |
| ∅P | 3.75 | | 3.85 | 3.75 | | 3.85 |
| Q | 2.65 | | 2.95 | 2.65 | | 2.95 |

*In spite of some difference in tolerances, the packages are compatible.*

**Figure 13. Drawing dimension TO-220 (type STD-ST Dual Gauge)**




*Note: 1 Maximum resin gate protrusion: 0.5 mm.*

*2 Resin gate position is accepted in each of the two positions shown on the drawing, or their symmetrical.*

**Figure 14. Drawing dimension TO-220 (type STD-ST Single Gauge)**

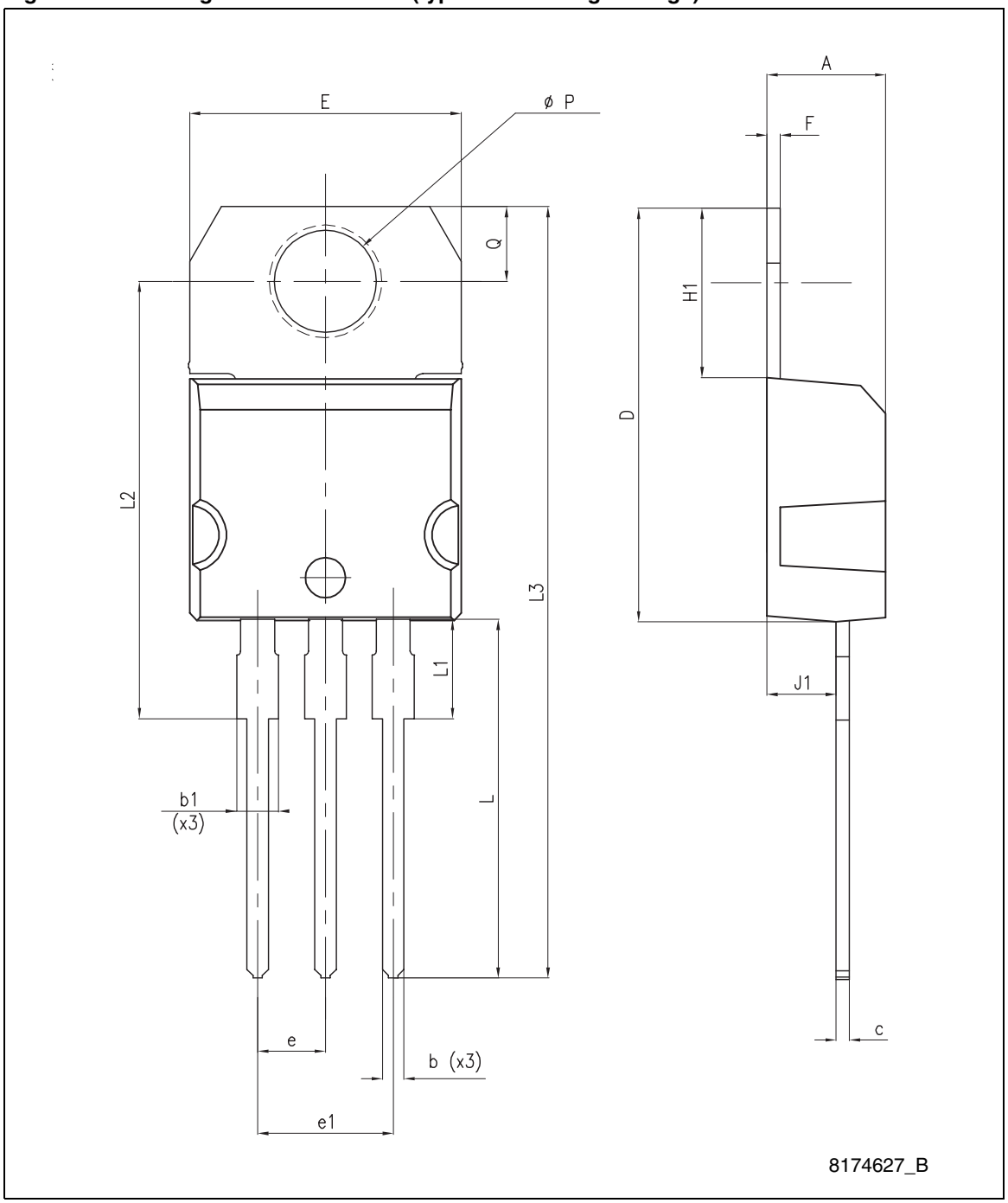


**Figure 15. Drawing dimension tube for TO-220 Dual Gauge (mm.)**

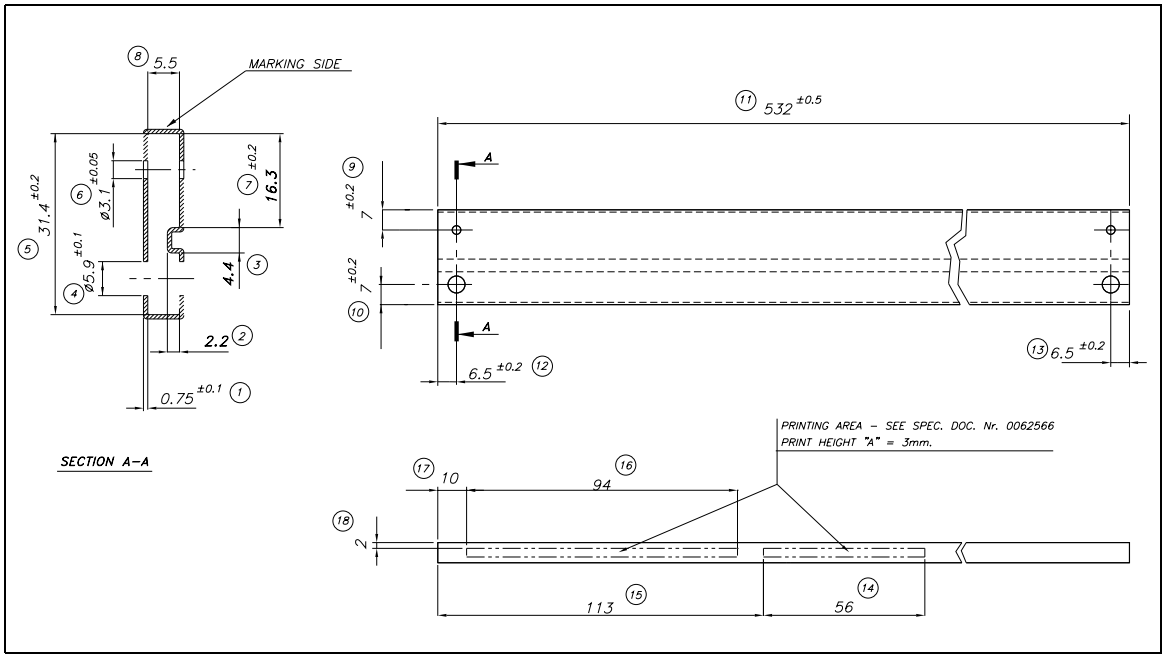
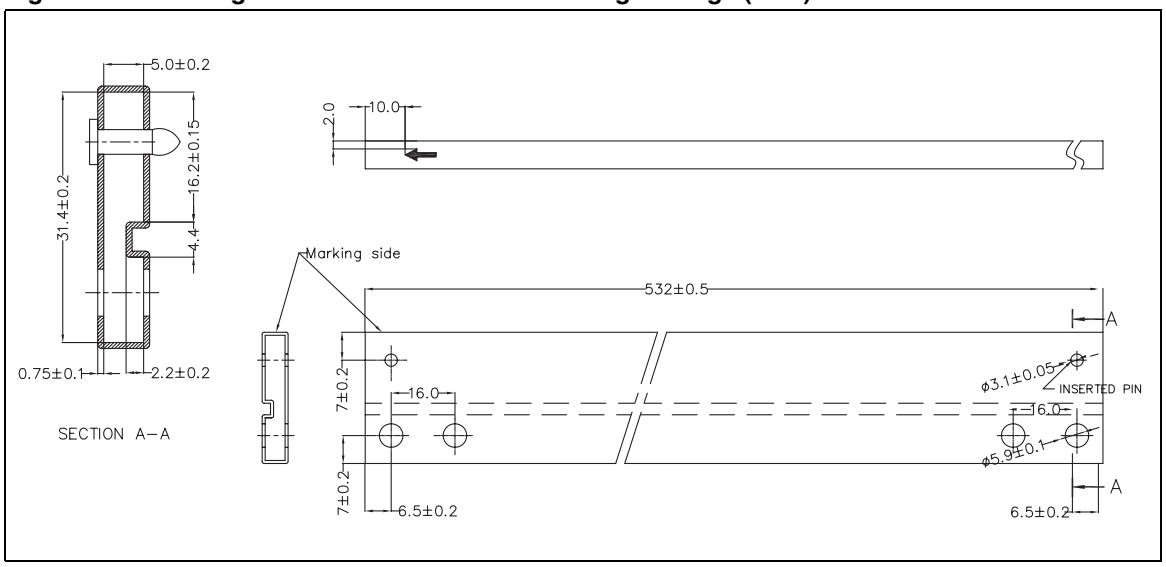
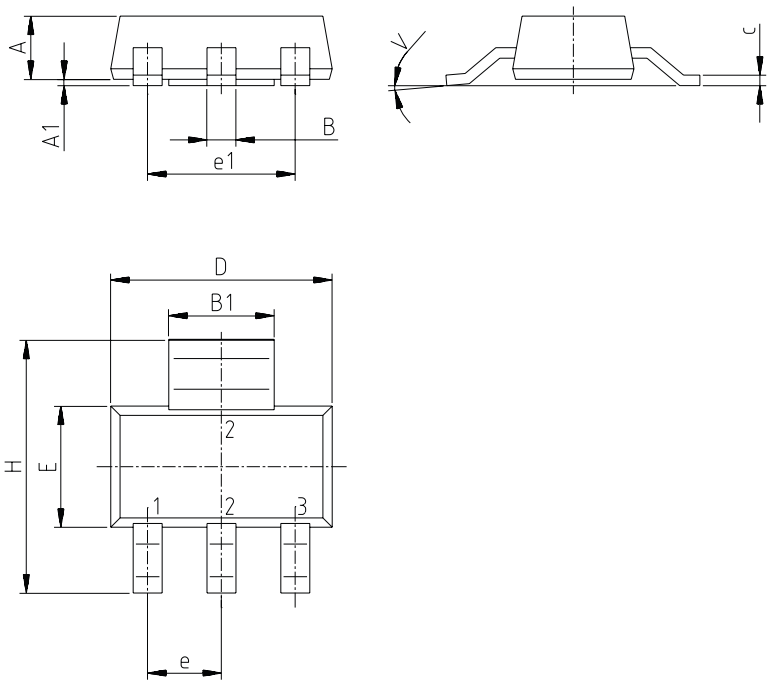



**Figure 16. Drawing dimension tube for TO-220 Single Gauge (mm.)**



## SOT-223 mechanical data

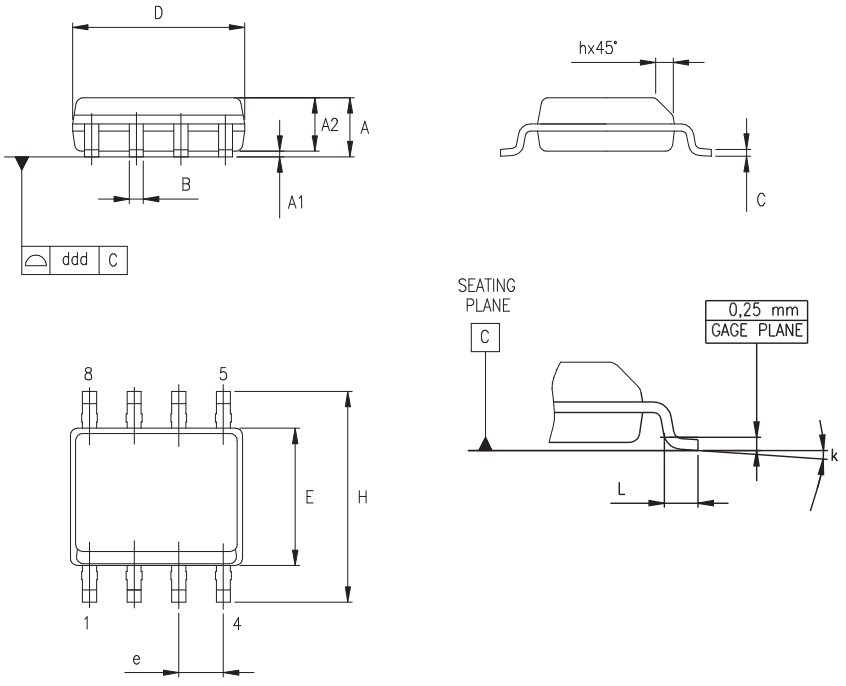
| Dim. | mm. | | | mils. | | |
|---|---|---|---|---|---|---|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 1.8 | | | 70.9 |
| A1 | 0.02 | | 0.1 | 0.8 | | 3.9 |
| B | 0.6 | 0.7 | 0.85 | 23.6 | 27.6 | 33.5 |
| B1 | 2.9 | 3 | 3.15 | 114.2 | 118.1 | 124.0 |
| c | 0.24 | 0.26 | 0.35 | 9.4 | 10.2 | 13.8 |
| D | 6.3 | 6.5 | 6.7 | 248.0 | 255.9 | 263.8 |
| e | | 2.3 | | | 90.6 | |
| e1 | | 4.6 | | | 181.1 | |
| E | 3.3 | 3.5 | 3.7 | 129.9 | 137.8 | 145.7 |
| H | 6.7 | 7 | 7.3 | 263.8 | 275.7 | 287.5 |
| V | | | 10° | | | 10° |




0046067/H

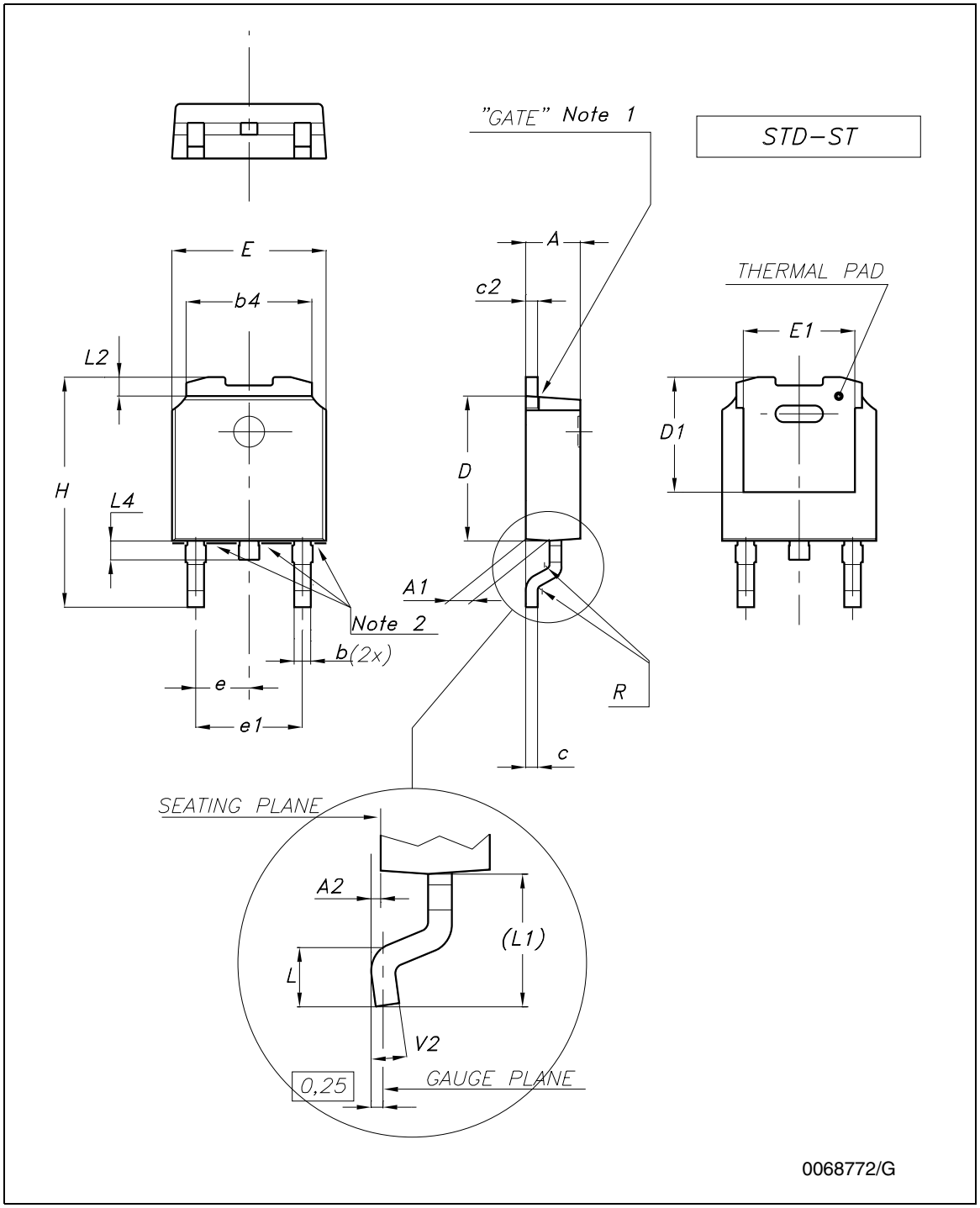
## SO-8 mechanical data

| Dim. | mm. | | | inch. | | |
|---|---|---|---|---|---|---|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 1.35 | | 1.75 | 0.053 | | 0.069 |
| A1 | 0.10 | | 0.25 | 0.04 | | 0.010 |
| A2 | 1.10 | | 1.65 | 0.043 | | 0.065 |
| B | 0.33 | | 0.51 | 0.013 | | 0.020 |
| C | 0.19 | | 0.25 | 0.007 | | 0.010 |
| D | 4.80 | | 5.00 | 0.189 | | 0.197 |
| E | 3.80 | | 4.00 | 0.150 | | 0.157 |
| e | | 1.27 | | | 0.050 | |
| H | 5.80 | | 6.20 | 0.228 | | 0.244 |
| h | 0.25 | | 0.50 | 0.010 | | 0.020 |
| L | 0.40 | | 1.27 | 0.016 | | 0.050 |
| k | 8° (max.) | | | | | |
| ddd | | | 0.1 | | | 0.04 |




0016023/C

**Figure 17. Drawing dimension DPAK (type STD-ST)**




*Note: 1 Maximum resin gate protrusion: 0.5 mm.*

*2 Maximum resin protrusion: 0.25 mm.*

**Figure 18. Drawing dimension DPAK (type Fujitsu-subcon.)**

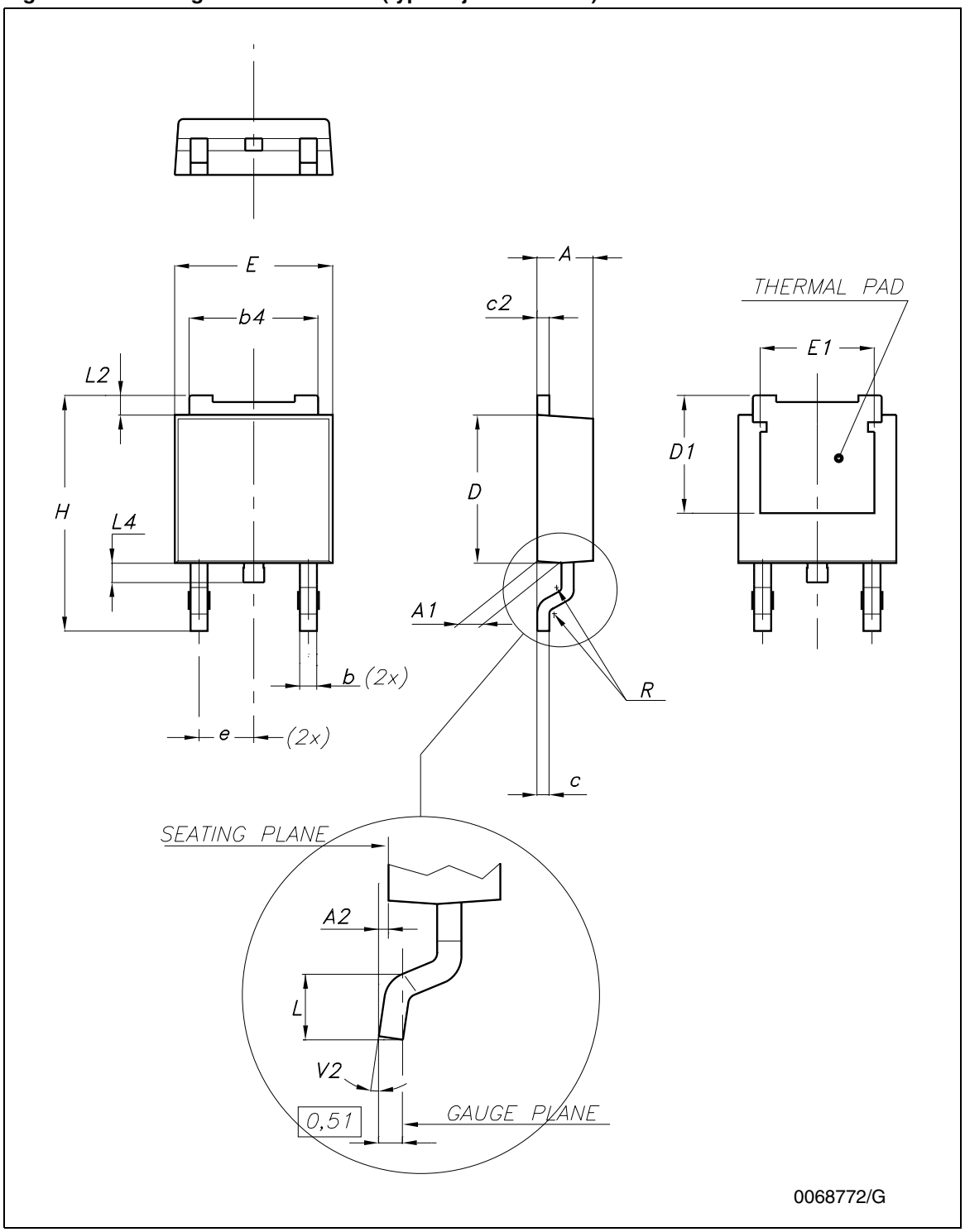


**Figure 19. Drawing dimension DPAK (type IDS-subcon.)**

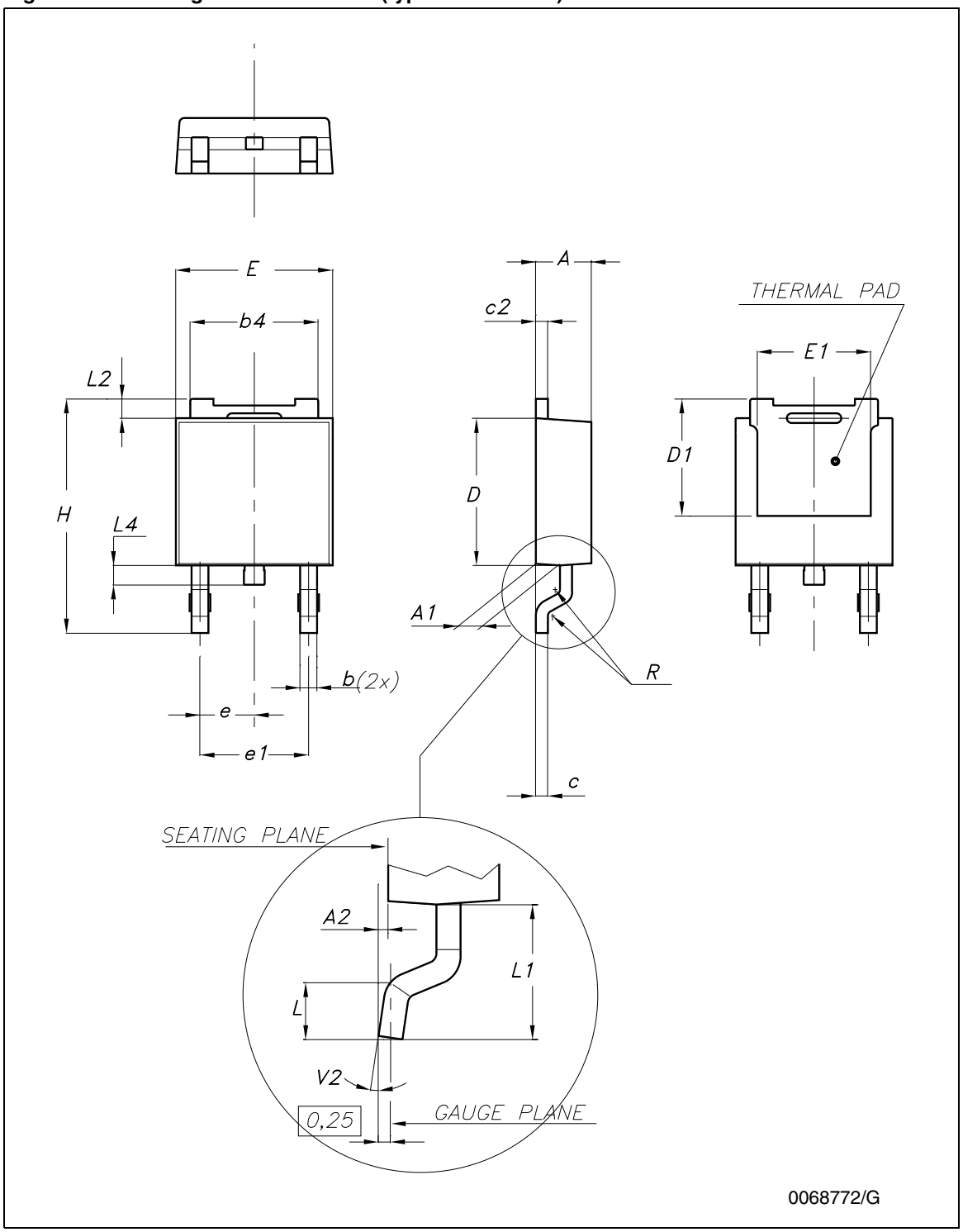


**Table 18. DPAK mechanical data**

| Dim. | Type STD-ST | | | Type Fujitsu-subcon. | | | Type IDS-subcon | | |
|---|---|---|---|---|---|---|---|---|---|
| | mm. | | | mm. | | | mm. | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 2.20 | | 2.40 | 2.25 | 2.30 | 2.35 | 2.19 | | 2.38 |
| A1 | 0.90 | | 1.10 | 0.96 | | 1.06 | 0.89 | | 1.14 |
| A2 | 0.03 | | 0.23 | 0 | | 0.10 | 0.03 | | 0.23 |
| b | 0.64 | | 0.90 | 0.76 | | 0.86 | 0.64 | | 0.88 |
| b4 | 5.20 | | 5.40 | 5.28 | | 5.38 | 5.21 | | 5.46 |
| c | 0.45 | | 0.60 | 0.46 | | 0.56 | 0.46 | | 0.58 |
| c2 | 0.48 | | 0.60 | 0.46 | | 0.56 | 0.46 | | 0.58 |
| D | 6.00 | | 6.20 | 6.05 | | 6.15 | 5.97 | | 6.22 |
| D1 | | 5.10 | | 5.27 | | 5.47 | | 5.20 | |
| E | 6.40 | | 6.60 | 6.55 | 6.60 | 6.65 | 6.35 | | 6.73 |
| E1 | | 4.70 | | | 4.77 | | | 4.70 | |
| e | | 2.28 | | 2.23 | 2.28 | 2.33 | | 2.28 | |
| e1 | 4.40 | | 4.60 | | | | 4.51 | | 4.61 |
| H | 9.35 | | 10.10 | 9.90 | | 10.30 | 9.40 | | 10.42 |
| L | 1.00 | | | 1.40 | | 1.60 | 0.90 | | |
| L1 | | 2.80 | | | | | 2.50 | | 2.65 |
| L2 | | 0.80 | | 1.03 | | 1.13 | 0.89 | | 1.27 |
| L4 | 0.60 | | 1.00 | 0.70 | | 0.90 | 0.64 | | 1.02 |
| R | | 0.20 | | | 0.40 | | | 0.20 | |
| V2 | 0° | | 8° | 0° | | 8° | 0° | | 8° |

*Note: The DPAK package coming from the two subcontractors (Fujitsu and IDS) are fully compatible with the ST's package suggested footprint.*

**Figure 20. DPAK footprint recommended data**

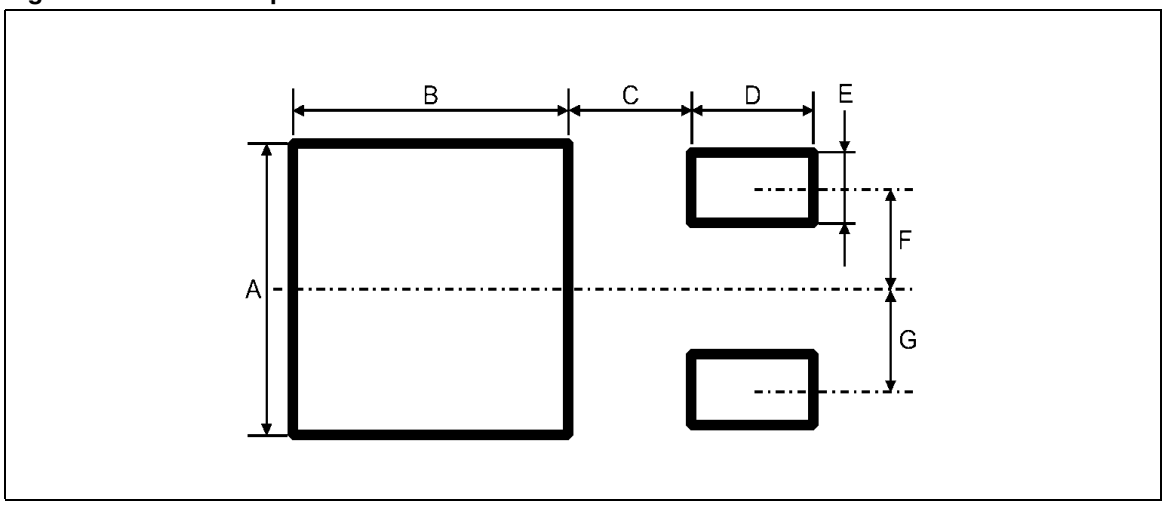
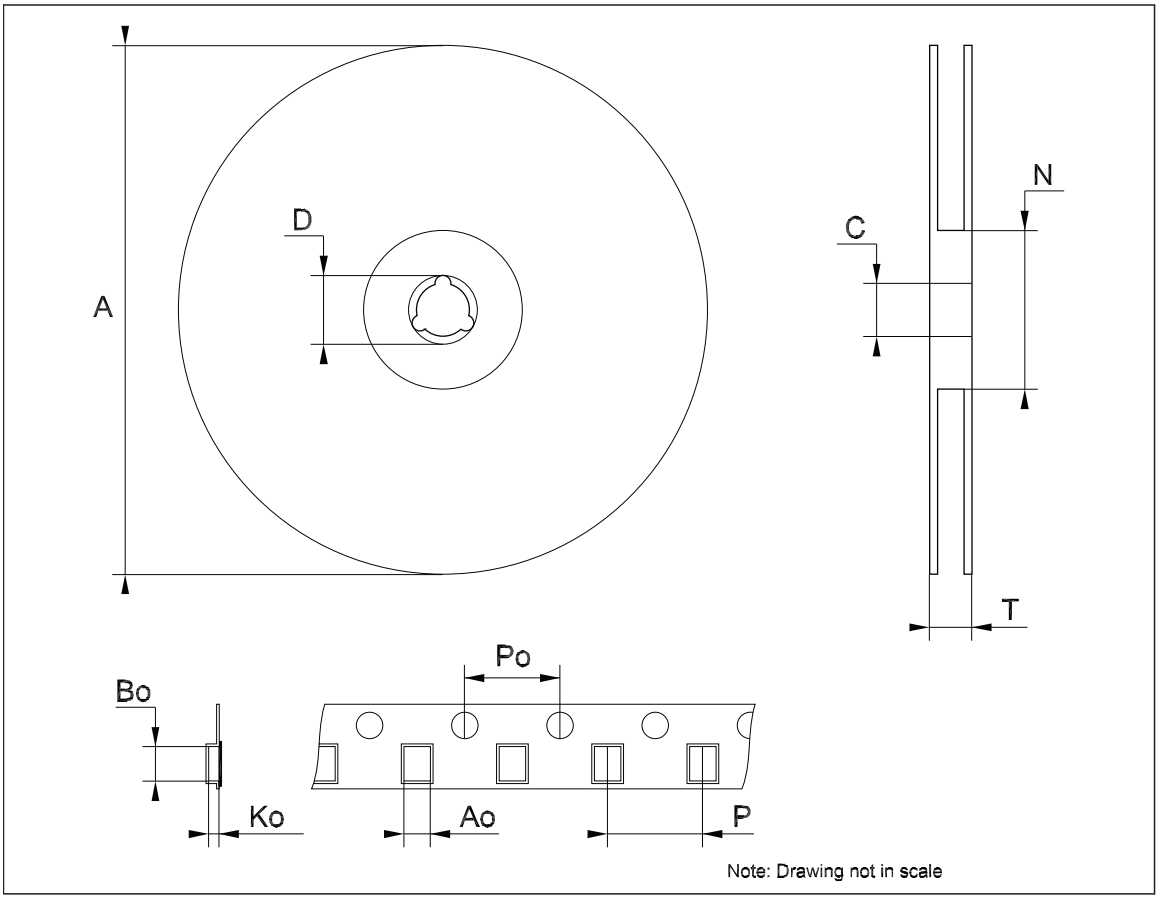



**Table 19. Footprint data**

| Values | | |
|---|---|---|
| | mm. | inch. |
| A | 6.70 | 0.264 |
| B | 6.70 | 0.64 |
| C | 1.8 | 0.070 |
| D | 3.0 | 0.118 |
| E | 1.60 | 0.063 |
| F | 2.30 | 0.091 |
| G | 2.30 | 0.091 |

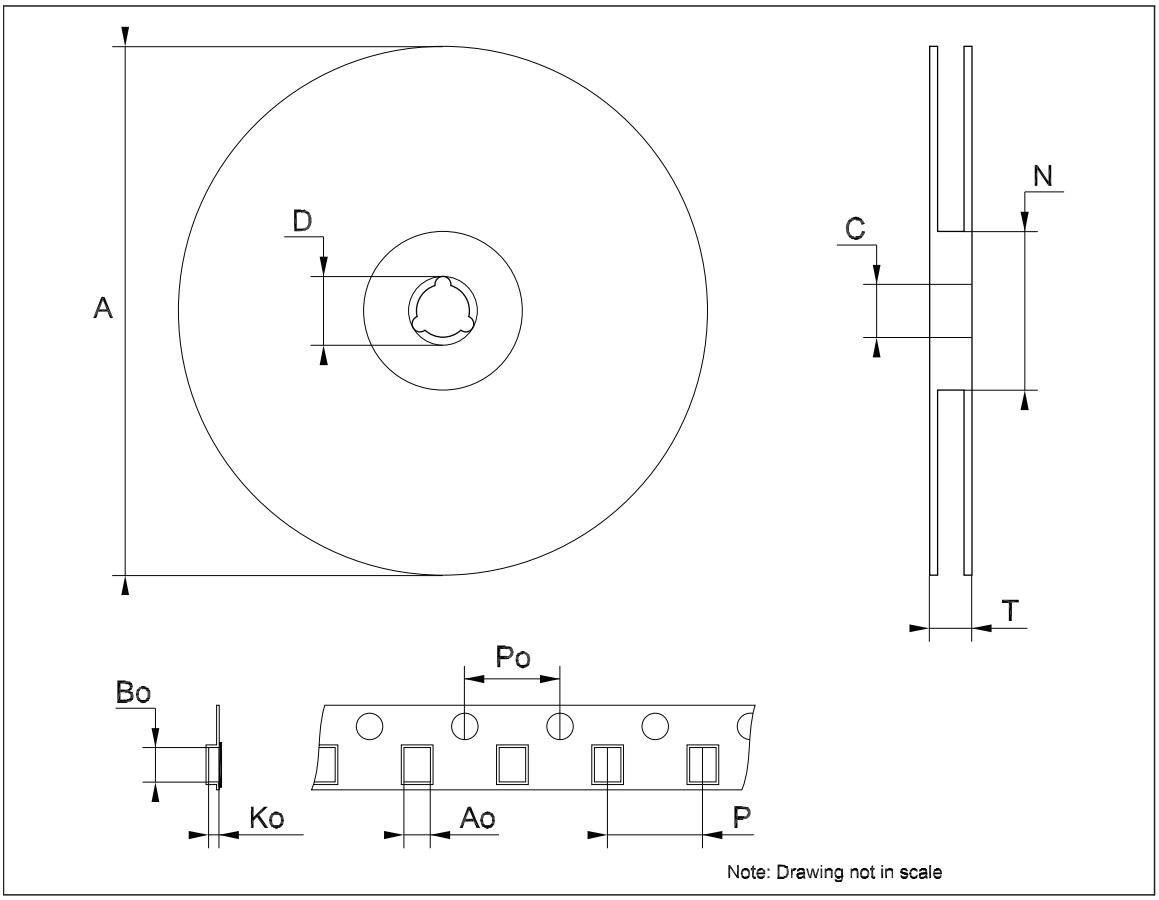
## Tape & reel SOT223 mechanical data

| Dim. | mm. | | | inch. | | |
|---|---|---|---|---|---|---|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 330 | | | 12.992 |
| 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 | 6.73 | 6.83 | 6.93 | 0.265 | 0.269 | 0.273 |
| Bo | 7.32 | 7.42 | 7.52 | 0.288 | 0.292 | 0.296 |
| Ko | 1.78 | | 2 | 0.070 | | 0.078 |
| Po | 3.9 | 4.0 | 4.1 | 0.153 | 0.157 | 0.161 |
| P | 7.9 | 8.0 | 8.1 | 0.311 | 0.315 | 0.319 |



## Tape & reel SO-8 mechanical data

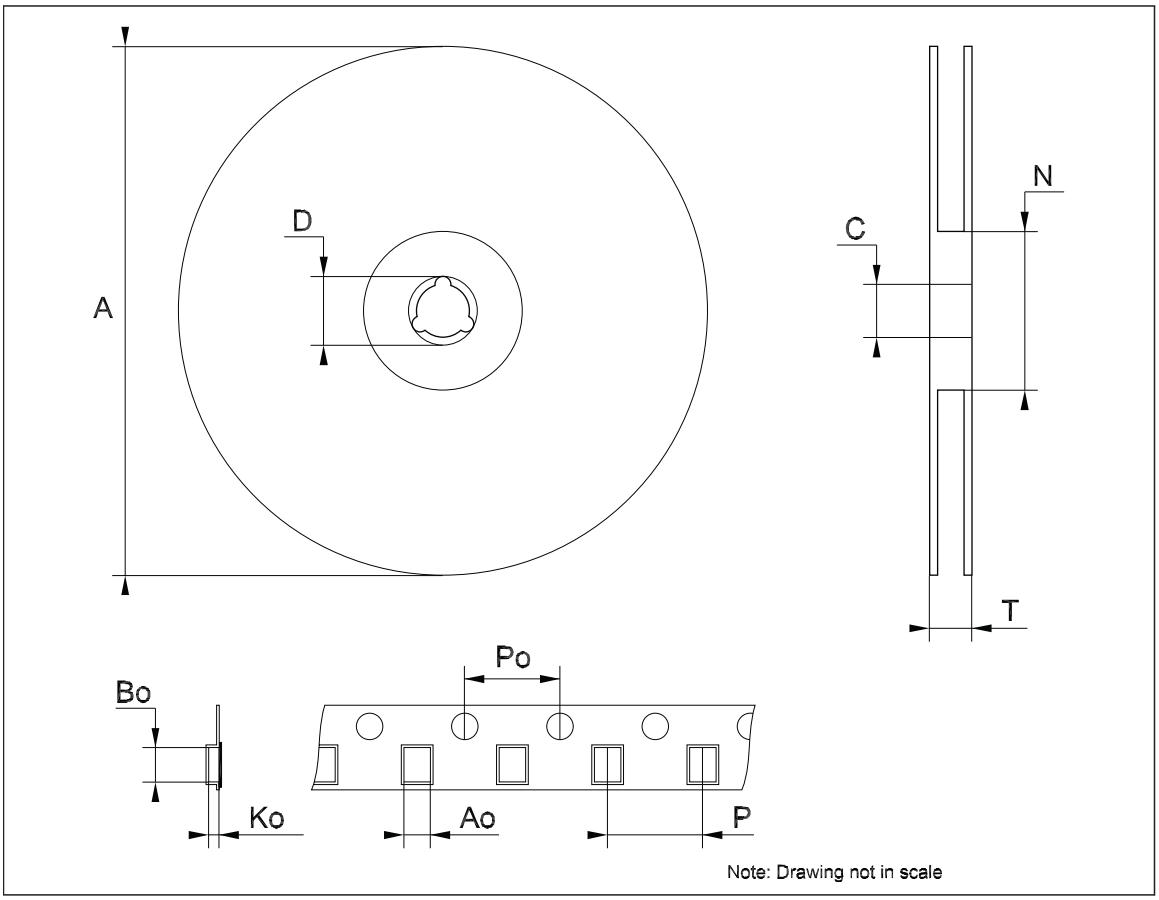
| Dim. | mm. | | | inch. | | |
|---|---|---|---|---|---|---|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 330 | | | 12.992 |
| C | 12.8 | | 13.2 | 0.504 | | 0.519 |
| D | 20.2 | | | 0.795 | | |
| N | 60 | | | 2.362 | | |
| T | | | 22.4 | | | 0.882 |
| Ao | 8.1 | | 8.5 | 0.319 | | 0.335 |
| Bo | 5.5 | | 5.9 | 0.216 | | 0.232 |
| Ko | 2.1 | | 2.3 | 0.082 | | 0.090 |
| Po | 3.9 | | 4.1 | 0.153 | | 0.161 |
| P | 7.9 | | 8.1 | 0.311 | | 0.319 |




Note: Drawing not in scale

## Tape & reel DPAK-PPAK mechanical data

| Dim. | mm. | | | inch. | | |
|---|---|---|---|---|---|---|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 330 | | | 12.992 |
| C | 12.8 | 13.0 | 13.2 | 0.504 | 0.512 | 0.519 |
| D | 20.2 | | | 0.795 | | |
| N | 60 | | | 2.362 | | |
| T | | | 22.4 | | | 0.882 |
| Ao | 6.80 | 6.90 | 7.00 | 0.268 | 0.272 | 0.2.76 |
| Bo | 10.40 | 10.50 | 10.60 | 0.409 | 0.413 | 0.417 |
| Ko | 2.55 | 2.65 | 2.75 | 0.100 | 0.104 | 0.105 |
| Po | 3.9 | 4.0 | 4.1 | 0.153 | 0.157 | 0.161 |
| P | 7.9 | 8.0 | 8.1 | 0.311 | 0.315 | 0.319 |




Note: Drawing not in scale

# 9 Order codes

**Table 20. Order codes**

| Packages | | | | | |
|---|---|---|---|---|---|
| **SOT-223** | **SO-8** | **DPAK** | **DPAK (T & R)** | **TO-220** | **Output voltages** |
| LD1117S12TR | LD1117D12TR (1) | LD1117DT12 (1) | LD1117DT12TR | | 1.2 V |
| LD1117S12CTR | LD1117D12CTR (1) | LD1117DT12C (1) | | LD1117V12C (1) | 1.2 V |
| LD1117S18TR | LD1117D18TR (1) | | LD1117DT18TR | LD1117V18 | 1.8 V |
| LD1117S18CTR | LD1117D18CTR (1) | | LD1117DT18CTR | LD1117V18C (1) | 1.8 V |
| LD1117S25TR | LD1117D25TR (1) | | LD1117DT25TR | | 2.5 V |
| LD1117S25CTR | LD1117D25CTR (1) | | LD1117DT25CTR | | 2.5 V |
| LD1117S30TR | | | | | 3 V |
| LD1117S33TR | LD1117D33TR | | LD1117DT33TR | LD1117V33 | 3.3 V |
| LD1117S33CTR | LD1117D33CTR | | LD1117DT33CTR | LD1117V33C | 3.3 V |
| LD1117S50TR | | | LD1117DT50TR | LD1117V50 | 5 V |
| LD1117S50CTR | | | LD1117DT50CTR | | 5 V |
| LD1117STR | LD1117DTR (1) | | LD1117DTTR | LD1117V | ADJ from 1.25 to 15V |
| LD1117SC-R | LD1117DC-R (1) | LD1117DTC (1) | LD1117DTC-R | LD1117VC (1) | ADJ from 1.25 to 15V |

1. Available on request.

# 10 Revision history

**Table 21. Document revision history**

| Date | Revision | Changes |
|---|---|---|
| 22-Sep-2004 | 15 | Add new part number #12C; typing error: note on table 2. |
| 25-Oct-2004 | 16 | Add $V_{ref}$ reference voltage on table 12. |
| 18-Jul-2005 | 17 | The DPAK mechanical data updated. |
| 25-Nov-2005 | 18 | The TO220FM package removed. |
| 14-Dec-2005 | 19 | The $T_{op}$ on table 2 updated. |
| 06-Dec-2006 | 20 | DPAK mechanical data updated and added footprint data. |
| 05-Apr-2007 | 21 | Order codes updated. |
| 30-Nov-2007 | 22 | Added *Table 1*. |
| 16-Apr-2008 | 23 | Modified: *Table 20 on page 40*. |
| 08-Jul-2008 | 24 | Added note *1. on page 7*. |
| 30-Mar-2009 | 25 | Modified: $V_{IN}$ max value *Table 5 on page 10* and *Figure 10 on page 24*. |
| 29-Jul-2009 | 26 | Modified: *Table 20 on page 40*. |
| 03-Feb-2010 | 27 | Modified *Table 11 on page 16*. |
| 22-Mar-2010 | 28 | Added: *Table 17 on page 26*, *Figure 13 on page 27*, *Figure 14 on page 28*, *Figure 15* and *Figure 16 on page 29*. |

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