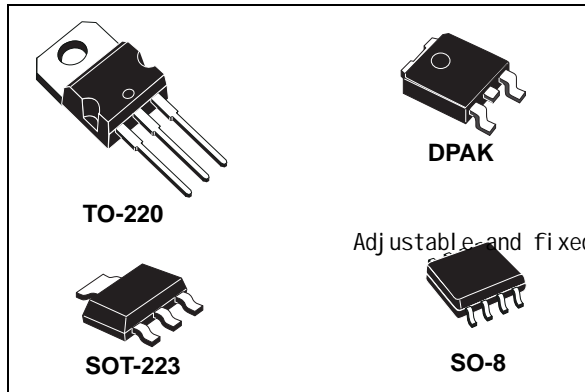


Adjustable and fixed low drop positive voltage regulator

Datasheet - production data



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 $\pm 1\%$ 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.

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, 3.3 V, 5.0 V
- Adjustable version availability ($V_{\text{REF}} = 1.25\text{ V}$)
- Internal current and thermal limit
- Available in $\pm 1\%$ (at 25 °C) and 2 % in full temperature range
- Supply voltage rejection: 75 dB (typ.)

Description

The LD1117 is a low drop voltage regulator able to provide up to 800 mA of output current, available even in adjustable version ($V_{\text{REF}} = 1.25\text{ V}$). Concerning fixed versions, are offered the following output voltages: 1.2 V, 1.8 V, 2.5 V, 2.85 V, 3.3 V and 5.0 V. 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

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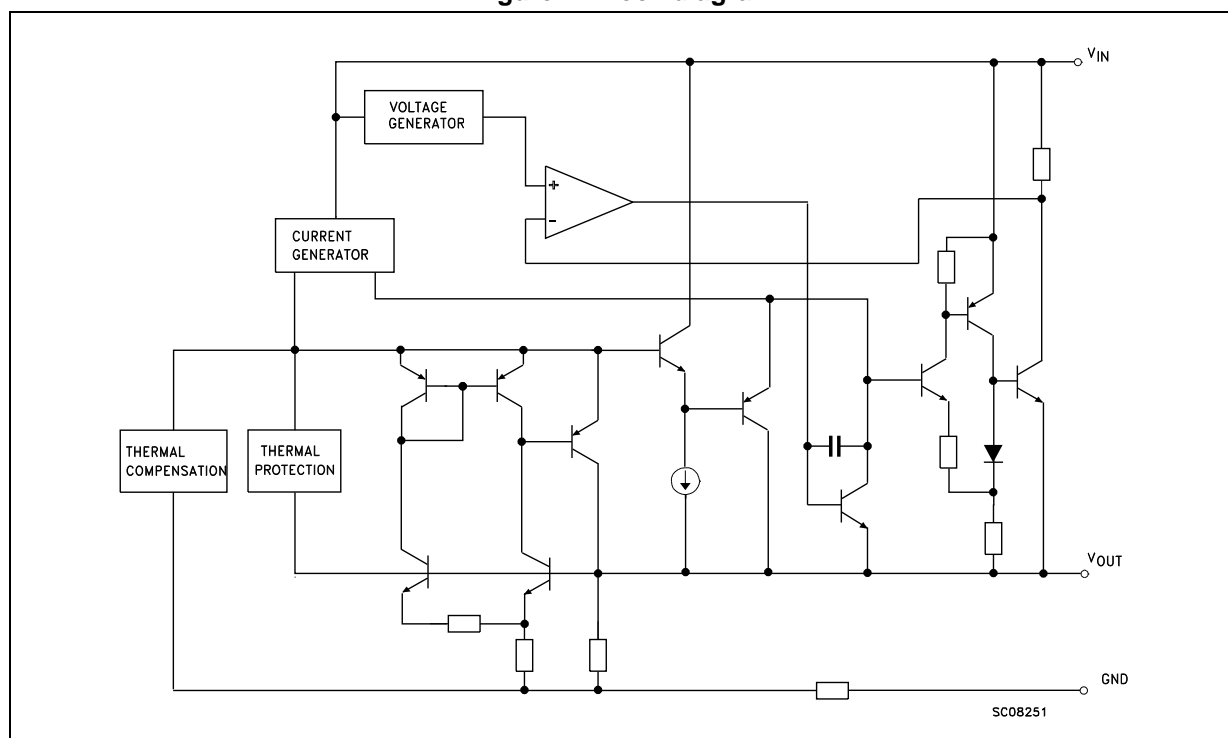
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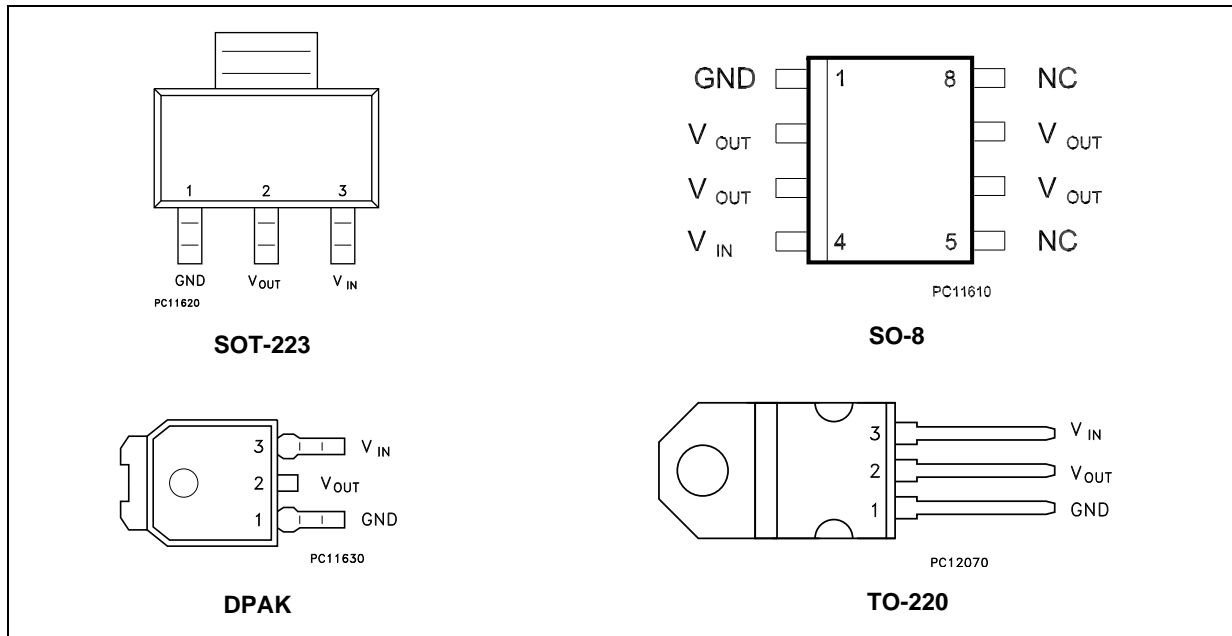
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1 Diagram

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 1. 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 2. Thermal data

| Symbol | Parameter | SOT-223 | SO-8 | DPAK | TO-220 | Unit |
|------------|-------------------------------------|---------|------|------|--------|------|
| R_{thJC} | Thermal resistance junction-case | 15 | 20 | 8 | 5 | °C/W |
| R_{thJA} | Thermal resistance junction-ambient | 110 | 55 | 100 | 50 | °C/W |

4 Schematic application

Figure 3. Application circuit (for 1.2 V)

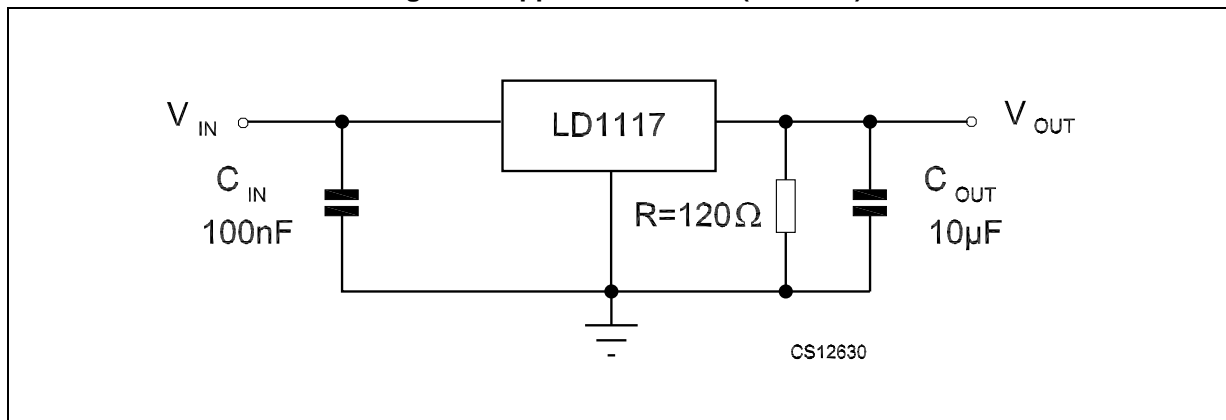
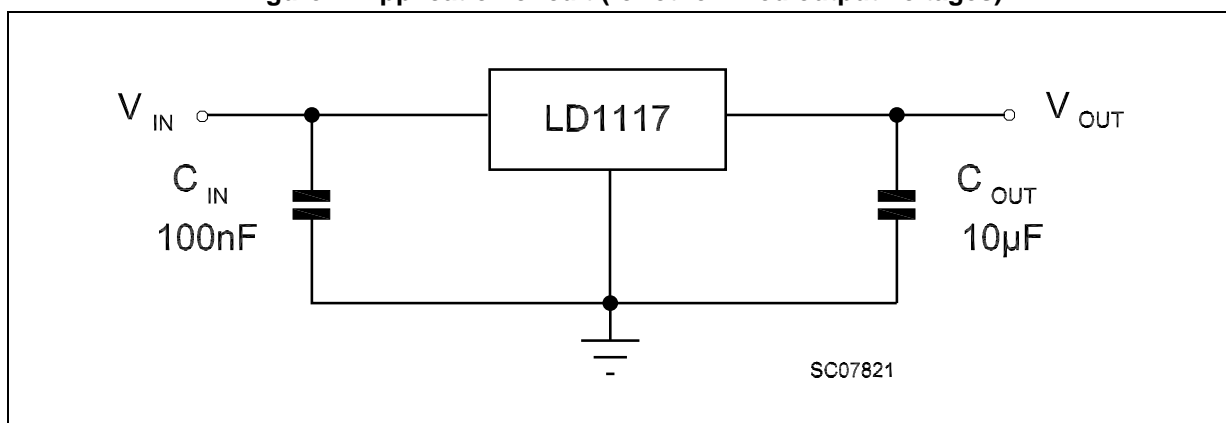


Figure 4. Application circuit (for other fixed output voltages)



5 Electrical characteristics

Refer to the test circuits, $T_J = 0$ to $125\text{ }^{\circ}\text{C}$, $C_O = 10\text{ }\mu\text{F}$, $R = 120\text{ }\Omega$ between GND and OUT pins, unless otherwise specified.

Table 3. Electrical characteristics of LD1117#12

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

Refer to the test circuits, $T_J = 0$ to $125\text{ }^{\circ}\text{C}$, $C_O = 10\text{ }\mu\text{F}$, unless otherwise specified.

Table 4. Electrical characteristics of LD1117#18

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

Refer to the test circuits, $T_J = 0$ to $125\text{ }^{\circ}\text{C}$, $C_O = 10\text{ }\mu\text{F}$, unless otherwise specified.

Table 5. Electrical characteristics of LD1117#25

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

Refer to the test circuits, $T_J = 0$ to $125\text{ }^{\circ}\text{C}$, $C_O = 10\text{ }\mu\text{F}$, unless otherwise specified.

Table 6. Electrical characteristics of LD1117#33

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

Refer to the test circuits, $T_J = 0$ to $125\text{ }^{\circ}\text{C}$, $C_O = 10\text{ }\mu\text{F}$, unless otherwise specified.

Table 7. Electrical characteristics of LD1117#50

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

Refer to the test circuits, $T_J = 0$ to $125\text{ }^{\circ}\text{C}$, $C_O = 10\text{ }\mu\text{F}$, unless otherwise specified.

Table 8. Electrical characteristics of LD1117 (adjustable)

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

Refer to the test circuits, $T_J = -40$ to $125\text{ }^{\circ}\text{C}$, $C_O = 10\text{ }\mu\text{F}$, $R = 120\text{ }\Omega$ between GND and OUT pins, unless otherwise specified.

Table 9. Electrical characteristics of LD1117#12C

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

Refer to the test circuits, $T_J = -40$ to $125\text{ }^{\circ}\text{C}$, $C_O = 10\text{ }\mu\text{F}$, unless otherwise specified.

Table 10. Electrical characteristics of LD1117#18C

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

Refer to the test circuits, $T_J = -40$ to $125\text{ }^{\circ}\text{C}$, $C_O = 10\text{ }\mu\text{F}$, unless otherwise specified.

Table 11. Electrical characteristics of LD1117#25C

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

Refer to the test circuits, $T_J = -40$ to $125\text{ }^{\circ}\text{C}$, $C_O = 10\text{ }\mu\text{F}$, unless otherwise specified.

Table 12. Electrical characteristics of LD1117#33C

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

Refer to the test circuits, $T_J = -40$ to $125\text{ }^{\circ}\text{C}$, $C_O = 10\text{ }\mu\text{F}$, unless otherwise specified.

Table 13. Electrical characteristics of LD1117#50C

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

Refer to the test circuits, $T_J = -40$ to $125\text{ }^{\circ}\text{C}$, $C_O = 10\text{ }\mu\text{F}$, unless otherwise specified.

Table 14. Electrical characteristics of LD1117C (adjustable)

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

6 Typical application

Figure 5. Negative supply

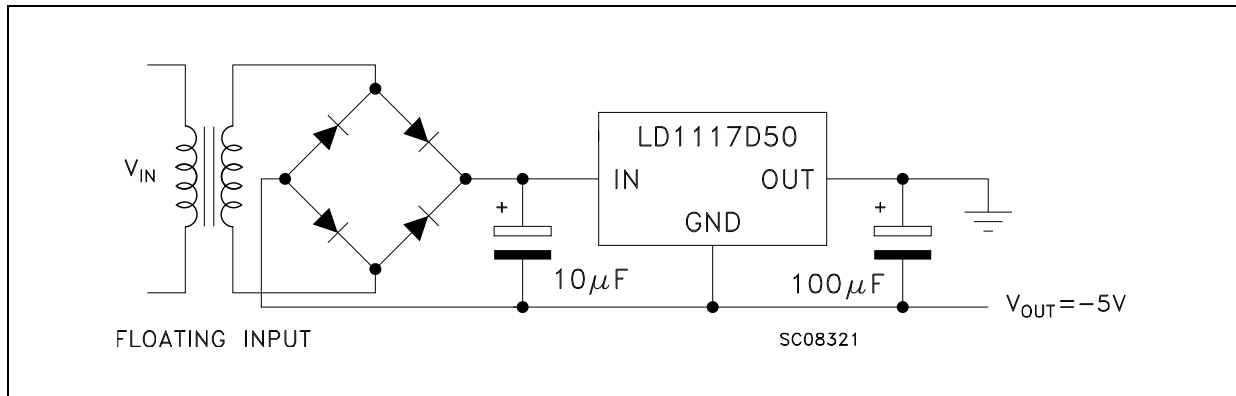


Figure 6. Circuit for increasing output voltage

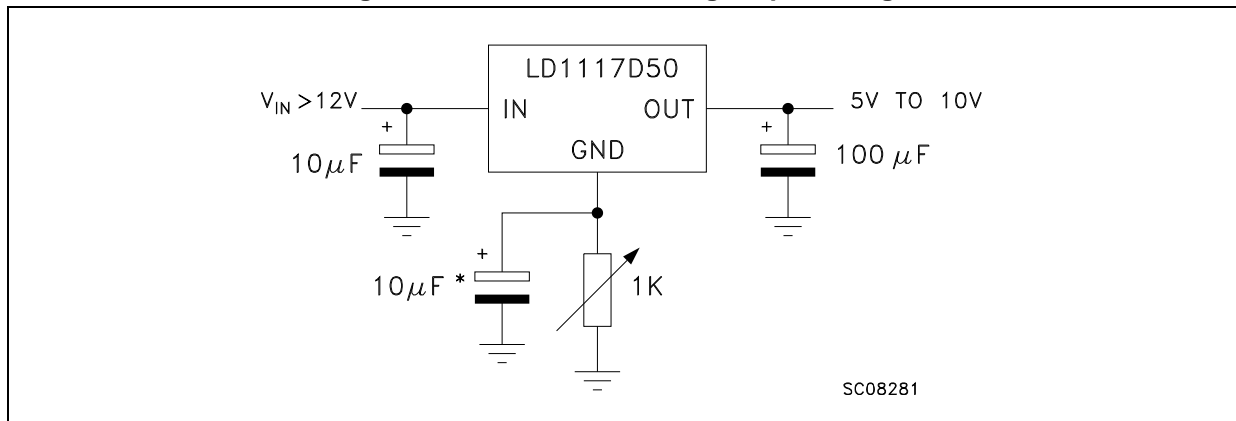


Figure 7. Voltage regulator with reference

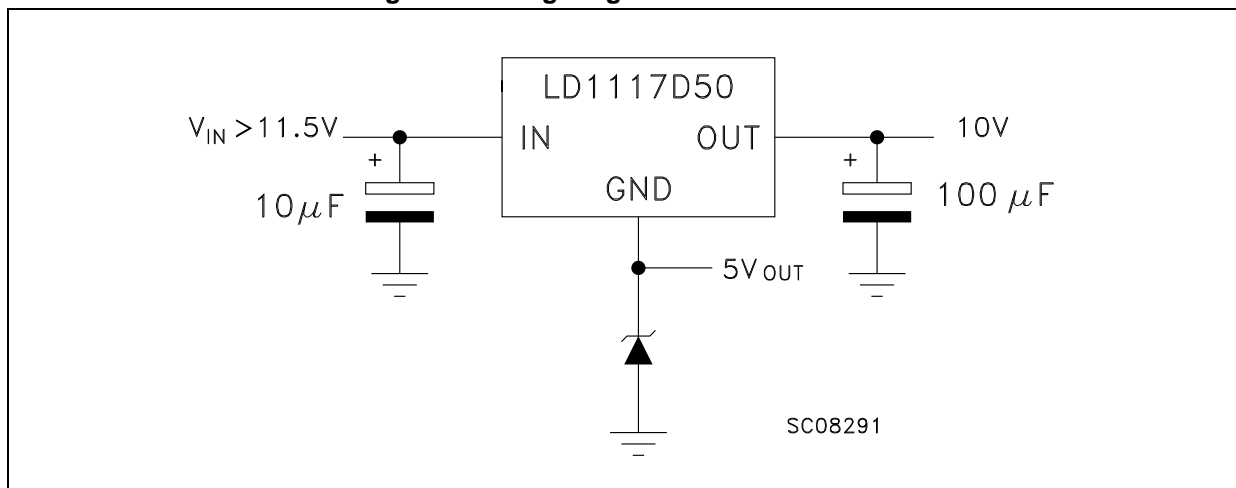


Figure 8. Battery backed-up regulated supply

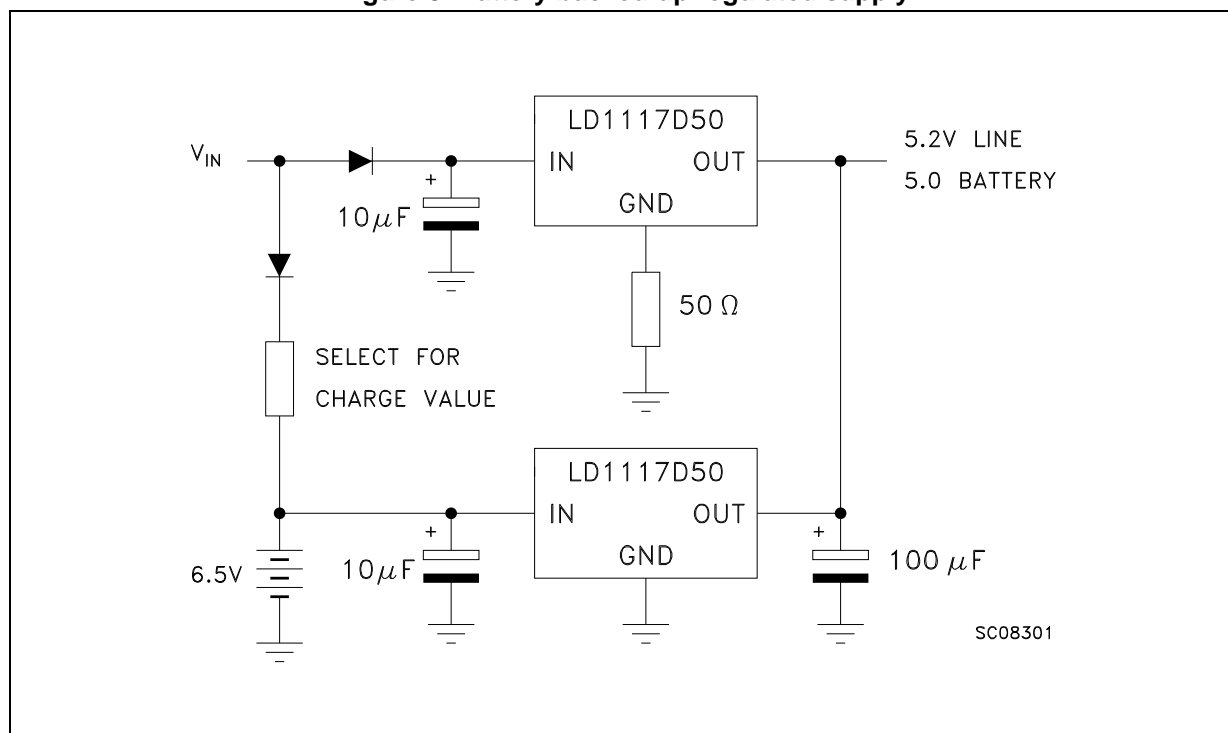
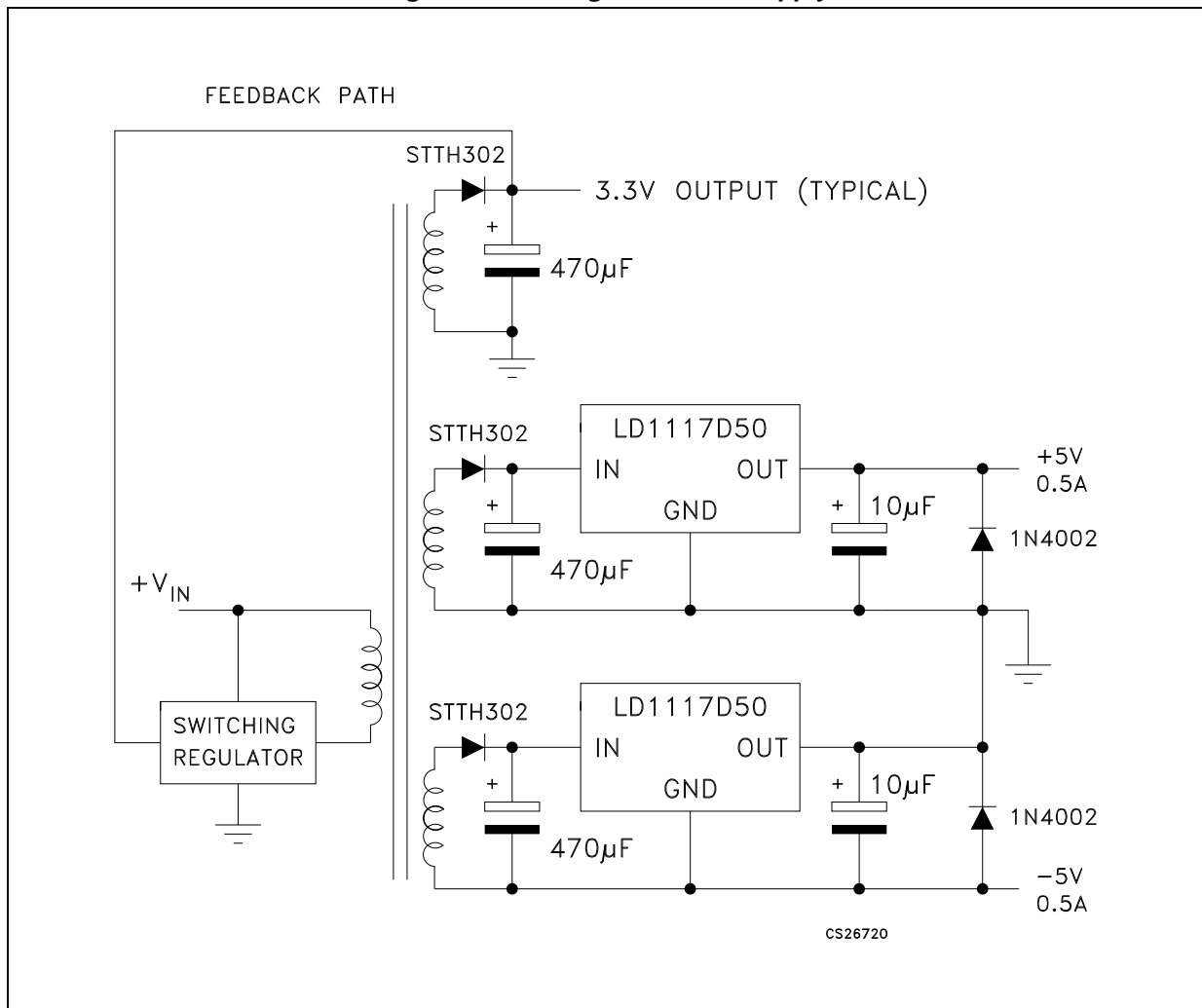


Figure 9. Post-regulated dual supply



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 μ A typ. (120 μ A max.) and ΔI_{ADJ} is 1 μ A typ. (5 μ A max.).

R_1 is normally fixed to 120 Ω . From [Figure 9](#) 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 k Ω , 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 μ F electrolytic capacitor placed in parallel to the R_2 resistor (see [Figure 10](#)).

Figure 10. Adjustable output voltage application

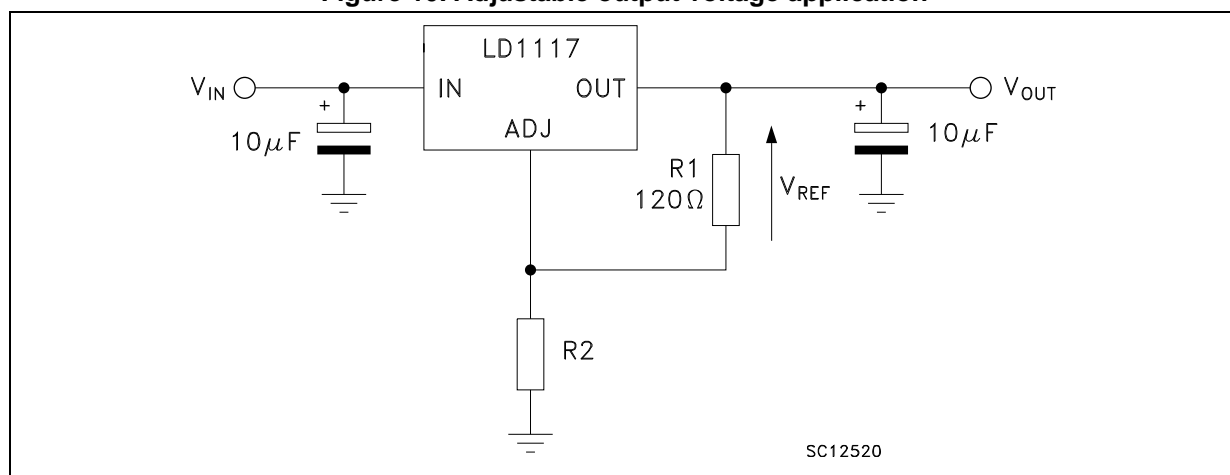
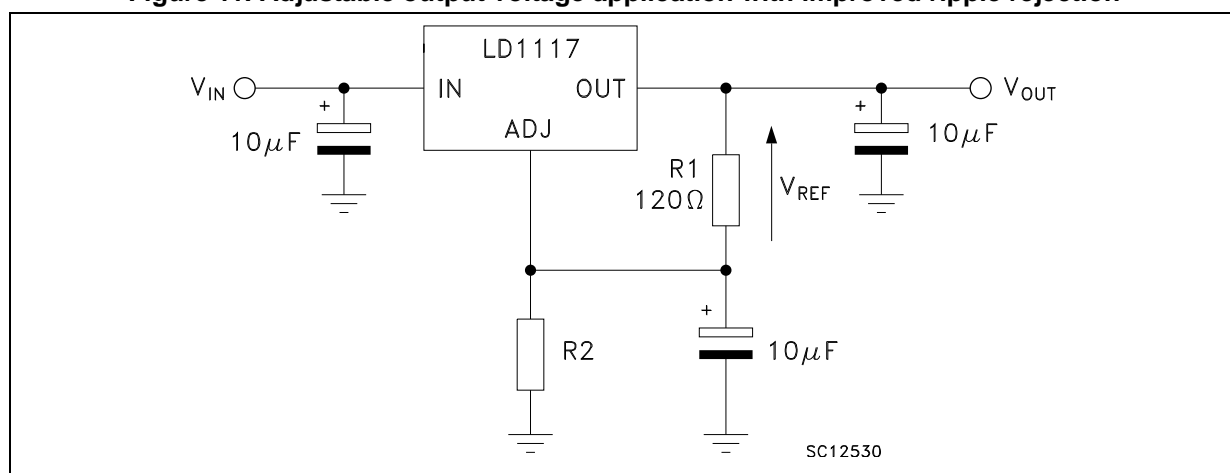


Figure 11. Adjustable output voltage application with improved ripple rejection



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 15. TO-220 mechanical data (type STD-ST Dual Gauge)

| 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 |
| D1 | | 1.27 | |
| E | 10 | | 10.40 |
| e | 2.40 | | 2.70 |
| e1 | 4.95 | | 5.15 |
| F | 1.23 | | 1.32 |
| 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 12. Drawing dimension TO-220 (type STD-ST Dual Gauge)

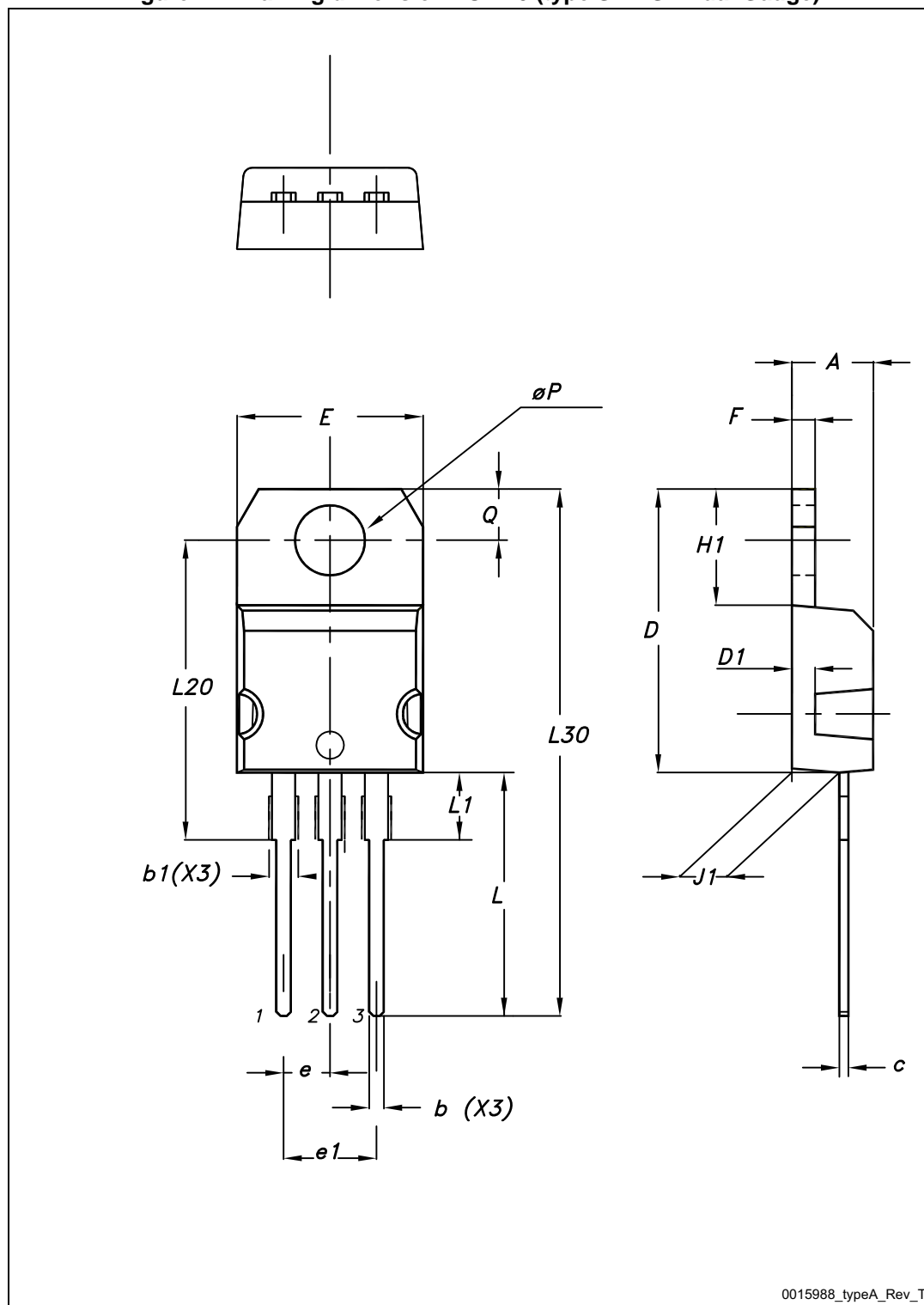


Table 16. TO-220 mechanical data (type STD-ST Single Gauge)

| 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 13. Drawing dimension TO-220 (type STD-ST Single Gauge)

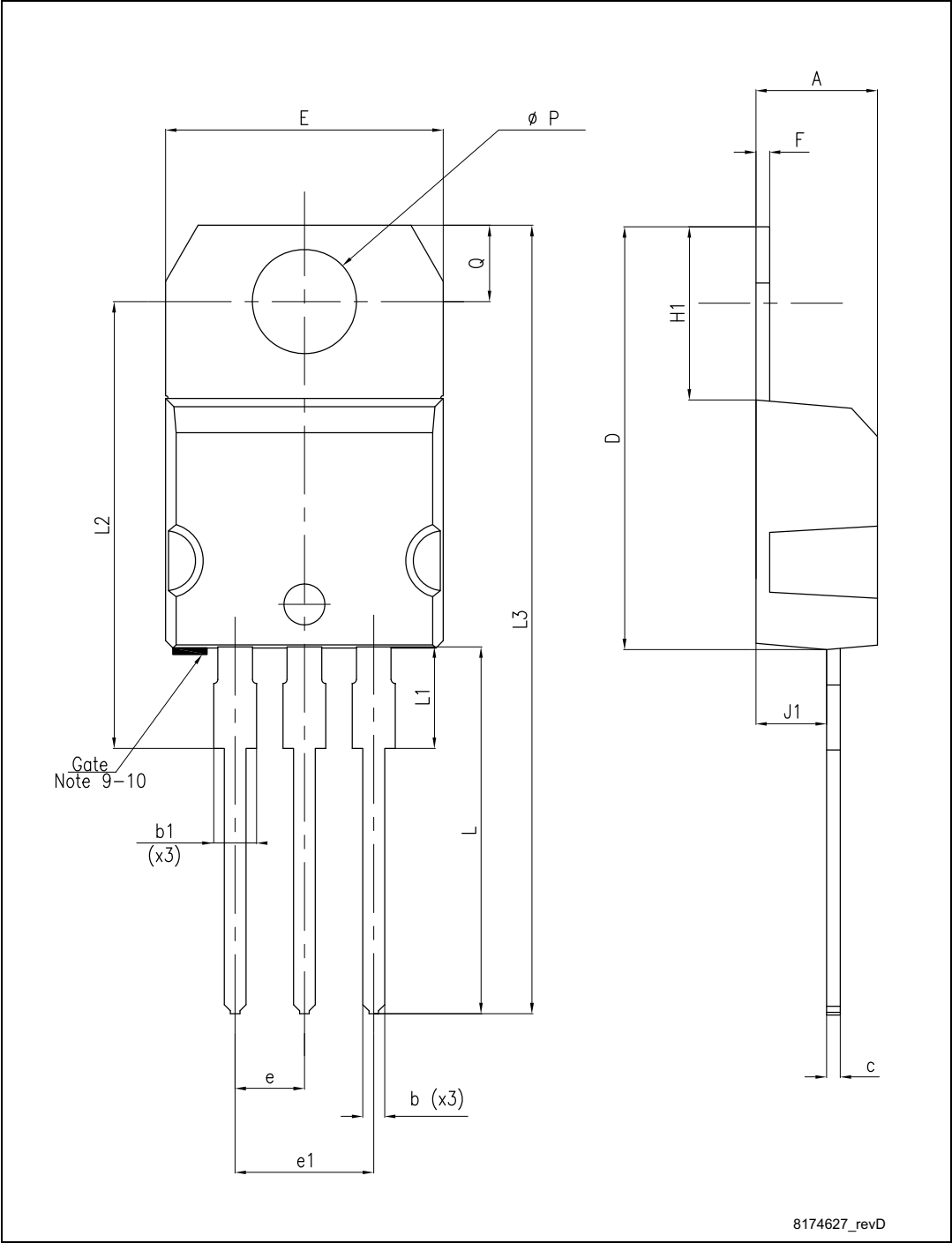


Table 17. SOT-223 mechanical data

| Dim. | mm | | |
|------|------|------|------|
| | Min. | Typ. | Max. |
| A | | | 1.80 |
| A1 | 0.02 | | 0.1 |
| B | 0.60 | 0.70 | 0.85 |
| B1 | 2.90 | 3.00 | 3.15 |
| c | 0.24 | 0.26 | 0.35 |
| D | 6.30 | 6.50 | 6.70 |
| e | | 2.30 | |
| e1 | | 4.60 | |
| E | 3.30 | 3.50 | 3.70 |
| H | 6.70 | 7.00 | 7.30 |
| V | | | 10° |

Figure 14. Drawing dimension SOT-223

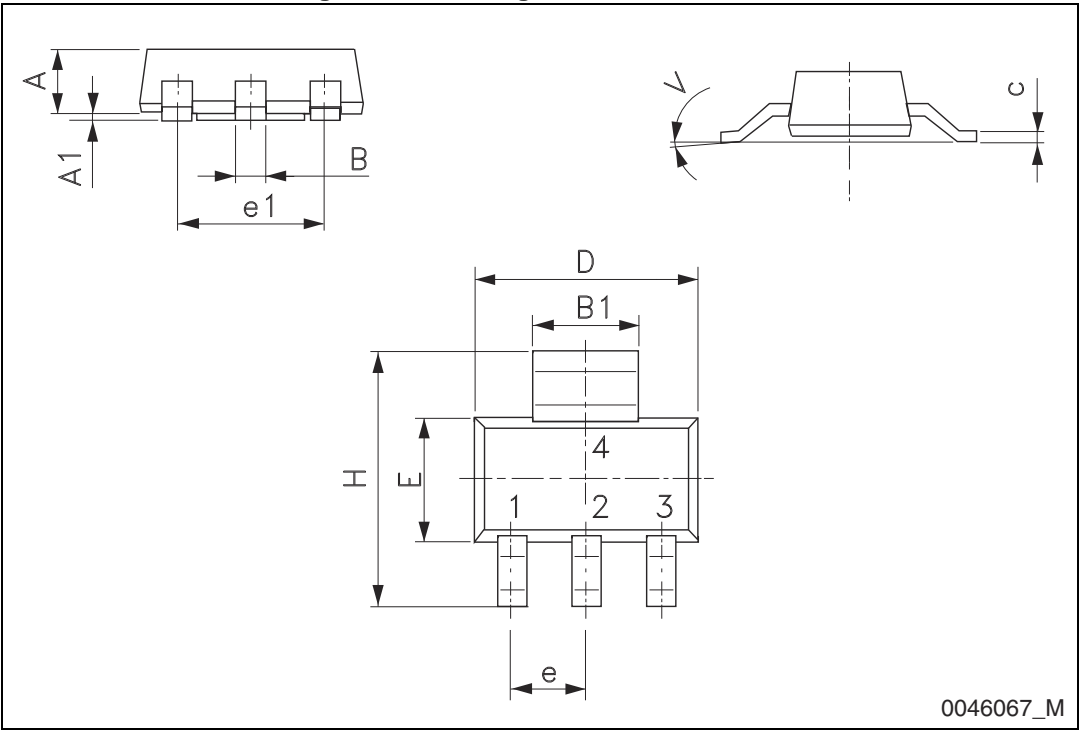


Table 18. SO-8 mechanical data

| Dim. | mm | | |
|------|------|------|------|
| | Min. | Typ. | Max. |
| A | | | 1.75 |
| A1 | 0.10 | | 0.25 |
| A2 | 1.25 | | |
| b | 0.28 | | 0.48 |
| c | 0.17 | | 0.23 |
| D | 4.80 | 4.90 | 5.00 |
| E | 5.80 | 6.00 | 6.20 |
| E1 | 3.80 | 3.90 | 4.00 |
| e | | 1.27 | |
| h | 0.25 | | 0.50 |
| L | 0.40 | | 1.27 |
| L1 | | 1.04 | |
| k | 0° | | 8° |
| ccc | | | 0.10 |

Figure 15. Drawing dimension SO-8

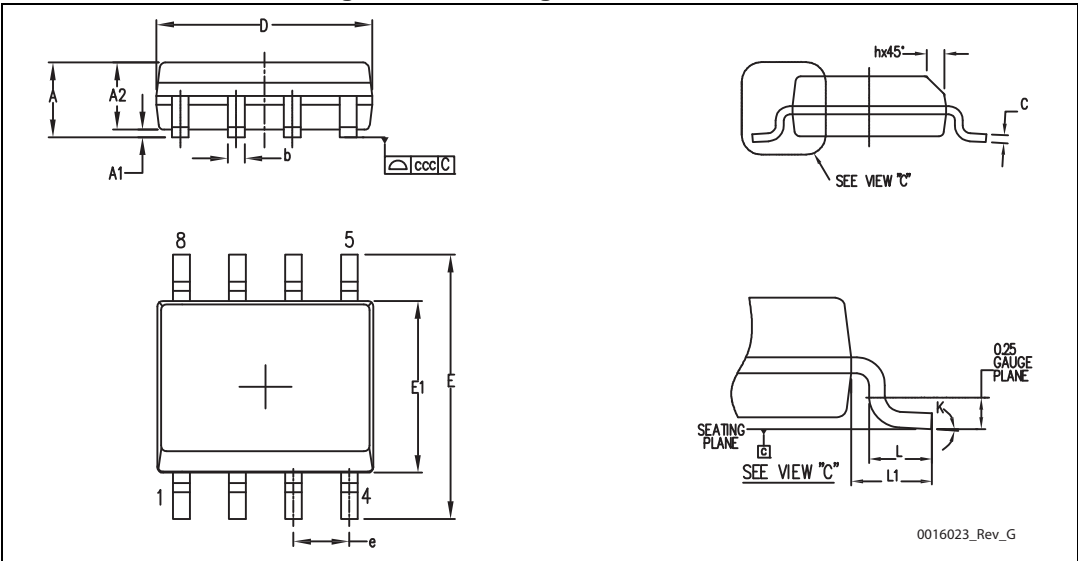
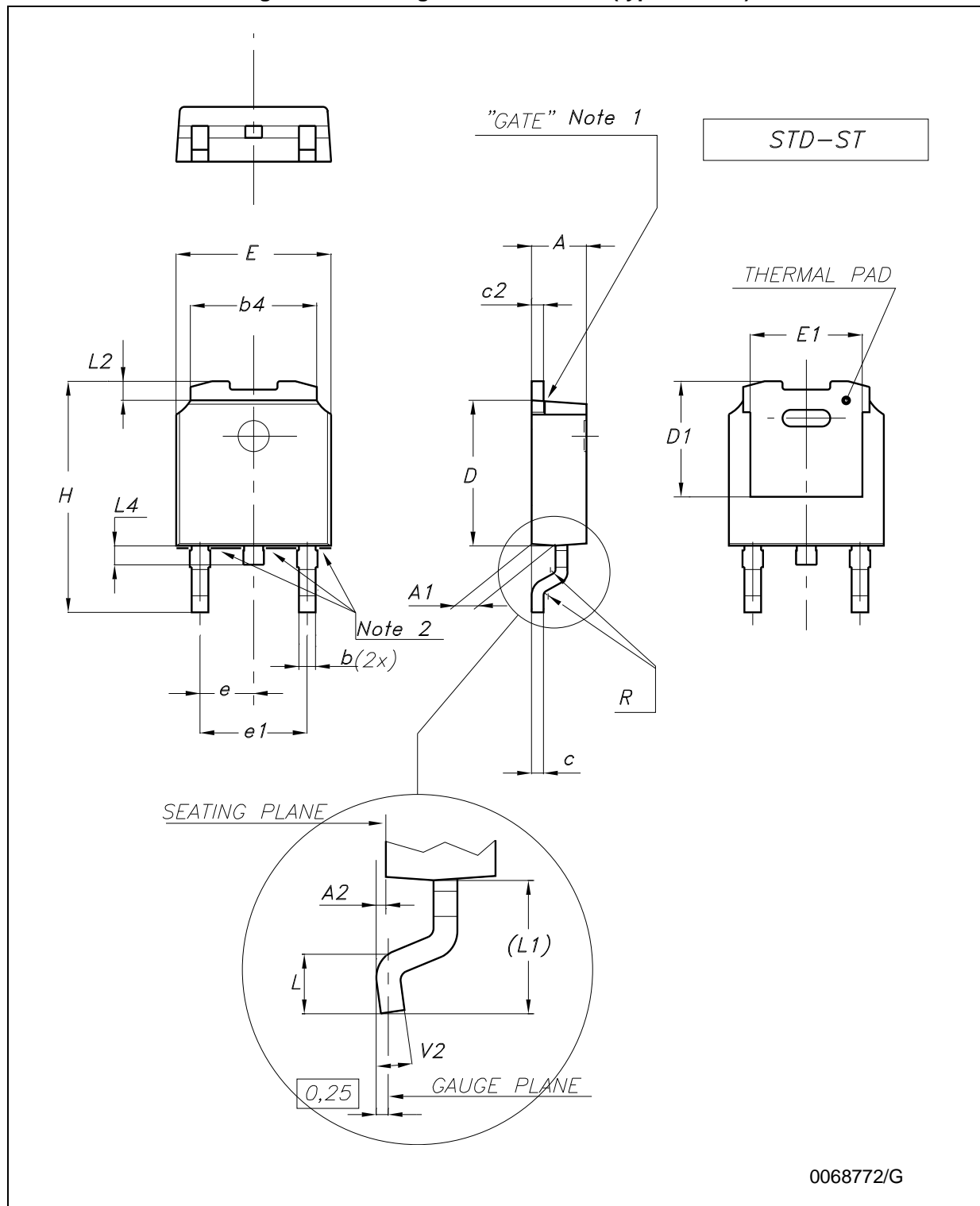


Table 19. DPAK mechanical data

| 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 16. Drawing dimension DPAK (type STD-ST)



Note: 1 Maximum resin gate protrusion: 0.5 mm.

2 Maximum resin protrusion: 0.25 mm.

Figure 17. Drawing dimension DPAK (type Fujitsu-subcon.)

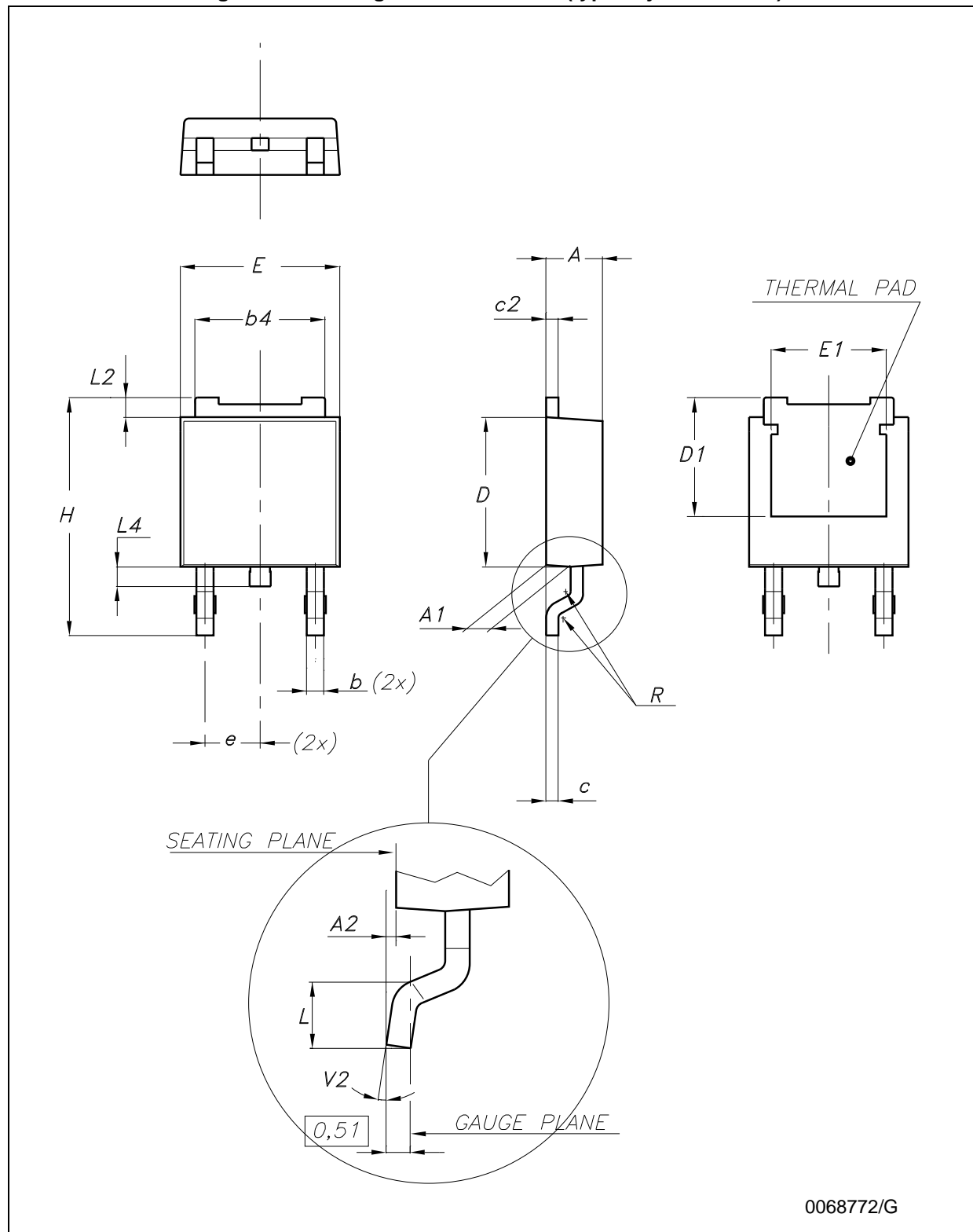


Figure 18. Drawing dimension DPAK (type IDS-subcon.)

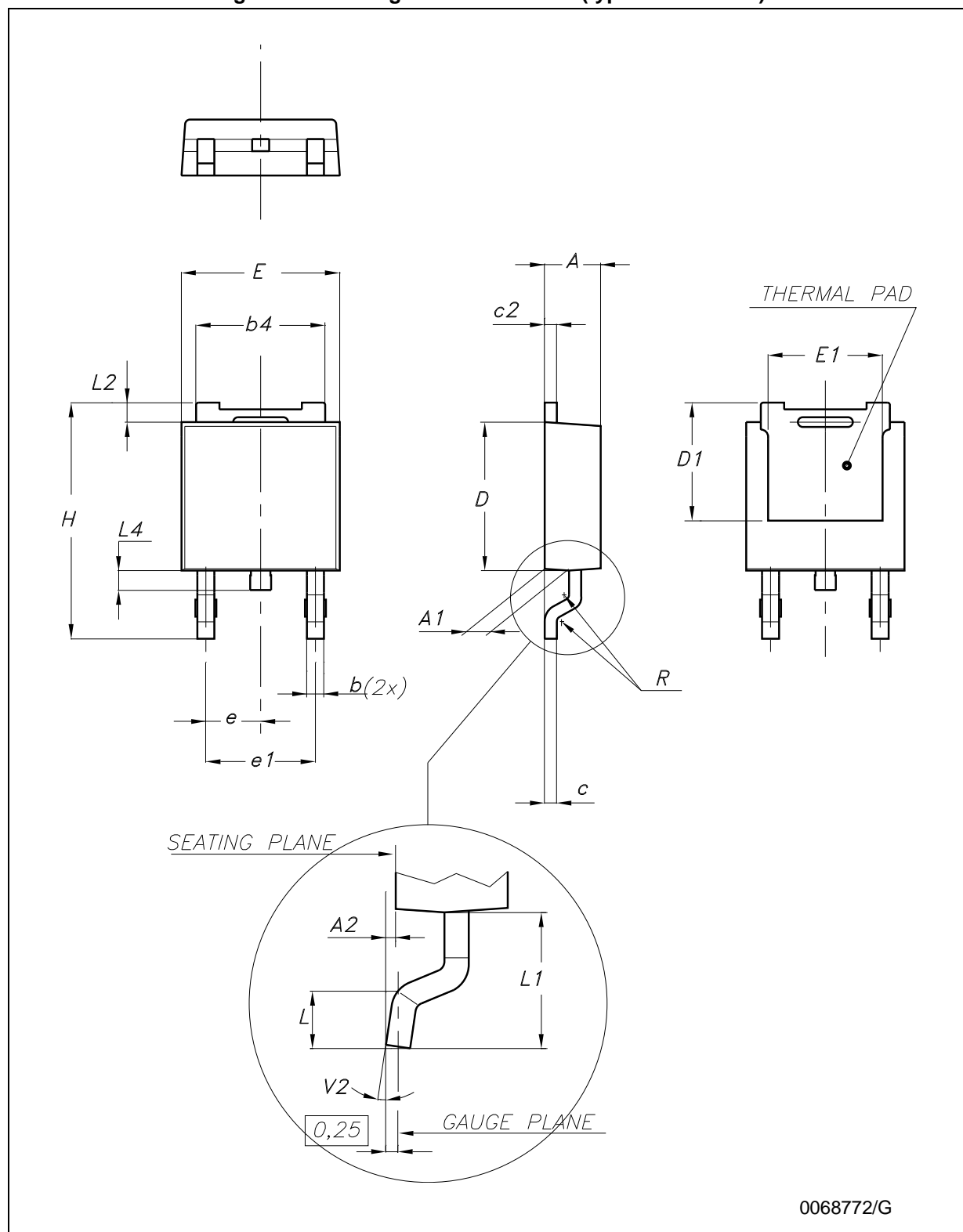
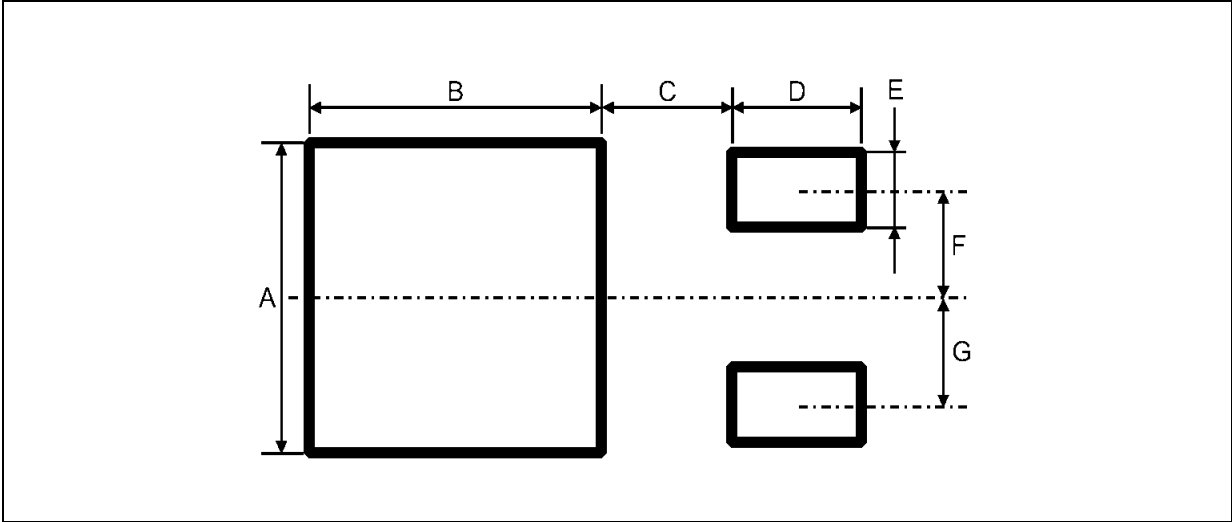


Table 20. Footprint data

| 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 |

Figure 19. DPAK footprint recommended data



9 Packaging mechanical data

Figure 20. Drawing dimension tube for TO-220 Dual Gauge (mm.)

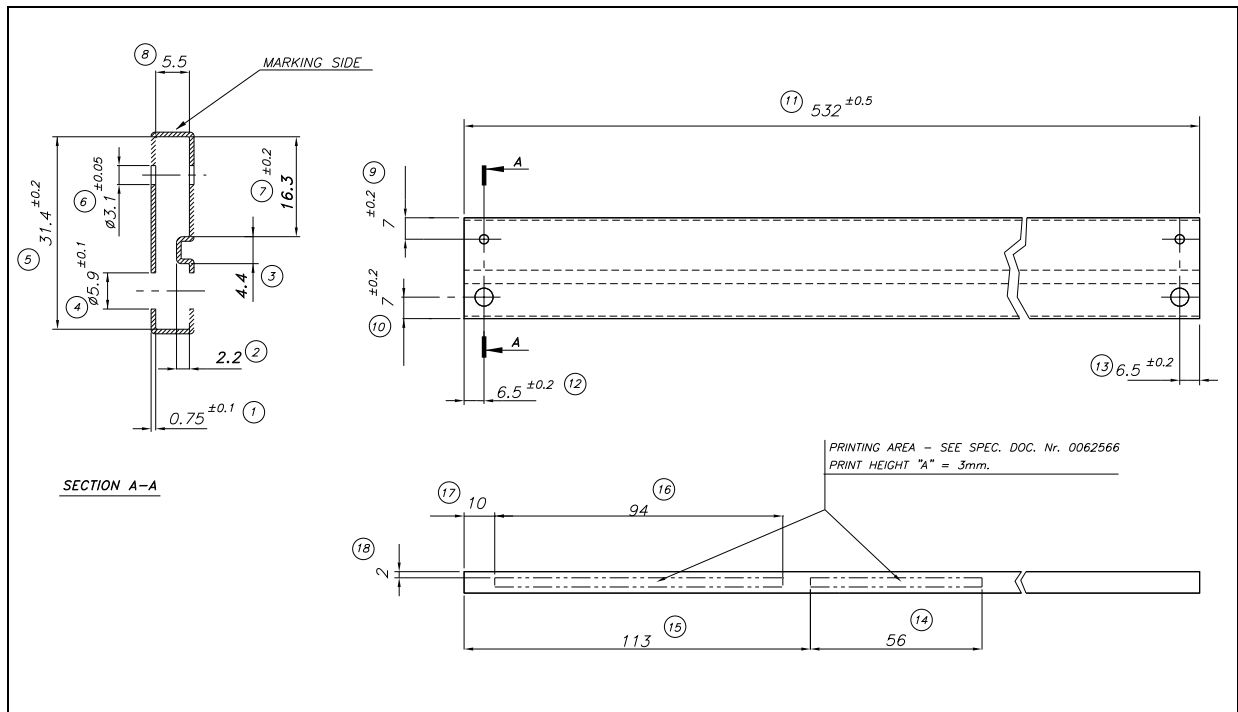


Figure 21. Drawing dimension tube for TO-220 Single Gauge (mm.)

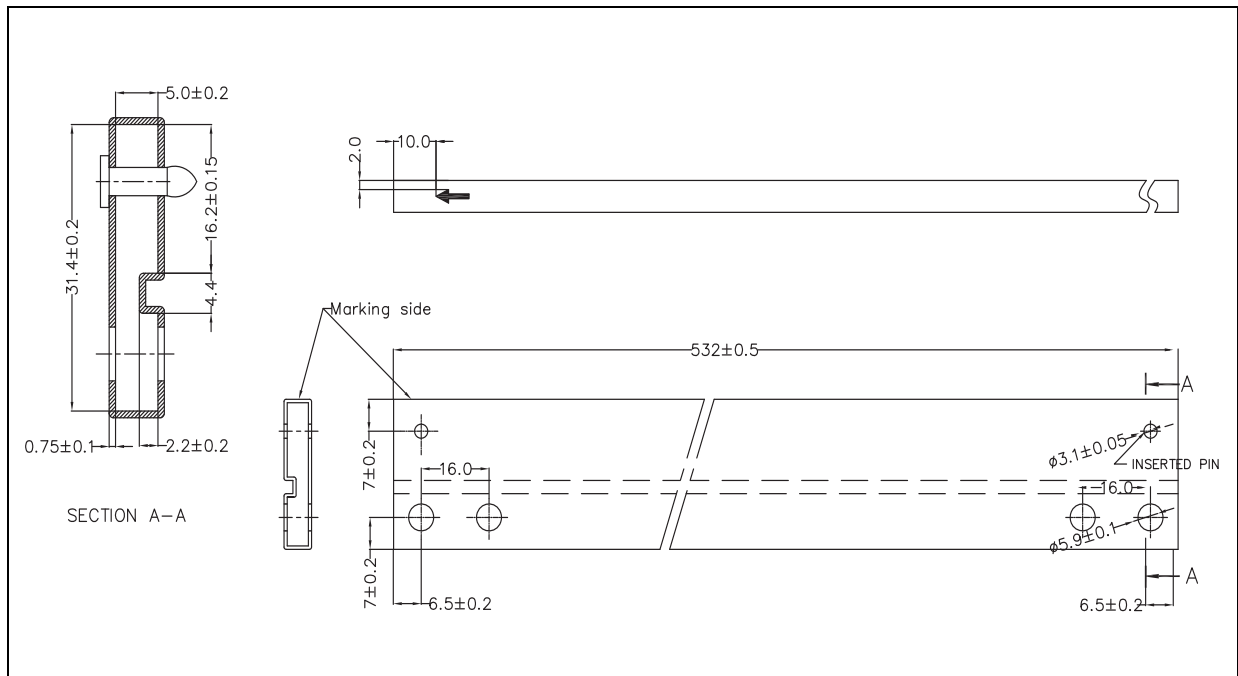


Table 21. SOT-223 tape and reel mechanical data

| Tape | | | | Reel | | |
|-----------|------|------|------|-------------------|------|------|
| Dim. | mm | | | Dim. | mm | |
| | Min. | Typ. | Max. | | Min. | Max. |
| A0 | 6.75 | 6.85 | 6.95 | A | | 180 |
| B0 | 7.30 | 7.40 | 7.50 | N | 60 | |
| K0 | 1.80 | 1.90 | 2.00 | W1 | | 12.4 |
| F | 5.40 | 5.50 | 5.60 | W2 | | 18.4 |
| E | 1.65 | 1.75 | 1.85 | W3 | 11.9 | 15.4 |
| W | 11.7 | 12 | 12.3 | | | |
| P2 | 1.90 | 2 | 2.10 | Base quantity pcs | | 1000 |
| P0 | 3.90 | 4 | 4.10 | Bulk quantity pcs | | 1000 |
| P1 | 7.90 | 8 | 8.10 | | | |
| T | 0.25 | 0.30 | 0.35 | | | |
| D ϕ | 1.50 | 1.55 | 1.60 | | | |
| D1 ϕ | 1.50 | 1.60 | 1.70 | | | |

Figure 22. Tape for SOT-223 (dimensions are in mm)

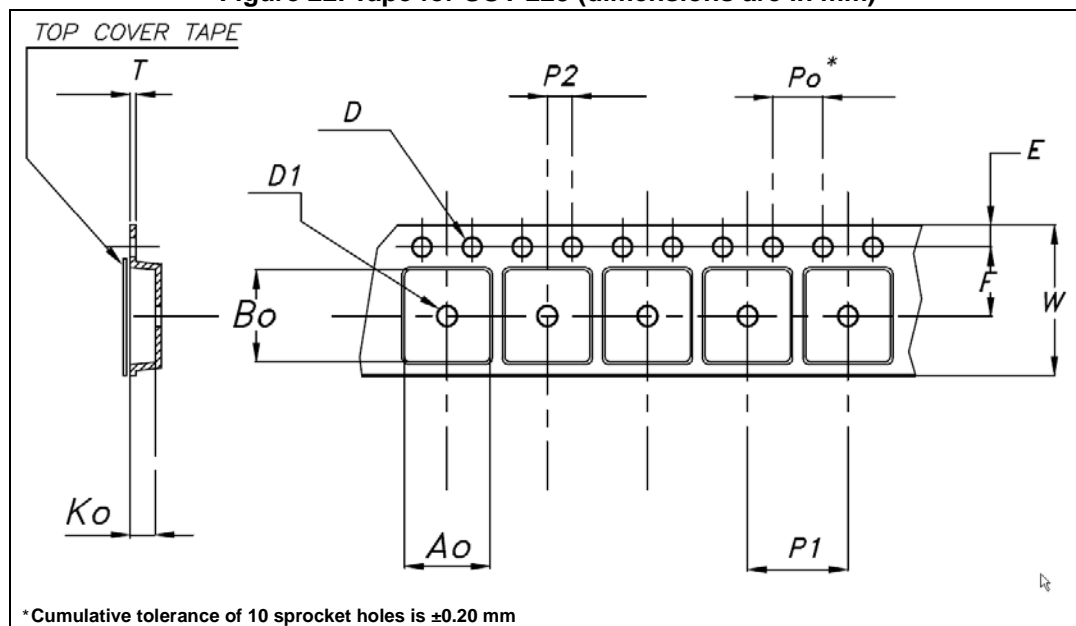


Figure 23. Reel for SOT-223 (dimensions are in mm)

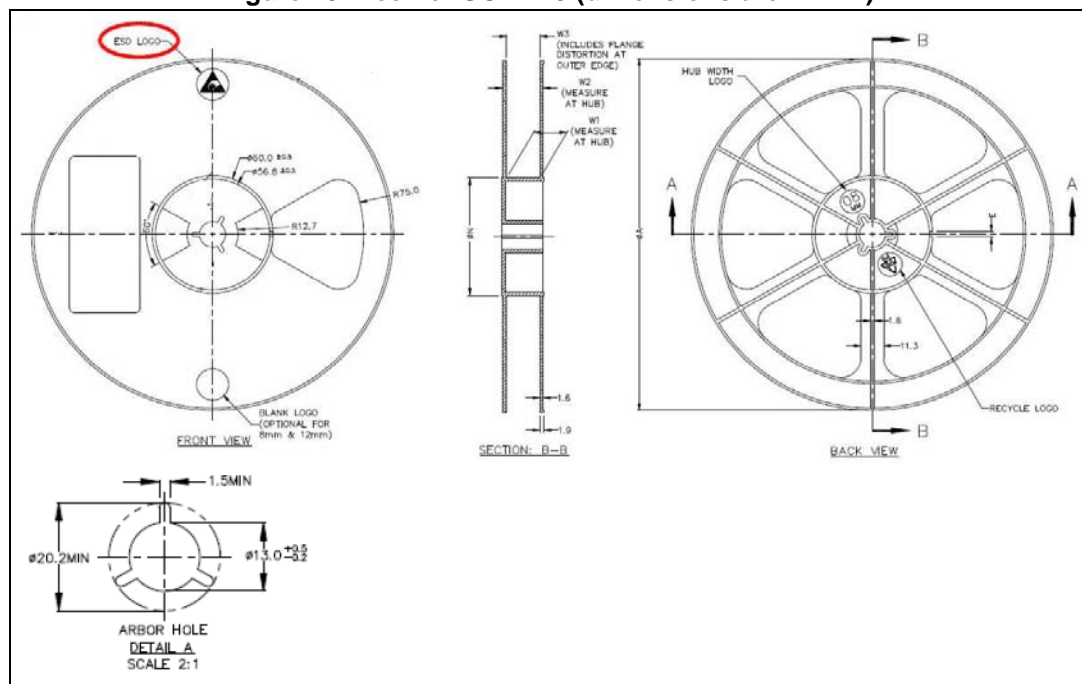


Table 22. SO-8 tape and reel mechanical data

| Dim. | mm | | |
|------|------|------|------|
| | Min. | Typ. | Max. |
| A | | | 330 |
| C | 12.8 | | 13.2 |
| D | 20.2 | | |
| N | 60 | | |
| T | | | 22.4 |
| Ao | 8.1 | | 8.5 |
| Bo | 5.5 | | 5.9 |
| Ko | 2.1 | | 2.3 |
| Po | 3.9 | | 4.1 |
| P | 7.9 | | 8.1 |

Figure 24. SO-8 tape and reel dimensions

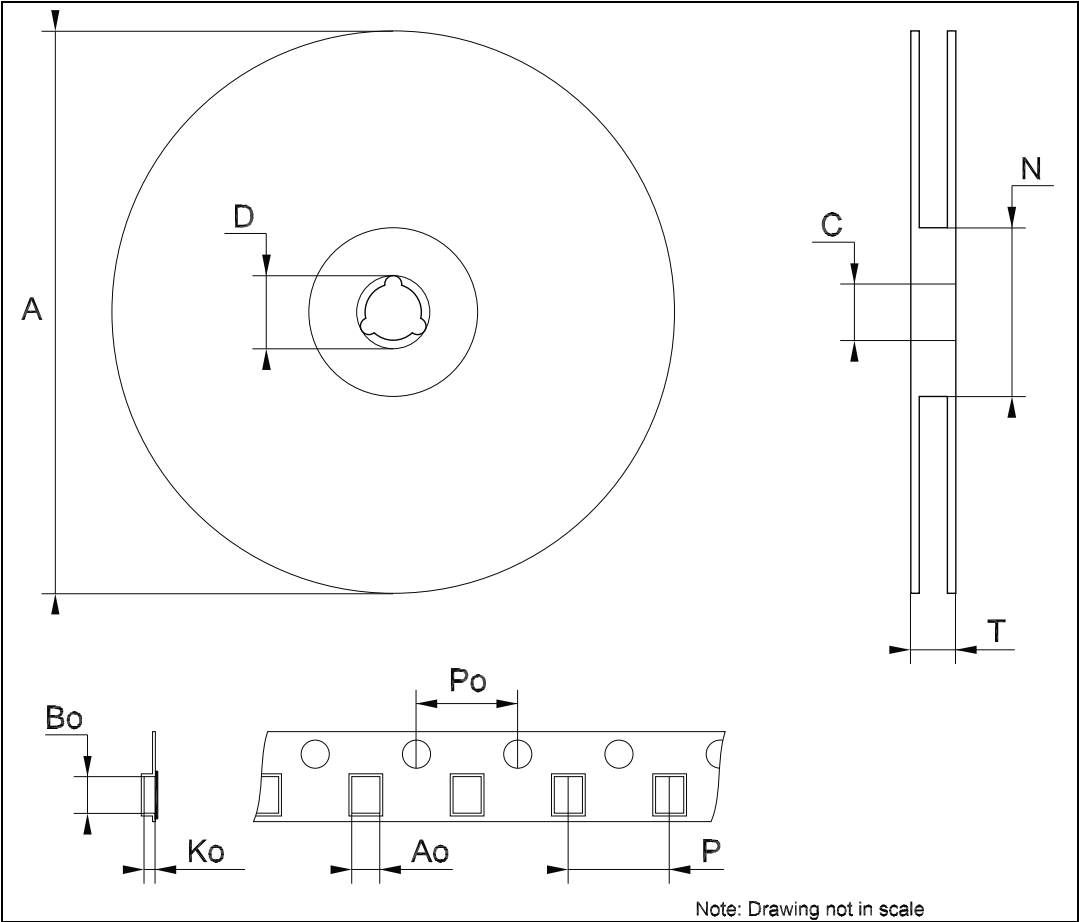
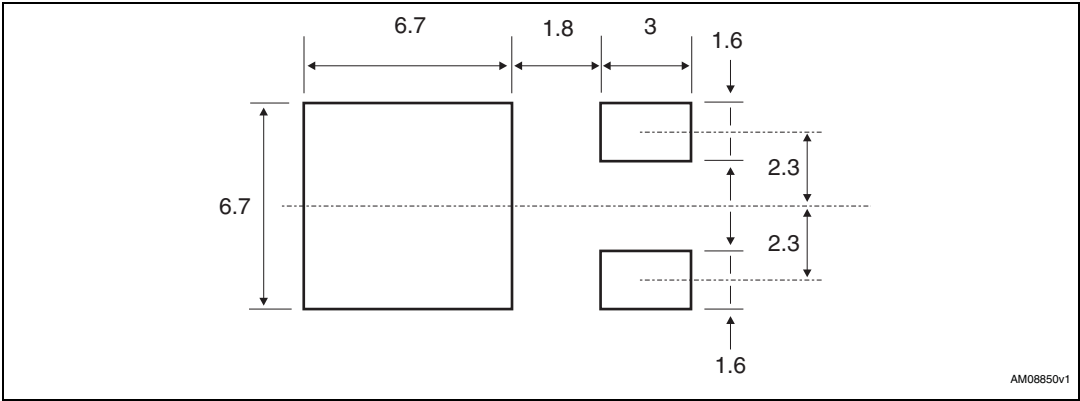


Table 23. DPAK tape and reel mechanical data

| Tape | | | Reel | | |
|------|------|------|-----------|------|------|
| Dim. | mm | | Dim. | mm | |
| | Min. | Max. | | Min. | Max. |
| A0 | 6.8 | 7 | A | | 330 |
| B0 | 10.4 | 10.6 | B | 1.5 | |
| B1 | | 12.1 | C | 12.8 | 13.2 |
| D | 1.5 | 1.6 | D | 20.2 | |
| D1 | 1.5 | | G | 16.4 | 18.4 |
| E | 1.65 | 1.85 | N | 50 | |
| F | 7.4 | 7.6 | T | | 22.4 |
| K0 | 2.55 | 2.75 | | | |
| P0 | 3.9 | 4.1 | Base qty. | | 2500 |
| P1 | 7.9 | 8.1 | Bulk qty. | | 2500 |
| P2 | 1.9 | 2.1 | | | |
| R | 40 | | | | |
| T | 0.25 | 0.35 | | | |
| W | 15.7 | 16.3 | | | |

Figure 25. DPAK footprint^(a)



a. All dimensions are in millimeters

Figure 26. Tape for DPAK

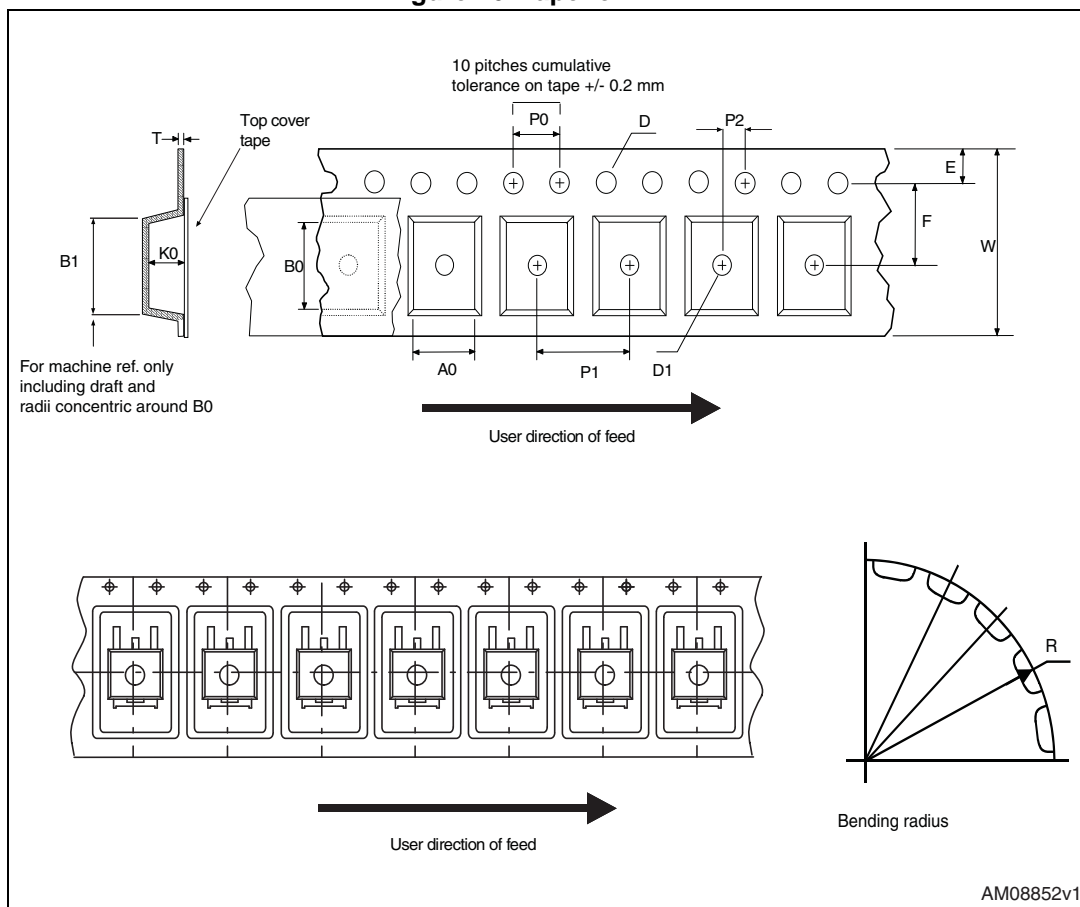
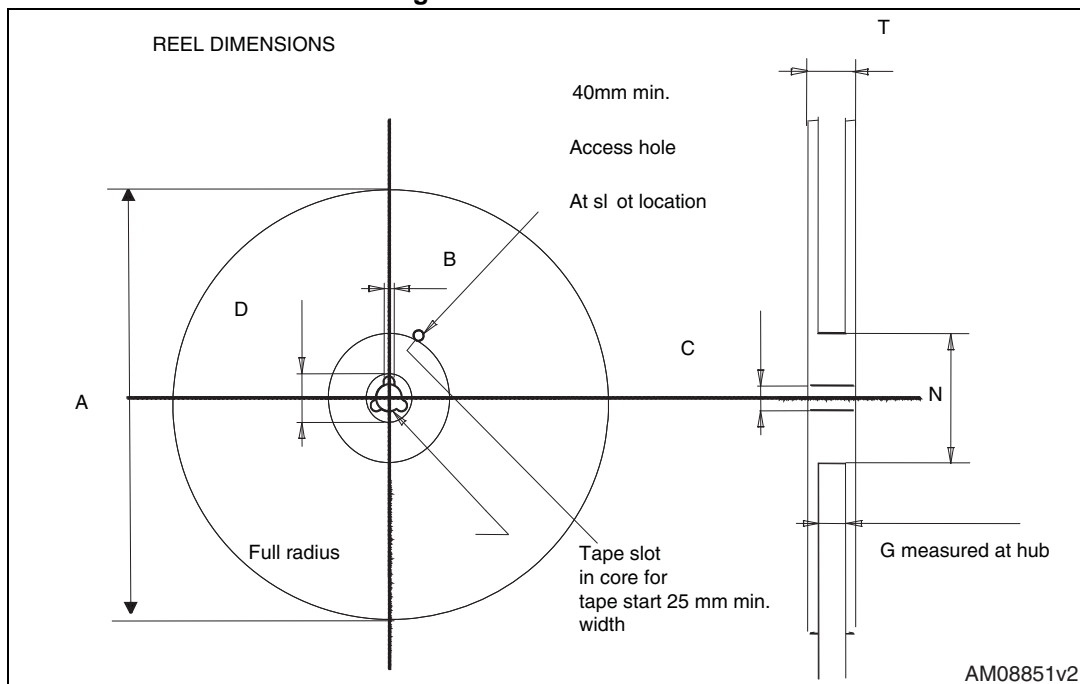


Figure 27. Reel for DPAK



10 Order codes

Table 24. Order codes

| Packages | | | | | |
|--------------|--------------|-------------------------|------------|------------------------|--------------------------|
| SOT-223 | SO-8 | DPAK (Tape and reel) | TO-220 | TO-220 (Dual Gauge) | Output voltages |
| LD1117S12TR | | LD1117DT12TR | | | 1.2 V |
| LD1117S12CTR | | LD1117DT12CTR | | | 1.2 V |
| LD1117S18TR | | LD1117DT18TR | LD1117V18 | | 1.8 V |
| LD1117S18CTR | | LD1117DT18CTR | | | 1.8 V |
| LD1117S25TR | | LD1117DT25TR | | | 2.5 V |
| LD1117S25CTR | | LD1117DT25CTR | | | 2.5 V |
| LD1117S33TR | LD1117D33TR | LD1117DT33TR | LD1117V33 | LD1117V33-DG | 3.3 V |
| | | | | LD1117V33C-DG | 3.3 V |
| LD1117S33CTR | LD1117D33CTR | LD1117DT33CTR | LD1117V33C | | 3.3 V |
| LD1117S50TR | | LD1117DT50TR | LD1117V50 | LD1117V50-DG | 5 V |
| | | | | | 5 V |
| LD1117S50CTR | | LD1117DT50CTR | LD1117V50C | | 5 V |
| LD1117STR | | LD1117DTTR | LD1117V | LD1117V-DG | ADJ from 1.25 to 15 V |
| | | | | | ADJ from 1.25 to 15 V |
| LD1117SC-R | | LD1117DTC-R | | | ADJ from 1.25 to 15 V |

11 Revision history

Table 25. 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 24 on page 42 . |
| 08-Jul-2008 | 24 | Added note 1. on page 7 . |
| 30-Mar-2009 | 25 | Modified: V_{IN} max value Table 4 on page 10 and Figure 9 on page 23 . |
| 29-Jul-2009 | 26 | Modified: Table 24 on page 42 . |
| 03-Feb-2010 | 27 | Modified Table 9 on page 15 . |
| 22-Mar-2010 | 28 | Added: Table 16 on page 22 , Figure 13 on page 23 , Figure 14 on page 24 , Figure 17 and Figure 18 on page 33 . |
| 15-Nov-2010 | 29 | Modified: R_{thJC} value for TO-220 Table 2 on page 7 . |
| 30-Nov-2011 | 30 | Added: order code LD1117V33-DG Table 24 on page 42 . |
| 13-Feb-2012 | 31 | Added: order codes LD1117V50-DG and LD1117V-DG Table 24 on page 42 . |
| 19-Oct-2012 | 32 | Added: R_{thJA} value for DPAK, SOT-223 and SO-8 Table 2 on page 7 . |
| 20-Nov-2013 | 33 | Part number LD1117xx changed to LD1117. Updated the Description in cover page, Section 8: Package mechanical data and Table 24: Order codes . Cancelled Table 1: Device summary. Added Section 9: Packaging mechanical data . Minor text changes. |

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