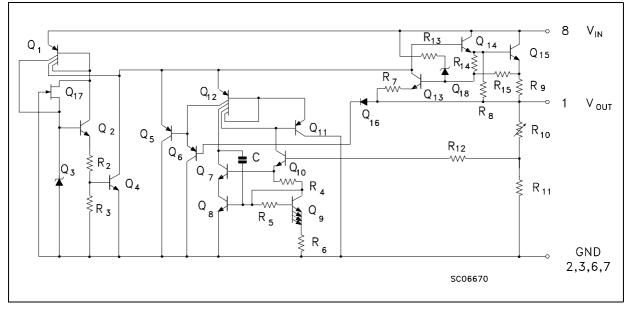
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1 Diagram

Figure 1. Schematic diagram





2 Pin configuration

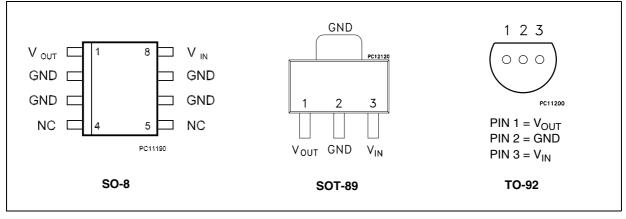
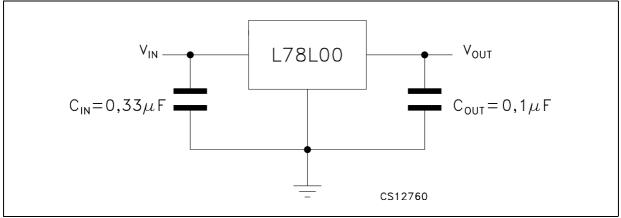


Figure 2. Pin connection (top view, bottom view for TO-92)

Figure 3. Test circuits





3 Maximum ratings

| Symbol | Parameter | Value | Unit | | |
|------------------|--------------------------------------|-----------------------------|-----------------------------------|----|--|
| | | V _O = 3.3 to 9 V | 30 | | |
| VI | DC Input voltage | V _O = 12 to 15 V | 35 | V | |
| | | V _O = 18 to 24 V | 40 | | |
| Ι _Ο | Output current | current 100 | | mA | |
| P _D | Power dissipation | | Internally limited ⁽¹⁾ | mW | |
| T _{STG} | Storage temperature range | | -65 to 150 | °C | |
| | Operating junction temperature range | for L78L00AC | 0 to 125 | °C | |
| T _{OP} | | for L78L00AB | -40 to 125 | | |

 Our SO-8 package used for voltage regulators is modified internally to have pins 2, 3, 6 and 7 electrically communed to the die attach flag. This particular frame decreases the total thermal resistance of the package and increases its ability to dissipate power when an appropriate area of copper on the printed circuit board is available for heat-sinking. The external dimensions are the same as for the standard SO-8.

Table 3. Thermal data

| Symbol | Parameter | SO-8 | TO-92 | SOT-89 | Unit |
|-------------------|--|-------------------|-------|-------------------|------|
| R _{thJC} | Thermal resistance junction-case. (max) | 20 | | 15 | °C/W |
| R _{thJA} | Thermal resistance junction-ambient. (max) | 55 ⁽¹⁾ | 200 | 55 ⁽¹⁾ | °C/W |

1. Considering 6 cm² of copper Board heat-sink.



4 Electrical characteristics

Refer to the test circuits, T_J = 0 to 125 °C, I_O = 40 mA, C_I = 0.33 $\mu F,\,C_O$ = 0.1 μF unless otherwise specified.

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|----------------|--------------------------|--|-------|------|-------|------|
| V _O | Output voltage | T _J = 25 °C | 3.036 | 3.3 | 3.564 | V |
| V | | $I_0 = 1$ to 40 mA, $V_1 = 5.3$ to 20 V | 2.97 | | 3.63 | v |
| Vo | Output voltage | I _O = 1 to 70 mA, V _I = 8.3 V | 2.97 | | 3.63 | v |
| A) (| Line regulation | V_{I} = 5.3 to 20 V, T_{J} = 25 °C | | | 150 | mV |
| ΔV_{O} | Line regulation | V_{I} = 6.3 to 20 V, T_{J} = 25 °C | | | 100 | IIIV |
| | Load regulation | I_{O} = 1 to 100 mA, T_{J} = 25 °C | | | 60 | - mV |
| ΔV_{O} | | I_{O} = 1 to 40 mA, T_{J} = 25 °C | | | 30 | |
| 1 | Quiescent current | T _J = 25 °C | | | 6 | mA |
| ا _ط | | T _J = 125 °C | | | 5.5 | mA |
| 41 | Quiescent current change | I _O = 1 to 40 mA | | | 0.2 | mA |
| ΔI_d | | V _I = 6.3 to 20 V | | | 1.5 | ШA |
| eN | Output noise voltage | B =10 Hz to 100 kHz, $T_J = 25 \degree C$ | | 40 | | μV |
| SVR | Supply voltage rejection | $V_{\rm I}$ = 6.3 to 16.3 V, f = 120 Hz $I_{\rm O}$ = 40 mA, $T_{\rm J}$ = 25 °C | 41 | 49 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |

Table 4.Electrical characteristics of L78L33C (VI = 8.3 V)

Table 5.Electrical characteristics of L78L05C (VI = 10 V)

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|----------------|---------------------------------|--|------|------|------|------|
| Vo | Output voltage | T _J = 25 °C | 4.6 | 5 | 5.4 | V |
| V | Output voltage | $I_0 = 1$ to 40 mA, $V_1 = 7$ to 20 V | 4.5 | | 5.5 | V |
| Vo | Output voltage | I _O = 1 to 70 mA, V _I = 10 V | 4.5 | | 5.5 | v |
| | ΔV _O Line regulation | V_{I} = 8.5 to 20 V, T_{J} = 25 °C | | | 200 | mV |
| ΔvO | | $V_{I} = 9$ to 20 V, $T_{J} = 25 \ ^{\circ}C$ | | | 150 | IIIV |
| A) (| Load regulation | $I_{O} = 1$ to 100 mA, $T_{J} = 25 \ ^{\circ}C$ | | | 60 | mV |
| ΔV_O | | I_{O} = 1 to 40 mA, T_{J} = 25 °C | | | 30 | mv |
| | Quipagent ourrent | T _J = 25 °C | | | 6 | mA |
| I _d | Quiescent current | T _J = 125 °C | | | 5.5 | mA |
| 41 | | I _O = 1 to 40 mA | | | 0.2 | mA |
| ΔI_d | Quiescent current change | V _I = 8 to 20 V | | | 1.5 | ШA |
| eN | Output noise voltage | B =10 Hz to 100 kHz, T_J = 25 °C | | 40 | | μV |



| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|----------------|--------------------------|--|------|------|------|------|
| SVR | Supply voltage rejection | $V_{I} = 9 \text{ to } 20 \text{ V}, \text{ f} = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, \text{ T}_{J} = 25 \text{ °C}$ | 40 | 49 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |

Table 5. Electrical characteristics of L78L05C (V₁ = 10 V) (continued)

Table 6.Electrical characteristics of L78L08C (VI = 14 V)

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|-----------------|--------------------------------|---|------|------|------|------|
| V _O | Output voltage | T _J = 25 °C | 7.36 | 8 | 8.64 | V |
| N. | Output voltage | $I_0 = 1$ to 40 mA, $V_1 = 8.5$ to 20 V | 7.2 | | 8.8 | V |
| Vo | Output voltage | I _O = 1 to 70 mA, V _I = 12 V | 7.2 | | 8.8 | v |
| | Line regulation | V_{I} = 8.5 to 20 V, T_{J} = 25 °C | | | 200 | mV |
| ΔV _O | | $V_{I} = 9$ to 20 V, $T_{J} = 25 \ ^{\circ}C$ | | | 150 | IIIV |
| | N _O Load regulation | $I_{O} = 1$ to 100 mA, $T_{J} = 25 \text{ °C}$ | | | 80 | mV |
| ΔvO | | $I_{O} = 1$ to 40 mA, $T_{J} = 25 \text{ °C}$ | | | 40 | |
| | Quiescent current | T _J = 25 °C | | | 6 | mA |
| ا _ط | | T _J = 125 °C | | | 5.5 | mA |
| AL | Ouissesst surrout shows | I _O = 1 to 40 mA | | | 0.2 | mA |
| Δl _d | Quiescent current change | V ₁ = 8 to 20 V | | | 1.5 | ША |
| eN | Output noise voltage | B =10 Hz to 100 kHz, T _J = 25 °C | | 60 | | μV |
| SVR | Supply voltage rejection | V_I = 9 to 20 V, f = 120 Hz I_O = 40 mA, T_J = 25 °C | 36 | 45 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |

Table 7. Electrical characteristics of L78L09C (V_I = 15 V)

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|-----------------|--------------------------|--|------|------|------|------------|
| Vo | Output voltage | T _J = 25 °C | 8.28 | 9 | 9.72 | V |
| N. | Output voltage | $I_{O} = 1$ to 40 mA, $V_{I} = 11.5$ to 23 V | 8.1 | | 9.9 | V |
| V _O | Oulput voltage | $I_{O} = 1$ to 70 mA, $V_{I} = 15$ V | 8.1 | | 9.9 | v |
| ΔV _O | Line regulation | V_{I} = 11.5 to 23 V, T_{J} = 25 °C | | | 250 | mV |
| | | $V_{I} = 12 \text{ to } 23 \text{ V}, \text{ T}_{J} = 25 ^{\circ}\text{C}$ | | | 200 | IIIV |
| A) (| Load regulation | $I_{O} = 1$ to 100 mA, $T_{J} = 25 \ ^{\circ}C$ | | | 80 | mV |
| ΔV _O | | I_{O} = 1 to 40 mA, T_{J} = 25 °C | | | 40 | IIIV |
| | Quiescent current | T _J = 25 °C | | | 6 | mA |
| I _d | Quiescent current | T _J = 125 °C | | | 5.5 | mA |
| Δl_d | Quieseent ourrent abange | I _O = 1 to 40 mA | | | 0.2 | m 1 |
| | Quiescent current change | V _I = 12 to 23 V | | | 1.5 | mA |



| 10010 11 | | | | | | | |
|----------------|--------------------------|--|------|------|------|------|--|
| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit | |
| eN | Output noise voltage | B =10 Hz to 100 kHz, T_J = 25 °C | | 70 | | μV | |
| SVR | Supply voltage rejection | V_I = 12 to 23 V, f = 120 Hz I_O = 40 mA, T_J = 25 °C | 36 | 44 | | dB | |
| V _d | Dropout voltage | | | 1.7 | | V | |

 Table 7.
 Electrical characteristics of L78L09C (V₁ = 15 V) (continued)

| Table 8. | Electrical characteristics of L78L10C (V _I = 16 V) |
|----------|---|
|----------|---|

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|-----------------|--------------------------|---|------|------|------|------|
| V _O | Output voltage | T _J = 25 °C | 9.2 | 10 | 10.8 | V |
| N. | | $I_0 = 1$ to 40 mA, $V_1 = 12.5$ to 23 V | 9 | | 11 | V |
| Vo | Output voltage | $I_0 = 1$ to 70 mA, $V_1 = 16$ V | 9 | | 11 | v |
| | | $V_{I} = 12.5$ to 23 V, $T_{J} = 25 \ ^{\circ}C$ | | | 230 | mV |
| ΔV _O | Line regulation | V_{I} = 13 to 23 V, T_{J} = 25 °C | | | 170 | IIIV |
| | D Load regulation | $I_{O} = 1$ to 100 mA, $T_{J} = 25 \text{ °C}$ | | | 80 | mV |
| ΔV _O | | $I_{O} = 1$ to 40 mA, $T_{J} = 25 \text{ °C}$ | | | 40 | |
| | Quiescent current | T _J = 25 °C | | | 6 | mA |
| ۱ _d | Quiescent current | T _J = 125 °C | | | 5.5 | mA |
| AL | Quiescent current change | I _O = 1 to 40 mA | | | 0.1 | mA |
| Δl _d | Quescent current change | V _I = 13 to 23 V | | | 1.5 | ША |
| eN | Output noise voltage | B =10Hz to 100kHz, $T_J = 25 \text{ °C}$ | | 60 | | μV |
| SVR | Supply voltage rejection | V_I = 14 to 23 V, f = 120Hz I_O = 40 mA, T_J = 25 °C | 37 | 45 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |

Table 9.Electrical characteristics of L78L12C (VI = 19 V)

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|----------------|--|--|------|------|------|------|
| V _O | Output voltage | T _J = 25 °C | 11.1 | 12 | 12.9 | V |
| V | | $I_0 = 1$ to 40 mA, $V_1 = 14.5$ to 27 V | 10.8 | | 13.2 | V |
| V _O | Output voltage $I_0 = 1$ | I _O = 1 to 70 mA, V _I = 19 V | 10.8 | | 13.2 | v |
| A)/ | Line regulation | V_{I} = 14.5 to 27 V, T_{J} = 25 °C | | | 250 | mV |
| ΔV_{O} | Line regulation $V_I = 16 \text{ to } 27 \text{ V}, T_J = 25 \text{ °C}$ | | | 200 | IIIV | |
| A) (| Lood regulation | $I_{O} = 1$ to 100 mA, $T_{J} = 25 \text{ °C}$ | | | 100 | mV |
| ΔV_{O} | Load regulation | $I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$ | | | 50 | ΠV |
| I _d | Quiescent current | T _J = 25 °C | | | 6.5 | mA |
| | | T _J = 125 °C | | | 6 | mA |



| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|----------------|-------------------------------------|---|------|------|------|------|
| 41 | Quiescent current change | I _O = 1 to 40 mA | | | 0.2 | mA |
| ΔI_d | $V_l = 16 \text{ to } 27 \text{ V}$ | | | 1.5 | ШA | |
| eN | Output noise voltage | B =10 Hz to 100 kHz, $T_J = 25 \text{ °C}$ | | 80 | | μV |
| SVR | Supply voltage rejection | $V_{I} = 15 \text{ to } 25 \text{ V}, \text{ f} = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, \text{ T}_{J} = 25 \text{ °C}$ | 36 | 42 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |

Table 9. Electrical characteristics of L78L12C (V₁ = 19 V) (continued)

Table 10. Electrical characteristics of L78L15C (V_I = 23 V)

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|-----------------|--------------------------|--|------|------|------|------|
| Vo | Output voltage | T _J = 25 °C | 13.8 | 15 | 16.2 | V |
| V | | $I_{O} = 1$ to 40 mA, $V_{I} = 17.5$ to 30 V | 13.5 | | 16.5 | v |
| Vo | Output voltage | $I_0 = 1$ to 70 mA, $V_1 = 23$ V | 13.5 | | 16.5 | v |
| 41/ | Line regulation | $V_{I} = 17.5$ to 30 V, $T_{J} = 25 \ ^{\circ}C$ | | | 300 | mV |
| ΔV _O | Line regulation | $V_{I} = 20 \text{ to } 30 \text{ V}, \text{ T}_{J} = 25 ^{\circ}\text{C}$ | | | 250 | ΠV |
| 41/ | Lood regulation | $I_{O} = 1$ to 100 mA, $T_{J} = 25 \ ^{\circ}C$ | | | 150 | mV |
| ΔV _O | Load regulation | $I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$ | | | 75 | ΠV |
| | Quiescent current | T _J = 25 °C | | | 6.5 | mA |
| ۱ _d | Quiescent current | T _J = 125 °C | | | 6 | mA |
| AL | Quiescent current change | I _O = 1 to 40 mA | | | 0.2 | mA |
| ΔI_d | Quescent current change | V ₁ = 20 to 30 V | | | 1.5 | ША |
| eN | Output noise voltage | B =10 Hz to 100 kHz, T_J = 25 °C | | 90 | | μV |
| SVR | Supply voltage rejection | $V_{I} = 18.5$ to 28.5 V, f = 120 Hz $I_{O} = 40$ mA, $T_{J} = 25$ °C | 33 | 39 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |

Table 11. Electrical characteristics of L78L18C (V_I = 27 V)

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|-----------------|-----------------|--|------|------|------|------|
| Vo | Output voltage | T _J = 25 °C | 16.6 | 18 | 19.4 | V |
| M | Output voltage | $I_{O} = 1$ to 40 mA, $V_{I} = 22$ to 33 V | 16.2 | | 19.8 | V |
| Vo | Oulput voltage | $I_{O} = 1$ to 70 mA, $V_{I} = 27$ V | 16.2 | | 19.8 | v |
| A) / | Line regulation | V_{I} = 22 to 33 V, T_{J} = 25 °C | | | 320 | mV |
| ΔV _O | Line regulation | V_{I} = 22 to 33 V, T_{J} = 25 °C | | | 270 | IIIV |
| | Load regulation | I_{O} = 1 to 100 mA, T_{J} = 25 °C | | | 170 | mV |
| ΔV _O | Load regulation | I_{O} = 1 to 40 mA, T_{J} = 25 °C | | | 85 | IIIV |



| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|----------------|----------------------------------|---|------|------|------|------|
| | Quipagent ourrent | T _J = 25 °C | | | 6.5 | mA |
| 'd | I _d Quiescent current | T _J = 125 °C | | | 6 | mA |
| 41 | | I _O = 1 to 40 mA | | | 0.2 | m۸ |
| ΔI_d | Quiescent current change | V ₁ = 23 to 33 V | | | 1.5 | mA |
| eN | Output noise voltage | B =10 Hz to 100 kHz, T_J = 25 °C | | 120 | | μV |
| SVR | Supply voltage rejection | $V_{I} = 23 \text{ to } 33 \text{ V}, f = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, T_{J} = 25 ^{\circ}\text{C}$ | 32 | 38 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |

Table 11. Electrical characteristics of L78L18C (V_I = 27 V) (continued)

Table 12.Electrical characteristics of L78L24C (VI = 33 V)

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|-----------------|--------------------------|---|------|------|------|------|
| V _O | Output voltage | T _J = 25 °C | 22.1 | 24 | 25.9 | V |
| V | | $I_0 = 1$ to 40 mA, $V_1 = 27$ to 38 V | 21.6 | | 26.4 | V |
| Vo | Output voltage | I _O = 1 to 70 mA, V _I = 33 V | 21.6 | | 26.4 | v |
| A) / | Line regulation | $V_{I} = 27$ to 38 V, $T_{J} = 25 \ ^{\circ}C$ | | | 350 | mV |
| ΔV _O | Line regulation | $V_1 = 28 \text{ to } 38 \text{ V}, \text{ T}_3 = 25 \ ^\circ\text{C}$ | | | 300 | IIIV |
| A) (| Lood regulation | $I_0 = 1$ to 100 mA, $T_J = 25 \ ^{\circ}C$ | | | 200 | mV |
| ΔV _O | Load regulation | $I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$ | | | 100 | ΠV |
| | Quiescent current | T _J = 25 °C | | | 6.5 | mA |
| ۱ _d | Quiescent current | T _J = 125 °C | | | 6 | mA |
| 41 | Quiaccent ourrent change | I _O = 1 to 40 mA | | | 0.2 | mA |
| Δl _d | Quiescent current change | V ₁ = 28 to 38 V | | | 1.5 | ШA |
| eN | Output noise voltage | B =10 Hz to 100 kHz, $T_J = 25 \degree C$ | | 200 | | μV |
| SVR | Supply voltage rejection | $V_{I} = 29 \text{ to } 35 \text{ V}, \text{ f} = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, \text{ T}_{J} = 25 \text{ °C}$ | 30 | 37 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |

 T_J = 0 to 125 °C for L78L33AC, T_J = -40 to 125 °C for L78L33AB.

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|--------------|-------------------------------|---|-------|------|-------|------|
| Vo | Output voltage | T _J = 25 °C | 3.168 | 3.3 | 3.432 | V |
| V | V _O Output voltage | $I_{O} = 1$ to 40 mA, $V_{I} = 5.3$ to 20 V | 3.135 | | 3.465 | V |
| v 0 | | $I_{O} = 1$ to 70 mA, $V_{I} = 8.3$ V | 3.135 | | 3.465 | v |
| A) (| | V_{I} = 5.3 to 20 V, T_{J} = 25 °C | | | 150 | mV |
| ΔV_O | Line regulation | V_{I} = 6.3 to 20 V, T_{J} = 25 °C | | | 100 | mv |

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| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|----------------|--------------------------|---|------|------|------|------|
| A) (| | I _O = 1 to 100 mA, T _J = 25 °C | | | 60 | |
| ΔV_O | Load regulation | I_{O} = 1 to 40 mA, T_{J} = 25 °C | | | 30 | mV |
| 1 | | T _J = 25 °C | | | 6 | mA |
| ا _ط | Quiescent current | T _J = 125 °C | | | 5.5 | mA |
| 41 | Quiescent current change | I _O = 1 to 40 mA | | | 0.1 | mA |
| ΔI_d | Quiescent current change | V ₁ = 6.3 to 20 V | | | 1.5 | ШA |
| eN | Output noise voltage | B =10 Hz to 100 kHz, $T_J = 25 \ ^{\circ}C$ | | 40 | | μV |
| SVR | Supply voltage rejection | $V_{I} = 6.3$ to 16.3 V, f = 120 Hz $I_{O} = 40$ mA, $T_{J} = 25 \text{ °C}$ | 41 | 49 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |

| Table 13. | Electrical characteristics of L78L33AB and L78L33AC (| (V | i = 8.3 V |) (| continued) | |
|-----------|---|----|-----------|-----|------------|--|
| | | •• | - 0.0 . | / \ | | |

 T_J = 0 to 125 °C for L78L05AC, T_J = -40 to 125 °C for L78L05AB.

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|----------------|--------------------------|--|------|------|------|------|
| V _O | Output voltage | T _J = 25 °C | 4.8 | 5 | 5.2 | V |
| M | | $I_0 = 1$ to 40 mA, $V_1 = 7$ to 20 V | 4.75 | | 5.25 | v |
| Vo | Output voltage | I _O = 1 to 70 mA, V _I = 10 V | 4.75 | | 5.25 | v |
| | Line regulation | $V_{I} = 7 \text{ to } 20 \text{ V}, \text{ T}_{J} = 25 ^{\circ}\text{C}$ | | | 150 | mV |
| ΔV_{O} | | $V_{I} = 8 \text{ to } 20 \text{ V}, \text{ T}_{J} = 25 \ ^{\circ}\text{C}$ | | | 100 | IIIV |
| A) / | Lood regulation | $I_{O} = 1$ to 100 mA, $T_{J} = 25 \text{ °C}$ | | | 60 | mV |
| ΔV_{O} | Load regulation | I _O = 1 to 40 mA, T _J = 25 °C | | | 30 | IIIV |
| | Quiescent current | T _J = 25 °C | | | 6 | mA |
| I _d | Quiescent current | T _J = 125 °C | | | 5.5 | mA |
| 41 | Quiessent surrent shange | I _O = 1 to 40 mA | | | 0.1 | m۸ |
| ΔI_d | Quiescent current change | V _I = 8 to 20 V | | | 1.5 | mA |
| eN | Output noise voltage | B =10 Hz to 100 kHz, $T_J = 25 \ ^{\circ}C$ | | 40 | | μV |
| SVR | Supply voltage rejection | $V_{I} = 8 \text{ to } 18 \text{ V}, \text{ f} = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, \text{ T}_{J} = 25 ^{\circ}\text{C}$ | 41 | 49 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |

Table 14. Electrical characteristics of L78L05AB and L78L05AC ($V_1 = 10 V$)

 T_J = 0 to 125 °C for L78L06AC, T_J = -40 to 125 °C for L78L06AB.



| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|----------------|--------------------------|---|------|------|------|-------|
| V _O | Output voltage | T _J = 25 °C | 5.76 | 6 | 6.24 | V |
| | | I _O = 1 to 40 mA, V _I = 8.5 to 20 V | 5.7 | | 6.3 | |
| Vo | Output voltage | $I_0 = 1$ to 70 mA, $V_1 = 12$ V | 5.7 | | 6.3 | V |
| A) (| Line regulation | $V_{I} = 8.5$ to 20 V, $T_{J} = 25 \ ^{\circ}C$ | | | 150 | m\/ |
| ΔV_{O} | Line regulation | $V_{I} = 9$ to 20 V, $T_{J} = 25 \ ^{\circ}C$ | | | 100 | mV |
| | Load regulation | $I_{O} = 1$ to 100 mA, $T_{J} = 25 \ ^{\circ}C$ | | | 60 | mV |
| ΔV_{O} | | $I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$ | | | 30 | IIIV |
| I _d | Quiescent current | T _J = 25 °C | | | 6 | mA |
| 'd | | $T_{J} = 125 \ ^{\circ}C$ | | | 5.5 | mA |
| ΔI_d | Quiescent current change | I _O = 1 to 40 mA | | | 0.1 | mA |
| ∆'d | ducsecht eurent enange | V ₁ = 9 to 20 V | | | 1.5 | 110.4 |
| eN | Output noise voltage | B =10 Hz to 100 kHz, $T_J = 25 \ ^{\circ}C$ | | 50 | | μV |
| SVR | Supply voltage rejection | $V_I = 9$ to 20 V, f = 120 Hz $I_O = 40$ mA, $T_J = 25$ °C | 39 | 46 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |

Table 15. Electrical characteristics of L78L06AB and L78L06AC ($V_1 = 12 V$)

 T_J = 0 to 125 °C for L78L08AC, T_J = -40 to 125 °C for L78L08AB.

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|----------------|--------------------------|--|------|------|------|------|
| V _O | Output voltage | T _J = 25 °C | 7.68 | 8 | 8.32 | V |
| V | | $I_{O} = 1$ to 40 mA, $V_{I} = 10.5$ to 23 V | 7.6 | | 8.4 | v |
| Vo | Output voltage | I _O = 1 to 70 mA, V _I = 14 V | 7.6 | | 8.4 | v |
| A) / | Line regulation | V_{I} = 10.5 to 23 V, T_{J} = 25 °C | | | 175 | mV |
| ΔV_{O} | Line regulation | V_{I} = 11 to 23 V, T_{J} = 25 °C | | | 125 | |
| A) / | Lood regulation | $I_{\rm O}$ = 1 to 100 mA, $T_{\rm J}$ = 25 °C | | | 80 | mV |
| ΔV_{O} | Load regulation | $I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$ | | | 40 | |
| | Quiescent current | T _J = 25 °C | | | 6 | mA |
| I _d | Quiescent current | T _J = 125 °C | | | 5.5 | mA |
| 41 | Quiescent current change | I _O = 1 to 40 mA | | | 0.1 | mA |
| ΔI_d | Quescent current change | V _I = 11 to 23 V | | | 1.5 | ША |
| eN | Output noise voltage | B =10 Hz to 100 kHz, $T_J = 25 \text{ °C}$ | | 60 | | μV |
| SVR | Supply voltage rejection | V_{I} = 12 to 23 V, f = 120 Hz I_{O} = 40 mA, T_{J} = 25 °C | 37 | 45 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |

| Table 16. | Electrical characteristics of L78L08AB and L78L08AC (| Vi : | = 14 \ | (∖ |
|-----------|---|------|--------|----|
| | | | | |



 T_J = 0 to 125 °C for L78L09AC, T_J = -40 to 125 °C for L78L09AB.

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|----------------|--------------------------|---|------|------|--------|-------------|
| Vo | Output voltage | T _J = 25 °C | 8.64 | 9 | 9.36 | V |
| V | | $I_0 = 1$ to 40 mA, $V_1 = 11.5$ to 23 V | 8.55 | | 9.45 | V |
| V _O | Output voltage | I _O = 1 to 70 mA, V _I = 15 V | 8.55 | | 9.45 | v |
| A) (| Line regulation | $V_{\rm I} = 11.5$ to 23 V, $T_{\rm J} = 25 \ ^{\circ}{\rm C}$ | | | 225 mV | m\/ |
| ΔV_O | Line regulation | V_{I} = 12 to 23 V, T_{J} = 25 °C | | | 150 | |
| A) (| Lood regulation | $I_{O} = 1$ to 100 mA, $T_{J} = 25 \ ^{\circ}C$ | | | 80 | 80 40 mV |
| ΔV_O | Load regulation | $I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$ | | | 40 | |
| 1 | Quiescent current | T _J = 25 °C | | | 6 | mA |
| I _d | Quescent current | T _J = 125 °C | | | 5.5 | mA |
| 41 | Quipagent ourrant change | I _O = 1 to 40 mA | | | 0.1 | mA |
| ΔI_d | Quiescent current change | V _I = 12 to 23 V | | | 1.5 | ША |
| eN | Output noise voltage | B =10 Hz to 100 kHz, $T_J = 25 \text{ °C}$ | | 70 | | μV |
| SVR | Supply voltage rejection | $V_{I} = 12 \text{ to } 23 \text{ V}, \text{ f} = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, \text{ T}_{J} = 25 \text{ °C}$ | 37 | 44 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |

| Table 17. | Electrical characteristics of L78L09AB and L78L09AC (V ₁ = 15 V) |
|-----------|---|
|-----------|---|

 T_J = 0 to 125 °C for L78L10AC, T_J = -40 to 125 °C for L78L10AB.

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|----------------|--------------------------|---|------|------|--------|------|
| V _O | Output voltage | T _J = 25 °C | 9.6 | 10 | 10.4 | V |
| M | Output voltage | $I_{O} = 1$ to 40 mA, $V_{I} = 12.5$ to 23 V | 9.5 | | 10.5 V | V |
| V _O | Output voltage | I _O = 1 to 70 mA, V _I = 16 V | 9.5 | | 10.5 | v |
| A)/ . | Line regulation | $V_{\rm I}$ = 12.5 to 23 V, $T_{\rm J}$ = 25 °C | | | 230 | mV |
| ΔV_{O} | Line regulation | V_{I} = 13 to 23 V, T_{J} = 25 °C | | | 170 | |
| 41/ | Lood regulation | I_{O} = 1 to 100 mA, T_{J} = 25 °C | | | 80 | — mV |
| ΔV_O | Load regulation | $I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$ | | | 40 | |
| 1 | Quiescent current | T _J = 25 °C | | | 6 | mA |
| l _d | | T _J = 125 °C | | | 5.5 | mA |
| 41 | Quiaccent ourrent change | I _O = 1 to 40 mA | | | 0.1 | m۸ |
| ΔI_d | Quiescent current change | V _I = 13 to 23 V | | | 1.5 | - mA |
| eN | Output noise voltage | B =10 Hz to 100 kHz, $T_J = 25 \text{ °C}$ | | 60 | | μV |
| SVR | Supply voltage rejection | $V_{I} = 14 \text{ to } 23 \text{ V}, f = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, T_{J} = 25 \text{ °C}$ | 37 | 45 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |

Table 18.Electrical characteristics of L78L10AC ($V_1 = 16 V$)



| $T_{J} = 0$ to 125 °C for L78L12AC, T_{J} | = -40 to 125 °C for L78L12AB. |
|---|-------------------------------|

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|----------------|--------------------------|---|------|------|------|--------|
| Vo | Output voltage | T _J = 25 °C | 11.5 | 12 | 12.5 | V |
| V | | $I_{O} = 1$ to 40 mA, $V_{I} = 14.5$ to 27 V | 11.4 | | 12.6 | v |
| V _O | Output voltage | I _O = 1 to 70 mA, V _I = 19 V | 11.4 | | 12.6 | v |
| A) (| Line regulation | $V_{\rm I}$ = 14.5 to 27 V, $T_{\rm J}$ = 25 °C | | | 250 | m\/ |
| ΔV_O | Line regulation | V_{I} = 16 to 27 V, T_{J} = 25 °C | | | 200 | 200 mV |
| 437 | Lood regulation | I_{O} = 1 to 100 mA, T_{J} = 25 °C | | | 100 | mV |
| ΔV_{O} | Load regulation | $I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$ | | | 50 | |
| 1 | Quiescent current | T _J = 25 °C | | | 6.5 | mA |
| I _d | Quiescent current | T _J = 125 °C | | | 6 | mA |
| 41 | Quipagent ourrant change | I _O = 1 to 40 mA | | | 0.1 | mA |
| ΔI_d | Quiescent current change | V _I = 16 to 27 V | | | 1.5 | mA |
| eN | Output noise voltage | B =10 Hz to 100 kHz, $T_J = 25 \text{ °C}$ | | 80 | | μV |
| SVR | Supply voltage rejection | $V_{I} = 15 \text{ to } 25 \text{ V}, \text{ f} = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, \text{ T}_{J} = 25 \text{ °C}$ | 37 | 42 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |

| Table 19. | Electrical characteristics of L78L12AB and L78L12AC (V _I = 19 V) |
|-----------|---|
|-----------|---|

 T_J = 0 to 125 °C for L78L15AC, T_J = -40 to 125 °C for L78L15AB.

| Table 20. Electrical characteristics of L78L15AB and L78L15AC ($V_1 = 23 V$) |
|--|
|--|

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|-----------------|--------------------------|---|-------|------|-------|------|
| V _O | Output voltage | T _J = 25 °C | 14.4 | 15 | 15.6 | V |
| N. | Output voltage | $I_0 = 1$ to 40 mA, $V_1 = 17.5$ to 30 V | 14.25 | | 15.75 | V |
| Vo | Output voltage | $I_0 = 1$ to 70 mA, $V_1 = 23$ V | 14.25 | | 15.75 | v |
| ΔV _O | Line regulation | V_{I} = 17.5 to 30 V, T_{J} = 25 °C | | | 300 | mV |
| ΔvO | Line regulation | V_{I} = 20 to 30 V, T_{J} = 25 °C | | | 250 | |
| | Load regulation | I_{O} = 1 to 100 mA, T_{J} = 25 °C | | | 150 | mV |
| ΔV _O | Load regulation | I_{O} = 1 to 40 mA, T_{J} = 25 °C | | | 75 | 111V |
| | Quiescent current | $T_{\rm J} = 25 \ ^{\circ}{\rm C}$ | | | 6.5 | mA |
| ۱ _d | | T _J = 125 °C | | | 6 | mA |
| 41 | Quiescent current change | I _O = 1 to 40 mA | | | 0.1 | mA |
| Δl _d | Quiescent current change | V ₁ = 20 to 30 V | | | 1.5 | ША |
| eN | Output noise voltage | B =10 Hz to 100 kHz, T_J = 25 °C | | 90 | | μV |
| SVR | Supply voltage rejection | V_{I} = 18.5 to 28.5 V, f = 120 Hz I_{O} = 40 mA, T _J = 25 °C | 34 | 39 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |



 T_J = 0 to 125 °C for L78L18AC, T_J = -40 to 125 °C for L78L18AB.

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit |
|-----------------|--------------------------|---|------|------|------|------|
| Vo | Output voltage | T _J = 25 °C | 17.3 | 18 | 18.7 | V |
| N. | Output voltage | $I_{O} = 1$ to 40 mA, $V_{I} = 22$ to 33 V | 17.1 | | 18.9 | V |
| Vo | Output voltage | I _O = 1 to 70 mA, V _I = 27 V | 17.1 | | 18.9 | v |
| | Line regulation | $V_{I} = 22 \text{ to } 33 \text{ V}, \text{ T}_{J} = 25 ^{\circ}\text{C}$ | | | 320 | — mV |
| ΔV _O | Line regulation | $V_{I} = 22$ to 33 V, $T_{J} = 25 \ ^{\circ}C$ | | | 270 | |
| 41/ | Lood regulation | $I_{O} = 1$ to 100 mA, $T_{J} = 25 \text{ °C}$ | | | 170 | mV |
| ΔV _O | Load regulation | $I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$ | | | 85 | |
| | Quiescent current | T _J = 25 °C | | | 6.5 | mA |
| ۱ _d | | T _J = 125 °C | | | 6 | mA |
| 41 | Quiessent current change | I _O = 1 to 40 mA | | | 0.1 | mA |
| Δl _d | Quiescent current change | V ₁ = 23 to 33 V | | | 1.5 | ШA |
| eN | Output noise voltage | B =10 Hz to 100 kHz, $T_J = 25 \text{ °C}$ | | 120 | | μV |
| SVR | Supply voltage rejection | $V_{I} = 23 \text{ to } 33 \text{ V}, \text{ f} = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, \text{ T}_{J} = 25 \text{ °C}$ | 33 | 38 | | dB |
| V _d | Dropout voltage | | | 1.7 | | V |

Table 21. Electrical characteristics of L78L18AC ($V_1 = 27 V$)

 T_J = 0 to 125 °C for L78L24AC, T_J = -40 to 125 °C for L78L24AB.

| Symbol | Parameter | Test conditions | Min. | Тур. | Max. | Unit | |
|----------------|--------------------------|---|------|------|--------|-----------|--|
| Vo | Output voltage | T _J = 25 °C | 23 | 24 | 25 | V | |
| V | | $I_0 = 1$ to 40 mA, $V_1 = 27$ to 38 V | 22.8 | | 25.2 | v | |
| Vo | Output voltage | $I_{O} = 1$ to 70 mA, $V_{I} = 33$ V | 22.8 | | 25.2 | v | |
| A) (| Line regulation | $V_{\rm I}$ = 27 to 38 V, $T_{\rm J}$ = 25 °C | | | 350 m) | m)/ | |
| ΔV_O | Line regulation | V_{I} = 28 to 38 V, T_{J} = 25 °C | | | 300 | mV 300 | |
| A) (| Lood regulation | $I_{O} = 1$ to 100 mA, $T_{J} = 25 \text{ °C}$ | | | 200 | | |
| ΔV_O | Load regulation | I_{O} = 1 to 40 mA, T_{J} = 25 °C | | | 100 | mV | |
| | Quiescent current | T _J = 25 °C | | | 6.5 | mA | |
| I _d | Quiescent current | T _J = 125 °C | | | 6 | mA | |
| 41 | Quipagent ourrent change | I _O = 1 to 40 mA | | | 0.1 | mA | |
| ΔI_d | Quiescent current change | V _I = 28 to 38 V | | | 1.5 | ШA | |
| eN | Output noise voltage | B =10 Hz to 100 kHz, $T_J = 25 \text{ °C}$ | | 200 | | μV | |
| SVR | Supply voltage rejection | $V_{I} = 29 \text{ to } 33 \text{ V}, f = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, T_{J} = 25 ^{\circ}\text{C}$ | 31 | 37 | | dB | |
| V _d | Dropout voltage | | | 1.7 | | V | |

Table 22. Electrical characteristics of L78L24AB and L78L24AC (V₁ = 33 V)



Figure 4.

5 Typical performance

L78L05/12 output voltage vs.

 ambient temperature

 CC25400

 V°
 (V) $(V_{IN} = 10V/19V, I_o = 1.0mA)$

 15
 10
 15

 10
 10
 10

 5
 10
 178L05

 5
 10
 178L05

 -25
 0
 25
 50

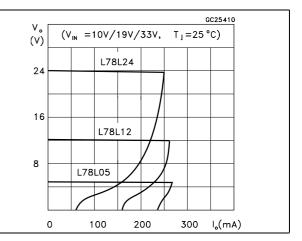
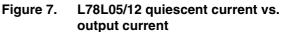
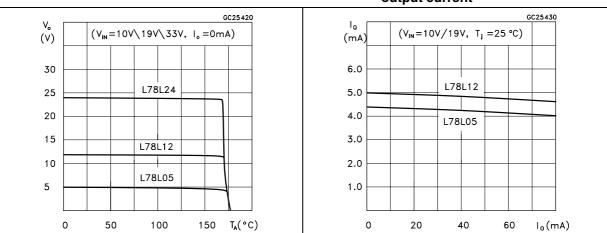


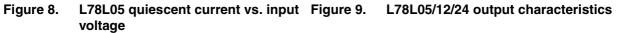
Figure 5. L78L05/12/24 load characteristics

Figure 6. L78L05/12/24 thermal shutdown









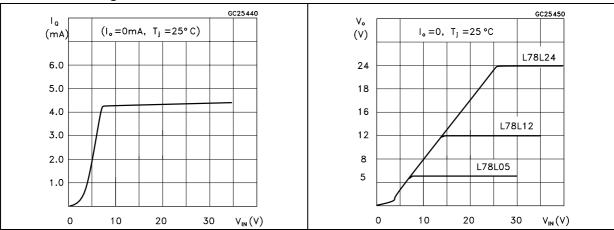


Figure 11. L78L05 dropout characteristics

Figure 10. L78L05/12/24 ripple rejection

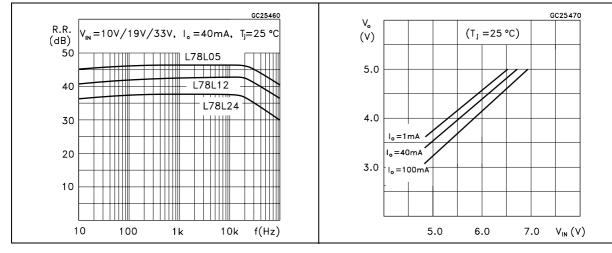
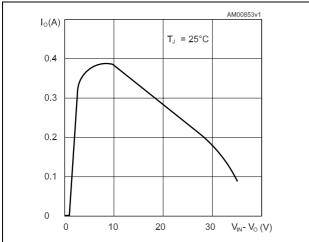


Figure 12. L78Lxx short-circuit output current



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6 **Typical application**

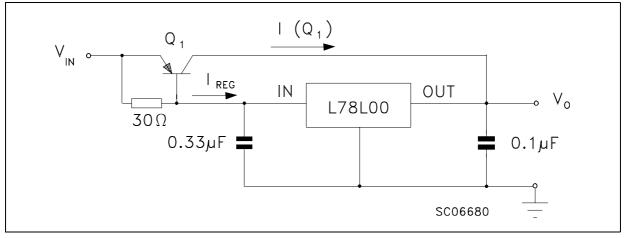
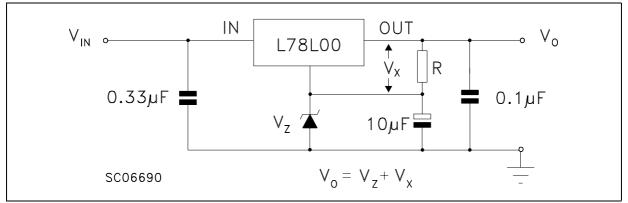
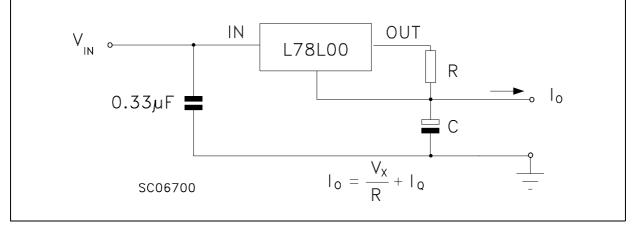


Figure 13. High output current short-circuit protected

Figure 14. Edit boost circuit

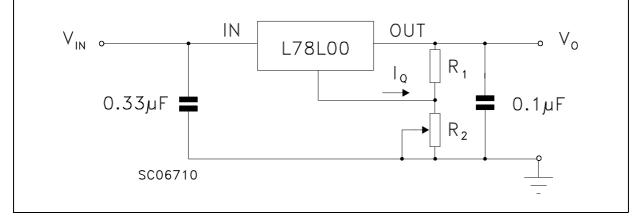






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| | | |







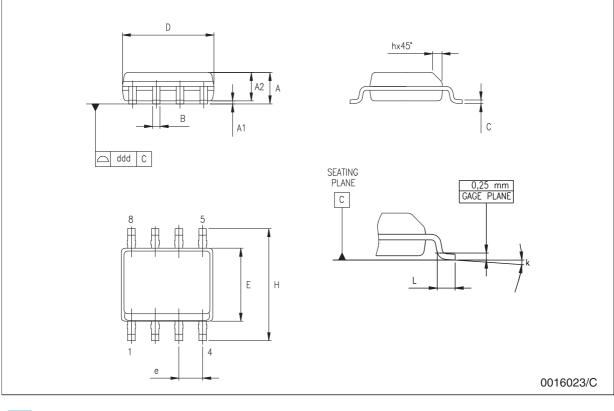
7 Package mechanical data

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*. ECOPACK[®] is an ST trademark.



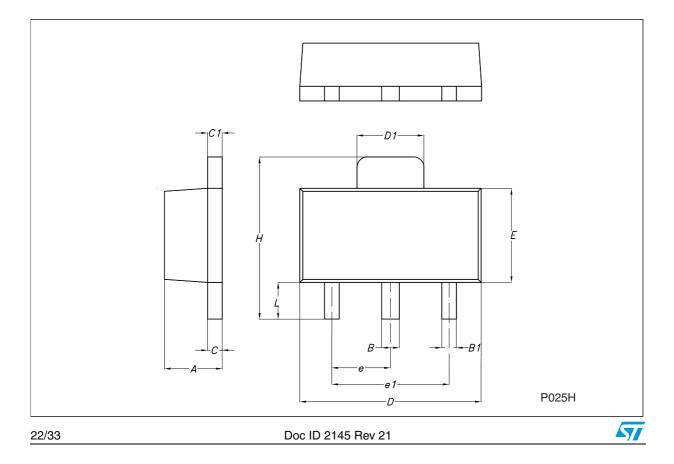
| Dim. | | mm. | | inch. | | |
|------|------|------|-------|-------|---------------------------------------|-------|
| Dim. | Min. | Тур. | Max. | Min. | Тур. | Max. |
| А | 1.35 | | 1.75 | 0.053 | | 0.069 |
| A1 | 0.10 | | 0.25 | 0.04 | | 0.010 |
| A2 | 1.10 | | 1.65 | 0.043 | | 0.065 |
| В | 0.33 | | 0.51 | 0.013 | | 0.020 |
| С | 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 |
| е | | 1.27 | | | 0.050 | |
| Н | 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° (1 | max.) | · · · · · · · · · · · · · · · · · · · | |
| ddd | | | 0.1 | | | 0.04 |







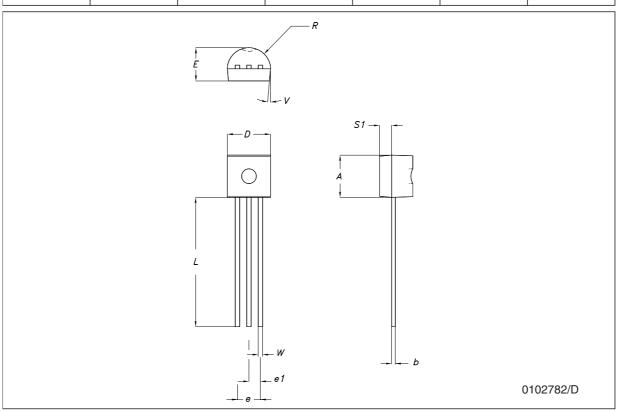
| Dim. | | mm. | | mils. | | | |
|-------|------|------|------|-------|------|-------|--|
| Dini. | Min. | Тур. | Max. | Min. | Тур. | Max. | |
| А | 1.4 | | 1.6 | 55.1 | | 63.0 | |
| В | 0.44 | | 0.56 | 17.3 | | 22.0 | |
| B1 | 0.36 | | 0.48 | 14.2 | | 18.9 | |
| С | 0.35 | | 0.44 | 13.8 | | 17.3 | |
| C1 | 0.35 | | 0.44 | 13.8 | | 17.3 | |
| D | 4.4 | | 4.6 | 173.2 | | 181.1 | |
| D1 | 1.62 | | 1.83 | 63.8 | | 72.0 | |
| E | 2.29 | | 2.6 | 90.2 | | 102.4 | |
| е | 1.42 | | 1.57 | 55.9 | | 61.8 | |
| e1 | 2.92 | | 3.07 | 115.0 | | 120.9 | |
| Н | 3.94 | | 4.25 | 155.1 | | 167.3 | |
| L | 0.89 | | 1.2 | 35.0 | | 47.2 | |



| SO1 | Г-89 | mec | hanica | data |
|-----|------|-----|--------|------|
|-----|------|-----|--------|------|

| Dim. | | mm. | | | mils. | |
|-------|------|------|-------|-------|-------|-------|
| Dini. | Min. | Тур. | Max. | Min. | Тур. | Max. |
| А | 4.32 | | 4.95 | 170.1 | | 194.9 |
| b | 0.36 | | 0.51 | 14.2 | | 20.1 |
| D | 4.45 | | 4.95 | 175.2 | | 194.9 |
| E | 3.30 | | 3.94 | 129.9 | | 155.1 |
| е | 2.41 | | 2.67 | 94.9 | | 105.1 |
| e1 | 1.14 | | 1.40 | 44.9 | | 55.1 |
| L | 12.7 | | 15.49 | 500.0 | | 609.8 |
| R | 2.16 | | 2.41 | 85.0 | | 94.9 |
| S1 | 0.92 | | 1.52 | 36.2 | | 59.8 |
| W | 0.41 | | 0.56 | 16.1 | | 22.0 |

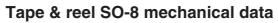


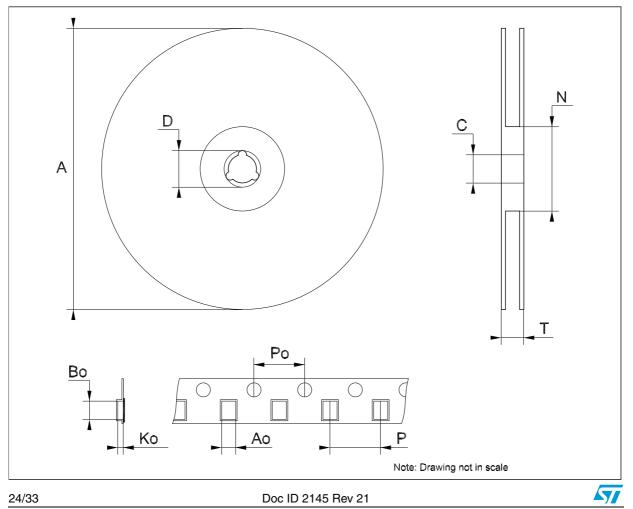


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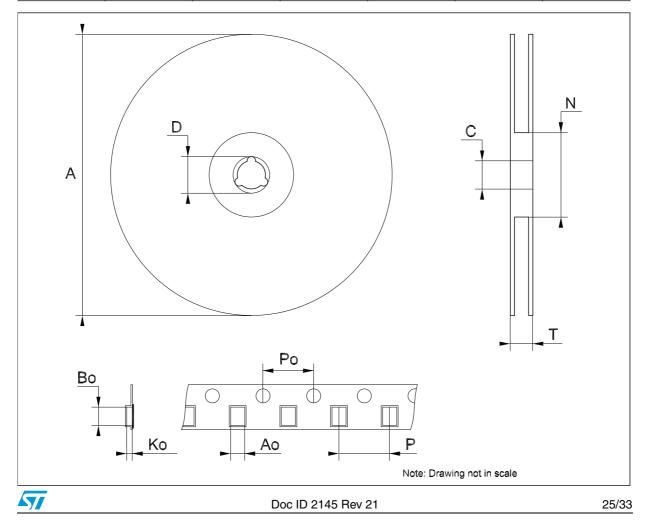
| Dim. | | mm. | | | inch. | |
|-------|------|------|------|-------|-------|--------|
| Dini. | Min. | Тур. | Max. | Min. | Тур. | Max. |
| А | | | 330 | | | 12.992 |
| С | 12.8 | | 13.2 | 0.504 | | 0.519 |
| D | 20.2 | | | 0.795 | | |
| Ν | 60 | | | 2.362 | | |
| Т | | | 22.4 | | | 0.882 |
| Ao | 8.1 | | 8.5 | 0.319 | | 0.335 |
| Во | 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 |
| Р | 7.9 | | 8.1 | 0.311 | | 0.319 |





| | | mm. | | inch. | | |
|------|------|------|------|-------|-------|-------|
| Dim. | Min. | Тур. | Max. | Min. | Тур. | Max. |
| А | | | 180 | | | 7.086 |
| С | 12.8 | 13.0 | 13.2 | 0.504 | 0.512 | 0.519 |
| D | 20.2 | | | 0.795 | | |
| Ν | 60 | | | 2.362 | | |
| Т | | | 14.4 | | | 0.567 |
| Ao | 4.70 | 4.80 | 4.90 | 0.185 | 0.189 | 0.193 |
| Во | 4.30 | 4.40 | 4.50 | 0.169 | 0.173 | 0.177 |
| Ko | 1.70 | 1.80 | 1.90 | 0.067 | 0.071 | 0.075 |
| Po | 3.9 | 4.0 | 4.1 | 0.153 | 0.157 | 0.161 |
| Р | 7.9 | 8.0 | 8.1 | 0.311 | 0.315 | 0.319 |





| Dim | | mm. | | | inch. | | | |
|-------------------|-------|-------|-------|-------|--------|-------|--|--|
| Dim. | Min. | Тур. | Max. | Min. | Тур. | Max. | | |
| A1 ⁽¹⁾ | | 4.80 | | | 0.189 | | | |
| T ⁽¹⁾ | | 3.80 | | | 0.150 | | | |
| T1 | | 1.60 | | | 0.063 | | | |
| T2 | | 2.30 | | | 0.091 | | | |
| d | | 0.48 | | | 0.019 | | | |
| P0 | 12.5 | | 12.9 | 0.492 | | 0.508 | | |
| P2 | 5.65 | | 7.05 | 0.222 | | 0.278 | | |
| F1, F2 | 2.44 | 2.54 | 2.94 | 0.096 | 0.100 | 0.116 | | |
| delta H | | ±2 | | | 0.079 | | | |
| W | 17.5 | 18.00 | 19.0 | 0.689 | 0.709 | 0.748 | | |
| W0 | 5.7 | | 6.3 | 0.224 | | 0.248 | | |
| W1 | 8.5 | | 9.25 | 0.335 | | 0.364 | | |
| W2 | | 0.50 | | | 0.20 | | | |
| Н | | 18.50 | 18.70 | | 0.728 | 0.726 | | |
| H0 | 15.50 | | 16.50 | 0.610 | | 0.650 | | |
| H1 | | 25.00 | | | 0.984 | | | |
| D0 | 3.8 | | 4.2 | 0.150 | | 0.165 | | |
| t | | 0.90 | | | 0.035 | | | |
| L1 | | 3 | | | 0.118 | | | |
| delta P | | ±1 | | | 0.039 | | | |
| u | | 50 | | | 1.968 | | | |
| Φ1 | | 360 | | | 14.173 | | | |
| Φ2 | | 30 | | | 1.181 | | | |

Table 23. Tape and reel TO-92 mechanical data

1. For the MAX and MIN values refer to the TO-92 mechanical data on page 23.



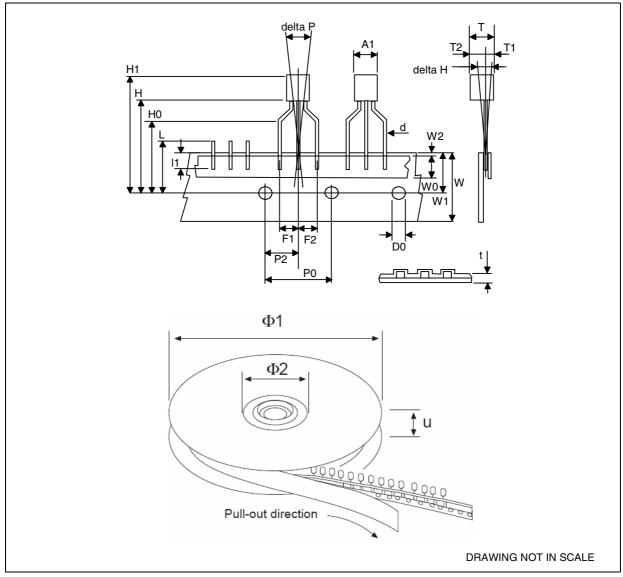


Figure 17. Tape and reel TO-92 drawing dimension



8 Order codes

Table 24.Order codes

| Part numbers | | Packages | - Output voltages | |
|--------------|---------------|---------------------------|-------------------|-------|
| Part numbers | SO-8 | TO92 (BAG) ⁽¹⁾ | SOT-89 | |
| L78L33C | L78L33CD-TR | | | 3.3 V |
| L78L33AC | L78L33ACD13TR | L78L33ACZ | L78L33ACUTR | 3.3 V |
| L78L33AB | L78L33ABD-TR | L78L33ABZ | L78L33ABUTR | 3.3 V |
| L78L05C | L78L05CD13TR | L78L05CZ | | 5 V |
| L78L05AC | L78L05ACD13TR | L78L05ACZ | L78L05ACUTR | 5 V |
| L78L05AB | L78L05ABD13TR | L78L05ABZ | L78L05ABUTR | 5 V |
| L78L06AC | L78L06ACD13TR | L78L06ACZ | L78L06ACUTR | 6 V |
| L78L06AB | L78L06ABD13TR | L78L06ABZ | L78L06ABUTR | 6 V |
| L78L08C | L78L08CD13TR | | | 8 V |
| L78L08AC | L78L08ACD13TR | L78L08ACZ | L78L08ACUTR | 8 V |
| L78L08AB | L78L08ABD13TR | L78L08ABZ | L78L08ABUTR | 8 V |
| L78L09C | L78L09CD13TR | | | 9 V |
| L78L09AC | L78L09ACD13TR | L78L09ACZ | L78L09ACUTR | 9 V |
| L78L09AB | L78L09ABD13TR | L78L09ABZ | L78L09ABUTR | 9 V |
| L78L10AC | | | L78L10ACUTR | 10 V |
| L78L12C | L78L12CD13TR | | | 12 V |
| L78L12AC | L78L12ACD13TR | L78L12ACZ | L78L12ACUTR | 12 V |
| L78L12AB | L78L12ABD-TR | L78L12ABZ | L78L12ABUTR | 12 V |
| L78L15C | L78L15CD-TR | | | 15 V |
| L78L15AC | L78L15ACD13TR | L78L15ACZ | L78L15ACUTR | 15 V |
| L78L15AB | | L78L15ABZ | L78L15ABUTR | 15 V |
| L78L18C | L78L18CD13TR | | | 18 V |
| L78L18AC | | | L78L18ACUTR | 18 V |
| L78L24C | L78L24CD-TR | | | 24 V |
| L78L24AC | | L78L24ACZ | L78L24ACUTR | 24 V |
| L78L24AB | | L78L24ABZ | | 24 V |

1. Available in Ammopak with the suffix "-AP" or in tape and reel with the suffix "TR". Please note that in these cases pins are shaped according to tape and reel specifications.



| Part numbers | Marking | Packages | Output voltages |
|--------------|---------|----------|-----------------|
| L78L05ABD | 78L05B | SO8 | 5 V |
| L78L05ABUTR | 8C | SOT 89 | 5 V |
| L78L05ABZ | L78L05 | TO 92 | 5 V |
| L78L05ABZ-AP | L78L05 | TO 92 | 5 V |
| L78L05ABZ-TR | L78L05 | TO 92 | 5 V |
| L78L05ACD | 78L05A | SO8 | 5 V |
| L78L05ACUTR | 8C | SOT 89 | 5 V |
| L78L05ACZ | L78L05 | TO 92 | 5 V |
| L78L05ACZ-AP | L78L05 | TO 92 | 5 V |
| L78L05ACZTR | L78L05 | TO 92 | 5 V |
| L78L05CD | 78L05 | SO8 | 5 V |
| L78L05CZ | L78L05 | TO 92 | 5 V |
| L78L06ABD | 78L06B | SO8 | 6 V |
| L78L06ABUTR | 8E | SOT 89 | 6 V |
| L78L06ABZ | L78L06 | TO 92 | 6 V |
| L78L06ACD | 78L06A | SO8 | 6 V |
| L78L06ACUTR | 8E | SOT 89 | 6 V |
| L78L06ACZ | L78L06 | TO 92 | 6 V |
| L78L06ACZ-AP | L78L06 | TO 92 | 6 V |
| L78L06ACZ-TR | L78L06 | TO 92 | 6 V |
| L78L06CD | 78L06 | SO8 | 6 V |
| L78L08ABD | 78L08B | SO8 | 8 V |
| L78L08ABUTR | 8G | SOT 89 | 8 V |
| L78L08ABZ | L78L08 | TO 92 | 8 V |
| L78L08ABZ-AP | L78L08 | TO 92 | 8 V |
| L78L08ABZTR | L78L08 | TO 92 | 8 V |
| L78L08ACD | 78L08A | SO8 | 8 V |
| L78L08ACUTR | 8G | SOT 89 | 8 V |
| L78L08ACZ | L78L08 | TO 92 | 8 V |
| L78L08ACZ-AP | L78L08 | TO 92 | 8 V |
| L78L08ACZTR | L78L08 | TO 92 | 8 V |
| L78L08CD | 78L08 | SO8 | 8 V |
| L78L09ABD | 78L09B | SO8 | 9 V |
| L78L09ABUTR | 8H | SOT 89 | 9 V |
| L78L09ABZ | L78L09 | TO 92 | 9 V |

Table 25.Marking information



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| Part numbers | Marking | Packages | Output voltages |
|--------------|---------|----------|-----------------|
| L78L09ACD | 78L09A | SO8 | 9 V |
| L78L09ACUTR | 8H | SOT 89 | 9 V |
| L78L09ACZ | L78L09 | TO 92 | 9 V |
| L78L09ACZ-AP | L78L09 | TO 92 | 9 V |
| L78L09ACZ-TR | L78L09 | TO 92 | 9 V |
| L78L09CD | 78L09 | SO8 | 9 V |
| L78L10ACUTR | 81 | SOT 89 | 10 V |
| L78L12ABD | 78L12B | SO8 | 12 V |
| L78L12ABUTR | 8K | SOT 89 | 12 V |
| L78L12ABZ | L78L12 | TO 92 | 12 V |
| L78L12ABZ-AP | L78L12 | TO 92 | 12 V |
| L78L12ACD | 78L12A | SO8 | 12 V |
| L78L12ACUTR | 8K | SOT 89 | 12 V |
| L78L12ACZ | L78L12 | TO 92 | 12 V |
| L78L12ACZ-AP | L78L12 | TO 92 | 12 V |
| L78L12ACZ-TR | L78L12 | TO 92 | 12 V |
| L78L12CD | 78L12 | SO8 | 12 V |
| L78L15ABD | 78L15B | SO8 | 15 V |
| L78L15ABUTR | 8L | SOT 89 | 15 V |
| L78L15ABZ | L78L15 | TO 92 | 15 V |
| L78L15ABZ-AP | L78L15 | TO 92 | 15 V |
| L78L15ACD | 78L15A | SO8 | 15 V |
| L78L15ACUTR | 8L | SOT 89 | 15 V |
| L78L15ACZ | L78L15 | TO 92 | 15 V |
| L78L15ACZ-AP | L78L15 | TO 92 | 15 V |
| L78L15ACZ-TR | L78L15 | TO 92 | 15 V |
| L78L15CD | 78L15 | SO8 | 15 V |
| L78L15CD-TR | 78L15A | SO8 | 15 V |
| L78L18ACUTR | 8B | SOT 89 | 18 V |
| L78L24ABD | 78L24B | SO8 | 24 V |
| L78L24ABUTR | 8P | SOT 89 | 24 V |
| L78L24ABZ-TR | L78L24 | TO 92 | 24 V |
| L78L24ACD | 78L24A | SO8 | 24 V |
| L78L24ACUTR | 8P | SOT 89 | 24 V |
| L78L24ACZ | L78L24 | TO 92 | 24 V |
| L78L24ACZ-AP | L78L24 | TO 92 | 24 V |

 Table 25.
 Marking information (continued)

| Part numbers | Marking | Packages | Output voltages |
|---------------|---------|----------|-----------------|
| L78L24CD | 78L24 | SO8 | 24 V |
| L78L33ABD | 78L33B | SO8 | 3.3 V |
| L78L33ABUTR | 8A | SOT 89 | 3.3 V |
| L78L33ABZ-AP | L78L33 | TO 92 | 3.3 V |
| L78L33ACD | 78L33A | SO8 | 3.3 V |
| L78L33ACD13TR | 78L33A | SO8 | 3.3 V |
| L78L33ACUTR | 8A | SOT 89 | 3.3 V |
| L78L33ACZ | L78L33 | TO 92 | 3.3 V |
| L78L33ACZ-AP | L78L33 | TO 92 | 3.3 V |
| L78L33ACZTR | L78L33 | TO 92 | 3.3 V |
| L78L33CD | 78L33 | SO8 | 3.3 V |
| L78L33CD-TR | 78L33 | SO8 | 3.3 V |

 Table 25.
 Marking information (continued)



9 Revision history

| Table 26. | Document revision history |
|-----------|---------------------------|
|-----------|---------------------------|

| Date | Revision | Changes |
|-------------|----------|---|
| 14-Mar-2005 | 9 | Add tape and reel for TO-92. |
| 15-Mar-2005 | 10 | Add note on Table 3. |
| 23-Dec-2005 | 11 | Mistake on ordering Table in header. |
| 12-Sep-2006 | 12 | Order codes updated. |
| 07-Jun-2007 | 13 | Order codes updated. |
| 18-Sep-2007 | 14 | Added Table 1 in cover page. |
| 15-Jul-2008 | 15 | Modified: Table 1 on page 1 and Table 24 on page 28. |
| 18-Aug-2008 | 16 | Modified Figure 12 on page 17. |
| 03-Apr-2009 | 17 | Added: R _{thJA} value for SOT-89 <i>Table 3 on page 5</i> . |
| 08-Feb-2011 | 18 | Added note Table 23 on page 26 |
| 21-Feb-2012 | 19 | Modified: SOT-89 <i>Figure 2 on page 4</i> . |
| 14-Aug-2012 | 20 | Updated T _{OP} value for L78L00AC in <i>Table 2 on page 5</i> . Minor text changes. |
| 07-Sep-2012 | 21 | Added: Table 25 on page 29. |



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