

## The Linear IC's Three-Terminal Low Current Positive Voltage Regulators

### DESCRIPTION

The 78L00A Series of three terminal positive voltage regulators is available with several fixed output voltages making them useful in a wide range of applications. These regulators are inexpensive, vise-to-use devices suitable for a multitude of applications that require a regulated supply of up to 100 mA. These regulators feature internal current limiting and thermal shutdown making them remarkably rugged. No external components are required with the 78L00A devices in many applications.

These devices offer a substantial performance advantage over the traditional zener diode-resistor combination, as output impedance and quiescent current are substantially reduced.

The voltages available allow the 78L00A to be used in logic systems, instrumentation, HiFi, and other solid state electronic equipment.

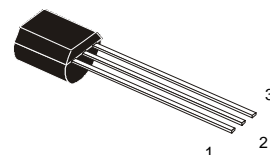
The 78L00A is available in 3-Pin plastic package SOT54 (Z), 3-Pin mini power plastic package SOT89 (F) and the 8-Pin plastic package SO8 (D) offers superior quality and performance at low cost.

### FEATURES

- High Output Current  
 $I_o = 100 \text{ mA}$
- Fixed Output Voltage  
 $V_o = 5 \text{ V}, 6 \text{ V}, 8 \text{ V}, 12 \text{ V}, 15 \text{ V}$
- Complementary Negative Regulators 79L00A Series
- Available in either  $\pm 5\%$  (AC) Selection

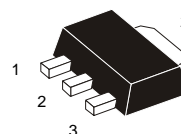
### DEVICE TYPE / NOMINAL VOLTAGE

| 5% Output Voltage Accuracy | Voltage | Package  |          |          |
|----------------------------|---------|----------|----------|----------|
|                            |         | Z Suffix | F Suffix | D Suffix |
| 78L05AC                    | 5       | 78L05ACZ | 78L05ACF | 78L05ACD |
| 78L06AC                    | 6       | 78L06ACZ | 78L06ACF | 78L06ACD |
| 78L08AC                    | 8       | 78L08ACZ | 78L08ACF | 78L08ACD |
| 78L09AC                    | 9       | 78L09ACZ | 78L09ACF | 78L09ACD |
| 78L12AC                    | 12      | 78L12ACZ | 78L12ACF | 78L12ACD |
| 78L15AC                    | 15      | 78L15ACZ | 78L15ACF | 78L15ACD |



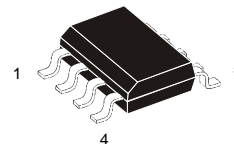
- 1 – Output
- 2 – Common
- 3 – Input

|         |       |
|---------|-------|
|         | SOT54 |
| JEDEC   | TO-92 |
| EIAJ    | SC-43 |
| GOST    | KT-26 |
| Weight: | 0.3g  |



- 1 – Output
- 2 – Common
- 3 – Input

|         |        |
|---------|--------|
|         | SOT89  |
| JEDEC   | TO-243 |
| EIAJ    | SC-62  |
| GOST    | KT-47  |
| Weight: | 0.055g |



|         |          |
|---------|----------|
|         | SOT96-1  |
| JEDEC   | MS-012   |
| EIAJ    | –        |
| GOST    | 4303.8-1 |
| Weight: | 0.08 ā   |

- 1 – Output, 2 – Common,
- 3 – Common, 4 – No Connect,
- 5 – No Connect, 6 – Common,
- 7 – Common, 8 – Input

# 78L00AC Series

## ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ }^\circ\text{C}$ )

| Rating  | Symbol     | Value                                  | Unit             |
|---|------------|--|------------------|
| Input Voltage<br>$V_o = 5\text{ V to }9\text{ V}$<br>$V_o = 12\text{ V to }15\text{ V}$                                   | $V_i$      | <b>30</b><br><b>35</b>                 | V                |
| Output Current  | $I_o$      | <b>100</b>                             | mA               |
| Maximum Power Dissipation<br>Case KT-26 (TO-92) Z Suffix<br>Case KT-47 (SOT-89) F Suffix<br>Case 4303.8-1 (SO-8) D Suffix | $P_D$      | <b>500</b><br><b>350</b><br><b>500</b> | mW               |
| Junction Temperature  | $T_{JMAX}$ | <b>150</b>                             | $^\circ\text{C}$ |
| Operating Junction Temperature Range  | $T_{OPR}$  | <b>-30 to +85</b>                      | $^\circ\text{C}$ |
| Storage Temperature Range   | $T_{STG}$  | <b>-40 to +150</b>                     | $^\circ\text{C}$ |

## ORDERING INFORMATION

| Device       | Marking   | Package | Quantity                           | Packing Style  |
|--------------|-----------|---------|------------------------------------|--|
| 78LXXACZ*    | 78LXXACZ* | SOT-54  | 1 Kpcs / plastic bags / carton box | In bulk  |
| 78LXXACF*    | 8LXX*     | SOT-89  | 5 Kpcs / plastic bags / carton box | In bulk  |
| 78LXXACF-T1* | 8LXX*     | SOT-89  | 1 Kpcs / Reel                      | Embossed tape 12-mm wide 7" dia.<br>Pin 2 (Common) towards the windung.<br>Perforation on the right. |
| 78LXXACD*    | 78LXXACD* | SO-8    | 5 Kpcs / plastic bags / carton box | In bulk  |
| 78LXXACD-R1* | 78LXXACD* | SO-8    | 500 pcs / Reel                     | Embossed tape 12-mm wide 7" dia.<br>Pin 1 (Output) face to perforation side of the tape.             |
| 78LXXACD-R2* | 78LXXACD* | SO-8    | 2.5 Kpcs / Reel                    | Embossed tape 12-mm wide 13" dia.<br>Pin 1 (Output) face to perforation side of the tape.            |

### Note 1:

XX indicates nominal voltage

\*Available in 5, 6, 8, 9, 12 and 15 V devices.

# 78L00AC Series

## 78L05AC ELECTRICAL CHARACTERISTICS

( $V_i = 10\text{ V}$ ,  $I_o = 40\text{ mA}$ ,  $C_i = 0.33\ \mu\text{F}$ ,  $C_o = 0.1\ \mu\text{F}$ ,  $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

| Characteristic   | Symbol          | Min    | Typ    | Max      | Unit |
|--|-----------------|--------|--------|----------|------|
| Output Voltage   | $V_o$           | 4.8    | 5.0    | 5.2      | V    |
| Output Voltage,<br>$7.0\text{V} < V_i < 20.0\text{V}$ , $1\text{mA} < I_o < 40\text{mA}$       | $V_o$           | 4.75   | –      | 5.25     | V    |
| Line Regulation,<br>$7.0\text{V} < V_i < 20.0\text{V}$   |                 | –      | –      | 150      | mV   |
| Load Regulation,<br>$1\text{mA} < I_o < 100\text{mA}$<br>$1\text{mA} < I_o < 40\text{mA}$      |                 | –<br>– | –<br>– | 60<br>30 | mV   |
| Input Bias Current   | $I_{IB}$        | –      | –      | 6        | mA   |
| Input Bias Current,<br>$8.0\text{V} < V_i < 20.0\text{V}$ , $1\text{mA} < I_o < 40\text{mA}$   | $\Delta I_{IB}$ | –      | –      | 1.5      | mA   |
| Ripple Rejection,<br>$8.0\text{V} < V_i < 18.0\text{V}$ , $I_o=40\text{mA}$ , $f=120\text{Hz}$ | RR              | 41     | –      | –        | dB   |
| Dropout Voltage  | $V_i - V_o$     |        | 1.7    | –        | V    |

## 78L06AC ELECTRICAL CHARACTERISTICS

( $V_i = 12\text{ V}$ ,  $I_o = 40\text{ mA}$ ,  $C_i = 0.33\ \mu\text{F}$ ,  $C_o = 0.1\ \mu\text{F}$ ,  $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

| Characteristic  | Symbol          | Min    | Typ    | Max      | Unit |
|---|-----------------|--------|--------|----------|------|
| Output Voltage  | $V_o$           | 5.75   | 6.0    | 6.25     | V    |
| Output Voltage,<br>$8.5\text{V} < V_i < 20.0\text{V}$ , $1\text{mA} < I_o < 40\text{mA}$        | $V_o$           | 5.7    | –      | 6.3      | V    |
| Line Regulation,<br>$8.5\text{V} < V_i < 20.0\text{V}$  |                 | –      | –      | 175      | mV   |
| Load Regulation,<br>$1\text{mA} < I_o < 100\text{mA}$<br>$1\text{mA} < I_o < 40\text{mA}$       |                 | –<br>– | –<br>– | 80<br>40 | mV   |
| Input Bias Current  | $I_{IB}$        | –      | –      | 6        | mA   |
| Input Bias Current,<br>$9.0\text{V} < V_i < 20.0\text{V}$ , $1\text{mA} < I_o < 40\text{mA}$    | $\Delta I_{IB}$ | –      | –      | 1.5      | mA   |
| Ripple Rejection,<br>$10.0\text{V} < V_i < 20.0\text{V}$ , $I_o=40\text{mA}$ , $f=120\text{Hz}$ | RR              | 40     | –      | –        | dB   |
| Dropout Voltage   | $V_i - V_o$     |        | 1.7    | –        | V    |

# 78L00AC Series

## 78L08AC ELECTRICAL CHARACTERISTICS

( $V_i = 14\text{ V}$ ,  $I_o = 40\text{ mA}$ ,  $C_i = 0.33\text{ }\mu\text{F}$ ,  $C_o = 0.1\text{ }\mu\text{F}$ ,  $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

| Characteristic  | Symbol          | Min        | Typ        | Max                    | Unit |
|---|-----------------|------------|------------|------------------------|------|
| Output Voltage  | $V_o$           | <b>7.7</b> | <b>8.0</b> | <b>8.3</b>             | V    |
| Output Voltage,<br>$10.5\text{V} < V_i < 23.0\text{V}$ , $1\text{mA} < I_o < 40\text{mA}$       | $V_o$           | <b>7.6</b> | –          | <b>8.4</b>             | V    |
| Line Regulation,<br>$10.5\text{V} < V_i < 23.0\text{V}$   |                 | –          | –          | <b>175</b>             | mV   |
| Load Regulation,<br>$1\text{mA} < I_o < 100\text{mA}$<br>$1\text{mA} < I_o < 40\text{mA}$       |                 | –          | –          | <b>80</b><br><b>40</b> | mV   |
| Input Bias Current  | $I_{IB}$        | –          | –          | <b>6</b>               | mA   |
| Input Bias Current,<br>$11.0\text{V} < V_i < 23.0\text{V}$ , $1\text{mA} < I_o < 40\text{mA}$   | $\Delta I_{IB}$ | –          | –          | <b>1.5</b>             | mA   |
| Ripple Rejection,<br>$13.0\text{V} < V_i < 23.0\text{V}$ , $I_o=40\text{mA}$ , $f=120\text{Hz}$ | RR              | <b>37</b>  | –          | –                      | dB   |
| Dropout Voltage   | $V_i - V_o$     |            | <b>1.7</b> | –                      | V    |

## 78L09AC ELECTRICAL CHARACTERISTICS

( $V_i = 16\text{ V}$ ,  $I_o = 40\text{ mA}$ ,  $C_i = 0.33\text{ }\mu\text{F}$ ,  $C_o = 0.1\text{ }\mu\text{F}$ ,  $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

| Characteristic  | Symbol          | Min         | Typ        | Max                    | Unit |
|---|-----------------|-------------|------------|------------------------|------|
| Output Voltage  | $V_o$           | <b>8.6</b>  | <b>9.0</b> | <b>9.4</b>             | V    |
| Output Voltage,<br>$12.0\text{V} < V_i < 24.0\text{V}$ , $1\text{mA} < I_o < 40\text{mA}$       | $V_o$           | <b>8.55</b> | –          | <b>9.45</b>            | V    |
| Line Regulation,<br>$12.0\text{V} < V_i < 24.0\text{V}$   |                 | –           | –          | <b>175</b>             | mV   |
| Load Regulation,<br>$1\text{mA} < I_o < 100\text{mA}$<br>$1\text{mA} < I_o < 40\text{mA}$       |                 | –           | –          | <b>90</b><br><b>40</b> | mV   |
| Input Bias Current  | $I_{IB}$        | –           | –          | <b>6</b>               | mA   |
| Input Bias Current,<br>$13.0\text{V} < V_i < 24.0\text{V}$ , $1\text{mA} < I_o < 40\text{mA}$   | $\Delta I_{IB}$ | –           | –          | <b>1.5</b>             | mA   |
| Ripple Rejection,<br>$15.0\text{V} < V_i < 25.0\text{V}$ , $I_o=40\text{mA}$ , $f=120\text{Hz}$ | RR              | <b>37</b>   | –          | –                      | dB   |
| Dropout Voltage   | $V_i - V_o$     |             | <b>1.7</b> | –                      | V    |

# 78L00AC Series

## 78L12AC ELECTRICAL CHARACTERISTICS

( $V_i = 19\text{ V}$ ,  $I_o = 40\text{ mA}$ ,  $C_i = 0.33\ \mu\text{F}$ ,  $C_o = 0.1\ \mu\text{F}$ ,  $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

| Characteristic  | Symbol          | Min  | Typ  | Max       | Unit |
|---|-----------------|------|------|-----------|------|
| Output Voltage  | $V_o$           | 11.5 | 12.0 | 12.5      | V    |
| Output Voltage,<br>$14.0\text{V} < V_i < 27.0\text{V}$ , $1\text{mA} < I_o < 40\text{mA}$       | $V_o$           | 11.4 | –    | 12.6      | V    |
| Line Regulation,<br>$14.5\text{V} < V_i < 27.0\text{V}$   |                 | –    | –    | 250       | mV   |
| Load Regulation,<br>$1\text{mA} < I_o < 100\text{mA}$<br>$1\text{mA} < I_o < 40\text{mA}$       |                 | –    | –    | 100<br>50 | mV   |
| Input Bias Current  | $I_{IB}$        | –    | –    | 6.5       | mA   |
| Input Bias Current,<br>$16.0\text{V} < V_i < 27.0\text{V}$ , $1\text{mA} < I_o < 40\text{mA}$   | $\Delta I_{IB}$ | –    | –    | 1.5       | mA   |
| Ripple Rejection,<br>$15.0\text{V} < V_i < 25.0\text{V}$ , $I_o=40\text{mA}$ , $f=120\text{Hz}$ | RR              | 37   | –    | –         | dB   |
| Dropout Voltage   | $V_i - V_o$     |      | 1.7  | –         | V    |

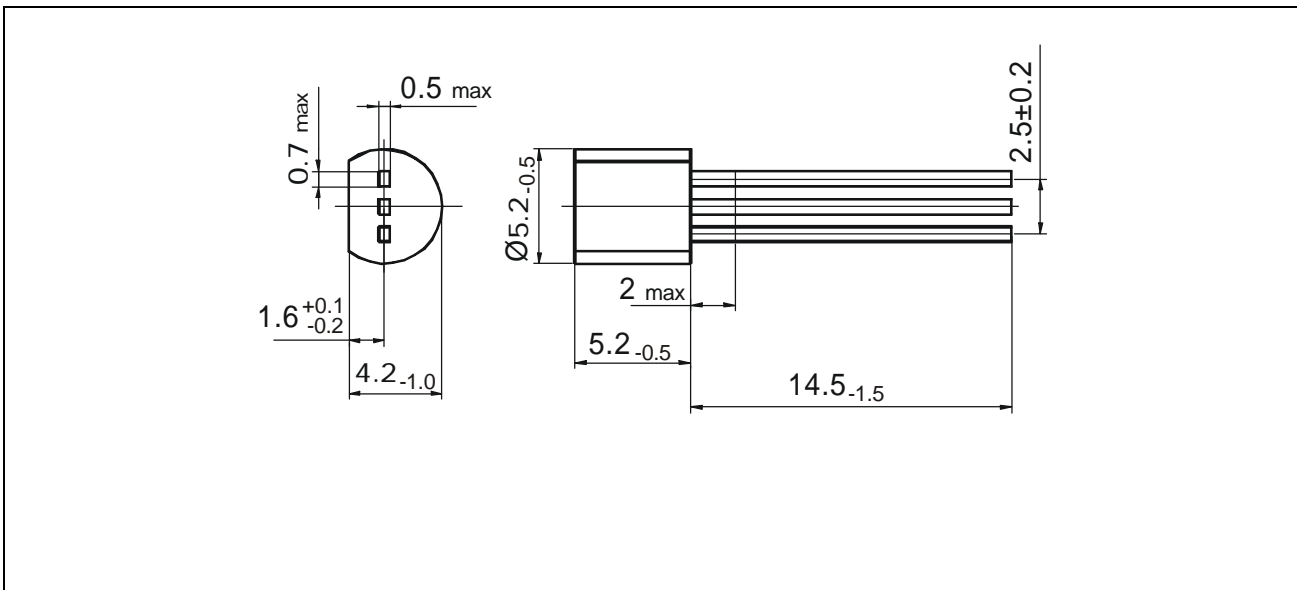
## 78L15AC ELECTRICAL CHARACTERISTICS

( $V_i = 23\text{ V}$ ,  $I_o = 40\text{ mA}$ ,  $C_i = 0.33\ \mu\text{F}$ ,  $C_o = 0.1\ \mu\text{F}$ ,  $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

| Characteristic  | Symbol          | Min   | Typ  | Max       | Unit |
|---|-----------------|-------|------|-----------|------|
| Output Voltage  | $V_o$           | 14.4  | 15.0 | 15.6      | V    |
| Output Voltage,<br>$17.5\text{V} < V_i < 30.0\text{V}$ , $1\text{mA} < I_o < 40\text{mA}$       | $V_o$           | 14.25 | –    | 15.75     | V    |
| Line Regulation,<br>$17.5\text{V} < V_i < 30.0\text{V}$   |                 | –     | –    | 300       | mV   |
| Load Regulation,<br>$1\text{mA} < I_o < 100\text{mA}$<br>$1\text{mA} < I_o < 40\text{mA}$       |                 | –     | –    | 150<br>75 | mV   |
| Input Bias Current  | $I_{IB}$        | –     | –    | 6.5       | mA   |
| Input Bias Current,<br>$19.0\text{V} < V_i < 30.0\text{V}$ , $1\text{mA} < I_o < 40\text{mA}$   | $\Delta I_{IB}$ | –     | –    | 1.5       | mA   |
| Ripple Rejection,<br>$18.5\text{V} < V_i < 28.5\text{V}$ , $I_o=40\text{mA}$ , $f=120\text{Hz}$ | RR              | 34    | –    | –         | dB   |
| Dropout Voltage   | $V_i - V_o$     |       | 1.7  | –         | V    |

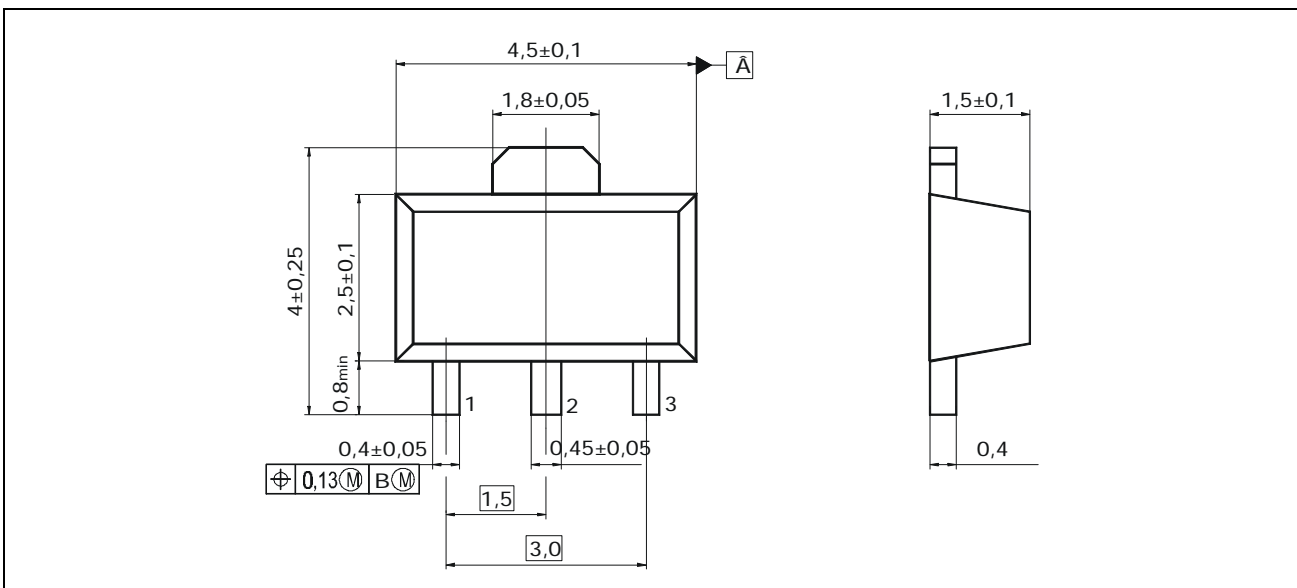
# 78L00AC Series

## PACKAGE DIMENSIONS of 78L00ACZ in mm



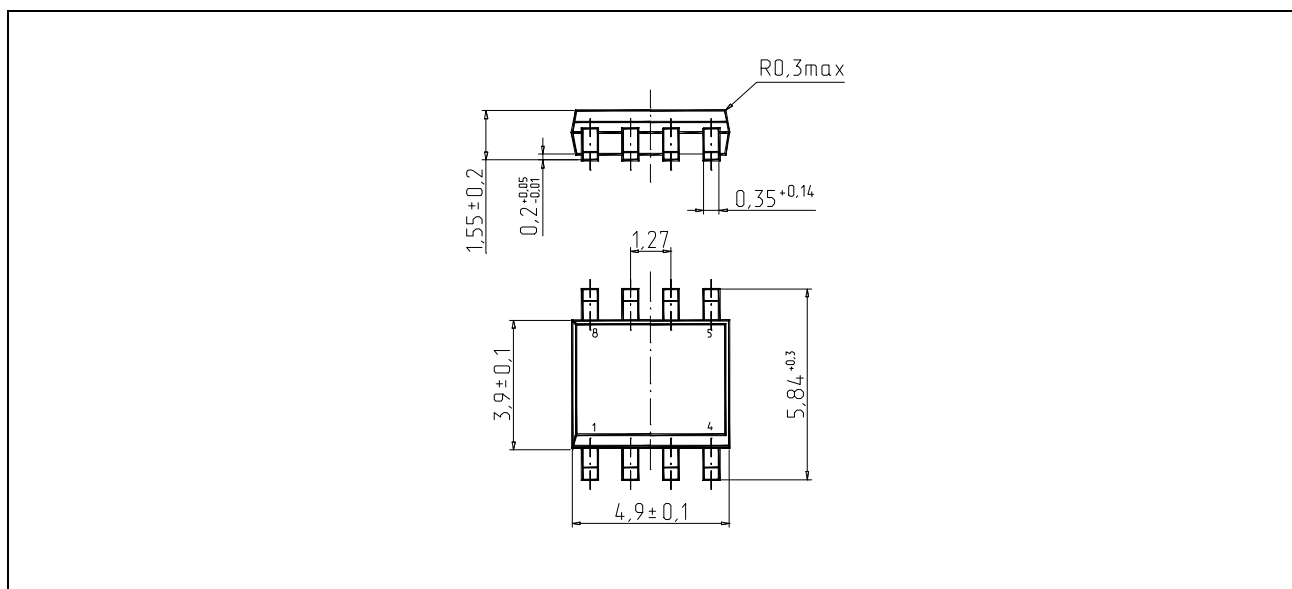
PLASTIC CASE KT-26

## PACKAGE DIMENSIONS of 78L00ACF in mm



PLASTIC CASE KT-47

## PACKAGE DIMENSIONS of 78L00ACD in mm



PLASTIC CASE 4303-8.1