

MC78L00A Series, NCV78L00A

MAXIMUM RATINGS ($T_A = +125^\circ\text{C}$, unless otherwise noted.)

| Rating | Symbol | Value | Unit |
|--|-----------|----------------|------------------|
| Input Voltage (2.6 V–8.0 V) (12 V–18 V) (24 V) | V_I | 30 35 40 | Vdc |
| Storage Temperature Range | T_{stg} | –65 to +150 | $^\circ\text{C}$ |
| Operating Junction Temperature Range | T_J | 0 to +150 | $^\circ\text{C}$ |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

ELECTRICAL CHARACTERISTICS ($V_I = 10\text{ V}$, $I_O = 40\text{ mA}$, $C_I = 0.33\text{ }\mu\text{F}$, $C_O = 0.1\text{ }\mu\text{F}$, $-40^\circ\text{C} < T_J < +125^\circ\text{C}$ (for MC78LXXAB, NCV78L05A), $0^\circ\text{C} < T_J < +125^\circ\text{C}$ (for MC78LXXAC), unless otherwise noted.)

| Characteristics | Symbol | MC78L05AC, AB, NCV78L05A | | | Unit |
|---|---------------------|--------------------------|-----------|--------------|---------------|
| | | Min | Typ | Max | |
| Output Voltage ($T_J = +25^\circ\text{C}$) | V_O | 4.8 | 5.0 | 5.2 | Vdc |
| Line Regulation ($T_J = +25^\circ\text{C}$, $I_O = 40\text{ mA}$) $7.0\text{ Vdc} \leq V_I \leq 20\text{ Vdc}$ $8.0\text{ Vdc} \leq V_I \leq 20\text{ Vdc}$ | Reg_{line} | – – | 55 45 | 150 100 | mV |
| Load Regulation ($T_J = +25^\circ\text{C}$, $1.0\text{ mA} \leq I_O \leq 100\text{ mA}$) ($T_J = +25^\circ\text{C}$, $1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) | Reg_{load} | – – | 11 5.0 | 60 30 | mV |
| Output Voltage ($7.0\text{ Vdc} \leq V_I \leq 20\text{ Vdc}$, $1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) ($V_I = 10\text{ V}$, $1.0\text{ mA} \leq I_O \leq 70\text{ mA}$) | V_O | 4.75 4.75 | – – | 5.25 5.25 | Vdc |
| Input Bias Current ($T_J = +25^\circ\text{C}$) ($T_J = +125^\circ\text{C}$) | I_{IB} | – – | 3.8 – | 6.0 5.5 | mA |
| Input Bias Current Change ($8.0\text{ Vdc} \leq V_I \leq 20\text{ Vdc}$) ($1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) | ΔI_{IB} | – – | – – | 1.5 0.1 | mA |
| Output Noise Voltage ($T_A = +25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$) | V_n | – | 40 | – | μV |
| Ripple Rejection ($I_O = 40\text{ mA}$, $f = 120\text{ Hz}$, $8.0\text{ Vdc} \leq V_I \leq 18\text{ V}$, $T_J = +25^\circ\text{C}$) | RR | 41 | 49 | – | dB |
| Dropout Voltage ($T_J = +25^\circ\text{C}$) | $V_I - V_O$ | – | 1.7 | – | Vdc |

NOTE: NCV78L05A: $T_{low} = -40^\circ\text{C}$, $T_{high} = +125^\circ\text{C}$. Guaranteed by design. NCV prefix is for automotive and other applications requiring site and change control.

MC78L00A Series, NCV78L00A

ELECTRICAL CHARACTERISTICS ($V_I = 14\text{ V}$, $I_O = 40\text{ mA}$, $C_I = 0.33\text{ }\mu\text{F}$, $C_O = 0.1\text{ }\mu\text{F}$, $-40^\circ\text{C} < T_J < +125^\circ\text{C}$ (for MC78LXXAB), $0^\circ\text{C} < T_J < +125^\circ\text{C}$ (for MC78LXXAC), unless otherwise noted.)

| Characteristics | Symbol | MC78L08AC, AB | | | Unit |
|--|----------------------------|---------------|-----------|------------|---------------|
| | | Min | Typ | Max | |
| Output Voltage ($T_J = +25^\circ\text{C}$) | V_O | 7.7 | 8.0 | 8.3 | Vdc |
| Line Regulation ($T_J = +25^\circ\text{C}$, $I_O = 40\text{ mA}$) $10.5\text{ Vdc} \leq V_I \leq 23\text{ Vdc}$ $11\text{ Vdc} \leq V_I \leq 23\text{ Vdc}$ | Reg_{line} | – – | 20 12 | 175 125 | mV |
| Load Regulation ($T_J = +25^\circ\text{C}$, $1.0\text{ mA} \leq I_O \leq 100\text{ mA}$) ($T_J = +25^\circ\text{C}$, $1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) | Reg_{load} | – – | 15 8.0 | 80 40 | mV |
| Output Voltage ($10.5\text{ Vdc} \leq V_I \leq 23\text{ Vdc}$, $1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) ($V_I = 14\text{ V}$, $1.0\text{ mA} \leq I_O \leq 70\text{ mA}$) | V_O | 7.6 7.6 | – – | 8.4 8.4 | Vdc |
| Input Bias Current ($T_J = +25^\circ\text{C}$) ($T_J = +125^\circ\text{C}$) | I_{IB} | – – | 3.0 – | 6.0 5.5 | mA |
| Input Bias Current Change ($11\text{ Vdc} \leq V_I \leq 23\text{ Vdc}$) ($1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) | ΔI_{IB} | – – | – – | 1.5 0.1 | mA |
| Output Noise Voltage ($T_A = +25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$) | V_n | – | 60 | – | μV |
| Ripple Rejection ($I_O = 40\text{ mA}$, $f = 120\text{ Hz}$, $12\text{ V} \leq V_I \leq 23\text{ V}$, $T_J = +25^\circ\text{C}$) | RR | 37 | 57 | – | dB |
| Dropout Voltage ($T_J = +25^\circ\text{C}$) | $V_I - V_O$ | – | 1.7 | – | Vdc |

ELECTRICAL CHARACTERISTICS ($V_I = 15\text{ V}$, $I_O = 40\text{ mA}$, $C_I = 0.33\text{ }\mu\text{F}$, $C_O = 0.1\text{ }\mu\text{F}$, $-40^\circ\text{C} < T_J < +125^\circ\text{C}$ (for MC78LXXAB), $0^\circ\text{C} < T_J < +125^\circ\text{C}$ (for MC78LXXAC), unless otherwise noted.)

| Characteristics | Symbol | MC78L09AC, AB | | | Unit |
|--|----------------------------|---------------|-----------|------------|---------------|
| | | Min | Typ | Max | |
| Output Voltage ($T_J = +25^\circ\text{C}$) | V_O | 8.6 | 9.0 | 9.4 | Vdc |
| Line Regulation ($T_J = +25^\circ\text{C}$, $I_O = 40\text{ mA}$) $11.5\text{ Vdc} \leq V_I \leq 24\text{ Vdc}$ $12\text{ Vdc} \leq V_I \leq 24\text{ Vdc}$ | Reg_{line} | – – | 20 12 | 175 125 | mV |
| Load Regulation ($T_J = +25^\circ\text{C}$, $1.0\text{ mA} \leq I_O \leq 100\text{ mA}$) ($T_J = +25^\circ\text{C}$, $1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) | Reg_{load} | – – | 15 8.0 | 90 40 | mV |
| Output Voltage ($11.5\text{ Vdc} \leq V_I \leq 24\text{ Vdc}$, $1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) ($V_I = 15\text{ V}$, $1.0\text{ mA} \leq I_O \leq 70\text{ mA}$) | V_O | 8.5 8.5 | – – | 9.5 9.5 | Vdc |
| Input Bias Current ($T_J = +25^\circ\text{C}$) ($T_J = +125^\circ\text{C}$) | I_{IB} | – – | 3.0 – | 6.0 5.5 | mA |
| Input Bias Current Change ($11\text{ Vdc} \leq V_I \leq 23\text{ Vdc}$) ($1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) | ΔI_{IB} | – – | – – | 1.5 0.1 | mA |
| Output Noise Voltage ($T_A = +25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$) | V_n | – | 60 | – | μV |
| Ripple Rejection ($I_O = 40\text{ mA}$, $f = 120\text{ Hz}$, $13\text{ V} \leq V_I \leq 24\text{ V}$, $T_J = +25^\circ\text{C}$) | RR | 37 | 57 | – | dB |
| Dropout Voltage ($T_J = +25^\circ\text{C}$) | $V_I - V_O$ | – | 1.7 | – | Vdc |

MC78L00A Series, NCV78L00A

ELECTRICAL CHARACTERISTICS ($V_I = 19\text{ V}$, $I_O = 40\text{ mA}$, $C_I = 0.33\text{ }\mu\text{F}$, $C_O = 0.1\text{ }\mu\text{F}$, $-40^\circ\text{C} < T_J < +125^\circ\text{C}$ (for MC78LXXAB), $0^\circ\text{C} < T_J < +125^\circ\text{C}$ (for MC78LXXAC), unless otherwise noted.)

| Characteristics | Symbol | MC78L12AC, AB | | | Unit |
|--|----------------------------|---------------|------------|--------------|---------------|
| | | Min | Typ | Max | |
| Output Voltage ($T_J = +25^\circ\text{C}$) | V_O | 11.5 | 12 | 12.5 | Vdc |
| Line Regulation ($T_J = +25^\circ\text{C}$, $I_O = 40\text{ mA}$) $14.5\text{ Vdc} \leq V_I \leq 27\text{ Vdc}$ $16\text{ Vdc} \leq V_I \leq 27\text{ Vdc}$ | Reg_{line} | – – | 120 100 | 250 200 | mV |
| Load Regulation ($T_J = +25^\circ\text{C}$, $1.0\text{ mA} \leq I_O \leq 100\text{ mA}$) ($T_J = +25^\circ\text{C}$, $1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) | Reg_{load} | – – | 20 10 | 100 50 | mV |
| Output Voltage ($14.5\text{ Vdc} \leq V_I \leq 27\text{ Vdc}$, $1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) ($V_I = 19\text{ V}$, $1.0\text{ mA} \leq I_O \leq 70\text{ mA}$) | V_O | 11.4 11.4 | – – | 12.6 12.6 | Vdc |
| Input Bias Current ($T_J = +25^\circ\text{C}$) ($T_J = +125^\circ\text{C}$) | I_{IB} | – – | 4.2 – | 6.5 6.0 | mA |
| Input Bias Current Change ($16\text{ Vdc} \leq V_I \leq 27\text{ Vdc}$) ($1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) | ΔI_{IB} | – – | – – | 1.5 0.1 | mA |
| Output Noise Voltage ($T_A = +25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$) | V_n | – | 80 | – | μV |
| Ripple Rejection ($I_O = 40\text{ mA}$, $f = 120\text{ Hz}$, $15\text{ V} \leq V_I \leq 25\text{ V}$, $T_J = +25^\circ\text{C}$) | RR | 37 | 42 | – | dB |
| Dropout Voltage ($T_J = +25^\circ\text{C}$) | $V_I - V_O$ | – | 1.7 | – | Vdc |

ELECTRICAL CHARACTERISTICS ($V_I = 23\text{ V}$, $I_O = 40\text{ mA}$, $C_I = 0.33\text{ }\mu\text{F}$, $C_O = 0.1\text{ }\mu\text{F}$, $-40^\circ\text{C} < T_J < +125^\circ\text{C}$ (for MC78LXXAB), $0^\circ\text{C} < T_J < +125^\circ\text{C}$ (for MC78LXXAC), unless otherwise noted.)

| Characteristics | Symbol | MC78L15AC, AB | | | Unit |
|--|----------------------------|----------------|------------|----------------|---------------|
| | | Min | Typ | Max | |
| Output Voltage ($T_J = +25^\circ\text{C}$) | V_O | 14.4 | 15 | 15.6 | Vdc |
| Line Regulation ($T_J = +25^\circ\text{C}$, $I_O = 40\text{ mA}$) $17.5\text{ Vdc} \leq V_I \leq 30\text{ Vdc}$ $20\text{ Vdc} \leq V_I \leq 30\text{ Vdc}$ | Reg_{line} | – – | 130 110 | 300 250 | mV |
| Load Regulation ($T_J = +25^\circ\text{C}$, $1.0\text{ mA} \leq I_O \leq 100\text{ mA}$) ($T_J = +25^\circ\text{C}$, $1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) | Reg_{load} | – – | 25 12 | 150 75 | mV |
| Output Voltage ($17.5\text{ Vdc} \leq V_I \leq 30\text{ Vdc}$, $1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) ($V_I = 23\text{ V}$, $1.0\text{ mA} \leq I_O \leq 70\text{ mA}$) | V_O | 14.25 14.25 | – – | 15.75 15.75 | Vdc |
| Input Bias Current ($T_J = +25^\circ\text{C}$) ($T_J = +125^\circ\text{C}$) | I_{IB} | – – | 4.4 – | 6.5 6.0 | mA |
| Input Bias Current Change ($20\text{ Vdc} \leq V_I \leq 30\text{ Vdc}$) ($1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) | ΔI_{IB} | – – | – – | 1.5 0.1 | mA |
| Output Noise Voltage ($T_A = +25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$) | V_n | – | 90 | – | μV |
| Ripple Rejection ($I_O = 40\text{ mA}$, $f = 120\text{ Hz}$, $18.5\text{ V} \leq V_I \leq 28.5\text{ V}$, $T_J = +25^\circ\text{C}$) | RR | 34 | 39 | – | dB |
| Dropout Voltage ($T_J = +25^\circ\text{C}$) | $V_I - V_O$ | – | 1.7 | – | Vdc |

MC78L00A Series, NCV78L00A

ELECTRICAL CHARACTERISTICS ($V_I = 27\text{ V}$, $I_O = 40\text{ mA}$, $C_I = 0.33\text{ }\mu\text{F}$, $C_O = 0.1\text{ }\mu\text{F}$, $0^\circ\text{C} < T_J < +125^\circ\text{C}$, unless otherwise noted.)

| Characteristics | Symbol | MC78L18AC | | | Unit |
|--|----------------------------|-----------|-----|------|---------------|
| | | Min | Typ | Max | |
| Output Voltage ($T_J = +25^\circ\text{C}$) | V_O | 17.3 | 18 | 18.7 | Vdc |
| Line Regulation ($T_J = +25^\circ\text{C}$, $I_O = 40\text{ mA}$) $21.4\text{ Vdc} \leq V_I \leq 33\text{ Vdc}$ $20.7\text{ Vdc} \leq V_I \leq 33\text{ Vdc}$ $22\text{ Vdc} \leq V_I \leq 33\text{ Vdc}$ $21\text{ Vdc} \leq V_I \leq 33\text{ Vdc}$ | Reg_{line} | – | 45 | 325 | mV |
| Load Regulation ($T_J = +25^\circ\text{C}$, $1.0\text{ mA} \leq I_O \leq 100\text{ mA}$) ($T_J = +25^\circ\text{C}$, $1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) | Reg_{load} | – | 30 | 170 | mV |
| Output Voltage ($21.4\text{ Vdc} \leq V_I \leq 33\text{ Vdc}$, $1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) ($20.7\text{ Vdc} \leq V_I \leq 33\text{ Vdc}$, $1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) ($V_I = 27\text{ V}$, $1.0\text{ mA} \leq I_O \leq 70\text{ mA}$) ($V_I = 27\text{ V}$, $1.0\text{ mA} \leq I_O \leq 70\text{ mA}$) | V_O | 17.1 | – | 18.9 | Vdc |
| Input Bias Current ($T_J = +25^\circ\text{C}$) ($T_J = +125^\circ\text{C}$) | I_{IB} | – | 3.1 | 6.5 | mA |
| Input Bias Current Change ($22\text{ Vdc} \leq V_I \leq 33\text{ Vdc}$) ($21\text{ Vdc} \leq V_I \leq 33\text{ Vdc}$) ($1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) | ΔI_{IB} | – | – | 1.5 | mA |
| Output Noise Voltage ($T_A = +25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$) | V_n | – | 150 | – | μV |
| Ripple Rejection ($I_O = 40\text{ mA}$, $f = 120\text{ Hz}$, $23\text{ V} \leq V_I \leq 33\text{ V}$, $T_J = +25^\circ\text{C}$) | RR | 33 | 48 | – | dB |
| Dropout Voltage ($T_J = +25^\circ\text{C}$) | $V_I - V_O$ | – | 1.7 | – | Vdc |

MC78L00A Series, NCV78L00A

ELECTRICAL CHARACTERISTICS ($V_I = 33\text{ V}$, $I_O = 40\text{ mA}$, $C_I = 0.33\text{ }\mu\text{F}$, $C_O = 0.1\text{ }\mu\text{F}$, $0^\circ\text{C} < T_J < +125^\circ\text{C}$, unless otherwise noted.)

| Characteristics | Symbol | MC78L24AC | | | Unit |
|---|----------------------------|-----------|-----|------|---------------|
| | | Min | Typ | Max | |
| Output Voltage ($T_J = +25^\circ\text{C}$) | V_O | 23 | 24 | 25 | Vdc |
| Line Regulation ($T_J = +25^\circ\text{C}$, $I_O = 40\text{ mA}$) $27.5\text{ Vdc} \leq V_I \leq 38\text{ Vdc}$ $28\text{ Vdc} \leq V_I \leq 80\text{ Vdc}$ $27\text{ Vdc} \leq V_I \leq 38\text{ Vdc}$ | Reg_{line} | – | – | – | mV |
| Load Regulation ($T_J = +25^\circ\text{C}$, $1.0\text{ mA} \leq I_O \leq 100\text{ mA}$) ($T_J = +25^\circ\text{C}$, $1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) | Reg_{load} | – | 40 | 200 | mV |
| Output Voltage ($28\text{ Vdc} \leq V_I \leq 38\text{ Vdc}$, $1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) ($27\text{ Vdc} \leq V_I \leq 38\text{ Vdc}$, $1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) ($28\text{ Vdc} \leq V_I = 33\text{ Vdc}$, $1.0\text{ mA} \leq I_O \leq 70\text{ mA}$) ($27\text{ Vdc} \leq V_I \leq 33\text{ Vdc}$, $1.0\text{ mA} \leq I_O \leq 70\text{ mA}$) | V_O | 22.8 | – | 25.2 | Vdc |
| Input Bias Current ($T_J = +25^\circ\text{C}$) ($T_J = +125^\circ\text{C}$) | I_{IB} | – | 3.1 | 6.5 | mA |
| Input Bias Current Change ($28\text{ Vdc} \leq V_I \leq 38\text{ Vdc}$) ($1.0\text{ mA} \leq I_O \leq 40\text{ mA}$) | ΔI_{IB} | – | – | 1.5 | mA |
| Output Noise Voltage ($T_A = +25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$) | V_n | – | 200 | – | μV |
| Ripple Rejection ($I_O = 40\text{ mA}$, $f = 120\text{ Hz}$, $29\text{ V} \leq V_I \leq 35\text{ V}$, $T_J = +25^\circ\text{C}$) | RR | 31 | 45 | – | dB |
| Dropout Voltage ($T_J = +25^\circ\text{C}$) | $V_I - V_O$ | – | 1.7 | – | Vdc |

MC78L00A Series, NCV78L00A

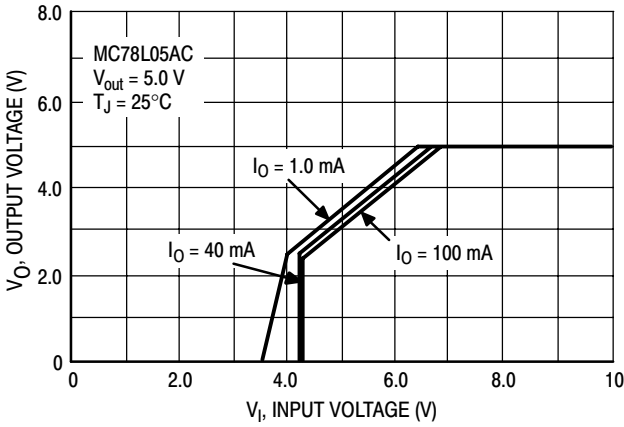


Figure 3. Dropout Characteristics

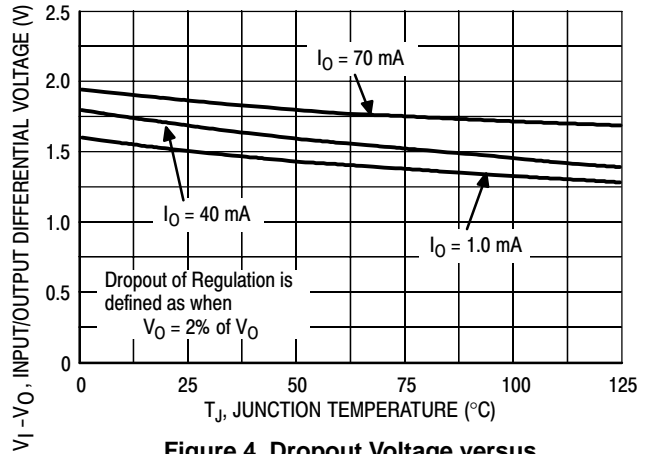


Figure 4. Dropout Voltage versus Junction Temperature

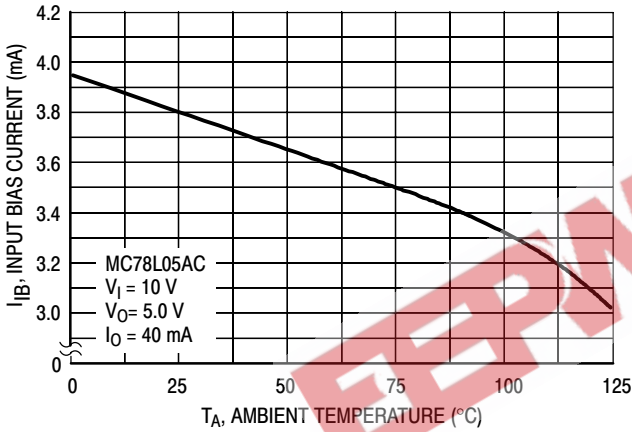


Figure 5. Input Bias Current versus Ambient Temperature

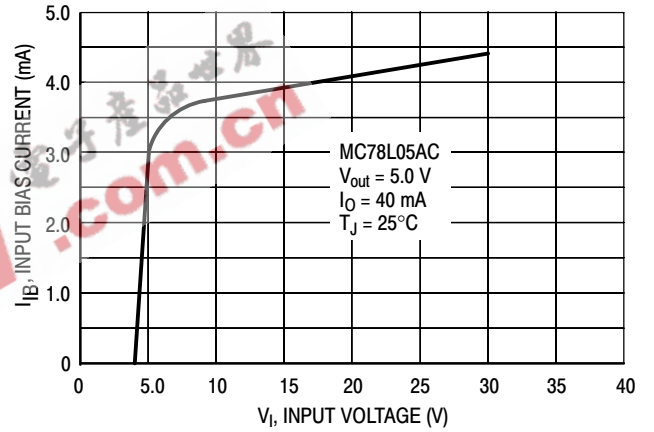


Figure 6. Input Bias Current versus Input Voltage

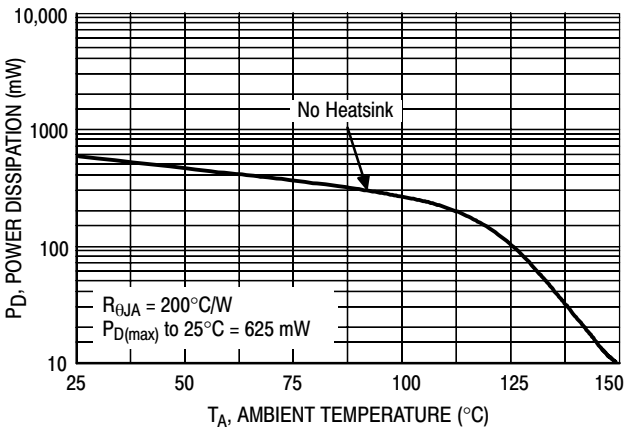


Figure 7. Maximum Average Power Dissipation versus Ambient Temperature – TO-92 Type Package

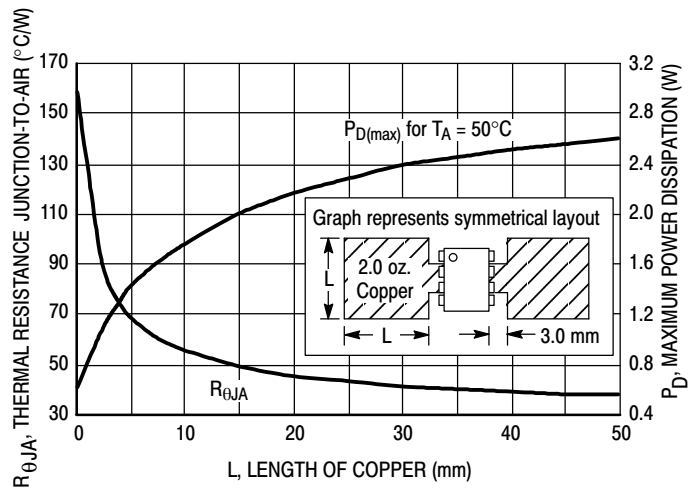


Figure 8. SOIC-8 Thermal Resistance and Maximum Power Dissipation versus P.C.B. Copper Length

MC78L00A Series, NCV78L00A

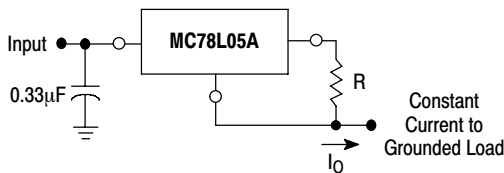
APPLICATIONS INFORMATION

Design Considerations

The MC78L00A Series of fixed voltage regulators are designed with Thermal Overload Protection that shuts down the circuit when subjected to an excessive power overload condition. Internal Short Circuit Protection limits the maximum current the circuit will pass.

In many low current applications, compensation capacitors are not required. However, it is recommended that the regulator input be bypassed with a capacitor if the regulator is connected to the power supply filter with long wire lengths, or if the output load capacitance is large. The

input bypass capacitor should be selected to provide good high-frequency characteristics to insure stable operation under all load conditions. A 0.33 μF or larger tantalum, mylar, or other capacitor having low internal impedance at high frequencies should be chosen. The bypass capacitor should be mounted with the shortest possible leads directly across the regulators input terminals. Good construction techniques should be used to minimize ground loops and lead resistance drops since the regulator has no external sense lead. Bypassing the output is also recommended.



The MC78L00 regulators can also be used as a current source when connected as above. In order to minimize dissipation the MC78L05C is chosen in this application. Resistor R determines the current as follows:

$$I_O = \frac{5.0 \text{ V}}{R} + I_B$$

$I_B = 3.8 \text{ mA}$ over line and load changes

For example, a 100 mA current source would require R to be a 50 Ω, 1/2 W resistor and the output voltage compliance would be the input voltage less 7 V.

Figure 9. Current Regulator

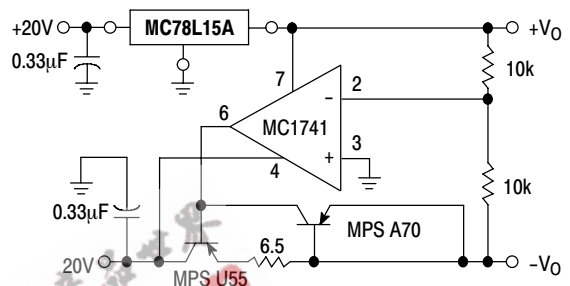


Figure 10. ± 15 V Tracking Voltage Regulator

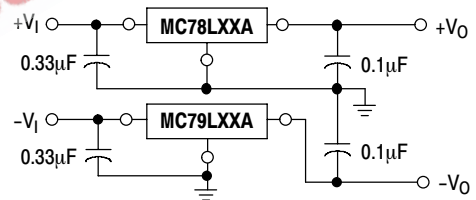


Figure 11. Positive and Negative Regulator

MC78L00A Series, NCV78L00A

ORDERING INFORMATION

| Device | Output Voltage | Operating Temperature Range | Package | Shipping† |
|-----------------|--------------------|---|---------------------|------------------|
| MC78L05ABD | 5.0 V | $T_J = -40^\circ \text{ to } +125^\circ \text{C}$ | SOIC-8 | 98 Units/Rail |
| MC78L05ABDG | | | SOIC-8 | 98 Units/Rail |
| MC78L05ABDR2 | | | SOIC-8 | 2500 Tape & Reel |
| MC78L05ABDR2G | | | SOIC-8 (Pb-Free) | 2500 Tape & Reel |
| NCV78L05ABDR2* | | | SOIC-8 | 2500 Tape & Reel |
| NCV78L05ABDR2G* | | | SOIC-8 (Pb-Free) | 2500 Tape & Reel |
| MC78L05ABP | | | TO-92 | 2000 Units/Bag |
| MC78L05ABPG | | | TO-92 (Pb-Free) | 2000 Units/Bag |
| MC78L05ABPRA | | | TO-92 | 2000 Tape & Reel |
| MC78L05ABPRAG | | | TO-92 (Pb-Free) | 2000 Tape & Reel |
| MC78L05ABPRE | | | TO-92 | 2000 Tape & Reel |
| MC78L05ABPREG | | | TO-92 (Pb-Free) | 2000 Tape & Reel |
| MC78L05ABPRM | | | TO-92 | 2000 Ammo Pack |
| MC78L05ABPRMG | | | TO-92 (Pb-Free) | 2000 Ammo Pack |
| MC78L05ACD | | $T_J = 0^\circ \text{ to } +125^\circ \text{C}$ | SOIC-8 | 98 Units/Rail |
| MC78L05ACDG | | | SOIC-8 (Pb-Free) | 98 Units/Rail |
| MC78L05ACDR2 | | | SOIC-8 | 2500 Tape & Reel |
| MC78L05ACDR2G | | | SOIC-8 (Pb-Free) | 2500 Tape & Reel |
| MC78L05ACP | | | TO-92 | 2000 Units/Bag |
| MC78L05ACPG | | | TO-92 (Pb-Free) | 2000 Units/Bag |
| MC78L05ACPRA | | | TO-92 | 2000 Tape & Reel |
| MC78L05ACPRAG | | | TO-92 (Pb-Free) | 2000 Tape & Reel |
| MC78L05ACPRE | | | TO-92 | 2000 Tape & Reel |
| MC78L05ACPREG | | | TO-92 (Pb-Free) | 2000 Tape & Reel |
| MC78L05ACPRM | TO-92 | | 2000 Ammo Pack | |
| MC78L05ACPRMG | TO-92 (Pb-Free) | | 2000 Ammo Pack | |
| MC78L05ACPRP | TO-92 | | 2000 Ammo Pack | |
| MC78L05ACPRPG | TO-92 (Pb-Free) | | 2000 Ammo Pack | |

*NCV78L05A: $T_{low} = -40^\circ \text{C}$, $T_{high} = +125^\circ \text{C}$. Guaranteed by design. NCV prefix is for automotive and other applications requiring site and change control.

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MC78L00A Series, NCV78L00A

ORDERING INFORMATION (continued)

| Device | Output Voltage | Operating Temperature Range | Package | Shipping [†] |
|----------------|-----------------|---|------------------|-----------------------|
| MC78L08ABD | 8.0 V | $T_J = -40^\circ \text{ to } +125^\circ \text{C}$ | SOIC-8 | 98 Units/Rail |
| MC78L08ABDG | | | SOIC-8 (Pb-Free) | 98 Units/Rail |
| MC78L08ABDR2 | | | SOIC-8 | 2500 Tape & Reel |
| MC78L08ABDR2G | | | SOIC-8 (Pb-Free) | 2500 Tape & Reel |
| MC78L08ABP | | | TO-92 | 2000 Units/Bag |
| MC78L08ABPG | | | TO-92 (Pb-Free) | 2000 Units/Bag |
| MC78L08ABPRA | | | TO-92 | 2000 Tape & Reel |
| MC78L08ABPRAG | | | TO-92 (Pb-Free) | 2000 Tape & Reel |
| MC78L08ABPRP | | | TO-92 | 2000 Ammo Pack |
| MC78L08ABPRPG | | | TO-92 (Pb-Free) | 2000 Ammo Pack |
| MC78L08ACD | | $T_J = 0^\circ \text{ to } +125^\circ \text{C}$ | SOIC-8 | 98 Units/Rail |
| MC78L08ACDG | | | SOIC-8 (Pb-Free) | 98 Units/Rail |
| MC78L08ACDR2 | | | SOIC-8 | 2500 Tape & Reel |
| MC78L08ACDR2G | | | SOIC-8 (Pb-Free) | 2500 Tape & Reel |
| MC78L08ACP | | | TO-92 | 2000 Units/Bag |
| MC78L08ACPG | | | TO-92 (Pb-Free) | 2000 Units/Bag |
| MC78L08ACPRA | | | TO-92 | 2000 Tape & Reel |
| MC78L08ACPRA G | | | TO-92 (Pb-Free) | 2000 Tape & Reel |
| MC78L08ACPRE | | | TO-92 | 2000 Tape & Reel |
| MC78L08ACPREG | | | TO-92 (Pb-Free) | 2000 Tape & Reel |
| MC78L08ACPRP | TO-92 | 2000 Ammo Pack | | |
| MC78L08ACPRPG | TO-92 (Pb-Free) | 2000 Ammo Pack | | |
| MC78L09ABD | 9.0 V | $T_J = -40^\circ \text{ to } +125^\circ \text{C}$ | SOIC-8 | 98 Units/Rail |
| MC78L09ABDG | | | SOIC-8 (Pb-Free) | 98 Units/Rail |
| MC78L09ABDR2 | | | SOIC-8 | 2500 Tape & Reel |
| MC78L09ABDR2G | | | SOIC-8 (Pb-Free) | 2500 Tape & Reel |
| MC78L09ABPRA | | | TO-92 | 2000 Tape & Reel |
| MC78L09ABPRAG | | | TO-92 (Pb-Free) | 2000 Tape & Reel |
| MC78L09ABPRP | | | TO-92 | 2000 Ammo Pack |
| MC78L09ABPRPG | | | TO-92 (Pb-Free) | 2000 Ammo Pack |

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MC78L00A Series, NCV78L00A

ORDERING INFORMATION (continued)

| Device | Output Voltage | Operating Temperature Range | Package | Shipping [†] |
|-----------------|-----------------|--|------------------|-----------------------|
| MC78L09ACD | 9.0 V | $T_J = 0^\circ \text{ to } +125^\circ\text{C}$ | SOIC-8 | 98 Units/Rail |
| MC78L09ACDG | | | SOIC-8 (Pb-Free) | 98 Units/Rail |
| MC78L09ACDR2 | | | SOIC-8 | 2500 Tape & Reel |
| MC78L09ACDR2G | | | SOIC-8 (Pb-Free) | 2500 Tape & Reel |
| MC78L09ACP | | | TO-92 | 2000 Units/Bag |
| MC78L09ACPG | | | TO-92 (Pb-Free) | 2000 Units/Bag |
| MC78L12ABD | 12 V | $T_J = -40^\circ \text{ to } +125^\circ\text{C}$ | SOIC-8 | 98 Units/Rail |
| MC78L12ABDG | | | SOIC-8 (Pb-Free) | 98 Units/Rail |
| MC78L12ABDR2 | | | SOIC-8 | 2500 Tape & Reel |
| MC78L12ABDR2G | | | SOIC-8 (Pb-Free) | 2500 Tape & Reel |
| MC78L12ABP | | | TO-92 | 2000 Units/Bag |
| MC78L12ABPG | | | TO-92 (Pb-Free) | 2000 Units/Bag |
| MC78L12ABPRP | | | TO-92 | 2000 Ammo Pack |
| MC78L12ABPRPG | | | TO-92 (Pb-Free) | 2000 Ammo Pack |
| NCV78L12ABDR2* | | | SOIC-8 | 2500 Tape & Reel |
| NCV78L12ABDR2G* | | | SOIC-8 (Pb-Free) | 2500 Tape & Reel |
| MC78L12ACD | | $T_J = 0^\circ \text{ to } +125^\circ\text{C}$ | SOIC-8 | 98 Units/Rail |
| MC78L12ACDG | | | SOIC-8 (Pb-Free) | 98 Units/Rail |
| MC78L12ACDR2 | | | SOIC-8 | 2500 Tape & Reel |
| MC78L12ACDR2G | | | SOIC-8 (Pb-Free) | 2500 Tape & Reel |
| MC78L12ACP | | | TO-92 | 2000 Units/Bag |
| MC78L12ACPG | | | TO-92 (Pb-Free) | 2000 Units/Bag |
| MC78L12ACPRA | | | TO-92 | 2000 Tape & Reel |
| MC78L12ACPRAG | | | TO-92 (Pb-Free) | 2000 Tape & Reel |
| MC78L12ACPRE | | | TO-92 | 2000 Tape & Reel |
| MC78L12ACPREG | | | TO-92 (Pb-Free) | 2000 Tape & Reel |
| MC78L12ACPRM | TO-92 | | 2000 Ammo Pack | |
| MC78L12ACPRMG | TO-92 (Pb-Free) | | 2000 Ammo Pack | |
| MC78L12ACPRP | TO-92 | | 2000 Ammo Pack | |
| MC78L12ACPRPG | TO-92 (Pb-Free) | | 2000 Ammo Pack | |

*NCV78L12A: $T_{\text{low}} = -40^\circ\text{C}$, $T_{\text{high}} = +125^\circ\text{C}$. Guaranteed by design. NCV prefix is for automotive and other applications requiring site and change control.
[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MC78L00A Series, NCV78L00A

ORDERING INFORMATION (continued)

| Device | Output Voltage | Operating Temperature Range | Package | Shipping [†] |
|---------------|----------------|---|------------------|-----------------------|
| MC78L15ABD | 15 V | $T_J = -40^\circ \text{ to } +125^\circ \text{C}$ | SOIC-8 | 98 Units/Rail |
| MC78L15ABDG | | | SOIC-8 (Pb-Free) | 98 Units/Rail |
| MC78L15ABDR2 | | | SOIC-8 | 2500 Tape & Reel |
| MC78L15ABDR2G | | | SOIC-8 (Pb-Free) | 2500 Tape & Reel |
| MC78L15ABP | | | TO-92 | 2000 Units/Bag |
| MC78L15ABPG | | | TO-92 (Pb-Free) | 2000 Units/Bag |
| MC78L15ABPRA | | | TO-92 | 2000 Tape & Reel |
| MC78L15ABPRAG | | | TO-92 (Pb-Free) | 2000 Tape & Reel |
| MC78L15ABPRP | | | TO-92 | 2000 Ammo Pack |
| MC78L15ABPRPG | | | TO-92 (Pb-Free) | 2000 Ammo Pack |
| MC78L15ACD | | $T_J = 0^\circ \text{ to } +125^\circ \text{C}$ | SOIC-8 | 98 Units/Rail |
| MC78L15ACDG | | | SOIC-8 (Pb-Free) | 98 Units/Rail |
| MC78L15ACDR2 | | | SOIC-8 | 2500 Tape & Reel |
| MC78L15ACDR2G | | | SOIC-8 (Pb-Free) | 2500 Tape & Reel |
| MC78L15ACP | | | TO-92 | 2000 Units/Bag |
| MC78L15ACPG | | | TO-92 (Pb-Free) | 2000 Units/Bag |
| MC78L15ACPRA | | | TO-92 | 2000 Tape & Reel |
| MC78L15ACPRAG | | | TO-92 (Pb-Free) | 2000 Tape & Reel |
| MC78L15ACPRP | | | TO-92 | 2000 Ammo Pack |
| MC78L15ACPRPG | | | TO-92 (Pb-Free) | 2000 Ammo Pack |

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MC78L00A Series, NCV78L00A

ORDERING INFORMATION (continued)

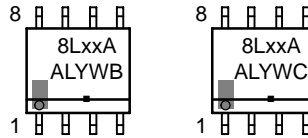
| Device | Output Voltage | Operating Temperature Range | Package | Shipping† |
|---------------|---|---|--------------------|---|
| MC78L18ABP | 18 V | $T_J = -40^\circ \text{ to } +125^\circ \text{C}$ | TO-92 | 2000 Units/Bag |
| MC78L18ABPG | | | TO-92 (Pb-Free) | 2000 Units/Bag |
| MC78L18ACP | | $T_J = 0^\circ \text{ to } +125^\circ \text{C}$ | TO-92 | 2000 Units/Bag |
| MC78L18ACPG | | | TO-92 (Pb-Free) | 2000 Units/Bag |
| MC78L18ACPRA | | | TO-92 | 2000 Tape & Reel |
| MC78L18ACPRAG | | | TO-92 (Pb-Free) | 2000 Tape & Reel |
| MC78L18ACPRM | | | TO-92 | 2000 Ammo Pack |
| MC78L18ACPRMG | | | TO-92 (Pb-Free) | 2000 Ammo Pack |
| MC78L18ACPRP | | | TO-92 | 2000 Ammo Pack |
| MC78L18ACPRPG | | | TO-92 (Pb-Free) | 2000 Ammo Pack |
| MC78L24ABP | | | 24 V | $T_J = -40^\circ \text{ to } +125^\circ \text{C}$ |
| MC78L24ABPG | TO-92 (Pb-Free) | 2000 Units/Bag | | |
| MC78L24ACP | $T_J = 0^\circ \text{ to } +125^\circ \text{C}$ | TO-92 | | 2000 Units/Bag |
| MC78L24ACPG | | TO-92 (Pb-Free) | | 2000 Units/Bag |
| MC78L24ACPRA | | TO-92 | | 2000 Tape & Reel |
| MC78L24ACPRAG | | TO-92 (Pb-Free) | | 2000 Tape & Reel |
| MC78L24ACPRP | | TO-92 | | 2000 Ammo Pack |
| MC78L24ACPRPG | | TO-92 (Pb-Free) | | 2000 Ammo Pack |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MC78L00A Series, NCV78L00A

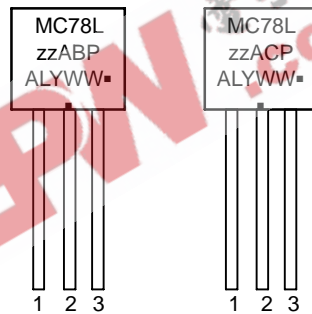
MARKING DIAGRAMS

SOIC-8 D SUFFIX CASE 751



- xx = 05, 08, 09, 12, or 15
- A = Assembly Location
- L = Wafer Lot
- Y = Year
- W = Work Week
- B, C = Temperature Range
- = Pb-Free Package

TO-92 P SUFFIX CASE 029

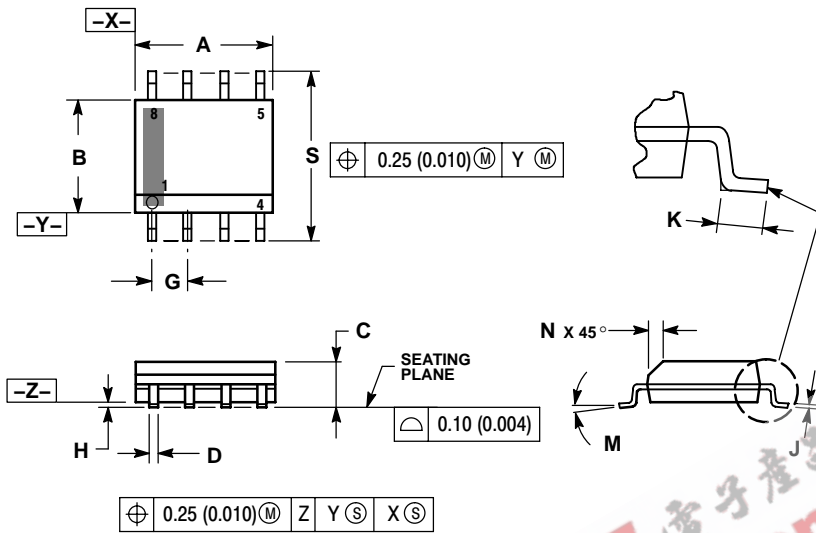


- zz = 05, 08, 09, 12, 15, 18 or 24
 - A = Assembly Location
 - L = Wafer Lot
 - Y = Year
 - WW = Work Week
 - = Pb-Free Package
- (Note: Microdot may be in either location)

MC78L00A Series, NCV78L00A

PACKAGE DIMENSIONS

SOIC-8 NB
D SUFFIX
CASE 751-07
ISSUE AF

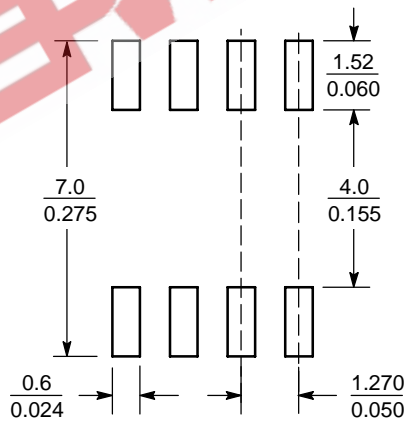


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. 751-01 THRU 751-06 ARE OBSOLETE. NEW STANDARD IS 751-07.

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 4.80 | 5.00 | 0.189 | 0.197 |
| B | 3.80 | 4.00 | 0.150 | 0.157 |
| C | 1.35 | 1.75 | 0.053 | 0.069 |
| D | 0.33 | 0.51 | 0.013 | 0.020 |
| G | 1.27 BSC | | 0.050 BSC | |
| H | 0.10 | 0.25 | 0.004 | 0.010 |
| J | 0.19 | 0.25 | 0.007 | 0.010 |
| K | 0.40 | 1.27 | 0.016 | 0.050 |
| M | 0° - 8° | | 0° - 8° | |
| N | 0.25 | 0.50 | 0.010 | 0.020 |
| S | 5.80 | 6.20 | 0.228 | 0.244 |

SOLDERING FOOTPRINT*



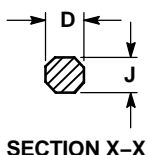
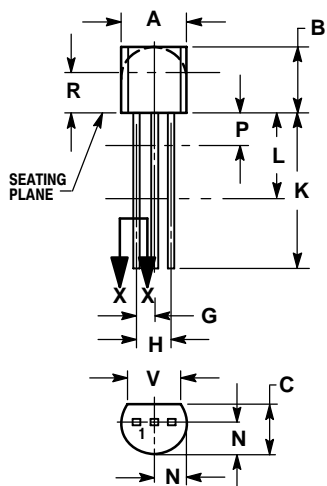
SCALE 6:1 $\left(\frac{\text{mm}}{\text{inches}} \right)$

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

MC78L00A Series, NCV78L00A

PACKAGE DIMENSIONS


TO-92 (TO-226)
P SUFFIX
CASE 29-11
ISSUE AL



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.175 | 0.205 | 4.45 | 5.20 |
| B | 0.170 | 0.210 | 4.32 | 5.33 |
| C | 0.125 | 0.165 | 3.18 | 4.19 |
| D | 0.016 | 0.021 | 0.407 | 0.533 |
| G | 0.045 | 0.055 | 1.15 | 1.39 |
| H | 0.095 | 0.105 | 2.42 | 2.66 |
| J | 0.015 | 0.020 | 0.39 | 0.50 |
| K | 0.500 | --- | 12.70 | --- |
| L | 0.250 | --- | 6.35 | --- |
| N | 0.080 | 0.105 | 2.04 | 2.66 |
| P | --- | 0.100 | --- | 2.54 |
| R | 0.115 | --- | 2.93 | --- |
| V | 0.135 | --- | 3.43 | --- |

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