

Positive-Voltage Regulators



Rev.2 Mar. 2017

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| | 78L05nd5 |
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- **3-Terminal Regulators**
- **Output Current Up to 100mA**
- **No External Components**
- **Internal Thermal Overload Protection**
- **Internal Short-Circuit Limiting**
- **Direct Replacement for Fairchild μ A78L00 Series**

DESCRIPTION

This series of fixed-voltage monolithic integrated circuit voltage regulators is designed for a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. In addition, they can be used with power-pass elements to make high-current voltage regulators. Each of these regulators can deliver up to 100mA of output current. The internal limiting and thermal shutdown features of these regulators make them essentially immune to overload. When used as a replacement for a Zener diode-resistor combination, an effective improvement in output impedance can be obtained together with lower-bias current.

| Nominal output voltage | Regulator |
|------------------------|-----------|
| 3V | 78L03nd5 |
| 3,3V | 78L33nd5 |
| 5V | 78L05nd5 |
| 6V | 78L06nd5 |
| 8V | 78L08nd5 |
| 9V | 78L09nd5 |
| 10V | 78L10nd5 |
| 12V | 78L12nd5 |
| 15V | 78L15nd5 |
| 18V | 78L18nd5 |
| 24V | 78L24nd5 |

SELECT PACKAGE TO-92 (TOP VIEW)



Absolute maximum ratings over operating temperature range (unless otherwise noted)

| | 78L03nd5 thru 78L10nd5 | 78L12nd5 thru 78L18nd5 | 78L24nd5 | UNIT |
|---|------------------------------|------------------------------|------------|------|
| Input voltage | 30 | 35 | 40 | V |
| Operating free-air, case, or virtual junction temperature range | -40 to 125 | -40 to 125 | -40 to 125 | °C |
| Storage temperature range | -65 to 150 | -65 to 150 | -65 to 150 | |
| Lead temperature 1.6 mm (1/16 inch) from case for 10 seconds | 260 | 260 | 260 | |

Recommended operating conditions

| Parameter | MIN | MAX | UNIT | |
|---|----------|------|------|---|
| Input voltage, V_I | 78L03nd5 | 5.5 | 18 | V |
| | 78L33nd5 | 5.5 | 18 | |
| | 78L05nd5 | 7 | 20 | |
| | 78L06nd5 | 8 | 20 | |
| | 78L08nd5 | 10.5 | 23 | |
| | 78L09nd5 | 11.5 | 24 | |
| | 78L10nd5 | 12.5 | 25 | |
| | 78L12nd5 | 14.5 | 27 | |
| | 78L15nd5 | 17.5 | 30 | |
| | 78L18nd5 | 20.5 | 33 | |
| | 78L24nd5 | 26.5 | 39 | |
| Output current, I_o | | 100 | mA | |
| Operating virtual junction temperature, T_j | 0 | 125 | °C | |

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VSP MIKRON

78LXXnd5

78L05nd5 electrical characteristics at specified virtual junction temperature, $V_I=10V$, $I_O=40mA$ (unless otherwise noted)

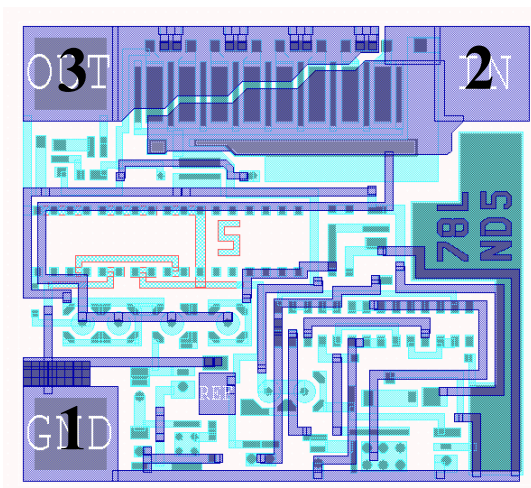
| PARAMETER | TEST CONDITIONS* | | 78L05nd5 | | | UNIT |
|----------------------|----------------------------|-------------|----------|-----|------|------|
| | | | MIN | TYP | MAX | |
| Output voltage** | | 25°C | 4.8 | 5 | 5.2 | V |
| | $I_O=1mA$ to 40mA | 0 to 125 °C | 4.75 | 5 | 5.25 | |
| | $V_I=7V$ to 20V | | 4.75 | 5 | 5.25 | |
| Input regulation | $V_I=7V$ to 20V | 25°C | | 32 | 150 | mV |
| | $V_I=8V$ to 20V | | | 26 | 100 | |
| Ripple rejection | $V_I=8V$ to 18V, $f=120Hz$ | 25°C | 41 | 49 | | dB |
| Output regulation | $I_O=1mA$ to 100mA | 25°C | | 15 | 60 | mV |
| | $I_O=1mA$ to 40mA | | | 8 | 30 | |
| Output noise voltage | $f=10Hz-100Hz$ | 25°C | | 42 | | µV |
| Dropout voltage | | 25°C | | 1.7 | | V |
| Bias current | | 25°C | | 1.9 | 6 | mA |
| | | 125°C | | | 5.5 | |
| Bias current change | $V_I=8V$ to 20V | 0 to 125 °C | | | 1.5 | |
| | $I_O=1mA$ to 40mA | | | | 0.1 | |

*Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible.

Thermal effects must be taken into account separately. All characteristics are measured with a 0.33µF capacitor across the input and a 0.1µF capacitor across the output.

**This specification applies only for dc power dissipation permitted by absolute maximum ratings.

Pad location 78LXXnd5



Wafer Thickness: 460±30µm (or 280±30µm)

Top metal: AlSi

Backside metal: -

Wafer size: 150mm

Chip size : 0,59 x 0,54 mm

| Pad № | Pad Name | X(um) | Y(um) | Pad size (um) |
|-------|----------|-------|-------|---------------|
| 1 | GROUND | 100 | 100 | 80 x 80 |
| 2 | INPUT | 490 | 440 | 80 x 80 |
| 3 | OUTPUT | 100 | 440 | 80 x 80 |