



# Linear Voltage Regulator – 79L05AC

**Negative Fixed 5V Voltage Regulator in bare die form**

**Rev 1.0  
01/05/25**

## Description

79L05AC 5V fixed 3-terminal negative voltage regulator delivers up to 100mA output current & is equipped with internal limiting + thermal shutdown features for overload immunity. Implementing this device at point-of-source removes the complexity of single point regulation methods + reduces noise. In replacement of a Zener diode/resistor combination, the device improves output impedance by x2 order of magnitude & delivers lower bias current with lower noise. The 79L05AC can be used with power-pass elements to make high-current voltage regulators.

## Features:

- $\pm 4\%$   $V_{OUT}$  tolerance
- 100mA Output Current
- Internal thermal overload protection
- Internal short circuit current limit
- Full Military Temperature Range
- Positive Voltage complement is 78L05AC

## Ordering Information

The following part suffixes apply:

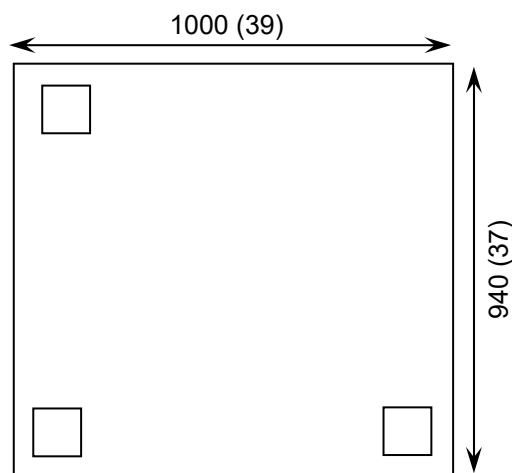
- No suffix - MIL-STD-883 /2010B Visual Inspection
- “H” - MIL-STD-883 /2010B Visual Inspection  
+ MIL-PRF-38534 Class H LAT
- “K” - MIL-STD-883 /2010A Visual Inspection (Space)  
+ MIL-PRF-38534 Class K LAT

LAT = Lot Acceptance Test.

For further information on LAT process flows see below.

[www.siliconsupplies.com/quality/bare-die-lot-qualification](http://www.siliconsupplies.com/quality/bare-die-lot-qualification)

## Die Dimensions in $\mu\text{m}$ (mils)



## Supply Formats:

- Default – Die in Waffle Pack (400 per tray capacity)
- Sawn Wafer on Tape – On request
- Unsawn Wafer – On request
- With Ti/Ni/Ag Back Metal – On request
- In Metal or Ceramic package – On request

## Mechanical Specification

|                        |                                      |                       |
|------------------------|--------------------------------------|-----------------------|
| Die Size (Unsawn)      | 1000 x 940<br>39 x 37                | $\mu\text{m}$<br>mils |
| Minimum Bond Pad Size  | 110 x 110<br>4.33 x 4.33             | $\mu\text{m}$<br>mils |
| Die Thickness          | 280 ( $\pm 20$ )<br>11 ( $\pm 0.8$ ) | $\mu\text{m}$<br>mils |
| Top Metal Composition  | Al-Si-Cu 3 $\mu\text{m}$             |                       |
| Back Metal Composition | N/A – Bare Si                        |                       |

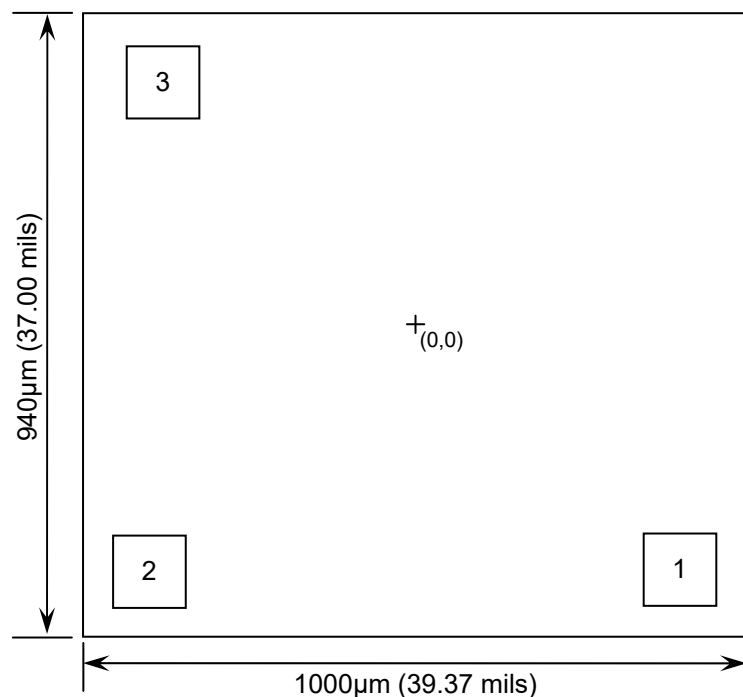




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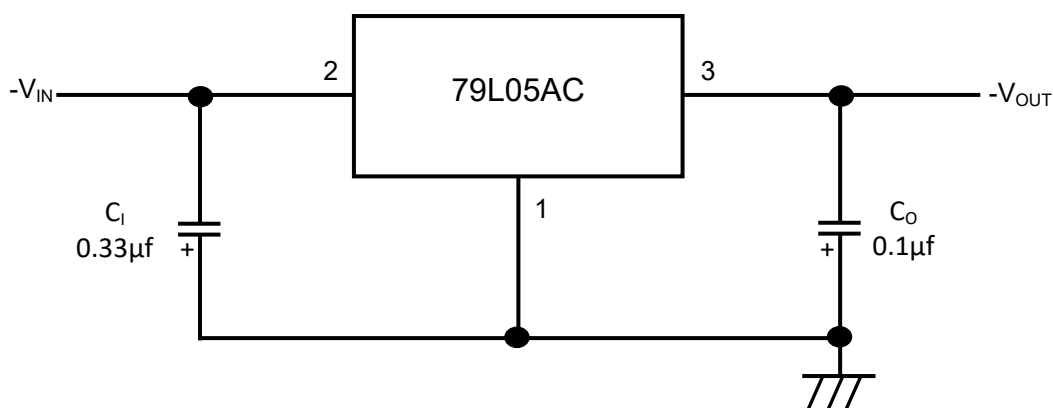
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## Pad Layout and Functions



| PAD                                   | FUNCTION          | COORDINATES (µm) |      |
|---------------------------------------|-------------------|------------------|------|
|                                       |                   | X                | Y    |
| 1                                     | GND               | 395              | -363 |
| 2                                     | -V <sub>IN</sub>  | -398             | -369 |
| 3                                     | -V <sub>OUT</sub> | -383             | 369  |
| CONNECT CHIP BACK TO -V <sub>IN</sub> |                   |                  |      |

## Typical Application



$C_I$  is required if the regulator is located an appreciable distance from power supply filter.  $C_O$  is not required for stability; however it does improve transient response. For optimum stability and transient response locate  $C_I$   $C_O$  as close as possible to the regulator.





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## Absolute Maximum Ratings

| PARAMETER                      | SYMBOL    | VALUE      | UNIT |
|--------------------------------|-----------|------------|------|
| Input Voltage                  | $V_{IN}$  | -30        | V    |
| Power Dissipation <sup>1</sup> | $P_D$     | 625        | mW   |
| Operating Temperature Range    | -         | -55 to 125 | °C   |
| Maximum Junction Temperature   | $T_J$     | 150        | °C   |
| Storage Temperature            | $T_{STG}$ | -65 to 150 | °C   |

## Recommended Operating Conditions

| PARAMETER                   | SYMBOL    | MIN | MAX | UNIT |
|-----------------------------|-----------|-----|-----|------|
| Input Voltage               | $V_{IN}$  | -7  | -20 | V    |
| Output Current              | $I_{OUT}$ | -   | 100 | mA   |
| Operating Temperature Range | $T_J$     | -55 | 125 | °C   |

## DC Electrical Characteristics $V_I = -10V$ , $I_{OUT}=40mA$ , $C_I=0.33\mu F$ , $C_O=0.1\mu f$ , $0^\circ C < T_J < +125^\circ C$ (unless noted otherwise)

| PARAMETER                 | SYMBOL           | TEST CONDITIONS   | MIN   | TYP   | MAX   | UNITS         |
|---------------------------|------------------|---|-------|-------|-------|---------------|
| Output Voltage            | $V_{OUT}$        | $T_J = 25^\circ C$ , $I_O = 40mA$                               | -4.80 | -5.00 | -5.20 | V             |
|                           |                  | $1mA \leq I_{OUT} \leq 40mA$ , $-7V \geq V_{IN} \geq -20V$      | -4.75 | -5.00 | -5.25 |               |
|                           |                  | $1mA \leq I_{OUT} \leq 70mA$ , $V_{IN} = -10V$                  | -4.75 | -5.00 | -5.25 |               |
| Line Regulation           | $\Delta V_{OUT}$ | $-7V \geq V_{IN} \geq -20V$ , $T_J = 25^\circ C$ , $I_O = 40mA$ | -     | 32    | 150   | mV            |
|                           |                  | $-8V \geq V_{IN} \geq -20V$ , $T_J = 25^\circ C$ , $I_O = 40mA$ | -     | 26    | 100   |               |
| Load Regulation           | $\Delta V_{OUT}$ | $1mA \leq I_{OUT} \leq 100mA$ , $T_J = 25^\circ C$              | -     | 15    | 60    |               |
|                           |                  | $1mA \leq I_{OUT} \leq 40mA$ , $T_J = 25^\circ C$               | -     | 8     | 30    |               |
| Input Bias Current        | $I_B$            | $T_J = 25^\circ C$  | -     | 3.5   | 6.0   | mA            |
|                           |                  | $T_J = 125^\circ C$   | -     | -     | 5.5   |               |
| Input Bias Current Change | $\Delta I_B$     | $-8V \geq V_{IN} \geq -20V$                                     | -     | -     | 1.5   | mA            |
|                           |                  | $1mA \leq I_{OUT} \leq 40mA$                                    | -     | -     | 0.1   |               |
| Output Noise Voltage      | $e_N$            | $10Hz \leq f \leq 100KHz$ , $T_J = 25^\circ C$                  | -     | 40    | -     | $\mu V_{RMS}$ |
| Ripple Rejection          | RR               | $f = 120Hz$ , $-8V \geq V_{IN} \geq 18V$ , $T_J = 25^\circ C$   | 41    | 71    | -     | dB            |
| Dropout Voltage           | $V_D$            | $V_{IN} - V_{OUT}$  | -     | 1.7   | -     | V             |

1. Value measured in TO-92 package applicable only for DC power dissipation permitted by absolute maximum ratings. Results in die form are dependent on die attach and assembly method.





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