

# MC78L05AB

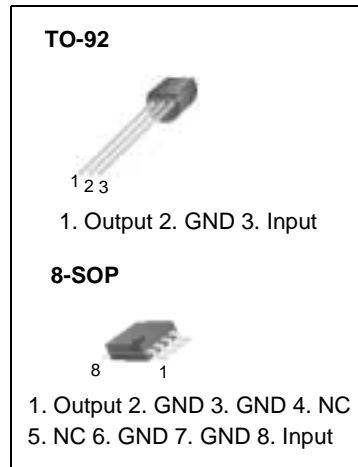
## 3-Terminal 0.1A 5V Positive Voltage Regulator

### Features

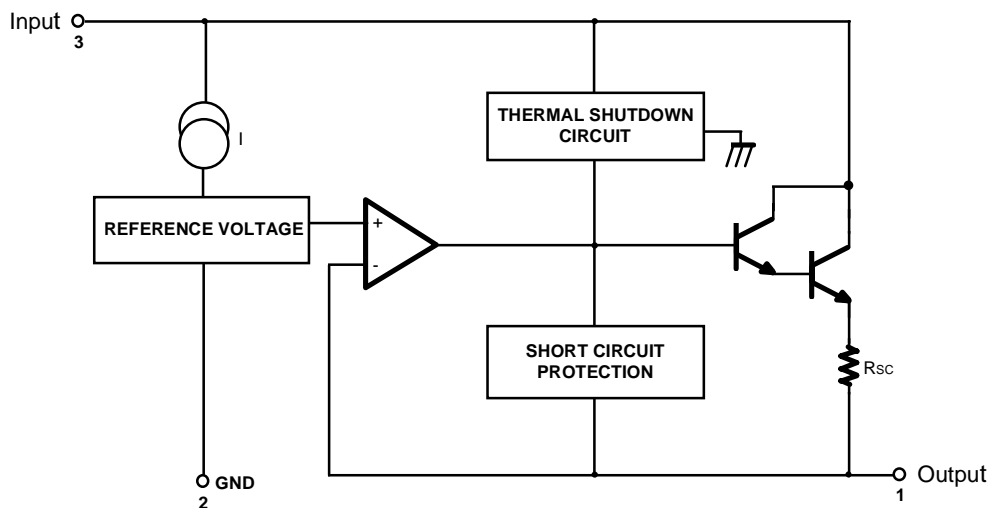
- Maximum Output Current of 100mA
- Output Voltage of 5V
- Thermal Overload Protection
- Short Circuit Current Limiting
- Output Voltage Offered in  $\pm 5\%$  Tolerance

### Description

The MC78L05AB series of fixed voltage monolithic integrated circuit voltage regulators are suitable for application that required supply current up to 100mA.



### Internal Block Diagram



## Absolute Maximum Ratings

( $T_a=25^\circ\text{C}$ , Unless otherwise noted, Note 5)

| Parameter                              | Symbol    | Value      | Unit             |
|--|-----------|------------|------------------|
| Input Voltage                          | $V_I$     | 30         | V                |
| Maximum Operating Junction Temperature | $T_J$     | +150       | $^\circ\text{C}$ |
| Storage Temperature Range              | $T_{STG}$ | -65 ~ +150 | $^\circ\text{C}$ |

## Electrical Characteristics

( $V_I = 10\text{V}$ ,  $I_O = 40\text{mA}$ ,  $-40^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$ ,  $C_I = 0.33\mu\text{F}$ ,  $C_O = 0.1\mu\text{F}$ , unless otherwise specified. (Note 1))

| Parameter                                | Symbol                | Conditions   | Min.   | Typ.  | Max. | Unit                       |    |
|--|-----------------------|--|--|-------|------|----------------------------|----|
| Output Voltage                           | $V_O$                 | $T_J = 25^\circ\text{C}$   | 4.8  | 5.0   | 5.2  | V                          |    |
| Line Regulation (Note1)                  | $\Delta V_O$          | $T_J = 25^\circ\text{C}$   | $7\text{V} \leq V_I \leq 20\text{V}$           | -     | 8    | 150                        | mV |
|  |                       |  | $8\text{V} \leq V_I \leq 20\text{V}$           | -     | 6    | 100                        | mV |
| Load Regulation (Note1)                  | $\Delta V_O$          | $T_J = 25^\circ\text{C}$   | $1\text{mA} \leq I_O \leq 100\text{mA}$        | -     | 11   | 60                         | mV |
|  |                       |  | $1\text{mA} \leq I_O \leq 40\text{mA}$         | -     | 5.0  | 30                         | mV |
| Output Voltage                           | $V_O$                 | $7\text{V} \leq V_I \leq 20\text{V}$   | $1\text{mA} \leq I_O \leq 40\text{mA}$         | -     | -    | 5.25                       | V  |
|  |                       | $7\text{V} \leq V_I \leq V_{MAX}$<br>(Note 2)  | $1\text{mA} \leq I_O \leq 70\text{mA}$         | 4.75  | -    | 5.25                       | V  |
| Quiescent Current                        | $I_Q$                 | $T_J = 25^\circ\text{C}$   | -  | 2.0   | 5.5  | mA                         |    |
| Quiescent Current Change                 | with line             | $\Delta I_Q$   | $8\text{V} \leq V_I \leq 20\text{V}$           | -     | -    | 1.5                        | mA |
|  | with load             | $\Delta I_Q$   | $1\text{mA} \leq I_O \leq 40\text{mA}$ (Note3) | -     | -    | 0.5                        | mA |
| Output Noise Voltage(Note3)              | $V_N$                 | $T_A = 25^\circ\text{C}$ , $10\text{Hz} \leq f \leq 100\text{kHz}$                   | -  | 40    | -    | $\mu\text{V}/V_o$          |    |
| Temperature Coefficient of $V_O$ (Note3) | $\Delta V_O/\Delta T$ | $I_O = 5\text{mA}$   | -  | -0.65 | -    | $\text{mV}/^\circ\text{C}$ |    |
| Ripple Rejection(Note3,4)                | RR                    | $f = 120\text{Hz}$ , $8\text{V} \leq V_I \leq 18\text{V}$ , $T_J = 25^\circ\text{C}$ | 41   | 80    | -    | dB                         |    |
| Dropout Voltage                          | $V_D$                 | $T_J = 25^\circ\text{C}$   | -  | 1.7   | -    | V                          |    |

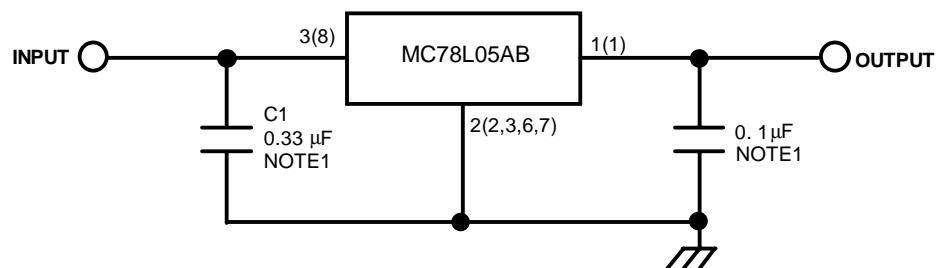
### Note:

- The maximum steady state usable output current and input voltage are very dependent on the heat sinking and/or lead length of the package. The data above represent pulse test conditions with junction temperature as indicated at the initiation of tests.
- Power dissipation  $P_D \leq 0.75\text{W}$ .
- These parameters although guaranteed over the recommended operating conditions are not 100% tested in production.
- Recommend minimum load capacitance of  $0.01\mu\text{F}$  to limit high frequency noise.
- Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Electrical specifications do not apply when operating the device outside of its stated operating conditions.

\*  $C_I$  is required if regulator is located an appreciable distance from power supply filter.

\*\*  $C_O$  is not needed for stability; however, it does improve transient response.

## Typical Application



'( )' : 8SOP Type

**Note:**

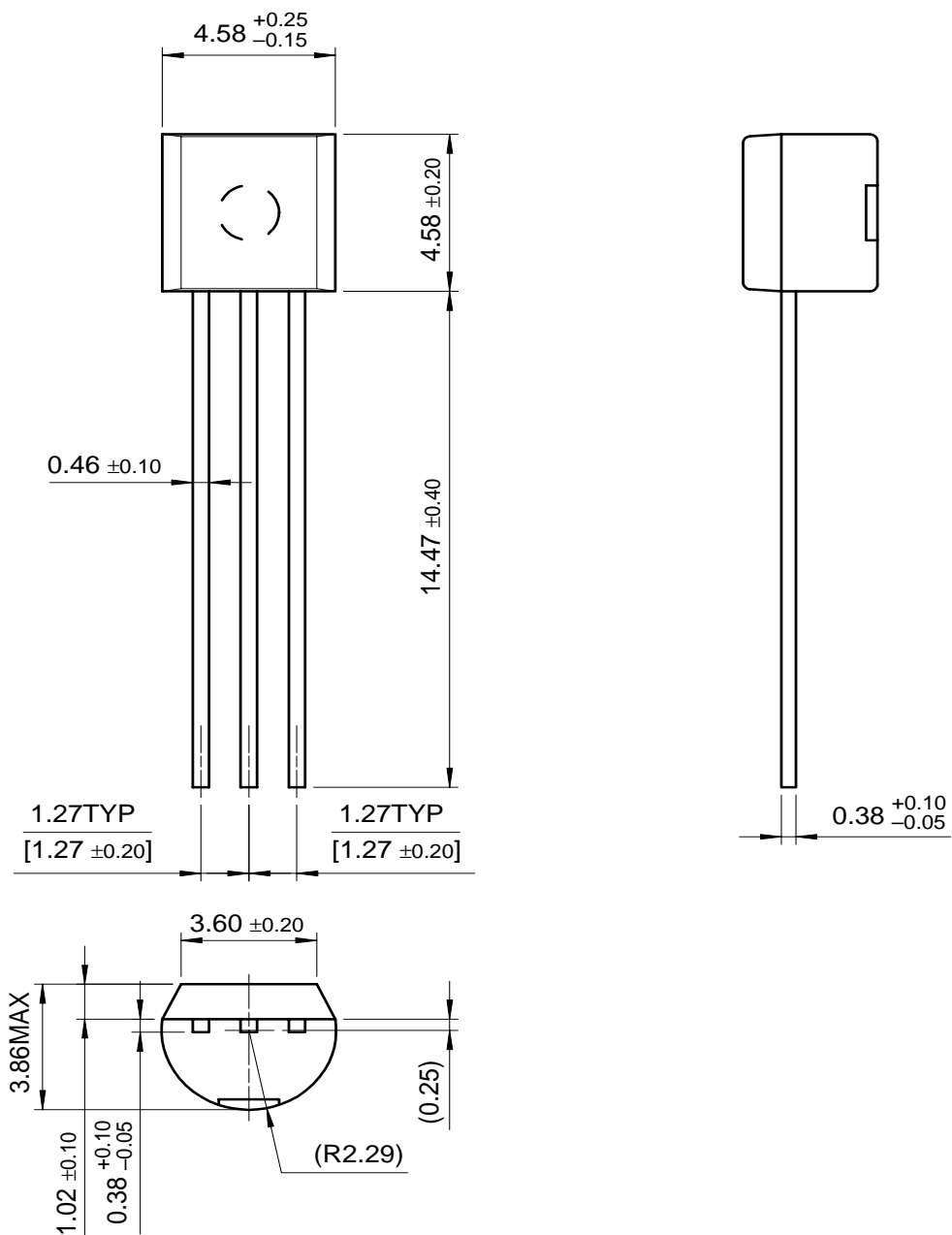
1. Bypass Capacitors are recommend for optimum stability and transient response and should be located as close as possible to the regulator

# Mechanical Dimensions

## Package

Dimensions in millimeters

### TO-92

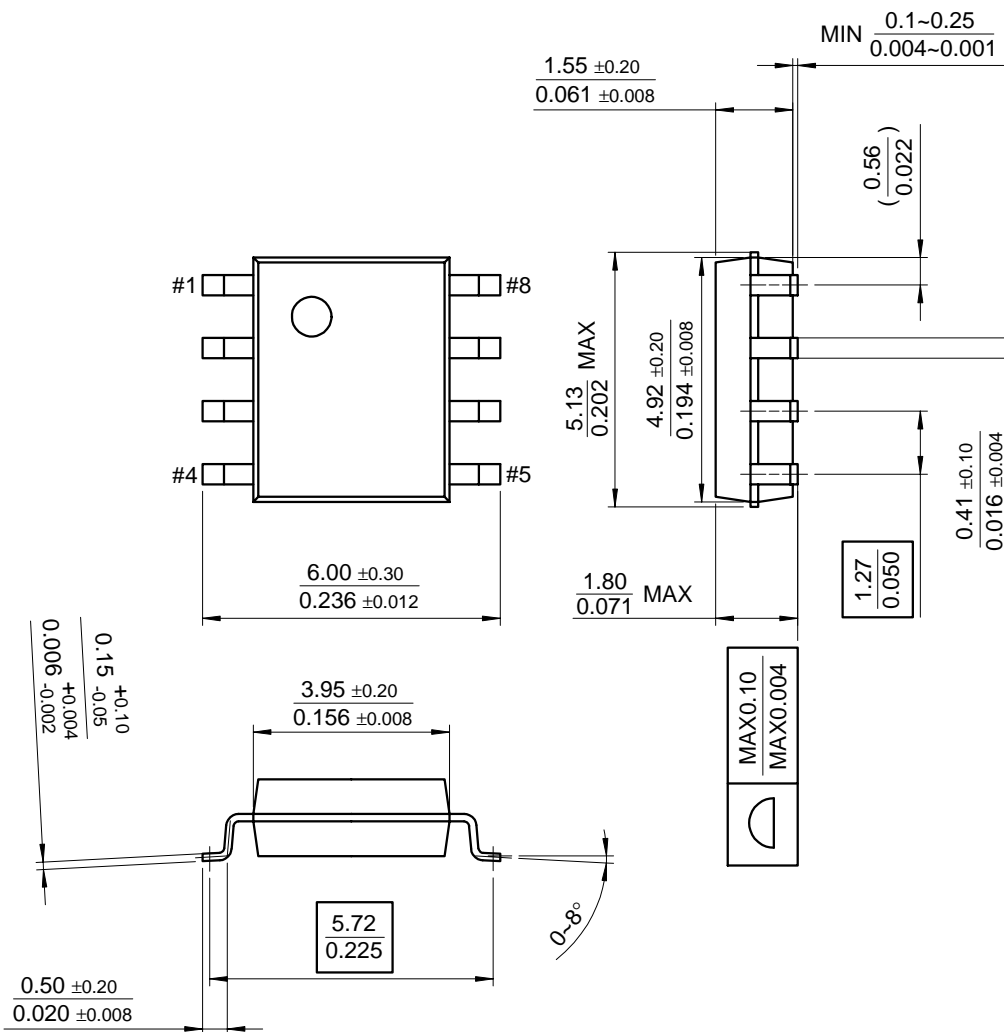


Mechanical Dimensions (Continued)

Package

Dimensions in millimeters

8-SOP



## Ordering Information

| Product Number | Package | Output Voltage Tolerance | Operating Temperature |
|----------------|---------|--------------------------|-----------------------|
| MC78L05ABP     | TO-92   | 5%                       | -40 ~ +125°C          |
| MC78L05ABD     | 8-SOP   |                          |                       |

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