

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.

TO-92



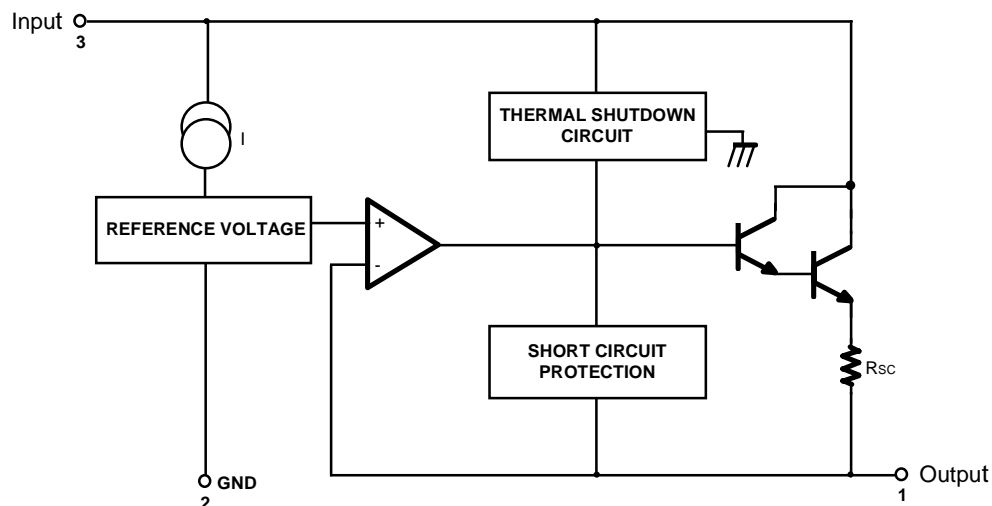
1. Output 2. GND 3. Input

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1. Output 2. GND 3. GND 4. NC
5. NC 6. GND 7. GND 8. Input

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) | ΔV_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) | ΔV_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 |
| | | $7\text{V} \leq V_I \leq V_{MAX}$ (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 | ΔI_Q | | | | |
| | with load | ΔI_Q | | | | |
| | | $8\text{V} \leq V_I \leq 20\text{V}$ | - | - | 1.5 | mA |
| | | $1\text{mA} \leq I_O \leq 40\text{mA}$ (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 |

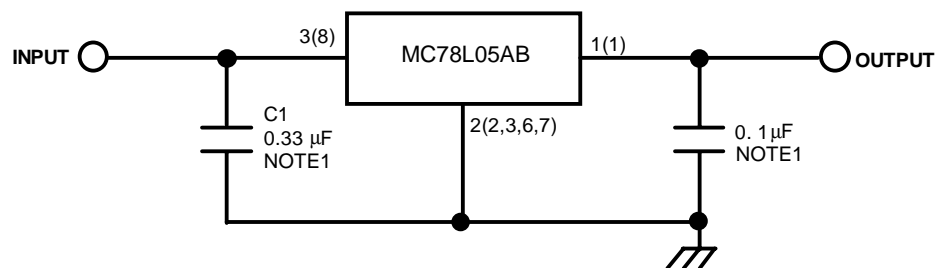
Note:

1. 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.
2. Power dissipation $P_D \leq 0.75\text{W}$.
3. These parameters although guaranteed over the recommended operating conditions are not 100% tested in production.
4. Recommend minimum load capacitance of $0.01\mu\text{F}$ to limit high frequency noise.
5. 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:

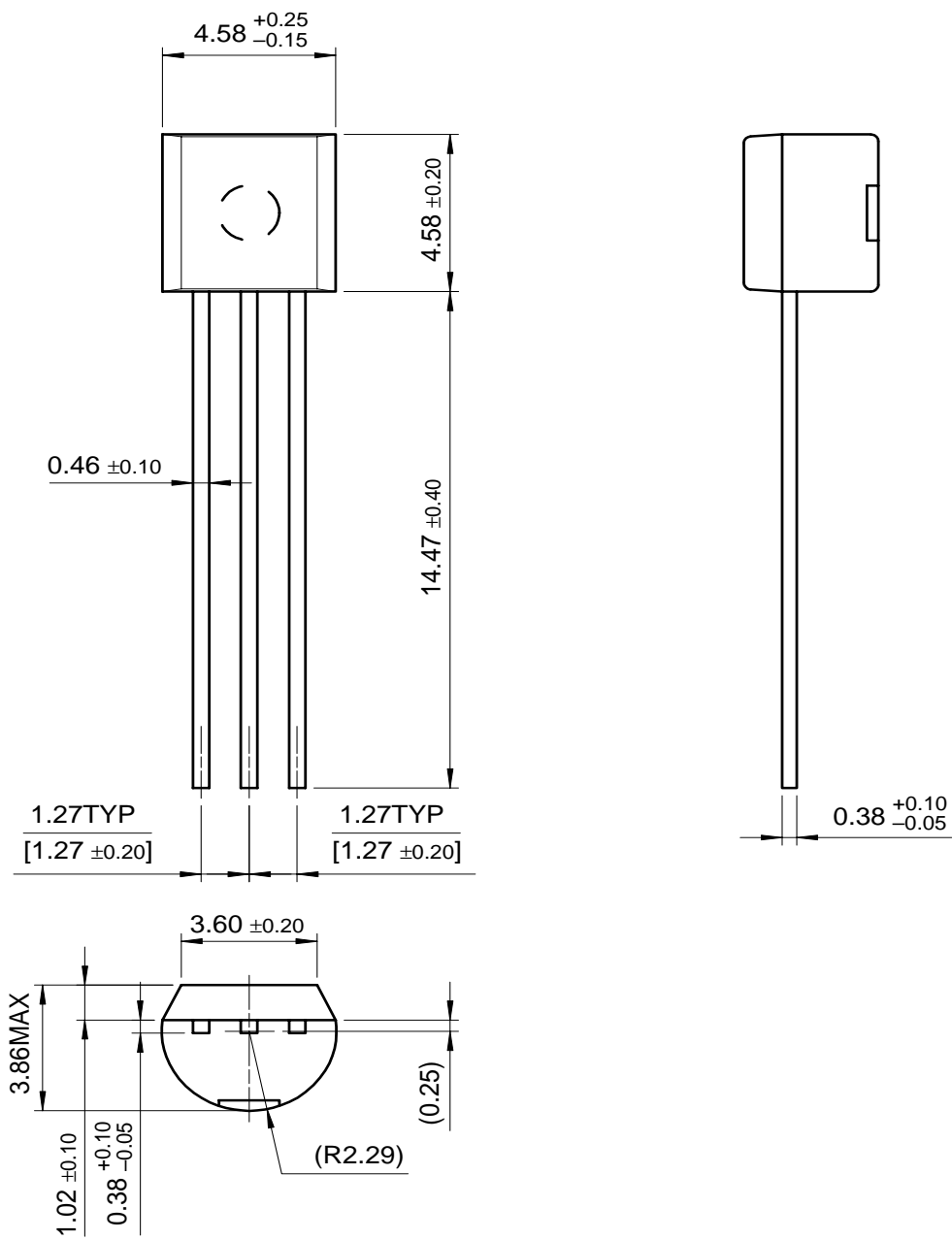
1. Bypass Capacitors are recommend for optimum stability and transient response and should be located as close as possible to the regulator

Mechanical Dimensions

Package

Dimensions in millimeters

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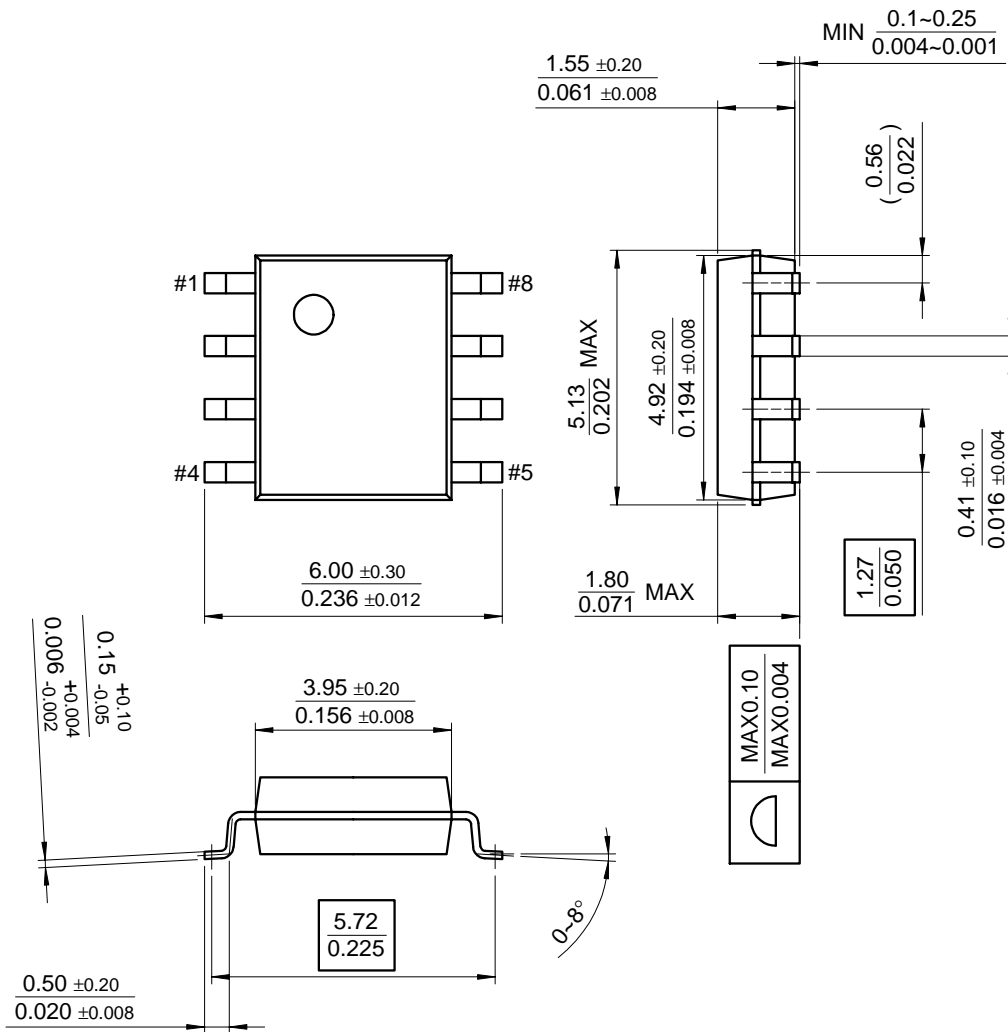


Mechanical Dimensions (Continued)

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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