

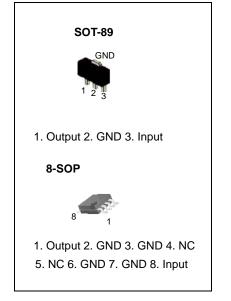
# **KA78L05AI** 3-Terminal 0.1A 5V Positive Voltage Regulator

### Features

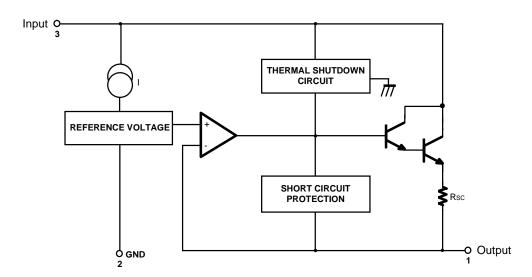
- Maximum Output Current of 100mA
- Output Voltage of 5V
- Thermal Overload Protection
- Short Circuit Current Limiting
- Output Voltage Offered in ±5% Tolerance

# Description

The KA78L05AI 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**

(Ta=25°C, Unless otherwise noted, Note 5)

| Parameter  | Symbol | Value      | Unit         |
|--|--------|------------|--------------|
| Input Voltage                                      | VI     | 30         | V            |
| Maximum Operating Junction Temperature             | Tj     | 150        | °C           |
| Operating Temperature Range                        | TOPR   | -40 ~ +125 | °C           |
| Storage Temperature Range                          | TSTG   | -65 ~ +150 | °C           |
| Thermal Resistance Junction-Air<br>SOT-89<br>8-SOP | Reja   | 225<br>160 | °C/W<br>°C/W |

#### **Electrical Characteristics**

(VI = 10V, IO = 40mA, -40°C  $\leq$  TJ  $\leq$  125°C, CI = 0.33 $\mu$ F, CO = 0.1 $\mu$ F, unless otherwise specified. (Note1))

| Parameter                             |   | Symbol                               | Conditions                                    |                        | Min. | Тур.  | Max. | Unit  |
|---------------------------------------|---|--------------------------------------|---|------------------------|------|-------|------|-------|
| Output Voltage                        |   | Vo                                   | TJ = 25°C                                     |                        | 4.8  | 5.0   | 5.2  | V     |
| Line Regulation (Note1)               |   | ΔVο                                  | TJ = 25°C                                     | $7V \le V_I \le 20V$   | -    | 8     | 150  | mV    |
|                                       |   |                                      |   | $8V \le V_I \le 20V$   | -    | 6     | 100  | mV    |
| Load Regulation (Note1)               |   | $\Delta V_{O}$ T <sub>J</sub> = 25°C | $1mA \le IO \le 100mA$                        | -                      | 11   | 60    | mV   |       |
|                                       |   |                                      | $1 J = 25^{\circ} C$                          | $1mA \le I_O \le 40mA$ | -    | 5.0   | 30   | mV    |
| Output Voltage                        |   |                                      | $7V \leq V_I \leq 20V$                        | $1mA \le IO \le 40mA$  | 4.75 | -     | 5.25 | V     |
|                                       |   | Vo                                   | $7V \le V_I \le V_{MAX}$<br>(Note2)           | $1mA \le IO \le 70mA$  | 4.75 | -     | 5.25 | V     |
| Quiescent Current                     |   | lq                                   | T <sub>J</sub> = 25°C                         |                        | -    | 2.0   | 5.5  | mA    |
| Change                                | With Line   | ΔlQ                                  | $8V \leq V_I \leq 20V$                        |                        | -    | -     | 1.5  | mA    |
|                                       | With Load   | ΔlQ                                  | $1mA \le IO \le 40 mA(Note3)$                 |                        | -    | -     | 0.5  | mA    |
| Output Noise Voltag                   | e(Note3)  | VN                                   | $T_A = 25^{\circ}C$ , $10Hz \le f \le 100kHz$ |                        | -    | 40    | -    | μV/Vo |
| Temperature Coefficient of VO (Note3) |   | ΔVο/ΔΤ                               | IO = 5mA                                      |                        | -    | -0.65 | -    | mV/°C |
| Ripple Rejection(No                   | Rejection(Note3,4)RRf = 120Hz, $8V \le VI \le 18V$ , $TJ = 25^{\circ}C$ |                                      | 41  | 80                     | -    | dB    |      |       |
| Dropout Voltage VD                    |   | T <sub>J</sub> = 25°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.

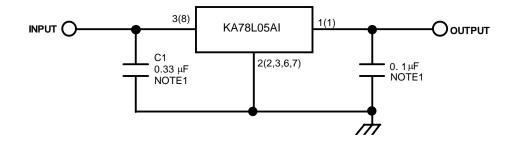
2. Power dissipation  $P_D \leq 0.75 W.$ 

3. These parameters although guaranteed over the recommended operating conditions are not 100% tested in production.

4. Recommend minimum load capacitance of 0.01uF 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.

# **Typical Application**



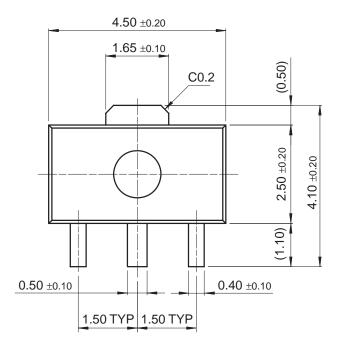
'()': 8SOP Type

Note:

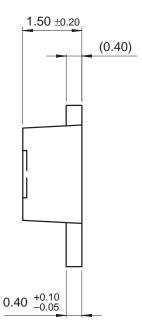
1. Bypass Capacitors are recommend for optimum stability and transient response and should be located as close as possible to the regulator

# **Mechanical Dimensions**

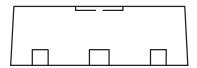
### Package



**SOT-89** 



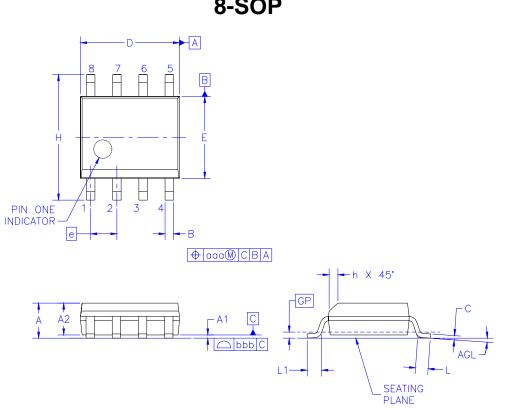
**Dimensions in millimeters** 



**Dimensions in millimeters** 

# Mechanical Dimensions (Continued)

### Package



8-SOP

| Symbol | Min      | Nom  | Мах  |  |
|--------|----------|------|------|--|
| А      | -        | -    | 1.75 |  |
| A1     | 0.10     | 0.15 | 0.25 |  |
| A2     | 1.25     | 1.45 | 1.50 |  |
| В      | 0.35     | 0.37 | 0.51 |  |
| С      | 0.19     | 0.20 | 0.25 |  |
| D      | 4.80     | 4.90 | 5.00 |  |
| E      | 3.80     | 3.90 | 4.00 |  |
| е      | 1.27BSC  |      |      |  |
| Н      | 5.79     | 5.99 | 6.20 |  |
| h      | 0.25     | -    | 0.50 |  |
| L      | 0.50     | 0.70 | 0.90 |  |
| GP     | 0.36 BSC |      |      |  |
| q      | 0        | -    | 8    |  |
| aaa    | -        | -    | 0.25 |  |
| bbb    | -        | -    | 0.10 |  |

#### **Ordering Information**

| Product Number | Package | Output Voltage Tolerance | Operating Temperature |
|----------------|---------|--------------------------|-----------------------|
| KA78L05AIMTF   | SOT-89  | 5%                       | -40 ~ +125°C          |
| KA78L05AIDTF   | 8-SOP   | 5%                       | -40 ~ +123 C          |

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