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# KA4558

## Dual Operational Amplifier

### Features

- No frequency compensation required.
- No latch up.
- Large common mode and differential voltage range.
- Parameter tracking over temperature range.
- Gain and phase match between amplifiers.
- Internally frequency compensated.
- Low noise input transistors.

### Descriptions

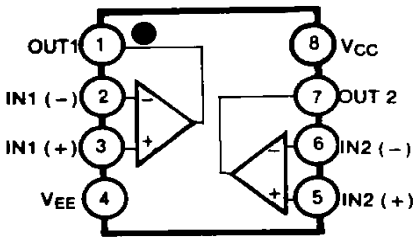
The KA4558 is a monolithic integrated circuit designed for dual operational amplifier.

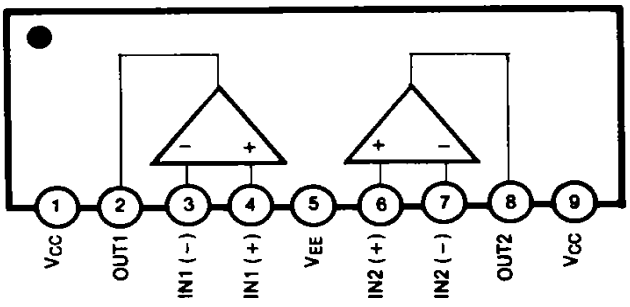
**8-DIP**


**8-SOP**


**9-SIP**


### Internal Block Diagram

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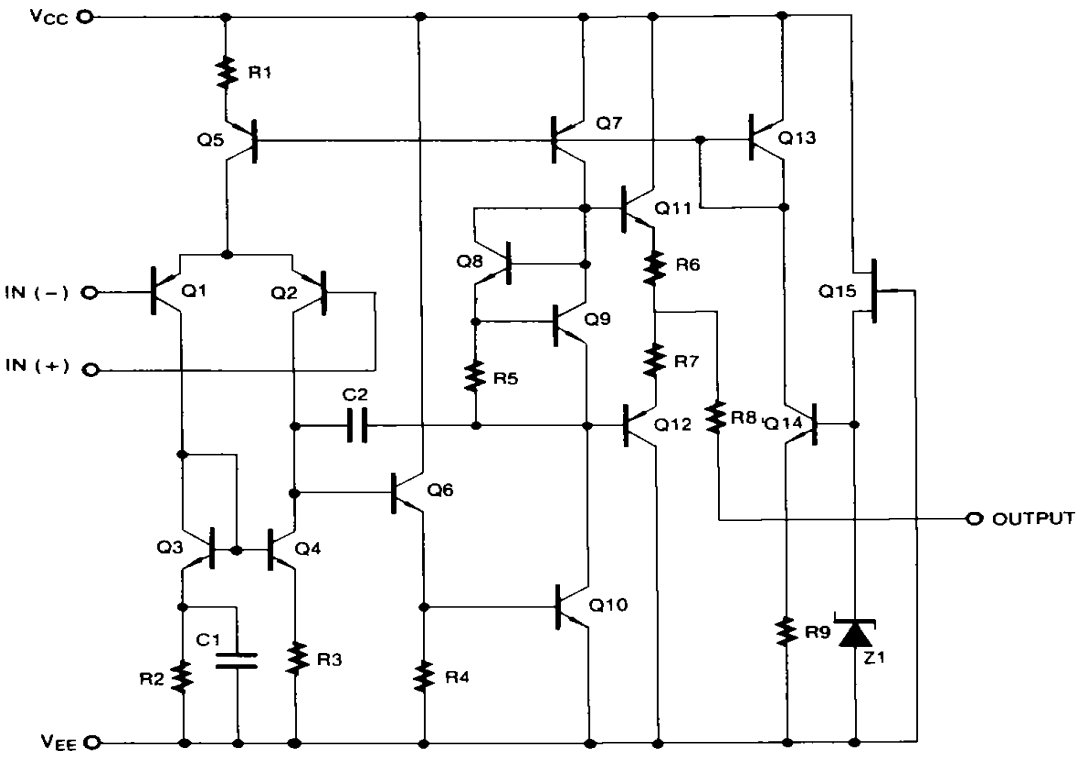
## Schematic Diagram

(One Section Only)




## Absolute Maximum Ratings

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Supply Voltage | $V_{CC}$ | ±22 | V |
| Differential Input Voltage | $V_{I(DIFF)}$ | 30 | V |
| Input Voltage | $V_I$ | ±15 | V |
| Power Dissipation | $P_D$ | 400 | mW |
| Operating Temperature Range<br>KA4558<br>KA4558I | $T_{OPR}$ | <br>0 ~ 70<br>-40 ~ 85 | °C |
| Storage Temperature Range | $T_{STG}$ | -65 ~ 150 | °C |



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## Electrical Characteristics

($V_{CC}$ = 15V, $V_{EE}$ = - 15V ,$T_A$ = 25 °C unless otherwise specified)

| Parameter | Symbol | Conditions | | KA4558/KA4558I | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | |
| Input Offset Voltage | $V_{IO}$ | $R_S$≤10KΩ | | - | 2 | 6 | mV |
| | | | Note 1 | - | - | 7.5 | |
| Input Offset Current | $I_{IO}$ | | | - | 5 | 200 | nA |
| | | | $T_A$=$T_{A(MAX)}$ | - | - | 300 | |
| | | | $T_A$ =$T_{A(MIN)}$ | - | - | 300 | |
| Input Bias Current | $I_{BIAS}$ | | | - | 30 | 500 | nA |
| | | | $T_A$=$T_{A(MAX)}$ | - | - | 800 | |
| | | | $T_A$ =$T_{A(MIN)}$ | - | - | 800 | |
| Large Signal Voltage Gain | $G_V$ | $V_{O(P-P)}$= ±10V,$R_L$≤2KΩ | | 20 | 200 | - | V/mV |
| | | | Note 1 | - | - | - | |
| Common Mode Input Voltage Range | $V_{I(R)}$ | | | ±12 | ±13 | - | V |
| | | | Note 1 | - | - | - | |
| Common Mode Rejection Ratio | CMRR | $R_S$≤10KΩ | | 70 | 90 | - | dB |
| | | | Note 1 | - | - | - | |
| Supply Voltage Rejection Ratio | PSRR | $R_S$≤10KΩ | | 76 | 90 | - | dB |
| | | | Note 1 | 76 | 90 | - | |
| Output Voltage Swing | $V_{O(P-P)}$ | $R_L$≥10KΩ | Note1 | ±12 | ±14 | - | V |
| | | $R_L$≥2KΩ | | ±10 | ±13 | - | |
| Supply Current (Both Amplifiers) | $I_{CC}$ | | | - | 3.5 | 5.8 | mA |
| | | | $T_A$ =$T_{A(MAX)}$ | - | - | 5.0 | |
| | | | $T_A$ =$T_{A(MIN)}$ | - | - | 6.7 | |
| Power Consumption (Both Amplifiers) | $P_C$ | | | - | 70 | 170 | mW |
| | | | $T_A$ =$T_{A(MAX)}$ | - | - | 150 | |
| | | | $T_a$ = $T_{A(MIN)}$ | - | - | 200 | |
| Slew Rate (Note2) | SR | $V_I$ =10V, $R_L$≥2KΩ $C_I$≤100pF | | 1.2 | - | - | V/μs |
| Rise Time (Note2) | $T_R$ | $V_I$ =20mV, $R_L$≥2KΩ $C_I$≤100pF | | - | 0.3 | - | μs |
| Overshoot (Note2) | OS | $V_I$ =20mV, $R_L$≥2KΩ $C_I$≤100pF | | - | 15 | - | % |

**Note :**

1. KA4558 : $T_{A(MIN)}$ ≤$T_A$≤$T_{A(MAX)}$ = 0≤$T_A$≤ 70 °C , KA4558I : $T_{A(MIN)}$ ≤$T_A$≤$T_{A(MAX)}$ = -40≤$T_A$≤ +85 °C
2. Guaranteed by design.



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# Typical Performance Characteristics

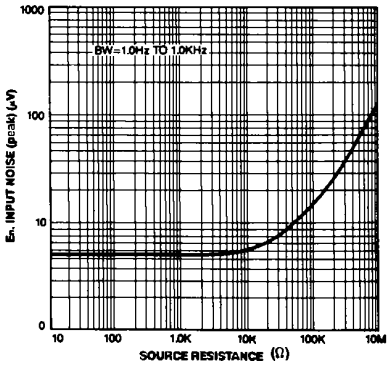


Figure 1. Burst Noise vs Source Resistance

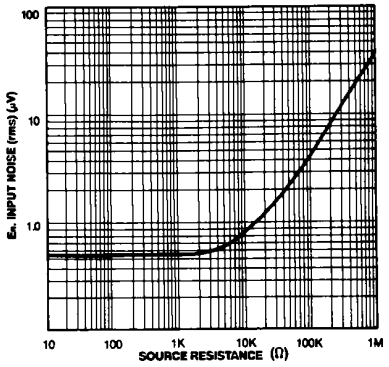


Figure 2. RMS Noise vs Source Resistance

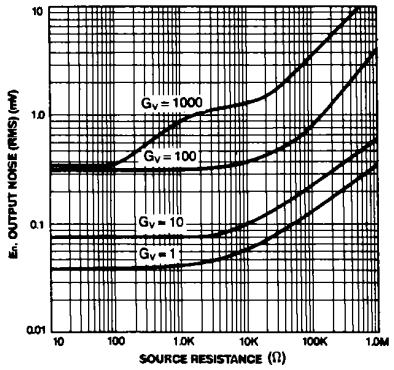


Figure 3. Output Noise vs Source Resistance

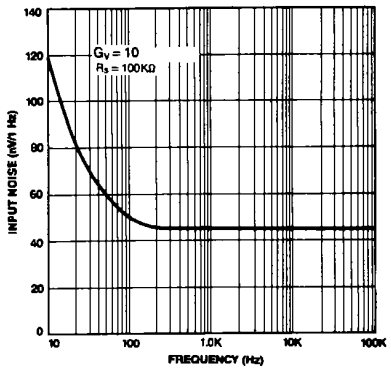


Figure 4. Spectral Noise Density

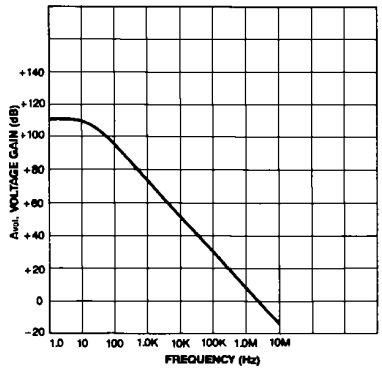


Figure 5. Open Loop Frequency Response

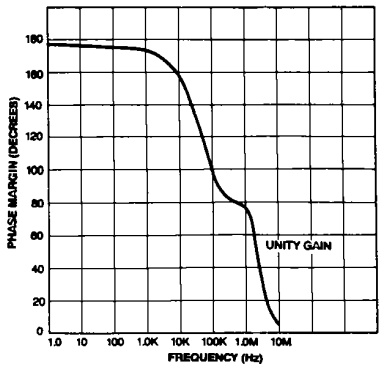


Figure 6. Phase Margin vs Frequency



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## Typical Performance Characteristics (continued)

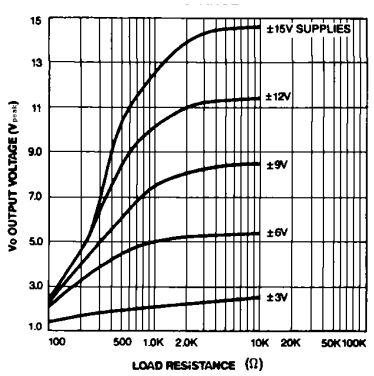


**Figure 7. Positive Output Voltage Swing vs Load Resistance**

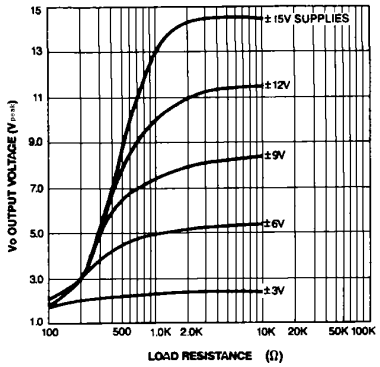


**Figure 8. Negative Output Voltage Swing vs Load Resistance**

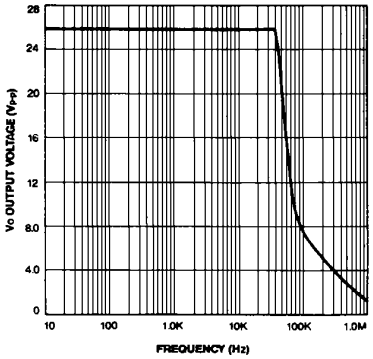


**Figure 9. Power Bandwidth (Large Signal Output Swing vs Frequency)**



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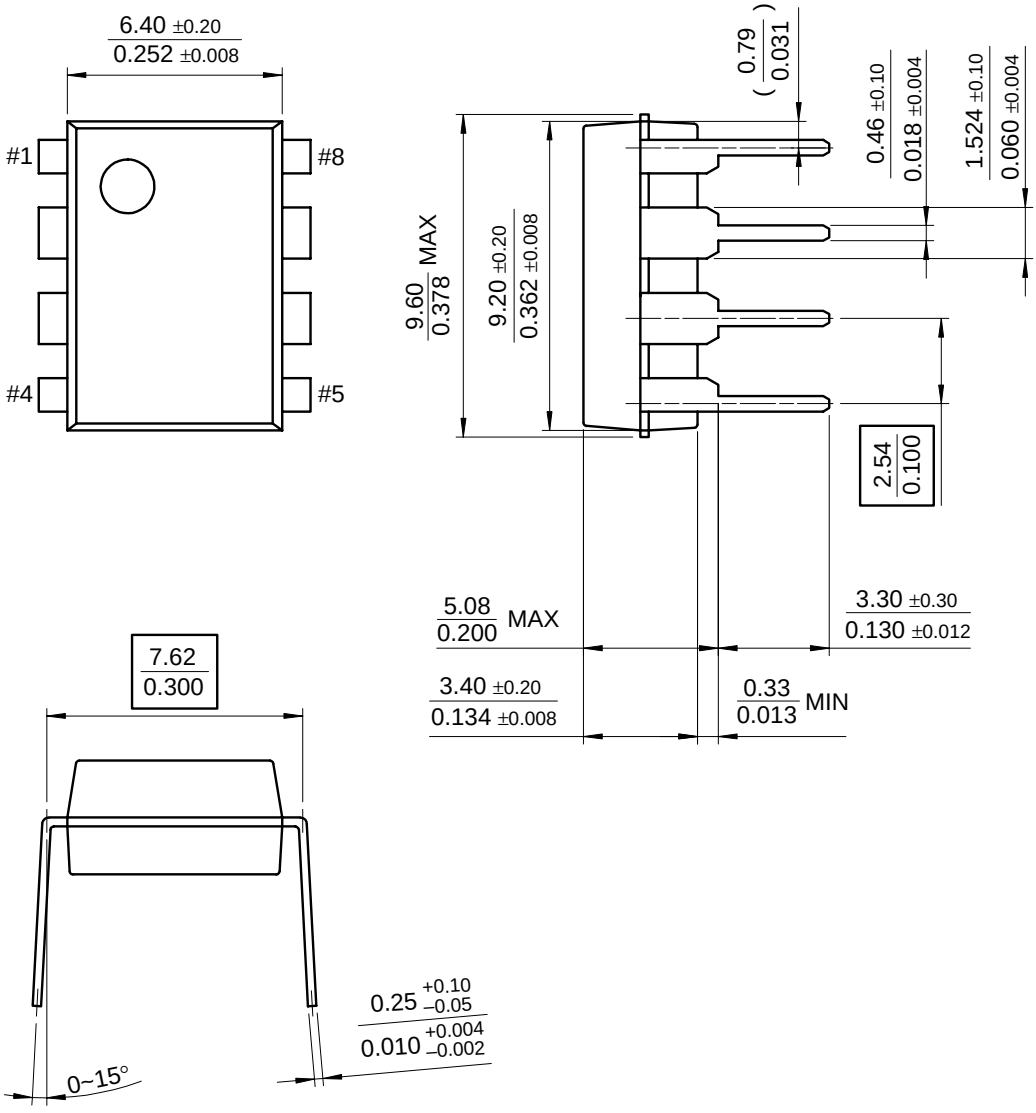
# Mechanical Dimensions

## Package

### 8-DIP



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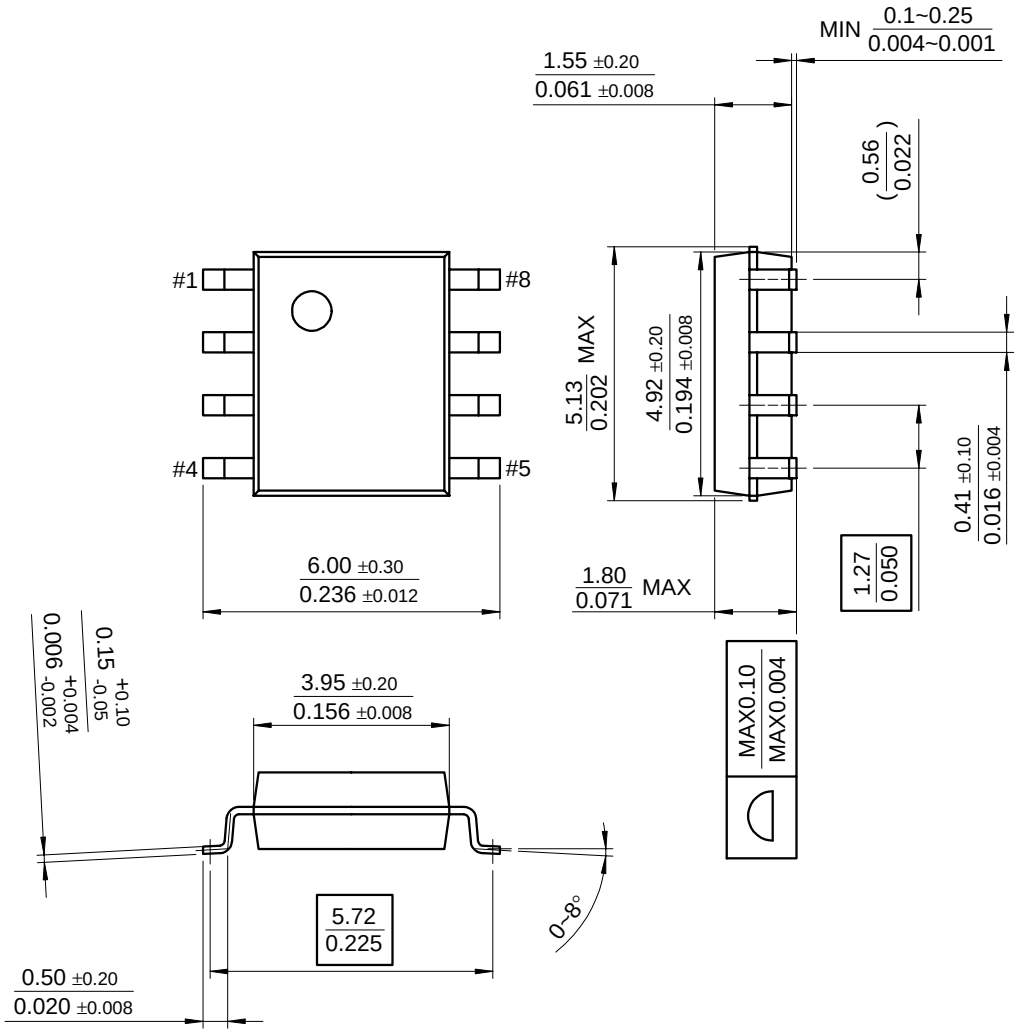
## Mechanical Dimensions (Continued)

### Package

# 8-SOP



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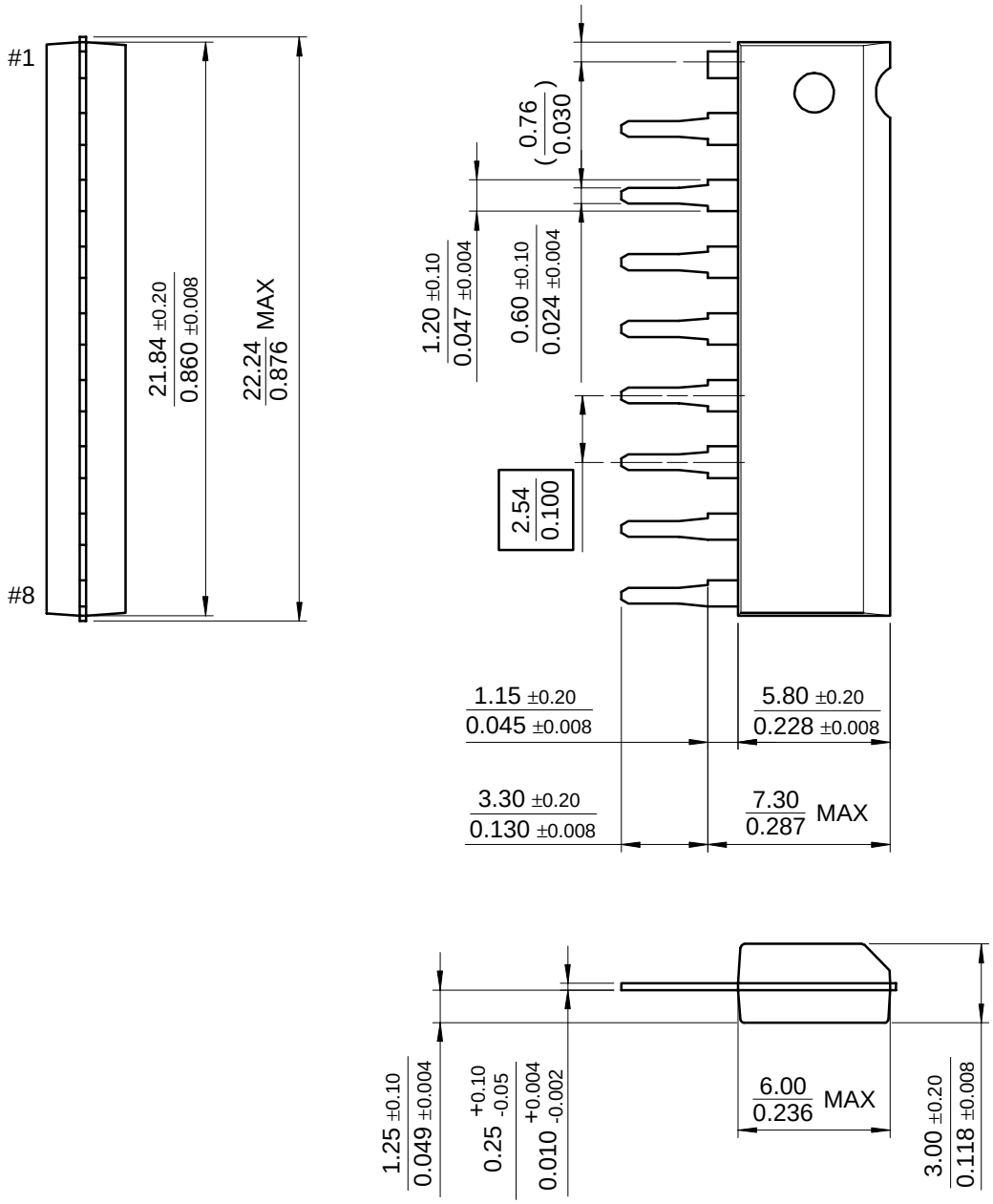
## Mechanical Dimensions (Continued)

### Package

# 9-SIP



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## Ordering Information

| Product Number | Package | Operating Temperature |
|---|---|---|
| KA4558 | 8-DIP | 0 ~ + 70°C |
| KA4558D | 8-SOP | |
| KA4558S | 9-SIP | |
| KA4558I | 8-DIP | -40 ~ + 85°C |



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