

SANYO Semiconductors DATA SHEET

LA6358AM — High-Performance Dual Operational Amplifier

Overview

The LA6358AM is a high-performance dual operational amplifier that can operate from a single voltage power supply (3 to 24 V) and over a wide operating temperature range (-40 to 125°C). It features a built-in phase correction circuit. It can also operate from a dual power supply with both positive and negative levels and features low power consumption. The LA6358AM can be used in a wide range of automotive and industrial applications as a transducer amplifier for all types of transducers, as a DC amplifier circuit, and for other purposes as well.

Functions

- · Phase correction not required
- Wide operating supply voltage range 3.0 V to 24.0 V (single power supply systems)

±1.5 V to 12.0 V (dual power supply systems)

- The input voltage range extends to essentially the ground level, and furthermore the output voltage range for V_{OUT} is from 0 V to V_{CC} 1.8 V.
- Low current drain: $I_{CC} = 0.5$ mA (typical) when $V_{CC} = +5$ V, $R_L = \infty$.

Specifications

Maximum Ratings at Ta = -40°C to +125°C

| Parameter | Symbol | Conditions | Ratings | Unit |
|-----------------------------|---------------------|------------|-------------|------|
| Maximum supply voltage | V _{CC} max | | 32 | V |
| Differential input voltage | V _{ID} | | 32 | V |
| Maximum input voltage | V _{IN} max | | -0.3 to +32 | V |
| Allowable power dissipation | Pd max | Ta ≤ 25°C | 300 | mW |
| Operating temperature | Topr | | -40 to +125 | °C |
| Storage temperature | Tstg | | −55 to +150 | °C |

Recommended Operating Conditions at Ta = -40°C to +125°C

| Parameter | Symbol | Conditions | Ratings | | | Linit |
|----------------|-----------------|------------|---------|-----|-----|-------|
| | | | min | typ | max | Unit |
| Supply voltage | V _{CC} | | 3 | | 24 | V |

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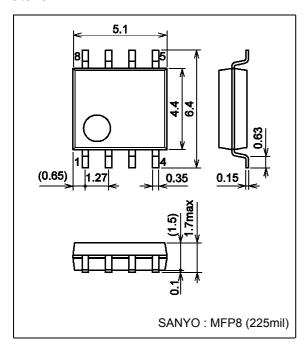
LA6358AM

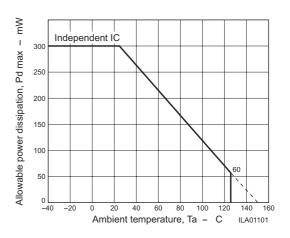
Electrical Characteristics (Unless specified otherwise, the conditions are Ta = -40°C to +125°C, $V_{CC} = 5$ V)

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---------------------------------|-----------------------|--|---------|-----|----------------------|------|
| | | | min | typ | max | Onit |
| Input offset voltage | VIO | | | ±2 | ±7 | mV |
| Input offset current | IIO | I_{IN}^+/I_{IN}^- | | ±5 | ±50 | nA |
| Input bias current | IB | I_{IN}^+/I_{IN}^- | | 45 | 250 | nA |
| Common-mode input voltage range | VICM | | 0 | | V _{CC} -1.8 | ٧ |
| Common-mode rejection ratio | CMR | V _{CC} = 30 V | 65 | 80 | | dB |
| Large-amplitude voltage gain | VG | $V_{CC} = 15V, R_L \ge 2 \text{ k}\Omega$ | 25 | 100 | | V/mV |
| Output voltage range | V _{OUT} | | 0 | | V _{CC} -1.8 | > |
| Supply voltage rejection ratio | SVR | | 65 | 100 | | dB |
| Channel separation | CH sep | f = 1 k to 20 kHz | | 120 | | dB |
| Current drain | Icc | | | 0.5 | 1.2 | mA |
| Output current (source) | I _O source | $V_{IN}^{+}=1 \text{ V}, V_{IN}^{-}=0 \text{ V}$ | 10 | 20 | | mA |
| Output current (sink) | I _O sink | $V_{IN}^{+} = 0 \text{ V}, V_{IN}^{-} = 1 \text{ V}$ | 7 | 20 | | mA |

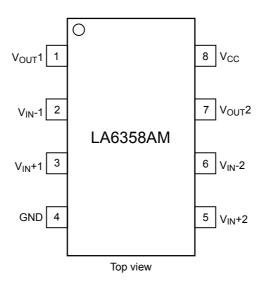
Package Dimensions

unit: mm 3032C

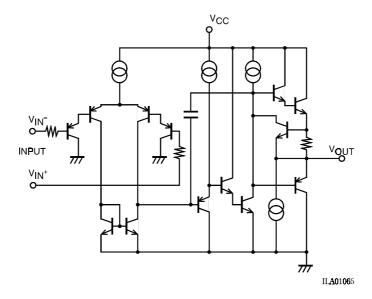




Pin Assignment

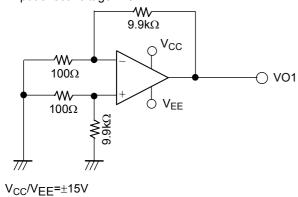


Equivalent Circuit

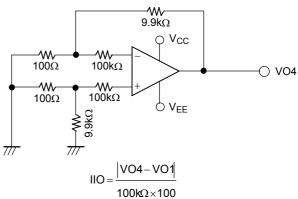


Test Circuits

1. Input offset voltage VIO

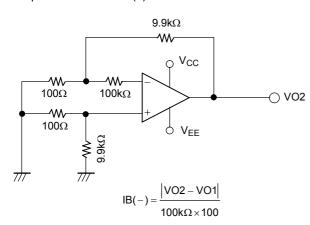


2. Input offset current IIO

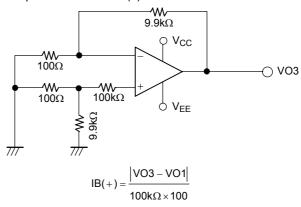


3. Input bias current IB (-)

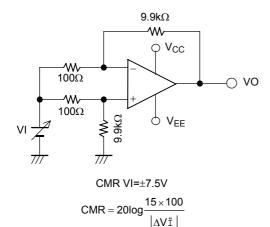
VIO=VO1/100



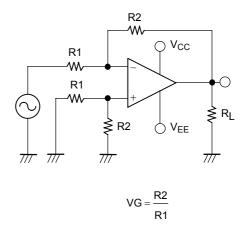
4. Input bias current IB (+)



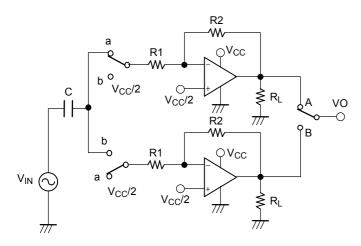
Common-mode rejection ratio CMR Common-mode input voltage range VICN



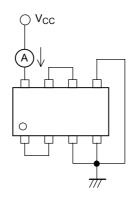
6. Voltage gain VG



7. Channel separation CH sep



8. Current drain I_{CC}



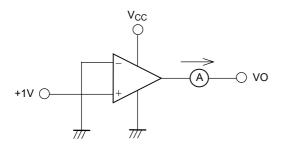
When the switch is in the "a" position

CH sep(A
$$\rightarrow$$
 B) = 20log $\frac{\text{R2VOA}}{\text{R1VOB}}$

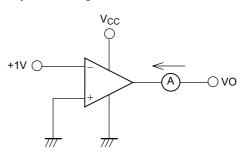
When the switch is in the "b" position

$$CHsep(B \rightarrow A) = 20log \frac{R2VOB}{R1VOA}$$

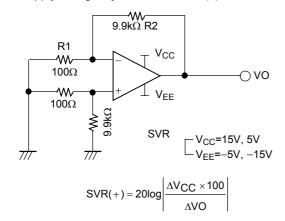
9. Output current IO source



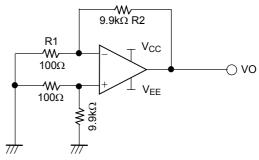
10. Output current IO sink



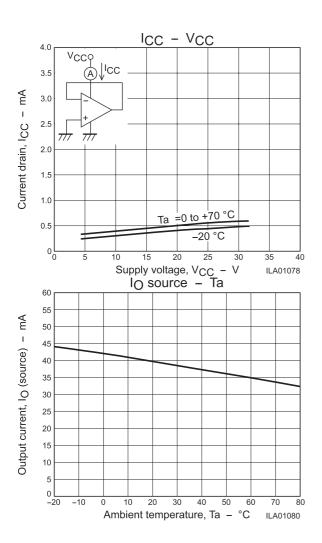
11. Supply voltage rejection ratio SVR (+)

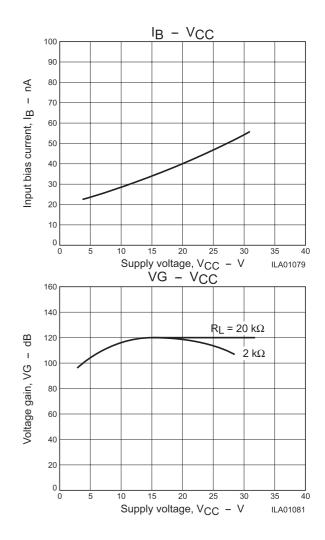


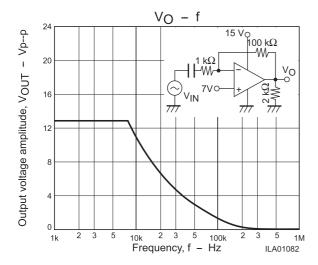
12. Supply voltage rejection ratio SVR (-)

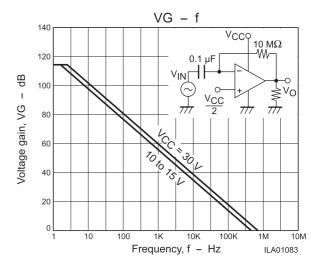


$$SVR(-) = 20log \frac{\Delta V_{EE} \times 100}{\Delta VO}$$









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