Ordering number : ENN7558

SANYO Semiconductors

DATA SHEET

Monolithic Digital IC

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 = ∞.

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			Unit
			min	typ	max	
Supply voltage	V_{CC}		3		24	V

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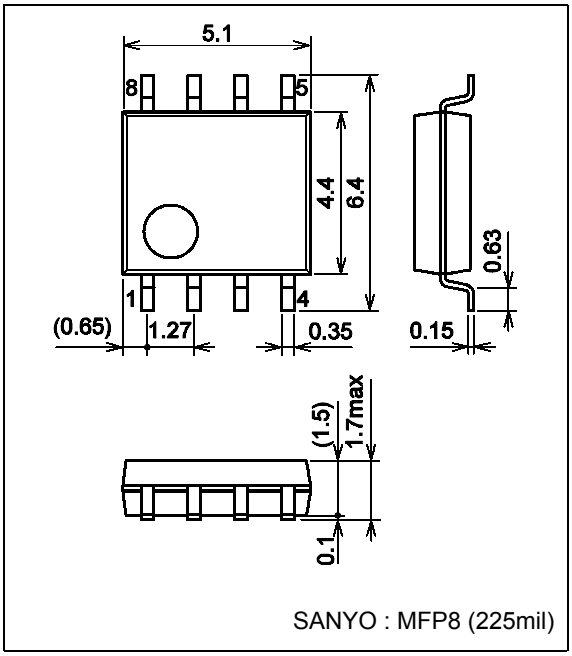
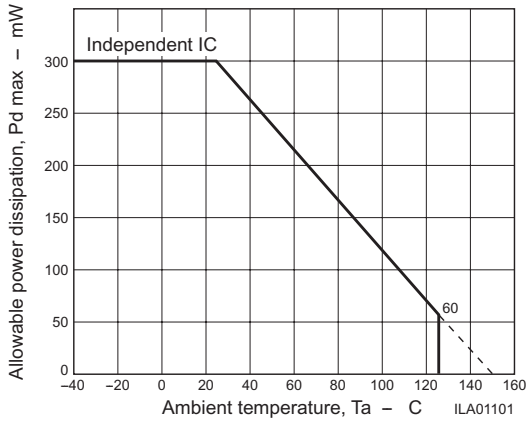
Electrical Characteristics (Unless specified otherwise, the conditions are Ta = −40°C to +125°C, V_{CC} = 5 V)

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
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	V
Common-mode rejection ratio	CMR	V_{CC} = 30 V	65	80		dB
Large-amplitude voltage gain	VG	V_{CC} = 15V, $R_L \geq 2$ kΩ	25	100		V/mV
Output voltage range	V_{OUT}		0		V_{CC}-1.8	V
Supply voltage rejection ratio	SVR		65	100		dB
Channel separation	CH sep	f = 1 k to 20 kHz		120		dB
Current drain	I_{CC}			0.5	1.2	mA
Output current (source)	I_O source	V_{IN}^+=1 V, V_{IN}^- = 0 V	10	20		mA
Output current (sink)	I_O sink	V_{IN}^+ = 0 V, V_{IN}^- = 1 V	7	20		mA

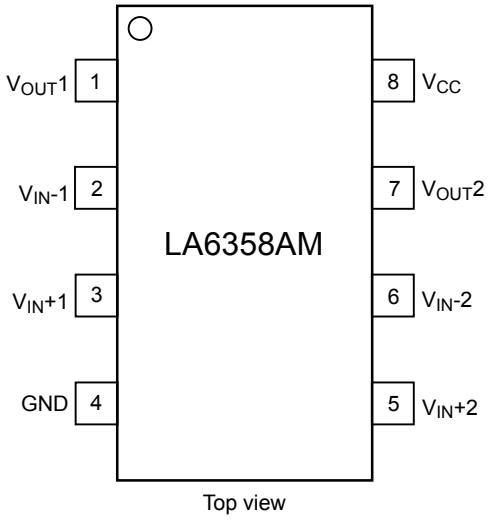
Package Dimensions

unit: mm
3032C

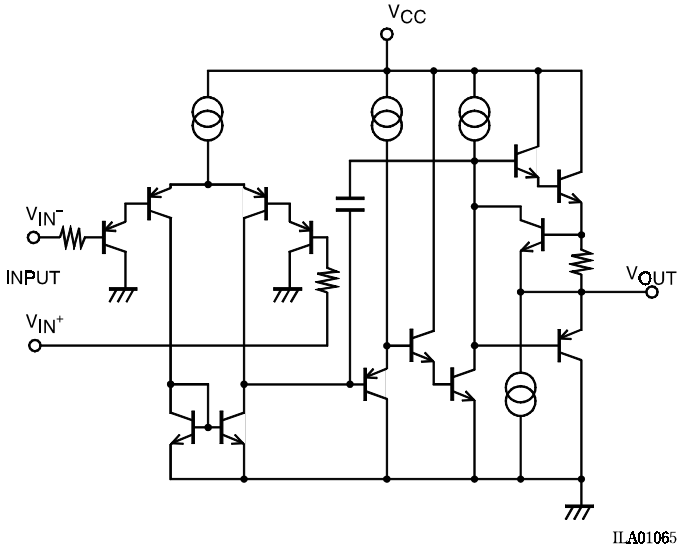




Pin Assignment

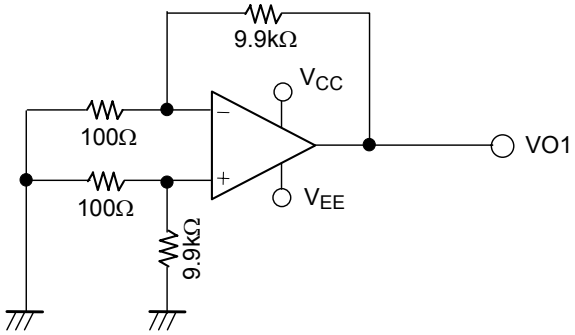


Equivalent Circuit



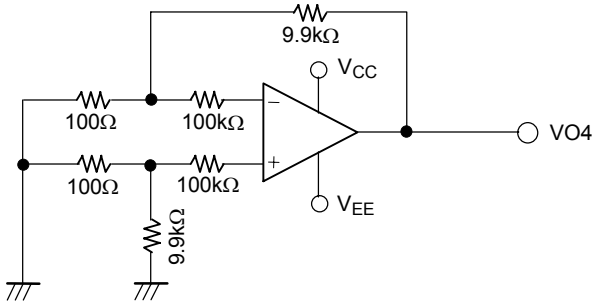
Test Circuits

1. Input offset voltage VIO



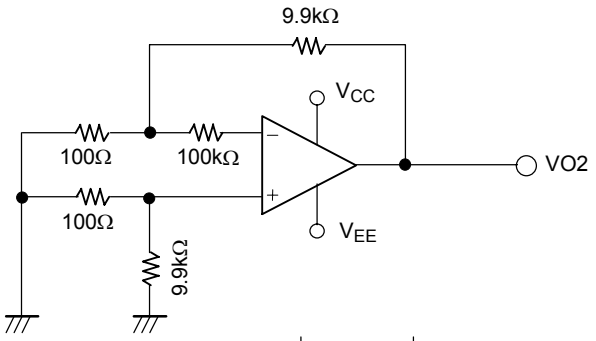
$V_{CC}/V_{EE}=\pm15V$
VIO=VO1/100

2. Input offset current IIO



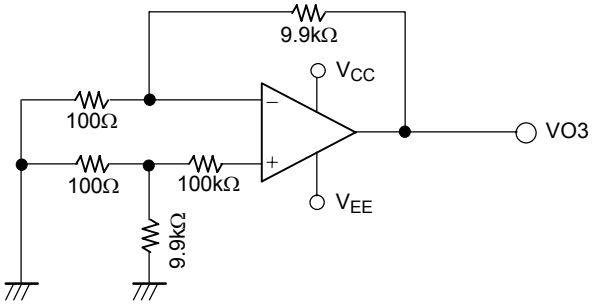
$$IIO=\frac{|VO4-VO1|}{100k\Omega\times100}$$

3. Input bias current IB (–)



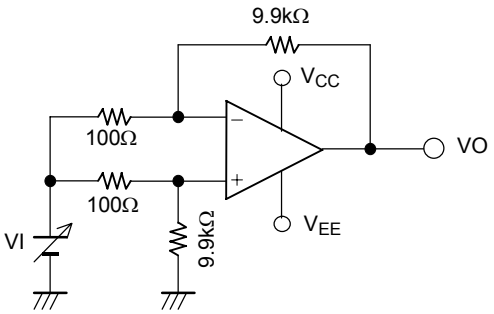
$$IB(-)=\frac{|VO2-VO1|}{100k\Omega\times100}$$

4. Input bias current IB (+)



$$IB(+)=\frac{|VO3-VO1|}{100k\Omega\times100}$$

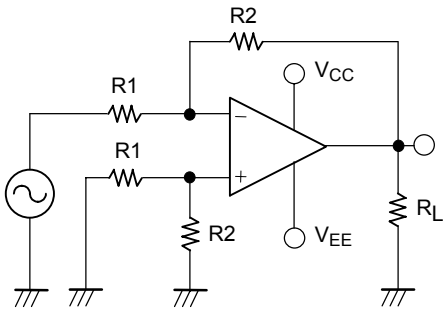
5. Common-mode rejection ratio CMR
Common-mode input voltage range VICN



CMR VI=±7.5V

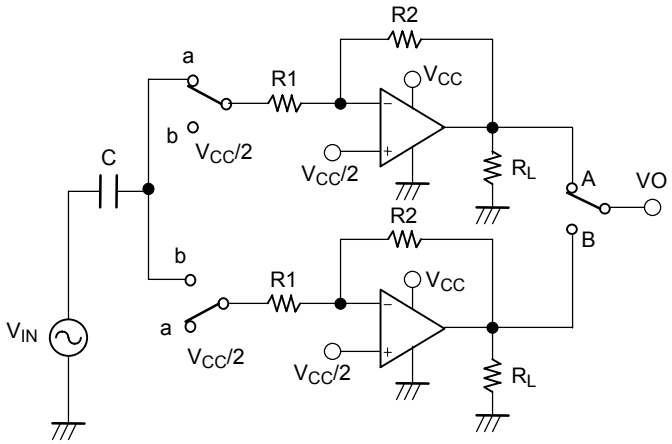
$$CMR = 20\log\frac{15\times 100}{|\Delta V\ddot{I}|}$$

6. Voltage gain VG



$$VG = \frac{R2}{R1}$$

7. Channel separation CH sep



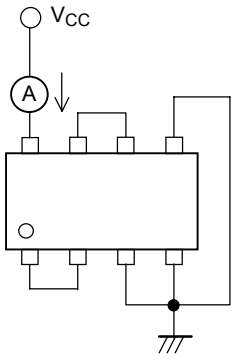
When the switch is in the "a" position

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

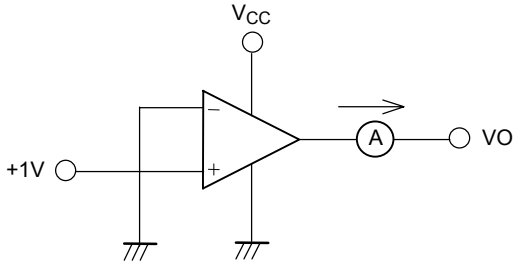
When the switch is in the "b" position

$$CH\,sep(B \rightarrow A) = 20\log\frac{R2VOB}{R1VOA}$$

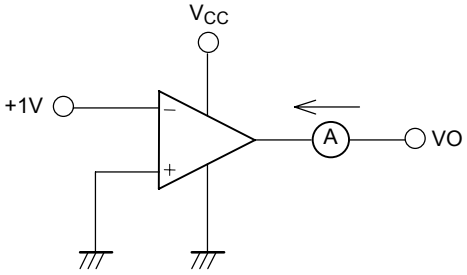
8. Current drain I_{CC}



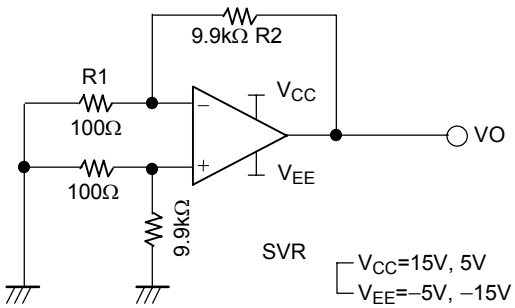
9. Output current I_O source



10. Output current I_O sink

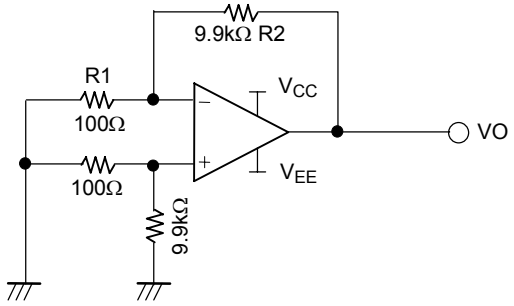


11. Supply voltage rejection ratio SVR (+)



$$SVR(+) = 20\log\left|\frac{\Delta V_{CC} \times 100}{\Delta VO}\right|$$

12. Supply voltage rejection ratio SVR (–)



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