

| | | |
|--------------|----------|---|
| SANYO | No.3191A | LA6358N,6358NS |
| | | High-Performance Dual Operational Amplifiers |

Overview

The LA6358N is an IC integrating two high-performance operational amplifiers in a single package. This operational amplifier contains an internal phase compensator and is designed to operate from a single power supply over a wide range of voltages. As with conventional general-purpose operational amplifiers, operation from dual power supplies is also possible and power dissipation is very low. This IC can be used widely in commercial and industrial applications including various transducer amplifiers and DC amplifiers.

Features

- Eliminates need for phase compensation
- Wide range of operating supply voltage : 3.0 to 30.0V (single power supply)
±1.5 to ±15.0V (dual power supply)
- Input voltage swingable down to nearly ground level and output voltage range V_{OUT} of 0 to $V_{CC} - 1.5V$
- Low current dissipation : $I_{CC} = 0.5mA$ typ/ $V_{CC} = +5V, R_L = \infty$

Maximum Ratings at $T_a = 25^\circ C$

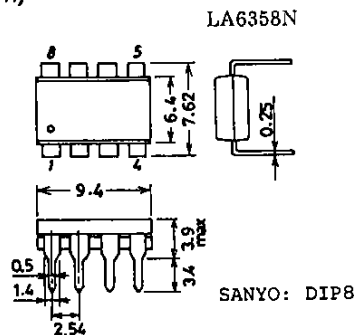
| | | unit |
|-----------------------------|----------------------------------|------------------------|
| Maximum Supply Voltage | V_{CC} | 32 V |
| Differential Input Voltage | V_{ID} | 32 V |
| Maximum Input Voltage | $V_{IN\ max}$ | -0.3 to +32 V |
| Allowable Power Dissipation | $P_d\ max$ $T_a \leq 25^\circ C$ | 570 mW |
| Operating Temperature | T_{opr} | -30 to +85 $^\circ C$ |
| Storage Temperature | T_{stg} | -55 to +125 $^\circ C$ |

Operating Characteristics at $T_a = 25^\circ C, V_{CC} = +5V$

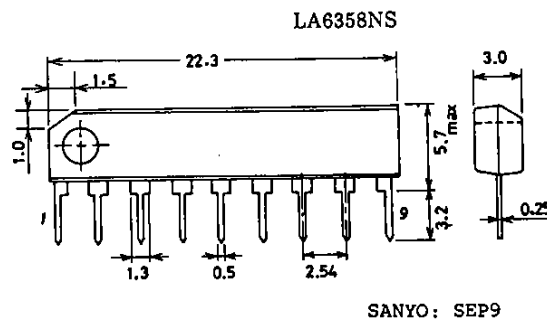
| | | | Test | | | | |
|---------------------------------|-----------|-------------------------|---------|-----|----------------|-----|------|
| | | | Circuit | min | typ | max | unit |
| Input Offset Voltage | V_{IO} | | 1 | | ±2 | ±7 | mV |
| Input Offset Current | I_{IO} | $I_{IN(+)} / I_{IN(-)}$ | 2 | | ±5 | ±50 | nA |
| Input Bias Current | I_B | $I_{IN(+)} / I_{IN(-)}$ | 3 | | 45 | 250 | nA |
| Common-Mode Input Voltage Range | V_{ICM} | | 4 | 0 | $V_{CC} - 1.5$ | | V |

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Package Dimensions 3001B-D8IC
(unit : mm)



Package Dimensions 3017B-S9IC
(unit : mm)



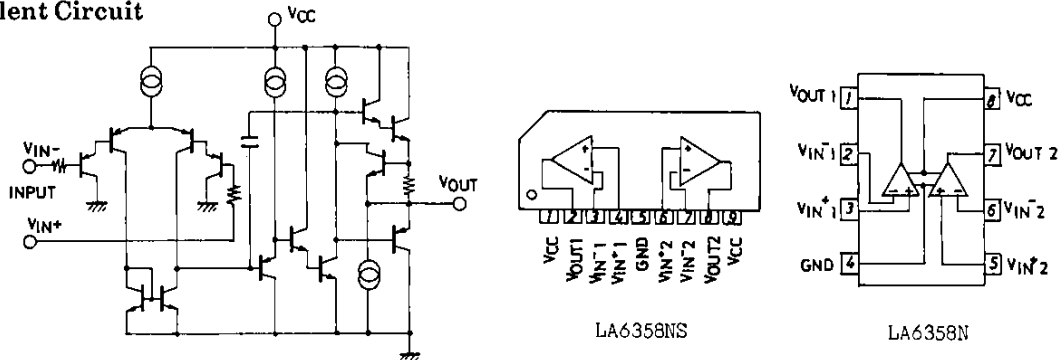
SANYO Electric Co., Ltd. Semiconductor Business Headquarters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110 JAPAN

1100YT/8029TA, TS №3191-1/4

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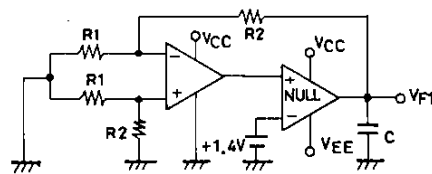
| | | | Test Circuit | min | typ | max | unit |
|------------------------------|------------------------|---------------------------------|--------------|-----|--------------|-----|------|
| Common-Mode Rejection Ratio | CMR | | 4 | 65 | 80 | | dB |
| Large Signal Voltage Gain | VG | $V_{CC}=15V, R_L \geq 2k\Omega$ | 5 | 25 | 100 | | V/mV |
| Output Voltage Range | V_{OUT} | | | 0 | $V_{CC}-1.5$ | | V |
| Power Supply Rejection Ratio | SVR | | 6 | 65 | 100 | | dB |
| Channel Separation | | $f=1k \text{ to } 20kHz$ | 7 | | 120 | | dB |
| Current Dissipation | I_{CC} | | 8 | | 0.5 | 1.2 | mA |
| Output Current (Source) | $I_{O \text{ source}}$ | $V_{IN+}=1V, V_{IN-}=0V$ | 9 | 20 | 40 | | mA |
| Output Current (Sink) | $I_{O \text{ sink}}$ | $V_{IN+}=0V, V_{IN-}=1V$ | 10 | 10 | 20 | | mA |

Equivalent Circuit



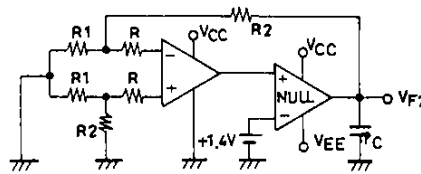
Test Circuits

1. Input Offset Voltage V_{IO}



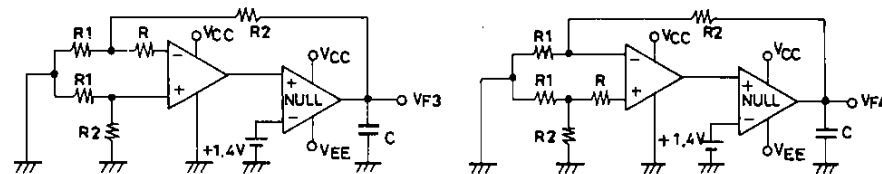
$$V_{IO} = \frac{VF1}{1 + R2/R1}$$

2. Input Offset Current I_{IO}



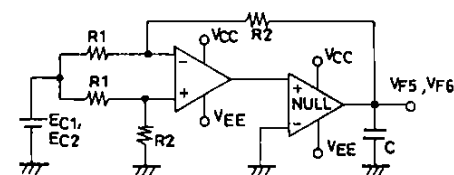
$$I_{IO} = \frac{VF2 - VF1}{R(1 + R2/R1)}$$

3. Input Bias Current I_B



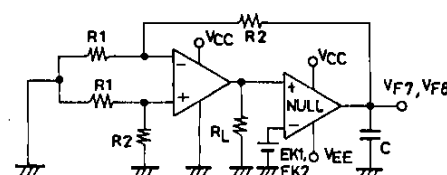
$$I_B = \frac{VF4 - VF3}{2R(1 + R2/R1)}$$

4. Common-mode Rejection Ratio CMR
Common-mode Input Voltage Range V_{ICM}



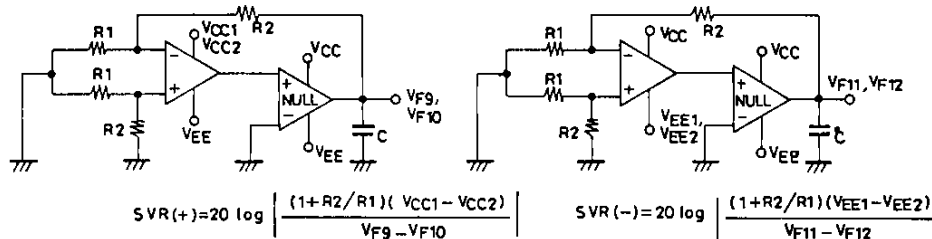
$$CMR = 20 \log \left| \frac{(EC1 - EC2)(1 + R2/R1)}{VF5 - VF6} \right|$$

5. Voltage Gain VG

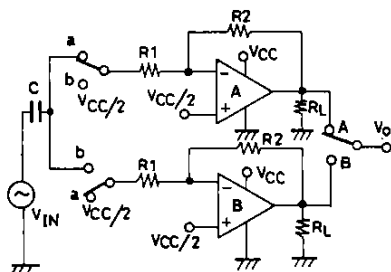


$$VG = \frac{(EK1 - EK2)(1 + R2/R1)}{VF8 - VF7}$$

6. Supply Voltage Rejection SVR



7. Channel Separation CS



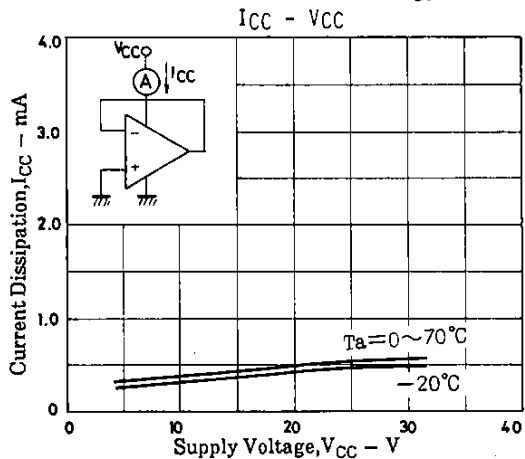
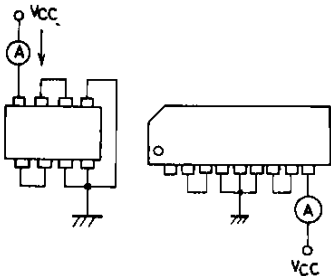
SW : a

$CS(A \rightarrow B) + 20 \log \frac{R_2 V_{OA}}{R_1 V_{OB}}$

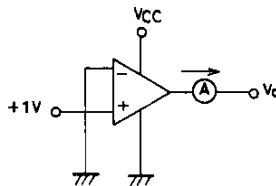
SW : b

$CS(B \rightarrow A) + 20 \log \frac{R_2 V_{OB}}{R_1 V_{OA}}$

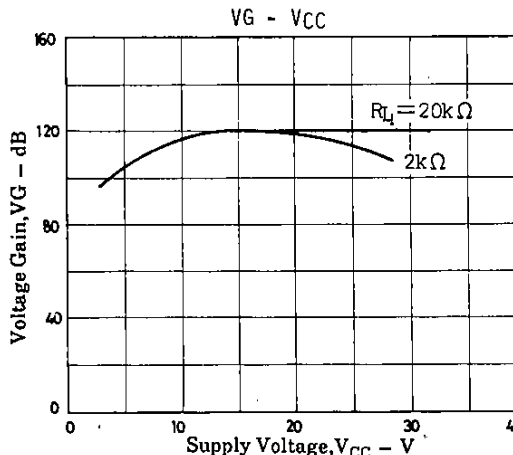
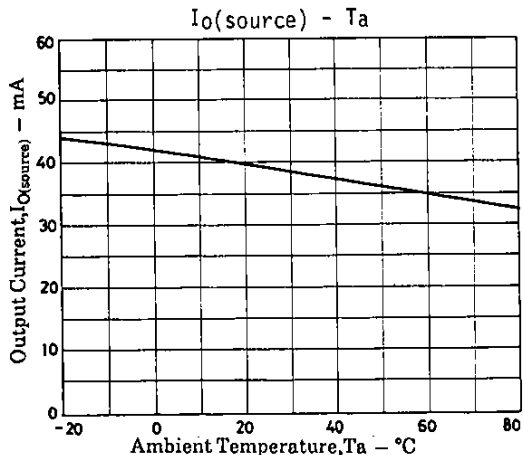
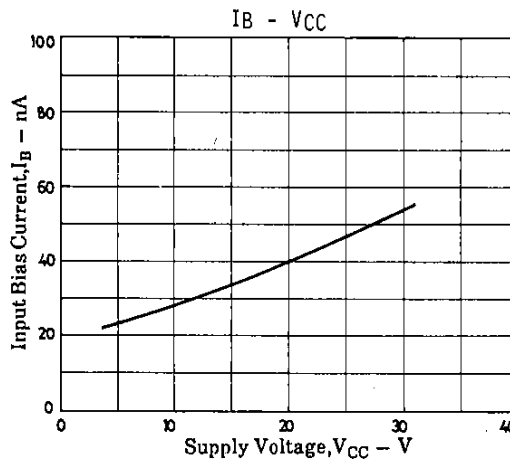
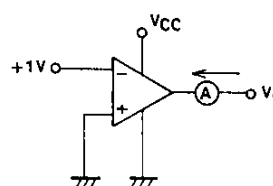
8. Current Dissipation I_{CC}

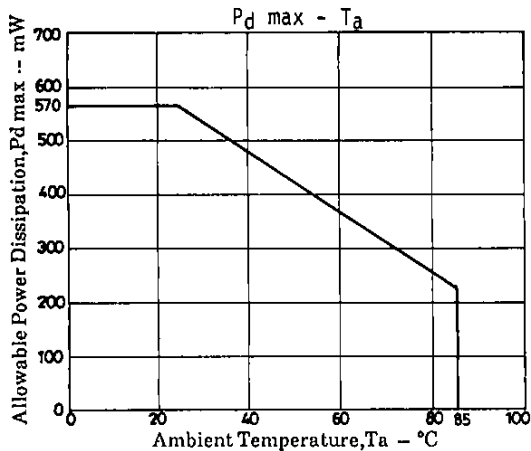
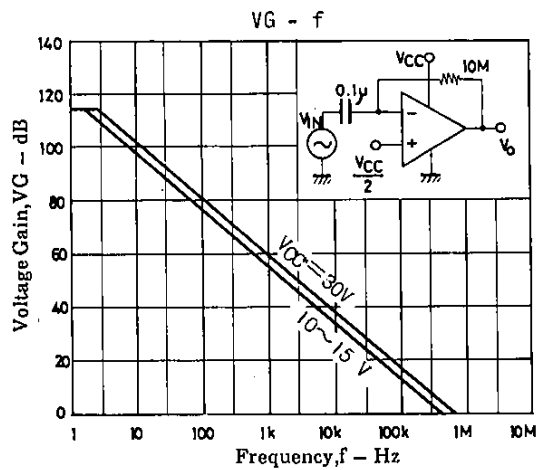
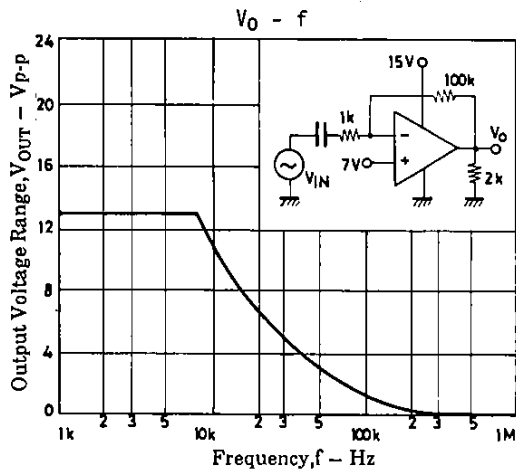


9. Output Current I_{O source}



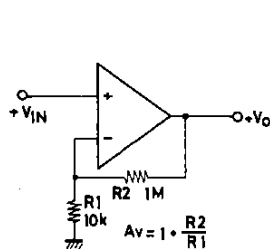
10. Output Current I_{O sink}



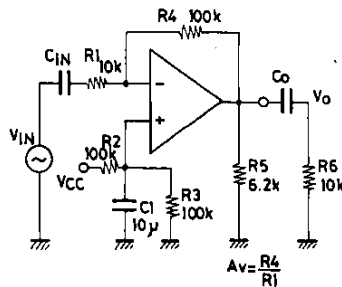


Sample Application Circuits

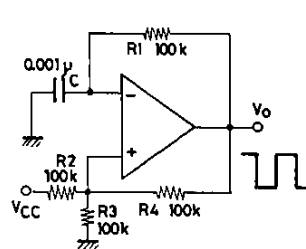
Noninverting DC amplifier



Inverting AC amplifier



Rectangular wave oscillator



Unit (resistance:Ω capacitance:F)

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