Ordering number: ENN5234A

Monolithic Linear IC

LA6358N, 6358NS, 6358NM, 6358NT

High-Performance Dual Operational Amplifiers

Overview

The LA6358 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.

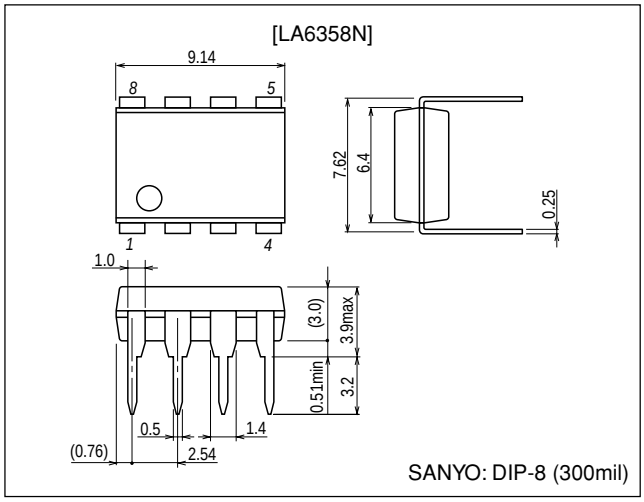
Features

- Eliminates need for phase compensation
- Wide range of operating supply voltage:
  3.0 to 30.0 V (single power supply)
  ±1.5 to ±15.0 V (dual power supply)
- Input voltage swingable down to nearly ground level and output voltage range V_{OUT} of 0 to V_{CC} – 1.5 V
- Low current dissipation:
  I_{CC} = 0.5 mA typ/V_{CC} = +5 V, R_L = ∞
- Miniflat package permitting the LA6358NM-applied sets to be made small

Package Dimensions

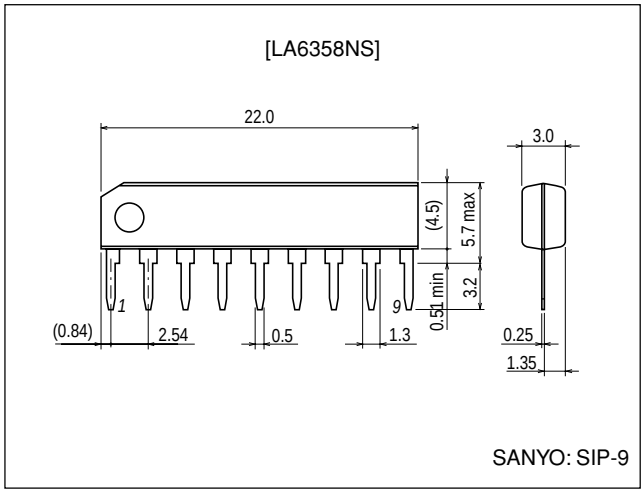
unit: mm

3001C



unit: mm

3017D

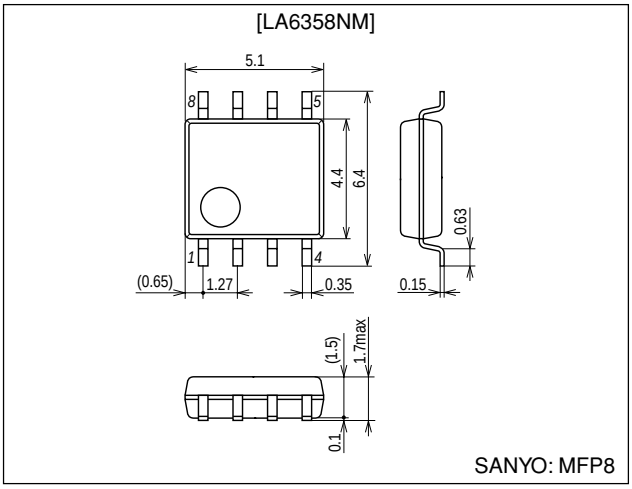


SANYO Electric Co.,Ltd. Semiconductor Company
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

Package Dimensions

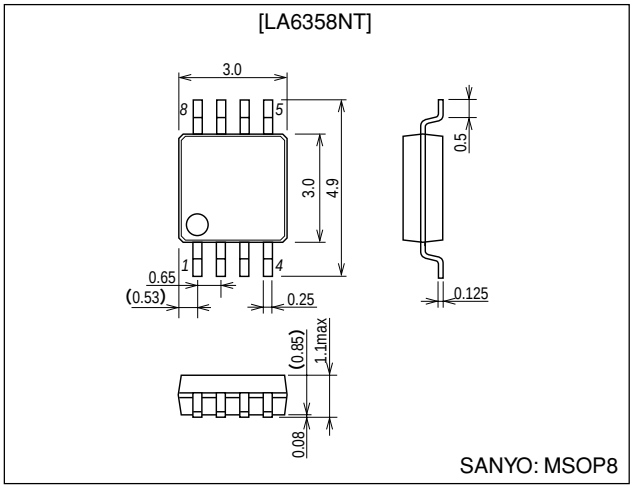
unit: mm

3032C



unit: mm

3245A



Specifications

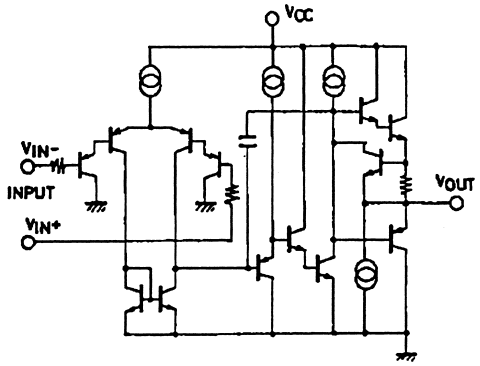
Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions		Ratings	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	Pd max	Ta ≤ 25°C	LA6358N, 6358NS	570	mW
		Ta ≤ 25°C	LA6358NM	300	mW
		Ta ≤ 25°C	LA6358NT	170	mW
Operating Temperature	Topr			–30 to +85	°C
Storage Temperature	Tstg			–55 to +125	°C

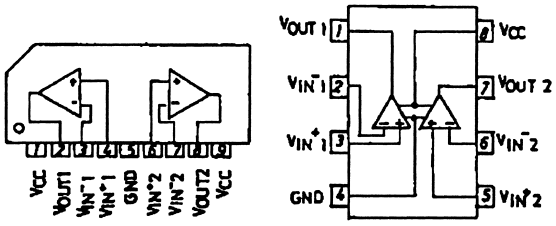
Operating Characteristics at Ta = 25°C, V_{CC} = +5 V

Parameter	Symbol	Conditions	Test Circuit	Ratings			Unit
				min	typ	max	
Input Offset Voltage	V_{IO}		1		±2	±7	mV
Input Offset Current	I_{IO}	$I_{IN}(+)/I_{IN}(-)$	6		±5	±50	nA
Input Bias Current	I_B	$I_{IN}(+)/I_{IN}(-)$	4, 5		45	250	nA
Common-Mode Input Voltage Range	V_{ICM}		3	0		V_{CC}–1.5	V
Common-Mode Rejection Ratio	CMRR		3	65	80		dB
Large Signal Voltage Gain	VG	V_{CC} = 15 V, R_L ≥ 2 kΩ		25	100		V/mV
Output Voltage Range	V_O		2	0		V_{CC}–1.5	V
Power Supply Rejection Ratio	SVRR		1	65	100		dB
Channel Separation	CS	f = 1 k to 20 kHz	9		120		dB
Current Dissipation	I_{CC}		7		0.5	1.2	mA
Output Current (Source)	$I_{O\ source}$	V_{IN+} = 1 V, V_{IN-} = 0 V	10	20	40		mA
Output Current (Sink)	$I_{O\ sink}$	V_{IN+} = 0 V, V_{IN-} = 1 V	11	10	20		mA

Equivalent Circuit



Pin Assignment

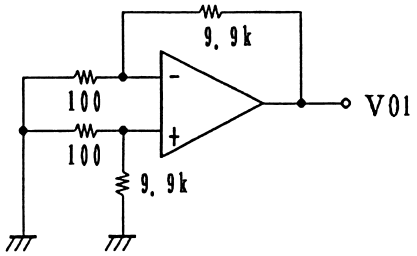


LA6358NS

LA6358N
LA6358NM
LA6358NT

Test Circuits

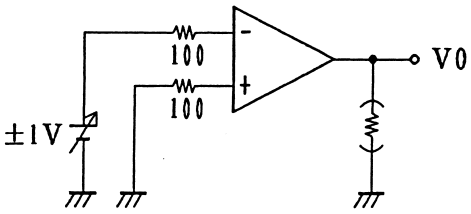
1. VIO, SVRR



VIO VCC/VEE=±15V

$$SVRR\begin{cases}VCC=15V,\ 5V\\VEE=-5V,\ -15V\end{cases}$$

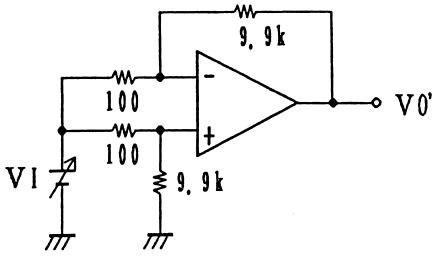
2. VO



$$VIO=VO1/100$$

$$\left.\begin{matrix}SVR(+)\\SVR(-)\end{matrix}\right\}=\left|\frac{\triangle VO1}{100\times10V}\right|$$

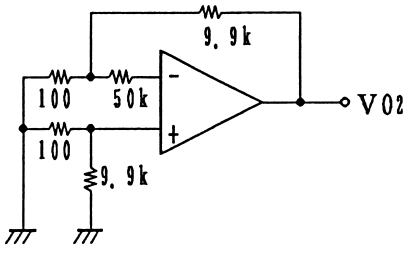
3. CMRR, VICM



CMRR VI=±7.5V

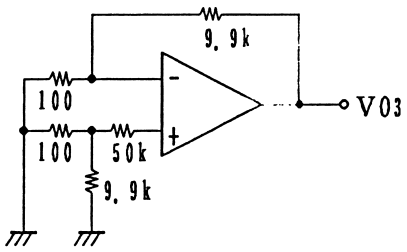
$$CMR=20\log\frac{15\times100}{|\triangle VO'|}$$

4. I B (+)



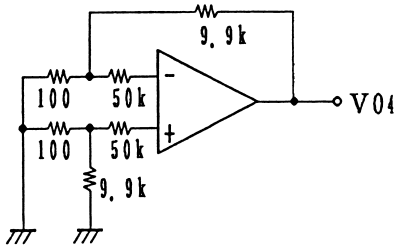
$$IB(+)=\frac{|VO2-VO1|}{50k\times100}$$

5. I B (–)



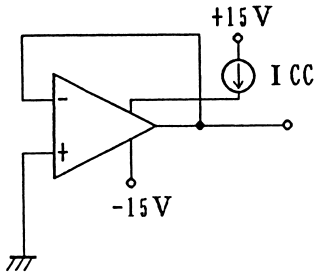
$$I_{B(-)} = \frac{|V_{03} - V_{01}|}{50k \times 100}$$

6. I IO

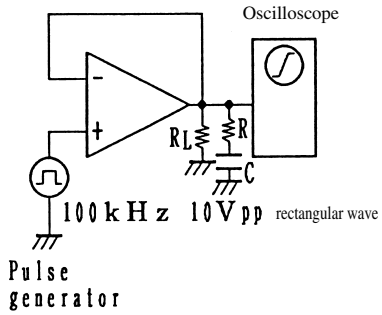


$$I_{IO} = \frac{|V_{04} - V_{01}|}{50k \times 100}$$

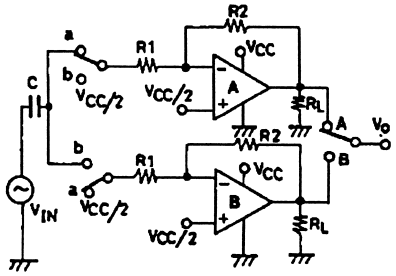
7. I CC



8. SR



9. Channel Separation CS



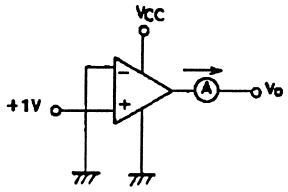
SW : a

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

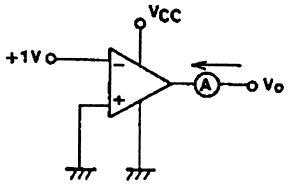
SW : b

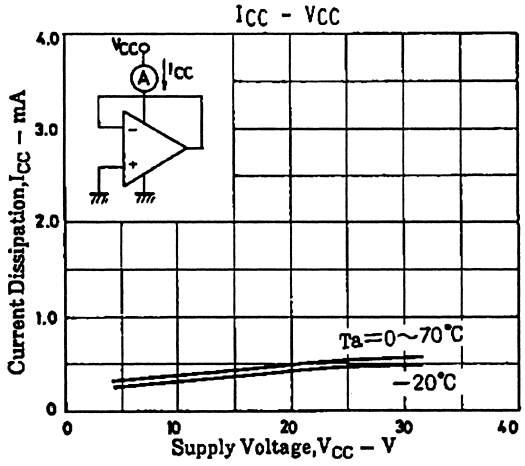
$$CS(B \rightarrow A) + 20\log \frac{R_2 V_{OB}}{R_1 V_{OA}}$$

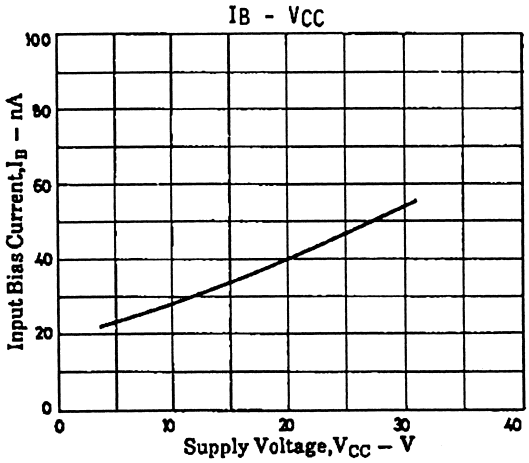
10. Output Current $I_{O\ source}$

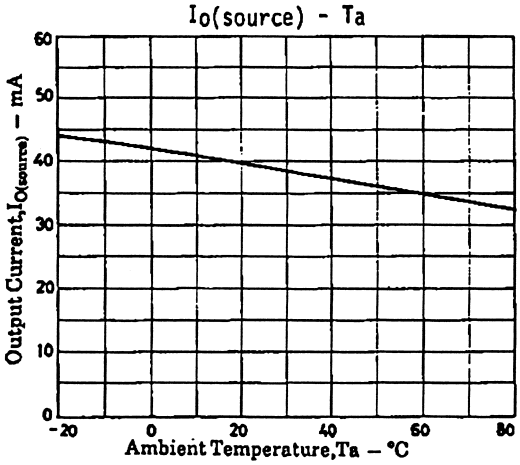


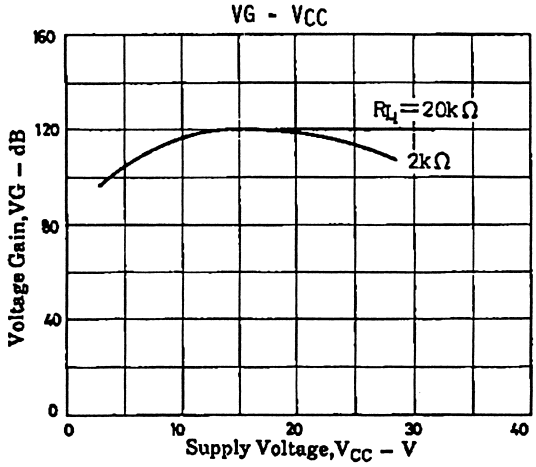
11. Output Current $I_{O\ sink}$

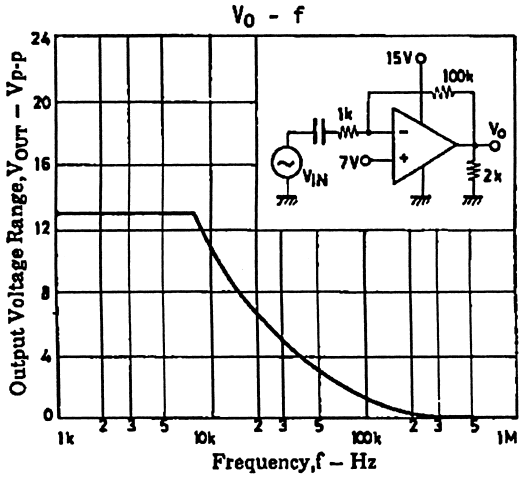


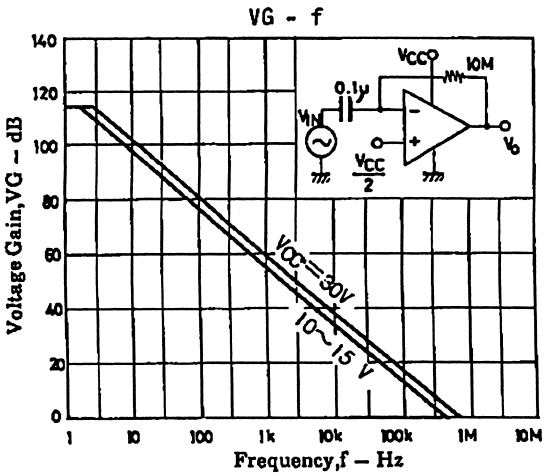

ICC - VCC
Current Dissipation, ICC – mA
Supply Voltage, VCC – V
Ta=0~70°C
–20°C
VCC
ICC
A


IB - VCC
Input Bias Current, IB – nA
Supply Voltage, VCC – V


IO(source) - Ta
Output Current, IO(source) – mA
Ambient Temperature, Ta – °C

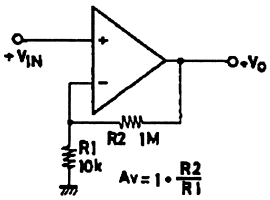

VG - VCC
Voltage Gain, VG – dB
Supply Voltage, VCC – V
RL=20kΩ
2kΩ


VO - f
Output Voltage Range, VOUT – Vp-p
Frequency, f – Hz
15V
100k
1k
7V
VIN
VO
2k

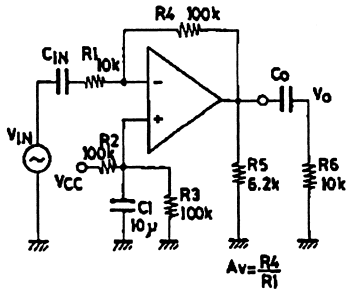

VG - f
Voltage Gain, VG – dB
Frequency, f – Hz
VCC
10M
0.1μ
VIN
VO
VCC/2
VCC=30V
10~15V

Sample Application Circuits

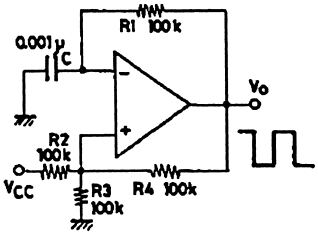
Noninverting DC amplifier



Inverting AC amplifier



Rectangular wave oscillator



Unit (resistance: Ω, capacitance: F)