T-79-05-20

LA6358, 6358S

3001A 3017B

Monolithic Linear IC

High-Performance Dual Operational Amplifier

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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 supplies)
- 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./R_L=∞

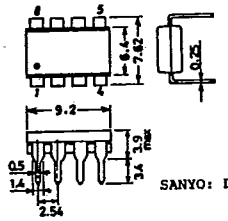
Maximum Ratings at T_a=25°C

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≦25°C	570	mW
Operating Temperature	Topg		-20 to +85	°C
Storage Temperature	Tstg		-55 to +125	°C

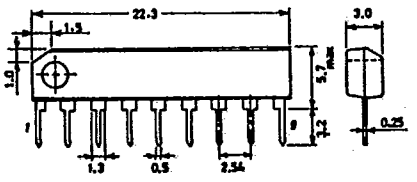
Operating Characteristics at T_a=25°C, V_{CC}=+5V

			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
Common-mode Rejection Ratio	CMR		4	65	80		dB
Large signal voltage gain	VG	V_{CC}=15V, R_L≧2kohms	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 to 20kHz	7		120		dB
Current Dissipation	I_{CC}		8		0.5	1.2	mA
Output Current (Source)	$I_{Osource}$	V_{IN+}=1V, V_{IN-}=0V	9	20	40		mA
Output Current (Sink)	I_{Osink}	V_{IN+}=0V, V_{IN-}=1V	10	10	20		mA

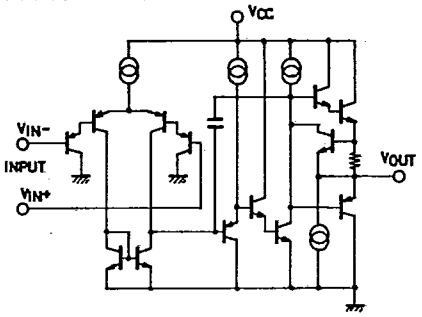
Case Outline 3001A-D8IC [LA6358]
(unit:mm)

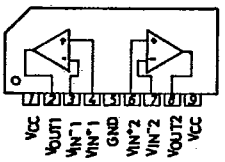


Case Outline 3017B-S9IC
(unit:mm) [LA6358S]

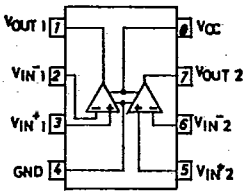


Equivalent Circuit





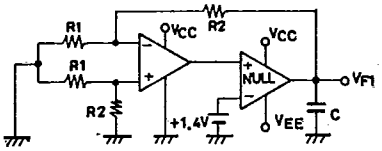
LA6358S



LA6358

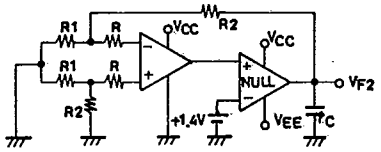
Test Circuits

1 Input Offset Voltage V_{IO}



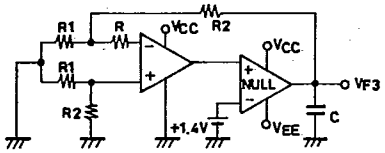
$$V_{IO} = \frac{V_{F1}}{1 + R2/R1}$$

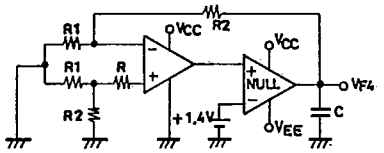
2 Input Offset Current I_{IO}



$$I_{IO} = \frac{V_{F2} - V_{F1}}{R\,(1 + R2/R1)}$$

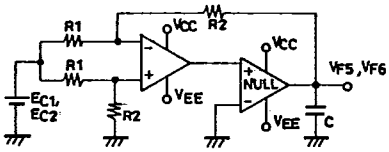
3 Input Bias Current I_B





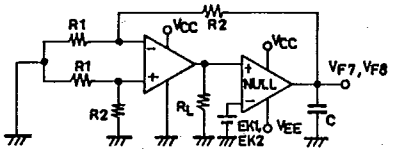
$$I_B = \frac{V_{F4} - V_{F3}}{2R\,(1 + R2/R1)}$$

4 Common-mode rejection ratio CMR
Input common-mode voltage range V_{ICM}



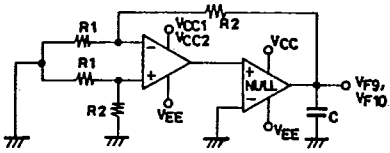
$$CMR = 20 \log \left| \frac{(E_{C1} - E_{C2})(1 + R2/R1)}{V_{F5} - V_{F6}} \right|$$

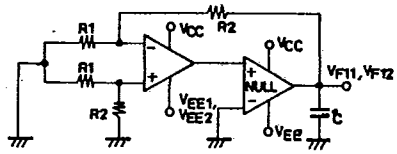
5 Voltage Gain VG



$$VG = \frac{(E_{K1} - E_{K2})(1 + R2/R1)}{V_{F8} - V_{F7}}$$

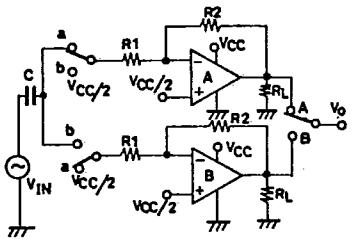
6 Supply Voltage Rejection SVR





$$SVR(+) = 20 \log \left| \frac{(1 + R2/R1)(V_{CC1} - V_{CC2})}{V_{F9} - V_{F10}} \right| \qquad SVR(-) = 20 \log \left| \frac{(1 + R2/R1)(V_{EE1} - V_{EE2})}{V_{F11} - V_{F12}} \right|$$

7-Channel Separation CS



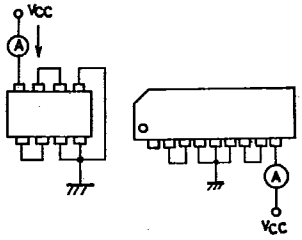
SW : a

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

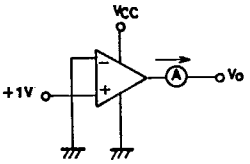
SW : b

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

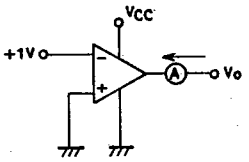
8 Current Dissipation I_{CC}

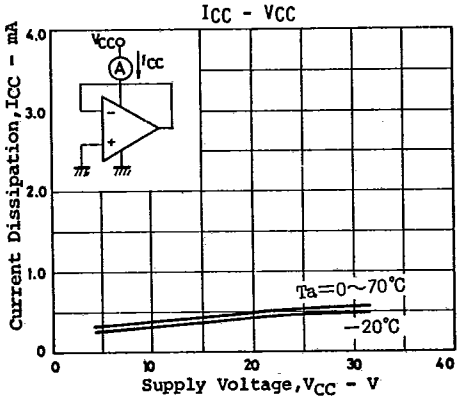


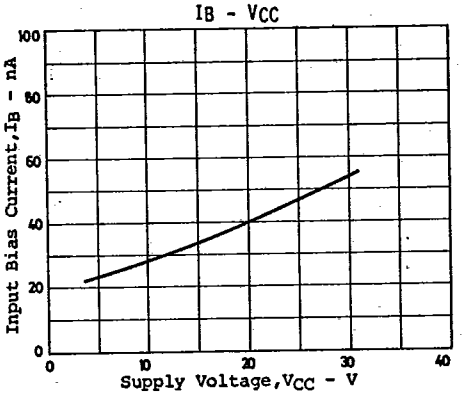
9 Output Current I_O source

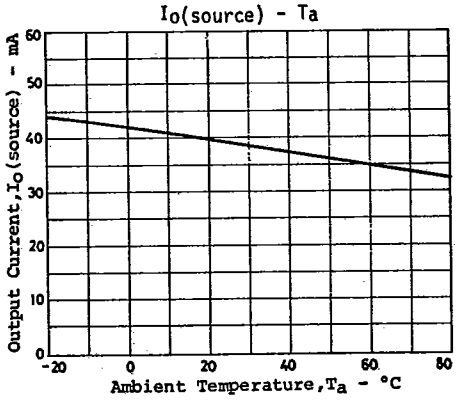


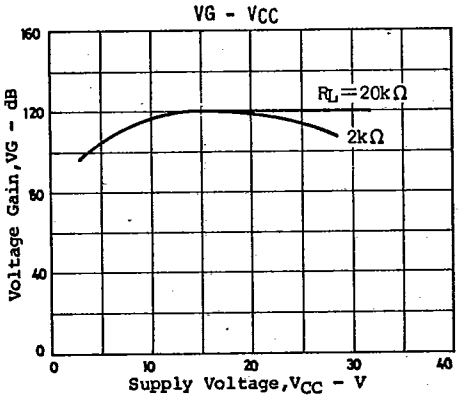
10 Output Current I_O sink



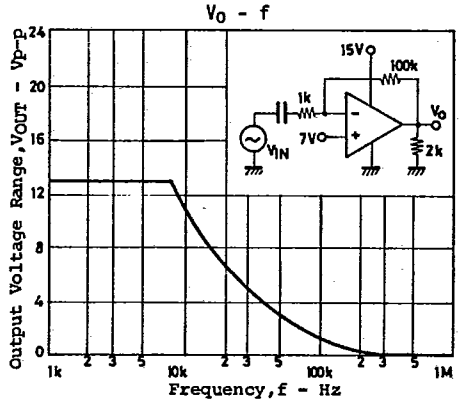




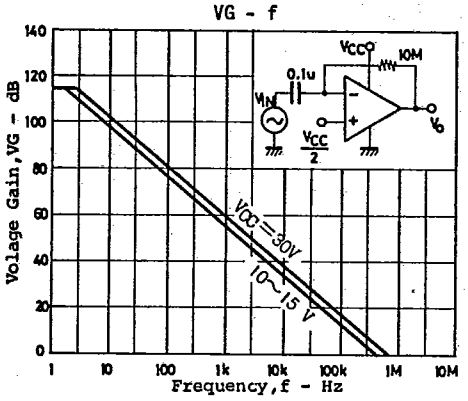




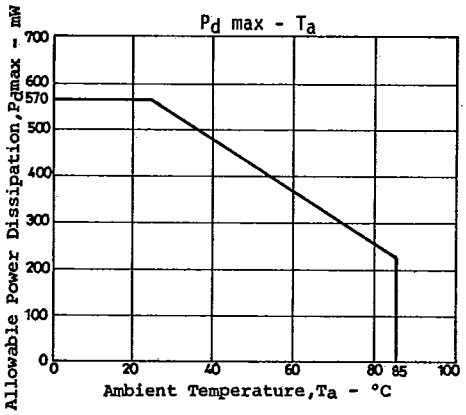
V_O - f



VG - f

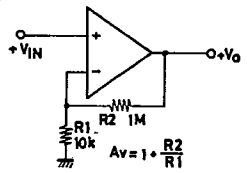


P_d max - T_a

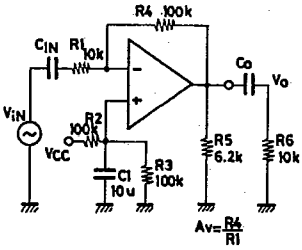


Application Circuits:

Noninverting DC amplifier



Inverting AC amplifier



Rectangular wave oscillator