Ordering number : EN5234D

LA6358N
LA6358NS

ON Semiconductor®

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Monolithic Linear IC

High-Performance Dual Operational Amplifiers

Overview

The LA6358 is a high-performance dual operational amplifier that can operate from a single voltage power supply. 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 LA6358NT can be used in a wide range of industrial applications as a transducer amplifier for all types of transducers, as a DC amplifier circuit, and for other purposes as well.

Functions

- Eliminates need for phase compensation
- Wide range of operating supply voltage: 3.0V 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 = ∞

Specifications

Maximum Ratings at Ta = 25°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 LA6358N, 6358NS	570	mW
Operating temperature	Topr		-30 to +85	°C
Storage temperature	Tstg		-55 to +125	°C

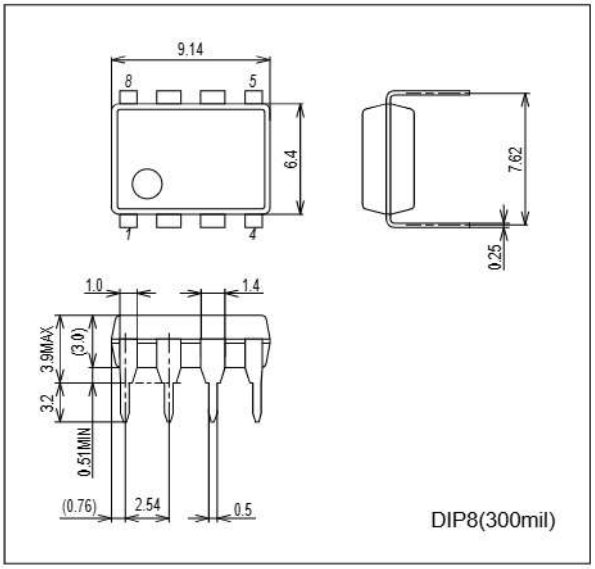
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Electrical Characteristics at Ta = 25°C, V_{CC} = 5.0V, Otherwise unless specified.

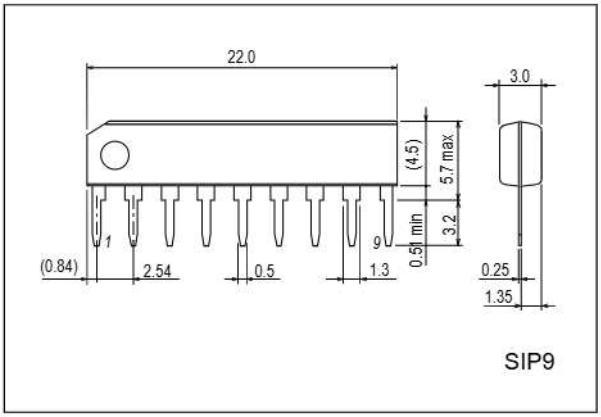
Parameter	Symbol	Conditions	Test Circuit	Ratings			Unit
				min	typ	max	
Input offset voltage	V_{IO}		1		±2	±7	mV
Input offset current	I_{IO}	I_{IN} (+)/I_{IN} (-)	2		±5	±50	nA
Input bias current	I_B	I_{IN} (+)/I_{IN} (-)	3		45	250	nA
Common-mode input voltage range	VICM		4	0		V_{CC}-1.5	V
Common-mode rejection ratio	CMR		4	65	80		dB
Large-amplitude voltage gain	VG	V_{CC} = 15V, R_L ≥ 2kΩ	5	25	100		V/mV
Output voltage range	V_{OUT}			0		V_{CC}-1.5	V
Supply voltage rejection ratio	SVR		6	65	100		dB
Channel separation		f = 1kHz to 20kHz	7		120		dB
Current drain	I_{CC}		8		0.5	1.2	mA
Output current (source)	I_O source	V_{IN}+ = 1V, V_{IN}- = 0V	9	20	40		mA
Output current (sink)	I_O sink	V_{IN}+ = 0V, V_{IN}- = 1V	10	10	20		mA

Package Dimensions

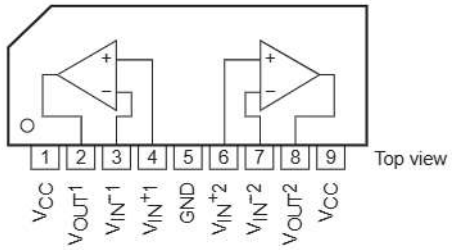
unit : mm (typ)
3001D [LA6358N]



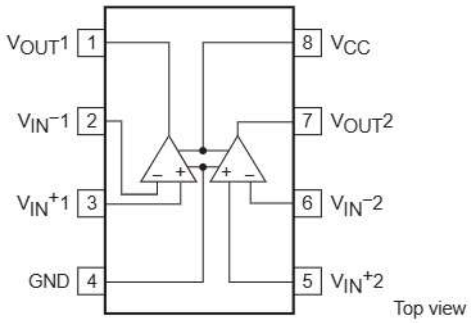
unit : mm (typ)
3017D [LA6358NS]



Pin Assignment

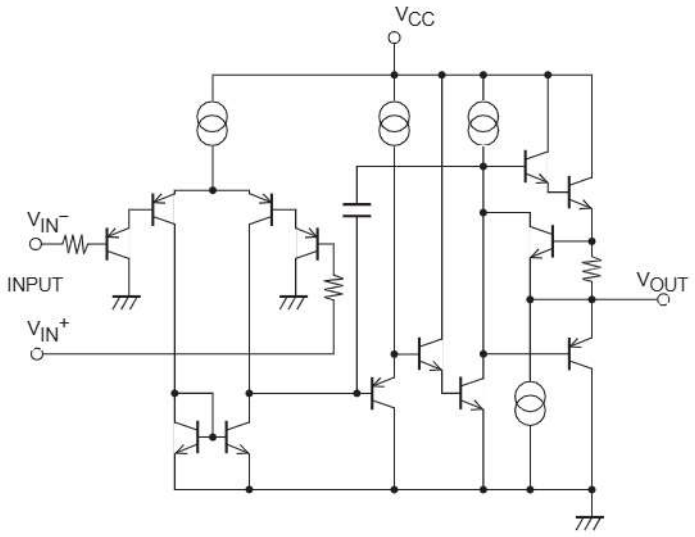


[LA6358NS]



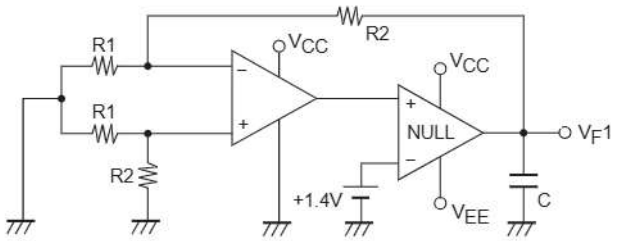
[LA6358N, 6358NM, 6358NT]

Equivalent Circuit



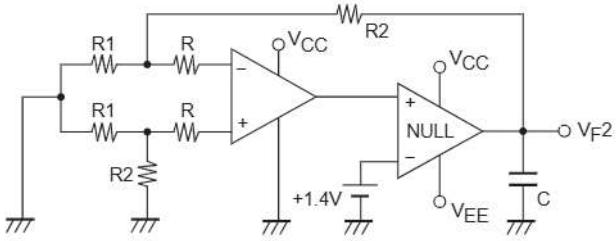
Test Circuits

1. V_{IO}



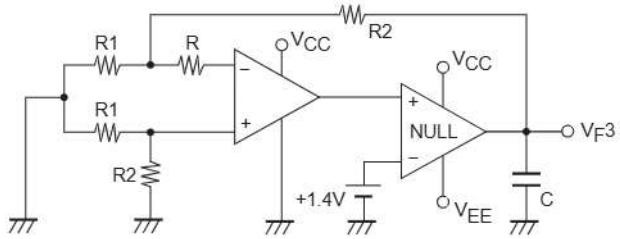
$$V_{IO} = \frac{V_F1}{1+R2 / R1}$$

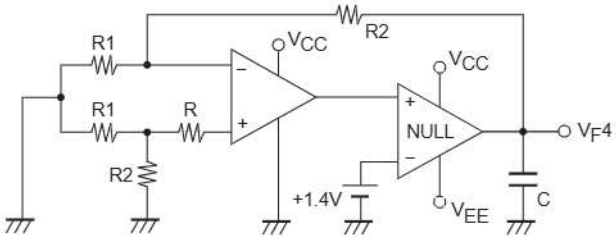
2. I_{IO}



$$I_{IO} = \frac{V_F2-V_F1}{R(1+R2 / R1)}$$

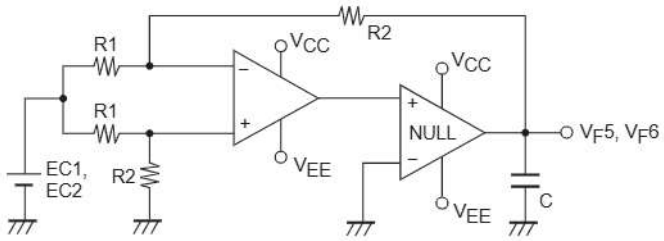
3. I_B





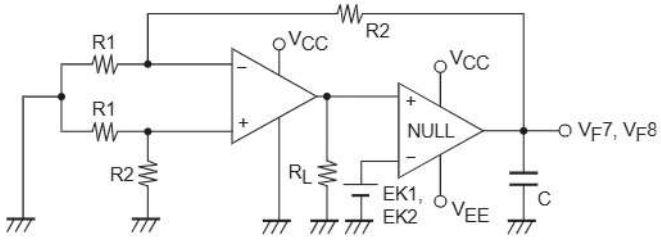
$$I_B = \frac{V_F4-V_F3}{2R(1+R2 / R1)}$$

4. CMR, V_{ICM}



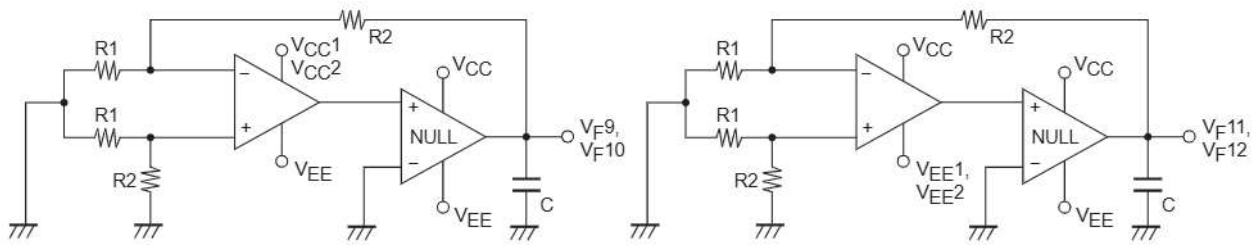
$$CMR=20 \log \left| \frac{(E_C1-E_C2)(1+R2 / R1)}{V_F5-V_F6} \right|$$

5. VG



$$VG= \frac{(E_K1-E_K2)(1+R2 / R1)}{V_F8-V_F7}$$

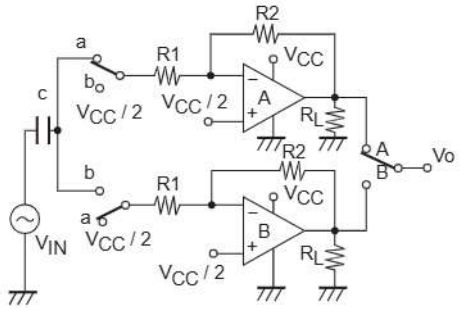
6. SVR



$$SVR(+)=20\log\left|\frac{(1+R2/R1)(V_{CC}1-V_{CC}2)}{V_F9-V_F10}\right|$$

$$SVR(-)=20\log\left|\frac{(1+R2/R1)(V_{EE}1-V_{EE}2)}{V_F11-V_F12}\right|$$

7. CS



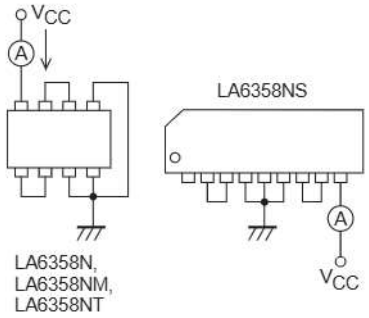
SW : a

$$CS(A\rightarrow B)=20\log\frac{R2\ V_{OA}}{R1\ V_{OB}}$$

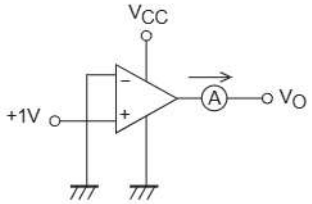
SW : b

$$CS(B\rightarrow A)=20\log\frac{R2\ V_{OB}}{R1\ V_{OA}}$$

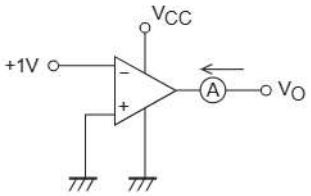
8. I_{CC}

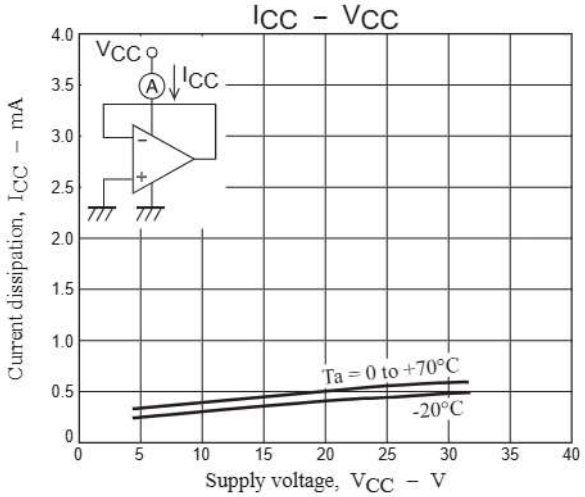


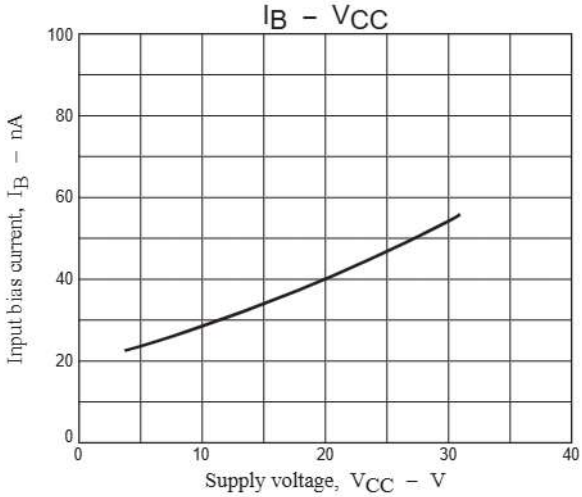
9. I_O source

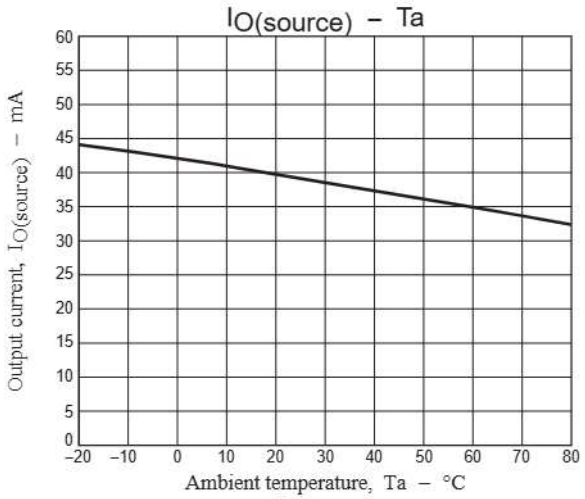


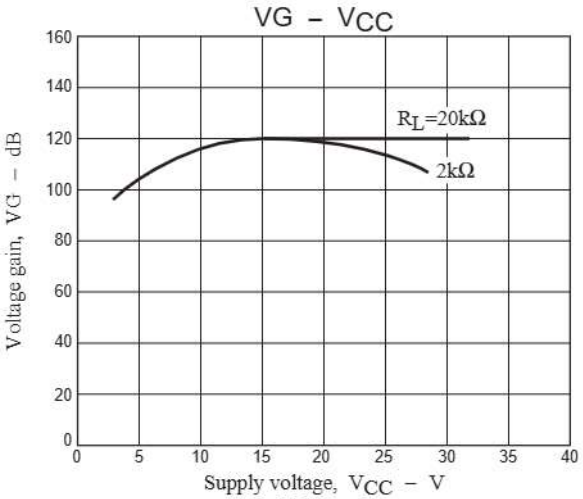
10. I_O sink

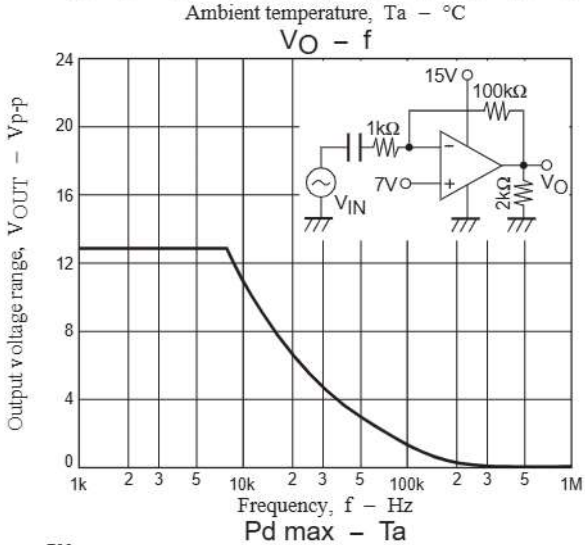


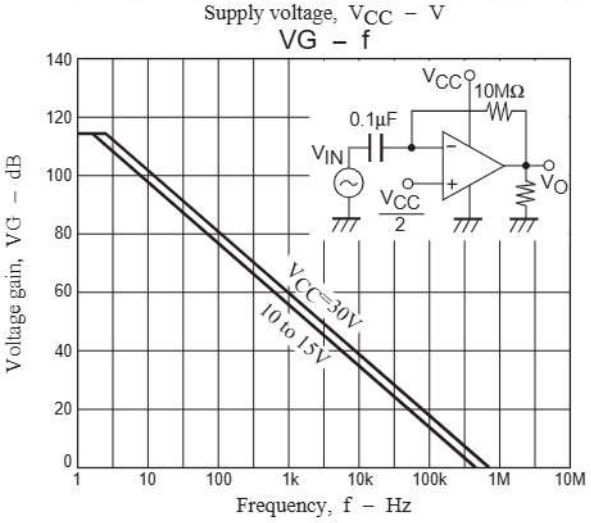


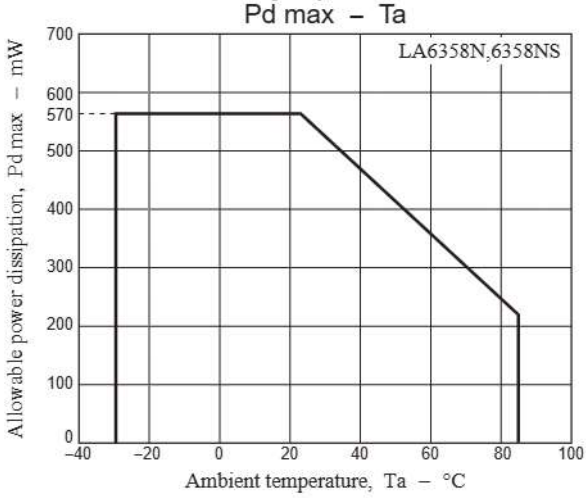



IO(source) – Ta
Output current, IO(source) – mA
Ambient temperature, Ta – °C


VG – VCC
RL=20kΩ
2kΩ
Voltage gain, VG – dB
Supply voltage, VCC – V

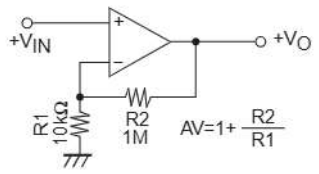

VO – f
15V
100kΩ
1kΩ
7V
VIN
2kΩ
VO
Output voltage range, VOUT – Vp-p
Frequency, f – Hz


VG – f
VCC
10MΩ
0.1μF
VIN
VCC
2
VO
VCC=30V
10 to 15V
Voltage gain, VG – dB
Frequency, f – Hz

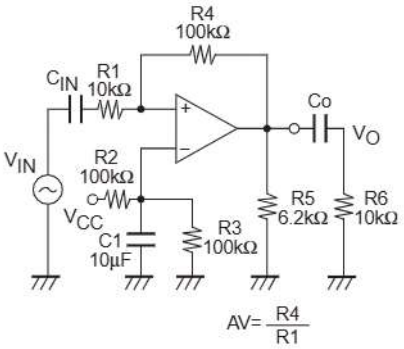

Pd max – Ta
LA6358N,6358NS
Allowable power dissipation, Pd max – mW
Ambient temperature, Ta – °C

Sample Application Circuits

Noninverting DC amplifier



Inverting AC amplifier



Rectangular wave oscillator