Ordering number : EN5234D

SANYO Semiconductors
DATA SHEET

LA6358N,6358NS, LA6358NM,6358NT — 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
		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

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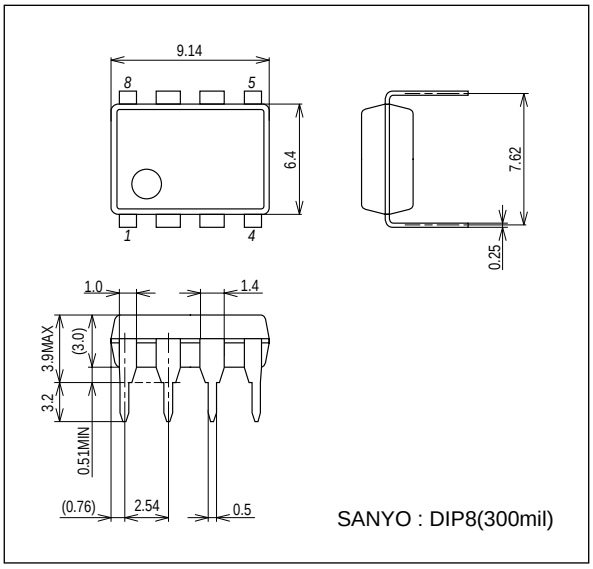
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Electrical Characteristics at Ta = 25°C, V_{CC} = 5.0V, Otherwise unless specified.

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

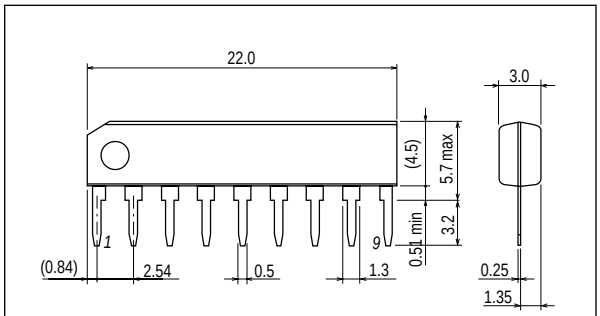
Package Dimensions

unit : mm (typ)
3001D [LA6358N]



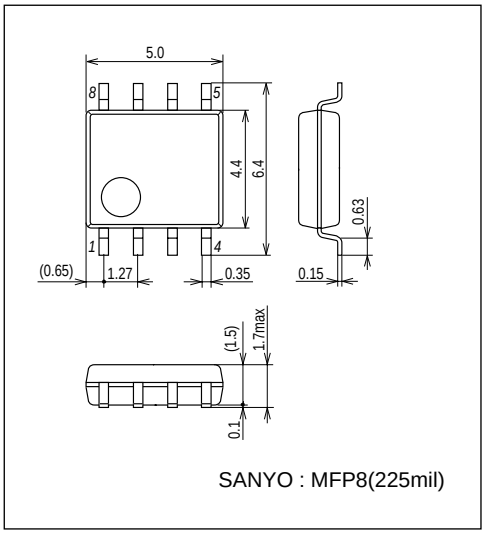
SANYO : DIP8(300mil)

unit : mm (typ)
3017D [LA6358NS]



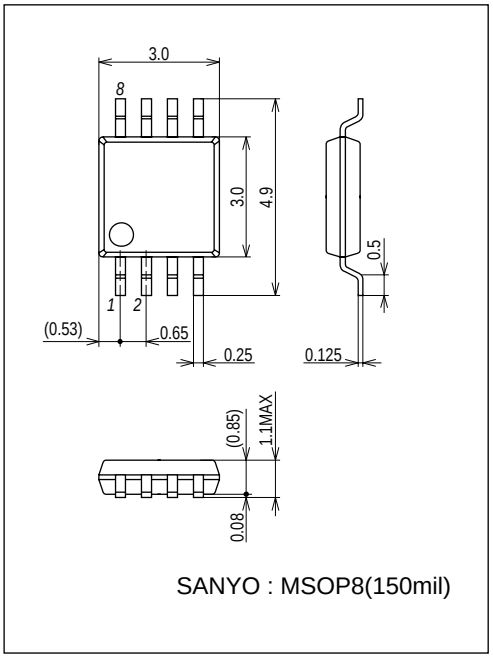
SANYO : SIP9

unit:mm (typ)
3032D [LA6358NM]



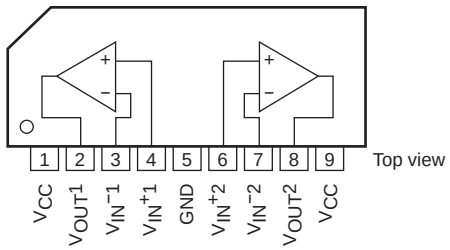
SANYO : MFP8(225mil)

unit:mm (typ)
3245B [LA6358NT]

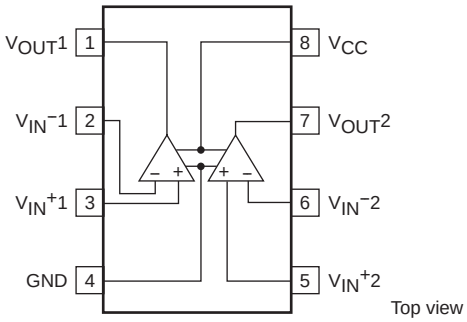


SANYO : MSOP8(150mil)

Pin Assignment

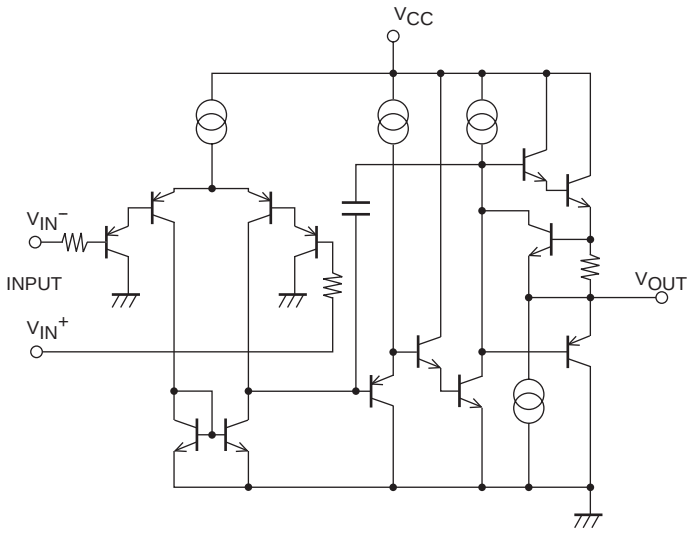


[LA6358NS]



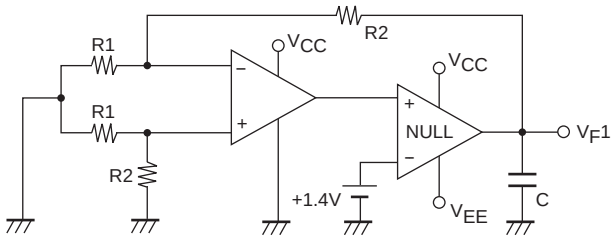
[LA6358N, 6358NM, 6358NT]

Equivalent Circuit



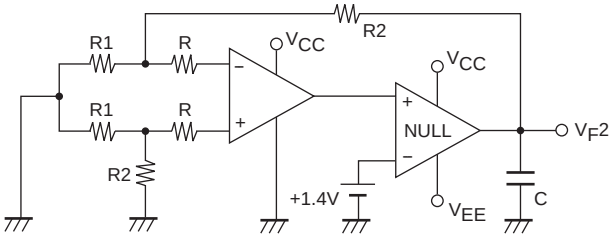
Test Circuits

1. V_{IO}



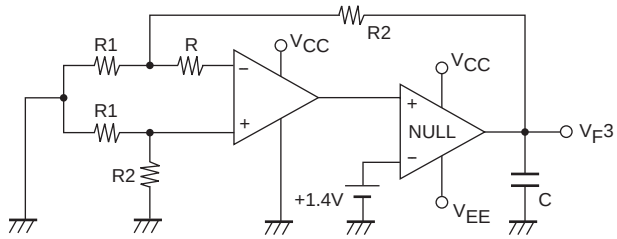
$$V_{IO} = \frac{V_F1}{1+R2 / R1}$$

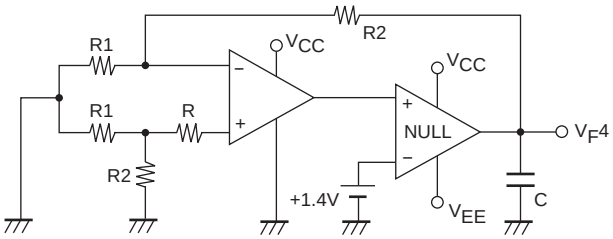
2. I_{IO}



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

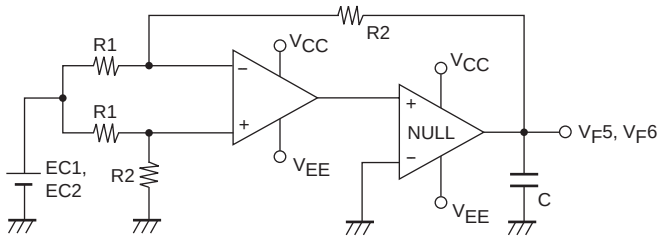
3. I_B





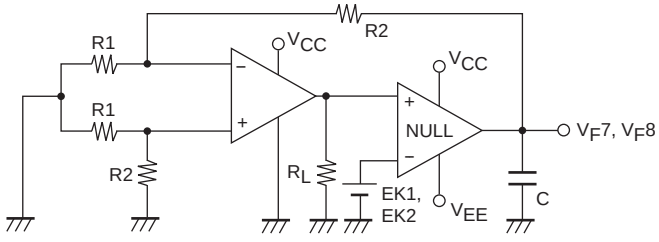
$$I_B = \frac{V_F4-V_F3}{2R(1+R2 / R1)}$$

4. CMR, V_{ICM}



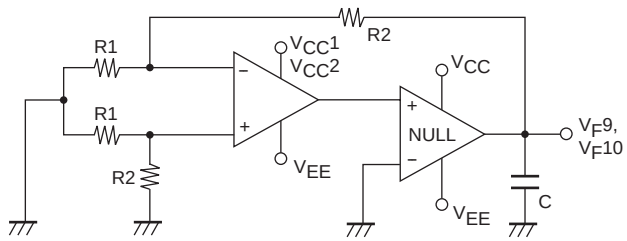
$$CMR=20 \log \left| \frac{(E_C1-E_C2)(1+R2 / R1)}{V_F5-V_F6} \right|$$

5. VG

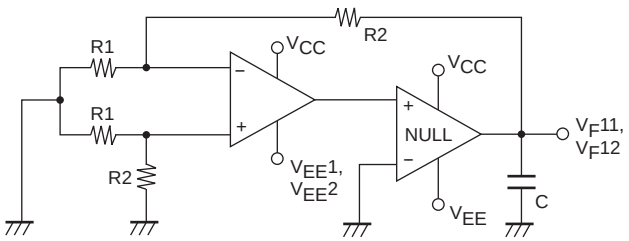


$$VG= \frac{(E_K1-E_K2)(1+R2 / R1)}{V_F8-V_F7}$$

6. SVR

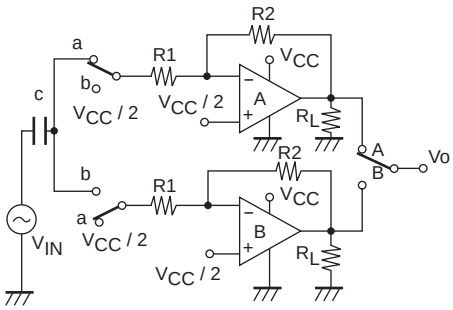


$$SVR(+)=20\log\left|\frac{(1+R2/R1)(V_{CC}1-V_{CC}2)}{V_F9-V_F10}\right|$$



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

7. CS



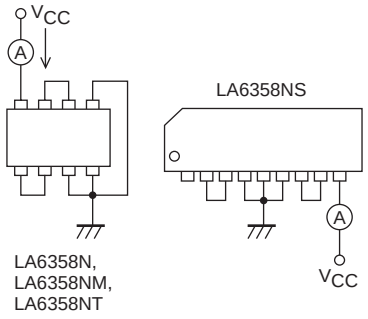
SW : a

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

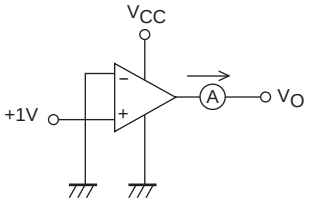
SW : b

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

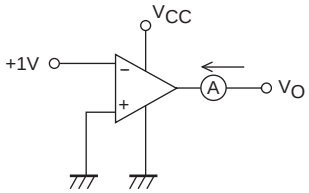
8. I_{CC}

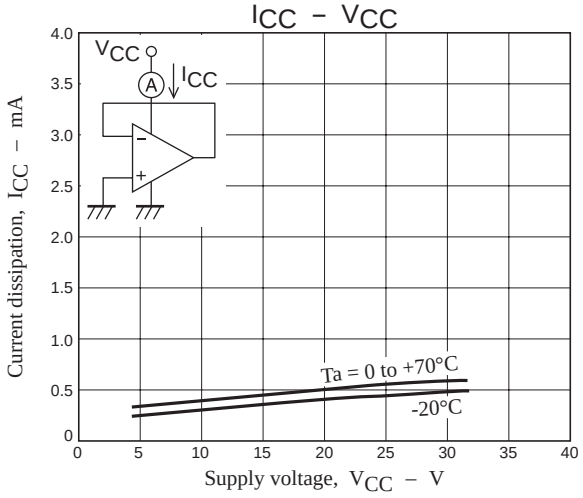


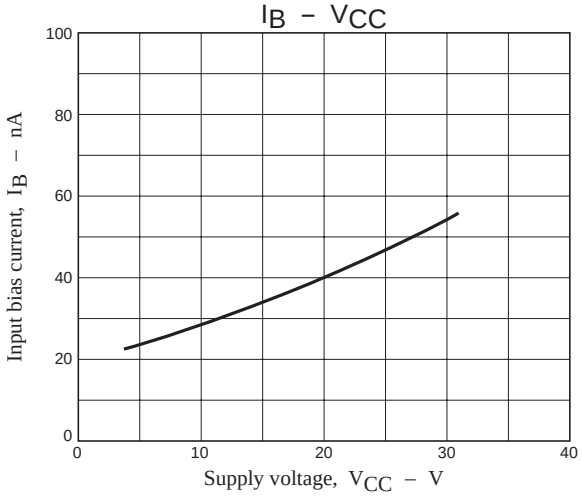
9. I_O source



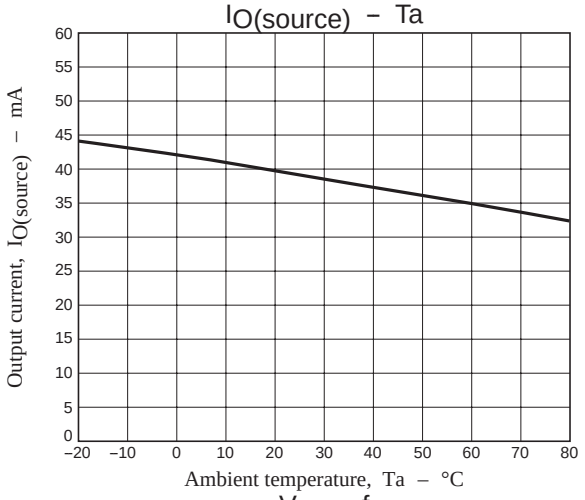
10. I_O sink



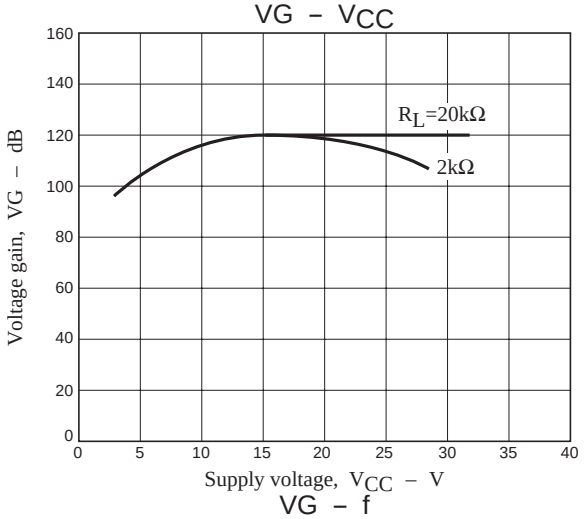




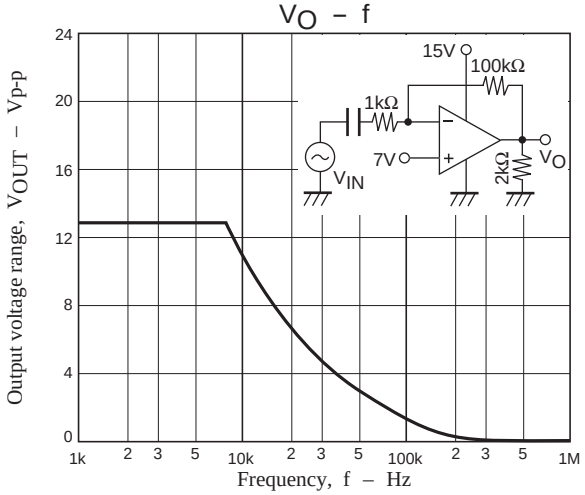
$I_{O(source)}$ – Ta



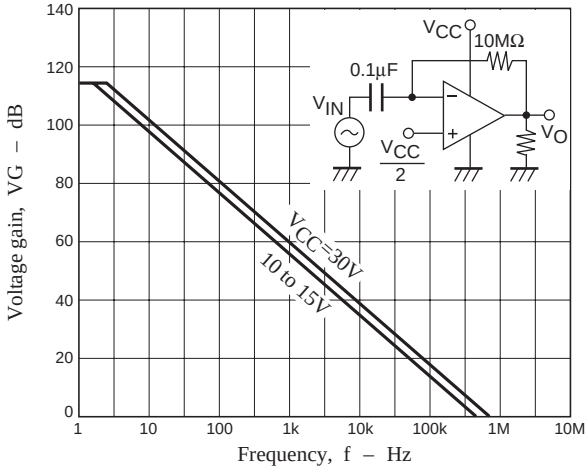
VG – V_{CC}



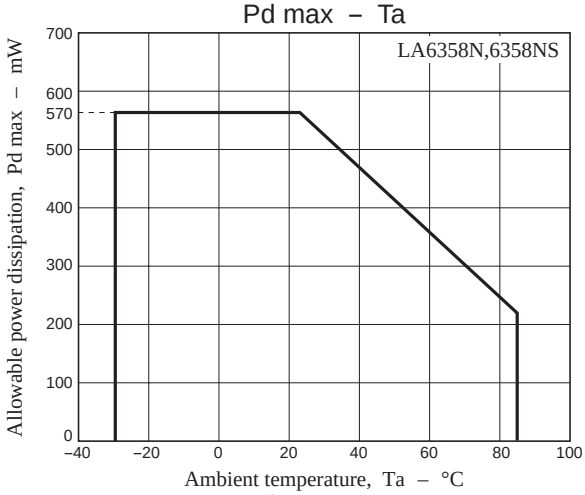
V_O – f



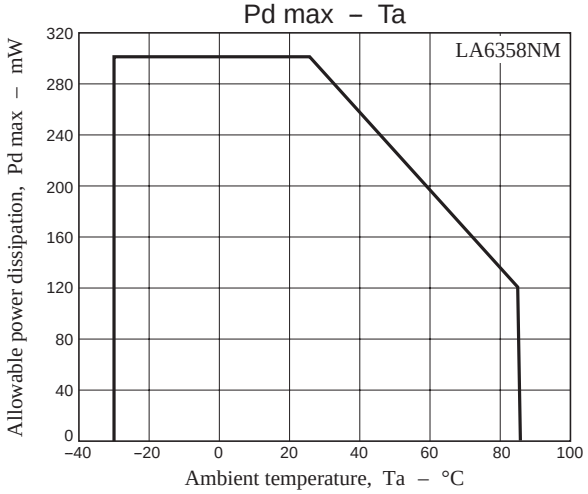
VG – f



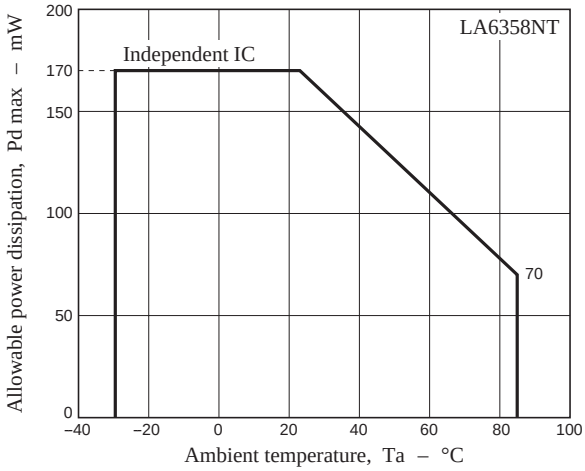
Pd max – Ta



Pd max – Ta

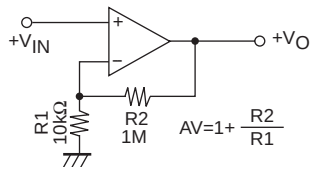


Pd max – Ta

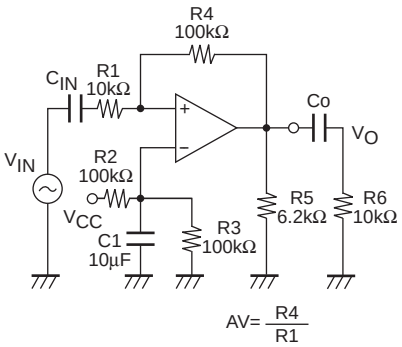


Sample Application Circuits

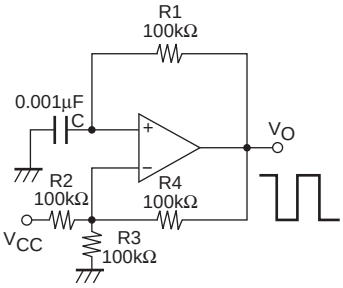
Noninverting DC amplifier



Inverting AC amplifier



Rectangular wave oscillator



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