

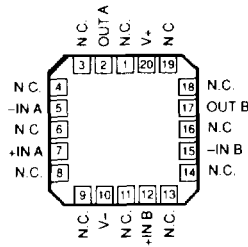
## OP271

### FEATURES

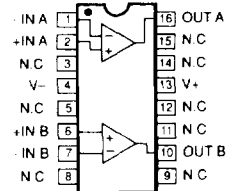
- Excellent Speed:** 8.5 V/ $\mu$ s typ
- Fast Settling (0.01%):** 2  $\mu$ s typ
- Unity-Gain Stable**
- High Gain-Bandwidth:** 5 MHz typ
- Low Input Offset Voltage:** 200  $\mu$ V max
- Low Offset Voltage Drift:** 2  $\mu$ V/ $^{\circ}$ C max
- High Gain:** 400 V/mV min
- Outstanding CMR:** 106 dB min
- Industry Standard 8-Pin Dual Pinout**
- Available in Die Form**

### PIN CONNECTIONS

#### LCC (RC Suffix)



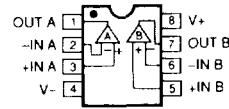
#### 16-Pin SOL (S Suffix)



NC = NO CONNECT

#### Epoxy Mini-DIP (P Suffix)

#### 8-Pin Hermetic DIP (Z Suffix)



### GENERAL DESCRIPTION

The OP271 is a unity-gain stable monolithic dual op amp featuring excellent speed, 8.5 V/ $\mu$ s typical, and fast settling time, 2  $\mu$ s typical to 0.01%. The OP271 has a gain bandwidth of 5 MHz with a high phase margin of 62°.

Input offset voltage of the OP271 is under 200  $\mu$ V with input offset voltage drift below 2  $\mu$ V/ $^{\circ}$ C, guaranteed over the full military temperature range. Open-loop gain exceeds 400,000 into a 10 k $\Omega$  load ensuring outstanding gain accuracy and linearity. The input bias current is under 20 nA limiting errors due to source resistance. The OP271's outstanding CMR, over 106 dB, and low PSRR, under 5.6  $\mu$ V/V, reduce errors caused by ground noise and power supply fluctuations. In addition, the OP271 exhibits high CMR and PSRR over a wide frequency range, further improving system accuracy.

The OP271 offers outstanding dc and ac matching between channels. This is especially valuable for applications such as multiple gain blocks, high speed instrumentation and amplifiers, buffers and active filters.

The OP271 conforms to the industry standard 8-pin dual op amp pinout. It is pin compatible with the TL072, TL082, LF412, and 1458/1558 dual op amps and can be used to significantly improve systems using these devices.

For applications requiring lower voltage noise, see the OP270. For a quad version of the OP271, see the OP471.

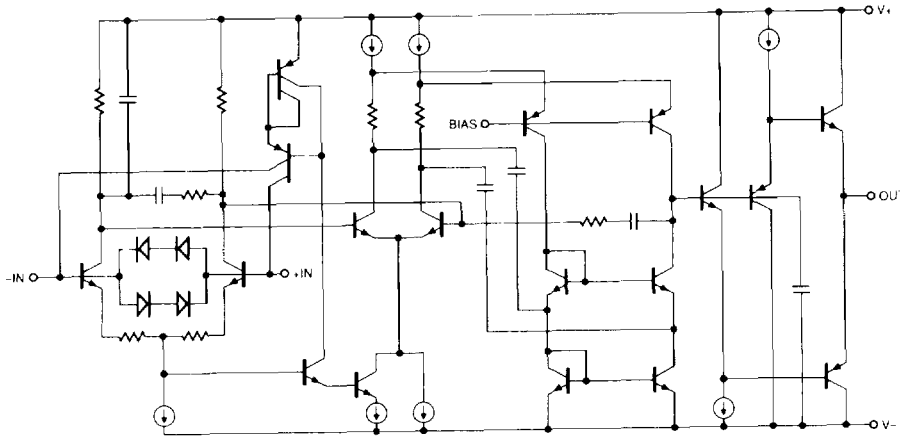


Figure 1. Simplified Schematic (One of the Two Amplifiers Is Shown.)

To obtain the most recent version or complete data sheet, call our fax retrieval system at 1-800-446-6212 or visit our World Wide Web site at <http://www.analog.com>.

# OP271—SPECIFICATIONS

## ELECTRICAL CHARACTERISTICS (@ $V_S = \pm 15\text{ V}$ , $T_A = +25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	OP271A/E			OP271F			OP271G			Units
			Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Input Offset Voltage	$V_{IO}$			75	200		150	300		200	400	$\mu\text{V}$
Input Offset Current	$I_{IO}$	$V_{CM} = 0\text{ V}$		1	10		1	15		7	20	$\text{nA}$
Input Bias Current	$I_{BI}$	$V_{CM} = 0\text{ V}$		1	20		6	40		12	60	$\text{nA}$
Input Noise Voltage Density	$e_n$	$f_n = 1\text{ kHz}$		7.6			7.6			7.6		$\text{nV}/\sqrt{\text{Hz}}$
Large-Signal Voltage Gain	$A_{VOL}$	$R_L = 10\text{ k}\Omega$	400	650		300	500		250	400		$\text{V}/\text{mV}$
		$R_L = 2\text{ k}\Omega$	300	500		200	300		175	250		$\text{V}/\text{mV}$
Input Voltage Range	JVR	(Note 1)	+12	$\pm 12.5$		+12	$\pm 12.5$		+12	$\pm 12.5$		$\text{V}$
Output Voltage Swing	$V_{VO}$	$R_L \geq 2\text{ k}\Omega$	+12	$\pm 13$		+12	$\pm 13$		+12	$\pm 13$		$\text{V}$
Common-Mode Rejection	CMR	$V_{CM} = \pm 12\text{ V}$	106	120		100	115		90	105		$\text{dB}$
Power Supply Rejection Ratio	PSRR	$V_S = +4.5\text{ V to }+18\text{ V}$		0.6	3.2		1.8	5.6		2.4	7.0	$\mu\text{V}/\text{V}$
				5.5	8.5		5.5	8.5		5.5	8.5	$\text{V}/\mu\text{s}$
Slew Rate	SR			6.2			6.2			6.2		Degree
Phase Margin	$\phi_{PM}$	$A_V = +1$		6.2			6.2			6.2		Degree
Supply Current (All Amplifiers)	$I_{CY}$	No Load		4.5	6.5		4.5	6.5		4.5	6.5	$\text{mA}$
Gain Bandwidth Product	GBW			5			5			5		$\text{MHz}$
Channel Separation	CS	$V_{IO} = 20\text{ V p-p}$ $f_{IO} = 10\text{ Hz}$	125	175		125	175			175		$\text{dB}$
Input Capacitance	$C_{IN}$			3			3			3		$\text{pF}$
Input Resistance												
Differential-Mode Input Resistance	$R_{IN}$			0.4			0.4			0.4		$\text{M}\Omega$
Input Resistance												
Common-Mode Input Resistance	$R_{INCM}$			20			20			20		$\text{G}\Omega$
Settling Time	$t_S$	$A_V = +1$ , 10 V Step to 0.01%		2			2			2		$\mu\text{s}$

### NOTES

<sup>1</sup>Guaranteed by CMR test.

<sup>2</sup>Guaranteed but not 100% tested.

Specifications subject to change without notice.

### ABSOLUTE MAXIMUM RATINGS<sup>1</sup>

Supply Voltage	$\pm 18\text{ V}$
Differential Input Voltage <sup>2</sup>	$\pm 1.0\text{ V}$
Differential Input Current <sup>2</sup>	$\pm 25\text{ mA}$
Input Voltage	Supply Voltage
Output Short-Circuit Duration	Continuous
Storage Temperature Range	$65^\circ\text{C to }+150^\circ\text{C}$
Lead Temperature (Soldering, 60 sec)	$+300^\circ\text{C}$
Junction Temperature ( $T_J$ )	$65^\circ\text{C to }+150^\circ\text{C}$
Operating Temperature Range	
OP271A	$55^\circ\text{C to }+125^\circ\text{C}$
OP271E, OP271F, OP271G	$40^\circ\text{C to }+85^\circ\text{C}$

Package Type	$\theta_{JA}$ <sup>3</sup>	$\theta_{JC}$	Units
8-Pin Hermetic DIP (Z)	134	12	$^\circ\text{C}/\text{W}$
8-Pin Plastic DIP (P)	96	37	$^\circ\text{C}/\text{W}$
20-Contact LCC (RC)	88	33	$^\circ\text{C}/\text{W}$
8-Pin SO (S)	92	27	$^\circ\text{C}/\text{W}$

### NOTES

<sup>1</sup>Absolute maximum ratings apply to both DICE and packaged parts, unless otherwise noted.

<sup>2</sup>The OP271's inputs are protected by back-to-back diodes. Current limiting resistors are not used in order to achieve low noise performance. If different voltage exceeds  $\pm 1.0\text{ V}$ , the input current should be limited to  $25\text{ mA}$ .

<sup>3</sup> $\theta_{JA}$  is specified for worst case mounting conditions, i.e.,  $\theta_{JA}$  is specified for device in socket for cerdip, P-DIP, and LCC packages;  $\theta_{JA}$  is specified for device soldered to printed circuit board for SOL package.

### ORDERING GUIDE

Model	$V_{OS\text{ max}}$ $T_A = +25^\circ\text{C}$	Temperature Range	Package Option*
OP271AZ	200 $\mu\text{V}$	$55^\circ\text{C to }+125^\circ\text{C}$	8-Pin Cerdip
OP271ARC/883	200 $\mu\text{V}$	$55^\circ\text{C to }+125^\circ\text{C}$	20-Contact LCC
OP271EZ	200 $\mu\text{V}$	$40^\circ\text{C to }+85^\circ\text{C}$	8-Pin Cerdip
OP271FZ	300 $\mu\text{V}$	$40^\circ\text{C to }+85^\circ\text{C}$	8-Pin Cerdip
OP271GP	400 $\mu\text{V}$	$40^\circ\text{C to }+85^\circ\text{C}$	8-Pin Plastic DIP
OP271GS	400 $\mu\text{V}$	$40^\circ\text{C to }+85^\circ\text{C}$	16-Pin SOL
OP271GS-REEL	400 $\mu\text{V}$	$40^\circ\text{C to }+85^\circ\text{C}$	16-Pin SOL
OP271GS-REEL7	400 $\mu\text{V}$	$40^\circ\text{C to }+85^\circ\text{C}$	16-Pin SOL

\*For outline information see Package Information section.