

FEATURES

- Rail-to-rail output**
- Gain bandwidth product: 4 MHz typical**
- Low offset voltage: 175 μ V**
- Unity-gain stable**
- High slew rate: 4.0 V/ μ s typical**
- Low noise: 3.9 nV/ $\sqrt{\text{Hz}}$ typical**

GENERAL DESCRIPTION

The **OP284** die is available only through this specification.

The **OP284** is a dual operational amplifier, featuring a 4 MHz bandwidth and rail-to-rail inputs and outputs. It is guaranteed to operate in single-supply from 3 V to 36 V, or dual-supply from ± 1.5 V to ± 18 V.

This amplifier is superb for single-supply applications requiring both ac and precision dc performance. The combination of wide bandwidth, low noise, and precision makes the **OP284** useful in a wide variety of applications, including filters and instrumentation.

For application information, please refer to the **OP284** package product data sheet and webpage.

The **OP284CHIPS** die is specified for 25°C operations only.

OP284 CHIP DIMENSIONS AND PAD LAYOUT

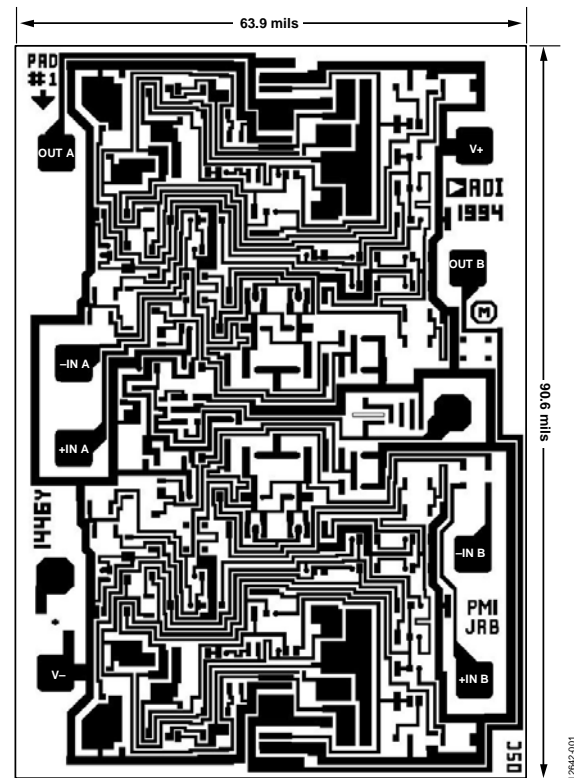


Figure 1. **OP284** Metal Mask Die Image

Table 1. Die Physical Characteristics

Parameter	Value
Die Size	63.9 mils \times 90.6 mils
Back Grind Thickness	19 mils
Bond Pad Opening Size	104 μ m \times 104 μ m
Top Metal Composition	AlCu
Passivation	OxyNitride
Polyimide	21 μ m
Die Marker	1446Y
Substrate Bias	V-

Rev. A

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Document Feedback

TABLE OF CONTENTS

Features	1	Absolute Maximum Ratings	4
General Description	1	ESD Caution.....	4
OP284 Chip Dimensions and Pad Layout.....	1	Outline Dimensions	5
Revision History	2	Die Pad Descriptions	5
Specifications.....	3	Ordering Guide	5
Electrical Characteristics, $V_{SY} = \pm 15.0\text{ V}$	3		

REVISION HISTORY

12/14—Rev. 0 to Rev. A

Changes to Table 4.....	5
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9/14—Revision 0: Initial Version

SPECIFICATIONS

ELECTRICAL CHARACTERISTICS, $V_{SY} = \pm 15.0\text{ V}$

$V_{SY} = \pm 15.0\text{ V}$, $V_{CM} = 0\text{ V}$, $V_{OUT} = 0\text{ V}$, $T_A = +25^\circ\text{C}$, unless otherwise noted.

Table 2.

Parameter	Symbol	Test Conditions/Comments	Min	Typ	Max	Unit
INPUT CHARACTERISTICS						
Offset Voltage	V_{OS}				175	μV
Offset Voltage Drift	$\Delta V_{OS}/\Delta T$			0.3		$\mu\text{V}/^\circ\text{C}$
Input Bias Current	I_B				150	nA
Input Offset Current	I_{OS}				50	nA
Input Voltage Range			-15		+15	V
Common-Mode Rejection Ratio	CMRR	$V_{CM} = -15.0\text{ V to }+15.0\text{ V}$	80	90		dB
Large Signal Voltage Gain	A_{VO}	$-10.0\text{ V} \leq V_O \leq +10.0\text{ V}$, $R_L = 2\text{ k}\Omega$	150	1000		V/mV
OUTPUT CHARACTERISTICS						
Output Voltage High	V_{OH}	$I_L = 1.0\text{ mA}$	14.8			V
Output Voltage Low	V_{OL}	$I_L = 1.0\text{ mA}$			-14.875	V
Short-Circuit Current	I_{OUT}		-10		+10	mA
POWER SUPPLY						
Power Supply Rejection Ratio	PSRR	$V_{SY} = \pm 2\text{ V to } \pm 18\text{ V}$	90			dB
Supply Current per Amplifier	I_{SY}	$V_O = 0\text{ V}$			2.0	mA
DYNAMIC PERFORMANCE						
Slew Rate	SR	$R_L = 2\text{ k}\Omega$	2.4	4.0		V/ μs
Gain Bandwidth Product	GBP			4.25		MHz
Phase Margin	Φ_M			50		Degrees
NOISE PERFORMANCE						
Voltage Noise	e_n p-p	0.1 Hz to 10 Hz		0.3		$\mu\text{V p-p}$
Voltage Noise Density	e_n	$f = 1\text{ kHz}$		3.9		nV/ $\sqrt{\text{Hz}}$
Current Noise Density	i_n			0.4		pA/ $\sqrt{\text{Hz}}$

ABSOLUTE MAXIMUM RATINGS

Table 3.

Parameter	Rating
Supply Voltage	±18 V
Input Voltage	$V- \leq V_{IN} \leq V+$
Differential Input Voltage ¹	±0.6 V
Output Short-Circuit Duration to GND	Indefinite
Functional Temperature Range	-40°C to +125°C

¹ Limit the input current to less than 5 mA to prevent degradation or destruction of the input devices.

Stresses at or above those listed under Absolute Maximum Ratings may cause permanent damage to the product. This is a stress rating only; functional operation of the product at these or any other conditions above those indicated in the operational section of this specification is not implied. Operation beyond the maximum operating conditions for extended periods may affect product reliability.

ESD CAUTION



ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

OUTLINE DIMENSIONS

DIE PAD DESCRIPTIONS

Die center is the reference location at $0.0\ \mu\text{m} \times 0.0\ \mu\text{m}$. Pad coordinates are to the center of each pad. Waffle pack orientation is the chamfer corner to the OUTA pad.

Table 4. Pad Mnemonics, Function Descriptions, and Coordinates

Mnemonic	Description	Pad Coordinates (μm)
OUTA	Output of Channel A.	$-660 \times +780$
-INA	Negative Input Channel A.	$-608 \times +149$
+INA	Positive Input Channel A.	-608×-107
V- Pad	Negative Power Supply. Substrate is connected to V-.	-662×-780
+INB	Positive Input Channel B.	$+590 \times -800$
-INB	Negative Input Channel B.	$+586 \times -424$
OUTB	Output Channel B.	570×437
V+	Positive Power Supply.	590×802
NC	No Connect—Factory Use Only.	-664×-490
NC	No Connect—Factory Use Only.	524×0

ORDERING GUIDE

Model	Functional Temperature Range	Package Option/Count	Package Option
OP284CHIPS	-40°C to $+125^{\circ}\text{C}$	Waffle Pack/221	DIE