Precision Rail-to-Rail Input and Output Operational Amplifier

Data Sheet

OP284CHIPS

FEATURES

Rail-to-rail output
Gain bandwidth product: 4 MHz typical
Low offset voltage: 175 µV
Unity-gain stable
High slew rate: 4.0 V/µs typical
Low noise: 3.9 nV/√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

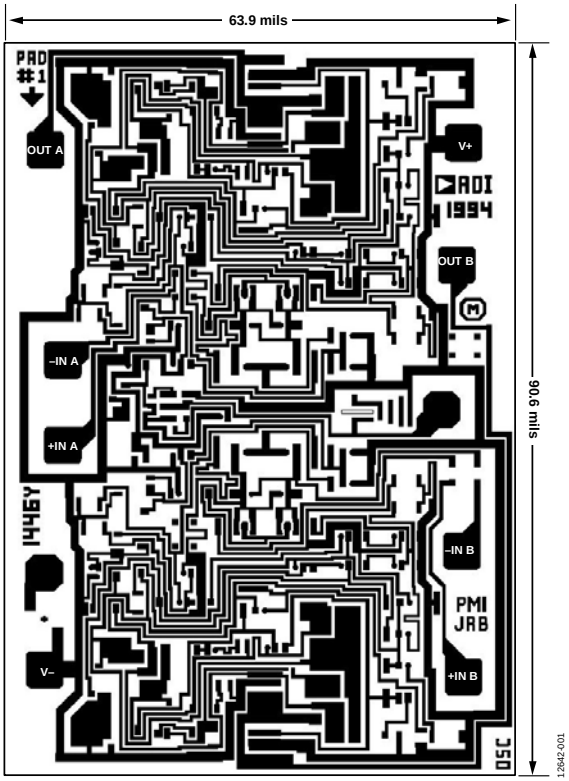

Figure 1. OP284 Metal Mask Die Image

Table 1. Die Physical Characteristics

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

Rev. A Document Feedback

One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106, U.S.A.
Tel: 781.329.4700
Technical Support www.analog.com

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REVISION HISTORY

12/14—Rev. 0 to Rev. A

Changes to Table 4 5

9/14—Revision 0: Initial Version

SPECIFICATIONS

ELECTRICAL CHARACTERISTICS, V_{SY} = ±15.0 V

V_{SY} = ±15.0 V, V_{CM} = 0 V, V_{OUT} = 0 V, T_A = +25°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		µV/°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 V to +15.0 V	80	90		dB
Large Signal Voltage Gain	A_{VO}	−10.0 V ≤ V_O ≤ +10.0 V, R_L = 2 kΩ	150	1000		V/mV
OUTPUT CHARACTERISTICS						
Output Voltage High	V_{OH}	I_L = 1.0 mA	14.8			V
Output Voltage Low	V_{OL}	I_L = 1.0 mA			−14.875	V
Short-Circuit Current	I_{OUT}		−10		+10	mA
POWER SUPPLY						
Power Supply Rejection Ratio	PSRR	V_{SY} = ±2 V to ±18 V	90			dB
Supply Current per Amplifier	I_{SY}	V_O = 0 V			2.0	mA
DYNAMIC PERFORMANCE						
Slew Rate	SR	R_L = 2 kΩ	2.4	4.0		V/µs
Gain Bandwidth Product	GBP			4.25		MHz
Phase Margin	ΦM			50		Degrees
NOISE PERFORMANCE						
Voltage Noise	e_n p-p	0.1 Hz to 10 Hz		0.3		µV p-p
Voltage Noise Density	e_n	f = 1 kHz		3.9		nV/√Hz
Current Noise Density	i_n			0.4		pA/√Hz

ABSOLUTE MAXIMUM RATINGS

Table 3.

Parameter	Rating
Supply Voltage	±18 V
Input Voltage	$V- \le V_{IN} \le V+$
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 µm × 0.0 µm. 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 × +780
−INA	Negative Input Channel A.	−608 × +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 × −800
−INB	Negative Input Channel B.	+586 × −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°C	Waffle Pack/221	DIE