

HIGH-SPEED, SINGLE-SUPPLY, RAIL-TO-RAIL OPERATIONAL AMPLIFIER MicroAmplifier™ SERIES

Check for Samples: [OPA4350-DIE](#)

FEATURES

- Rail-to-Rail Input
- Rail-to-Rail Output
- Wide Bandwidth
- High Slew Rate
- Low Noise
- Low THD+Noise
- Unity-Gain Stable

APPLICATIONS

- Cell Phone PA Control Loops
- Driving A/D Converters
- Video Processing
- Data Acquisition
- Process Control
- Audio Processing
- Communications
- Active Filters
- Test Equipment

DESCRIPTION

The OPA4350 rail-to-rail CMOS operational amplifier is optimized for low voltage, single-supply operation. Rail-to-rail input/output, low noise, and high speed operation makes it ideal for driving sampling analog-to-digital (A/D) converters. It is also well suited for cell phone PA control loops and video processing (75-Ω drive capability) as well as audio and general purpose applications.

The OPA4350 operates on a single supply as low as 2.5 V with an input common-mode voltage range that extends 300 mV below ground and 300 mV above the positive supply.

ORDERING INFORMATION⁽¹⁾

| PRODUCT | PACKAGE DESIGNATOR | PACKAGE | ORDERABLE PART NUMBER | PACKAGE QUANTITY |
|---------|--------------------|--|-----------------------|------------------|
| OPA4350 | TD | Bare Die In Waffle Pack ⁽²⁾ | OPA4350TDC1 | 130 |
| | | | OPA4350TDC2 | 10 |

(1) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI web site at www.ti.com.

(2) Processing is per the Texas Instruments commercial production baseline and is in compliance with the Texas Instruments Quality Control System in effect at the time of manufacture. Electrical screening consists of DC parametric and functional testing at room temperature only. Unless otherwise specified by Texas Instruments AC performance and performance over temperature is not warranted. Visual Inspection is performed in accordance with MIL-STD-883 Test Method 2010 Condition B at 75X minimum.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

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PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of the Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

BARE DIE INFORMATION

| DIE THICKNESS | BACKSIDE FINISH | BACKSIDE POTENTIAL | BOND PAD METALLIZATION COMPOSITION | BOND PAD THICKNESS |
|---------------|------------------------|--------------------|------------------------------------|--------------------|
| 10.5 mils. | Silicon with backgrind | Floating | Ti/AlSiCu/TiN | 800 nm |

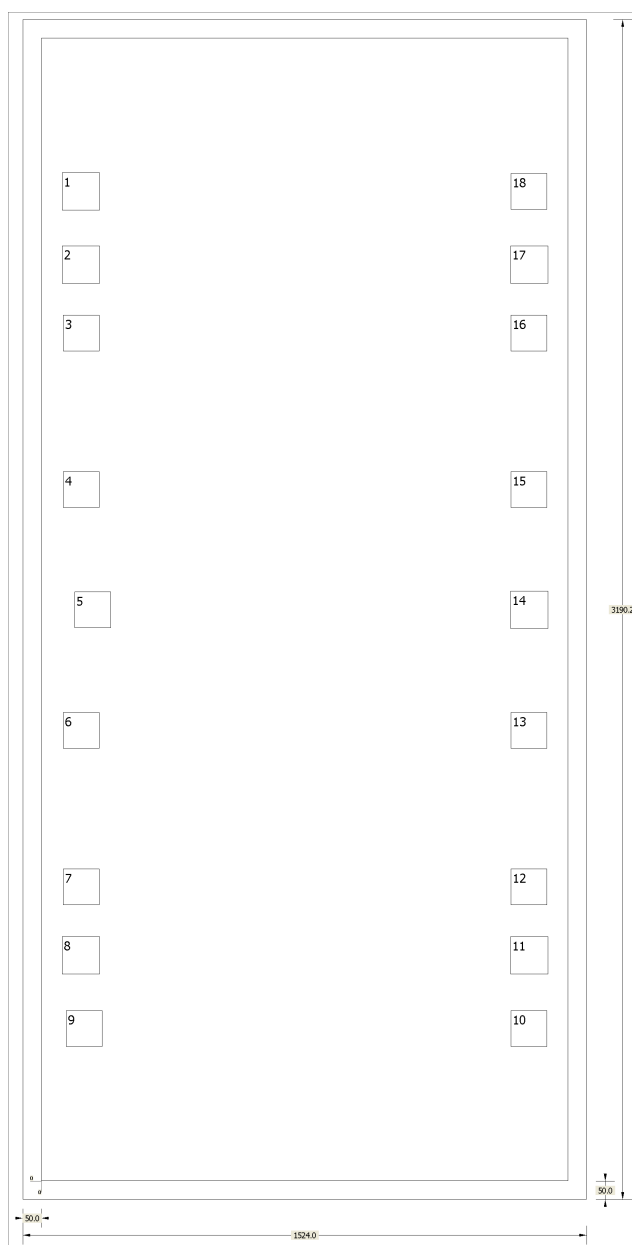


Table 1. Bond Pad Coordinates in Microns⁽¹⁾

| DESCRIPTION | PAD NUMBER | X MIN | Y MIN | X MAX | Y MAX |
|-------------|------------|---------|---------|---------|---------|
| Out A | 1 | 5 | 2550.35 | 107 | 2652.35 |
| N/C | 2 | 5 | 2352.5 | 107 | 2454.5 |
| -In A | 3 | 7.65 | 2168.95 | 105.65 | 2266.95 |
| +In A | 4 | 7.65 | 1746.1 | 105.65 | 1844.1 |
| V+ | 5 | 38.9 | 1420.7 | 136.9 | 1518.7 |
| +In B | 6 | 7.65 | 1095.3 | 105.65 | 1193.3 |
| -In B | 7 | 7.65 | 672.45 | 105.65 | 770.45 |
| N/C | 8 | 5 | 484.9 | 107 | 586.9 |
| Out B | 9 | 15.85 | 289.45 | 113.85 | 387.45 |
| Out C | 10 | 1218.35 | 289.45 | 1316.35 | 387.45 |
| N/C | 11 | 1217 | 484.9 | 1319 | 586.9 |
| -In C | 12 | 1218.35 | 672.45 | 1316.35 | 770.45 |
| +In C | 13 | 1218.35 | 1095.3 | 1316.35 | 1193.3 |
| V- | 14 | 1217 | 1418.7 | 1319 | 1520.7 |
| +In D | 15 | 1218.35 | 1746.1 | 1316.35 | 1844.1 |
| -In D | 16 | 1218.35 | 2168.95 | 1316.35 | 2266.95 |
| N/C | 17 | 1217 | 2352.5 | 1319 | 2454.5 |
| Out D | 18 | 1218.35 | 2551.95 | 1316.35 | 2649.95 |

(1) Substrate floating

PACKAGING INFORMATION

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead finish/ Ball material (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|------------------|---------------|--------------|--------------------|------|----------------|-----------------|--------------------------------------|----------------------|--------------|-------------------------|---------|
| OPA4350TDC1 | LIFEBUY | | | 0 | 130 | RoHS & Green | Call TI | N / A for Pkg Type | | | |

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

(2) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

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