

ADVANCED LinCMOS™ RAIL-TO-RAIL VERY LOW-POWER OPERATIONAL AMPLIFIER

FEATURES

- **Output Swing Includes Both Supply Rails**
- **Low Noise**
- **Low Input Bias Current**
- **Fully Specified for Both Single-Supply and Split-Supply Operation**
- **Very Low Power**
- **Common-Mode Input Voltage Range Includes Negative Rail**
- **Low Input Offset Voltage**
- **Macromodel Included**

DESCRIPTION

The TLC2252 is a dual and quadruple operational amplifier from Texas Instruments. The device exhibits rail-to-rail output performance for increased dynamic range in single- or split-supply applications. The micropower operation makes it a good choice for battery-powered applications. The noise performance has been dramatically improved over previous generations of CMOS amplifiers.

The TLC2252 amplifier, exhibiting high input impedance and low noise, is excellent for small-signal conditioning for high-impedance sources, such as piezoelectric transducers. Because of the micropower dissipation levels, this device works well in hand-held monitoring and remote-sensing applications. In addition, the rail-to-rail output feature with single or split supplies makes this device a great choice when interfacing with analog-to-digital converters (ADCs).

ORDERING INFORMATION⁽¹⁾

PRODUCT	PACKAGE DESIGNATOR	PACKAGE	ORDERABLE PART NUMBER	PACKAGE QUANTITY
TLC2252	TD	Bare die in waffle pack ⁽²⁾	TLC2252TDA1	400
			TLC2252TDA2	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.



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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	AlCuTiW	1540 nm

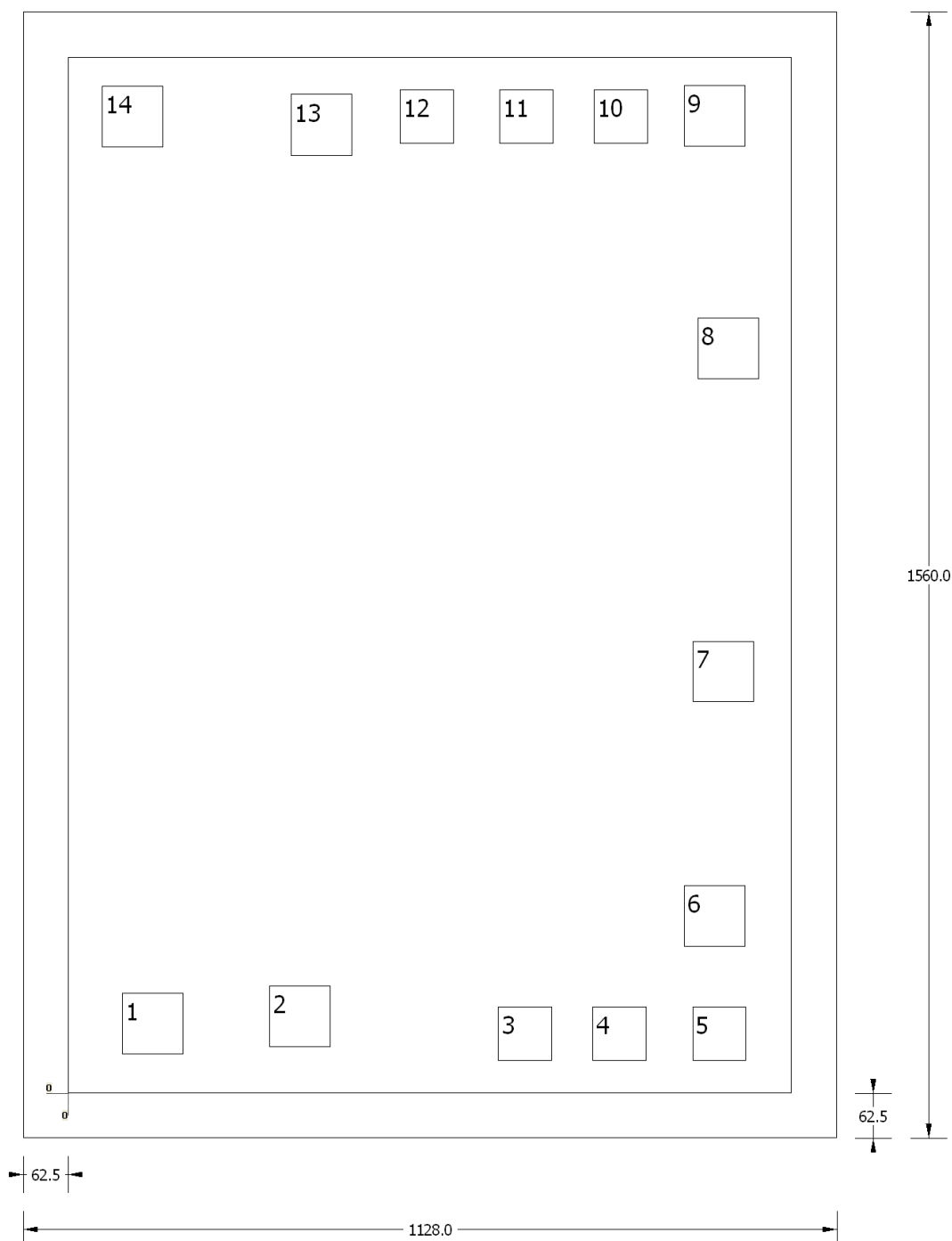


Table 1. Bond Pad Coordinates in Microns

DESCRIPTION	PAD NUMBER	X MIN	Y MIN	X MAX	Y MAX
1OUT	1	74.65	54	159.65	139
1IN–	2	278.7	63.95	363.7	148.95
N/C	3	596.15	45	671.15	120
N/C	4	727.35	45	802.35	120
N/C	5	865.5	45	940.5	120
1IN+	6	854.05	203	939.05	288
VDD–/GND	7	865.75	541.5	950.75	626.5
2IN+	8	873	988.7	958	1073.7
2IN–	9	854.05	1311	939.05	1396
N/C	10	729.45	1315	804.45	1390
N/C	11	598.25	1315	673.25	1390
N/C	12	460.1	1315	535.1	1390
2OUT	13	308.7	1298.5	393.7	1383.5
VDD+	14	46.8	1309.8	131.8	1394.8

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package Pins	Package qty Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
TLC2252TDA1	Active	Production	null (null) 0	221 TUBE	Yes	Call TI	N/A for Pkg Type	0 to 0	
TLC2252TDA1.A	Active	Production	null (null) 0	221 TUBE	Yes	Call TI	N/A for Pkg Type	0 to 0	
TLC2252TDA2	Active	Production	null (null) 0	10 TUBE	Yes	Call TI	N/A for Pkg Type	0 to 0	
TLC2252TDA2.A	Active	Production	null (null) 0	10 TUBE	Yes	Call TI	N/A for Pkg Type	0 to 0	

⁽¹⁾ **Status:** For more details on status, see our [product life cycle](#).

⁽²⁾ **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

⁽³⁾ **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

⁽⁴⁾ **Lead finish/Ball material:** Parts 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.

⁽⁵⁾ **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

⁽⁶⁾ **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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