

OPA857-DIE

Ultralow-Noise, Wideband, Selectable-Feedback Resistance Transimpedance Amplifier

1 Features

- Internal Midscale Reference Voltage
- Pseudo-Differential Output Voltage
- Wide Dynamic Range
- Closed-Loop Transimpedance Bandwidth:
 - 125 MHz (5-k Ω Transimpedance Gain, 1.5-pF External Parasitic Capacitance)
 - 105 MHz (20-k Ω Transimpedance Gain, 1.5-pF External Parasitic Capacitance)
- Ultralow Input-Referred Current Noise (Brickwall Filter BW = 135 MHz):
 - 15 nA_{RMS} (20-k Ω Transimpedance)
- Very Fast Overload Recovery Time: < 25 ns
- Internal Input Protection Diode
- Power Supply:
 - Voltage: 2.7 V to 3.6 V
 - Current: 23.4 mA
- Extended Temperature Range: –40°C to +85°C

2 Applications

- Photodiode Monitoring
- High-Speed I/V Conversions
- Optical Amplifiers
- CAT-Scanner Front-Ends

3 Description

The OPA857-DIE is a wideband, fast overdrive recovery, fast-settling, ultralow-noise transimpedance amplifier targeted at photodiode monitoring applications. With selectable feedback resistance, the OPA857-DIE simplifies the design of high-performance optical systems. Very fast overload recovery time and internal input protection provide the best combination to protect the remainder of the signal chain from overdrive while minimizing recovery time. The two selectable transimpedance gain configurations allow high dynamic range and flexibility required in modern transimpedance amplifier applications.

The device is characterized for operation over the full industrial temperature range from –40°C to +85°C.

Ordering Information⁽¹⁾

PRODUCT	PACKAGE DESIGNATOR	PACKAGE	ORDERABLE PART NUMBER	PACKAGE QUANTITY
OPA857-DIE	TD	Bare die in gel pak VR ⁽²⁾	OPA857TD1	324
			OPA857TD2	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.



OPA857-DIE

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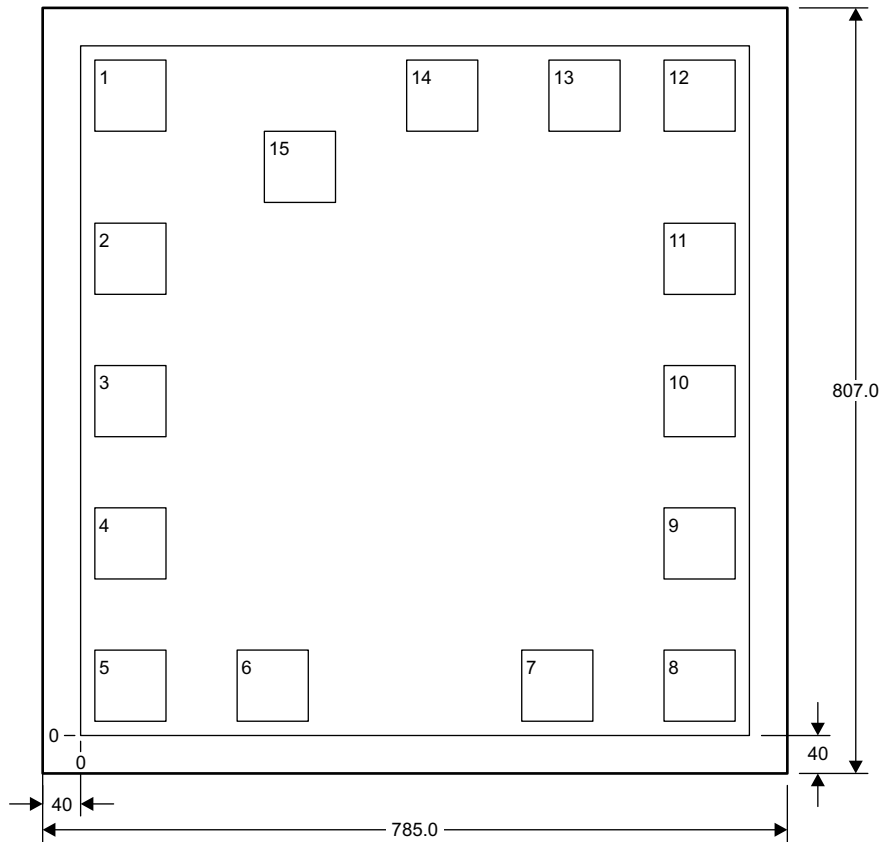


This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

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.

4 Bare Die Information

DIE THICKNESS	BACKSIDE FINISH	BACKSIDE POTENTIAL	BOND PAD METALLIZATION COMPOSITION	BOND PAD THICKNESS
15 mils.	Silicon with backgrind	GND	TiW/AlCu (0.5%)	1100 nm



Bond Pad Coordinates in Microns

NAME	PAD NUMBER	X MIN	Y MIN	X MAX	Y MAX	DESCRIPTION
GND	1	15	637	90	712	Ground
CTRL	2	15	465	90	540	Control pin for transimpedance gain. GND, logic 0 = 5-k Ω internal resistance; +V _S , logic 1 = 20-k Ω internal resistance.
GND	3	15	315	90	390	Ground
GND	4	15	165	90	240	Ground
OUTN	5	15	15	90	90	Common-mode voltage output reference
GND	6	165	15	240	90	Ground
GND	7	465	15	540	90	Ground
OUT	8	615	15	690	90	Signal output
+V _S	9	615	165	690	240	Supply voltage
+V _S	10	615	315	690	390	Supply voltage
+V _S	11	615	465	690	540	Supply voltage
GND	12	615	637	690	712	Ground
TESD_SD	13	493.7	637	568.7	712	Test mode enable. Connect to GND for normal operation, and connect to +V _S to enable test mode.
TEST_IN	14	343.7	637	418.7	712	Test mode input. Connect to +V _S during normal operation.
IN	15	193.7	561.95	268.7	636.95	Input

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)
OPA857TD1	Active	Production	null (null) 0	324 OTHER	-	Call TI	Call TI	-40 to 85	
OPA857TD1.B	Active	Production	null (null) 0	324 OTHER	-	Call TI	Call TI	-40 to 85	
OPA857TD2	Active	Production	null (null) 0	120 OTHER	-	Call TI	Call TI	-40 to 85	
OPA857TD2.B	Active	Production	null (null) 0	120 OTHER	-	Call TI	Call TI	-40 to 85	

(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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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265

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