OPA657-DIE 1.6-GHz, Low-Noise, FET-Input Operational Amplifier

1 Features

- High Gain Bandwidth Product: 1.6 GHz
- High Bandwidth 275 MHz (G = 10)
- Slew Rate 700 V/µs (G = 10, 1-V Step)
- Low-Input Offset Voltage: ±250 µV
- Low-Input Bias Current: 2 pA
- Low-Input Voltage Noise: 4.8 nV/√Hz
- High-Output Current: 70 mA
- Fast Overdrive Recovery

2 Applications

- Wideband Photodiode Amplifiers
- Wafer Scanning Equipment
- ADC Input Amplifiers
- Test and Measurement Front Ends
- High Gain Precision Amplifiers
- Optical Time Domain Reflectometry (OTDR)

3 Description

The OPA657 device combines a high gain-bandwidth, low-distortion, voltage-feedback operational amplifier with a low voltage noise JFET-input stage to offer a very high dynamic range amplifier for high-precision analog-to-digital converter (ADC) driving or wideband transimpedance applications. Photodiode applications achieve improved noise and bandwidth using this decompensated, high gain-bandwidth amplifier.

Very low level signals can be significantly amplified in a single OPA657 gain stage with exceptional bandwidth and accuracy. The very low input bias current and capacitance supports this performance even for relatively high source impedance. Broadband photodetector applications benefit from the low voltage noise JFET inputs for the OPA657. The JFET input contributes virtually no current noise, which makes the device ideal for high-gain photodiode applications.

Ordering Information(1)

PRODUCT	PACKAGE DESIGNATOR	PACKAGE	ORDERABLE PART NUMBER	PACKAGE QUANTITY
OPA657	TD	Bare Die in Gel Pak VR(2)	OPA657TD1	324
			OPA657TD2	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.

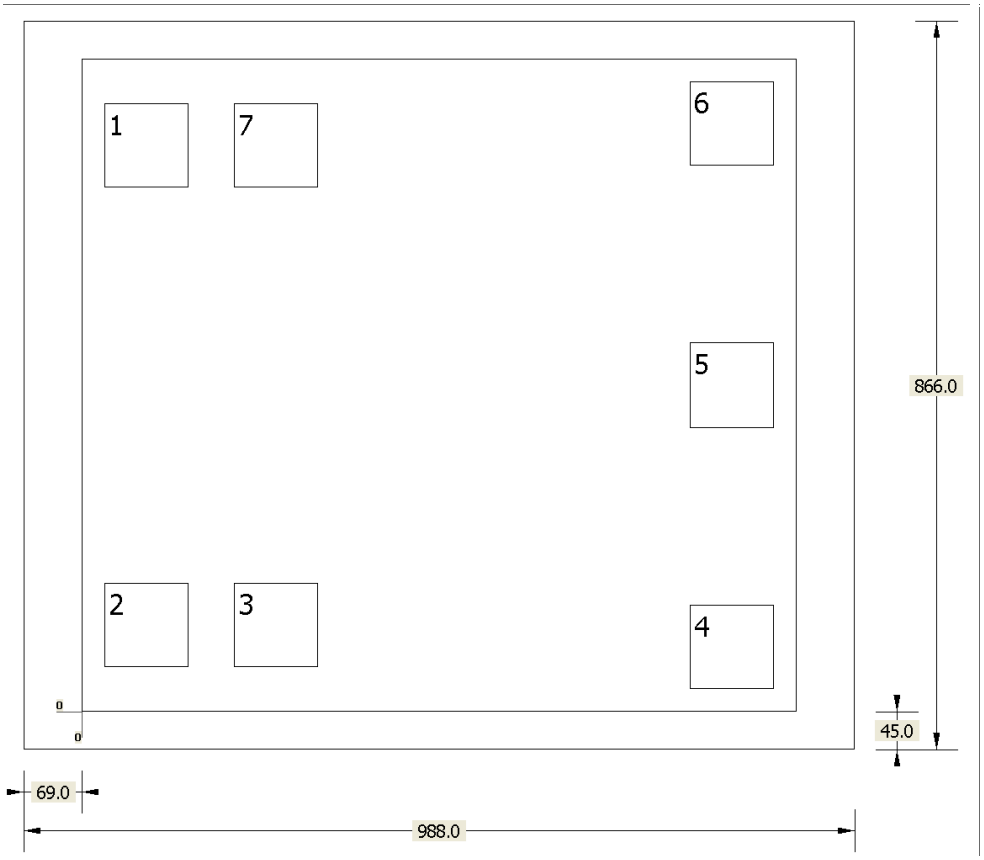
(2) Processing is per the Texas Instruments commercial production baseline and is in compliance with the Texas Instruments Quality Control System in effect at the time of manufacture. Electrical screening consists of DC parametric and functional testing at room temperature only. Unless otherwise specified 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.

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	V_S-	TiW/AlCu (0.5%)	1100 nm



Bond Pad Coordinates in Microns(1)

DESCRIPTION	PAD NUMBER	X MIN	Y MIN	X MAX	Y MAX
Inverting input	1	27	623	127	723
NonInverting input	2	27	53	127	153
N/C	3	181	53	281	153
Output	4	723	27	823	127
V_S–	5	723	337	823	439
V_S+	6	723	649	823	749
N/C	7	181	623	281	723

(1) Substrate is V_S–.

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)
OPA657TD1	Active	Production	null (null) | 0	324 | NOT REQUIRED	-	Call TI	Call TI	-40 to 85	
OPA657TD1.A	Active	Production	null (null) | 0	324 | NOT REQUIRED	-	Call TI	Call TI	-40 to 85	
OPA657TD2	Active	Production	null (null) | 0	120 | NOT REQUIRED	-	Call TI	Call TI	-40 to 85	
OPA657TD2.A	Active	Production	null (null) | 0	120 | NOT REQUIRED	-	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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