



OPA2111 DIE

Dual, Low Noise, Precision *Difet*® OPERATIONAL AMPLIFIER DIE

FEATURES

- LOW NOISE: 100% TESTED
- LOW BIAS CURRENT
- LOW OFFSET
- LOW DRIFT
- HIGH OPEN-LOOP GAIN
- HIGH COMMON-MODE REJECTION

Difet® Burr-Brown Corp.

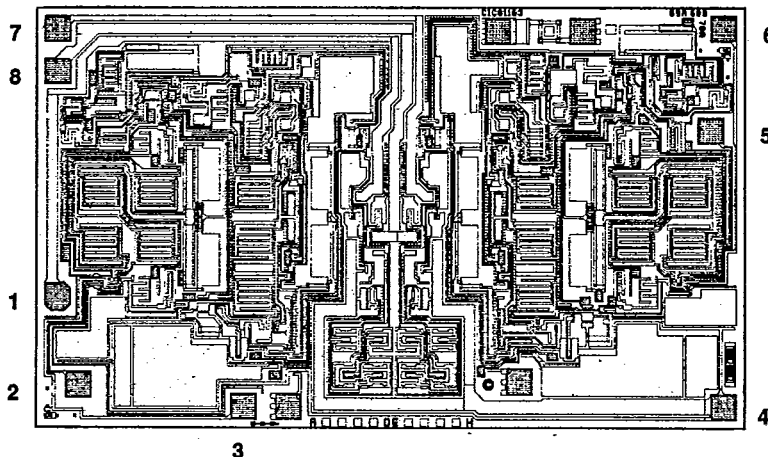
BIFET® National Semiconductor Corp.

DESCRIPTION

The OPA2111 die is a high-precision monolithic *Difet* (Dielectrically isolated FET) operational amplifier. Outstanding performance characteristics allow its use in the most critical instrumentation applications.

Noise, bias current, voltage offset, drift, open-loop gain, common-mode rejection, and power supply rejection are superior to BIFET® amplifiers.

DIE TOPOGRAPHY



PAD	FUNCTION	PAD	FUNCTION	
1	Output A	5	Noninverting Input B	Die Size: 138 x 84 mils Bonding Pad Size: 6 x 5 mils Backside Contact: Gold
2	Inverting Input A	6	Inverting Input B	
3	Noninverting Input A	7	Output B	
4	Negative Supply	8	Positive Supply	

NOTE: This dielectrically isolated substrate is normally connected to positive supply or left floating.

International Airport Industrial Park • Mailing Address: PO Box 11400 • Tucson, AZ 85734 • Street Address: 6730 S. Tucson Blvd. • Tucson, AZ 85706
 Tel: (602) 745-1111 • Twx: 910-952-1111 • Cable: BBRCORP • Telex: 066-6491 • FAX: (602) 889-1510 • Immediate Product Info: (800) 548-6132

PDS-578A

Very low bias current is obtained by dielectric isolation with on-chip guarding.

Laser trimming of thin film resistors gives very-low offset and drift. Extremely low noise is achieved with new circuit design techniques (patent pending). A new cascode design allows high precision input specifications and reduced susceptibility to flicker noise.

Standard dual op-amp pin configuration allows upgrading of existing designs to higher performance levels.

VISUAL

OPA211AD dice are visually inspected to MIL-STD-883, Method 2010, Test Condition B (AD, AD/LAT, SD, and MD-B) or Condition A (MD-S).

OPA211MD-S wafer lots are visually inspected to MIL-STD-883, Method 2018 (SEM Inspection of Metallization).

PACKAGING

Dice are packaged face-up in individually compartmented antistatic plastic carriers (waffle packs) and may be oriented for automated assembly. Carriers are heat-sealed in plastic bags with a dry atmosphere.

MARKING

Each die carrier is marked with:

1. Burr-Brown part number
2. Lot number
3. Wafer number
4. QA Seal and date
5. Quantity
6. QC identification number
7. Date code

If required, the customer part number and order number can be marked on each package.

T-79-15

SPECIFICATIONS

ELECTRICAL PROBE LIMITS⁽¹⁾

$T_{DE} = +25^{\circ}C$ and $\pm V_{CC} = \pm 15VDC$

PARAMETERS	CONDITIONS	OPA2111AD/SD ⁽¹⁾			OPA2111AD/LAT, MD-B, -S ⁽²⁾			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
OFFSET VOLTAGE Input Offset Voltage Average Drift	$V_{CM} = 0VDC$ $T_A = -25^{\circ}C, +85^{\circ}C$ $T_A = -55^{\circ}C, +125^{\circ}C$		5	500		200	1000	μV $\mu V/^{\circ}C$ $\mu V/^{\circ}C$
Supply Rejection	$\pm V_{CC} = 12V$ to $18V$	84		10	80		15	$\mu V/^{\circ}C$ dB
BIAS CURRENT Input Bias Current	$V_{CM} = 0VDC, +25^{\circ}C$ $T_{DE} = +85^{\circ}C$ $T_A = -55^{\circ}C$ to $+125^{\circ}C$		± 2 ± 1				± 15 20	pA nA nA
VOLTAGE RANGE Common-Mode Input Range Common-Mode Rejection	$V_{IN} \pm 10VDC$	± 10 88			± 10 82			V dB
OPEN-LOOP GAIN, DC Open-Loop Voltage Gain	$R_L = 2k\Omega$	105			95			dB
RATED OUTPUT Voltage Output Short-Circuit Current	$R_L \geq 1k\Omega$	± 11			± 10	± 60		V mA
POWER SUPPLY Quiescent Current	$I_O = 0mA$			± 9		± 4.5		mA

NOTES: (1) Electrical Probe Limits — All dice are 100% probe tested to the specification limits listed. Due to possible wafer saw and assembly shifts, parameters are not guaranteed for assembled units. (2) Guaranteed Limits — Specification Limits are guaranteed for a sample plan of 10¹¹ when die sample is prepared in the following manner: die attached with silver-filled glass (or solder) to a beryllium oxide or equivalent substrate, wirebonded with 4-mil (.004 inches) aluminum wire to the supplies and output, and 1-mil (.001 inches) aluminum wire to inputs and current limit pads. The unit must also be welded in a nitrogen atmosphere resulting in an internal water vapor content of less than 5,000ppm.

OPA2111 DIE

ABSOLUTE MAXIMUM RATINGS

Supply	±18V
Differential Input Voltage	±V _{cc}
Input Voltage Range	±V _{cc}
Storage Temperature Range	-65°C to +150°C
Output Short-Circuit Duration	Continuous
Junction Temperature	+175°C
Lead Temperature (soldering 10s)	300°C

ORDERING INFORMATION T-79-15

	OPA2111	(A, S, M)	D	(LAT, -B, -S)
Basic Model Number				
Grade Temperature Range				
A	-25°C to +85°C			
S	-55°C to +125°C			
M	-55°C to +125°C			
Package Code				
D	Die			
Screening Option				
/LAT	Lot Acceptance Testing (A grade only)			
-B	MIL-STD-883, Method 5008, Class B Compliant (M grade only)			
-S	MIL-STD-883, Method 5008, Class S Compliant (M grade only)			