



Tucson Corporation

High Performance Analog Products

Analytical Services

Reliability Report

For

OPA4374AIPW

New Model

12/4/2003

Texas Instruments
High Performance Analog Products

Approved by:

Mark Yampolsky
Supervisor/Reliability Engineering

The OPA4374AIPW is qualified and fully meets the Texas Instruments quality and reliability standards for High Performance Analog Products per the testing described below.

Packaging Information		Manufacturing Information	
Assembly Site:	Carsem S	Die Name:	ICC03217
Package Type:	TSSOP/PW	Die Size:	39 x 72 mils
Lead Count:	14	Mask Revision:	A
Mold Compound:	ARA2184	Wafer Fab Site:	TSMC 2B
Die Attach:	84-1 LMISR4	Process:	0.5 μ DPTM
Bond Wire Material:	Au	Technology:	CMOS
Bond Wire Diameter:	1 mil	Metal 1:	Ti(0.4kÅ)/TiN(1kÅ)/AlCu(4kÅ)/TiN(1.4kÅ)
Lead Frame Material:	CDA70	Metal 2:	TiN(1kÅ)/AlCu(8kÅ)/TiN(0.25kÅ)
Lead Frame Finish:	Solder Plate	Metal 3:	TiN(1kÅ)/AlCu(8kÅ)/TiN(250Å)
Flammability Rating	UL94-V0	Passivation:	SiO ₂ /Si ₃ N ₄ (2kÅ/7kÅ)
Moisture Sensitivity Level	L3	Transistor Count:	1080
Reflow Temperature	260°C		

Thermal Information

Absolute Max Junction Temp T_{J-MAX}	150°C
θ_{JA}	100°C/W
Specification Operating Temperature T_A	-55°C to 150°C
Lead Soldering Temperature 1.6mm from case	300°C
Storage Temperature T_{STG}	-65°C to 150°C

Qualification Evaluation & Results:

Qualification Material			
HTOL wafer/assem/lot :	B66116.1/3992407	Latch Up wafer/assem/lot	B66116.1/399240
HAST wafer/assem/lot:	B66116.1/399240	ESD wafer/assem/lot	B66116.1/399240
Autoclave wafer/assem/lot:	B66116.1/399240	X-Ray wafer/assem/lot	B66116.1/399240
Temp Cycle wafer/assem/lot:	B66116.1/399240	MSL wafer/assem/lot	B66116.1/399240

Qualification by Similarity (QBS):

Reliability data on similar packages and wafer fab processes may be used to support generic qualifications as approved by QRE.

Reliability Test Results

Test	Conditions	Lot 1 SS/F	Lot 2 SS/F	Lot 3 SS/F	QBS Reference
Life Test	150°C, 1008 Hrs.	3337/0			2QTR03
HAST	130°C, 85% RH, 33.5 psia, 96 Hrs.	2202/0			2QTR03
Autoclave	121°C, 15 psia, 100% RH, 240 Hrs.	3492/0			2QTR03
Temp Cycle	-65°C to 150 °C, 1000 cycles	3801/0			2QTR03
ESD	HBM/500 volts	3/0			OPA4374AID
	HBM/1000 volts	3/0			OPA4374AID
	HBM/1500 volts	3/0			OPA4374AID
	HBM/2000 volts	3/0			OPA4374AID
	HBM/3000 volts	3/0			OPA4374AID
	HBM/4000 volts	3/1			OPA4374AID
	CDM/100 volts	3/0			
	CDM/200 volts	3/0			
	CDM/500 volts	3/0			
	CDM/1000 volts	3/0			
Latch Up		6/0			OPA4374AID
Elec. Charac. over Temp	PDS	12/0			OPA4374AID
X-Ray		125/0			
Moisture Sensitivity Test	Level 3 @ 260°C	14/0			OPA4364AIPW

The FIT rate for this device is based upon qualification data from this qualification, process qualification data, and/or ongoing reliability monitoring. Current FIT information is available from the product quality web page.

Reliability Calculations			
OVEN TEMP C°	150	Activation Energy = 0.7 (eV)	
TEST DEVICES	3337		
PROCESS	C2	(90% Confidence level)	
	READ POINTS (HOURS)	TOTAL FAILURES	PASS DEVICE HOURS
	Total Failures	0	2492572
TEMP.	FAILRATE (FITS)	MTTF (HOURS)	MTTF (YEARS)
25	2.93E-01	3.41E+09	389412.5
30	4.60E-01	2.18E+09	248341.4
35	7.10E-01	1.41E+09	160705.7
40	1.08E+00	9.24E+08	105451.4
45	1.63E+00	6.14E+08	70117.6
50	2.42E+00	4.14E+08	47216.0
55	3.55E+00	2.82E+08	32180.1
60	5.15E+00	1.94E+08	22186.3
65	7.38E+00	1.35E+08	15465.4
70	1.05E+01	9.54E+07	10894.5
75	1.47E+01	6.79E+07	7752.2
80	2.05E+01	4.88E+07	5569.6
85	2.83E+01	3.54E+07	4038.7
90	3.86E+01	2.59E+07	2954.6
95	5.24E+01	1.91E+07	2180.0
100	7.04E+01	1.42E+07	1621.6
105	9.39E+01	1.06E+07	1215.7
110	1.24E+02	8.04E+06	918.3
115	1.63E+02	6.12E+06	698.7
120	2.13E+02	4.69E+06	535.3
125	2.76E+02	3.62E+06	412.9

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products		Applications	
Amplifiers	amplifier.ti.com	Audio	www.ti.com/audio
Data Converters	dataconverter.ti.com	Automotive	www.ti.com/automotive
DSP	dsp.ti.com	Broadband	www.ti.com/broadband
Interface	interface.ti.com	Digital Control	www.ti.com/digitalcontrol
Logic	logic.ti.com	Military	www.ti.com/military
Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
		Telephony	www.ti.com/telephony
		Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless

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

Copyright © 2003, Texas Instruments Incorporated