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Tucson Corporation

**High Performance Analog Products**

Analytical Services

**Reliability Report  
For  
OPA4374AID**

**12/04/2003**

**Texas Instruments  
High Performance Analog Products**

Approved by:

Mark Yampolsky  
Supervisor/Reliability Engineering

The OPA4374AID 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:	SOIC / D	Die Size:	39 x 72 mils
Lead Count:	14	Mask Revision:	A
Mold Compound:	EME6300HR	Wafer Fab Site:	TSMC 2B
Die Attach:	84-1 LMISR4	Process:	0.5 $\mu$ DPTM
Bond Wire Material:	Au	Technology:	CMOS
Bond Wire Diameter:	1.3 mils	Metal 1:	Ti(0.4kÅ)/TiN(1kÅ)/AlCu(4kÅ)/TiN(1.4kÅ)
Lead Frame Material:	Silver Spot Copper	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 <sub>2</sub> /Si <sub>3</sub> N <sub>4</sub> (2kÅ/7kÅ)
Moisture Sensitivity Level	L3	Transistor Count:	1080
Reflow Temperature	260°C		

### Thermal Information

Absolute Max Junction Temp $T_{J-MAX}$	150°C
$\theta_{JA}$	150°C/W
Specification Operating Temperature $T_A$	-40°C to +125°C
Lead Soldering Temperature 1.6mm from case	300°C, 10 seconds
Storage Temperature $T_{STG}$	-65°C to +150°C

### Qualification Evaluation & Results:

Qualification Material			
HTOL wafer/assem/lot :	NA	Latch Up wafer/assem/lot	B66116.1/3992117
HAST wafer/assem/lot:	NA	ESD wafer/assem/lot	B66116.1/3992117
Autoclave wafer/assem/lot:	NA	X-Ray wafer/assem/lot	B66116.1/3992117
Temp Cycle wafer/assem/lot:	NA	MSL wafer/assem/lot	NA

**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 Flagship Monitor
HAST	130°C, 85%RH, 33.5 psia, 96 Hrs.	2202/0			2QTR03 Flagship Monitor
Autoclave	121°C, 15 psia, 100%RH, 240 Hrs.	3492/0			2QTR03 Flagship Monitor
Temp Cycle	-65 C to 150 C, 1000 cycles	3801/0			2QTR03 Flagship Monitor
ESD	HBM/500 volts	3/0			
	HBM/1000 volts	3/0			
	HBM/1500 volts	3/0			
	HBM/2000 volts	3/0			
	HBM/3000 volts	3/0			
	HBM/4000 volts	3/0			
	CDM/100 volts	3/0			
	CDM/200 volts	3/0			
	CDM/500 volts	3/0			
	CDM/1000 volts	3/0			
Latch Up		6/0			
Elec. Charac. over Temp	Product Data Sheet	12/0			
X-Ray		125/0			
Manufacturability		Pass			
Moisture Sensitivity Test		14/0			OPA4364AID

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.

<b>Reliability Calculations</b>				
<b>OVEN TEMP C°</b>	<b>150</b>	<b>Activation Energy = 0.7 (eV)</b>		
<b>TEST DEVICES</b>	<b>3337</b>			
<b>PROCESS</b>	<b>C2</b>	<b>(90% Confidence level)</b>		
	<b>READ POINTS (HOURS)</b>	<b>TOTAL FAILURES</b>	<b>PASS</b>	<b>DEVICE HOURS</b>
	Total Failures	0		2492572
<b>TEMP.</b>		<b>FAILRATE (FITS)</b>	<b>MTTF (HOURS)</b>	<b>MTTF (YEARS)</b>
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
<b>55</b>		<b>3.55E+00</b>	<b>2.82E+08</b>	<b>32180.1</b>
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
<b>85</b>		<b>2.83E+01</b>	<b>3.54E+07</b>	<b>4038.7</b>
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

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