

**Reliability Report
For
OPA699ID
New product qualification.**

09/22/2003

**Texas Instruments
High Performance Analog Products**

Approved by:

Mark Yampolsky
Supervisor/Reliability Engineering

The **OPA699ID** 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:	CIC03318
Package Type:	SOIC	Die Size:	37 x 38 mils
Lead Count:	8	Mask Revision:	A
Mold Compound:	EME6300HR	Wafer Fab Site:	TI-Tucson
Die Attach:	Ablebond 84-1LMISR4	Process:	CBC10-A13
Bond Wire Material:	Gold	Technology:	Bipolar
Bond Wire Diameter:	1.3 mils	Metal 1:	TiW (0.25kÅ)/TiW (1kÅ)/TiW (0.3kÅ)/AlCu 0.5% (7.5kÅ)/TiW (0.5kÅ)
Lead Frame Material:	Silver Spot Copper	Metal 2:	TiW (1kÅ)/AlCu 0.5% (9.5kÅ)/TiW (0.5kÅ)
Lead Frame Finish:	Solder Plate	Metal 3:	N/A
Flammability Rating	UL94-V0	Passivation:	Cn (10kÅ)
Moisture Sensitivity Level	3	Transistor Count:	120
Reflow Temperature	260°C		

Thermal Information

Absolute Max Junction Temp T_{J-MAX}	175°C
Recommended Junction Temp T_J	< 150°C
θ_{JC}	39°C/W
θ_{JB}	N/A
Specification Operating Temperature T_A	-40°C to 85°C
Lead Soldering Temperature 1.6mm from case	260°C
Storage Temperature T_{STG}	-40°C to +125°C

Qualification Evaluation & Results:

qualify new product.

Qualification Material			
HTOL assem/wafer/lot :	N/A	Latch Up assem/wafer/lot	N/A
HAST assem/wafer/lot :	N/A	ESD assem/wafer/lot	3141046/3040560
Autoclave assem/wafer/lot :	N/A	X-Ray assem/wafer/lot	3141046/3040560
Temp Cycle assem/wafer/lot :	N/A	MSL assem/wafer/lot	N/A

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	125°C, 1008 Hrs.	1039/0			CBC10A13 composite
HAST	130°C, 85%RH, 33.5 psia, 96 Hrs.	952/0			CBC10A13 composite
Autoclave	121°C, 15 psia, 100%RH, 240 Hrs.	617/0			CBC10A13 composite
Temp Cycle	-65°C to 150°C, 1000 cycles	618/0			CBC10A13 composite
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			
	MM/100 volts	3/0			
MM/200 volts	3/0				
Elec. Charac. over Temp	PDS	50/0			
X-Ray		125/0			

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.

OVEN TEMP C°		Activation Energy: 0.7 eV		
TEST DEVICES		(90% Confidence level)		
PROCESS				
READ POINTS (HOURS)	TOTAL FAILURES	PASS	DEVICE HOURS	
0	0	1039	0	
168	0	1039	174552	
504	0	1039	349104	
1008	0	1039	523656	
Total Failures	0		1047312	
TEMP.	FAILRATE (FITS)	MTTF (HOURS)	MTTF (YEARS)	
25	2.33E+00	4.29E+08	48971.7	
30	3.66E+00	2.74E+08	31230.9	
35	5.65E+00	1.77E+08	20210.0	
40	8.61E+00	1.16E+08	13261.3	
45	1.29E+01	7.72E+07	8817.8	
50	1.92E+01	5.20E+07	5937.8	
55	2.82E+01	3.55E+07	4046.9	
60	4.09E+01	2.44E+07	2790.1	
65	5.87E+01	1.70E+07	1944.9	
70	8.33E+01	1.20E+07	1370.1	
75	1.17E+02	8.54E+06	974.9	
80	1.63E+02	6.14E+06	700.4	
85	2.25E+02	4.45E+06	507.9	
90	3.07E+02	3.25E+06	371.6	
95	4.16E+02	2.40E+06	274.1	
100	5.60E+02	1.79E+06	203.9	
105	7.47E+02	1.34E+06	152.9	
110	9.88E+02	1.01E+06	115.5	
115	1.30E+03	7.70E+05	87.9	
120	1.70E+03	5.90E+05	67.3	
125	2.20E+03	4.55E+05	51.9	

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