

RELIABILITY MONITOR REPORT  
FOR

**BGA Package**

**Dallas Semiconductor**

4401 South Beltwood Parkway  
Dallas, TX 75244-3292

This Report was prepared by  
Dallas Semiconductor Reliability Engineering

**Summary:**

The data in the tables that follow was generated as the result of an on-going Package Reliability Monitor. The assemblies covered by this package monitor are:

ASSY SITE	PINS	PACKAGE		
ASAT	256	CSBGA	ASAT	349 CSBGA
ASAT	400	CSBGA	ATP (Amkor, PI)	256 BGA
ATP (Amkor, PI)	272	BGA	ATP (Amkor, PI)	25 CSBGA
ATP (Amkor, PI)	256	CSBGA	ATP (Amkor, PI)	49 CSBGA
ATP (Amkor, PI)	144	TE-PBGA	ATP (Amkor, PI)	144 TECSBGA
Carsem	25	CSBGA	Stats	256 BGA
Stats	100	CSBGA	Stats	16 CSBGA
Stats	25	CSBGA	Stats	49 CSBGA

The calculated failure rate for this assembly is:

**FAILURE RATE:**                      **MTTF (YRS): 35251**                      **FITS: 3.2**

The parameters used to calculate this failure rate are as follows:

**Cf: 60%**                      **Ea: 0.7**                      **B: 0**                      **Tu: 25 °C**                      **Vu: 5.5 Volts**

The reliability data follows. At the start of this data is a description of the assembly vehicle used to generate this reliability data. The next section is the detailed reliability data for each stress. The reliability data section includes the latest data available. This report covers data between 07/01/2003 and 06/30/2004.

**Assembly Information:**

Package Type:                      BGA 27 mm  
 Flammability:                      UL 94-V0  
 Moisture Sensitivity  
 (JEDEC J-STD20A)                      Level 4  
 Date Code Range:                      0320                      to                      0320

**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH VOLTAGE LIFE	0320	DS31256	125C, 3.5 VOLTS	1000 HRS	45	0	
<b>Total:</b>						<b>0</b>	

**Assembly Information:**

Package Type:                      CSBGA 13 mm  
 Flammability:                      UL 94-V0  
 Moisture Sensitivity  
 (JEDEC J-STD20A)                      Level 3  
 Date Code Range:                      0317                      to                      0317

**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0317	DS3154	125C, 3.5 VOLTS	1000 HRS	45	0	
<b>Total:</b>						<b>0</b>	

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**Assembly Information:**

Package Type: CSBGA 17 mm  
Flammability: UL 94-V0  
Moisture Sensitivity (JEDEC J-STD20A) Level 3  
Date Code Range: 0332 to 0332

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**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH VOLTAGE LIFE	0332	DS26401	125C, 3.5 VOLTS	1000 HRS	42	0	
<b>Total:</b>						<b>0</b>	

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**Assembly Information:**

Package Type: CSBGA 27 mm  
Flammability: UL 94-V0  
Moisture Sensitivity (JEDEC J-STD20A) Level 3  
Date Code Range: 0319 to 0319

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**MOISTURE SENSITIVITY LEVEL 3**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
EXTERNAL VISUAL	0319	DS31412	J-STD-020, 6.1a		8	0	
ULTRASOUND			J-STD-020		8	0	
STORAGE LIFE			125C	48 HRS	8		
MOISTURE SOAK			30C/60% R.H.	192 HRS	8		
CONVECTION REFLOW			220C	3 PASS	8	0	
EXTERNAL VISUAL			J-STD-020, 6.1a		8	0	
PRECONDITION U/S			J-STD-020		8	0	
<b>Total:</b>						<b>0</b>	

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**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0319	DS31412	125C, 3.5 VOLTS	1000 HRS	46	0	
<b>Total:</b>						<b>0</b>	

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**PACKAGE TESTS**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
X-RAY	0319	DS31412	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS			JESD22-B100		6	0	
BALL SHEAR			JESD22-B117		6	0	
MARK PERMANENCY			JESD22-B107		6	0	
<b>Total:</b>						<b>0</b>	

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**PRECONDITIONING LEVEL 3**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0319	DS31412	125C	48 HRS	244		
MOISTURE SOAK			30C/60% R.H.	192 HRS	244		
CONVECTION REFLOW			220C	3 PASS	243	0	
<b>Total:</b>						<b>0</b>	

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**STORAGE LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0319	DS31412	150C	1000 HRS	76	0	
				<b>Total:</b>		<b>0</b>	

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0319	DS31412	-55C TO 125C	1000 CYS	77	0	
				<b>Total:</b>		<b>0</b>	

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**TEMPERATURE HUMIDITY BIAS**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	0319	DS31412	85/85, 3.5 VOLTS	1000 HRS	43	0	
				<b>Total:</b>		<b>0</b>	

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**Assembly Information:**

Package Type: CSBGA 5 mm  
Flammability: UL 94-V0  
Moisture Sensitivity (JEDEC J-STD20A) Level 3  
Date Code Range: 0335 to 0335

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**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0335	DS1849	125C, 5.5 VOLTS	1000 HRS	77	0	
				<b>Total:</b>		<b>0</b>	

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0335	DS1849	-55C TO 125C	1000 CYS	77	0	
				<b>Total:</b>		<b>0</b>	

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
MOISTURE SOAK	0335	DS1849	85 C/85% R.H.	1000 HRS	77	0	
				<b>Total:</b>		<b>0</b>	

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**Assembly Information:**

Package Type: TE-PBGA 17 mm  
Flammability: UL 94-V0  
Moisture Sensitivity (JEDEC J-STD20A) Level 3  
Date Code Range: 0402 to 0402

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**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0402	DS21448	125C, 3.5 VOLTS	1000 HRS	45	0	

**FAILURE RATE:**

**MTTF (YRS): 35251**

**FITS: 3.2**

**Total:**

**0**