

RELIABILITY MONITOR REPORT  
FOR

**SOIC 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		
ATK (Amkor, K)	14	SOIC	ATK (Amkor, K)	16 SOIC
ATK (Amkor, K)	20	SOIC	ATK (Amkor, K)	24 SOIC
ATK (Amkor, K)	28	SOIC	ATK (Amkor, K)	8 SOIC
ATP (Amkor, PI)	14	SOIC	ATP (Amkor, PI)	16 SOIC
ATP (Amkor, PI)	20	SOIC	ATP (Amkor, PI)	24 SOIC
ATP (Amkor, PI)	28	SOIC	ATP (Amkor, PI)	8 SOIC
ATP (Amkor, PI)	14	SOIC (Pb-Free)	ATP (Amkor, PI)	16 SOIC (Pb-Free)
ATP (Amkor, PI)	20	SOIC (Pb-Free)	ATP (Amkor, PI)	24 SOIC (Pb-Free)
ATP (Amkor, PI)	28	SOIC (Pb-Free)	ATP (Amkor, PI)	8 SOIC (Pb-Free)
ATP (Amkor, PI)	16	SOIC w/CRYSTAL	Carsem	14 SOIC
Carsem	16	SOIC	Carsem	20 SOIC
Carsem	24	SOIC	Carsem	28 SOIC
Carsem	8	SOIC	Carsem	14 SOIC (Pb-Free)
Carsem	16	SOIC (Pb-Free)	Carsem	20 SOIC (Pb-Free)
Carsem	24	SOIC (Pb-Free)	Carsem	28 SOIC (Pb-Free)
Carsem	8	SOIC (Pb-Free)	CIRTEK	16 SOIC
CIRTEK	16	SOIC (Pb-Free)	CIRTEK	16 SOIC w/Welded Crystal (Pb-Free)
CIRTEK	20	SOIC w/Welded Crystal (Pb-Free)	Hana	8 SOIC
Hana	8	SOIC (Pb-Free)	Hana	16 SOIC w/Welded Crystal (Pb-Free)
OSEP	14	SOIC	OSEP	16 SOIC
OSEP	20	SOIC	OSEP	24 SOIC
OSEP	28	SOIC	OSEP	8 SOIC
OSEP	14	SOIC (Pb-Free)	OSEP	16 SOIC (Pb-Free)
OSEP	20	SOIC (Pb-Free)	OSEP	24 SOIC (Pb-Free)
OSEP	28	SOIC (Pb-Free)	OSEP	8 SOIC (Pb-Free)
Unisem	8	SOIC	Unisem	8 SOIC (Pb-Free)
UTL (NSEB) UTAC	14	SOIC	UTL (NSEB) UTAC	16 SOIC
UTL (NSEB) UTAC	8	SOIC	UTL (NSEB) UTAC	14 SOIC (Pb-Free)
UTL (NSEB) UTAC	16	SOIC (Pb-Free)	UTL (NSEB) UTAC	8 SOIC (Pb-Free)

The calculated failure rate for this assembly is:

**FAILURE RATE:                      MTTF (YRS): 119854                      FITS: 1.0**

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. A 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 7/1/2005 and 6/30/2006 .

**Assembly Information:**

Package Type:                      SOIC 150x1.4  
 Flammability:                      UL 94-V0  
 Moisture Sensitivity                      Level 1  
 (JEDEC J-STD20A)  
 Date Code Range:                      0533      to      0550

**OPERATING LIFE**

DESCRIPTION	DATE	TEST	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
	CODE	VEHICLE					

HIGH TEMP OP LIFE	0533	DS2431	125C, 5.25 VOLTS	1000	HRS	77	0
HIGH TEMP OP LIFE	0536	DS1232	125C, 5.5 VOLTS	1000	HRS	80	0
HIGH TEMP OP LIFE	0545	DS1672	125C, 3.6 VOLTS	1000	HRS	77	0
HIGH TEMP OP LIFE	0547	DS2431	125C, 5.25 VOLTS	1000	HRS	77	0
HIGH TEMP OP LIFE	0550	DS1803	125C, 5.25 VOLTS	1000	HRS	80	0
<b>Total:</b>							<b>0</b>

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#### PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
ULTRASOUND	0536	DS1232	J-STD-020		4	0	
STORAGE LIFE	0536	DS1232	125C	24	HRS	241	
MOISTURE SOAK			85 C/85% R.H.	168	HRS	241	
CONVECTION REFLOW			235C +5/-0C	3	PASS	241	0
PRECONDITION U/S	0536	DS1232	J-STD-020		4	0	
ULTRASOUND	0550	DS1803	J-STD-020		4	0	
STORAGE LIFE	0550	DS1803	125C	24	HRS	241	
MOISTURE SOAK			85 C/85% R.H.	168	HRS	241	
CONVECTION REFLOW			235C +5/-0C	3	PASS	241	0
PRECONDITION U/S	0550	DS1803	J-STD-020		4	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	0533	DS2431	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE	0536	DS1232	-55C TO 125C	1000	CYS	40	0
TEMP CYCLE	0547	DS2431	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE	0550	DS1803	-55C TO 125C	1000	CYS	40	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
HAST	0533	DS2431	130C, 85%R.H.,5.5V	96	HRS	77	0
HAST	0536	DS1232	130C, 85%R.H.,5.5V	96	HRS	77	0
HAST	0547	DS2431	130C, 85%R.H.,5.5V	96	HRS	72	0
BIASED MOISTURE	0550	DS1803	85/85, 5.5 VOLTS	1000	HRS	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
AUTOCLAVE	0533	DS2431	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0536	DS1232	121C, 2 ATM STEAM, UNBIASED	96	HRS	40	0
AUTOCLAVE	0547	DS2431	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0550	DS1803	121C, 2 ATM STEAM, UNBIASED	168	HRS	40	0
<b>Total:</b>							<b>0</b>

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**Assembly Information:**

Package Type: SOIC 208x1.9  
Flammability: UL 94-V0  
Moisture Sensitivity (JEDEC J-STD20A) Level 1  
Date Code Range: 0535 to 0606

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**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0535	DS1624	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0606	DS1821	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	0535	DS1624	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0606	DS1821	-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
HAST	0535	DS1624	130C, 85%R.H.,5.5V	96 HRS	77	0	
BIASED MOISTURE	0606	DS1821	85/85, 5.5 VOLTS	1000 HRS	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
AUTOCLAVE	0535	DS1624	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
AUTOCLAVE	0606	DS1821	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
<b>Total:</b>						<b>0</b>	

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**Assembly Information:**

Package Type: SOIC 300x2.3  
Flammability: UL 94-V0  
Moisture Sensitivity (JEDEC J-STD20A) Level 1  
Date Code Range: 0513 to 0614

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**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0513	DS4026C	125C, 3.6 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0614	DS1205	125C, 5.5 VOLTS	1000 HRS	77	0	
<b>Total:</b>						<b>0</b>	

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**STORAGE LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
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STORAGE LIFE	0513	DS4026C	150C	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	0614	DS1205	-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	0614	DS1205	85/85, 5.5 VOLTS	1000 HRS	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
AUTOCLAVE	0614	DS1205	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
				<b>Total:</b>		<b>0</b>	

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**Assembly Information:**

Package Type: SOIC (Pb-Free) 150x1.4  
 Flammability: UL 94-V0  
 Moisture Sensitivity (JEDEC J-STD20A) Level 1  
 Date Code Range: 0530 to 0606

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**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0530	DS1482	125C, 4.9 V (PSA) & 3.6 V (PSB)	1000 HRS	45	0	
HIGH TEMP OP LIFE	0550	DS1337	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0606	DS25LV02	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0606	DS75LV	125C, 3.7 VOLTS	1000 HRS	77	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	0606	DS25LV02	150C	1000 HRS	77	0	
				<b>Total:</b>		<b>0</b>	

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**Assembly Information:**

Package Type: SOIC (Pb-Free) 208x1.9  
 Flammability: UL 94-V0  
 Moisture Sensitivity (JEDEC J-STD20A) Level 1  
 Date Code Range: 0532 to 0532

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**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
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HIGH TEMP OP LIFE      0532    DS1624    125C, 5.5 VOLTS      1000 HRS      77      0  
**Total:**      **0**

**Assembly Information:**

Package Type:                    SOIC (Pb-Free) 300x2.3  
 Flammability:                    UL 94-V0  
 Moisture Sensitivity            Level 1  
   (JEDEC J-STD20A)  
 Date Code Range:                0604    to    0619

**PACKAGE TESTS**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDERABILITY (Pb-Free)	0604	DS1021	EIAJ ED-4701, METHOD 303		15	0	
SOLDERABILITY (Pb-Free)	0604	DS1021	J-STD-002, WETTING BALANCE		20		
SOLDERABILITY (Pb-Free)	0619	DS1021	EIAJ ED-4701, METHOD 303		15	0	
SOLDERABILITY (Pb-Free)	0619	DS1021	J-STD-002, WETTING BALANCE		20		
<b>Total:</b>						<b>0</b>	

**SOLDER HEAT**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
ULTRASOUND	0619	DS1021	J-STD-020		22	0	
STORAGE LIFE			125C	24 HRS	22		
MOISTURE SOAK			85 C/85% R.H.	168 HRS	22		
WAVE SOLDERING			260C +/-3C, 3 SEC	2 PASS	22	0	
EXTERNAL VISUAL			J-STD-020, 6.1a		22	0	
PRECONDITION U/S			J-STD-020		22	0	
ULTRASOUND	0619	DS1021	J-STD-020		10	0	
STORAGE LIFE			125C	24 HRS	10		
MOISTURE SOAK			85 C/85% R.H.	168 HRS	10		
SOLDER DIP (HEAT RESISTANCE)			380C +/-10C, 3SEC	2 PASS	10	0	
EXTERNAL VISUAL			J-STD-020, 6.1a		10	0	
PRECONDITION U/S			J-STD-020		10	0	
ULTRASOUND	0619	DS1021	J-STD-020		22	0	
STORAGE LIFE			125C	24 HRS	22		
MOISTURE SOAK			85 C/85% R.H.	168 HRS	22		
WAVE SOLDERING			260C +/-3C, 3 SEC	2 PASS	22	0	
EXTERNAL VISUAL			J-STD-020, 6.1a		22	0	
PRECONDITION U/S			J-STD-020		22	0	
ULTRASOUND	0619	DS1021	J-STD-020		10	0	
STORAGE LIFE			125C	24 HRS	10		
MOISTURE SOAK			85 C/85% R.H.	168 HRS	10		
SOLDER DIP (HEAT RESISTANCE)			380C +/-10C, 3SEC	2 PASS	10	0	
EXTERNAL VISUAL			J-STD-020, 6.1a		10	0	
PRECONDITION U/S			J-STD-020		10	0	
<b>Total:</b>						<b>0</b>	

**FAILURE RATE:**                    **MTTF (YRS): 119854**                    **FITS: 1.0**