

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	Brilliance Semicondu	28 SOIC
Brilliance Semicondu	32	SOIC	Brilliance Semicondu	32 SOIC (Pb-Free)
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)
CSPI (Cypress)	28	SOIC	Cypress	28 SOIC
Cypress	32	SOIC	Hana	8 SOIC
Hana	8	SOIC (Pb-Free)	Hana	16 SOIC w/Welded Crystal (Pb-Free)
Hitachi	28	SOIC	Hyundai	32 SOIC
Mitsubishi	28	SOIC	Mitsubishi	32 SOIC
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)
Samsung	32	SOIC	Sharp	28 SOIC
Taiwan	32	SOIC	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)	ZMD	28 SOIC

The calculated failure rate for this assembly is:

FAILURE RATE: MTTF (YRS): 180695 FITS: 0.6

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 1/1/2006 and 12/31/2006

Assembly Information:

Package Type: SOIC 150x1.4
 Flammability: UL 94-V0

Moisture Sensitivity
(JEDEC J-STD20A)

Level 1

Date Code Range: 0545 to 0637

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0545	DS1672	125C, 3.6 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0550	DS1803	125C, 5.25 VOLTS	1000 HRS	80	0	
HIGH TEMP OP LIFE	0627	DS2431	125C, 5.25 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0629	DS620	125C, 3.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0629	DS2431	125C, 5.25 VOLTS	1000 HRS	76	0	
HIGH TEMP OP LIFE	0632	DS2431	125C, 5.25 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0637	DS2431	125C, 5.25 VOLTS	1000 HRS	77	0	
Total:						0	

PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
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	
STORAGE LIFE	0637	DS2431	125C	24 HRS	231		
MOISTURE SOAK			85 C/85% R.H.	168 HRS	231		
CONVECTION REFLOW			235C +5/-0C	3 PASS	231	0	
Total:						0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0550	DS1803	-55C TO 125C	1000 CYS	40	0	
TEMP CYCLE	0627	DS2431	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0629	DS2431	-55C TO 125C	1000 CYS	76	0	
TEMP CYCLE	0632	DS2431	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0637	DS2431	-55C TO 125C	1000 CYS	77	0	
Total:						0	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	0550	DS1803	85/85, 5.5 VOLTS	1000 HRS	77	0	
HAST	0627	DS2431	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0629	DS2431	130C, 85%R.H.,5.5V	96 HRS	76	0	
HAST	0632	DS2431	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0637	DS2431	130C, 85%R.H.,5.5V	96 HRS	77	0	
Total:						0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
AUTOCLAVE	0550	DS1803	121C, 2 ATM STEAM, UNBIASED	168 HRS	40	0	
AUTOCLAVE	0627	DS2431	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
AUTOCLAVE	0629	DS2431	121C, 2 ATM STEAM, UNBIASED	168 HRS	76	0	
AUTOCLAVE	0632	DS2431	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
AUTOCLAVE	0637	DS2431	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
Total:						0	

Assembly Information:

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

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0606	DS1821	125C, 5.5 VOLTS	1000 HRS	77	0	
Total:						0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0606	DS1821	-55C TO 125C	1000 CYS	77	0	
Total:						0	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	0606	DS1821	85/85, 5.5 VOLTS	1000 HRS	77	0	
Total:						0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
AUTOCLAVE	0606	DS1821	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
Total:						0	

Assembly Information:

Package Type: SOIC 300x2.3
Flammability: UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A) Level 1
Date Code Range: 0549 to 0614

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0549	DS2422	125C, 5.5V (PSA) & 3.0V (PSB)	1000 HRS	77	0	

HIGH TEMP OP LIFE	0614	DS1205	125C, 5.5 VOLTS	1000 HRS	77	0	
Total:						0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0614	DS1205	-55C TO 125C	1000 CYS	77	0	
Total:						0	

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	
Total:						0	

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	
Total:						0	

Assembly Information:

Package Type: SOIC (Pb-Free) 150x1.4
 Flammability: UL 94-V0
 Moisture Sensitivity (JEDEC J-STD20A) Level 1
 Date Code Range: 0550 to 0633

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0550	DS1337	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0552	DS1881	125C, +5.5V (PSA), +5.5V (PSD)	192 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	
HIGH TEMP OP LIFE	0623	DS1882	125C, 5.5V (PSA), -7.0V (PSC) & +7.0V (PSD)	1000 HRS	77	0	
HIGH TEMP OP LIFE	0624	DS28CM00	125C, 5.25 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0625	DS1805	125C, 5.5 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0628	DS1232	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0630	DS1805	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0633	DS1804	125C, 5.5 VOLTS	1000 HRS	77	0	
Total:						0	

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDERABILITY (Sn/Pb)	0625	DS1805	JESD22-B102, COND C		3	0	
SOLDERABILITY (Pb-Free)			JESD22-B102, COND C		3	0	
X-RAY	0625	DS1805	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS			JESD22-B100		6	0	

MARK PERMANENCY	0625	DS1805	JESD22-B107		6	0
LEAD INTEGRITY			JESD22-B105, COND B		6	0
Total:					0	0

PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0625	DS1805	125C	24 HRS	321		
MOISTURE SOAK			85 C/85% R.H.	168 HRS	321		
CONVECTION REFLOW			260C +/-5C	3 PASS	321	0	
STORAGE LIFE	0628	DS1232	125C	48 HRS	231		
MOISTURE SOAK			85 C/85% R.H.	168 HRS	231		
CONVECTION REFLOW			260C +/-5C	3 PASS	231	0	
Total:					0	0	

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0606	DS25LV02	150C	1000 HRS	77	0	
STORAGE LIFE	0625	DS1805	150C	1000 HRS	77	0	
Total:					0	0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0625	DS1805	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0628	DS1232	-55C TO 125C	1000 CYS	77	0	
Total:					0	0	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	0625	DS1805	85/85, 5.5 VOLTS	1000 HRS	45	0	
HAST	0628	DS1232	130C, 85%R.H.,5.5V	96 HRS	77	0	
Total:					0	0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
AUTOCLAVE	0625	DS1805	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
AUTOCLAVE	0628	DS1232	121C, 2 ATM STEAM, UNBIASED	168 HRS	75	0	
Total:					0	0	

Assembly Information:

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

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
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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	
Total:				0	0

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	
Total:					0	0	

Assembly Information:

Package Type: SOIC w/Crystal 300x2.3
 Flammability: UL 94-V0
 Moisture Sensitivity (JEDEC J-STD20A) Level 1
 Date Code Range: 0601 to 0633

MOISTURE SENSITIVITY LEVEL 1

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
ULTRASOUND	0601	DS3234	J-STD-020		22	0	
STORAGE LIFE			125C	24 HRS	22		
MOISTURE SOAK			85 C/85% R.H.	168 HRS	22		

CONVECTION REFLOW	0601	DS3234	260C +0/-5C	2	PASS	22	0
X-RAY			MIL-STD-883-2012 : TOP & SIDE VIEW			22	0
EXTERNAL VISUAL			J-STD-020, 6.1a			22	0
PRECONDITION U/S			J-STD-020			22	0
Total:						0	0

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0601	DS3234	125C, 5.5 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0633	DS32KHZS	125C, 5.5 VOLTS	1000 HRS	77	0	
Total:						0	0

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDERABILITY (Pb-Free)	0601	DS3234	JESD22-B102, COND C		6	0	
SOLDERABILITY (Sn/Pb)			JESD22-B102, COND C		6	0	
X-RAY	0601	DS3234	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS			JESD22-B100		6	0	
MARK PERMANENCY			JESD22-B107		6	0	
LEAD INTEGRITY			JESD22-B105, COND B		6	0	
Total:						0	0

PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0601	DS3234	125C	24 HRS	353		
MOISTURE SOAK			85 C/85% R.H.	168 HRS	353		
CONVECTION REFLOW			260C +0/-5C	2 PASS	353	0	
STORAGE LIFE	0626	DS3232	125C	24 HRS	77		
MOISTURE SOAK			85 C/85% R.H.	168 HRS	77		
CONVECTION REFLOW			260C +0/-5C	2 PASS	77	0	
STORAGE LIFE	0633	DS32KHZS	125C	24 HRS	231		
MOISTURE SOAK			85 C/85% R.H.	168 HRS	231		
CONVECTION REFLOW			260C +0/-5C	2 PASS	231	0	
Total:						0	0

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0601	DS3234	125C	1000 HRS	77	0	
STORAGE LIFE	0633	DS32KHZS	125C	1000 HRS	77	0	
Total:						0	0

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0601	DS3234	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0633	DS32KHZS	-40 TO 85C	1000 CYS	77	0	
Total:						0	0

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
BIASED MOISTURE	0601	DS3234	85/85, 5.5 VOLTS	1000 HRS	45	0	
BIASED MOISTURE	0633	DS32KHZS	85/85, 5.5 VOLTS	1000 HRS	77	0	
Total:						0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
AUTOCLAVE	0601	DS3234	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
AUTOCLAVE	0626	DS3232	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
AUTOCLAVE	0633	DS32KHZS	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
Total:						0	

FAILURE RATE: **MTTF (YRS): 180695** **FITS: 0.6**