



04/27/2005

RELIABILITY MONITOR REPORT
FOR

TO 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		
Carsem	3	TO220	Carsem	3 TO226 (PR35)
Carsem	2	TO92	Carsem	3 TO92
Carsem	2	TO92 (Pb-Free)	Carsem	3 TO92 (Pb-Free)
Hana	2	TO92	Hana	3 TO92
Hana	2	TO92 (Pb-Free)	Hana	3 TO92 (Pb-Free)

The calculated failure rate for this assembly is:

FAILURE RATE: **MTTF (YRS): 91535** **FITS: 1.2**

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 04/01/2004 and 03/31/2005.

Assembly Information:

Package Type: TO92 150 mil
 Flammability: UL 94-V0
 Moisture Sensitivity
 (JEDEC J-STD20A)
 Date Code Range: 0408 to 0441

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0408	DS2401	125C, 6.0 VOLTS	1000 HRS	80	0	
HIGH TEMP OP LIFE	0412	DS2501	125C, 6.0 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0413	DS2501	125C, 6.0 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0414	DS2503	125C, 6.0 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0418	DS1822	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0428	DS2401	125C, 6.0 VOLTS	1000 HRS	80	0	
HIGH TEMP OP LIFE	0441	DS2401	125C, 6.0 VOLTS	1000 HRS	80	0	
Total:						0	

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDERABILITY (Sn/Pb)	0412	DS2501	JESD22-B102, COND C		3	0	
X-RAY	0412	DS2501	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	
SOLDERABILITY (Sn/Pb)	0412	DS2501	JESD22-B102, COND C		20	0	
SOLDERABILITY (Sn/Pb)	0413	DS2501	JESD22-B102, COND C		3	0	

X-RAY	0413	DS2501	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
SOLDERABILITY (Sn/Pb)	0414	DS2503	JESD22-B102, COND C	3	0
X-RAY	0414	DS2503	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

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0408	DS2401	-55C TO 125C	1000 CYS	45	0	
TEMP CYCLE	0412	DS2501	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0413	DS2501	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0414	DS2503	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0428	DS2401	-55C TO 125C	1000 CYS	45	0	
TEMP CYCLE	0441	DS2401	-55C TO 125C	1000 CYS	45	0	
Total:						0	0

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HAST	0408	DS2401	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0412	DS2501	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0413	DS2501	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0414	DS2503	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0428	DS2401	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0441	DS2401	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	0408	DS2401	121C, 2 ATM STEAM, UNBIASED	168 HRS	45	0	
AUTOCLAVE	0412	DS2501	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
AUTOCLAVE	0413	DS2501	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
AUTOCLAVE	0414	DS2503	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
AUTOCLAVE	0428	DS2401	121C, 2 ATM STEAM, UNBIASED	168 HRS	45	0	
AUTOCLAVE	0441	DS2401	121C, 2 ATM STEAM, UNBIASED	168 HRS	45	0	
Total:						0	0

Assembly Information:

Package Type: TO92 (Pb-Free) 150 mil
Flammability: UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A) Level 1
Date Code Range: 0434 to 0435

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0434	DS2501	125C, 6.0 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0435	DS2501	125C, 6.0 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0435	DS2501	125C, 6.0 VOLTS	1000 HRS	77	0	
Total:						0	

PACKAGE TESTS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDERABILITY (Sn/Pb)	0434	DS2501	JESD22-B102, COND C		3	0	
X-RAY	0434	DS2501	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	
SOLDERABILITY (Sn/Pb)	0435	DS2501	JESD22-B102, COND C		3	0	
X-RAY	0435	DS2501	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	
SOLDERABILITY (Sn/Pb)	0435	DS2501	JESD22-B102, COND C		3	0	
X-RAY	0435	DS2501	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	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0434	DS2501	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0435	DS2501	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0435	DS2501	-55C TO 125C	1000 CYS	77	0	
Total:						0	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HAST	0434	DS2501	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0435	DS2501	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0435	DS2501	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	0434	DS2501	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
AUTOCLAVE	0435	DS2501	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
AUTOCLAVE	0435	DS2501	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
				Total:		0	

FAILURE RATE: MTTF (YRS): 91535 FITS: 1.2