



10/22/2007

**RELIABILITY MONITOR REPORT
FOR**

DAL 0.6 μ m Process

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 Process Reliability Monitor. The specific products in this process monitor are:

DS1086H	DS1311	DS1372	DS1643	DS1682
DS1722	DS1744	DS1922L	DS1990	DS21348
DS21448	DS2154	DS2432	DS2502	DS29020
DS29022	DS3232	DS32B35	DS32C35	DS5001
DS5240	DS5250	DS9490	DSQ33G4	

The calculated failure rate for devices using this process is:

FAILURE RATE: **MTTF (YRS): 168007** **FITS: 0.7**

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

Cf: 60% **Ea: 0.7** **Tu: 25 °C**

The reliability data follows. At the start of this data is the process information. 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 10/1/2006 and 9/30/2007 .

Device Information:

Process: DAL 0.6µm Process
 Interconnect: Aluminum / 1% Silicon / 0.5% Copper
 Gate Oxide Thickness: 150 Å

OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0626	DS2502	125C, 6.0 VOLTS	1000 HRS	77	0	
HIGH VOLTAGE LIFE	0636	DS32B35	125C, 3.6 VOLTS	168 HRS	100	0	
HIGH VOLTAGE LIFE	0636	DS32B35	125C, 3.6 VOLTS	168 HRS	100	0	
HIGH TEMP OP LIFE	0636	DS32C35	125C, 3.6 VOLTS	1000 HRS	100	0	
HIGH VOLTAGE LIFE	0636	DS32B35	125C, 3.6 VOLTS	168 HRS	100	0	
HIGH VOLTAGE LIFE	0636	DS32C35	125C, 3.6 VOLTS	168 HRS	100	0	
HIGH VOLTAGE LIFE	0636	DS32C35	125C, 3.6 VOLTS	168 HRS	100	0	
HIGH VOLTAGE LIFE	0636	DS32C35	125C, 3.6 VOLTS	168 HRS	100	0	
HIGH TEMP OP LIFE	0641	DS21348	125C, 3.5 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0642	DS5250	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0644	DS2154	125C, 5.25 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0645	DS21448	125C, 3.3 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0647	DS2502	125C, 6.0 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0651	DS1086H	125C, 5.25 VOLTS	1000 HRS	45	0	
HIGH VOLTAGE LIFE	0651	DS5240	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0652	DS1086H	125C, 5.25 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0701	DS1086H	125C, 5.25 VOLTS	1000 HRS	45	0	

HIGH TEMP OP LIFE	0705	DS5001	125C, 5.5 VOLTS	1000 HRS	77	0
HIGH TEMP OP LIFE	0710	DS21448	125C, 3.5 VOLTS	1000 HRS	77	0
HIGH TEMP OP LIFE	0710	DS1722	125C, 5.5 VOLTS	1000 HRS	77	0
HIGH TEMP OP LIFE	0714	DS1682	125C, 5.5 VOLTS	1000 HRS	77	0
HIGH TEMP REVERSE BIAS	0717	DS2432	125C, 5.25 VOLTS	1000 HRS	48	0
HIGH TEMP REVERSE BIAS	0717	DS2432	125C, 5.25 VOLTS	1000 HRS	48	0
HIGH TEMP REVERSE BIAS	0717	DS2432	125C, 5.25 VOLTS	1000 HRS	48	0
HIGH TEMP OP LIFE	0720	DS3232	125C, 5.5 VOLTS	1000 HRS	45	0
HIGH TEMP OP LIFE	0722	DS1311	125C, 5.5 VOLTS	1000 HRS	77	0
HIGH TEMP OP LIFE	0723	DS1372	125C, 5.5 VOLTS	1000 HRS	45	0
Total:						0

STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0626	DS2502	150C	1000 HRS	77	0	
STORAGE LIFE	0636	DS32C35	125C	1000 HRS	77	0	
STORAGE LIFE	0639	DS2502	150C	1000 HRS	231	0	
STORAGE LIFE	0641	DS21348	150C	1000 HRS	77	0	
STORAGE LIFE	0645	DS21448	150C	1000 HRS	77	0	
STORAGE LIFE	0647	DS2502	150C	1000 HRS	77	0	
STORAGE LIFE	0651	DS1086H	150C	1000 HRS	77	0	
STORAGE LIFE	0651	DS5240	150C	1000 HRS	77	0	
STORAGE LIFE	0652	DS1086H	150C	1000 HRS	77	0	
STORAGE LIFE	0653	DS1922L	85 C	500 HRS	77	0	
STORAGE LIFE	0653	DS1922L	85 C	1000 HRS	77	0	
STORAGE LIFE	0701	DS1086H	150C	1000 HRS	76	0	
STORAGE LIFE	0703	DS1922L	85 C	500 HRS	77	0	
STORAGE LIFE	0709	DS1990	70 C	1000 HRS	77	0	
STORAGE LIFE	0710	DS21448	150C	1000 HRS	77	0	
STORAGE LIFE	0710	DS29022	70 C	336 HRS	77	0	
STORAGE LIFE	0710	DS29022	70 C	336 HRS	77	0	
STORAGE LIFE	0710	DS29022	70 C	336 HRS	77	0	
STORAGE LIFE	0714	DS29020	70 C	336 HRS	77	0	
STORAGE LIFE	0714	DS1643	85 C	1000 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		76	0	
STORAGE LIFE	0715	DS1744	85 C	1000 HRS	77	0	

STORAGE LIFE	0716	DS1990	85 C	1000	HRS	77	0
STORAGE LIFE	0716	DSQ33G4	85 C	1000	HRS	77	0
STORAGE LIFE	0717	DS9490	85 C	1000	HRS	77	0
STORAGE LIFE	0717	DS2432	150C	1000	HRS	77	0
STORAGE LIFE	0717	DS2432	150C	1000	HRS	77	0
STORAGE LIFE	0717	DS2432	150C	1000	HRS	77	0
STORAGE LIFE	0718	DS1744	85 C	1000	HRS	77	0
STORAGE LIFE	0718	DS1744	85 C	1000	HRS	77	0
Total:							0

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0626	DS2502	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE	0636	DS32C35	-40 TO 85C	1000	CYS	77	0
TEMP CYCLE	0641	DS21348	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE	0642	DS2502	-40 TO 85C	1000	CYS	80	0
TEMP CYCLE	0642	DS2502	-40 TO 85C	1000	CYS	80	0
TEMP CYCLE	0642	DS5250	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE	0645	DS21448	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE	0647	DS2502	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE	0651	DS1086H	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE	0651	DS5240	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE	0652	DS1086H	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE	0653	DS1922L	-40 TO 85C	1000	CYS	77	0
TEMP CYCLE	0653	DS1922L	-40 TO 85C	1000	CYS	77	0
TEMP CYCLE	0701	DS1086H	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE	0703	DS1922L	-40 TO 85C	1000	CYS	77	0
TEMP CYCLE	0709	DS1990	-40 TO 85C	500	CYS	77	0
TEMP CYCLE	0710	DS21448	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE	0710	DS29022	0C TO 70C	300	CYS	77	0
TEMP CYCLE	0710	DS29022	0C TO 70C	300	CYS	77	0
TEMP CYCLE	0710	DS29022	0C TO 70C	300	CYS	77	0
TEMP CYCLE	0714	DS29020	-40 TO 85C	500	CYS	77	0
TEMP CYCLE	0714	DS1643	-40 TO 85C	1000	CYS	77	0
VISUAL INSPECTION			WHISKERS < 50uM			77	0
TEMP CYCLE	0715	DS1744	-40 TO 85C	1000	CYS	77	0
TEMP CYCLE	0716	DSQ33G4	-40 TO 85C	1000	CYS	77	0
TEMP CYCLE	0717	DS9490	-40 TO 85C	1000	CYS	77	0

TEMP CYCLE	0717	DS2432	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE	0717	DS2432	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE	0717	DS2432	-55C TO 125C	1000	CYS	77	0
TEMP CYCLE	0718	DS1744	-40 TO 85C	1000	CYS	77	0
TEMP CYCLE	0718	DS1744	-40 TO 85C	1000	CYS	77	0
TEMP CYCLE	0728	DS29020	-40 TO 85C	500	CYS	153	0
Total:						0	0

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HAST	0626	DS2502	130C, 85%R.H.,5.5V	96	HRS	77	0
BIASED MOISTURE	0636	DS32C35	85/85, 3.5 VOLTS	1000	HRS	77	0
BIASED MOISTURE	0641	DS21348	85/85, 3.5 VOLTS	1000	HRS	45	0
BIASED MOISTURE	0642	DS2502	85/85, 5.5 VOLTS	1000	HRS	80	0
BIASED MOISTURE	0642	DS2502	85/85, 5.5 VOLTS	1000	HRS	80	0
BIASED MOISTURE	0642	DS5250	85/85, 5.5 VOLTS	1000	HRS	45	0
BIASED MOISTURE	0647	DS2502	85/85, 5.5 VOLTS	1000	HRS	77	0
HAST	0651	DS1086H	130C, 85%R.H.,5.5V	96	HRS	45	0
BIASED MOISTURE	0651	DS5240	85/85, 5.5 VOLTS	1000	HRS	77	0
HAST	0652	DS1086H	130C, 85%R.H.,5.5V	96	HRS	45	0
HAST	0701	DS1086H	130C, 85%R.H.,5.5V	96	HRS	45	0
BIASED MOISTURE	0710	DS21448	85/85, 3.5 VOLTS	1000	HRS	45	0
BIASED MOISTURE	0714	DS1643	85/85, 5.5 VOLTS	1000	HRS	77	0
VISUAL INSPECTION			WHISKERS < 50uM			77	0
HAST	0717	DS2432	130C, 85%R.H.,5.5V	96	HRS	45	0
HAST	0717	DS2432	130C, 85%R.H.,5.5V	96	HRS	45	0
HAST	0717	DS2432	130C, 85%R.H.,5.5V	96	HRS	45	0
Total:						0	0

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
AUTOCLAVE	0626	DS3232	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
HAST, NO BIAS	0636	DS32C35	130C, 85% R.H.	96	HRS	77	0
AUTOCLAVE	0642	DS5250	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
HAST, NO BIAS	0645	DS21448	130C, 85% R.H.	200	HRS	77	0
AUTOCLAVE	0647	DS2502	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0651	DS1086H	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0651	DS5240	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0652	DS1086H	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0

MOISTURE SOAK	0653	DS1922L	85 C/85% R.H.	500	HRS	77	0
MOISTURE SOAK	0653	DS1922L	85 C/85% R.H.	500	HRS	77	0
AUTOCLAVE	0701	DS1086H	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
MOISTURE SOAK	0703	DS1922L	85 C/85% R.H.	500	HRS	77	0
MOISTURE SOAK	0709	DS1990	60C/90% R.H.	1000	HRS	77	0
MOISTURE SOAK	0714	DS29020	85 C/85% R.H.	274	HRS	77	0
MOISTURE SOAK	0715	DS1744	60C/90% R.H.	1000	HRS	77	0
MOISTURE SOAK	0716	DS1990	85 C/85% R.H.	959	HRS	77	0
MOISTURE SOAK	0716	DSQ33G4	60C/90% R.H.	1000	HRS	77	0
MOISTURE SOAK	0717	DS9490	60C/90% R.H.	1000	HRS	77	0
MOISTURE SOAK	0718	DS1744	60C/90% R.H.	1000	HRS	77	0
MOISTURE SOAK	0718	DS1744	60C/90% R.H.	1000	HRS	77	0
Total:							0

W/E ENDURANCE AND DATA RET'N

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0714	DS1682	150C	1000	HRS	77	0
WRITE CYCLE STRESS (KCYS)			85 C, 5.5 VOLTS	30	KCYS	77	0
Total:							0

FAILURE RATE:

MTTF (YRS): 168007

FITS: 0.7