

**RELIABILITY MONITOR REPORT  
FOR**

**0.8  $\mu\text{m}$  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 products covered by this process monitor are:

DS1023	DS1033	DS1035	DS1044	DS1065
DS1073	DS1075	DS1175	DS1231	DS1232
DS1233	DS1302	DS1305	DS1306	DS1307
DS1308	DS1312	DS1314	DS1315	DS1321
DS1323	DS13D12	DS13D14	DS13D21	DS1481
DS1620	DS1621	DS1623	DS1624	DS1629
DS1670	DS1671	DS1673	DS1674	DS1677
DS1680	DS1685	DS1705	DS1706	DS1707
DS1708	DS1720	DS1721	DS17285	DS17485
DS1780	DS17885	DS1800	DS1801	DS1802
DS1803	DS1804	DS1806	DS1807	DS1810
DS1811	DS1812	DS1813	DS1814	DS1815
DS1816	DS1817	DS1818	DS1819	DS1821
DS1832	DS1834	DS1836	DS1844	DS1866
DS1868	DS2105	DS2106	DS2109	DS2110
DS2114	DS2118M	DS21372	DS2151	DS2152
DS2153	DS2154	DS2172	DS21Q41	DS21S07
DS21T05	DS21T06	DS21T07	DS21T11	DS2401
DS2406	DS2407	DS2423	DS2430	DS2434
DS2435	DS2436	DS2480	DS24S03	DS24S34
DS2502	DS2503	DS2505	DS2506	DS32KHZ
DS32KHZS	DS4201	DS56	DS60	DS75
DS76KHZ	DS80CH10	DS83C520	DS87C520	DS87C530

The calculated failure rate for devices using this process is

**FAILURE RATE:                      MTTF (YRS): 147585                      FITS: 0.8**

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 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 12/31/05 and .

**Device Information:**

Process: 0.8 µm Process  
 Interconnect: Aluminum / 1% Silicon / 0.5% Copper  
 Gate Oxide Thickness: 175 Å

**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0444	DS1233	125C, 5.5 VOLTS	1000 HRS	80	0	
HIGH TEMP OP LIFE	0445	DS87C520	125C, 5.5 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0447	DS1302	125C, 5.5 VOLTS	1000 HRS	80	0	
HIGH TEMP OP LIFE	0449	DS1232	125C, 5.5 VOLTS	1000 HRS	78	0	
HIGH TEMP OP LIFE	0451	DS32KHZS	125C, 5.5 VOLTS	1000 HRS	45	0	

HIGH TEMP OP LIFE	0451	DS32KHZS	125C, 5.5 VOLTS	1000 HRS	45	0
HIGH TEMP OP LIFE	0452	DS32KHZS	125C, 5.5 VOLTS	1000 HRS	45	0
HIGH TEMP OP LIFE	0502	DS1803	125C, 5.25 VOLTS	1000 HRS	45	0
VISUAL INSPECTION			WHISKERS < 50uM		3	0
HIGH TEMP OP LIFE	0502	DS1803	125C, 5.25 VOLTS	1000 HRS	45	0
VISUAL INSPECTION			WHISKERS < 50uM		3	0
HIGH TEMP OP LIFE	0502	DS1803	125C, 5.25 VOLTS	1000 HRS	45	0
VISUAL INSPECTION			WHISKERS < 50uM		3	0
HIGH TEMP OP LIFE	0505	DS1629	125C, 5.5 VOLTS	1000 HRS	77	0
HIGH TEMP OP LIFE	0509	DS32KHZS	125C, 5.5 VOLTS	1000 HRS	45	0
HIGH TEMP OP LIFE	0511	DS1302	125C, 5.5 VOLTS	1000 HRS	80	0
HIGH TEMP OP LIFE	0512	DS2430	125C, 6.0 VOLTS	1000 HRS	45	0
HIGH TEMP OP LIFE	0520	DS32KHZS	125C, 5.5 VOLTS	1000 HRS	45	0
HIGH TEMP OP LIFE	0520	DS32KHZS	125C, 5.5 VOLTS	1000 HRS	45	0
HIGH TEMP OP LIFE	0520	DS32KHZS	125C, 5.5 VOLTS	1000 HRS	45	0
HIGH TEMP OP LIFE	0522	DS32KHZS	125C, 5.5 VOLTS	1000 HRS	45	0
HIGH TEMP OP LIFE	0522	DS32KHZS	125C, 5.5 VOLTS	1000 HRS	45	0
HIGH TEMP OP LIFE	0522	DS32KHZS	125C, 5.5 VOLTS	1000 HRS	45	0
HIGH TEMP OP LIFE	0532	DS1624	125C, 5.5 VOLTS	1000 HRS	77	0
HIGH TEMP OP LIFE	0535	DS1624	125C, 5.5 VOLTS	1000 HRS	77	0
				<b>Total:</b>	<b>0</b>	<b>0</b>

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### STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0445	DS87C520	150C	1000 HRS	50	0	
STORAGE LIFE	0451	DS32KHZS	125C	1000 HRS	77	0	
STORAGE LIFE	0451	DS32KHZS	125C	1000 HRS	77	0	
STORAGE LIFE	0452	DS32KHZS	125C	1000 HRS	77	0	
STORAGE LIFE	0502	DS1803	150C	1000 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
STORAGE LIFE	0502	DS1803	150C	1000 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
STORAGE LIFE	0502	DS1803	150C	1000 HRS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
STORAGE LIFE	0509	DS32KHZS	125C	1000 HRS	77	0	
STORAGE LIFE	0512	DS2430	150C	1000 HRS	77	0	
STORAGE LIFE	0512	DS2430	150C	1000 HRS	77	0	
STORAGE LIFE	0520	DS32KHZS	125C	1000 HRS	77	0	
STORAGE LIFE	0520	DS32KHZS	125C	1000 HRS	77	0	

STORAGE LIFE	0520	DS32KHZS 125C	1000 HRS	77	0
STORAGE LIFE	0522	DS32KHZS 125C	1000 HRS	77	0
STORAGE LIFE	0522	DS32KHZS 125C	1000 HRS	77	0
STORAGE LIFE	0522	DS32KHZS 125C	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	0444	DS1233	-55C TO 125C	1000 CYS	40	0	
TEMP CYCLE	0445	DS87C520	-55C TO 125C	1000 CYS	50	0	
TEMP CYCLE	0447	DS1302	-55C TO 125C	1000 CYS	45	0	
TEMP CYCLE	0449	DS1232	-55C TO 125C	1000 CYS	40	0	
TEMP CYCLE	0451	DS32KHZS	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0451	DS32KHZS	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0452	DS32KHZS	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0502	DS1803	-55C TO 125C	1000 CYS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
TEMP CYCLE	0502	DS1803	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0502	DS1803	-55C TO 125C	1000 CYS	77	0	
VISUAL INSPECTION			WHISKERS < 50uM		3	0	
TEMP CYCLE	0509	DS32KHZS	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0511	DS1302	-55C TO 125C	1000 CYS	45	0	
TEMP CYCLE	0512	DS2430	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0512	DS2430	-55C TO 125C	1000 CYS	77	0	
TEMP CYCLE	0520	DS32KHZS	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0520	DS32KHZS	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0520	DS32KHZS	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0522	DS32KHZS	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0522	DS32KHZS	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0522	DS32KHZS	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0522	DS32KHZS	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0535	DS1624	-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	0444	DS1233	130C, 85%R.H.,5.5V	96 HRS	77	0	
HAST	0445	DS87C520	130C, 85%R.H.,5.5V	96 HRS	60	0	
BIASED MOISTURE	0447	DS1302	85/85, 5.5 VOLTS	1000 HRS	77	0	
HAST	0449	DS1232	130C, 85%R.H.,5.5V	96 HRS	77	0	

BIASED MOISTURE	0451	DS32KHZS	85/85, 5.5 VOLTS	1000	HRS	77	0
BIASED MOISTURE	0451	DS32KHZS	85/85, 5.5 VOLTS	1000	HRS	77	0
BIASED MOISTURE	0452	DS32KHZS	85/85, 5.5 VOLTS	1000	HRS	77	0
BIASED MOISTURE	0502	DS1803	85/85, 5.5 VOLTS	1000	HRS	77	0
VISUAL INSPECTION			WHISKERS < 50uM			3	0
BIASED MOISTURE	0502	DS1803	85/85, 5.5 VOLTS	1000	HRS	77	0
VISUAL INSPECTION			WHISKERS < 50uM			3	0
BIASED MOISTURE	0502	DS1803	85/85, 5.5 VOLTS	1000	HRS	77	0
VISUAL INSPECTION			WHISKERS < 50uM			3	0
BIASED MOISTURE	0509	DS32KHZS	85/85, 5.5 VOLTS	1000	HRS	77	0
BIASED MOISTURE	0511	DS1302	85/85, 5.5 VOLTS	1000	HRS	77	0
BIASED MOISTURE	0512	DS2430	85/85, 5.5 VOLTS	1000	HRS	45	0
BIASED MOISTURE	0512	DS2430	85/85, 5.5 VOLTS	1000	HRS	45	0
BIASED MOISTURE	0520	DS32KHZS	85/85, 5.5 VOLTS	1000	HRS	77	0
BIASED MOISTURE	0520	DS32KHZS	85/85, 5.5 VOLTS	1000	HRS	77	0
BIASED MOISTURE	0520	DS32KHZS	85/85, 5.5 VOLTS	1000	HRS	77	0
BIASED MOISTURE	0522	DS32KHZS	85/85, 5.5 VOLTS	1000	HRS	77	0
BIASED MOISTURE	0522	DS32KHZS	85/85, 5.5 VOLTS	1000	HRS	77	0
BIASED MOISTURE	0522	DS32KHZS	85/85, 5.5 VOLTS	1000	HRS	77	0
HAST	0535	DS1624	130C, 85%R.H.,5.5V	96	HRS	77	0
<b>Total:</b>						<b>0</b>	<b>0</b>

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### UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
AUTOCLAVE	0444	DS1233	121C, 2 ATM STEAM, UNBIASED	168	HRS	40	0
AUTOCLAVE	0447	DS1302	121C, 2 ATM STEAM, UNBIASED	96	HRS	45	0
AUTOCLAVE	0449	DS1232	121C, 2 ATM STEAM, UNBIASED	96	HRS	40	0
AUTOCLAVE	0451	DS32KHZS	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0451	DS32KHZS	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0452	DS32KHZS	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0502	DS1803	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0502	DS1803	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0502	DS1803	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
VISUAL INSPECTION			WHISKERS < 50uM			3	0
AUTOCLAVE	0509	DS32KHZS	121C, 2 ATM STEAM, UNBIASED	168	HRS	76	0
AUTOCLAVE	0511	DS1302	121C, 2 ATM STEAM, UNBIASED	96	HRS	45	0
AUTOCLAVE	0512	DS2430	121C, 2 ATM STEAM, UNBIASED	168	HRS	75	0
AUTOCLAVE	0512	DS2430	121C, 2 ATM STEAM, UNBIASED	168	HRS	76	0
AUTOCLAVE	0520	DS32KHZS	121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0

AUTOCLAVE	0520	DS32KHZS 121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0520	DS32KHZS 121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0522	DS32KHZS 121C, 2 ATM STEAM, UNBIASED	168	HRS	76	0
AUTOCLAVE	0522	DS32KHZS 121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0522	DS32KHZS 121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
AUTOCLAVE	0535	DS1624 121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0
<b>Total:</b>						<b>0</b>

**W/E ENDURANCE AND DATA RET'N**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
WRITE CYCLE STRESS (KCYS)	0505	DS1629	85 C, 5.5 VOLTS	2	KCYS	77	0
STORAGE LIFE			150C	1000	HRS	77	0
WRITE CYCLE STRESS (KCYS)	0532	DS1624	85 C, 5.5 VOLTS	25	KCYS	77	0
STORAGE LIFE			150C	1000	HRS	77	0
WRITE CYCLE STRESS (KCYS)	0535	DS1624	85 C, 5.5 VOLTS	25	KCYS	77	0
STORAGE LIFE			150C	1000	HRS	77	0
<b>Total:</b>						<b>0</b>	

**FAILURE RATE:**

**MTTF (YRS): 147585**

**FITS: 0.8**