



5/9/2009

RELIABILITY MONITOR REPORT  
FOR

**Dallas 0.6 $\mu$ m Silicon Gate CMOS**

**MAXIM Integrated Products**

120 San Gabriel Dr.  
Sunnyvale, CA 94086

This Report was prepared by  
Maxim 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:

DS1086L	DS1090	DS12R887	DS1501	DS1626
DS1747	DS1852	DS1977	DS2119M	DS21448
DS2401	DS2432	DS2502	DS2710	DS29020
DS3510	DS3514	DS3690	DS80C320	

The calculated failure rate for devices using this process is:

**FAILURE RATE:**                      **MTTF (YRS): 145519**                      **FITS: 0.8**

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

**Cf: 60%**                      **Ea: 0.7**                      **Tu: 25 °C**

The reliability data follows and in this section is the detailed reliability data by stress. The reliability data section includes the latest data available. This report covers data between 4/1/2008 and 3/31/2009 .

**Process Information:**

Process Description:                      Dallas 0.6µm Silicon Gate CMOS

**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.
HIGH TEMP OP LIFE	0726	DS3690	125C, 3.6 VOLTS	1000 HRS	45	0	QJ732632BB-NPI
HIGH TEMP OP LIFE	0747	DS3510	125C, 5.5 V (PSA) & 15.0 V (PSB)	1000 HRS	77	0	QJ712635BA
HIGH TEMP OP LIFE	0747	DS3510	125C, 5.5 V (PSA) & 15.0 V (PSB)	1000 HRS	77	0	QJ712635BA
HIGH TEMP OP LIFE	0751	DS2119M	125C, 5.5 VOLTS	1000 HRS	77	0	VJ716430ABC
HIGH TEMP OP LIFE	0752	DS2401	125C, 6.0 VOLTS	1000 HRS	80	0	VH739001AIA
HIGH TEMP OP LIFE	0806	DS2710	125C, 5.5 VOLTS	1000 HRS	45	0	QJ751638CC-NPI
HIGH TEMP OP LIFE	0808	DS80C320	125C, 5.5 VOLTS	1000 HRS	77	0	QH805039AB
HIGH TEMP OP LIFE	0808	DS80C320	125C, 5.5 VOLTS	1000 HRS	77	0	QH805039AC
HIGH TEMP OP LIFE	0810	DS80C320	125C, 5.5 VOLTS	1000 HRS	77	0	QH805039AD
HIGH TEMP OP LIFE	0810	DS1852	125C, 5.5 VOLTS	1000 HRS	77	0	QS810097AA-QUAL
HIGH TEMP OP LIFE	0817	DS2432	125C, 5.25 VOLTS	1000 HRS	77	0	QJ832164BB
HIGH TEMP OP LIFE	0819	DS21448	125C, 3.5 VOLTS	1000 HRS	45	0	QS751045AB-QUAL

HIGH TEMP OP LIFE	0819	DS21448	125C, 3.5 VOLTS	1000 HRS	45	0	QS751045AC-QUAL
HIGH TEMP OP LIFE	0819	DS21448	125C, 3.5 VOLTS	1000 HRS	45	0	QS751045AD-QUAL
HIGH TEMP OP LIFE	0832	DS2502	125C, 6.0 VOLTS	1000 HRS	77	0	QJ846128AB
HIGH TEMP OP LIFE	0832	DS12R887	85 C, 3.3 VOLTS	1000 HRS	46	0	DM547055AAD
HIGH TEMP OP LIFE	0833	DS3514	125C, 5.5 V (PSA) & 15.0 V (PSB)	1000 HRS	77	0	QJ803644BA-NPI
HIGH TEMP OP LIFE	0833	DS1501	125C, 6.0 VOLTS	1000 HRS	45	0	QH803253AB
HIGH TEMP OP LIFE	0842	DS1626	125C, 5.5 VOLTS	1000 HRS	77	0	QJ909643ACA-NPI
HIGH TEMP OP LIFE	0843	DS1090	125C, 5.5 VOLTS	408 HRS	45	0	VJ645637AEA
HIGH TEMP OP LIFE	0843	DS1090	125C, 5.5 VOLTS	408 HRS	45	0	VJ645637AEA
<b>Total:</b>						<b>0</b>	

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#### STORAGE LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.
STORAGE LIFE	0751	DS2119M	150C	1000 HRS	77	0	VJ716430ABC
STORAGE LIFE	0752	DS2401	150C	1000 HRS	77	0	VH739001AIA
STORAGE LIFE	0808	DS80C320	150C	1000 HRS	77	0	QH805039AB
STORAGE LIFE	0808	DS80C320	150C	1000 HRS	77	0	QH805039AC
STORAGE LIFE	0810	DS80C320	150C	1000 HRS	77	0	QH805039AD
STORAGE LIFE	0810	DS1086L	150C	1000 HRS	75	0	ID822214AB
VISUAL INSPECTION	0818	DS1747	WHISKERS < 50uM		75	0	M6362914EC
STORAGE LIFE	0818	DS1747	85 C	1000 HRS	76	0	M6362914EC
VISUAL INSPECTION	0818	DS1747	WHISKERS < 50uM		77	0	M6362915EC
STORAGE LIFE	0818	DS1747	85 C	1000 HRS	77	0	M6362915EC
VISUAL INSPECTION	0818	DS1747	WHISKERS < 50uM		77	0	M6362916EC
STORAGE LIFE	0818	DS1747	85 C	1000 HRS	77	0	M6362916EC
STORAGE LIFE	0819	DS21448	150C	1000 HRS	74	0	QS751045AB-QUAL
STORAGE LIFE	0819	DS21448	150C	1000 HRS	77	0	QS751045AC-QUAL
STORAGE LIFE	0819	DS21448	150C	1000 HRS	77	0	QS751045AD-QUAL
STORAGE LIFE	0823	DS29020	70 C	336 HRS	77	0	MB363153QAL-1
STORAGE LIFE	0823	DS29020	70 C	336 HRS	77	0	MB363154QAL-1
STORAGE LIFE	0823	DS29020	70 C	336 HRS	77	0	MB363155QAL-1
STORAGE LIFE	0827	DS2502	150C	1000 HRS	77	0	QH827010ADA
STORAGE LIFE	0827	DS2502	150C	1000 HRS	77	0	QH827010AEA

STORAGE LIFE	0827	DS2502	150C	1000	HRS	77	0	QH827010AFD
STORAGE LIFE	0833	DS1501	150C	1000	HRS	77	0	QH803253AB
STORAGE LIFE	0834	DS29020	70 C	336	HRS	77	0	MC825512ABA-QAL
<b>Total:</b>							<b>0</b>	

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### TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.	
TEMP CYCLE, 5' RAMP, 10' DWELL	0725	DS3690	-55C TO 125C	1000	CYS	77	0	QJ732632BER-NPI
TEMP CYCLE, 5' RAMP, 10' DWELL	0726	DS3690	-55C TO 125C	1000	CYS	77	0	QJ732632BB-NPI
TEMP CYCLE, 5' RAMP, 10' DWELL	0726	DS3690	-55C TO 125C	1000	CYS	77	0	QJ732632BC-NPI
TEMP CYCLE, 5' RAMP, 10' DWELL	0751	DS2119M	-55C TO 125C	1000	CYS	77	0	VJ716430ABC
TEMP CYCLE, 5' RAMP, 10' DWELL	0752	DS2401	-55C TO 125C	1000	CYS	77	0	VH739001AIA
TEMP CYCLE, 5' RAMP, 10' DWELL	0808	DS80C320	-55C TO 125C	1000	CYS	77	0	QH805039AB
TEMP CYCLE, 5' RAMP, 10' DWELL	0808	DS80C320	-55C TO 125C	1000	CYS	77	0	QH805039AC
TEMP CYCLE, 5' RAMP, 10' DWELL	0810	DS80C320	-55C TO 125C	1000	CYS	77	0	QH805039AD
TEMP CYCLE, 5' RAMP, 10' DWELL	0810	DS1852	-55C TO 125C	1000	CYS	76	0	QS810097AA-QUAL
BOND STRENGTH	0810	DS1086L	MIL-STD-883-2011 : COND D	40	WIRES	5	0	ID822214AB
TEMP CYCLE, 5' RAMP, 10' DWELL	0810	DS1086L	-55C TO 125C	1000	CYS	77	0	ID822214AB
TEMP CYCLE, 5' RAMP, 10' DWELL	0817	DS2432	-55C TO 125C	1000	CYS	77	0	QJ832164BB
VISUAL INSPECTION	0818	DS1747	WHISKERS < 50uM			77	0	M6362914EC
TEMP CYCLE, 5' RAMP, 10' DWELL	0818	DS1747	-40 TO 85C	1000	CYS	77	0	M6362914EC
VISUAL INSPECTION	0818	DS1747	WHISKERS < 50uM			77	0	M6362915EC
TEMP CYCLE, 5' RAMP, 10' DWELL	0818	DS1747	-40 TO 85C	1000	CYS	77	0	M6362915EC
VISUAL INSPECTION	0818	DS1747	WHISKERS < 50uM			77	0	M6362916EC
TEMP CYCLE, 5' RAMP, 10' DWELL	0818	DS1747	-40 TO 85C	1000	CYS	77	0	M6362916EC
TEMP CYCLE, 5' RAMP, 10' DWELL	0819	DS21448	-55C TO 125C	1000	CYS	77	0	QS751045AB-QUAL
TEMP CYCLE, 5' RAMP, 10' DWELL	0819	DS21448	-55C TO 125C	1000	CYS	77	0	QS751045AC-QUAL
TEMP CYCLE, 5' RAMP, 10' DWELL	0819	DS21448	-55C TO 125C	1000	CYS	77	0	QS751045AD-QUAL
TEMP CYCLE, 5' RAMP, 10' DWELL	0823	DS29020	-40 TO 85C	500	CYS	77	0	MB363153QAL-1

TEMP CYCLE, 5' RAMP, 10' DWELL	0823	DS29020	-40 TO 85C	500	CYS	77	0	MB363154QAL-1
TEMP CYCLE, 5' RAMP, 10' DWELL	0827	DS2502	-55C TO 125C	1000	CYS	77	0	QH827010ADA
TEMP CYCLE, 5' RAMP, 10' DWELL	0827	DS2502	-55C TO 125C	1000	CYS	77	0	QH827010AEA
TEMP CYCLE, 5' RAMP, 10' DWELL	0827	DS2502	-55C TO 125C	1000	CYS	77	0	QH827010AFD
TEMP CYCLE, 5' RAMP, 10' DWELL	0832	DS12R887	0C TO 70C	1000	CYS	77	0	DM547055AAD
TEMP CYCLE, 5' RAMP, 10' DWELL	0832	DS12R887	-40 TO 85C	1000	CYS	77	0	DM547055AAD
TEMP CYCLE, 5' RAMP, 10' DWELL	0833	DS1501	-55C TO 125C	1000	CYS	77	0	QH803253AB
TEMP CYCLE, 5' RAMP, 10' DWELL	0834	DS29020	-40 TO 85C	500	CYS	77	0	MC825512ABA-QAL
TEMP CYCLE, 5' RAMP, 10' DWELL	0841	DS1977	-40 TO 85C	1000	CYS	77	0	MG364960QAL1
TEMP CYCLE, 5' RAMP, 10' DWELL	0841	DS1977	-40 TO 85C	1000	CYS	77	0	MG364961QAL
TEMP CYCLE, 5' RAMP, 10' DWELL	0841	DS1977	-40 TO 85C	1000	CYS	77	0	MG364962QAL
<b>Total:</b>							<b>0</b>	

#### TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.
BIASED MOISTURE	0751	DS2119M	85/85, 5.5 VOLTS	1000 HRS	77	0	VJ716430ABC
HAST, NO BIAS	0751	DS2119M	130C, 85% R.H.	96 HRS	77	0	VJ716430ABC
HAST	0752	DS2401	130C, 85%R.H.,5.5V	96 HRS	77	0	VH739001AIA
BIASED MOISTURE	0808	DS80C320	85/85, 5.5 VOLTS	1000 HRS	77	0	QH805039AB
BIASED MOISTURE	0808	DS80C320	85/85, 5.5 VOLTS	1000 HRS	77	0	QH805039AC
BIASED MOISTURE	0810	DS80C320	85/85, 5.5 VOLTS	1000 HRS	77	0	QH805039AD
HAST	0810	DS1086L	130C, 85%R.H.,3.5V	96 HRS	77	0	ID822214AB
VISUAL INSPECTION	0818	DS1747	WHISKERS < 50uM		73	0	M6362914EC
BIASED MOISTURE	0818	DS1747	85/85, 3.5 VOLTS	1000 HRS	77	0	M6362914EC
VISUAL INSPECTION	0818	DS1747	WHISKERS < 50uM		72	0	M6362915EC
BIASED MOISTURE	0818	DS1747	85/85, 3.5 VOLTS	1000 HRS	77	0	M6362915EC
VISUAL INSPECTION	0818	DS1747	WHISKERS < 50uM		76	0	M6362916EC
BIASED MOISTURE	0818	DS1747	85/85, 3.5 VOLTS	1000 HRS	77	0	M6362916EC

BIASED MOISTURE	0819	DS21448	85/85, 3.5 VOLTS	1000	HRS	45	0	QS751045AB-QUAL
BIASED MOISTURE	0819	DS21448	85/85, 3.5 VOLTS	1000	HRS	45	0	QS751045AC-QUAL
BIASED MOISTURE	0819	DS21448	85/85, 3.5 VOLTS	1000	HRS	45	0	QS751045AD-QUAL
HAST	0827	DS2502	130C, 85%R.H.,5.5V	96	HRS	81	0	QH827010AFD
HAST	0827	DS2502	130C, 85%R.H.,5.5V	96	HRS	79	0	QH827010AEA
HAST	0827	DS2502	130C, 85%R.H.,5.5V	96	HRS	80	0	QH827010ADA
BIASED MOISTURE	0833	DS1501	85/85, 5.5 VOLTS	1000	HRS	77	0	QH803253AB
<b>Total:</b>							<b>0</b>	

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### UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE	TEST CODE	VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.	
HAST, NO BIAS	0725	DS3690		130C, 85% R.H.	96	HRS	77	0	QJ732632BER-NPI
HAST, NO BIAS	0726	DS3690		130C, 85% R.H.	96	HRS	77	0	QJ732632BB-NPI
HAST, NO BIAS	0726	DS3690		130C, 85% R.H.	96	HRS	77	0	QJ732632BC-NPI
HAST, NO BIAS	0808	DS80C320		130C, 85% R.H.	96	HRS	77	0	QH805039AB
HAST, NO BIAS	0808	DS80C320		130C, 85% R.H.	96	HRS	77	0	QH805039AC
HAST, NO BIAS	0810	DS80C320		130C, 85% R.H.	96	HRS	77	0	QH805039AD
AUTOCLAVE	0810	DS1086L		121C, 2 ATM STEAM, UNBIASED	168	HRS	77	0	ID822214AB
MOISTURE SOAK	0823	DS29020		85 C/85% R.H.	274	HRS	77	0	MB363153QAL-1
MOISTURE SOAK	0823	DS29020		85 C/85% R.H.	274	HRS	77	0	MB363154QAL-1
MOISTURE SOAK	0823	DS29020		85 C/85% R.H.	274	HRS	77	0	MB363155QAL-1
HAST, NO BIAS	0827	DS2502		130C, 85% R.H.	100	HRS	72	0	QH827010ADA
HAST, NO BIAS	0827	DS2502		130C, 85% R.H.	100	HRS	77	0	QH827010AEA
HAST, NO BIAS	0827	DS2502		130C, 85% R.H.	100	HRS	77	0	QH827010AFD
HAST, NO BIAS	0833	DS1501		130C, 85% R.H.	96	HRS	77	0	QH803253AB
MOISTURE SOAK	0834	DS29020		85 C/85% R.H.	274	HRS	77	0	MC825512ABA-QAL
<b>Total:</b>							<b>0</b>		

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

DESCRIPTION	DATE	TEST CODE	VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.	
WRITE CYCLE STRESS (KCYS)	0810	DS1852		85 C, 5.5 VOLTS	25	KCYS	77	0	QS810097AA-QUAL
STORAGE LIFE	0810	DS1852		150C	1000	HRS	77	0	QS810097AA-QUAL
WRITE CYCLE STRESS (KCYS)	0810	DS1086L		70 C, 3.6 VOLTS	10	KCYS	77	0	ID822214AB
STORAGE LIFE	0810	DS1086L		150C	500	HRS	77	0	ID822214AB

WRITE CYCLE STRESS (KCYS)	0817	DS2432	25 C, 5.0 VOLTS	50	KCYS	77	0	QJ832164BB
STORAGE LIFE	0817	DS2432	150C	1000	HRS	77	0	QJ832164BB
WRITE CYCLE STRESS (KCYS)	0833	DS3514	70 C, 5.5V (PSA) & 15.0V (PSB)	50	KCYS	77	0	QJ803644BA-NPI
STORAGE LIFE	0833	DS3514	150C	1000	HRS	77	0	QJ803644BA-NPI
WRITE CYCLE STRESS (KCYS)	0842	DS1626	85 C, 5.5 VOLTS	20	KCYS	77	0	QJ909643ACA-NPI
STORAGE LIFE	0842	DS1626	150C	1000	HRS	77	0	QJ909643ACA-NPI
<b>Total:</b>							<b>0</b>	

**W/E ENDURANCE AND OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	LOT NO.
WRITE CYCLE STRESS (KCYS)	0810	DS1086L	70 C, 3.6 VOLTS	10	KCYS	77	0 ID822214AB
HIGH TEMP OP LIFE	0810	DS1086L	125C, 3.6 VOLTS	408	HRS	75	0 ID822214AB
<b>Total:</b>							<b>0</b>

**FAILURE RATE:**

**MTTF (YRS): 145519**

**FITS: 0.8**