

RELIABILITY MONITOR REPORT  
FOR

**iButton 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		
Dallas		BRICK	Dallas	Dongle/Fob
Dallas		iButton F30 (RoHS)	Dallas	iButton F30 w/Bump
Dallas		iButton F30 w/Bump (RoHS)	Dallas	iButton F50 (Pb-Free)
Dallas		iButton F50 w/Bump	Dallas	iButton F50nw
Dallas		iButton F50w/IC's	Dallas	iButton R30
Dallas		iButton Retainer	Dallas	iButton Socket
Dallas		Puk Can F50 Insert Mold w/Bump	Dallas	Puk Can F50 Insert Mold w/Bump/
Dallas		Puk Can F50 Insert Mold w/Bump/	Fastech	BRICK
Fastech		Dongle/Fob	Fastech	iButton F30 (RoHS)
Fastech		iButton F30 w/Bump	Fastech	iButton F30w/IC's
Fastech		iButton F50 (Pb-Free)	Fastech	iButton F50 w/Bump
Fastech		iButton F50w/IC's	Fastech	Puk Can F50 Insert Mold w/Bump/
Hana		iButton F50 (Pb-Free)	ISPL (ATEC, PI)	BRICK
ISPL (ATEC, PI)		iButton F50 (Pb-Free)	ISPL (ATEC, PI)	iButton Retainer

The calculated failure rate for this assembly is:

**FAILURE RATE:                      MTTF (YRS): 31548                      FITS: 3.6**

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. 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 10/1/04 and 9/30/05 .

**Assembly Information:**

Package Type:                      BRICK (Pb-Free)  
 Flammability:                      UL 94-V0  
 Moisture Sensitivity                      Level 1  
 (JEDEC J-STD20A)  
 Date Code Range:                      0509                      to                      0542

**MOISTURE SENSITIVITY LEVEL 1**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0509	DS9098	125C	24	HRS	14	
MOISTURE SOAK			85 C/85% R.H.	168	HRS	14	
CONVECTION REFLOW			260C +/-5C	3	PASS	14	0
EXTERNAL VISUAL			J-STD-020, 6.1a			14	0
<b>Total:</b>						<b>0</b>	

**MOISTURE SENSITIVITY LEVEL 3**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0509	DS9098	125C	24	HRS	15	
MOISTURE SOAK			30C/60% R.H.	192	HRS	15	
CONVECTION REFLOW			260C +/-5C	3	PASS	15	0
EXTERNAL VISUAL			J-STD-020, 6.1a			15	0
<b>Total:</b>						<b>0</b>	

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**PACKAGE TESTS**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDERABILITY (Sn/Pb)	0509	DS9098	JESD22-B102, COND C		8	0	
SOLDERABILITY (Pb-Free)	0509	DS9098	JESD22-B102, COND C		8	0	
SOLDERABILITY (Sn/Pb)	0542	DS9100	JESD22-B102, COND C		15	0	
SOLDERABILITY (Pb-Free)	0542	DS9100	JESD22-B102, COND C		15	0	
<b>Total:</b>						<b>0</b>	

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**Assembly Information:**

Package Type: iButton  
Flammability: UL 94-V0  
Moisture Sensitivity (JEDEC J-STD20A)  
Date Code Range: 0435 to 0543

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**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0440	DS1955B0	85 C, 5.25 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0445	DS1955B0	85 C, 5.25 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0445	DS1955B0	85 C, 5.25 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0451	DS1955B0	85 C, 5.25 VOLTS	1000 HRS	77	0	
HIGH TEMP OP LIFE	0543	DS1955B2	125C, 3.3 VOLTS	1000 HRS	77	0	
<b>Total:</b>						<b>0</b>	

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**STORAGE LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0435	DS1992	70 C	1000 HRS	77	0	
STORAGE LIFE	0440	DS1955B0	85 C	1000 HRS	77	0	
STORAGE LIFE	0441	DS1922T	125C	1000 HRS	77	0	
STORAGE LIFE	0445	DS1955B0	85 C	1000 HRS	70	0	
STORAGE LIFE	0445	DS1955B0	85 C	1000 HRS	77	0	
STORAGE LIFE	0445	DS1955B0	85 C	1000 HRS	77	0	
STORAGE LIFE	0446	DS1990	70 C	1000 HRS	77	0	
STORAGE LIFE	0450	DS1992	70 C	1000 HRS	77	0	
STORAGE LIFE	0451	DS1955B0	85 C	1000 HRS	77	0	
STORAGE LIFE	0503	DS1990	70 C	1000 HRS	77	0	
STORAGE LIFE	0543	DS1955B2	85 C	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
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TEMP CYCLE	0435	DS1992	-40 TO 85C	500	CYS	77	0
TEMP CYCLE	0440	DS1955B0	-40 TO 85C	1000	CYS	77	0
TEMP CYCLE	0446	DS1990	-40 TO 85C	500	CYS	77	0
TEMP CYCLE	0450	DS1992	-40 TO 85C	500	CYS	77	0
TEMP CYCLE	0451	DS1955B0	-40 TO 85C	1000	CYS	77	0
TEMP CYCLE	0502	DS1955B0	-40 TO 85C	1000	CYS	77	0
TEMP CYCLE	0502	DS1955B0	-40 TO 85C	1000	CYS	77	0
TEMP CYCLE	0502	DS1955B0	-40 TO 85C	1000	CYS	77	0
TEMP CYCLE	0503	DS1990	-40 TO 85C	500	CYS	77	0
TEMP CYCLE	0505	DS1922L	-40 TO 85C	1000	CYS	74	0
TEMP CYCLE	0514	DS1922T	0C TO +125C	2500	CYS	77	0
TEMP CYCLE	0543	DS1955B2	-40 TO 85C	1000	CYS	77	0
<b>Total:</b>							<b>0</b>

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### UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
MOISTURE SOAK	0435	DS1992	60C/90% R.H.	1000 HRS	77	0	
MOISTURE SOAK	0440	DS1955B0	60C/90% R.H.	1000 HRS	77	0	
MOISTURE SOAK	0441	DS1922T	60C/90% R.H.	1000 HRS	77	0	
MOISTURE SOAK	0445	DS1955B0	60C/90% R.H.	1000 HRS	71	0	
MOISTURE SOAK	0445	DS1955B0	60C/90% R.H.	1000 HRS	77	0	
MOISTURE SOAK	0445	DS1955B0	60C/90% R.H.	1000 HRS	77	0	
MOISTURE SOAK	0446	DS1990	60C/90% R.H.	1000 HRS	77	0	
MOISTURE SOAK	0450	DS1992	60C/90% R.H.	1000 HRS	77	0	
MOISTURE SOAK	0451	DS1955B0	60C/90% R.H.	1000 HRS	77	0	
MOISTURE SOAK	0503	DS1990	60C/90% R.H.	1000 HRS	77	0	
MOISTURE SOAK	0543	DS1955B2	60C/90% R.H.	1000 HRS	77	0	
<b>Total:</b>							<b>0</b>

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### Assembly Information:

Package Type: iButton (RoHS)  
 Flammability: UL 94-V0  
 Moisture Sensitivity (JEDEC J-STD20A) NA  
 Date Code Range: 0437 to 0437

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### OPERATING LIFE

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0437	DS2502	125C, 6.0 VOLTS	1000 HRS	80	0	
			125C, 6.0 VOLTS	1000 HRS	80	0	
<b>Total:</b>							<b>0</b>

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**STORAGE LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0437	DS2502	125C	1000 HRS	80	0	
			125C	1000 HRS	80	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	0437	DS2502	-40 TO 85C	1000 CYS	80	0	
			-40 TO 85C	1000 CYS	80	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
BIASED MOISTURE	0437	DS2502	85/85, 5.5 VOLTS	1000 HRS	80	0	
			85/85, 5.5 VOLTS	1000 HRS	80	0	
				<b>Total:</b>		<b>0</b>	

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
AUTOCLAVE	0437	DS2502	121C, 2 ATM STEAM, UNBIASED	168 HRS	76	0	
			121C, 2 ATM STEAM, UNBIASED	168 HRS	76	0	
				<b>Total:</b>		<b>0</b>	

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**FAILURE RATE:****MTTF (YRS): 31548****FITS: 3.6**