

**RELIABILITY REPORT  
FOR**

**DS1556P, 34 Pin Power Cap Base w/DS9034X Cap, Pb-Free**

**Dallas Semiconductor**

**4401 South Beltwood Parkway  
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**Prepared by:**

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**Conclusion:**

The following qualification successfully meets the quality and reliability standards required of all Dallas Semiconductor products and processes:

DS1556P, 34 Pin Power Cap Base w/DS9034X Cap, Pb-Free

In addition, Dallas Semiconductor's continuous reliability monitor program ensures that all outgoing product will continue to meet Maxim's quality and reliability standards. The current status of the reliability monitor program can be viewed at <http://www.maxim-ic.com/TechSupport/dsreliability.html>.\*

**Module Description**

A description of this Module can be found in the product data sheet. You can find the product data sheet at [http://dbserv.maxim-ic.com/l\\_datasheet3.cfm](http://dbserv.maxim-ic.com/l_datasheet3.cfm).\*

**Reliability Derating:**

A module device consists of one or more IC's in a single, upward integrated, package. This package is assembled to include batteries, crystals, and other piece parts that make up the configuration of the Module. Because of either the complexity of the package or the included piece parts, standard high temperature reliability testing is not possible. Therefore, in order to determine the reliability of module products, the reliability of each of the piece parts is individually determined, then summed to determine the reliability of the integrated module product. If there are "n" significant components in the module then:

$$Fr(\text{module}) = Fr(1) + Fr(2) + Fr(3) + \dots + Fr(n)$$

Fr (module) = Failure rate of module  
 Fr(n) = Failure rate of the nth component

Failure Rates are reported in FITs (Failures in Time) or MTTF (Mean Time To Failure). The FIT rate is related to MTTF by:

$$MTTF = 1/Fr$$

NOTE: MTTF is frequently used interchangeably with MTBF.

The calculated failure rate for this module/assembly is:

<u>Module Device:</u>	<u>Module Units:</u>	<u>Quantity:</u>	<u>Fails:</u>	<u>Ea:</u>	<u>Beta:</u>	<u>MTTF (Yrs):</u>	<u>FITs:</u>
1 MEG SRAM 5V	1	1789	0	0.7	0.0	190662	0.6
BR1632	1	100	1	1.0	0.0	47996	2.4
CRYSTAL	1	100	0	0.7	0.0	12463	9.2
DS1558	1	1457	0	0.7	0.0	171094	0.7
<b>Totals:</b>						<b>8916</b>	<b>12.8</b>

The parameters used to calculate the module failure rate are as follows

Cf: 60%      Tu: 25 °C      Vu: 5 Volts

The reliability data follows. At the start of this data is the module assembly information. This is a description of the module. The next section is the detailed reliability data for each stress found in the qualification / monitor. If there are additional processes or assemblies used as part of this report, a description of each will follow which includes the respective reliability data for that process/ assembly. The reliability data section includes the latest data available. Some of this data may be generic with other packages or products.

\* Some proprietary products may be excepted from this requirement

**Assembly Information:**

Assembly Site: Fastech  
 Pin Count: 34  
 Package Type: Power Cap (Pb-Free)  
 Body Size: 980x980x1.0  
 Mold Compound: NA  
 Lead Frame: PCB; BT  
 Lead Finish: Sn Plate 100% Matte (With Anneal Bake)  
 Die Attach: n/a  
 Bond Wire / Size: /  
 Flammability: UL 94-V0  
 Moisture Sensitivity (JEDEC J-STD20A) Level 3  
 Date Code Range: 0452 to 0545

**PACKAGE TESTS**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
SOLDERABILITY (Pb-Free)	0452	JESD22-B102, COND C		3	0	
<b>Total:</b>					<b>0</b>	

**PACKAGE TESTS**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
X-RAY	0452	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS		JESD22-B100		6	0	
EXTERNAL VISUAL		JESD22-B101		6	0	
MARK PERMANENCY		JESD22-B107		6	0	
LEAD INTEGRITY		JESD22-B105, COND B		6	0	
<b>Total:</b>					<b>0</b>	

**PRECONDITIONING LEVEL 3**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
MOISTURE SOAK	0452	30C/60% R.H.	192 HRS	331		
CONVECTION REFLOW		260C +/-5C	2 PASS	331	0	
STORAGE LIFE		125C	24 HRS	331		
<b>Total:</b>					<b>0</b>	

**OPERATING LIFE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
HIGH TEMP OP LIFE	0452	85 C, 5.5V (PSA) & 0.0V (PSB)	1000 HRS	74	0	
<b>Total:</b>					<b>0</b>	

**TEMPERATURE CYCLE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE	0452	-40 TO 85C	1000 CYS	77	0	
<b>Total:</b>					<b>0</b>	

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
MOISTURE SOAK	0452	60C/90% R.H.	1000 HRS	77	0	
<b>Total:</b>					<b>0</b>	

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**STORAGE LIFE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0452	85 C	1000 HRS	100	0	
<b>Total:</b>					<b>0</b>	

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**PACKAGE TESTS**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
SOLDERABILITY (Pb-Free)	0504	JESD22-B102, COND C		3	0	
<b>Total:</b>					<b>0</b>	

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**PACKAGE TESTS**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
X-RAY	0504	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS		JESD22-B100		6	0	
LEAD INTEGRITY		JESD22-B105, COND B		6	0	
MARK PERMANENCY		JESD22-B107		6	0	
EXTERNAL VISUAL		JESD22-B101		6	0	
<b>Total:</b>					<b>0</b>	

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**PRECONDITIONING LEVEL 3**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0504	125C	24 HRS	331		
MOISTURE SOAK		30C/60% R.H.	192 HRS	331		
CONVECTION REFLOW		260C +/-5C	2 PASS	331	0	
<b>Total:</b>					<b>0</b>	

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**OPERATING LIFE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
HIGH TEMP OP LIFE	0504	85 C, 5.5V (PSA) & 0.0V (PSB)	1000 HRS	76	0	
<b>Total:</b>					<b>0</b>	

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE	0504	-40 TO 85C	1000 CYS	77	0	
<b>Total:</b>					<b>0</b>	

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
MOISTURE SOAK	0504	60C/90% R.H.	1000 HRS	77	0	
<b>Total:</b>					<b>0</b>	

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**STORAGE LIFE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0504	85 C	1000 HRS	100	0	
<b>Total:</b>					<b>0</b>	

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**PACKAGE TESTS**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
SOLDERABILITY (Pb-Free)	0504	JESD22-B102, COND C		3	0	

Total: 0

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**PACKAGE TESTS**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
X-RAY	0504	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS		JESD22-B100		6	0	
LEAD INTEGRITY		JESD22-B105, COND B		6	0	
MARK PERMANENCY		JESD22-B107		6	0	
EXTERNAL VISUAL		JESD22-B101		6	0	
<b>Total:</b>					<b>0</b>	

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**PRECONDITIONING LEVEL 3**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0504	125C	24 HRS	331		
MOISTURE SOAK		30C/60% R.H.	192 HRS	331		
CONVECTION REFLOW		260C +/-5C	2 PASS	331	0	
<b>Total:</b>					<b>0</b>	

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**OPERATING LIFE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
HIGH TEMP OP LIFE	0504	85 C, 5.5V (PSA) & 0.0V (PSB)	1000 HRS	77	0	
<b>Total:</b>					<b>0</b>	

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE	0504	-40 TO 85C	1000 CYS	77	0	
<b>Total:</b>					<b>0</b>	

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
MOISTURE SOAK	0504	60C/90% R.H.	1000 HRS	77	0	
<b>Total:</b>					<b>0</b>	

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**STORAGE LIFE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0504	85 C	1000 HRS	100	0	
<b>Total:</b>					<b>0</b>	

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**PRECONDITIONING LEVEL 3**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0504	125C	24 HRS	240		
MOISTURE SOAK		30C/60% R.H.	192 HRS	240		
CONVECTION REFLOW		260C +/-5C	2 PASS	240	0	
<b>Total:</b>					<b>0</b>	

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE	0504	-40 TO 85C	1000 CYS	77	0	
<b>Total:</b>					<b>0</b>	

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
MOISTURE SOAK	0504	60C/90% R.H.	1000 HRS	77	0	
<b>Total:</b>					<b>0</b>	

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**STORAGE LIFE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0504	85 C	1000 HRS	77	0	
<b>Total:</b>					<b>0</b>	

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**PRECONDITIONING LEVEL 3**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0504	125C	24 HRS	240		
MOISTURE SOAK		30C/60% R.H.	192 HRS	240		
CONVECTION REFLOW		260C +/-5C	2 PASS	240	0	
<b>Total:</b>					<b>0</b>	

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE	0504	-40 TO 85C	1000 CYS	77	0	
<b>Total:</b>					<b>0</b>	

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
MOISTURE SOAK	0504	60C/90% R.H.	1000 HRS	77	0	
<b>Total:</b>					<b>0</b>	

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**STORAGE LIFE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0504	85 C	1000 HRS	77	0	
<b>Total:</b>					<b>0</b>	

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**PRECONDITIONING LEVEL 3**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0504	125C	24 HRS	240		
MOISTURE SOAK		30C/60% R.H.	192 HRS	240		
CONVECTION REFLOW		260C +/-5C	2 PASS	240	0	
<b>Total:</b>					<b>0</b>	

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE	0504	-40 TO 85C	1000 CYS	77	0	
<b>Total:</b>					<b>0</b>	

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
MOISTURE SOAK	0504	60C/90% R.H.	1000 HRS	77	0	
<b>Total:</b>					<b>0</b>	

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**STORAGE LIFE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0504	85 C	1000 HRS	77	0	
<b>Total:</b>					<b>0</b>	

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**PACKAGE TESTS**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
SOLDERABILITY (Sn/Pb)	0541	JESD22-B102, COND C		6	0	
SOLDERABILITY (Pb-Free)		JESD22-B102, COND C		6	0	
<b>Total:</b>					<b>0</b>	

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**PACKAGE TESTS**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
X-RAY	0541	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS		JESD22-B100		6	0	
LEAD INTEGRITY		JESD22-B105, COND B		6	0	
MARK PERMANENCY		JESD22-B107		6	0	
EXTERNAL VISUAL		JESD22-B101		6	0	
<b>Total:</b>					<b>0</b>	

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**PRECONDITIONING LEVEL 3**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0541	125C	24 HRS	308		
MOISTURE SOAK		30C/60% R.H.	192 HRS	308		
CONVECTION REFLOW		260C +0/-5C	2 PASS	308	0	
<b>Total:</b>					<b>0</b>	

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**OPERATING LIFE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
HIGH TEMP OP LIFE	0541	85 C, 3.3V (PSA) & 0.0V (PSB)	1000 HRS	77	0	
<b>Total:</b>					<b>0</b>	

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE	0541	-40 TO 85C	1000 CYS	77	0	
<b>Total:</b>					<b>0</b>	

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
MOISTURE SOAK	0541	60C/90% R.H.	1000 HRS	77	0	
<b>Total:</b>					<b>0</b>	

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**STORAGE LIFE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0541	85 C	1000 HRS	76	0	
<b>Total:</b>					<b>0</b>	

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**PACKAGE TESTS**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
SOLDERABILITY (Sn/Pb)	0545	JESD22-B102, COND C		6	0	
SOLDERABILITY (Pb-Free)		JESD22-B102, COND C		6	0	
<b>Total:</b>					<b>0</b>	

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**PACKAGE TESTS**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
X-RAY	0545	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS		JESD22-B100		6	0	
LEAD INTEGRITY		JESD22-B105, COND B		6	0	
MARK PERMANENCY		JESD22-B107		6	0	
EXTERNAL VISUAL		JESD22-B101		6	0	
<b>Total:</b>					<b>0</b>	

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**PRECONDITIONING LEVEL 3**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0545	125C	24 HRS	308		
MOISTURE SOAK		30C/60% R.H.	192 HRS	308		

CONVECTION REFLOW	0545	260C +/-5C	2	PASS	308	0
<b>Total:</b>						<b>0</b>

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**OPERATING LIFE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
HIGH TEMP OP LIFE	0545	85 C, 3.3V (PSA) & 0.0V (PSB)	1000 HRS	68	0	
<b>Total:</b>						<b>0</b>

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE	0545	-40 TO 85C	1000 CYS	77	0	
<b>Total:</b>						<b>0</b>

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
MOISTURE SOAK	0545	60C/90% R.H.	1000 HRS	77	0	
<b>Total:</b>						<b>0</b>

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**STORAGE LIFE**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0545	85 C	1000 HRS	77	0	
<b>Total:</b>						<b>0</b>

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**PACKAGE TESTS**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
SOLDERABILITY (Pb-Free)	0525	JESD22-B102, COND C		6	0	
SOLDERABILITY (Sn/Pb)		JESD22-B102, COND C		6	0	
<b>Total:</b>						<b>0</b>

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**PACKAGE TESTS**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
X-RAY	0525	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS		JESD22-B100		6	0	
LEAD INTEGRITY		JESD22-B105, COND B		6	0	
MARK PERMANENCY		JESD22-B107		6	0	
EXTERNAL VISUAL		JESD22-B101		6	0	
<b>Total:</b>						<b>0</b>

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**PRECONDITIONING LEVEL 3**

DESCRIPTION	DATE CD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0525	125C	24 HRS	235		
MOISTURE SOAK		30C/60% R.H.	192 HRS	235		
CONVECTION REFLOW		260C +/-5C	2 PASS	235	0	

**FOLLOWED BY:** **Total:** **0**

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**STORAGE LIFE**

<b>DESCRIPTION</b>	<b>CONDITION</b>	<b>READPOINT</b>	<b>QTY</b>	<b>FAILS</b>	<b>FA#</b>
STORAGE LIFE	85 C	1000 HRS	77	0	
<b>Total:</b>				<b>0</b>	

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**TEMPERATURE CYCLE**

<b>DESCRIPTION</b>	<b>CONDITION</b>	<b>READPOINT</b>	<b>QTY</b>	<b>FAILS</b>	<b>FA#</b>
TEMP CYCLE	-40 TO 85C	1000 CYS	77	0	
<b>Total:</b>				<b>0</b>	

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**UNBIASED MOISTURE RESISTANCE**

<b>DESCRIPTION</b>	<b>CONDITION</b>	<b>READPOINT</b>	<b>QTY</b>	<b>FAILS</b>	<b>FA#</b>
MOISTURE SOAK	60C/90% R.H.	1000 HRS	77	0	
<b>Total:</b>				<b>0</b>	