Conclusion:

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

DS1803, Rev A2

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.

Device Description:

A description of this device can be found in the product data sheet. You can find the product data sheet at http://dbserv.maxim-ic.com/l_datasheet3.cfm.

Reliability Derating:

The Arrhenius model will be used to determine the acceleration factor for failure mechanisms that are temperature accelerated.

AfT = exp((Ea/k)*(1/Tu - 1/Ts)) = tu/ts
AfT = Acceleration factor due to Temperature
tu = Time at use temperature (e.g. 55°C)
ts = Time at stress temperature (e.g. 125°C)
k = Boltzmann's Constant (8.617 x 10-5 eV/°K)
Tu = Temperature at Use (°K)
Ts = Temperature at Stress (°K)
Ea = Activation Energy (e.g. 0.7 ev)

The activation energy of the failure mechanism is derived from either internal studies or industry accepted standards, or activation energy of 0.7ev will be used whenever actual failure mechanisms or their activation energies are unknown. All deratings will be done from the stress ambient temperature to the use ambient temperature.

An exponential model will be used to determine the acceleration factor for failure mechanisms, which are voltage accelerated.

AfV = exp(B*(Vs - Vu))
AfV = Acceleration factor due to Voltage
Vs = Stress Voltage (e.g. 7.0 volts)
Vu = Maximum Operating Voltage (e.g. 5.5 volts)
B = Constant related to failure mechanism type (e.g. 1.0, 2.4, 2.7, etc.)

The Constant, B, related to the failure mechanism is derived from either internal studies or industry accepted standards, or a B of 1.0 will be used whenever actual failure mechanisms or their B are unknown. All deratings will be done from the stress voltage to the maximum operating voltage. Failure rate data from the operating life test is reported using a Chi-Squared statistical model at the 60% or 90% confidence level (Cf).

The failure rate, Fr, is related to the acceleration during life test by:

Fr = X/(ts * AfV * AfT * N * 2)
X = Chi-Sq statistical upper limit
N = Life test sample size

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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 device/process is:

FAILURE RATE: MTTF (YRS): 63926 FITS: 2

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. A the start of this data is the device information. This is a description of the device either used as a reliability test vehicle for a process / assembly qualification / monitor or a device used as part of a product qualification / monitor. Following this is the assembly information. This section includes a description of the assembly vehicle used to generate this reliability data for both qualifications and monitors. 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.

Device Information:

Device:	DS1803
Process:	1P, 2M, 0.8um, PdplDiode , WJ BPSG, N+ESD II,
Passivation:	Passivation w/Nov TEOS Oxide-Nitride
Die Size:	66 x 106
Number of Transistors:	12259
Interconnect:	Aluminum / 1% Silicon / 0.5% Copper
Gate Oxide Thickness:	175 Å

Assembly Information:

Qualification Vehicle:	DS1803
Assembly Site:	ATP (Amkor, PI)
Pin Count:	16
Package Type:	PDIP
Body Size:	300
Mold Compound:	Sumitomo 6300H
Lead Frame:	Stamped Copper CDA194
Lead Finsh:	SnPb Plate
Die Attach:	84-1 LMISR4 Epoxy Silverfilled Ablebond
Bond Wire / Size:	Au / 1.0 mil
Flammability:	UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A)	
Date Code Range:	0122 to 0122

ELECTRICAL CHARACTERIZATION

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
ESD SENSITIVITY	0122	EOS/ESD S5.1 HBM 500 VOLTS	2	PULSES	3	0

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ESD SENSITIVITY	0122	EOS/ESD S5.1 HBM 1000 VOLTS	2	PULSES	3	0
ESD SENSITIVITY	0122	EOS/ESD S5.1 HBM 2000 VOLTS	2	PULSES	3	0
ESD SENSITIVITY	0122	EOS/ESD S5.1 HBM 4000 VOLTS	2	PULSES	3	3
ESD SENSITIVITY	0122	EOS/ESD S5.1 HBM 8000 VOLTS	2	PULSES	3	3
LATCH-UP	0122	JESD78, I-TEST 125C			3	0
LATCH-UP	0122	JESD78, Vsupply TEST 125C			3	0
				Total:		**6**

Assembly Information:

Qualification Vehicle:	DS1803
Assembly Site:	ATP (Amkor, PI)
Pin Count:	16
Package Type:	SOIC
Body Size:	150x1.4
Mold Compound:	Sumitomo 6300H
Lead Frame:	Stamped Copper CDA194
Lead Finsh:	SnPb Plate
Die Attach:	84-1 LMISR4 Epoxy Silverfilled Ablebond
Bond Wire / Size:	Au / 1.0 mil
Flammability:	UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A)	Level 1
Date Code Range:	0143 to 0143

HIGH TEMPERATURE OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
HIGH VOLTAGE LIFE	0143	125C, 7.0 VOLTS	336	HOURS	80	0
				Total:		**0**

PACKAGE TESTS

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
ULTRASOUND	0143	J-STD-020			4	0
PRECONDITION U/S	0143	J-STD-020			4	0
				Total:		**0**

PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
STORAGE LIFE	0143	125C	24	HOURS	241	
MOISTURE SOAK		85 C/85% R.H.	168	HOURS	241	
CONVECTION REFLOW		235C	3	PASS	241	0
				Total:		**0**

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
TEMP CYCLE	0143	-55C TO 125C	1000	CYCLES	40	0
				Total:		**0**

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TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
BIASED MOISTURE	0143	85/85, 5.5 VOLTS	959	HOURS	77	0
				Total:		**0**

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
AUTOCLAVE	0143	121C, 2 ATM STEAM, UNBIASED	168	HOURS	37	0
				Total:		**0**

Assembly Information:

Qualification Vehicle:	DS1803
Assembly Site:	Carsem
Pin Count:	16
Package Type:	SOIC
Body Size:	150x1.4
Mold Compound:	Sumitomo 6300H
Lead Frame:	Stamped Copper CDA194
Lead Finsh:	SnPb Plate
Die Attach:	84-1 LMISR4 Epoxy Silverfilled Ablebond
Bond Wire / Size:	Au / 1.3 mil
Flammability:	UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A)	Level 1
Date Code Range:	0115 to 0115

HIGH TEMPERATURE OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
HIGH VOLTAGE LIFE	0115	125C, 7.0 VOLTS	1000	HOURS	77	0
				Total:		**0**

PACKAGE TESTS

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
ULTRASOUND	0115	J-STD-020			4	0
PRECONDITION U/S	0115	J-STD-020			4	0
				Total:		**0**

PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
STORAGE LIFE	0115	125C	24	HOURS	238	
MOISTURE SOAK		85 C/85% R.H.	168	HOURS	238	
CONVECTION REFLOW		235C	3	PASS	238	0
				Total:		**0**

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
TEMP CYCLE	0115	-55C TO 125C	1000	CYCLES	40	0
				Total:		**0**

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TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
BIASED MOISTURE	0115	85/85, 5.5 VOLTS	959	HOURS	77	0
				Total:		**0**

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
AUTOCLAVE	0115	121C, 2 ATM STEAM, UNBIASED	96	HOURS	37	0
				Total:		**0**

Assembly Information:

Qualification Vehicle:	DS1803
Assembly Site:	OSEP
Pin Count:	16
Package Type:	SOIC
Body Size:	150x1.4
Mold Compound:	Sumitomo 6300H
Lead Frame:	Stamped Copper CDA194
Lead Finsh:	SnPb Plate
Die Attach:	84-1 LMISR4 Epoxy Silverfilled Ablebond
Bond Wire / Size:	Au / 1.0 mil
Flammability:	UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A)	Level 1
Date Code Range:	0105 to 0119

HIGH TEMPERATURE OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
INFANT LIFE	0105	125C, 7.0 VOLTS	48	HOURS	232	0
HIGH VOLTAGE LIFE	0105	125C, 7.0 VOLTS	1000	HOURS	77	0
HIGH VOLTAGE LIFE	0119	125C, 7.0 VOLTS	1000	HOURS	80	0
				Total:		**0**

PACKAGE TESTS

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
ULTRASOUND	0105	J-STD-020		4	0
PRECONDITION U/S	0105	J-STD-020		4	0
ULTRASOUND	0119	J-STD-020		4	0
PRECONDITION U/S	0119	J-STD-020		4	0
			Total:		**0**

PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
STORAGE LIFE	0105	125C	24	HOURS	238	
MOISTURE SOAK		85 C/85% R.H.	168	HOURS	238	
CONVECTION REFLOW		235C	3	PASS	238	0

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STORAGE LIFE	0119	125C	24	HOURS	241	
MOISTURE SOAK		85 C/85% R.H.	168	HOURS	241	
CONVECTION REFLOW		235C	3	PASS	241	0
				Total:		**0**

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
TEMP CYCLE	0105	-55C TO 125C	1000	CYCLES	40	0
TEMP CYCLE	0119	-55C TO 125C	1000	CYCLES	40	0
				Total:		**0**

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
BIASED MOISTURE	0105	85/85, 5.5 VOLTS	959	HOURS	77	0
BIASED MOISTURE	0119	85/85, 5.5 VOLTS	959	HOURS	77	0
				Total:		**0**

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
AUTOCLAVE	0105	121C, 2 ATM STEAM, UNBIASED	96	HOURS	30	0
AUTOCLAVE	0119	121C, 2 ATM STEAM, UNBIASED	96	HOURS	40	0
				Total:		**0**

Device Information:

Device:	DS1803
Process:	1P, 2M, 0.8um, PdplDiode, Ti/TiN M1+M2 , WJ BPSG, N+E
Passivation:	Passivation w/Nov TEOS Oxide-Nitride
Die Size:	66 x 106
Number of Transistors:	12259
Interconnect:	Aluminum / 1% Silicon / 0.5% Copper
Gate Oxide Thickness:	175 Å

Assembly Information:

Qualification Vehicle:	DS1803
Assembly Site:	ATP (Amkor, PI)
Pin Count:	16
Package Type:	PDIP
Body Size:	300
Mold Compound:	Sumitomo 6300H
Lead Frame:	Stamped Copper CDA194
Lead Finsh:	SnPb Plate
Die Attach:	84-1 LMISR4 Epoxy Silverfilled Ablebond
Bond Wire / Size:	Au / 1.0 mil
Flammability:	UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A)	
Date Code Range:	0122 to 0122

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ELECTRICAL CHARACTERIZATION

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
ESD SENSITIVITY	0122	EOS/ESD S5.1 HBM 500 VOLTS	2	PULSES	3	0
ESD SENSITIVITY	0122	EOS/ESD S5.1 HBM 1000 VOLTS	2	PULSES	3	0
ESD SENSITIVITY	0122	EOS/ESD S5.1 HBM 2000 VOLTS	2	PULSES	3	0
ESD SENSITIVITY	0122	EOS/ESD S5.1 HBM 4000 VOLTS	2	PULSES	3	3
ESD SENSITIVITY	0122	EOS/ESD S5.1 HBM 8000 VOLTS	2	PULSES	3	3
LATCH-UP	0122	JESD78, I-TEST 125C			3	0
LATCH-UP	0122	JESD78, Vsupply TEST 125C			3	0
				Total:		**6**

Assembly Information:

Qualification Vehicle:	DS1803
Assembly Site:	ATP (Amkor, PI)
Pin Count:	16
Package Type:	SOIC
Body Size:	150x1.4
Mold Compound:	Sumitomo 6300H
Lead Frame:	Stamped Copper CDA194
Lead Finsh:	SnPb Plate
Die Attach:	84-1 LMISR4 Epoxy Silverfilled Ablebond
Bond Wire / Size:	Au / 1.0 mil
Flammability:	UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A)	Level 1
Date Code Range:	0143 to 0143

HIGH TEMPERATURE OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
HIGH VOLTAGE LIFE	0143	125C, 7.0 VOLTS	336	HOURS	80	0
				Total:		**0**

PACKAGE TESTS

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
ULTRASOUND	0143	J-STD-020			4	0
PRECONDITION U/S	0143	J-STD-020			4	0
				Total:		**0**

PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
STORAGE LIFE	0143	125C	24	HOURS	241	
MOISTURE SOAK		85 C/85% R.H.	168	HOURS	241	
CONVECTION REFLOW		235C	3	PASS	241	0
				Total:		**0**

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TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
TEMP CYCLE	0143	-55C TO 125C	1000	CYCLES	40	0
				Total:		**0**

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
BIASED MOISTURE	0143	85/85, 5.5 VOLTS	959	HOURS	77	0
				Total:		**0**

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
AUTOCLAVE	0143	121C, 2 ATM STEAM, UNBIASED	168	HOURS	37	0
				Total:		**0**

Assembly Information:

Qualification Vehicle:	DS1803
Assembly Site:	Carsem
Pin Count:	16
Package Type:	SOIC
Body Size:	150x1.4
Mold Compound:	Sumitomo 6300H
Lead Frame:	Stamped Copper CDA194
Lead Finsh:	SnPb Plate
Die Attach:	84-1 LMISR4 Epoxy Silverfilled Ablebond
Bond Wire / Size:	Au / 1.3 mil
Flammability:	UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A)	Level 1
Date Code Range:	0115 to 0115

HIGH TEMPERATURE OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
HIGH VOLTAGE LIFE	0115	125C, 7.0 VOLTS	1000	HOURS	77	0
				Total:		**0**

PACKAGE TESTS

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
ULTRASOUND	0115	J-STD-020			4	0
PRECONDITION U/S	0115	J-STD-020			4	0
				Total:		**0**

PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
STORAGE LIFE	0115	125C	24	HOURS	238	
MOISTURE SOAK		85 C/85% R.H.	168	HOURS	238	
CONVECTION REFLOW		235C	3	PASS	238	0
				Total:		**0**

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TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
TEMP CYCLE	0115	-55C TO 125C	1000	CYCLES	40	0
				Total:		**0**

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
BIASED MOISTURE	0115	85/85, 5.5 VOLTS	959	HOURS	77	0
				Total:		**0**

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
AUTOCLAVE	0115	121C, 2 ATM STEAM, UNBIASED	96	HOURS	37	0
				Total:		**0**

Assembly Information:

Qualification Vehicle:	DS1803
Assembly Site:	OSEP
Pin Count:	16
Package Type:	SOIC
Body Size:	150x1.4
Mold Compound:	Sumitomo 6300H
Lead Frame:	Stamped Copper CDA194
Lead Finsh:	SnPb Plate
Die Attach:	84-1 LMISR4 Epoxy Silverfilled Ablebond
Bond Wire / Size:	Au / 1.0 mil
Flammability:	UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A)	Level 1
Date Code Range:	0105 to 0119

HIGH TEMPERATURE OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
INFANT LIFE	0105	125C, 7.0 VOLTS	48	HOURS	232	0
HIGH VOLTAGE LIFE	0105	125C, 7.0 VOLTS	1000	HOURS	77	0
HIGH VOLTAGE LIFE	0119	125C, 7.0 VOLTS	1000	HOURS	80	0
				Total:		**0**

PACKAGE TESTS

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
ULTRASOUND	0105	J-STD-020		4	0
PRECONDITION U/S	0105	J-STD-020		4	0
ULTRASOUND	0119	J-STD-020		4	0
PRECONDITION U/S	0119	J-STD-020		4	0
			Total:		**0**

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PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
STORAGE LIFE	0105	125C	24	HOURS	238	
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CONVECTION REFLOW		235C	3	PASS	238	0
STORAGE LIFE	0119	125C	24	HOURS	241	
MOISTURE SOAK		85 C/85% R.H.	168	HOURS	241	
CONVECTION REFLOW		235C	3	PASS	241	0
				Total:		**0**

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
TEMP CYCLE	0105	-55C TO 125C	1000	CYCLES	40	0
TEMP CYCLE	0119	-55C TO 125C	1000	CYCLES	40	0
				Total:		**0**

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
BIASED MOISTURE	0105	85/85, 5.5 VOLTS	959	HOURS	77	0
BIASED MOISTURE	0119	85/85, 5.5 VOLTS	959	HOURS	77	0
				Total:		**0**

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
AUTOCLAVE	0105	121C, 2 ATM STEAM, UNBIASED	96	HOURS	30	0
AUTOCLAVE	0119	121C, 2 ATM STEAM, UNBIASED	96	HOURS	40	0
				Total:		**0**

FAILURE RATE: **MTTF (YRS): 63926** **FITS: 2**

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