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RELIABILITY REPORT
FOR

DS2108

Dallas Semiconductor

4401 South Beltwood Parkway
Dallas, TX 75244-3292

Prepared by:

Ken Wendel
Reliability Engineering Manager
Dallas Semiconductor
4401 South Beltwood Pkwy.
Dallas, TX 75244-3292
Email : ken.wendel@dalsemi.com
ph: 972-371-3726
fax: 972-371-6016
mbl: 214-435-6610

Conclusion:

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

DS2108

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

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): 18355 FITS: 6.2

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:	DS2108
Process:	1P,1M,5.0um,NegZTC P1R,30VNF&PF,UVNd&Pd,N+ESD,T
Passivation:	Laser/Nit - Pass/Nit - General LaserPrb
Die Size:	276 x 154
Number of Transistors:	0
Interconnect:	Aluminum / 1% Silicon / 0.5% Copper
Gate Oxide Thickness:	225 Å

Assembly Information:

Qualification Vehicle:	DS2108
Assembly Site:	ATK (Amkor, K)
Pin Count:	24
Package Type:	SOIC
Body Size:	300x2.3
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:	9735 to 9747

HIGH TEMPERATURE OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
INFANT LIFE	9735	125C, 6.0 VOLTS	48	HOURS	234	0
HIGH VOLTAGE LIFE	9735	125C, 6.0 VOLTS	1000	HOURS	77	0
INFANT LIFE	9740	125C, 7.0 VOLTS	48	HOURS	234	0

HIGH VOLTAGE LIFE	9740	125C, 6.0 VOLTS	1000	HOURS	77	0
INFANT LIFE	9741	125C, 6.0 VOLTS	48	HOURS	234	0
HIGH VOLTAGE LIFE	9741	125C, 6.0 VOLTS	1000	HOURS	77	0
INFANT LIFE	9747	125C, 6.0 VOLTS	48	HOURS	234	0
HIGH VOLTAGE LIFE	9747	125C, 6.0 VOLTS	1000	HOURS	77	0
				Total:		**0**

PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
ULTRASOUND	9740	J-STD-020			4	0
STORAGE LIFE	9740	125C	24	HOURS	238	
MOISTURE SOAK		85 C/85% R.H.	168	HOURS	238	
SOLDER HEAT		HTC VAPOR PHASE	3	PASS	238	0
PRECONDITION U/S	9740	J-STD-020			4	0
				Total:		**0**

PRECONDITIONING LEVEL 4

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
ULTRASOUND	9735	J-STD-020			4	0
STORAGE LIFE	9735	125C	24	HOURS	238	
MOISTURE SOAK		30C/60% R.H.	144	HOURS	238	
SOLDER HEAT		HTC VAPOR PHASE	3	PASS	238	0
PRECONDITION U/S	9735	J-STD-020			4	0
ULTRASOUND	9741	J-STD-020			4	0
STORAGE LIFE	9741	125C	24	HOURS	238	
MOISTURE SOAK		30C/60% R.H.	144	HOURS	238	
SOLDER HEAT		HTC VAPOR PHASE	3	PASS	238	0
PRECONDITION U/S	9741	J-STD-020			4	0
ULTRASOUND	9747	J-STD-020			4	0
STORAGE LIFE	9747	125C	24	HOURS	238	
MOISTURE SOAK		30C/60% R.H.	144	HOURS	238	
SOLDER HEAT		HTC VAPOR PHASE	3	PASS	238	0
PRECONDITION U/S	9747	J-STD-020			4	0
				Total:		**0**

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
TEMP CYCLE	9735	-55C TO 125C	1500	CYCLES	40	0
TEMP CYCLE	9740	-55C TO 125C	1000	CYCLES	40	0
TEMP CYCLE	9741	-55C TO 125C	1000	CYCLES	40	0
TEMP CYCLE	9747	-55C TO 125C	1000	CYCLES	40	0
				Total:		**0**

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS

BIASED MOISTURE	9735	85/85, 5.5 VOLTS	1507	HOURS	77	0
BIASED MOISTURE	9740	85/85, 5.5 VOLTS	959	HOURS	77	0
BIASED MOISTURE	9741	85/85, 5.5 VOLTS	959	HOURS	77	0
BIASED MOISTURE	9747	85/85, 5.5 VOLTS	959	HOURS	77	0
				Total:		**0**

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
AUTOCLAVE	9735	121C, 2 ATM STEAM, UNBIASED	264	HOURS	39	0
AUTOCLAVE	9740	121C, 2 ATM STEAM, UNBIASED	96	HOURS	40	0
AUTOCLAVE	9741	121C, 2 ATM STEAM, UNBIASED	98	HOURS	39	0
AUTOCLAVE	9747	121C, 2 ATM STEAM, UNBIASED	96	HOURS	40	0
				Total:		**0**

Assembly Information:

Qualification Vehicle:	DS2108
Assembly Site:	ATP (Amkor, PI)
Pin Count:	24
Package Type:	SOIC
Body Size:	300x2.3
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:	9922 to 9951

HIGH TEMPERATURE OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
INFANT LIFE	9922	125C, 6.0 VOLTS	48	HOURS	234	0
HIGH VOLTAGE LIFE	9922	125C, 6.0 VOLTS	1000	HOURS	77	0
INFANT LIFE	9951	125C, 6.0 VOLTS	48	HOURS	234	2
HIGH VOLTAGE LIFE	9951	125C, 6.0 VOLTS	1000	HOURS	77	0
				Total:		**2**

PRECONDITIONING LEVEL 4

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
ULTRASOUND	9922	J-STD-020			4	0
STORAGE LIFE	9922	125C	24	HOURS	238	
MOISTURE SOAK		30C/60% R.H.	144	HOURS	238	
CONVECTION REFLOW		235C	3	PASS	238	0
PRECONDITION U/S	9922	J-STD-020			4	0
ULTRASOUND	9951	J-STD-020			4	0
STORAGE LIFE	9951	125C	24	HOURS	238	
MOISTURE SOAK		30C/60% R.H.	144	HOURS	238	

CONVECTION REFLOW	9951	235C	3	PASS	238	0
PRECONDITION U/S	9951	J-STD-020			4	0
				Total:		**0**

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
TEMP CYCLE	9922	-55C TO 125C	1000	CYCLES	40	0
TEMP CYCLE	9951	-55C TO 125C	1200	CYCLES	40	0
				Total:		**0**

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
BIASED MOISTURE	9922	85/85, 5.5 VOLTS	959	HOURS	77	0
BIASED MOISTURE	9951	85/85, 5.5 VOLTS	959	HOURS	77	0
				Total:		**0**

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
AUTOCLAVE	9922	121C, 2 ATM STEAM, UNBIASED	96	HOURS	40	0
AUTOCLAVE	9951	121C, 2 ATM STEAM, UNBIASED	96	HOURS	35	0
				Total:		**0**

FAILURE RATE: MTTF (YRS): 18355 FITS: 6.2