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RELIABILITY REPORT
FOR

DS2760, B3

Dallas Semiconductor

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Conclusion:

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

DS2760, B3

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): 9013 FITS: 12.7

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:	DS2760
Process:	2P, 2M, 0.6um, E2PROM, P2Cap, DSD,HPVts, WJ BPSG
Passivation:	Laser/TEOS Ox - Pass/Nit - Gen.LaserPrb
Die Size:	128 x 108
Number of Transistors:	25000
Interconnect:	Aluminum / 1% Silicon / 0.5% Copper
Gate Oxide Thickness:	150 Å

Assembly Information:

Qualification Vehicle:	DS2760
Assembly Site:	Dallas
Pin Count:	19
Package Type:	Bump, 2 layer, underfill
Body Size:	60
Mold Compound:	?
Lead Frame:	95Pb:5Sn Solder
Lead Finsh:	
Die Attach:	Underfill FP4549, Dexter Hysol
Bond Wire / Size:	/
Flammability:	UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A)	Level 1
Date Code Range:	0235 to 0235

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QUANTITY	FAILS
TEMP CYCLE	0235	0C TO 70C	100 CYCLES	77	0

					Total:		**0**

Assembly Information:

Qualification Vehicle:	DS2760
Assembly Site:	ATP (Amkor, PI)
Pin Count:	16
Package Type:	Flip-Chip in TSSOP
Body Size:	4.4x0.9
Mold Compound:	Sumitomo 7351T
Lead Frame:	Stamped Copper C7025
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:	0049 to 0122

ELECTRICAL CHARACTERIZATION

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
ESD SENSITIVITY	0049	EOS/ESD S5.1 HBM 500 VOLTS	2	PULSES	3	0
ESD SENSITIVITY	0049	EOS/ESD S5.1 HBM 1000 VOLTS	2	PULSES	3	0
ESD SENSITIVITY	0049	EOS/ESD S5.1 HBM 2000 VOLTS	2	PULSES	3	0
ESD SENSITIVITY	0049	EOS/ESD S5.1 HBM 4000 VOLTS	2	PULSES	3	0
ESD SENSITIVITY	0049	EOS/ESD S5.1 HBM 8000 VOLTS	2	PULSES	3	3
LATCH-UP	0049	JESD78, I-TEST 25C			3	0
LATCH-UP	0049	JESD78, I-TEST 125C			3	0
				Total:		**3**

STORAGE LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
STORAGE LIFE	0049	150C	1000	HOURS	20	0
STORAGE LIFE	0120	150C	1000	HOURS	20	0
STORAGE LIFE	0122	150C	1000	HOURS	20	0
				Total:		**0**

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
TEMP CYCLE	0049	-55C TO 125C	1000	CYCLES	77	0
TEMP CYCLE	0049	-55C TO 125C	1000	CYCLES	20	0
TEMP CYCLE	0120	-55C TO 125C	1000	CYCLES	77	0
TEMP CYCLE	0120	-55C TO 125C	1000	CYCLES	20	0
TEMP CYCLE	0122	-55C TO 125C	1000	CYCLES	77	0
TEMP CYCLE	0122	-55C TO 125C	1000	CYCLES	20	0

					Total:	**0**

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
AUTOCLAVE	0049	121C, 2 ATM STEAM, UNBIASED	168	HOURS	45	0
AUTOCLAVE	0049	121C, 2 ATM STEAM, UNBIASED	96	HOURS	20	0
AUTOCLAVE	0120	121C, 2 ATM STEAM, UNBIASED	168	HOURS	45	0
AUTOCLAVE	0120	121C, 2 ATM STEAM, UNBIASED	168	HOURS	20	0
AUTOCLAVE	0122	121C, 2 ATM STEAM, UNBIASED	168	HOURS	44	0
AUTOCLAVE	0122	121C, 2 ATM STEAM, UNBIASED	96	HOURS	20	0
				Total:		**0**

Assembly Information:

Qualification Vehicle:	DS2760
Assembly Site:	ATP (Amkor, PI)
Pin Count:	16
Package Type:	TSSOP
Body Size:	4.4x0.9
Mold Compound:	Sumitomo 7351T
Lead Frame:	Stamped Copper C7025
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:	0211 to 0211

EEPROM WRITE/ERASE ENDURANCE AND DATA RETENTION

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
WRITE CYCLE STRESS	0211	85 C, 6.0 VOLTS	50	KCYCLS	77	0
STORAGE LIFE		150C	1000	HOURS	77	0
				Total:		**0**

ELECTRICAL CHARACTERIZATION

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
ESD SENSITIVITY	0211	EOS/ESD S5.1 HBM 500 VOLTS	2	PULSES	3	0
ESD SENSITIVITY	0211	EOS/ESD S5.1 HBM 1000 VOLTS	2	PULSES	3	0
ESD SENSITIVITY	0211	EOS/ESD S5.1 HBM 2000 VOLTS	2	PULSES	3	0
ESD SENSITIVITY	0211	EOS/ESD S5.1 HBM 4000 VOLTS	2	PULSES	3	0
ESD SENSITIVITY	0211	EOS/ESD S5.1 HBM 8000 VOLTS	2	PULSES	3	3
LATCH-UP	0211	JESD78, I-TEST 125C			3	0
LATCH-UP	0211	JESD78, Vsupply TEST 125C			3	0
				Total:		**3**

HIGH TEMPERATURE OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
HIGH VOLTAGE LIFE	0211	125C, 6.0 VOLTS	1000	HOURS	80	0
				Total:		**0**

Assembly Information:

Qualification Vehicle:	DS2760
Assembly Site:	Carsem
Pin Count:	16
Package Type:	TSSOP
Body Size:	4.4x0.9
Mold Compound:	Sumitomo 7351LS
Lead Frame:	Stamped Copper C7025
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:	0040 to 0040

EEPROM WRITE/ERASE ENDURANCE AND DATA RETENTION

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
WRITE CYCLE STRESS	0040	85 C, 6.0 VOLTS	50	KCYCLS	77	0
STORAGE LIFE		150C	1000	HOURS	77	0
				Total:		**0**

HIGH TEMPERATURE OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT		QUANTITY	FAILS
INFANT LIFE	0040	125C, 6.0 VOLTS	48	HOURS	256	1
HIGH VOLTAGE LIFE	0040	125C, 6.0 VOLTS	1000	HOURS	77	0
				Total:		**1**

FAILURE RATE: MTTF (YRS): 9013 FITS: 12.7