Cypress Semiconductor
Package Qualification Report

QTP# 014011 VERSION 1.1
February, 2003

120-lead Thin Quad Flat Pack

14 x 14 x 1.4mm, MSL3

ANAM-SEOUL Korea Assembly

CYPRESS TECHNICAL CONTACT FOR QUALIFICATION DATA:

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PACKAGE QUALIFICATION HISTORY

QUAL REPORT		DESCRIPTION OF QUALIFICATION PURPOSE		DATE COMP.
014011		120-lead TQFP (14mm x 14mm x 1.4mm), die size 153.6 x 130.7, ANAM-SEOUL Korea Assembly, MSL3		Oct 01

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	AT120
Package Outline, Type, or Name:	120-pin Thin Quad Flat Pack (TQFP)
Mold Compound Name/Manufacturer:	Sumitomo EME7351UL
Mold Compound Flammability Rating:	V-O per UL 94
Oxygen Rating Index:	＞28%
Lead Frame Material:	Copper
Lead Finish, Composition / Thickness:	Solder Plated, 85%Sn, 15%Pb
Die Backside Preparation Method/Metallization:	N/A
Die Separation Method:	Wafer Saw
Die Attach Supplier:	Ablestik
Die Attach Material:	8361J
Bond Diagram Designation	10-03783
Wire Bond Method:	Thermosonic
Wire Material/Size:	1.0um
Thermal Resistance Theta JA °C/W:	45°C/W
Package Cross Section Yes/No:	N/A
Assembly Process Flow:	49-10044
Name/Location of Assembly (prime) facility:	Anam Seoul Korea (SEOL-L)

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	Anam Seoul Korea (SEOL-L)
Fault Coverage:	100%

Note: Please contact a Cypress Representative for other packages availability.

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

Stress/Test	Test Condition (Temp/Bias)	Result P/F
High Temperature Operating Life Early Failure	Dynamic Operating Condition, Vcc = 3.8V, 125°C	P
High Temperature Operating Life Latent Failure Rate	Dynamic Operating Condition, Vcc = 3.8V, 125°C	P
Temperature Cycle	MIL-STD-883C, Method 1010, Condition C, -65°C to 150°C Precondition: JESD22 Moisture Sensitivity MSL 3 192 Hrs., 30°C/60%RH+3IR-Reflow, 220°C+5, -0°C	P
Pressure Cooker	121°C, 100%RH Precondition: JESD22 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3IR-Reflow, 220°C+5, 0°C	P
High Accelerated Saturation Test (HAST)	130°C, 3.63V, 85%RH Precondition: JESD22 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3IR-Reflow, 220°C+5, 0°C	P
External Visual	Cypress Spec. 12-00292	P
Physical Dimensions	Cypress Spec. 25-00031	P
X-Ray	MIL-STD-883, Method 32012, Cypress Spec. 12-00292	P
Thermal Shock	-55C to +125C Cypress Spec. 25-00014	P
Acoustic Microscopy, MSL 3	Cypress Spec. 25-00104	P

***This Qualification is contingent on the product CYS25G0101 qualification, QTP O11402.**

RELIABILITY FAILURE RATE SUMMARY

Stress/Test	Device Tested/ Device Hours	# Fails	Activation Energy	Acceleration Factor[4]	Failure Rate[5]
High Temperature Operating Life Early Failure Rate	1,047	0	N/A	N/A	0 PPM
High Temperature Operating Life[1,2] Long Term Failure Rate	368,184 HRs	0	0.7	170	45FIT

[1] Assuming an ambient temperature of 55°C and a junction temperature rise of 15°C.
[2] Chi-squared 60% estimations used to calculate the failure rate.
[3] Thermal Acceleration Factor is calculated from the Arrhenius equation

$$AF = \exp\left[\frac{E_A}{k}\left[\frac{1}{T_2} - \frac{1}{T_1}\right]\right]$$

where:

E_A = The Activation Energy of the defect mechanism.
k = Boltzmann's constant = 8.62×10^{-5} eV/Kelvin.
T_1 is the junction temperature of the device under stress and T_2 is the junction temperature of the device at use conditions.

Reliability Test Data

QTP #: 014011

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3							
CYS25G0101GX-ATC (7B9532A)	4040862	*610102176*	SEOL-L	COMP	15	0	
CYS25G0101GX -ATC (7B9532A)	4048706	*610111752*	SEOL-L	COMP	15	0	
CYS25G0101GX -ATC (7B9532A)	4048679	*610123195L1*	SEOL-L	COMP	15	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 125C, 3.8V, Vcc Max							
CYS25G0101DX -ATC (7B9532A)	4048706	*610118512L1*	SEOL-L	96	1047	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (125C, 3.8V, Vcc Max)							
CYS25G0101DX -ATC (7B9532A)	4048706	*610118512L1*	SEOL-L	168	379	0	
CYS25G0101DX -ATC (7B9532A)	4048706	*610118512L1*	SEOL-L	1000	366	0	
STRESS: THERMAL SHOCK (+125C/-55C)							
CYS25G0101GX -ATC (7B9532A)	4040862	*610102176*	SEOL-L	100	50	0	
CYS25G0101GX -ATC (7B9532A)	4040862	*610102176*	SEOL-L	200	50	0	
STRESS: PHYSICAL DIMENSIONS							
CYS25G0101GX -ATC (7B9532A)	4048706	*610111752*	SEOL-L	COMP	5	0	
STRESS: EXTERNAL VISUAL							
CYS25G0101GX -ATC (7B9532A)	4048706	*610111752*	SEOL-L	COMP	15	0	
STRESS: X-RAY							
CYS25G0101GX -ATC (7B9532A)	4048706	*610121607*	SEOL-L	COMP	15	0	
STRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 3.63V), PRE COND 192 HR 30C/60%RH, MSL3							
CYS25G0101GX -ATC (7B9532A)	4040862	*610102176*	SEOL-L	128	48	0	
STRESS: PRESSURE COOKER TEST (121C, 100%RH), PRE COND 192 HR 30C/60%RH							
CYS25G0101GX -ATC (7B9532A)	4040862	*610102176*	SEOL-L	168	47	0	

Reliability Test Data

QTP #: 014011

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: TC COND. C -65C TO 150C, PRECONDITION 192 HRS 30C/60%RH (MSL3)							
CYS25G0101GX -ATC (7B9532A)	4040862	*610102176*	SEOL-L	300	46	0	
CYS25G0101GX -ATC (7B9532A)	4040862	*610102176*	SEOL-L	500	46	0	
CYS25G0101GX -ATC (7B9532A)	4040862	*610102176*	SEOL-L	1000	46	0	
CYS25G0101GX -ATC (7B9532A)	4048706	*610118512L1*	SEOL-L	300	60	0	
CYS25G0101GX -ATC (7B9532A)	4048706	*610118512L1*	SEOL-L	500	59	0	
CYS25G0101GX -ATC (7B9532A)	4048679	*610123195L1*	SEOL-L	300	59	0	
CYS25G0101GX -ATC (7B9532A)	4048679	*610123195L1*	SEOL-L	500	57	0	
CYS25G0101GX -ATC (7B9532A)	4048679	*610123195L1*	SEOL-L	1000	55	0	