

Cypress Semiconductor Package Qualification Report

**97354 VERSION 1.2
April, 2003**

**48-ball Fine Pitch Ball Grid Array (FBGA) Level 3
7 x 7 x 1.2 mm
ASE Taiwan (TAIWN-G)**

CYPRESS TECHNICAL CONTACT FOR QUALIFICATION DATA:

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PACKAGE QALIFICATION HISTORY

Qual Report	Description of Qualification Purpose	Date Comp
97354	48 ld Mini BGA Package ASE Taiwan Assembly, for all products excluding 7C37K	Feb 99
024906	48-ball FBGA (7 x 7 x 1.2mm) ASE Taiwan Assembly, using New Substrate Cu Mesh Design, MSL3 for 7C37K Product Family	Apr 03

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	BA48
Package Outline, Type, or Name:	48-ball Fine Pitch Ball Grid Array (FBGA)
Mold Compound Name/Manufacturer:	PLASKON SMT-B-1
Mold Compound Flammability Rating:	V-O per UL94
Oxygen Rating Index:	> 28%
Lead Frame Designation:	BA
Substrate Material:	BT Laminate
Lead Finish, Composition / Thickness:	Solder Ball 63%Sn, 37%Pb
Die Backside Preparation Method/Metallization:	N/A
Die Separation Method:	Saw Through
Die Attach Supplier:	Ablestik
Die Attach Material:	Ablestik 8355F
Die Attach Method:	Silver Filled Epoxy
Bond Diagram Designation:	10-03639
Wire Bond Method:	Thermo sonic
Wire Material/Size:	Au, 1.0um
Thermal Resistance Theta JA °C/W:	94 °C/W
Package Cross Section Yes/No:	N/A
Assembly Process Flow:	49-41010
Name/Location of Assembly (prime) facility:	ASE Taiwan (TAIWN-G)

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	CSJ, CML-R, ASE Taiwan
Fault Coverage:	100%

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

Stress/Test	Test Condition (Temp/Bias)	Result P/F
High Temperature Operating Life Early Failure Rate	Dynamic Operating Condition, Vcc Max = 4.3V/5.75V, 150 °C/125°C	P
High Temperature Operating Life Latent Failure Rate	Dynamic Operating Condition, Vcc Max = 4.3V/5.75V, 150 °C/125°C	P
Temperature Cycle	JEDEC22, Condition C, -65°C to 150°C Precondition: JESD22 Moisture Sensitivity Level 3 192 Hrs., 30°C/60%RH+3IR-Reflow, 220°C+5, -0°C	P
High Accelerated Saturation	Precondition: JESD22 Moisture Sensitivity Level 3 192 Hrs., 30°C/60%RH+3IR-Reflow, 220°C+5, -0°C JEDEC22, Condition C, -65°C to 150°C	P
Pressure Cooker	Precondition: JESD22 Moisture Sensitivity Level 3 192 Hrs., 30°C/60%RH+3IR-Reflow, 220°C+5, -0°C JEDEC22, Condition C, -65°C to 150°C	P
High Temperature Storage	165C/150C, no bias	P
Internal Visual	Cypress Spec 25-00017	P
External Visual	Cypress Spec 25-00038	P
Physical Dimension	Cypress Spec. 25-00031	P
Die Shear	Cypress Spec 12-00292	P
Ball Shear	Cypress Spec 24-00018	P
Bond Pull	Cypress Spec 24-00002	P
Thermal Shock	Cypress Spec 25-00014	P
X-Ray	Cypress Spec 12-00292	P
Acoustic Microscopy, MSL3	Cypress Spec 25-000104	P

Reliability Test Data

QTP #: 97354

<i>Device</i>	<i>Fab Lot #</i>	<i>Assy Lot #</i>	<i>Ass Loc</i>	<i>Duration</i>	<i>Samp</i>	<i>Rej</i>	<i>Failure Mechanism</i>
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 150C, 4.3V, Vcc Max							
CY7C1021V33-BSC	4721580	619706882	TAIWN-G	48	726	0	
CY7C1021V33-BSC	4721580	619706884	TAIWN-G	48	438	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 125C, 5.75V, Vcc Max							
CY7C1021-BSC	4711080	349705284/5/6	TAIWN-G	96	11	0	See note 1
CY7C1021-BSC	4711080	349705284/5/6	TAIWN-G	96	96	0	See note 2
CY7C1021-BSC	4711080	349705284/5/6	TAIWN-G	96	147	0	See note 3
CY7C1021-BSC	4711080	349705284/5/6	TAIWN-G	96	240	0	See note 4
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 150C, 4.3V, Vcc Max							
CY7C1021V33-BSC	4721580	619706882	TAIWN-G	80	116	0	
CY7C1021V33-BSC	4721580	619706882	TAIWN-G	401	116	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 125C, 5.75V, Vcc Max							
CY7C1021-BSC	4711080	349705284/5/6	TAIWN-G	168	120	0	
CY7C1021-BSC	4711080	349705284/5/6	TAIWN-G	500	120	0	
STRESS: THERMAL SHOCK (125c / -55C)							
CY7C1021-BSC	4711080	349705284	TAIWN-G	100	50	0	
CY7C1021-BSC	4711080	349705284	TAIWN-G	200	50	0	

NOTE:

1. One package chip out due to handling.
2. One broken bond. The failure was found to be the substrate quality. Permanent corrective action has been implemented to switch substrate vendor. In addition, a wire pull control of 5 grams was implemented to improve wire pull strength.
3. One topside crack and 2 non-visual failures. The topside crack unit did not show any delamination on C-SAM test, the ball was not lifted off the band pad. This failure is an isolated wafer related case. The failure is not chargeable for this package qual.
4. One single bit failure. The device will not receive production burn-in. This is a device failure, which is associated with wafer processing and is not chargeable for this package qual.

Reliability Test Data

QTP #: 97354

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: PHYSICAL DIMENSION							
CY7C1021-BSC	4711080	349705284/5/6	TAIWN-G	COMP	5	0	
STRESS: EXTERNAL VISUAL							
CY7C1021-BSC	4711080	349705284/5/6	TAIWN-G	COMP	15	0	
STRESS: INTERNAL VISUAL							
CY7C1021-BSC	4711080	349705284/5/6	TAIWN-G	COMP	5	0	
STRESS: BALL SHEAR							
CY7C1021-BSC	4711080	349705285	TAIWN-G	COMP	64	0	
STRESS: BOND PULL							
CY7C1021-BSC	4711080	349705285	TAIWN-G	COMP	48	0	
STRESS: DIE SHEAR							
CY7C1021-BSC	4711080	349705285	TAIWN-G	COMP	4	0	
STRESS: X-RAY							
CY7C1021-BSC	4711080	349705284/5/6	TAIWN-G	COMP	15	0	
STRESS: HI-ACCEL SATURATION TEST (140C, 85%RH, 3.63vV), PRE COND 192 HR 30C/60%RH							
CY7C1021-BSC	4711080	349705285	TAIWN-G	128	52	0	
CY7C1021-BSC	4711080	349705286	TAIWN-G	128	51	0	
STRESS: TC COND. B -40C TO 125C, PRECONDITION 192 HRS 30C/60%RH (MSL3)							
CY7C1021-BSC	4711080	349705284	TAIWN-G	500	55	0	
CY7C1021-BSC	4711080	349705284	TAIWN-G	1000	55	0	
CY7C1021-BSC	4711080	349705284	TAIWN-G	1500	55	0	
CY7C1021-BSC	4711080	349705285	TAIWN-G	500	55	0	
CY7C1021-BSC	4711080	349705285	TAIWN-G	1000	55	0	
CY7C1021-BSC	4711080	349705285	TAIWN-G	1500	55	0	
CY7C1021-BSC	4711080	349705286	TAIWN-G	500	55	0	
CY7C1021-BSC	4711080	349705286	TAIWN-G	1000	55	0	
CY7C1021-BSC	4711080	349705286	TAIWN-G	1500	55	0	
STRESS: HIGH TEMPERATURE STORAGE, PLASTIC, 165C							
CY7C1021-BSC	4711080	349705284	TAIWN-G	336	50	0	
CY7C1021-BSC	4711080	349705284	TAIWN-G	500	50	0	
CY7C1021-BSC	4711080	349705284	TAIWN-G	1000	50	0	

Reliability Test Data

QTP #: 024906

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC - MICROSCOPE MSL3							
7C37620B-BA	9108704	610248329	TAIWN-G	COMP	15	0	
7C37620B-BA	9108704	610248330	TAIWN-G	COMP	15	0	
7C37620B-BA	9108704	610248331	TAIWN-G	COMP	15	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 85%RH, 3.63V, PRE COND 192 HR 30C/60%RH. MSL3							
7C37620B-BA	9108704	610248329	TAIWN-G	128	46	0	
STRESS: PRESSURE COOKER TEST, 121C, 100%RH, PRE COND 192HRS 30C/60%RH,MSL3							
7C37620B-BA	9108704	610248329	TAIWN-G	168	47	0	
7C37620B-BA	9108704	610248330	TAIWN-G	168	43	0	
STRESS: TC CONDITION C, -65C TO 150C, PRE COND. 192 HRS 30C/60% RH, MSL3							
7C37620B-BA	9108704	610248329	TAIWN-G	300	50	0	
7C37620B-BA	9108704	610248329	TAIWN-G	500	50	0	
7C37620B-BA	9108704	610248329	TAIWN-G	1000	50	0	
7C37620B-BA	9108704	610248330	TAIWN-G	300	47	0	
7C37620B-BA	9108704	610248330	TAIWN-G	500	47	0	
7C37620B-BA	9108704	610248330	TAIWN-G	1000	47	0	
7C37620B-BA	9108704	610248331	TAIWN-G	300	56	0	
7C37620B-BA	9108704	610248331	TAIWN-G	500	56	0	
7C37620B-BA	9108704	610248331	TAIWN-G	1000	56	0	
STRESS: HIGH TEMP STORGAE, PLASTIC, 150C							
7C37620B-BA	9108704	610248330	TAIWN-G	500	45	0	
7C37620B-BA	9108704	610248330	TAIWN-G	1000	45	0	