

Cypress Semiconductor Package Qualification Report

**QTP# 003103 VERSION 2.0 (G1)
October 2004**

48 Fine Pitch Ball Grid Array (FBGA)

7mm x 8.5 mm, MSL1

Cypress Philippines (CML-R) Assembly

CYPRESS TECHNICAL CONTACT FOR QUALIFICATION DATA:

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PACKAGE QUALIFICATION HISTORY

| QUAL REPORT | DESCRIPTION OF QUALIFICATION PURPOSE | DATE COMP. |
|--------------------|--------------------------------------------------|-------------------|
| 003103 | 48-lead FBGA (7mm x 8.5mm), MSL3, CML-R Assembly | Feb 01 |
| 022802 | Upgrade from MSL3 to MSL1 | Jul 02 |

| MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION | |
|-------------------------------------------------------|-----------------------------------------------|
| Package Designation: | BA48 |
| Package Outline, Type, or Name: | Fine-Pitch Ball Grid Array (7mm x 8.5mm) FBGA |
| Mold Compound Name/Manufacturer: | Plaskon SMT B I N |
| Mold Compound Flammability Rating: | V-O per UL 94 |
| Oxygen Rating Index: | >28% |
| Substrate Material: | BT Resin |
| Lead Finish, Composition / Thickness: | Solder Balls 62%Sn - 36% Pb – 2%Ag |
| Die Backside Preparation Method/Metallization: | N/A |
| Die Separation Method: | Wafer Saw |
| Die Attach Supplier: | QMI |
| Die Attach Material: | QMI 506 |
| Bond Diagram Designation | 10-03495 |
| Wire Bond Method: | Thermosonic |
| Wire Material/Size: | Gold, 1.0mil |
| Thermal Resistance Theta JA °C/W: | 54.9°C/W |
| Package Cross Section Yes/No: | N/A |
| Assembly Process Flow: | 11-20034 |
| Name/Location of Assembly (prime) facility: | Cypress Philippines (CML-R) |

RoHS PPM level:

| Package | Package Weight | Solder Plating | Assembly Site | Lead (Pb) | Mercury (Hg) | Chromium (Cr VI) | Cadmium (Cd) |
|---------|----------------|----------------|---------------|-----------|--------------|------------------|--------------|
| FBGA 48 | 0.10 gm | Sn/Pb | CML | 3 ppm | <0.05 ppm | < 2 ppm | < 1 ppm |

| Polychlorinated biphenyls (PCB) | Polybrominated biphenyls (PBB) | Polybrominated diphenylethers (PBDE) |
|---------------------------------|--------------------------------|--------------------------------------|
| < 1 ppm | < 1 ppm | < 1 ppm |

| ELECTRICAL TEST / FINISH DESCRIPTION | |
|--------------------------------------|-----------------------------|
| Test Location: | Cypress Philippines (CML-R) |
| Fault Coverage: | 100% |

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

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENT

| Stress/Test | Test Condition (Temp/Bias) | Result P/F |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Temperature Cycle | Precondition: JESD22 Moisture Sensitivity MSL 1 168 Hrs., 85°C/85%RH+3IR-Reflow, 220°C+5, -0°C Precondition: JESD22 Moisture Sensitivity MSL 3 192 Hrs., 30°C/60%RH+3IR-Reflow, 220°C+5, -0°C MIL-STD-883C, Method 1010, Condition C, -65°C to 150°C | P |
| High Accelerated Saturation Test | Precondition: JESD22 Moisture Sensitivity MSL 1 168 Hrs., 85°C/85%RH+3IR-Reflow, 220°C+5, -0°C Precondition: JESD22 Moisture Sensitivity MSL 3 192 Hrs., 30°C/60%RH+3IR-Reflow, 220°C+5, -0°C MIL-STD-883C, Method 1010, Condition C, -65°C to 150°C | P |
| Pressure Cooker Test | Precondition: JESD22 Moisture Sensitivity MSL 1 168 Hrs., 85°C/85%RH+3IR-Reflow, 220°C+5, -0°C Precondition: JESD22 Moisture Sensitivity MSL 3 192 Hrs., 30°C/60%RH+3IR-Reflow, 220°C+5, -0°C MIL-STD-883C, Method 1010, Condition C, -65°C to 150°C | P |
| Internal Visual | Cypress Specification 25-00017 | P |
| External Visual | Cypress Specification 12-00292 | P |
| Ball Shear | Cypress Spec 24-00018 | P |
| High Temperature Storage | 150°C, no bias | P |
| Physical Dimensions | Cypress Specification 25-00031 | P |
| Bond Pull | Cypress Spec 24-00002 | P |
| Thermal Shock | 125C, -55C Cypress Spec 25-00014 | P |
| Die Shear | Cypress Specification 12-00292 | P |
| X-Ray | MIL-STD-883-2012 | P |
| Acoustic Microscopy Test (C-SAM) | Cypress Spec 25-00104 | P |

Reliability Test Data

QTP #: 003103

| <i>Device</i> | <i>Fab Lot #</i> | <i>Assy Lot #</i> | <i>Assy Loc</i> | <i>Duration</i> | <i>Samp</i> | <i>Rej</i> | <i>Failure Mechanism</i> |
|---------------------------------------------------------------------------------------|------------------|-------------------|-----------------|-----------------|-------------|------------|--------------------------|
| STRESS: ACOUSTIC - MICROSCOPE MSL3 | | | | | | | |
| CY62146VLL-BA (7C621464B) | 4021372 | 610034867 | CSPI-R | COMP | 15 | 0 | |
| CY62146VLL-BA (7C621464B) | 4022374 | 610035011 | CSPI-R | COMP | 15 | 0 | |
| CY62146VLL-BA (7C621464B) | 4021244 | 610035012 | CSPI-R | COMP | 15 | 0 | |
| STRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 3.63V)PRE COND 192 HR 30C/60%RH | | | | | | | |
| CY62146VLL-BA (7C621464B) | 4021244 | 610035012 | CSPI-R | 128 | 48 | 0 | |
| STRESS: HIGH TEMP STORAGE, PLASTIC, 150C | | | | | | | |
| CY62146VLL-BA (7C621464B) | 4021372 | 610034867 | CSPI-R | 500 | 50 | 0 | |
| STRESS: PRESSURE COOKER TEST (121C, 100%RH), PRE COND 192HRS 30C/60%RH | | | | | | | |
| CY62146VLL-BA (7C621464B) | 4022374 | 610035011 | CSPI-R | 168 | 500 | | |
| CY62146VLL-BA (7C621464B) | 4021372 | 610034867 | CSPI-R | 168 | 50 | 0 | |
| STRESS: THERMAL SHOCK, CONDITION B 125C, -55C | | | | | | | |
| CY62146VLL-BA (7C621464B) | 4021372 | 610034867 | CSPI-R | 100 | 50 | 0 | |
| STRESS: PHYSICAL DIMENSIONS | | | | | | | |
| CY62146VLL-BA (7C621464B) | 4021372 | 610034867 | CSPI-R | COMP | 5 | 0 | |
| STRESS: X-RAY | | | | | | | |
| CY62146VLL-BA (7C621464B) | 4021372 | 610034867 | CSPI-R | COMP | 15 | 0 | |
| STRESS: DIE SHEAR | | | | | | | |
| CY62146VLL-BA (7C621464B) | 4021372 | 610034867 | CSPI-R | COMP | 15 | 0 | |
| STRESS: BOND PULL | | | | | | | |
| CY62146VLL-BA (7C621464B) | 4021372 | 610034867 | CSPI-R | COMP | 10 | 0 | |
| STRESS: BALL SHEAR | | | | | | | |
| CY62146VLL-BA (7C621464B) | 4021372 | 610034867 | CSPI-R | COMP | 10 | 0 | |
| STRESS: INTERNAL VISUAL | | | | | | | |
| CY62146VLL-BA (7C621464B) | 4021372 | 610034867 | CSPI-R | COMP | 5 | 0 | |
| STRESS: EXTERNAL VISUAL | | | | | | | |
| CY62146VLL-BA (7C621464B) | 4021372 | 610034867 | CSPI-R | COMP | 15 | 0 | |

Reliability Test Data

QTP #: 003103

| Device | Fab Lot # | Assy Lot # | Assy Loc | Duration | Samp | Rej | Failure Mechanism |
|----------------------------------------------------------------------------------|------------------|-------------------|-----------------|-----------------|-------------|------------|--------------------------|
| STRESS: TC CONDITION C, -65C TO 150C, PRE COND. 192 HRS 30C/60% RH (MSL3) | | | | | | | |
| CY62146VLL-BA (7C621464B) | 4021244 | 610035012 | CSPI-R | 300 | 48 | 0 | |
| CY62146VLL-BA (7C621464B) | 4021244 | 610035012 | CSPI-R | 500 | 48 | 0 | |
| CY62146VLL-BA (7C621464B) | 4021244 | 610035012 | CSPI-R | 1000 | 48 | 0 | |
| CY62146VLL-BA (7C621464B) | 4022374 | 610035011 | CSPI-R | 300 | 48 | 0 | |
| CY62146VLL-BA (7C621464B) | 4022374 | 610035011 | CSPI-R | 500 | 48 | 0 | |
| CY62146VLL-BA (7C621464B) | 4022374 | 610035011 | CSPI-R | 1000 | 48 | 0 | |
| CY62146VLL-BA (7C621464B) | 4022372 | 610034867 | CSPI-R | 300 | 48 | 0 | |
| CY62146VLL-BA (7C621464B) | 4022372 | 610034867 | CSPI-R | 500 | 48 | 0 | |
| CY62146VLL-BA (7C621464B) | 4022372 | 610034867 | CSPI-R | 1000 | 48 | 0 | |

Reliability Test Data

QTP #: 022802

| Device | Fab Lot # | Assy Lot # | Assy Loc | Duration | Samp | Rej | Failure Mechanism |
|--------|-----------|------------|----------|----------|------|-----|-------------------|
|--------|-----------|------------|----------|----------|------|-----|-------------------|

STRESS: ACOUSTIC - MICROSCOPE MSL1

| | | | | | | | |
|---------------------------|---------|-----------|-------|------|----|---|--|
| CY62127VLL-BA (7C621273A) | 4943666 | 619938873 | CML-R | COMP | 15 | 0 | |
| CY62127VLL-BA (7C621273A) | 4941237 | 619938675 | CML-R | COMP | 15 | 0 | |
| CY62127VLL-BA (7C621273A) | 4938950 | 619938755 | CML-R | COMP | 15 | 0 | |

STRESS: HI-ACCEL SATURATION TEST, 130C, 85%RH, 3.63V, PRE COND 168 HR 85C/85%RH, MSL1

| | | | | | | | |
|---------------------------|---------|-----------|-------|-----|----|---|--|
| CY62127VLL-BA (7C621273A) | 4938950 | 619938755 | CML-R | 128 | 50 | 0 | |
|---------------------------|---------|-----------|-------|-----|----|---|--|

STRESS: PRESSURE COOKER TEST (121C, 100%RH), PRE COND 168 HRS 85C/85% RH, MSL1

| | | | | | | | |
|---------------------------|---------|-----------|-------|-----|----|---|--|
| CY62127VLL-BA (7C621273A) | 4938950 | 619938755 | CML-R | 168 | 50 | 0 | |
|---------------------------|---------|-----------|-------|-----|----|---|--|

STRESS: TC CONDITION C, -65C TO 150C, PRE COND. 168 HRS 85C/85% RH, MSL1

| | | | | | | | |
|---------------------------|---------|-----------|-------|-----|----|---|--|
| CY62127VLL-BA (7C621273A) | 4943666 | 619938873 | CML-R | 300 | 50 | 0 | |
| CY62127VLL-BA (7C621273A) | 4941237 | 619938675 | CML-R | 300 | 41 | 0 | |
| CY62127VLL-BA (7C621273A) | 4938950 | 619938755 | CML-R | 300 | 50 | 0 | |