



Cypress Semiconductor Corporation, 198 Champion Court, San Jose, CA 95134. Tel: (408) 943-2600

PRODUCT CHANGE NOTIFICATION

PCN: PCN182411

Date: June 17, 2018

Subject: Qualification of OSE-T as an Additional Assembly Site for Select Pb-Free Products

To: FUTURE ELECTRONICS
 FUTURE ELE
 pcn.system@futureelectronics.com

Change Type: Major

Description of Change:

Cypress announces the qualification of Orient Semiconductor Electronics, Taiwan (OSE-T) as an additional assembly site for select commercial and industrial grade products. These products are RoHS and REACH compliant. These products are assembled in the following package configurations.

The 28-Lead TSOP I (8x13.4x1.2mm) Pb-Free package are assembled at OSE-T using the following Bill of Materials:

| Material | OSE Bill of Materials | JCET Bill of Materials |
|---------------------|-----------------------|------------------------|
| Mold Compound | Sumitomo EMEG631SH | Kyocera G6000DA |
| Leadfinish | Pure Sn | NiPdAu |
| Die Attach Material | Sumitomo CRM1076WA | Henkel QMI509 |
| Bond Wire | 0.8 mil Au | 0.8 mil Au |

The 44-Lead TSOP II (11x18.5x1.2mm) Pb-Free packages are assembled at OSE-T using the following Bill of Materials:

| Material | OSE Bill of Materials | JCET Bill of Materials |
|------------------|-----------------------|------------------------|
| Mold Compound | Sumitomo EMEG631LT | Sumitomo EME-G620B |
| Leadfinish | Matte Sn | Matte Sn |
| Die Attach Epoxy | Sumitomo CRM-1076WA | Henkel QMI-509 |
| Bond Wire | 0.8 mil CuPdAu | 0.8 mil CuPd |

The 56-Lead SSOP (7.50x18.41x2.60mm) Pb-Free packages are assembled at OSE-T using the following Bill of Materials:

| Material | OSE Bill of Materials | JCET Bill of Materials |
|------------------|-----------------------------|-----------------------------|
| Mold Compound | Sumitomo G700L | Kyocera G3000DA / EME G620B |
| Leadfinish | Matte Sn | NiPdAu / Pure Sn |
| Die Attach Epoxy | Sumitomo CRM-1076WA | Henkel QMI-509 |
| Bond Wire | 0.8 mil Au / 0.8 mil CuPdAu | 0.9 mil Au / 0.8 mil CuPd |

The 28-Lead SOJ (7.50x17.90x3.30mm) Pb-Free packages are assembled at OSE-T using the following Bill of Materials:

| Material | OSE Bill of Materials | JCET Bill of Materials |
|------------------|-----------------------------|--------------------------------|
| Mold Compound | Hitachi 9240HF | Kyocera G6000DA / EME-G631SH-Q |
| Leadfinish | Matte Sn | NiPdAu |
| Die Attach Epoxy | Sumitomo CRM-1076WA | Henkel QMI-509 |
| Bond Wire | 0.8 mil Au / 0.8 mil CuPdAu | 0.9 mil Au / 0.8 mil CuPd |

The 32-Lead SOJ (7.58x20.82x3.40mm) Pb-Free packages are assembled at OSE-T using the following Bill of Materials:

| Material | OSE Bill of Materials | JCET Bill of Materials |
|------------------|-----------------------------|--------------------------------|
| Mold Compound | Hitachi 9240HF | Kyocera G6000DA / EME-G631SH-Q |
| Leadfinish | Matte Sn | NiPdAu |
| Die Attach Epoxy | Sumitomo CRM-1076WA | Henkel QMI-509 |
| Bond Wire | 0.8 mil Au / 0.8 mil CuPdAu | 0.9 mil Au / 0.8 mil CuPd |

The 32-Lead SOJ (10.16x20.95x3.50mm) Pb-Free packages are assembled at OSE-T using the following Bill of Materials:

| Material | OSE Bill of Materials | JCET Bill of Materials |
|------------------|-----------------------------|--------------------------------|
| Mold Compound | Hitachi 9240HF | Kyocera G6000DA / EME-G631SH-Q |
| Leadfinish | Matte Sn | NiPdAu |
| Die Attach Epoxy | Sumitomo CRM-1076WA | Henkel QMI-509 |
| Bond Wire | 0.8 mil Au / 0.8 mil CuPdAu | 0.9 mil Au / 0.8 mil CuPd |

The 36-Lead SOJ (10.16x23.50x3.50mm) Pb-Free packages are assembled at OSE-T using the following Bill of Materials:

| Material | OSE Bill of Materials | JCET Bill of Materials |
|------------------|-----------------------------|--------------------------------|
| Mold Compound | Hitachi 9240HF | Kyocera G6000DA / EME-G631SH-Q |
| Leadfinish | Matte Sn | NiPdAu |
| Die Attach Epoxy | Sumitomo CRM-1076WA | Henkel QMI-509 |
| Bond Wire | 0.8 mil Au / 0.8 mil CuPdAu | 0.9 mil Au / 0.8 mil CuPd |

The 44-Lead SOJ (10.16x28.57x3.50mm) Pb-Free packages are assembled at OSE-T using the following Bill of Materials:

| Material | OSE Bill of Materials | JCET Bill of Materials |
|------------------|-----------------------------|--------------------------------|
| Mold Compound | Hitachi 9240HF | Kyocera G6000DA / EME-G631SH-Q |
| Leadfinish | Matte Sn | NiPdAu |
| Die Attach Epoxy | Sumitomo CRM-1076WA | Henkel QMI-509 |
| Bond Wire | 0.8 mil Au / 0.8 mil CuPdAu | 0.9 mil Au / 0.8 mil CuPd |

Benefit of Change:

Qualification of alternate manufacturing sites is part of the ongoing flexible manufacturing initiative announced by Cypress. The goal of the flexible manufacturing initiative is to provide the means for Cypress to continue to meet delivery commitments through dynamic, changing market conditions.

Part Numbers Affected: 85

See the attached 'Affected Parts List' file for a list of all part numbers affected by this change. Note that any new parts that are introduced after the publication of this PCN will include all changes outlined in this PCN.

Qualification Status:

These assembly sites have been qualified through a series of tests documented in the Qualification Test Plans summarized in the table below. These qualification reports can be found as attachments to this PCN or by visiting www.cypress.com and typing the QTP number in the keyword search window.

| QTP Number | Qualification |
|------------|---|
| 181101 | OSE Taiwan as Additional Assembly Site for 28-Lead TSOP |
| 180419 | OSE Taiwan as Additional Assembly Site for 44-Lead TSOP |
| 180303 | OSE Taiwan as Additional Assembly Site for 56-Lead SSOP |
| 180205 | OSE Taiwan as Additional Assembly Site for 28 and 32-Lead SOJ |
| 180206 | OSE Taiwan as Additional Assembly Site for 32, 36 and 44-Lead SOJ |

Sample Status:

Qualification samples may not be built ahead of time for all part numbers affected by this change. Please review the attached 'Affected Parts List' file for a list of affected part numbers with their associated OSE sample ordering part numbers. Samples are available now unless there is an indication that the sample ordering part numbers are subject to lead times. If you require qualification samples, please contact your local Cypress sales representative as soon as possible, preferably within 30 days of the date of this PCN, to place any sample orders.

Approximate Implementation Date:

Effective 90 days from the date of this notification or upon customer approval, whichever comes first, all shipments of Commercial and Industrial non-PPAP part numbers in the attached file will be assembled at OSE-T or other approved assembly sites.

Anticipated Impact:

Products assembled at the new site are completely compatible with existing products from form, fit, functional, parametric and quality performance perspectives.

Cypress also recommends that customers take this opportunity to review these changes against current application notes, system design considerations and customer environment conditions to assess impact (if any) to their application.

Method of Identification:

Cypress maintains traceability of product to wafer level, including wafer fabrication location, through the lot number marked on the package.

Response Required:

No response is required.

For additional information regarding this change, contact your local sales representative or contact the PCN Administrator at pcn_adm@cypress.com.

Sincerely,

Cypress PCN Administration

Cypress Semiconductor Package Qualification Report

**QTP# 180303 VERSION **
March 2018**

**56-Lead SSOP (300mils)
Matte Sn Leadfinish, Au / CuPdAu Wire
MSL3, 260°C Reflow
OSE-Taiwan (T)**

**FOR ANY QUESTIONS ON THIS REPORT PLEASE CONTACT reliability@cypress.com :
OR VIA LINK A CYLINK CRM CASE**

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PACKAGE QUALIFICATION HISTORY

| QTP Number | Description of Qualification Purpose | Date |
|-------------------|--|-------------|
| 180303 | Qualification of 56-lead SSOP (300mils) Package at OSE-Taiwan (T) using 0.8mil Au/CuPdAu wire with G700L mold compound, CRM-1076 die attach material, Copper leadframe and Matte Sn leadfinish at MSL3, 260 C reflow temperature | May 2018 |

| MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION | |
|---|----------------------------------|
| Package Designation: | SP56 |
| Package Outline, Type, or Name: | 56-Lead SSOP 300mils |
| Mold Compound Name/Manufacturer: | G700L / Sumitomo |
| Mold Compound Flammability Rating: | V-0 / UL-94 |
| Mold Compound Alpha Emission Rate: | NA (Non low alpha mold compound) |
| Oxygen Rating Index: | 28 |
| Lead Frame Designation: | FMP |
| Lead Frame Material: | Copper |
| Lead Finish, Composition / Thickness: | Matte Sn |
| Die Backside Preparation Method/Metallization: | Backgrind |
| Die Separation Method: | Wafer saw |
| Die Attach Supplier: | Sumitomo |
| Die Attach Material: | CRM1076 |
| Bond Diagram Designation: | 10-06407 / 002-21809 |
| Wire Bond Method: | Thermosonic |
| Wire Material/Size: | Au / CuPdAu / 0.8 mil (20um) |
| Thermal Resistance Theta JA °C/W: | 47.7 C/W |
| Package Cross Section Yes/No: | N |
| Assembly Process Flow: | 49-35999M |
| Name/Location of Assembly (prime) facility: | OSE-Taiwan (T) |
| MSL Level | 3 |
| Reflow Profile | 260C |

| ELECTRICAL TEST / FINISH DESCRIPTION | |
|---|------------------|
| Test Location: | CML-RA / JCET-JT |

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENT

| Stress/Test | Test Condition (Temp/Bias) | Result P/F |
|--|--|---------------|
| Acoustic Microscopy | J-STD-020 Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60 RH, 260°C Reflow) | P |
| Ball Shear | JESD22-B116 | P |
| High Accelerated Saturation Test (HAST) – Unbiased | JEDEC STD 22-A110: 130 C, 85 RH Precondition: JESD22 Moisture Sensitivity Level 3 (192 Hrs., 30 °C, 60 RH, 260°C Reflow) | P |
| Bond Pull | MIL-STD-883 – Method 2011 | P |
| Constructional Analysis | Criteria: Meet external and internal characteristics of Cypress package | P |
| Die Shear | MIL-STD-883, Method 2019 Per die size: <ul style="list-style-type: none"> • 3000 sq. mils 1.2 kgf • 30001-5000 sq. mils 1.2 kgf • 5001 sq. mils 1.2 kgf | P |
| Dye Penetrant Test | Test to determine the existence and extent of cracks, Criteria: No Package Crack | P |
| Electrostatic Discharge Charge Device Model (ESD-CDM) | 500V / 1000V / 1250V JESD22-C101 | P |
| High Accelerated Saturation Test (HAST) | JESD22-A110, 130°C, 3.3V, 85 RH Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60 RH, 260°C Reflow) | P |
| Physical Dimension | MIL-STD-1835, JESD22-B100 | P |
| Final Visual Inspection | JESD22-B101B | P |
| Solderability | J-STD-002, JESD22-B102 95 solder coverage minimum | P |
| Pressure Cooker | JESD22-A102, 121°C, 100 RH, 15 Psig Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60 RH, 260°C Reflow) | P |
| Temperature Cycle | MIL-STD-883, Method 1010, Condition C, -65 C to 150 C Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60 RH, 260°C Reflow) | P |
| X-Ray | MIL-STD-883 - 2012 | P |

Reliability Test Data

QTP #: 180303

| <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: ACOUSTICS | | | | | | | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | COMP | 22 | 0 | |
| CG8082AM (7CP682000BC) | 4730595 | 611742073 | T-TAIWAN | COMP | 22 | 0 | |
| CY7C64713 (7C682030BC) | 4720584 | 611742074 | T-TAIWAN | COMP | 22 | 0 | |
| CY7C68001 (7CP68001EC) | 4722153 | 611748409 | T-TAIWAN | COMP | 22 | 0 | |
| STRESS: BALL SHEAR | | | | | | | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | COMP | 30 | 0 | |
| CG8082AM (7CP682000BC) | 4730595 | 611742073 | T-TAIWAN | COMP | 30 | 0 | |
| CY7C64713 (7C682030BC) | 4720584 | 611742074 | T-TAIWAN | COMP | 30 | 0 | |
| CY7C68001 (7CP68001EC) | 4722153 | 611748409 | T-TAIWAN | COMP | 30 | 0 | |
| STRESS: BOND PULL | | | | | | | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | COMP | 30 | 0 | |
| CG8082AM (7CP682000BC) | 4730595 | 611742073 | T-TAIWAN | COMP | 30 | 0 | |
| CY7C64713 (7C682030BC) | 4720584 | 611742074 | T-TAIWAN | COMP | 30 | 0 | |
| CY7C68001 (7CP68001EC) | 4722153 | 611748409 | T-TAIWAN | COMP | 30 | 0 | |
| STRESS: CONSTRUCTIONAL ANALYSIS | | | | | | | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | COMP | 5 | 0 | |
| CG8082AM (7CP682000BC) | 4730595 | 611742073 | T-TAIWAN | COMP | 5 | 0 | |
| CY7C64713 (7C682030BC) | 4720584 | 611742074 | T-TAIWAN | COMP | 5 | 0 | |
| CY7C68001 (7CP68001EC) | 4722153 | 611748409 | T-TAIWAN | COMP | 5 | 0 | |
| STRESS: DIE SHEAR | | | | | | | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | COMP | 10 | 0 | |
| CG8082AM (7CP682000BC) | 4730595 | 611742073 | T-TAIWAN | COMP | 10 | 0 | |
| CY7C64713 (7C682030BC) | 4720584 | 611742074 | T-TAIWAN | COMP | 10 | 0 | |
| CY7C68001 (7CP68001EC) | 4722153 | 611748409 | T-TAIWAN | COMP | 10 | 0 | |
| STRESS: DYE PENETRANT | | | | | | | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | COMP | 15 | 0 | |
| CG8082AM (7CP682000BC) | 4730595 | 611742073 | T-TAIWAN | COMP | 15 | 0 | |
| CY7C64713 (7C682030BC) | 4720584 | 611742074 | T-TAIWAN | COMP | 15 | 0 | |
| CY7C68001 (7CP68001EC) | 4722153 | 611748409 | T-TAIWAN | COMP | 15 | 0 | |

Reliability Test Data

QTP #: 180303

| <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: ESD-CHARGE DEVICE MODEL | | | | | | | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | 500 | 9 | 0 | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | 1000 | 3 | 0 | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | 1250 | 3 | 0 | |
| STRESS: FINAL VISUAL | | | | | | | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | COMP | 1000 | 0 | |
| CG8082AM (7CP682000BC) | 4730595 | 611742073 | T-TAIWAN | COMP | 600 | 0 | |
| CY7C64713 (7C682030BC) | 4720584 | 611742074 | T-TAIWAN | COMP | 1000 | 0 | |
| CY7C68001 (7CP68001EC) | 4722153 | 611748409 | T-TAIWAN | COMP | 1012 | 0 | |
| STRESS: UNBIASED HAST | | | | | | | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | 96 | 77 | 0 | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | 192 | 77 | 0 | |
| CG8082AM (7CP682000BC) | 4730595 | 611742073 | T-TAIWAN | 96 | 77 | 0 | |
| CG8082AM (7CP682000BC) | 4730595 | 611742073 | T-TAIWAN | 192 | 75 | 0 | |
| STRESS: HI-ACCEL SATURATION TEST, 130C, 85%RH, 3.3V, PRE COND 192 HR 30C/60%RH, MSL3 | | | | | | | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | 96 | 25 | 0 | |
| CG8082AM (7CP682000BC) | 4730595 | 611742073 | T-TAIWAN | 96 | 25 | 0 | |
| CY7C64713 (7C682030BC) | 4720584 | 611742074 | T-TAIWAN | 96 | 25 | 0 | |
| CY7C68001 (7CP68001EC) | 4722153 | 611748409 | T-TAIWAN | 96 | 25 | 0 | |
| STRESS: PRESSURE COOKER TEST, 121C, 100%RH, 15 Psig, PRE COND 192 HR 30C/60%RH, MSL3 | | | | | | | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | 96 | 77 | 0 | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | 168 | 77 | 0 | |
| CG8082AM (7CP682000BC) | 4730595 | 611742073 | T-TAIWAN | 168 | 77 | 0 | |
| STRESS: PHYSICAL DIMENSION | | | | | | | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | COMP | 10 | 0 | |
| CG8082AM (7CP682000BC) | 4730595 | 611742073 | T-TAIWAN | COMP | 10 | 0 | |
| CY7C64713 (7C682030BC) | 4720584 | 611742074 | T-TAIWAN | COMP | 10 | 0 | |
| CY7C68001 (7CP68001EC) | 4722153 | 611748409 | T-TAIWAN | COMP | 10 | 0 | |

Reliability Test Data

QTP #: 180303

| <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: SOLDERABILITY | | | | | | | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | COMP | 3 | 0 | |
| CG8082AM (7CP682000BC) | 4730595 | 611742073 | T-TAIWAN | COMP | 3 | 0 | |
| CY7C64713 (7C682030BC) | 4720584 | 611742074 | T-TAIWAN | COMP | 3 | 0 | |
| CY7C68001 (7CP68001EC) | 4722153 | 611748409 | T-TAIWAN | COMP | 3 | 0 | |
| STRESS: TC COND. C -65C TO 150C, PRE COND 192 HRS 30C/60%RH, MSL3 | | | | | | | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | 500 | 77 | 0 | |
| CG8082AM (7CP682000BC) | 4730595 | 611742073 | T-TAIWAN | 500 | 77 | 0 | |
| CY7C64713 (7C682030BC) | 4720584 | 611742074 | T-TAIWAN | 500 | 77 | 0 | |
| CY7C68001 (7CP68001EC) | 4722153 | 611748409 | T-TAIWAN | 500 | 77 | 0 | |
| CY7C68001 (7CP68001EC) | 4722153 | 611748409 | T-TAIWAN | 1000 | 77 | 0 | |
| STRESS: X-RAY | | | | | | | |
| CY7C68013A (7C682000BC) | 4730595 | 611748990 | T-TAIWAN | COMP | 15 | 0 | |
| CG8082AM (7CP682000BC) | 4730595 | 611742073 | T-TAIWAN | COMP | 15 | 0 | |
| CY7C64713 (7C682030BC) | 4720584 | 611742074 | T-TAIWAN | COMP | 15 | 0 | |
| CY7C68001 (7CP68001EC) | 4722153 | 611748409 | T-TAIWAN | COMP | 15 | 0 | |



Document History Page

Document Title: QTP 180303: 56-LEAD SSOP (300MILS) MATTE SN LEADFINISH, AU / CUPDAU WIRE MSL3,
260C REFLOW OSE-TAIWAN (T)
Document Number: 002-23985

| Rev. | ECN No. | Orig. of Change | Description of Change |
|------|---------|-----------------|-----------------------|
| ** | 6177777 | HSTO | Initial spec release. |

Cypress Semiconductor Package Qualification Report

**QTP# 180205 VERSION **
June 2018**

**28-Lead SOJ (7.62x18.11x3.5mm) /
32-Lead SOJ (7.75x21.08x3.5mm)
Matte Sn Leadfinish, Au / CuPdAu Wire
MSL3, 260°C Reflow
OSE-Taiwan (T)**

**FOR ANY QUESTIONS ON THIS REPORT PLEASE CONTACT reliability@cypress.com :
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David Hoffman
Reliability Director

PACKAGE QUALIFICATION HISTORY

| QTP Number | Description of Qualification Purpose | Date |
|-------------------|---|-------------|
| 180205 | Qualification of 28-Lead SOJ (7.62x18.11x3.5mm) / 32-lead SOJ (7.75x21.08x3.5mm) Package in OSE-Taiwan (T) using 0.8mil Au/CuPdAu wire with CEL-9240HF mold compound, CRM-1076WA die attach material, Copper leadframe and Matte Sn leadfinish at MSL3, 260 C reflow temperature. | May 2018 |

| MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION | |
|---|---|
| Package Designation: | VZ283 / VZ323 |
| Package Outline, Type, or Name: | 28-Lead SOJ (7.62x18.11x3.5mm) / 32-lead SOJ (7.75x21.08x3.5mm) |
| Mold Compound Name/Manufacturer: | CEL-9240HF / Hitachi |
| Mold Compound Flammability Rating: | V-0 / UL-94 |
| Mold Compound Alpha Emission Rate: | 0.0015 count/cm ² .h (Low alpha mold compound) |
| Oxygen Rating Index: | 28 |
| Lead Frame Designation: | FMP |
| Lead Frame Material: | Copper |
| Lead Finish, Composition / Thickness: | Matte Sn |
| Die Backside Preparation Method/Metallization: | Backgrind |
| Die Separation Method: | Wafer Saw |
| Die Attach Supplier: | Sumitomo |
| Die Attach Material: | CRM1076WA |
| Bond Diagram Designation: | 002-21831 / 002-21829 / 002-22062 / 002-22064 |
| Wire Bond Method: | Thermosonic |
| Wire Material/Size: | Au / CuPdAu / 0.8 mil (20um) |
| Thermal Resistance Theta JA °C/W: | 59.2 / 57.61 C/W |
| Package Cross Section Yes/No: | No |
| Assembly Process Flow: | 49-35999M |
| Name/Location of Assembly (prime) facility: | OSE-Taiwan (T) |
| MSL Level | 3 |
| Reflow Profile | 260C |

| ELECTRICAL TEST / FINISH DESCRIPTION | |
|---|-----------------|
| Test Location: | CML-R / JCET-JT |

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENT

| Stress/Test | Test Condition (Temp/Bias) | Result P/F |
|---|--|---------------|
| Acoustic Microscopy | J-STD-020 Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60 RH, 260°C Reflow) | P |
| Ball Shear | JESD22-B116 | P |
| High Accelerated Saturation Test (HAST) – Unbiased | JEDEC STD 22-A110: 130 C, 85 RH Precondition: JESD22 Moisture Sensitivity Level 3 (192 Hrs., 30 °C, 60 RH, 260°C Reflow) | P |
| Bond Pull | MIL-STD-883 – Method 2011 | P |
| Constructional Analysis | Criteria: Meet external and internal characteristics of Cypress package | P |
| Die Shear | MIL-STD-883, Method 2019 Per die size: <ul style="list-style-type: none"> • 3000 sq. mils 1.2 kgf • 30001-5000 sq. mils 1.2 kgf • 5001 sq. mils 1.2 kgf | P |
| Dye Penetrant Test | Test to determine the existence and extent of cracks, Criteria: No Package Crack | P |
| Electrostatic Discharge Charge Device Model (ESD-CDM) | 500V / 1000V / 1250V JESD22-C101 | P |
| High Accelerated Saturation Test (HAST) | JESD22-A110, 130°C, 5.5V, 85 RH Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60 RH, 260°C Reflow) | P |
| Physical Dimension | MIL-STD-1835, JESD22-B100 | P |
| Final Visual Inspection | JESD22-B101B | P |
| Solderability | J-STD-002, JESD22-B102 95 solder coverage minimum | P |
| Pressure Cooker | JESD22-A102, 121°C, 100 RH, 15 Psig Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60 RH, 260°C Reflow) | P |
| Temperature Cycle | MIL-STD-883, Method 1010, Condition C, -65 C to 150 C Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60 RH, 260°C Reflow) | P |
| X-Ray | MIL-STD-883 - 2012 | P |



Reliability Test Data

QTP #: 180205

| <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: ACOUSTICS | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 22 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 22 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 22 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 22 | 0 | |
| STRESS: BALL SHEAR | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 30 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 30 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 30 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 30 | 0 | |
| STRESS: BOND PULL | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 30 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 30 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 30 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 30 | 0 | |
| STRESS: CONSTRUCTIONAL ANALYSIS | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 5 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 5 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 5 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 5 | 0 | |
| STRESS: DIE SHEAR | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 10 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 10 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 10 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 10 | 0 | |
| STRESS: DYE PENETRANT | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 15 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 15 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 15 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 15 | 0 | |

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Reliability Test Data

QTP #: 180205

| <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: ESD-CHARGE DEVICE MODEL | | | | | | | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 500 | 9 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 1000 | 3 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 1250 | 3 | 0 | |
| STRESS: FINAL VISUAL | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 990 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 595 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 592 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 597 | 0 | |
| STRESS: GLUE ADHESION | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 15 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 15 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 15 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 15 | 0 | |
| STRESS: UNBIASED HAST, 130C, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3 | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | 96 | 77 | 0 | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | 192 | 77 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 96 | 77 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 192 | 77 | 0 | |
| STRESS: HI-ACCEL SATURATION TEST, 130C, 85%RH, 5.5V, PRE COND 192 HR 30C/60%RH, MSL3 | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | 96 | 25 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 96 | 25 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | 96 | 25 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | 128 | 25 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | 96 | 25 | 0 | |



Reliability Test Data

QTP #: 180205

| Device | Fab Lot # | Assy Lot # | Assy Loc | Duration | Samp | Rej | Failure Mechanism |
|---|-----------|------------|----------|----------|------|-----|-------------------|
| STRESS: HIGH TEMPERATURE STORAGE | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | 500 | 45 | 0 | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | 1000 | 45 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 500 | 45 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 1000 | 45 | 0 | |
| STRESS: INTERNAL VISUAL INSPECTION | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 5 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 5 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 5 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 5 | 0 | |
| STRESS: PRESSURE COOKER TEST, 121C, 100%RH, 15 Psig, PRE COND 192 HR 30C/60%RH, MSL3 | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | 96 | 77 | 0 | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | 168 | 77 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 96 | 77 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 168 | 77 | 0 | |
| STRESS: PHYSICAL DIMENSION | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 10 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 10 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 10 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 10 | 0 | |
| STRESS: SOLDERABILITY | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 3 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 3 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 3 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 3 | 0 | |



Reliability Test Data

QTP #: 180205

| <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: TC COND. C -65C TO 150C, PRE COND 192 HRS 30C/60%RH, MSL3 | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | 500 | 77 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 500 | 77 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | 500 | 77 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | 500 | 77 | 0 | |
| STRESS: X-RAY | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 15 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 15 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 15 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 15 | 0 | |



Document History Page

Document Title: QTP 180205: 28-LEAD SOJ (7.62x18.11x3.5mm) / 32-LEAD SOJ (7.75x21.08x3.5mm) MATTE
SN LEADFINISH, AU / CUPDAU WIRE MSL3, 260C REFLOW OSE-TAIWAN (T)
Document Number: 002-24136

| Rev. | ECN No. | Orig. of Change | Description of Change |
|------|---------|-----------------|-----------------------|
| ** | 6195555 | HSTO | Initial spec release. |

Cypress Semiconductor Package Qualification Report

**QTP# 180206 VERSION **
June 2018**

**32-Lead SOJ (10.16x20.96x3.5mm)
36-Lead SOJ (10.16x23.50x3.5mm)
44-Lead SOJ (10.16x28.57x3.5mm)
Matte Sn Leadfinish, Au / CuPdAu Wire
MSL3, 260°C Reflow
OSE-Taiwan (T)**

**FOR ANY QUESTIONS ON THIS REPORT PLEASE CONTACT reliability@cypress.com :
OR VIA LINK A CYLINK CRM CASE**

Prepared By:
Honesto Sintos
Reliability Engineer

Reviewed By:
Lorena Zapanta
Reliability Manager

Approved By:
David Hoffman
Reliability Director

PACKAGE QUALIFICATION HISTORY

| QTP Number | Description of Qualification Purpose | Date |
|------------|---|----------|
| 180205 | Qualification of 28-Lead SOJ (7.62x18.11x3.5mm) / 32-lead SOJ (7.75x21.08x3.5mm) Package in OSE-Taiwan (T) using 0.8mil Au/CuPdAu wire with CEL-9240HF mold compound, CRM-1076WA die attach material, Copper leadframe and Matte Sn leadfinish at MSL3, 260 C reflow temperature. | May 2018 |
| 180206 | Qualification of 32-Lead SOJ (10.16x20.96x3.5mm) / 36-Lead SOJ (10.16x23.50x3.5mm) / 44-Lead SOJ (10.16x28.57x3.5mm) using 0.8mil Au/CuPdAu wire with CEL-9240HF mold compound, CRM-1076WA die attach material, Copper leadframe and Matte Sn leadfinish at MSL3, 260 C reflow temperature. | Jun 2018 |

| MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION | |
|---|---|
| Package Designation: | VZ283 / VZ323 |
| Package Outline, Type, or Name: | 28-Lead SOJ (7.62x18.11x3.5mm) / 32-lead SOJ (7.75x21.08x3.5mm) |
| Mold Compound Name/Manufacturer: | CEL-9240HF / Hitachi |
| Mold Compound Flammability Rating: | V-0 / UL-94 |
| Mold Compound Alpha Emission Rate: | 0.0015 count/cm ² .h (Low alpha mold compound) |
| Oxygen Rating Index: | 28 |
| Lead Frame Designation: | FMP |
| Lead Frame Material: | Copper |
| Lead Finish, Composition / Thickness: | Matte Sn |
| Die Backside Preparation Method/Metallization: | Backgrind |
| Die Separation Method: | Wafer Saw |
| Die Attach Supplier: | Sumitomo |
| Die Attach Material: | CRM1076WA |
| Bond Diagram Designation: | 002-21831 / 002-21829 / 002-22062 / 002-22064 |
| Wire Bond Method: | Thermosonic |
| Wire Material/Size: | Au / CuPdAu / 0.8 mil (20um) |
| Thermal Resistance Theta JA °C/W: | 59.2 / 57.61 C/W |
| Package Cross Section Yes/No: | No |
| Assembly Process Flow: | 49-35999M |
| Name/Location of Assembly (prime) facility: | OSE-Taiwan (T) |
| MSL Level | 3 |
| Reflow Profile | 260C |

| ELECTRICAL TEST / FINISH DESCRIPTION | |
|---|-------|
| Test Location: | CML-R |

| MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION | |
|--|--|
| Package Designation: | VZ36 / VZ44 |
| Package Outline, Type, or Name: | 36-Lead SOJ (10.16x23.50x3.5mm) / 44-Lead SOJ (10.16x28.57x3.5mm) |
| Mold Compound Name/Manufacturer: | CEL-9240HF / Hitachi |
| Mold Compound Flammability Rating: | V-0 / UL-94 |
| Mold Compound Alpha Emission Rate: | 0.0015 count/cm ² .h (Low alpha mold compound) |
| Oxygen Rating Index: | 28 |
| Lead Frame Designation: | FMP |
| Lead Frame Material: | Copper |
| Lead Finish, Composition / Thickness: | Matte Sn |
| Die Backside Preparation Method/Metallization: | Backgrind |
| Die Separation Method: | Wafer Saw |
| Die Attach Supplier: | Sumitomo |
| Die Attach Material: | CRM1076WA |
| Bond Diagram Designation: | 002-21876 / 002-21334 / 002-21346 |
| Wire Bond Method: | Thermosonic |
| Wire Material/Size: | Au / CuPdAu / 0.8 mil (20um) |
| Thermal Resistance Theta JA °C/W: | 59.17 C/W / 59.52 C/W / 55.37 C/W |
| Package Cross Section Yes/No: | No |
| Assembly Process Flow: | 49-35999M |
| Name/Location of Assembly (prime) facility: | OSE-Taiwan (T) |
| MSL Level | 3 |
| Reflow Profile | 260C |

| ELECTRICAL TEST / FINISH DESCRIPTION | |
|--------------------------------------|-----------------|
| Test Location: | CML-R / JCET-JT |

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENT

| Stress/Test | Test Condition (Temp/Bias) | Result P/F |
|---|--|-----------------------|
| Acoustic Microscopy | J-STD-020 Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60 RH, 260°C Reflow) | P |
| Ball Shear | JESD22-B116 | P |
| High Accelerated Saturation Test (HAST) Unbiased | JEDEC STD 22-A110: 130 C, 85 RH Precondition: JESD22 Moisture Sensitivity Level 3 (192 Hrs., 30 °C, 60 RH, 260°C Reflow) | P |
| Bond Pull | MIL-STD-883 Method 2011 | P |
| Constructional Analysis | Criteria: Meet external and internal characteristics of Cypress package | P |
| Die Shear | MIL-STD-883, Method 2019 Per die size: <ul style="list-style-type: none"> • 3000 sq. mils 1.2 kgf • 30001-5000 sq. mils 1.2 kgf • 5001 sq. mils 1.2 kgf | P |
| Dye Penetrant Test | Test to determine the existence and extent of cracks, Criteria: No Package Crack | P |
| Electrostatic Discharge Charge Device Model (ESD-CDM) | 500V / 1000V / 1250V JESD22-C101 | P |
| High Accelerated Saturation Test (HAST) | JESD22-A110, 130°C, 3.65V, 85 RH Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60 RH, 260°C Reflow) | P |
| Physical Dimension | MIL-STD-1835, JESD22-B100 | P |
| Final Visual Inspection | JESD22-B101B | P |
| Solderability | J-STD-002, JESD22-B102 95 solder coverage minimum | P |
| Pressure Cooker | JESD22-A102, 121°C, 100 RH, 15 Psig Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60 RH, 260°C Reflow) | P |
| Temperature Cycle | MIL-STD-883, Method 1010, Condition C, -65 C to 150 C Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60 RH, 260°C Reflow) | P |
| X-Ray | MIL-STD-883 - 2012 | P |

Reliability Test Data

QTP #: 180205

| <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: ACOUSTICS | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 22 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 22 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 22 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 22 | 0 | |
| STRESS: BALL SHEAR | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 30 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 30 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 30 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 30 | 0 | |
| STRESS: BOND PULL | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 30 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 30 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 30 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 30 | 0 | |
| STRESS: CONSTRUCTIONAL ANALYSIS | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 5 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 5 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 5 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 5 | 0 | |
| STRESS: DIE SHEAR | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 10 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 10 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 10 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 10 | 0 | |
| STRESS: DYE PENETRANT | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 15 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 15 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 15 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 15 | 0 | |

Reliability Test Data

QTP #: 180205

| <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: ESD-CHARGE DEVICE MODEL | | | | | | | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 500 | 9 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 1000 | 3 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 1250 | 3 | 0 | |
| STRESS: FINAL VISUAL | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 990 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 595 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 592 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 597 | 0 | |
| STRESS: GLUE ADHESION | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 15 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 15 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 15 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 15 | 0 | |
| STRESS: UNBIASED HAST, 130C, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3 | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | 96 | 77 | 0 | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | 192 | 77 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 96 | 77 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 192 | 77 | 0 | |
| STRESS: HI-ACCEL SATURATION TEST, 130C, 85%RH, 5.5V, PRE COND 192 HR 30C/60%RH, MSL3 | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | 96 | 25 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 96 | 25 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | 96 | 25 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | 128 | 25 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | 96 | 25 | 0 | |



Reliability Test Data

QTP #: 180205

| <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: HIGH TEMPERATURE STORAGE | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | 500 | 45 | 0 | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | 1000 | 45 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 500 | 45 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 1000 | 45 | 0 | |
| STRESS: INTERNAL VISUAL INSPECTION | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 5 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 5 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 5 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 5 | 0 | |
| STRESS: PRESSURE COOKER TEST, 121C, 100%RH, 15 Psig, PRE COND 192 HR 30C/60%RH, MSL3 | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | 96 | 77 | 0 | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | 168 | 77 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 96 | 77 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 168 | 77 | 0 | |
| STRESS: PHYSICAL DIMENSION | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 10 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 10 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 10 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 10 | 0 | |
| STRESS: SOLDERABILITY | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 3 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 3 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 3 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 3 | 0 | |



Reliability Test Data

QTP #: 180205

| <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: TC COND. C -65C TO 150C, PRE COND 192 HRS 30C/60%RH, MSL3 | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | 500 | 77 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | 500 | 77 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | 500 | 77 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | 500 | 77 | 0 | |
| STRESS: X-RAY | | | | | | | |
| CY7C199CNL (7C1995SMC) | 4711970 | 611746986 | OSE-T | COMP | 15 | 0 | |
| CY7C1399BN (7CP1399SHC) | 4709084 | 611746983 | OSE-T | COMP | 15 | 0 | |
| CY7C1009D (7CP1009NC) | 4729014 | 611746984 | OSE-T | COMP | 15 | 0 | |
| CY7C1018DV33 (7CP1318NC) | 4729014 | 611746985 | OSE-T | COMP | 15 | 0 | |



Reliability Test Data

QTP #: 180206

| Device | Fab Lot # | Assy Lot # | Assy Loc | Duration | Samp | Rej | Failure Mechanism |
|--|-----------|------------|----------|----------|------|-----|-------------------|
| STRESS: ACOUSTICS | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | COMP | 22 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | COMP | 22 | 0 | |
| CY7C1041GE (7CP1710413AO) | 9721001 | 611746239 | OSE-T | COMP | 22 | 0 | |
| CY7C1010DV33 (7CP13492NC) | 4734908 | 611748783 | OSE-T | COMP | 22 | 0 | |
| STRESS: BALL SHEAR | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | COMP | 30 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | COMP | 30 | 0 | |
| CY7C1041GE (7CP1710413AO) | 9721001 | 611746239 | OSE-T | COMP | 30 | 0 | |
| CY7C1010DV33 (7CP13492NC) | 4734908 | 611748783 | OSE-T | COMP | 30 | 0 | |
| STRESS: BOND PULL | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | COMP | 30 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | COMP | 30 | 0 | |
| CY7C1041GE (7CP1710413AO) | 9721001 | 611746239 | OSE-T | COMP | 30 | 0 | |
| CY7C1010DV33 (7CP13492NC) | 4734908 | 611748783 | OSE-T | COMP | 30 | 0 | |
| STRESS: CONSTRUCTIONAL ANALYSIS | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | COMP | 5 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | COMP | 5 | 0 | |
| CY7C1041GE (7CP1710413AO) | 9721001 | 611746239 | OSE-T | COMP | 5 | 0 | |
| CY7C1010DV33 (7CP13492NC) | 4734908 | 611748783 | OSE-T | COMP | 5 | 0 | |
| STRESS: DIE SHEAR | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | COMP | 10 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | COMP | 10 | 0 | |
| CY7C1041GE (7CP1710413AO) | 9721001 | 611746239 | OSE-T | COMP | 10 | 0 | |
| CY7C1010DV33 (7CP13492NC) | 4734908 | 611748783 | OSE-T | COMP | 10 | 0 | |
| STRESS: DYE PENETRANT | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | COMP | 15 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | COMP | 15 | 0 | |
| CY7C1041GE (7CP1710413AO) | 9721001 | 611746239 | OSE-T | COMP | 15 | 0 | |
| CY7C1010DV33 (7CP13492NC) | 4734908 | 611748783 | OSE-T | COMP | 15 | 0 | |

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Reliability Test Data

QTP #: 180206

| <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: ESD-CHARGE DEVICE MODEL | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | 500 | 9 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | 1000 | 3 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | 1250 | 3 | 0 | |
| STRESS: FINAL VISUAL | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | COMP | 999 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | COMP | 599 | 0 | |
| CY7C1041GE (7CP1710413AO) | 9721001 | 611746239 | OSE-T | COMP | 866 | 0 | |
| CY7C1010DV33 (7CP13492NC) | 4734908 | 611748783 | OSE-T | COMP | 737 | 0 | |
| STRESS: GLUE ADHESION | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | COMP | 15 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | COMP | 15 | 0 | |
| CY7C1041GE (7CP1710413AO) | 9721001 | 611746239 | OSE-T | COMP | 15 | 0 | |
| CY7C1010DV33 (7CP13492NC) | 4734908 | 611748783 | OSE-T | COMP | 15 | 0 | |
| STRESS: UNBIASED HAST, 130C, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3 | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | 96 | 77 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | 192 | 77 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | 96 | 77 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | 192 | 77 | 0 | |
| STRESS: HI-ACCEL SATURATION TEST, 130C, 85%RH, 3.65V, PRE COND 192 HR 30C/60%RH, MSL3 | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | 96 | 25 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | 128 | 25 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | 96 | 25 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | 128 | 25 | 0 | |
| CY7C1041GE (7CP1710413AO) | 9721001 | 611746239 | OSE-T | 96 | 25 | 0 | |
| CY7C1010DV33 (7CP13492NC) | 4734908 | 611748783 | OSE-T | 96 | 25 | 0 | |
| CY7C1010DV33 (7CP13492NC) | 4734908 | 611748783 | OSE-T | 128 | 25 | 0 | |



Reliability Test Data

QTP #: 180206

| <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: HIGH TEMPERATURE STORAGE | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | 500 | 45 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | 1000 | 45 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | 500 | 45 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | 1000 | 45 | 0 | |
| STRESS: PRESSURE COOKER TEST, 121C, 100%RH, 15 Psig, PRE COND 192 HR 30C/60%RH, MSL3 | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | 168 | 77 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | 288 | 77 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | 168 | 77 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | 288 | 77 | 0 | |
| STRESS: PHYSICAL DIMENSION | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | COMP | 10 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | COMP | 10 | 0 | |
| CY7C1041GE (7CP1710413AO) | 9721001 | 611746239 | OSE-T | COMP | 10 | 0 | |
| CY7C1010DV33 (7CP13492NC) | 4734908 | 611748783 | OSE-T | COMP | 10 | 0 | |
| STRESS: SOLDERABILITY | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | COMP | 3 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | COMP | 3 | 0 | |
| CY7C1041GE (7CP1710413AO) | 9721001 | 611746239 | OSE-T | COMP | 3 | 0 | |
| CY7C1010DV33 (7CP13492NC) | 4734908 | 611748783 | OSE-T | COMP | 3 | 0 | |
| STRESS: TC COND. C -65C TO 150C, PRE COND 192 HRS 30C/60%RH, MSL3 | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | 500 | 77 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | 1000 | 77 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | 500 | 77 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | 1000 | 77 | 0 | |
| CY7C1041GE (7CP1710413AO) | 9721001 | 611746239 | OSE-T | 500 | 77 | 0 | |
| CY7C1010DV33 (7CP13492NC) | 4734908 | 611748783 | OSE-T | 500 | 77 | 0 | |



Reliability Test Data

QTP #: 180206

| <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: X-RAY | | | | | | | |
| CY7C1021D (7C1021NC) | 4729014 | 611744405 | OSE-T | COMP | 15 | 0 | |
| CY7C1021D (7C1021NC) | 4729014 | 611744404 | OSE-T | COMP | 15 | 0 | |
| CY7C1041GE (7CP1710413AO) | 9721001 | 611746239 | OSE-T | COMP | 15 | 0 | |
| CY7C1010DV33 (7CP13492NC) | 4734908 | 611748783 | OSE-T | COMP | 15 | 0 | |



Document History Page

Document Title: QTP 180206: 32-LEAD SOJ (10.16x20.96x3.5mm) 36-LEAD SOJ (10.16x23.50x3.5mm) 44-LEAD SOJ (10.16x28.57x3.5mm) MATTE SN LEADFINISH, AU / CUPDAU WIRE MSL3, 260C REFLOW OSE-TAIWAN (T)

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