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# Cypress Semiconductor Automotive Package Qualification Report

**QTP# 111803  
June 2012**

**Automotive 100L TQFP (14x20x1.4mm)  
NiPdAu, MSL3, 260°C Reflow  
JCET-China (JT)**

## **CYPRESS TECHNICAL CONTACT FOR QUALIFICATION DATA:**

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**PRODUCT QUALIFICATION HISTORY**

| <b>QTP<br/>Number</b> | <b>Description of Qualification Purpose</b>   | <b>Date</b> |
|-----------------------|---|-------------|
| 111803                | New Assembly Site (JCET) Qual – Automotive TQFP 100ld, 14x20x<br>1.4 mm body – Pb-free (KEG6000, QMI 509, 1.0 mil Wire, NiPdAu) | May 2011    |

| MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION |   |
|--|---|
| Package Designation:                                 | AZ0AA   |
| Package Outline, Type, or Name:                      | 100L THIN QUAD FLATPACK (TQFP) PACKAGE, (14x20x1.4mm) |
| Mold Compound Name/Manufacturer:                     | KEG6000 / Kyocera                                     |
| Mold Compound Flammability Rating:                   | V-O per UL94  |
| Mold Compound Alpha Emission Rate:                   | 0.002 CPH/cm <sup>2</sup>                             |
| Oxygen Rating Index: >28%                            | N/A   |
| Lead Frame Designation:                              | Reduced Metal Pad                                     |
| Lead Frame Material:                                 | Copper  |
| Substrate Material:                                  | N/A   |
| Lead Finish, Composition / Thickness:                | NiPdAu  |
| Die Backside Preparation Method/Metallization:       | Backgrind   |
| Die Separation Method:                               | Wafersaw  |
| Die Attach Supplier:                                 | Henkel  |
| Die Attach Material:                                 | QMI509  |
| Bond Diagram Designation                             | 001-52700   |
| Wire Bond Method:                                    | Thermosonic   |
| Wire Material/Size:                                  | 1.0 mil / Au  |
| Thermal Resistance Theta JA °C/W:                    | 11.3 C/W  |
| Package Cross Section Yes/No:                        | Yes   |
| Assembly Process Flow:                               | 001-64159   |
| Name/Location of Assembly (prime) facility:          | JT-JCET China   |
| MSL LEVEL  | 3   |
| REFLOW PROFILE                                       | 260C  |

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

**Note:** Please contact a Cypress Representative for other package availability.

## RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

| Stress/Test  | Test Condition (Temp/Bias)   | Result<br>P/F |
|--|--|---------------|
| Electrostatic Discharge<br>Human Body Model (ESD-HBM)    | AEC-Q100-002   | P             |
| Electrostatic Discharge<br>Charge Device Model (ESD-CDM) | AEC-Q100-011   | P             |
| High Temperature Operating Life<br>Early Failure Rate    | AEC-Q100-008 and JESD22-A108, 150 C<br>Dynamic Operating Condition, Vcc = 3.8V   | P             |
| High Temperature Operating Life<br>Latent Failure Rate   | JESD22-A108, 150 C /125C<br>Dynamic Operating Condition, Vcc = 3.8V, 150C  | P             |
| High Accelerated Saturation Test<br>(HAST)               | JESD22-A110, 130 C, 85%RH, 3.65V<br>Precondition: JESD22-A113 Moisture Sensitivity Level<br>(192 Hrs., 30 C°, 60% RH)    | P             |
| High Temperature Storage Life<br>Test                    | JESD22-A103, 150 C   | P             |
| Temperature Cycle  | JESD22- A104, -65 C to 150 C<br>Precondition: JESD22-A113 Moisture Sensitivity Level<br>(192 Hrs., 30 C°, 60% RH)        | P             |
| Post Temperature Cycle Wire Bond<br>Pull                 | Mil-Std 883, Method 2011   | P             |
| Pressure Cooker Test                                     | JESD22-A102, 121 C, 100%RH, 15 PSIG<br>Precondition: JESD22-A113 Moisture Sensitivity Level<br>(192 Hrs., 30 C°, 60% RH) | P             |
| Wire Bond Shear  | AEC Q100-001   | P             |
| Wire Bond Pull   | Mil-Std 883, Method 2011   | P             |
| Solderability  | JESD22-B102  | P             |
| Physical Dimensions                                      | JESD22B100 and B108  | P             |
| Electrical Distributions                                 | AEC Q100-009   | P             |
| Lead Integrity   | JESD22-B105  | P             |

## Reliability Test Data

**QTP #: 111803**

| <b>Device</b>  | <b>Fab Lot #</b> | <b>Assy Lot #</b> | <b>Assy Loc</b> | <b>Duration</b> | <b>Samp</b> | <b>Rej</b> | <b>Failure Mechanism</b> |
|--|------------------|-------------------|-----------------|-----------------|-------------|------------|--------------------------|
| <b>STRESS: ACOUSTIC, MSL3</b>  |                  |                   |                 |                 |             |            |                          |
| CY7C68320C (7A682081BC)  | 4041951          | 611110204         | JT-CHINA        | COMP            | 22          | 0          |                          |
| CY7C68320C (7A682081BC)  | 4021103          | 611110202         | JT-CHINA        | COMP            | 22          | 0          |                          |
| CY7C68320C (7A682081BC)  | 4021103          | 611110203         | JT-CHINA        | COMP            | 22          | 0          |                          |
| <b>STRESS: BOND SHEAR</b>  |                  |                   |                 |                 |             |            |                          |
| CY7C68320C (7A682081BC)  | 4041951          | 611110204         | JT-CHINA        | COMP            | 30          | 0          |                          |
| <b>STRESS: BOND PULL</b>   |                  |                   |                 |                 |             |            |                          |
| CY7C68320C (7A682081BC)  | 4041951          | 611110204         | JT-CHINA        | COMP            | 30          | 0          |                          |
| <b>STRESS: CONSTRUCTIONAL ANALYSIS</b>                                   |                  |                   |                 |                 |             |            |                          |
| CY7C68320C (7A682081BC)  | 4041951          | 611110204         | JT-CHINA        | COMP            | 5           | 0          |                          |
| CY7C68320C (7A682081BC)  | 4021103          | 611110202         | JT-CHINA        | COMP            | 5           | 0          |                          |
| CY7C68320C (7A682081BC)  | 4021103          | 611110203         | JT-CHINA        | COMP            | 5           | 0          |                          |
| <b>STRESS: DYE PENETRATION TEST</b>                                      |                  |                   |                 |                 |             |            |                          |
| CY7C68320C (7A682081BC)  | 4041951          | 611110204         | JT-CHINA        | COMP            | 15          | 0          |                          |
| CY7C68320C (7A682081BC)  | 4021103          | 611110202         | JT-CHINA        | COMP            | 15          | 0          |                          |
| CY7C68320C (7A682081BC)  | 4021103          | 611110203         | JT-CHINA        | COMP            | 15          | 0          |                          |
| <b>STRESS: ESD-CHARGE DEVICE MODEL, 250V</b>                             |                  |                   |                 |                 |             |            |                          |
| CY7C68320C (7A682081BC)  | 4041951          | 611110204         | JT-CHINA        | COMP            | 3           | 0          |                          |
| <b>STRESS: ESD-CHARGE DEVICE MODEL, 500V</b>                             |                  |                   |                 |                 |             |            |                          |
| CY7C68320C (7A682081BC)  | 4041951          | 611110204         | JT-CHINA        | COMP            | 3           | 0          |                          |
| <b>STRESS: ESD-CHARGE DEVICE MODEL, 750V</b>                             |                  |                   |                 |                 |             |            |                          |
| CY7C68320C (7A682081BC)  | 4041951          | 611110204         | JT-CHINA        | COMP            | 3           | 0          |                          |
| <b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-E, (500V)</b>  |                  |                   |                 |                 |             |            |                          |
| CY7C68320C (7A682081BC)  | 4041951          | 611110204         | JT-CHINA        | COMP            | 3           | 0          |                          |
| <b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-E, (1000V)</b> |                  |                   |                 |                 |             |            |                          |
| CY7C68320C (7A682081BC)  | 4041951          | 611110204         | JT-CHINA        | COMP            | 3           | 0          |                          |
| <b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-E, (1500V)</b> |                  |                   |                 |                 |             |            |                          |
| CY7C68320C (7A682081BC)  | 4041951          | 611110204         | JT-CHINA        | COMP            | 3           | 0          |                          |

## Reliability Test Data

**QTP #: 111803**

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

**STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-E, (2000V)**

|                         |         |           |          |      |   |   |  |
|-------------------------|---------|-----------|----------|------|---|---|--|
| CY7C68320C (7A682081BC) | 4041951 | 611110204 | JT-CHINA | COMP | 3 | 0 |  |
|-------------------------|---------|-----------|----------|------|---|---|--|

**STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 150C, 3.8V, Vcc Core**

|                         |         |           |          |    |     |   |  |
|-------------------------|---------|-----------|----------|----|-----|---|--|
| CY7C68320C (7A682081BC) | 4041951 | 611110204 | JT-CHINA | 24 | 800 | 0 |  |
|-------------------------|---------|-----------|----------|----|-----|---|--|

|                         |         |           |          |    |     |   |  |
|-------------------------|---------|-----------|----------|----|-----|---|--|
| CY7C68320C (7A682081BC) | 4021103 | 611110202 | JT-CHINA | 24 | 800 | 0 |  |
|-------------------------|---------|-----------|----------|----|-----|---|--|

|                         |         |           |          |    |     |   |  |
|-------------------------|---------|-----------|----------|----|-----|---|--|
| CY7C68320C (7A682081BC) | 4021103 | 611110203 | JT-CHINA | 24 | 800 | 0 |  |
|-------------------------|---------|-----------|----------|----|-----|---|--|

**STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 3.8V, Vcc Core**

|                         |         |           |          |     |     |   |  |
|-------------------------|---------|-----------|----------|-----|-----|---|--|
| CY7C68320C (7A682081BC) | 4041951 | 611110204 | JT-CHINA | 408 | 800 | 0 |  |
|-------------------------|---------|-----------|----------|-----|-----|---|--|

|                         |         |           |          |     |     |   |  |
|-------------------------|---------|-----------|----------|-----|-----|---|--|
| CY7C68320C (7A682081BC) | 4021103 | 611110202 | JT-CHINA | 408 | 800 | 0 |  |
|-------------------------|---------|-----------|----------|-----|-----|---|--|

|                         |         |           |          |     |     |   |  |
|-------------------------|---------|-----------|----------|-----|-----|---|--|
| CY7C68320C (7A682081BC) | 4021103 | 611110203 | JT-CHINA | 408 | 800 | 0 |  |
|-------------------------|---------|-----------|----------|-----|-----|---|--|

**STRESS: HI-ACCEL SATURATION TEST, 130C, 3.65V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3**

|                         |         |           |          |    |    |   |  |
|-------------------------|---------|-----------|----------|----|----|---|--|
| CY7C68320C (7A682081BC) | 4041951 | 611110204 | JT-CHINA | 96 | 80 | 0 |  |
|-------------------------|---------|-----------|----------|----|----|---|--|

|                         |         |           |          |    |    |   |  |
|-------------------------|---------|-----------|----------|----|----|---|--|
| CY7C68320C (7A682081BC) | 4021103 | 611110202 | JT-CHINA | 96 | 80 | 0 |  |
|-------------------------|---------|-----------|----------|----|----|---|--|

|                         |         |           |          |    |    |   |  |
|-------------------------|---------|-----------|----------|----|----|---|--|
| CY7C68320C (7A682081BC) | 4021103 | 611110203 | JT-CHINA | 96 | 80 | 0 |  |
|-------------------------|---------|-----------|----------|----|----|---|--|

**STRESS: HIGH TEMP STORAGE**

|                         |         |           |          |      |    |   |  |
|-------------------------|---------|-----------|----------|------|----|---|--|
| CY7C68320C (7A682081BC) | 4041951 | 611110204 | JT-CHINA | 1000 | 80 | 0 |  |
|-------------------------|---------|-----------|----------|------|----|---|--|

**STRESS: LEAD INTEGRITY**

|                         |         |           |          |      |   |   |  |
|-------------------------|---------|-----------|----------|------|---|---|--|
| CY7C68320C (7A682081BC) | 4041951 | 611110204 | JT-CHINA | COMP | 5 | 0 |  |
|-------------------------|---------|-----------|----------|------|---|---|--|

**STRESS: PRESSURE COOKER TEST (121C, 100%RH), 15 Psig, PRE COND 192 HR 30C/60%RH (MSL3)**

|                         |         |           |          |    |    |   |  |
|-------------------------|---------|-----------|----------|----|----|---|--|
| CY7C68320C (7A682081BC) | 4041951 | 611110204 | JT-CHINA | 96 | 80 | 0 |  |
|-------------------------|---------|-----------|----------|----|----|---|--|

|                         |         |           |          |     |    |   |  |
|-------------------------|---------|-----------|----------|-----|----|---|--|
| CY7C68320C (7A682081BC) | 4041951 | 611110204 | JT-CHINA | 168 | 80 | 0 |  |
|-------------------------|---------|-----------|----------|-----|----|---|--|

|                         |         |           |          |    |    |   |  |
|-------------------------|---------|-----------|----------|----|----|---|--|
| CY7C68320C (7A682081BC) | 4021103 | 611110202 | JT-CHINA | 96 | 80 | 0 |  |
|-------------------------|---------|-----------|----------|----|----|---|--|

|                         |         |           |          |     |    |   |  |
|-------------------------|---------|-----------|----------|-----|----|---|--|
| CY7C68320C (7A682081BC) | 4021103 | 611110202 | JT-CHINA | 168 | 80 | 0 |  |
|-------------------------|---------|-----------|----------|-----|----|---|--|

|                         |         |           |          |    |    |   |  |
|-------------------------|---------|-----------|----------|----|----|---|--|
| CY7C68320C (7A682081BC) | 4021103 | 611110203 | JT-CHINA | 96 | 80 | 0 |  |
|-------------------------|---------|-----------|----------|----|----|---|--|

|                         |         |           |          |     |    |   |  |
|-------------------------|---------|-----------|----------|-----|----|---|--|
| CY7C68320C (7A682081BC) | 4021103 | 611110203 | JT-CHINA | 168 | 80 | 0 |  |
|-------------------------|---------|-----------|----------|-----|----|---|--|

## Reliability Test Data

**QTP #: 111803**

| <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> |
|---|------------------|-------------------|-----------------|-----------------|-------------|------------|--------------------------|
| <b>STRESS: PHYSICAL DIMENSION</b>                                       |                  |                   |                 |                 |             |            |                          |
| CY7C68320C (7A682081BC)   | 4041951          | 611110204         | JT-CHINA        | COMP            | 10          | 0          |                          |
| CY7C68320C (7A682081BC)   | 4021103          | 611110202         | JT-CHINA        | COMP            | 10          | 0          |                          |
| CY7C68320C (7A682081BC)   | 4021103          | 611110203         | JT-CHINA        | COMP            | 10          | 0          |                          |
| <b>STRESS: SOLDERABILITY</b>  |                  |                   |                 |                 |             |            |                          |
| CY7C68320C (7A682081BC)   | 4041951          | 611110204         | JT-CHINA        | COMP            | 15          | 0          |                          |
| CY7C68320C (7A682081BC)   | 4021103          | 611110202         | JT-CHINA        | COMP            | 15          | 0          |                          |
| CY7C68320C (7A682081BC)   | 4021103          | 611110203         | JT-CHINA        | COMP            | 15          | 0          |                          |
| <b>STRESS: TC COND. C -65C TO 150C, PRE COND 192 HR 30C/60%RH, MSL3</b> |                  |                   |                 |                 |             |            |                          |
| CY7C68320C (7A682081BC)   | 4041951          | 611110204         | JT-CHINA        | 500             | 85          | 0          |                          |
| CY7C68320C (7A682081BC)   | 4041951          | 611110204         | JT-CHINA        | 1000            | 80          | 0          |                          |
| CY7C68320C (7A682081BC)   | 4021103          | 611110202         | JT-CHINA        | 500             | 80          | 0          |                          |
| CY7C68320C (7A682081BC)   | 4021103          | 611110202         | JT-CHINA        | 1000            | 79          | 0          |                          |
| CY7C68320C (7A682081BC)   | 4021103          | 611110203         | JT-CHINA        | 500             | 80          | 0          |                          |
| CY7C68320C (7A682081BC)   | 4021103          | 611110203         | JT-CHINA        | 1000            | 80          | 0          |                          |
| <b>STRESS: POST TC BOND PULL</b>  |                  |                   |                 |                 |             |            |                          |
| CY7C68320C (7A682081BC)   | 4041951          | 611110204         | JT-CHINA        | COMP            | 5           | 0          |                          |
| <b>STRESS: ELECTRICAL DISTRIBUTIONS</b>                                 |                  |                   |                 |                 |             |            |                          |
| CY7C68320C (7A682081BC)   | 4841094          | 610921926         | CML-R           | COMP            | 30          | 0          |                          |
| CY7C68320C (7A682081BC)   | 4841884          | 610922507         | CML-R           | COMP            | 30          | 0          |                          |
| CY7C68320C (7A682081BC)   | 4841670          | 610922921         | CML-R           | COMP            | 30          | 0          |                          |



## Document History Page

Document Title: QTP 111803: AUTOMOTIVE 100L TQFP (14X20X1.4MM) NIPDAU, MSL3, 260C REFLOW  
JCET-CHINA (JT) QUALIFICATION REPORT  
Document Number: 001-69916

| Rev. | ECN No. | Orig. of Change | Description of Change                  |
|------|---------|-----------------|--|
| **   | 3269160 | NSR             | Initial Spec Release                   |
| *A   | 4033708 | NSR             | Removed VERSION 1.0 in the title page. |

Distribution: WEB

Posting: None