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Cypress Semiconductor Package Qualification Report

**QTP# 161601 VERSION **
September 2016**

**32L TSOP I (8x13.4x1.2mm)
NiPdAu Leadfinish, Au Wire
MSL3, 260°C Reflow
JCET-China (JT)**

FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT
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PACKAGE QUALIFICATION HISTORY

| QTP Number | Description of Qualification Purpose | Date |
|-------------------|--|-------------|
| 104815 | Qualification of New Assembly Site (JCET) for TSOPI (8X13.4), STSOP (8X13.4), Standard (KEG6000, QMI509, 0.9 mil, NiPdAu) | Mar 2011 |
| 104816 | Qualification of New Assembly Site (JCET) for TSOPI (8X13.4), STSOP (8X13.4), Pb-Free (KEG6000, QMI509, 0.9 mil, NiPdAu) | Mar 2011 |
| 161601 | Qualification of 32L TSOP I (8x13.4x1.2mm) Package at JCET-China (JT) using KE-G6000 Mold Compound, QMI-509 Die Attach Epoxy, NiPdAu Leadfinish, 0.8 mil Au Wire at MSL 3, 260C Reflow temperature | Sept 2016 |

| MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION | |
|--|---------------------------|
| Package Designation: | ZB32 |
| Package Outline, Type, or Name: | 32L TSOP I (8x13.4x1.2mm) |
| Mold Compound Name/Manufacturer: | KE-G6000 /Kyocera |
| Mold Compound Flammability Rating: | V-O at 0.8 - 3.2mm |
| Oxygen Rating Index: | > 28% |
| Leaframe Material: | Copper |
| Lead Finish, Composition / Thickness: | NiPdAu |
| Die Backside Preparation Method/Metallization: | Backgrind |
| Die Separation Method: | Wafer Saw (Laser Groove) |
| Die Attach Supplier: | Henkel |
| Die Attach Material: | QMI 509 |
| Bond Diagram Designation: | 002-11320 |
| Wire Bond Method: | Thermosonic |
| Wire Material/Size: | Au, 0.8 mil |
| Thermal Resistance Theta JA °C/W: | 51.43°C/W |
| Package Cross Section Yes/No: | Yes |
| Assembly Process Flow: | 001-64159 |
| Name/Location of Assembly (prime) facility: | JCET-China (JT) |
| MSL Level | 3 |
| Reflow Profile | 260C |

| ELECTRICAL TEST / FINISH DESCRIPTION | |
|--------------------------------------|-------------|
| Test Location: | KYEC-Taiwan |

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

| 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 |
| Bond Pull | MIL-STD-883 – Method 2011 | P |
| Constructional Analysis | Criteria: Meet external and internal characteristics of Cypress package | 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 JESD22-C101 | P |
| Electrostatic Discharge Human Body Model (ESD-HBM) | 2200V JESD22-A114 | P |
| Final Visual | JESD22-B101 | P |
| High Accelerated Saturation Test (HAST) | JEDEC STD 22-A110: 130°C, 85% RH, 5.5V Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30 °C, 60% RH, 260°C Reflow) | P |
| High Temperature Storage | JESD22-A103:150°C No bias | P |
| Internal Visual | MIL-STD-883-2014 | P |
| Lead Integrity | JESD22-B105, MIL STD 883 | P |
| Physical Dimension | MIL-STD-1835, JESD22-B100 | 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 |
| Solderability | J-STD-002, JESD22-B102 | 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 |
| Thermal Shock | MIL-STD-883, Method 1011, Condition B, -55°C to 125°C and JESD22-A106, Condition C, -55°C to 125°C | P |
| X-Ray | MIL-STD-883 - 2012 | P |

Reliability Test Data

QTP #: 104816

| <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: ACOUSTIC, MSL3 | | | | | | | |
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | COMP | 15 | 0 | |
| CY62128ELL (7C62128KC) | 4007701 | 611056817 | JT-CHINA | COMP | 15 | 0 | |
| CY62256NLL (7C62256NFK) | 4038465 | 611056819 | JT-CHINA | COMP | 15 | 0 | |
| STRESS: BALL SHEAR | | | | | | | |
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | COMP | 30 | 0 | |
| CY62128ELL (7C62128KC) | 4007701 | 611056817 | JT-CHINA | COMP | 30 | 0 | |
| CY62256NLL (7C62256NFK) | 4038465 | 611056819 | JT-CHINA | COMP | 30 | 0 | |
| STRESS: BOND PULL | | | | | | | |
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | COMP | 30 | 0 | |
| CY62128ELL (7C62128KC) | 4007701 | 611056817 | JT-CHINA | COMP | 30 | 0 | |
| CY62256NLL (7C62256NFK) | 4038465 | 611056819 | JT-CHINA | COMP | 30 | 0 | |
| STRESS: CONSTRUCTIONAL ANALYSIS | | | | | | | |
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | COMP | 5 | 0 | |
| CY62128ELL (7C62128KC) | 4007701 | 611056817 | JT-CHINA | COMP | 5 | 0 | |
| CY62256NLL (7C62256NFK) | 4038465 | 611056819 | JT-CHINA | COMP | 5 | 0 | |
| STRESS: DYE PENETRANT TEST | | | | | | | |
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | COMP | 15 | 0 | |
| CY62128ELL (7C62128KC) | 4007701 | 611056817 | JT-CHINA | COMP | 15 | 0 | |
| CY62256NLL (7C62256NFK) | 4038465 | 611056819 | JT-CHINA | COMP | 15 | 0 | |
| STRESS: ESD-CHARGE DEVICE MODEL | | | | | | | |
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | 500 | 9 | 0 | |
| STRESS: ESD-HUMAN BODY CIRCUIT PER JEDEC EIA/JESD22-A114 | | | | | | | |
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | 2200 | 8 | 0 | |
| STRESS: FINAL VISUAL | | | | | | | |
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | COMP | 957 | 0 | |
| CY62128ELL (7C62128KC) | 4007701 | 611056817 | JT-CHINA | COMP | 828 | 0 | |
| CY62256NLL (7C62256NFK) | 4038465 | 611056819 | JT-CHINA | COMP | 912 | 0 | |

Reliability Test Data

QTP #: 104816

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

STRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 5.5V), PRE COND 192 HR 30C/60%RH (MSL3)

| | | | | | | | |
|-----------|---------|-----------|----------|-----|----|---|--|
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | 128 | 77 | 0 | |
|-----------|---------|-----------|----------|-----|----|---|--|

STRESS: HIGH TEMPERATURE STORAGE, PLASTIC, 150C

| | | | | | | | |
|-----------|---------|-----------|----------|-----|----|---|--|
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | 500 | 77 | 0 | |
|-----------|---------|-----------|----------|-----|----|---|--|

| | | | | | | | |
|-----------|---------|-----------|----------|------|----|---|--|
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | 1000 | 77 | 0 | |
|-----------|---------|-----------|----------|------|----|---|--|

STRESS: INTERNAL VISUAL

| | | | | | | | |
|-----------|---------|-----------|----------|------|---|---|--|
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | COMP | 5 | 0 | |
|-----------|---------|-----------|----------|------|---|---|--|

| | | | | | | | |
|------------------------|---------|-----------|----------|------|---|---|--|
| CY62128ELL (7C62128KC) | 4007701 | 611056817 | JT-CHINA | COMP | 5 | 0 | |
|------------------------|---------|-----------|----------|------|---|---|--|

| | | | | | | | |
|-------------------------|---------|-----------|----------|------|---|---|--|
| CY62256NLL (7C62256NFK) | 4038465 | 611056819 | JT-CHINA | COMP | 5 | 0 | |
|-------------------------|---------|-----------|----------|------|---|---|--|

STRESS: LEAD INTEGRITY

| | | | | | | | |
|-----------|---------|-----------|----------|------|---|---|--|
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | COMP | 5 | 0 | |
|-----------|---------|-----------|----------|------|---|---|--|

| | | | | | | | |
|------------------------|---------|-----------|----------|------|---|---|--|
| CY62128ELL (7C62128KC) | 4007701 | 611056817 | JT-CHINA | COMP | 5 | 0 | |
|------------------------|---------|-----------|----------|------|---|---|--|

| | | | | | | | |
|-------------------------|---------|-----------|----------|------|---|---|--|
| CY62256NLL (7C62256NFK) | 4038465 | 611056819 | JT-CHINA | COMP | 5 | 0 | |
|-------------------------|---------|-----------|----------|------|---|---|--|

STRESS: PHYSICAL DIMENSION

| | | | | | | | |
|-----------|---------|-----------|----------|------|----|---|--|
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | COMP | 30 | 0 | |
|-----------|---------|-----------|----------|------|----|---|--|

| | | | | | | | |
|------------------------|---------|-----------|----------|------|----|---|--|
| CY62128ELL (7C62128KC) | 4007701 | 611056817 | JT-CHINA | COMP | 30 | 0 | |
|------------------------|---------|-----------|----------|------|----|---|--|

| | | | | | | | |
|-------------------------|---------|-----------|----------|------|----|---|--|
| CY62256NLL (7C62256NFK) | 4038465 | 611056819 | JT-CHINA | COMP | 30 | 0 | |
|-------------------------|---------|-----------|----------|------|----|---|--|

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

| | | | | | | | |
|-----------|---------|-----------|----------|-----|----|---|--|
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | 168 | 77 | 0 | |
|-----------|---------|-----------|----------|-----|----|---|--|

| | | | | | | | |
|-------------------------|---------|-----------|----------|-----|----|---|--|
| CY62256NLL (7C62256NFK) | 4038465 | 611056819 | JT-CHINA | 168 | 80 | 0 | |
|-------------------------|---------|-----------|----------|-----|----|---|--|

STRESS: SOLDERABILITY TEST

| | | | | | | | |
|-----------|---------|-----------|----------|------|---|---|--|
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | COMP | 3 | 0 | |
|-----------|---------|-----------|----------|------|---|---|--|

| | | | | | | | |
|------------------------|---------|-----------|----------|------|---|---|--|
| CY62128ELL (7C62128KC) | 4007701 | 611056817 | JT-CHINA | COMP | 3 | 0 | |
|------------------------|---------|-----------|----------|------|---|---|--|

| | | | | | | | |
|-------------------------|---------|-----------|----------|------|---|---|--|
| CY62256NLL (7C62256NFK) | 4038465 | 611056819 | JT-CHINA | COMP | 3 | 0 | |
|-------------------------|---------|-----------|----------|------|---|---|--|



Reliability Test Data

QTP #: 104816

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

STRESS: TEMPERATURE CYCLE COND. C -65C TO 150C, PRE COND 192 HRS 30C/60%RH, MSL3

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|-------------------------|---------|-----------|----------|------|----|---|--|
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | 500 | 75 | 0 | |
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | 1000 | 75 | 0 | |
| CY62128ELL (7C62128KC) | 4007701 | 611056817 | JT-CHINA | 500 | 80 | 0 | |
| CY62128ELL (7C62128KC) | 4007701 | 611056817 | JT-CHINA | 1000 | 80 | 0 | |
| CY62256NLL (7C62256NFK) | 4038465 | 611056819 | JT-CHINA | 500 | 80 | 0 | |
| CY62256NLL (7C62256NFK) | 4038465 | 611056819 | JT-CHINA | 1000 | 80 | 0 | |

STRESS: THERMAL SHOCK

| | | | | | | | |
|-----------|---------|-----------|----------|------|----|---|--|
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | 200 | 77 | 0 | |
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | 1000 | 77 | 0 | |

STRESS: X-RAY

| | | | | | | | |
|-------------------------|---------|-----------|----------|------|----|---|--|
| 7C1995SMC | 4029579 | 611056818 | JT-CHINA | COMP | 15 | 0 | |
| CY62128ELL (7C62128KC) | 4007701 | 611056817 | JT-CHINA | COMP | 15 | 0 | |
| CY62256NLL (7C62256NFK) | 4038465 | 611056819 | JT-CHINA | COMP | 15 | 0 | |

Reliability Test Data

QTP #: 161601

| <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: ACOUSTIC, MSL3 | | | | | | | |
| FM28V100 (FP28V100AY) | 2533000 | 611610625 | JT-China | COMP | 15 | 0 | |
| FM28V100 (FP28V100AY) | 2533000 | 611610626 | JT-China | COMP | 15 | 0 | |
| FM28V100 (FP28V100AY) | 2533000 | 611610627 | JT-China | COMP | 15 | 0 | |
| STRESS: CONSTRUCTIONAL ANALYSIS | | | | | | | |
| FM28V100 (FP28V100AY) | 2533000 | 611610625 | JT-China | COMP | 5 | 0 | |
| FM28V100 (FP28V100AY) | 2533000 | 611610626 | JT-China | COMP | 5 | 0 | |
| FM28V100 (FP28V100AY) | 2533000 | 611610627 | JT-China | COMP | 5 | 0 | |
| STRESS: DYE PENETRANT TEST | | | | | | | |
| FM28V100 (FP28V100AY) | 2533000 | 611610625 | JT-China | COMP | 15 | 0 | |
| FM28V100 (FP28V100AY) | 2533000 | 611610626 | JT-China | COMP | 15 | 0 | |
| FM28V100 (FP28V100AY) | 2533000 | 611610627 | JT-China | COMP | 15 | 0 | |
| STRESS: TEMPERATURE CYCLE COND. C -65C TO 150C, PRE COND 192 HRS 30C/60%RH, MSL3 | | | | | | | |
| FM28V100 (FP28V100AY) | 2533000 | 611610625 | JT-China | 500 | 77 | 0 | |

Document History Page

Document Title: QTP # 161601: 32L TSOP I, NIPDAU LEADFINISH, AU WIRE, MSL3, 260C REFLOW, JCET-CHINA (JT)
Document Number: 002-16633

| Rev. | ECN No. | Orig. of Change | Description of Change |
|------|---------|-----------------|-----------------------|
| ** | 5436195 | JYF | Initial spec release. |