

Cypress Semiconductor Package Qualification Report

QTP# 092006 VERSION*B
February 2019

**56-Lead Saw QFN (Quad Flat No-Lead)
(8 x 8 x 1.0mm)
NiPdAu, MSL3, 260°C Reflow,
CML-RA**

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

| QTP Number | Description of Qualification Purpose | Date |
|-------------------|--|-------------|
| 092006 | Qualify 56-Lead Saw QFN (8 x 8 x 1mm), NiPdAu, using Nitto GE7470LA Mold Compound, QMI519 Epoxy, MSL3, 260C Reflow assembled at CML-RA | May 09 |

| MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION | |
|---|--|
| Package Designation: | LT56 |
| Package Outline, Type, or Name: | 32-Lead Saw Quad Flat No Lead (QFN) |
| Mold Compound Name/Manufacturer: | Nitto GE7470LA |
| Mold Compound Flammability Rating: | V-O per UL94 |
| Mold Compound Alpha Emission Rate: | 0.003-0.002 cm ² /h |
| Oxygen Rating Index: | >28% |
| Lead Frame Material: | Copper based - CDA 194 Full Hard |
| Lead Finish, Composition / Thickness: | NiPdAu / Ni-20 to 80, Pd-0.8min, Au-0.2-0.5 micro inch |
| Die Backside Preparation | Grinding |
| Die Separation Method: | Blade Sawing |
| Die Attach Supplier: | Henkel |
| Die Attach Material: | QMI519 |
| Die Attach Method: | Epoxy |
| Wire Bond Method: | Thermosonic |
| Wire Material/Size: | AuPd/0.8mil (20um) |
| Package Cross Section Yes/No: | No |
| Assembly Process Flow: | 11-21099 |
| Name/Location of Assembly (prime) facility: | CML-RA |
| MSL Level | 3 |
| Reflow Profile | 260C |

| ELECTRICAL TEST/FINISH DESCRIPTION | |
|---|--------|
| Test Location | CML-RA |

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

| Stress/Test | Test Condition (Temp/Bias) | Result P/F |
|---|---|------------|
| Temperature Cycle | MIL-STD-883, Method 1010, Condition C, -65 C to 150 C Precondition: JESD22 Moisture Sensitivity MSL3 192 Hrs, 30°C/60%RH+ Reflow, 260°C+0, -5°C | P |
| Pressure Cooker Test | JESD22-A102: 121°C, 100%RH, 15 Psig Precondition: JESD22 Moisture Sensitivity MSL3 192 Hrs, 30°C/60%RH+ Reflow, 260°C+0, -5°C | P |
| High Accelerated Saturation Test (HAST) | JEDEC STD 22-A110: 130°C, 3.8V, 85% RH Precondition: JESD22 Moisture Sensitivity MSL3 192 Hrs, 30°C/60%RH+ Reflow, 260°C+0, -5°C | P |
| High Temp Storage | JESD22-A103:150C, no bias | P |
| Acoustics Microscopy | J-STD-020 Precondition: JESD22 Moisture Sensitivity MSL3 192 Hrs, 30°C/60%RH+ Reflow, 260°C+0, -5°C | P |
| Ball Shear | JESD22-B116, Cpk : 1.33, Ppk : 1.66 | P |
| Bond Pull | MIL-STD-883 – Method 2011, 1.33, Ppk : 1.66 | 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 Penetration | Test to determine the existence and extent of cracks, Criteria: No Package Crack | P |
| Final Visual | JESD22-B101 | P |
| Internal Visual | MIL-STD-883-2014 | P |
| Physical Dimension | MIL-STD-1835, JESD22-B100 | P |
| Solderability, Steam Aged | J-STD-002, JESD22-B102 95% solder coverage minimum | P |
| Thermal Shock | MIL-STD-883, Method 1011, Condition B, -55 C to 125C and JESD22-A106, Condition C, -55 C to 125C | P |
| X-ray | MIL-STD-883 2012 | P |

Reliability Test Data

QTP #:092006

| <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, MSL3 | | | | | | | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | COMP | 15 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-2 | CML-RA | COMP | 15 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-3 | CML-RA | COMP | 15 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-1 | CML-RA | COMP | 15 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-2 | CML-RA | COMP | 15 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-3 | CML-RA | COMP | 15 | 0 | |
| STRESS: BALL SHEAR | | | | | | | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | COMP | 10 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-1 | CML-RA | COMP | 10 | 0 | |
| STRESS: BOND PULL | | | | | | | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | COMP | 10 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-1 | CML-RA | COMP | 10 | 0 | |
| STRESS: CONSTRUCTIONAL ANALYSIS | | | | | | | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | COMP | 5 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-1 | CML-RA | COMP | 5 | 0 | |
| STRESS: DIE SHEAR | | | | | | | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | COMP | 15 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-2 | CML-RA | COMP | 15 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-1 | CML-RA | COMP | 15 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-2 | CML-RA | COMP | 15 | 0 | |
| STRESS: DYE PENETRANT TEST | | | | | | | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | COMP | 5 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-2 | CML-RA | COMP | 5 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-3 | CML-RA | COMP | 5 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-1 | CML-RA | COMP | 5 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-2 | CML-RA | COMP | 5 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-3 | CML-RA | COMP | 5 | 0 | |

Reliability Test Data

QTP #:092006

| Device | Fab Lot# | Assy Lot # | Assy Loc | Duration | Samp | Rej | Failure Mechanism |
|---|-----------------|-------------------|-----------------|-----------------|-------------|------------|--------------------------|
| STRESS: FINAL VISUAL | | | | | | | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | COMP | 499 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-2 | CML-RA | COMP | 285 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-3 | CML-RA | COMP | 200 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-1 | CML-RA | COMP | 498 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-2 | CML-RA | COMP | 248 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-3 | CML-RA | COMP | 200 | 0 | |
| STRESS: HI-ACCEL SATURATION TEST, 130C, 3.8V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3 | | | | | | | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | 128 | 77 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-1 | CML-RA | 128 | 77 | 0 | |
| STRESS: HIGH TEMP STORAGE | | | | | | | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | 500 | 76 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | 1000 | 76 | 0 | |
| STRESS: INTERNAL VISUAL | | | | | | | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | COMP | 5 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-1 | CML-RA | COMP | 5 | 0 | |
| STRESS: PRESSURE COOKER TEST, 121C, 100%RH, 15 Psig, PRE COND 192 HR 30C/60%RH, MSL3 | | | | | | | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | 168 | 80 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-1 | CML-RA | 168 | 80 | 0 | |
| STRESS: PHYSICAL DIMENSION | | | | | | | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | COMP | 30 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-1 | CML-RA | COMP | 30 | 0 | |
| STRESS: SOLDERABILITY | | | | | | | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | COMP | 3 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-2 | CML-RA | COMP | 3 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-3 | CML-RA | COMP | 3 | 0 | |

Reliability Test Data

QTP #:092006

| <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 HR 30C/60%RH, MSL3 | | | | | | | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | 500 | 80 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-2 | CML-RA | 500 | 79 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-3 | CML-RA | 500 | 80 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-1 | CML-RA | 500 | 80 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-2 | CML-RA | 500 | 80 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-3 | CML-RA | 500 | 80 | 0 | |
| STRESS: THERMAL SHOCK | | | | | | | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | 200 | 80 | 0 | |
| STRESS: X-RAY | | | | | | | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-1 | CML-RA | COMP | 15 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902567-2 | CML-RA | COMP | 15 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-1 | CML-RA | COMP | 15 | 0 | |
| CY7C65640A (7C65642EC) | 4841890 | 610902568-2 | CML-RA | COMP | 15 | 0 | |



Document History Page

Document Title: QTP# 092006:56-LEAD SAW QFN (QUAD FLAT NO-LEAD) (8 X 8 X 1.0MM) NIPDAU, MSL3,
260C REFLOW, CML-RA
Document Number: 001-89589

| Rev. | ECN No. | Orig. of Change | Description of Change |
|------|---------|-----------------|---|
| ** | 4149284 | JYF | Initial Spec Release. |
| *A | 4535338 | JYF | Updated QTP title page for template alignment. |
| *B | 6483841 | HSTO | Update Cypress logo Update Contact person Update "MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION" table |
| | | SLLO | Removed Distribution and Posting from the document history page. |