# Cypress Semiconductor
# Product Qualification Report

**QTP# 142304 VERSION *A**
**July 2014**

| PSoC4 Family<br>S8PF-10R, Fab 3 HHGrace | |
|---|---|
| CY8C4013<br>CY8C4014 | Programmable System-on-Chip (PSoC) |

**FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT reliability@cypress.com or via a CYLINK CRM CASE**

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# PRODUCT QUALIFICATION HISTORY

| QTP Number | Description of Qualification Purpose | Date |
|---|---|---|
| 090706 | Qualification of Capsense (CY8C20X36A, CY8C20X46A, CY8C20X66A, CY8C20X96A) Device in Fab 5 GSMC on S8DIN-5R Process | Mar 10 |
| 100101 | Qualification of Touch Screen PSoC Device in S8TMC-5R Process at GSMC | Apr 10 |
| 124505 | Qualification of 5th Generation Touch Screen (TSG5_M) device using S8P12-10P technology at GSMC-Fab 5 | May 13 |
| 142304 | Qualification of CY8C4013/ CY8C4014 PSoC4 Family, S8PF-10R Technology in HHGrace-Fab3 | June 14 |

| PRODUCT DESCRIPTION (for qualification) | |
|---|---|
| Qualification Purpose: To Qualify CapSense Controller device family, S8PF-10R Technology in HHGrace Fab3 | |
| Marketing Part #: | CY8C4013 / CY8C4014 |
| Device Description: | 5V, Industrial Programmable System on a Chip |
| Cypress Division: | Cypress Semiconductor Corporation – Programmable System Division (PSD) |

| TECHNOLOGY/FAB PROCESS DESCRIPTION | | | |
|---|---|---|---|
| Number of Metal Layers: | 5 | Metal Composition: | Metal 1: 150A Ti /250A TiN / 3200Al-0.5%Cu / 90A Ti/500A TiN<br>Metal 2: 150A Ti /250A TiN/ 3200Al-0.5%Cu / 90A Ti/500A TiN<br>Metal 3: 150A Ti /250A TiN 6500Al-0.5%Cu / 90A Ti/500A TiN<br>Metal 4: 150A Ti /250A TiN 6500Al-0.5%Cu / 90A Ti/500A TiN<br>Metal 5: 190A Ti/450A TiN/10000A Al-0.5% Cu/90A Ti/200A TiN |
| Passivation Type and Thickness: | | | NFUSOX / 1K oxide / 6k Nitride |
| Generic Process Technology/Design Rule (μ-drawn): | | | S8PF-10R |
| Gate Oxide Material/Thickness (MOS): | | | SiO2 / 32A/110A |
| Name/Location of Die Fab (prime) Facility: | | | Fab 3 / HHGrace, Shanghai China |
| Die Fab Line ID/Wafer Process ID: | | | S8PF-10R |

## ALTERNATIVE FAB FACILITY SITE

| FAB SITE | LOCATION | QTP NUMBER |
|---|---|---|
| CMI Fab 4 | MINNESOTA, USA | 132802 |

## PACKAGE AVAILABILITY

| PACKAGE | ASSEMBLY FACILITY SITE | WIRE | QTP NUMBER |
|---|---|---|---|
| 16-Lead QFN | CML-RA | CuPd | 140804 |
| 16-Lead QFN | ASE-K | CuPd | 134505 |
| 16/24 -Lead QFN | UTL-UT | CuPd | 141704 |
| 8-Lead SOIC | UTL-UT | CuPd | 134513 |
| 16-Lead SOIC | UTL-UT | CuPd | 134506 |
| 28-Lead SSOP | CML-RA | CuPd | 145006 |
| 28-Lead SSOP | JCET-JT | CuPd | 145005 |

Note: **Package Qualification details upon request.**

| MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION | |
|---|---|
| **Package Designation:** | LQ44A, LQ48A |
| **Package Outline, Type, or Name:** | 44 & 48 Quad Flat No-Lead (QFN) |
| **Mold Compound Name/Manufacturer:** | 7470LA / Nitto |
| **Mold Compound Flammability Rating:** | UL94 – V0 |
| **Oxygen Rating Index:** | None |
| **Lead Frame Material:** | Copper |
| **Lead Finish, Composition / Thickness:** | NiPdAu |
| **Die Backside Preparation Method/Metallization:** | Backgrind |
| **Die Separation Method:** | 100% Saw |
| **Die Attach Supplier:** | Henkel |
| **Die Attach Material:** | QMI-519 |
| **Die Attach Method:** | Epoxy |
| **Bond Diagram Designation:** | 001-78882 |
| **Wire Bond Method:** | Thermosonic |
| **Wire Material/Size:** | CuPd 0.8 mil |
| **Thermal Resistance Theta JA °C/W:** | 31.36 C/W |
| **Package Cross Section Yes/No:** | N/A |
| **Assembly Process Flow:** | 001-69810 |
| **Name/Location of Assembly (prime) facility:** | CML-RA |
| **MSL Level** | 3 |
| **Reflow Profile** | 260C |

| ELECTRICAL TEST / FINISH DESCRIPTION | |
|---|---|
| Test Location: | CML-RA, ASE-KH, UTAC-UT |

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

## RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

| Stress/Test | Test Condition (Temp/Bias) | Result P/F |
|---|---|---|
| High Temperature Operating Life<br>Early Failure Rate (EFR) | Dynamic Operating Condition, 150°C, 2.1V, 48 Hours<br>JESD22-A-108 | P |
| High Temperature Operating Life<br>Early Failure Rate (EFR) – Regulator On | Dynamic Operating Condition, 150°C, 2.1V/5.5V, 48 Hours<br>JESD22-A-108 | P |
| High Temperature Operating Life<br>Latent Failure Rate (LFR) | Dynamic Operating Condition, 150°C, 2.1V, 500 Hours<br>JESD22-A-108 | P |
| High Temperature Steady State life | Static Operating Condition, 150°C, 5.75.V, Vcc Max<br>JESD22-A-108 | P |
| Low Temperature Operating Life | Dynamic Operating Condition, -30°C, 2.1V<br>JESD22-A-108 | P |
| Endurance | 10K Cycles, Per datasheet, JESD22-A117 | P |
| Data Retention | 150°C, 1000 Hours<br>JESD22-A117 and JESD22-A103 | P |
| Temperature Cycle | MIL-STD-883, Method 1010, Condition C, -65 °C to 150°C<br>Precondition: JESD22 Moisture Sensitivity Level 3<br>192 Hrs, 30C/60%RH+ Reflow, 260°C+0, -5°C | P |
| High Accelerated Saturation Test<br>(HAST) | JEDEC STD 22-A110: 130°C, 85% RH, 5.25V/5.5V<br>Precondition: JESD22 Moisture Sensitivity Level 3<br>192 Hrs, 30C/60%RH+ Reflow, 260°C+0, -5°C | P |
| Pressure Cooker | JESD22-A102:121°C /100%RH, 15 PSIG<br>Precondition: JESD22 Moisture Sensitivity Level 3<br>192 Hrs, 30C/60%RH+ Reflow, 260°C+0, -5°C | P |
| Aged Bond Strength | 200C, 4hrs<br>MIL-STD-883, Method 883-2011 | P |
| Electrostatic Discharge<br>Human Body Model (ESD-HBM) | 2200V/ 3300V/ 4000V/5000V/ 6000V, JESD22-A114 | P |
| Electrostatic Discharge<br>Charge Device Model (ESD-CDM) | 500V/750V/ 1000V/ 1250V/ 1500V/1750V, JESD22-C101 | P |
| Electrostatic Discharge<br>Machine Model (ESD-MM) | 200V, JESD22-A115 | P |
| Dynamic Latch-Up | 150°C, 9.0 V JESD78 | P |
| Static Latch-up | ± 140mA, 125°C/85°C, 8.25V<br>± 300mA, 85C, 9.1V JESD78 | P |
| Acoustic Microscopy | J-STD-020<br>Precondition: JESD22 Moisture Sensitivity Level 3<br>192 Hrs, 30C/60%RH+ Reflow, 260°C+0, -5°C | P |

## RELIABILITY FAILURE RATE SUMMARY

| Stress/Test | Device Tested/ Device Hours | # Fails | Activation Energy | Thermal AF[3] | Failure Rate |
|---|---|---|---|---|---|
| High Temperature Operating Life Early Failure Rate | 1,503 | 0 | N/A | N/A | 0 PPM [1] |
| High Temperature Operating Life Long Term Failure Rate | 902,240 DHRs | 0 | 0.7 | 170 | 6 FIT [2] |

[1] Assuming an ambient temperature of 55°C and a junction temperature rise of 15°C.
[2] Chi-squared 60% estimations used to calculate the failure rate.
[3] Thermal Acceleration Factor is calculated from the Arrhenius equation

$$AF = \exp\left[\frac{E_A}{k}\left[\frac{1}{T_2} - \frac{1}{T_1}\right]\right]$$

where:

$E_A$ =The Activation Energy of the defect mechanism.
K = Boltzmann's constant = $8.62 \times 10^{-5}$ eV/Kelvin.
$T_1$ is the junction temperature of the device under stress and $T_2$ is the junction temperature of the device at use conditions.

[1] Early Failure Rate was computed from QTPs 142304
[2] Long Term Failure Rate was computed from QTPs 090706, 100101, 124505 & 142304 LFR Data.

# Reliability Test Data

## QTP #: 090706

| Device | Fab Lot # | Assy Lot # | Assy Lot | Duration | Samp | Rej | Failure Mechanism |
|---|---|---|---|---|---|---|---|
| **STRESS: ACOUSTIC, MSL3** | | | | | | | |
| CY8C20466A (8C204665A) | 4926959 | *610927071* | CML-RA | COMP | 15 | 0 | |
| CY8C20466A (8C204665A) | 4934292 | *610931047* | CML-RA | COMP | 15 | 0 | |
| CY8C20466A (8C204665A) | 4938497 | *610935369* | CML-RA | COMP | 15 | 0 | |
| **STRESS: AGE BOND STRENGTH** | | | | | | | |
| CY8C20466A (8C204665A) | 4926959 | *610927071* | CML-RA | COMP | 3 | 0 | |
| CY8C20466A (8C204665A) | 4934292 | *610931047* | CML-RA | COMP | 3 | 0 | |
| CY8C20466A (8C204665A) | 4938497 | *610935369* | CML-RA | COMP | 3 | 0 | |
| **STRESS: DATA RETENTION, PLASTIC, 150C** | | | | | | | |
| CY8C20466A (8C204665A) | 4926959 | *610927071* | CML-RA | 500 | 77 | 0 | |
| CY8C20466A (8C204665A) | 4926959 | *610927071* | CML-RA | 1000 | 77 | 0 | |
| CY8C20466A (8C204665A) | 4926959 | *610927071* | CML-RA | 1446 | 77 | 0 | |
| CY8C20466A (8C204665A) | 4934292 | *610931047* | CML-RA | 500 | 80 | 0 | |
| CY8C20466A (8C204665A) | 4934292 | *610931047* | CML-RA | 1000 | 80 | 0 | |
| CY8C20466A (8C204665A) | 4938497 | *610935369* | CML-RA | 500 | 80 | 0 | |
| CY8C20466A (8C204665A) | 4938497 | *610935369* | CML-RA | 1000 | 80 | 0 | |
| **STRESS: ENDURANCE** | | | | | | | |
| CY8C20566A (8C205665A) | 4926959 | *610926865* | CML-R | 168 | 77 | 0 | |
| CY8C20566A (8C205665A) | 4926959 | *610926865* | CML-R | 524 | 77 | 0 | |
| CY8C20566A (8C205665A) | 4934292 | *610931057* | CML-R | 168 | 78 | 0 | |
| CY8C20566A (8C205665A) | 4938497 | *610935104* | CML-R | 168 | 77 | 0 | |
| **STRESS: ESD-CHARGE DEVICE MODEL, (500V)** | | | | | | | |
| CY8C20066A (8C200665A) | 4926959 | *610926836* | Malaysia-CA | COMP | 9 | 0 | |
| CY8C20066A (8C200665A) | 4934292 | *610932270* | Malaysia-CA | COMP | 9 | 0 | |
| CY8C20066A (8C200665A) | 4938497 | *610935356* | Malaysia-CA | COMP | 9 | 0 | |

# Reliability Test Data

## QTP #: 090706

| Device | Fab Lot # | Assy Lot # | Assy Loc | Duration | Samp | Rej | Failure Mechanism |
|---|---|---|---|---|---|---|---|
| ***STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-B, (2,200V)*** | | | | | | | |
| CY8C20066A (8C200665A) | 4926959 | *610926836* | Malaysia-CA | COMP | 8 | 0 | |
| CY8C20066A (8C200665A) | 4934292 | *610932270* | Malaysia-CA | COMP | 8 | 0 | |
| CY8C20066A (8C200665A) | 4938497 | *610935356* | Malaysia-CA | COMP | 8 | 0 | |
| ***STRESS: STATIC LATCH-UP (125C, 8.25V, 140mA)*** | | | | | | | |
| CY8C20066A (8C200665A) | 4926959 | *610926836* | Malaysia-CA | COMP | 6 | 0 | |
| CY8C20066A (8C200665A) | 4934292 | *610932270* | Malaysia-CA | COMP | 6 | 0 | |
| CY8C20066A (8C200665A) | 4938497 | *610935356* | Malaysia-CA | COMP | 6 | 0 | |
| ***STRESS: DYNAMIC LATCH-UP (150C, 9.0V)*** | | | | | | | |
| CY8C20466A (8C204665A) | 4926959 | *610927071* | CML-RA | COMP | 5 | 0 | |
| ***STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (150, 2.1V, Vcc Max)*** | | | | | | | |
| CY8C20466A (8C204665A) | 4926959 | *610927071* | CML-RA | 48 | 1000 | 0 | |
| CY8C20466A (8C204665A) | 4934292 | *610931047* | CML-RA | 48 | 1000 | 0 | |
| CY8C20466A (8C204665A) | 4938497 | *610935369* | CML-RA | 48 | 1000 | 0 | |
| ***STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE REGULATOR ON (150, 5.5V, Vcc Max)*** | | | | | | | |
| CY8C20466A (8C204665A) | 4926959 | *610927071* | CML-RA | 48 | 45 | 0 | |
| ***STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (150C, 2.1V, Vcc Max)*** | | | | | | | |
| CY8C20466A (8C204665A) | 4926959 | *610927071* | CML-RA | 80 | 400 | 0 | |
| CY8C20466A (8C204665A) | 4926959 | *610927071* | CML-RA | 500 | 399 | 0 | |
| CY8C20466A (8C204665A) | 4934292 | *610931047* | CML-RA | 500 | 444 | 0 | |
| CY8C20466A (8C204665A) | 4938497 | *610935369* | CML-RA | 80 | 400 | 0 | |
| CY8C20466A (8C204665A) | 4938497 | *610935369* | CML-RA | 500 | 400 | 0 | |
| ***STRESS: HIGH TEMP STEADY STATE LIFE TEST (150C, 5.75V)*** | | | | | | | |
| CY8C20466A (8C204665A) | 4926959 | *610927071* | CML-RA | 80 | 77 | 0 | |
| CY8C20466A (8C204665A) | 4926959 | *610927071* | CML-RA | 168 | 77 | 0 | |
| ***STRESS: LOW TEMPERATURE DYNAMIC OPERATING LIFE, -30C, 2.1V*** | | | | | | | |
| CY8C20566A (8C205665A) | 4926959 | *610926865* | CML-R | 500 | 83 | 0 | |

# *Reliability Test Data*

## *QTP #:* 090706

| *Device* | *Fab Lot #* | *Assy Lot #* | *Assy Loc* | *Duration* | *Samp* | *Rej* | *Failure Mechanism* |
|---|---|---|---|---|---|---|---|
| ***STRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 5.25V), PRE COND 192 HR 30C/60%RH (MSL3)*** | | | | | | | |
| CY8C20466A (8C204665A) | 4948407GSMC | *610946935* | CML-RA | 128 | 80 | 0 | |
| CY8C20466A (8C204665A) | 4948407ª2 | *610947114* | CML-RA | 128 | 80 | 0 | |
| CY8C20466A (8C204665A) | 4948407ª3 | *611002233* | CML-RA | 128 | 80 | 0 | |
| ***STRESS: PRESSURE COOKER TEST (121C, 100%RH), 15 Psig, PRE COND 192 HR 30C/60%RH (MSL3)*** | | | | | | | |
| CY8C20466A (8C204665A) | 4948407GSMC | *610946935* | CML-RA | 168 | 80 | 0 | |
| CY8C20466A (8C204665A) | 4948407ª2 | *610947114* | CML-RA | 168 | 80 | 0 | |
| CY8C20466A (8C204665A) | 4948407ª3 | *611002233* | CML-RA | 168 | 80 | 0 | |
| ***STRESS: TC COND. C –65C TO 150C, PRE COND 192 HRS 30C/60%RH (MSL3)*** | | | | | | | |
| CY8C20466A (8C204665A) | 4926959 | *610927071* | CML-RA | 500 | 76 | 0 | |
| CY8C20466A (8C204665A) | 4934292 | *610931047* | CML-RA | 500 | 80 | 0 | |
| CY8C20466A (8C204665A) | 4934292 | *610931047* | CML-RA | 1000 | 80 | 0 | |
| CY8C20466A (8C204665A) | 4938497 | *610935369* | CML-RA | 500 | 80 | 0 | |
| ***STRESS: SEM CROSS SECTION*** | | | | | | | |
| CY8C20066A (8C20066AC) | 4934292 | *610931047* | CML-RA | COMP | 1 | 0 | |

# Reliability Test Data

## QTP #:100101

| Device | Fab Lot # | Assy Lot # | Assy Lot | Duration | Samp | Rej | Failure Mechanism |
|---|---|---|---|---|---|---|---|
| **STRESS: ACOUSTIC, MSL3** | | | | | | | |
| CY8CTMA300EES | 4016083 | 611028818 | MB-PHIL | COMP | 15 | 0 | |
| CY8CTMA300EES | 4016083 | 611028819 | MB-PHIL | COMP | 15 | 0 | |
| CY8CTMA300EES | 4021994 | 611028331 | MB-PHIL | COMP | 15 | 0 | |
| **STRESS: DATA RETENTION, PLASTIC, 150C** | | | | | | | |
| CY8CTMA300EES | 4016083 | 611021260 | MB-PHIL | 500 | 77 | 0 | |
| CY8CTMA300EES | 4016083 | 611021260 | MB-PHIL | 1000 | 77 | 0 | |
| CY8CTMA300EES | 4016083 | 611021260 | MB-PHIL | 1500 | 77 | 0 | |
| **STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (150C, 2.07V, Vcc Max)** | | | | | | | |
| CY8CTMA300EES | 4016083 | 611021260 | MB-PHIL | 48 | 500 | 0 | |
| CY8CTMA300EES | 4016083 | 611028818 | MB-PHIL | 48 | 1540 | 0 | |
| CY8CTMA300EES | 4021994 | 611028331 | MB-PHIL | 48 | 1528 | 0 | |
| **STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE REGULATOR ON (150C, 2.07V, Vcc Max)** | | | | | | | |
| CY8CTMA300EES | 4021994 | 611028331 | MB-PHIL | 48 | 50 | 0 | |
| **STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (150C, 2.07V, Vcc Max)** | | | | | | | |
| CY8CTMA300EES | 4016083 | 611028818 | MB-PHIL | 80 | 118 | 0 | |
| CY8CTMA300EES | 4016083 | 611028818 | MB-PHIL | 500 | 116 | 0 | |
| CY8CTMA300EES | 4021994 | 611028331 | MB-PHIL | 80 | 116 | 0 | |
| CY8CTMA300EES | 4021994 | 611028331 | MB-PHIL | 500 | 115 | 0 | |
| **STRESS: ENDURANCE** | | | | | | | |
| CY8CTMA300EES | 4016083 | 611021260 | MB-PHIL | 168 | 80 | 0 | |
| CY8CTMA300EES | 4016083 | 611021260 | MB-PHIL | 500 | 80 | 0 | |
| **STRESS: ESD-CHARGE DEVICE MODEL, (500V)** | | | | | | | |
| CY8CTMA300EES | 4016083 | 611021260 | MB-PHIL | COMP | 9 | 0 | |
| CY8CTMA300EES | 4021994 | 611028331 | MB-PHIL | COMP | 9 | 0 | |
| **STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-B, (2,200V)** | | | | | | | |
| CY8CTMA300EES | 4021994 | 611028331 | MB-PHIL | COMP | 8 | 0 | |

# Reliability Test Data

## QTP #:100101

| Device | Fab Lot # | Assy Lot # | Assy Lot | Duration | Samp | Rej | Failure Mechanism |
|---|---|---|---|---|---|---|---|
| **STRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 5.5V), PRE COND 192 HR 30C/60%RH (MSL3)** | | | | | | | |
| CY8CTMA300EES | 4021994 | *611028331* | MB-PHIL | 128 | 8 | 0 | |
| **STRESS: PRESSURE COOKER TEST (121C, 100%RH), 15 Psig, PRE COND 192 HR 30C/60%RH (MSL3)** | | | | | | | |
| CY8CTMA300EES | 4016083 | *611021260* | MB-PHIL | 168 | 80 | 0 | |
| CY8CTMA300EES | 4021994 | *611028331* | MB-PHIL | 168 | 80 | 0 | |
| **STRESS: STATIC LATCH-UP (85C, 8.25V, 90mA)** | | | | | | | |
| CY8CTMA300EES | 4021994 | *611028331* | MB-PHIL | COMP | 6 | 0 | |
| **STRESS: TC COND. C –65C TO 150C, PRE COND 192 HRS 30C/60%RH (MSL3)** | | | | | | | |
| CY8CTMA300EES | 4016083 | *611028818* | MB-PHIL | 500 | 80 | 0 | |
| CY8CTMA300EES | 4016083 | *611028819* | MB-PHIL | 500 | 80 | 0 | |
| CY8CTMA300EES | 4021994 | *611028331* | MB-PHIL | 500 | 80 | 0 | |

# Reliability Test Data

## QTP #:124505

| Device | Fab Lot # | Assy Lot # | Assy Lot | Duration | Samp | Rej | Failure Mechanism |
|---|---|---|---|---|---|---|---|
| **STRESS: DATA RETENTION** | | | | | | | |
| CY8CTMA440 (8CC205001B) | 4301809 | 611300880 | CML-RA | 500 | 80 | 0 | |
| CY8CTMA440 (8CC205001B) | 4301809 | 611300880 | CML-RA | 1000 | 79 | 0 | |
| **STRESS: ENDURANCE** | | | | | | | |
| CY8CTMA440 (8CC205001B) | 4301809 | 611300880 | CML-RA | 168 | 80 | 0 | |
| CY8CTMA440 (8CC205001B) | 4301809 | 611300880 | CML-RA | 500 | 80 | 0 | |
| **STRESS: ESD-CHARGE DEVICE MODEL, (500V)** | | | | | | | |
| CY8CTMA440 (8CC205001B) | 4301809 | 611300880 | CML-RA | COMP | 9 | 0 | |
| **STRESS: ESD-CHARGE DEVICE MODEL, (750V)** | | | | | | | |
| CY8CTMA440 (8CC205002B) | 4301809 | 6113011261 | CML-RA | COMP | 15 | 0 | |
| **STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, (2,200V)** | | | | | | | |
| CY8CTMA440 (8CC205001B) | 4301809 | 611300880 | CML-RA | COMP | 8 | 0 | |
| **STRESS: STATIC LATCH-UP (85C, 2.93V/8.25V, +/-140mA)** | | | | | | | |
| CY8CTMA440 (8CC205001B) | 4301809 | 611300880 | CML-RA | COMP | 6 | 0 | |
| **STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (150, 2.1V, Vcc Max)** | | | | | | | |
| CY8CTMA440 (8CC205001B) | 4301809 | 611300880 | CML-RA | 48 | 498 | 0 | |
| CY8CTMA440 (8CC205001B) | 4301809 | 611300880 | CML-RA | 48 | 990 | 0 | |
| CY8CTMA440 (8CC205001B) | 4301809 | 611300880 | CML-RA | 48 | 827 | 0 | |
| CY8CTMA440 (8CC205001B) | 4301809 | 611300880 | CML-RA | 48 | 721 | 0 | |
| CY8CTMA440 (8CC205001B) | 4301809 | 611300880 | CML-RA | 48 | 594 | 0 | |
| CY8CTMA445 (8CC205001B) | 4301809 | 611304958 | CML-RA | 48 | 1205 | 1 – Scan Failure | |
| CY8CTMA445 (8CC205001B) | 4301809 | 611304958 | CML-RA | 48 | 345 | 0 | |
| CY8CTMA445 (8C205001B) | 4301809 | 611306104 | CML-RA | 48 | 1382 | 0 | |
| CY8CTMA445 (8C205001B) | 4301809 | 611306104 | CML-RA | 48 | 168 | 0 | |
| CY8CTMA445 (8C205001B) | 4301809 | 611306104 | CML-RA | 48 | 756 | 0 | |

# Reliability Test Data

## QTP #:124505

| Device | Fab Lot # | Assy Lot # | Assy Lot | Duration | Samp | Rej | Failure Mechanism |
|---|---|---|---|---|---|---|---|
| **STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (150C, 2.1V, Vcc Max)** | | | | | | | |
| CY8CTMA440 (8CC205001B) | 4301809 | *611300880* | CML-RA | 80 | 126 | 0 | |
| CY8CTMA440 (8CC205001B) | 4301809 | *611300880* | CML-RA | 500 | 126 | 0 | |
| **STRESS: TC COND. C –65C TO 150C, PRE COND 192 HRS 30C/60%RH (MSL3)** | | | | | | | |
| CY8CTMA440 (8CC205001B) | 4301809 | *611300880* | CML-RA | 500 | 80 | 0 | |
| CY8CTMA440 (8CC205001B) | 4301809 | *611300880* | CML-RA | 1000 | 80 | 0 | |
| **STRESS: PRESSURE COOKER TEST (121C, 100%RH), 15 Psig, PRE COND 192 HR 30C/60%RH (MSL3)** | | | | | | | |
| CY8CTMA440 (8CC205001B) | 4301809 | *611300880* | CML-RA | 168 | 80 | 0 | |

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# Reliability Test Data

## QTP #: 142304

| Device | Fab Lot # | Assy Lot # | Assy Lot | Duration | Samp | Rej | Failure Mechanism |
|---|---|---|---|---|---|---|---|
| ***STRESS: DATA RETENTION, 150C*** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | 500 | 80 | 0 | |
| ***STRESS: ENDURANCE, CYLCLING + DATA BAKE (150C)*** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | 168 | 77 | 0 | |
| ***STRESS: ESD-CHARGE DEVICE MODEL (500V)*** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | COMP | 9 | 0 | |
| ***STRESS: ESD-CHARGE DEVICE MODEL (750V)*** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | COMP | 3 | 0 | |
| ***STRESS: ESD-CHARGE DEVICE MODEL (1000V)*** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | COMP | 3 | 0 | |
| ***STRESS: ESD-CHARGE DEVICE MODEL (1250V)*** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | COMP | 3 | 0 | |
| ***STRESS: ESD-CHARGE DEVICE MODEL (1500V)*** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | COMP | 3 | 0 | |
| ***STRESS: ESD-CHARGE DEVICE MODEL (1750V)*** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | COMP | 3 | 0 | |
| ***STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-B (2,200V)*** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | COMP | 8 | 0 | |
| ***STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-B (3,300V)*** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | COMP | 3 | 0 | |
| ***STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-B (4,000V)*** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | COMP | 3 | 0 | |
| ***STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-B (5,000V)*** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | COMP | 3 | 0 | |
| ***STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-B (6,000V)*** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | COMP | 3 | 0 | |
| ***STRESS: ESD-MACHINE MODEL, (200V)*** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | COMP | 5 | 0 | |

# Reliability Test Data

## QTP #: 142304

| Device | Fab Lot # | Assy Lot # | Assy Lot | Duration | Samp | Rej | Failure Mechanism |
|---|---|---|---|---|---|---|---|
| **STRESS: STATIC LATCH-UP (85C, +/-140mA)** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | COMP | 6 | 0 | |
| **STRESS: STATIC LATCH-UP (85C, +/-200mA)** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | COMP | 3 | 0 | |
| **STRESS: STATIC LATCH-UP (125C, +/-140mA)** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | COMP | 3 | 0 | |
| **STRESS: STATIC LATCH-UP (85C, +/-300mA)** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | COMP | 3 | 0 | |
| **STRESS: HIGH TEMPERATURE DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (150, 2.1V, Vcc Max)** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | 48 | 1503 | 0 | |
| **STRESS: HIGH TEMPERATURE DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (150, 2.1V, Vcc Max)** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | 80 | 118 | 0 | |
| **STRESS: PRESSURE COOKER TEST** | | | | | | | |
| CY8C4014 (8CP44304B) | 5412006 | 611415880 | CML-RA | 168 | 80 | 0 | |
| **STRESS: TC COND. C -65 TO 150C, PRE COND 192 HRS 30C/60% RH (MSL3)** | | | | | | | |
| CY8C4014 (8CP44304B) | B5412006 | 611415880 | CML-RA | 500 | 80 | 0 | |

# Document History Page

Document Title: QTP#142304: QUALIFICATION OF CY8C4013 / CY8C4014 PSOC4 DEVICE FAMILY, S8PF-10R TECHNOLOGY, FAB3 HHGRACE

Document Number: 001-92842

| Rev. | ECN No. | Orig. of Change | Description of Change |
|---|---|---|---|
| ** | 4404221 | HSTO | Initial Spec Release |
| *A | 4411698 | HSTO | Updated technology from S8P12-10R to S8PF-10R in title page and page 2.<br>Updated Technology/Fab Process Description at page 3.<br>Update Package Availability table at page 3.<br>- Removed Au wire option<br>- Add 8L/16L SOIC package option<br>- Update assembly site name from ASE-G to ASE-K |
| *B | 4624766 | HSTO | Update Package Availability table<br>- Add 28-Lead SSOP package |

Distribution: WEB

Posting: None