



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

PRODUCT CHANGE NOTIFICATION

PCN: PCN192102

Date: May 23, 2019

Subject: Qualification of ASE Kaohsiung (ASE-KH) as an Additional Bumping and Backend Process Site for Select WLCSP Products

To: PCN Coordinator PCN Coordinator
FUTURE
PCN.System@Future.ca

Change Type: Major

Description of Change:

Cypress announces the qualification of Advanced Semiconductor Engineering Inc. (ASE-KH, No.47, Kaifa Road, N.E.P.Z. Kaohsiung City 811, Taiwan, R.O.C.) as an additional bumping and backend process site for select WLCSP products. ASE-KH is Cypress' existing manufacturing site for many other WLCSP products in high volume production mode.

The WLCSP products are bumped at ASE-KH using the following Bill of Materials:

Material	ASE-KH BOM	DECATECH BOM
Passivation	PBO (HD8820)	PBO (HD8820)
RDL	Cu, 4um	Cu, 4um
UBM Seed Layer	Ti, 1000A	Ti, 1000A
UBM Seed Layer	Cu, 2000A	Cu, 2000A
UBM	Cu, 8.9um (before etch) or 8.6um (post etch)	Cu, 9um (before etch) or 8.6um (post etch)
Solder Bump	95.5Sn/4.0Ag/0.5Cu	95.5Sn/4.0Ag/0.5Cu

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: 25

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 products have been qualified through a series of tests documented in the Qualification Test Plan QTP#191401. This qualification report can be found as an attachment to this PCN or by visiting www.cypress.com and typing the QTP number in the keyword search window.

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 ASE-KH 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, Industrial and Automotive non-PPAP part numbers in the attached file will be assembled at ASE-KH 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



Material Composition Declaration

© Copyright 2005. IPC, Bannockburn, Illinois. All rights reserved under both international and Pan-American copyright conventions.

This document is a declaration of the substances within the manufacturer listed item. Note: if the item is an assembly with lower level parts, the declaration encompasses all lower level materials for which the manufacturer has engineering responsibility.

Adobe Reader version 7.0.5 is required to complete this declaration.

1752-2 1.1	IPC Web Site for Information on IPC-1752 Standard http://www.ipc.org/IPC-175x	Form Type * Distribute	Declaration Class * Class 6 - RoHS Yes/No, Homogeneous Materials and Mfg Informat
------------	--	---------------------------	--

Supplier Information

Company Name *	Company Unique ID	Unique ID Authority	Response Date *	Response Document ID				
Cypress Semiconductor Corp	CY	CY	2019-05-07					
Contact Name *	Title - Contact	Phone - Contact *	Email - Contact *	Duplicate Contact -> Authorized Representative				
Quality Customer Support Center	Quality Customer Support Group	6328497500	qacs_team@cypress.com					
Authorized Representative *	Title - Representative	Phone - Representative *	Email - Representative *	Supplier Comments or URL for Additional Information				
Jeff Gary Balesca	EH&S Engineer	6328497500	jgtb@cypress.com					
Requester Item Number	Mfr Item Number	Mfr Item Name	Effective Date	Version	Manufacturing Site	Weight *	UOM	Unit Type
FN35 (3.23X2.10X0.55 mm)	FN35 (3.23X2.10X0.55 mm)	FN35 (3.23X2.10X0.55 mm)	2019-05-07		ASE Taiwan	7.6748	mg	Each
Alternate Recommendation				Alternate Item Comments	Package QTP# 191401			

Manufacturing Process Information

Terminal Plating / Grid Array Material	Terminal Base Alloy	J-STD-020 MSL Rating	Peak Process Body Temperature	Max Time at Peak Temperature	Number of Reflow Cycles
Tin/Silver/Copper (Sn/Ag/Cu)	CU Alloy	1	260 C	30 seconds	3

Comments

Test Report: PBO(002-26309), UMICORE CU 4N5(002-26320),UMICORE TI 3N(002-27189), Lintec LC2850(002-24203),Solder Ball(002-26332, 001-79873, 001-79880,002-27202)

* Required Field

CAS Registry Number(R) is a Registered Trademark of the American Chemical Society

Form enabled by Adobe

Save the fields in this form to a file	<input type="button" value="Export Data"/>	Import fields from a file into this form	<input type="button" value="Import Data"/>	Clear all of the fields on this form	<input type="button" value="Reset Form"/>	Lock the fields on this form to prevent changes	<input type="button" value="Lock Supplier Fields"/>
--	--	--	--	--------------------------------------	---	---	---

RoHS Material Composition Declaration		Declaration Type *	<input type="button" value="Detailed"/>
--	--	---------------------------	---

RoHS Directive 2002/95/EC	RoHS Definition: Quantity limit of 0.1% by mass (1000 PPM) in homogeneous material for: Lead (Pb), Mercury, Hexavalent Chromium, Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE) and quantity limit of 0.01% by mass (100 PPM) of homogeneous material for Cadmium
----------------------------------	---

Please indicate whether any homogeneous material (as defined by the RoHS Directive, EU 2002/95/EC and implemented by the laws of the European Union member states) of the part identified on this form contains lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and/or polybrominated diphenyl ethers (each a "RoHS restricted substance") in excess of the applicable quantity limit identified above. If a homogeneous material within the part contains a RoHS restricted substance in excess of an applicable quantity limit, please indicate below which, if any, RoHS exemption you believe may apply. If the part is an assembly with lower level components, the declaration shall encompass all such components. Supplier certifies that it gathered the information it provides in this form using appropriate methods to ensure its accuracy and that such information is true and correct to the best of its knowledge and belief, as of the date that Supplier completes this form. Supplier acknowledges that Company will rely on this certification in determining the compliance of its products with European Union member state laws that implement the RoHS Directive. Company acknowledges that Supplier may have relied on information provided by others in completing this form, and that Supplier may not have independently verified such information. However, in situations where Supplier has not independently verified information provided by others, Supplier agrees that, at a minimum, its suppliers have provided certifications regarding their contributions to the part, and those certifications are at least as comprehensive as the certification in this paragraph. If the Company and the Supplier enter into a written agreement with respect to the identified part, the terms and conditions of that agreement, including any warranty rights and/or remedies provided as part of that agreement, will be the sole and exclusive source of the Supplier's liability and the Company's remedies for issues that arise regarding information the Supplier provides in this form. In the absence of such written agreement, the warranty rights and/or remedies of Supplier's Standard Terms and Conditions of Sale applicable to such part shall apply.

RoHS Declaration *	1 - Item(s) does not contain RoHS restricted substances per the definition above	Supplier Acceptance *	<input type="button" value="Accepted"/>
---------------------------	--	------------------------------	---

Exemptions: If the declared item does not contain RoHS restricted substances per the definition above except for defined RoHS exemptions, then select the corresponding response in the RoHS Declaration above and choose all applicable exemptions.

Declaration Signature

Instructions: Complete all of the required fields on all pages of this form. Select the "Accepted" on the Supplier Acceptance drop-down. This will display the signature area. Digitally sign the declaration (if required by the Requester) and click on Submit Form to have the form returned to the Requester.

Supplier Digital Signature	Jeff Gary Balleca	<small>Digitally signed by Jeff Gary Balleca DN: cn=Jeff Gary Balleca, o=EHS, ou=EHS, email=jgb@cyress.com, c=PH Date: 2019.05.07 08:45:29 +0800</small>
----------------------------	-------------------	--

* Required Field

CAS Registry Number(R) is a Registered Trademark of the American Chemical Society

Form enabled by Adobe

Homogeneous Material Composition Declaration for Electronic Products

Subitem Instructions: The presence of any JIG Level A or B substances must be declared. [1] indicate the subpart in which the substance is located, [2] provide a description of the homogeneous material [3], enter the weight of the homogeneous material.

Substance Instructions: [A] select the Level (JIG A, JIG B, Requester or Supplier) [B] select the substance category (JIG or Requester) or enter a value (Supplier). [C] select the substance (JIG) or enter the substance and CAS (Other). [D] select a RoHS exemption, if applicable [E] enter the weight of the substance or the PPM concentration [F] Optionally enter the positive (+) and negative (-) tolerance in percent (Note: percent tolerance values are expected to cover a 3 sigma range of distribution unless otherwise noted).

Line Functions: +I Inserts a New Item /Subitem +M Inserts a new Material +C Inserts a new Substance Category +S Inserts a new Substance - Deletes the element line

	Item/Subitem Name		Homogeneous Material	Weight	Unit of Measure	Level	Substance Category	Substance	CAS	Exempt	Weight	Unit of Measure	Tolerance		PPM
													-	+	
+I	-I	PBO HD8820	+M -M Dielectric	0.1555	mg	+C -C Supplier	Proprietary	+S -S Proprietary	Trade Secret		0.1555	mg			20,265
+I	-I	Titanium	+M -M Redistribution	0.0035	mg	+C -C Supplier	Ti	+S -S Ti	7440-32-6		0.0035	mg			459
+I	-I	Copper	+M -M Redistribution	0.2876	mg	+C -C Supplier	Cu	+S -S Cu	7440-50-8		0.2876	mg			37,477
+I	-I	Titanium	+M -M Under Bump Metal	0.0035	mg	+C -C Supplier	Ti	+S -S Ti	7440-32-6		0.0035	mg			459
+I	-I	Copper	+M -M Under Bump Metal	0.6027	mg	+C -C Supplier	Cu	+S -S Cu	7440-50-8		0.6027	mg			78,523
+I	-I	Solder Ball	+M -M Interconnect	2.1049	mg	+C -C Supplier	Sn	+S -S Sn	7440-31-5		2.0102	mg			261,91
						+C -C Supplier	Ag	+S -S Ag	7440-22-4		0.0842	mg			10,970
						+C -C Supplier	Cu	+S -S Cu	7440-50-8		0.0105	mg			1,371
+I	-I	Die	+M -M Circuit	4.1992	mg	+C -C Supplier	Si	+S -S Si	7440-21-3		4.1992	mg			547,12
+I	-I	Coating Film	+M -M LC2850	0.3179	mg	+C -C Supplier	Silica	+S -S Silica	Trade Secret		0.1825	mg			23,766
						+C -C Supplier	Epoxy Resin	+S -S Epoxy Resin	Trade Secret		0.0677	mg			8,823
						+C -C Supplier	Acrylic Resin	+S -S Acrylic Resin	Trade Secret		0.0677	mg			8,823

* Required Field

CAS Registry Number(R) is a Registered Trademark of the American Chemical Society

Form enabled by Adobe



Material Composition Declaration

© Copyright 2005. IPC, Bannockburn, Illinois. All rights reserved under both international and Pan-American copyright conventions.

This document is a declaration of the substances within the manufacturer listed item. Note: if the item is an assembly with lower level parts, the declaration encompasses all lower level materials for which the manufacturer has engineering responsibility.

Adobe Reader version 7.0.5 is required to complete this declaration.

1752-2 1.1	IPC Web Site for Information on IPC-1752 Standard http://www.ipc.org/IPC-175x	Form Type * Distribute	Declaration Class * Class 6 - RoHS Yes/No, Homogeneous Materials and Mfg Information
------------	--	----------------------------------	--

Supplier Information

Company Name * Cypress Semiconductor Corp	Company Unique ID CY	Unique ID Authority CY	Response Date * 2018-10-08	Response Document ID				
Contact Name * Quality Customer Support Center	Title - Contact Quality Customer Support Group	Phone - Contact * 6328497500	Email - Contact * qacs_team@cypress.com	Duplicate Contact -> Authorized Representative				
Authorized Representative * Jeff Gary Balesca	Title - Representative EH&S Engineer	Phone - Representative * 6328497500	Email - Representative * jgtb@cypress.com	Supplier Comments or URL for Additional Information				
Requester Item Number	Mfr Item Number	Mfr Item Name	Effective Date	Version	Manufacturing Site	Weight *	UOM	Unit Type
FN25 (2.07X2.11X0.55 MM)	FN25 (2.07X2.11X0.55 MM)	FN25 (2.07X2.11X0.55 MM)	2018-10-08		ASE - Taiwan	4.6364	mg	Each
Alternate Recommendation		Alternate Item Comments						

Manufacturing Process Information

Terminal Plating / Grid Array Material Tin/Silver/Copper (Sn/Ag/Cu)	Terminal Base Alloy CU Alloy	J-STD-020 MSL Rating 1	Peak Process Body Temperature 260 C	Max Time at Peak Temperature 30 seconds	Number of Reflow Cycles 3
Comments					

* Required Field

CAS Registry Number(R) is a Registered Trademark of the American Chemical Society

Form enabled by Adobe

Save the fields in this form to a file	<input type="button" value="Export Data"/>	Import fields from a file into this form	<input type="button" value="Import Data"/>	Clear all of the fields on this form	<input type="button" value="Reset Form"/>	Lock the fields on this form to prevent changes	<input type="button" value="Lock Supplier Fields"/>
--	--	--	--	--------------------------------------	---	---	---

RoHS Material Composition Declaration	Declaration Type *	<input type="button" value="Detailed"/>
--	---------------------------	---

RoHS Directive 2002/95/EC	RoHS Definition: Quantity limit of 0.1% by mass (1000 PPM) in homogeneous material for: Lead (Pb), Mercury, Hexavalent Chromium, Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE) and quantity limit of 0.01% by mass (100 PPM) of homogeneous material for Cadmium
----------------------------------	---

Please indicate whether any homogeneous material (as defined by the RoHS Directive, EU 2002/95/EC and implemented by the laws of the European Union member states) of the part identified on this form contains lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and/or polybrominated diphenyl ethers (each a "RoHS restricted substance") in excess of the applicable quantity limit identified above. If a homogeneous material within the part contains a RoHS restricted substance in excess of an applicable quantity limit, please indicate below which, if any, RoHS exemption you believe may apply. If the part is an assembly with lower level components, the declaration shall encompass all such components. Supplier certifies that it gathered the information it provides in this form using appropriate methods to ensure its accuracy and that such information is true and correct to the best of its knowledge and belief, as of the date that Supplier completes this form. Supplier acknowledges that Company will rely on this certification in determining the compliance of its products with European Union member state laws that implement the RoHS Directive. Company acknowledges that Supplier may have relied on information provided by others in completing this form, and that Supplier may not have independently verified such information. However, in situations where Supplier has not independently verified information provided by others, Supplier agrees that, at a minimum, its suppliers have provided certifications regarding their contributions to the part, and those certifications are at least as comprehensive as the certification in this paragraph. If the Company and the Supplier enter into a written agreement with respect to the identified part, the terms and conditions of that agreement, including any warranty rights and/or remedies provided as part of that agreement, will be the sole and exclusive source of the Supplier's liability and the Company's remedies for issues that arise regarding information the Supplier provides in this form. In the absence of such written agreement, the warranty rights and/or remedies of Supplier's Standard Terms and Conditions of Sale applicable to such part shall apply.

RoHS Declaration *	1 - Item(s) does not contain RoHS restricted substances per the definition above	Supplier Acceptance *	<input type="button" value="Accepted"/>
---------------------------	--	------------------------------	---

Exemptions: If the declared item does not contain RoHS restricted substances per the definition above except for defined RoHS exemptions, then select the corresponding response in the RoHS Declaration above and choose all applicable exemptions.

Declaration Signature

Instructions: Complete all of the required fields on all pages of this form. Select the "Accepted" on the Supplier Acceptance drop-down. This will display the signature area. Digitally sign the declaration (if required by the Requester) and click on Submit Form to have the form returned to the Requester.

Supplier Digital Signature	Jeff Gary Balleca	<small>Digitally signed by Jeff Gary Balleca DN: cn=Jeff Gary Balleca, o.ou, email=jgb@cyress.com, c=US Date: 2018.10.08 11:00:44 +08'00'</small>
----------------------------	--------------------------	---

* Required Field

CAS Registry Number(R) is a Registered Trademark of the American Chemical Society

Form enabled by Adobe

Homogeneous Material Composition Declaration for Electronic Products

Subitem Instructions: The presence of any JIG Level A or B substances must be declared. [1] indicate the subpart in which the substance is located, [2] provide a description of the homogeneous material [3], enter the weight of the homogeneous material.

Substance Instructions: [A] select the Level (JIG A, JIG B, Requester or Supplier) [B] select the substance category (JIG or Requester) or enter a value (Supplier). [C] select the substance (JIG) or enter the substance and CAS (Other). [D] select a RoHS exemption, if applicable [E] enter the weight of the substance or the PPM concentration [F] Optionally enter the positive (+) and negative (-) tolerance in percent (Note: percent tolerance values are expected to cover a 3 sigma range of distribution unless otherwise noted).

Line Functions: +I Inserts a New Item /Subitem +M Inserts a new Material +C Inserts a new Substance Category +S Inserts a new Substance - Deletes the element line

	Item/Subitem Name		Homogeneous Material	Weight	Unit of Measure	Level	Substance Category	Substance	CAS	Exempt	Weight	Unit of Measure	Tolerance		PPM
													-	+	
+I	-I	PBO HD8820	+M -M Dielectric	0.0995	mg	+C -C Supplier	Proprietary	+S -S Proprietary	Trade Secret		0.0995	mg			21,553
+I	-I	Titanium	+M -M Redistribution	0.0223	mg	+C -C Supplier	Ti	+S -S Ti	7440-32-6		0.0223	mg			498
+I	-I	Copper	+M -M Redistribution	0.184	mg	+C -C Supplier	Cu	+S -S Cu	7440-50-8		0.184	mg			39,857
+I	-I	Titanium	+M -M Under Bump Metal	0.0023	mg	+C -C Supplier	Ti	+S -S Ti	7440-32-6		0.0023	mg			498
+I	-I	Copper	+M -M Under Bump Metal	0.3855	mg	+C -C Supplier	Cu	+S -S Cu	7440-50-8		0.3855	mg			83,505
+I	-I	Solder Ball	+M -M Interconnect	0.9383	mg	+C -C Supplier	Sn	+S -S Sn	7440-31-5		0.8961	mg			194,100
						+C -C Supplier	Ag	+S -S Ag	7440-22-4		0.0375	mg			8,123
						+C -C Supplier	Cu	+S -S Cu	7440-50-8		0.0047	mg			1,018
+I	-I	Die	+M -M Circuit	2.8012	mg	+C -C Supplier	Si	+S -S Si	7440-21-3		2.8012	mg			606,800
+I	-I	Top Surface Laminate	+M -M Mark Surface	0.2033	mg	+C -C Supplier	Silica	+S -S Silica	Trade Secret		0.1167	mg			25,270
						+C -C Supplier	Epoxy Resin	+S -S Epoxy Resin	Trade Secret		0.0433	mg			9,379
						+C -C Supplier	Acrylic Resin	+S -S Acrylic Resin	Trade Secret		0.0433	mg			9,379

* Required Field

CAS Registry Number(R) is a Registered Trademark of the American Chemical Society

Form enabled by Adobe

Cypress Semiconductor Package Qualification Report

QTP# 191401 VERSION
April 2019**

**20-Ball (1.63x2.03x0.55mm)
25-Ball (2.02x1.93x0.48mm/2.07x2.11x0.55mm)
34-Ball (2.495x2.44x0.55mm)
35-Ball (3.23x2.10x0.55mm/2.582x2.097x0.482mm)
45-Ball (1.975x3.68x0.48mm)
Wafer Level Chip Scale Package (WLCSP)
MSL1, 260C
ASE-Taiwan (G/AH)**

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

Prepared By:
Josephine Pineda (JYF)
Sr. Staff Reliability Engineer

Reviewed By:
Lorena Zapanta (ILZ)
Sr. Principal Reliability Engineer

Approved By:
David Hoffman (DHH)
Reliability Director

PACKAGE QUALIFICATION HISTORY

QTP Number	Description of Qualification Purpose	Date
154802	New WLCSP Assembly Site Qualification at ASE-Taiwan (G) using 25-Ball WLCSP	January 2016
191401	Qualification of 20/25/34/35/45-Ball Wafer Level Chip Scale Package (WLCSP) at ASE-Taiwan (G/AH)	April 2019

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	FN20B, FN25A/FN25C, FN34A, FN35A/FN35B, FN45A
Package Outline, Type, or Name:	20-Ball WLCSP (1.63x2.03x0.55mm) 25-Ball WLCSP (2.02x1.93x0.48mm/2.07x2.11x0.55mm) 34-Ball WLCSP (2.495x2.44x0.55mm) 35-Ball WLCSP (3.23x2.10x0.55mm/2.582x2.097x0.482mm) 45-Ball WLCSP (1.975x3.68x0.48mm)
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Saw Process
Solder Ball/Bump Material:	SAC-405
Bonding Method:	Bump/ RDL
Package Cross Section Yes/No:	N/A
Name/Location of Assembly (prime) facility:	ASE-Taiwan (G/AH)
MSL Level	1
Reflow Profile	260C

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	ASE-Taiwan (AH)



RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

Stress/Test	Test Condition (Temp/Bias)	Result P/F
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//1,000V/1,250V JESD22-C101	P
Electrostatic Discharge Human Body Model (ESD-HBM)	1,100V/2,200V /3,300V JESD22, Method A114	P
External Visual	MIL-PRF-38535, MIL-STD-883,Method 2009	P
Final Visual	JESD22-B101	P
Functional Board Level Reliability Test	Temperature Cycle,-40°C to 85°C	P
High Accelerated Saturation Test (HAST)	JEDEC STD 22-A110: 130°C, 85%RH, 2.27V/5.5V Precondition: JESD22 Moisture Sensitivity Level (168 Hrs., 85°C, 85% RH, 260°C Reflow)	P
High Accelerated Saturation Test (HAST) – Unbiased	JEDEC STD 22-A110: 130°C, 85%RH Precondition: JESD22 Moisture Sensitivity MSL 1 (168 Hrs.,85°C, 85%RH, 260°C Reflow)	P
High Temperature Operating Life Early Failure Rate	Dynamic Operating Condition, Vcc Max=1.8V, 125°C JESD22-A-108	P
High Temperature Operating Life Latent Failure Rate	Dynamic Operating Condition, Vcc Max=1.8V, 125°C JESD22-A-108	P
High Temp Storage	JESD22-A103: 150°C, no bias	P
Internal Visual	MIL-STD-883-2014	P
Physical Dimension	MIL-STD-1835, JESD22-B100	P
Pressure Cooker Test	JESD22-A102, 121°C, 100%RH, 15 PSIG Precondition: JESD22 Moisture Sensitivity Level (168 Hrs., 85°C, 85% RH, 260°C Reflow)	P
Solder Ball/Bump Shear	JESD22-B117	P
Solderability Test	J-STD-002, JESD22-B102	P
Temperature Cycle	MIL-STD-883, Method 1010, Condition B, -55°C to 125°C Precondition: JESD22 Moisture Sensitivity Level (168 Hrs., 85°C, 85% RH, 260°C Reflow)	P



Reliability Test Data

QTP #: 154802

<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: CONSTRUCTIONAL ANALYSIS							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	COMP	5	0	
STRESS: DYE PENETRANT TEST							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	COMP	15	0	
STRESS: ESD-CHARGE DEVICE MODEL							
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	500	9	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	1000	3	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	1250	3	0	
STRESS: ESD-HUMAN BODY MODEL PER JESD22, METHOD A114							
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	1100	3	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	2200	8	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	3300	3	0	
STRESS: EXTERNAL VISUAL							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	COMP	5811	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	COMP	5739	0	
STRESS: FINAL VISUAL							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	COMP	25	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	COMP	16	0	
CY8C4246FNI (8F480000A)	4528732	611533010	G-TAIWAN	COMP	18	0	
STRESS: FUNCTIONAL BOARD LEVEL RELIABILITY TEST, TC COND.N -40C TO 85C							
CY8C4247FNI (8F42478A)	4427504	611431846	DT-PHILS	256	502	0	
TRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 2.27V), PRE COND 168 HR 85C/85%RH (MSL1)							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	96	30	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	96	30	0	
STRESS: UNBIASED HI-ACCEL SATURATION TEST (130C, 85%RH), PRE COND 168 HR 85C/85%RH (MSL1)							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	96	80	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	96	80	0	
CY8C4246FNI (8F480000A)	4528732	611533010	G-TAIWAN	96	80	0	



Reliability Test Data
QTP #: 154802

<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 TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (125C, 1.8V, Vcc Max)							
MB9AF01AM	MIFS # 101	4K55169	G-TAIWAN	COMP	78	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (125C, 1.8V, Vcc Max)							
MB9AF01AM	MIFS # 101	4K55169	G-TAIWAN	COMP	75	0	
STRESS: HIGH TEMPERATURE STORAGE, 150C							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	500	80	0	
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	1000	80	0	
STRESS: PHYSICAL DIMENSION							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	COMP	30	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	COMP	30	0	
CY8C4246FNI (8F480000A)	4528732	611533010	G-TAIWAN	COMP	30	0	
STRESS: SOLDER BALL/BUMP SHEAR							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	COMP	5	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	COMP	5	0	
CY8C4246FNI (8F480000A)	4528732	611533010	G-TAIWAN	COMP	5	0	
STRESS: TC COND. B -55C TO 125C, PRE COND 168 HRS 85C/85%RH, MSL 1							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	500	80	0	
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	1000	80	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	500	80	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	1000	80	0	
CY8C4246FNI (8F480000A)	4528732	611533010	G-TAIWAN	500	80	0	
CY8C4246FNI (8F480000A)	4528732	611533010	G-TAIWAN	1000	80	0	



Reliability Test Data
QTP #: 191401

<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: CONSTRUCTIONAL ANALYSIS							
CYPD2103 (7F64100A)	4524074	611607212	AH-TAIWAN	COMP	5	0	
CYPD2104 (7F64100A)	4524074	611607213	AH-TAIWAN	COMP	5	0	
CYPD2103 (7F64100A)	4524074	611607214	AH-TAIWAN	COMP	5	0	
CP8645XTT (8F44320CB)	3708108	611709436	AH-TAIWAN	COMP	5	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709440	AH-TAIWAN	COMP	5	0	
STRESS: DYE PENETRANT TEST							
CYPD2103 (7F64100A)	4524074	611607212	AH-TAIWAN	COMP	15	0	
CYPD2104 (7F64100A)	4524074	611607213	AH-TAIWAN	COMP	15	0	
CYPD2103 (7F64100A)	4524074	611607214	AH-TAIWAN	COMP	15	0	
STRESS: ESD-CHARGE DEVICE MODEL							
CP8645XTT (8F44320CB)	3708108	611709436	AH-TAIWAN	500	9	0	
CP8645XTT (8F44320CB)	3708108	611709436	AH-TAIWAN	1000	3	0	
CP8645XTT (8F44320CB)	3708108	611709436	AH-TAIWAN	1250	3	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709440	AH-TAIWAN	500	9	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709440	AH-TAIWAN	1000	3	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709440	AH-TAIWAN	1250	3	0	
STRESS: ESD-HUMAN BODY MODEL							
CY8C4146FNI2 (8F41005BB)	3708104	611709440	AH-TAIWAN	1100	3	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709440	AH-TAIWAN	2200	8	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709440	AH-TAIWAN	3300	3	0	
STRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 5.5V), PRE COND 168 HR 85C/85%RH (MSL1)							
CY8C4146FNI2 (8F41005BB)	3708104	611709440	AH-TAIWAN	96	80	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709439	AH-TAIWAN	96	80	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709438	AH-TAIWAN	96	79	0	
CYPDC1186 (7F64361A)	3737039	611736463	AH-TAIWAN	96	79	0	
CYPDC1186 (7F64361A)	3742149	611743512	AH-TAIWAN	96	79	0	
CYPDC1186 (7F64361B)	3752081	611801306	AH-TAIWAN	96	78	0	



Reliability Test Data
QTP #: 191401

<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: UNBIASED HI-ACCEL SATURATION TEST (130C, 85%RH), PRE COND 168 HR 85C/85%RH (MSL1)							
CYPD2103 (7F64100A)	4524074	611607212	AH-TAIWAN	96	83	0	
CYPD2104 (7F64100A)	4524074	611607213	AH-TAIWAN	96	89	0	
CYPD2103 (7F64100A)	4524074	611607214	AH-TAIWAN	96	89	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709440	AH-TAIWAN	96	80	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709439	AH-TAIWAN	96	80	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709438	AH-TAIWAN	96	80	0	
CYPDC1186 (7F64361A)	3737039	611736463	AH-TAIWAN	96	74	0	
CYPDC1186 (7F64361A)	3742149	611743512	AH-TAIWAN	96	80	0	
CYPDC1186 (7F64361A)	3742149	611743513	AH-TAIWAN	96	80	0	
STRESS: INTERNAL VISUAL							
CYPD2103 (7F64100A)	4524074	611607212	AH-TAIWAN	COMP	5	0	
CYPD2104 (7F64100A)	4524074	611607213	AH-TAIWAN	COMP	5	0	
CYPD2103 (7F64100A)	4524074	611607214	AH-TAIWAN	COMP	5	0	
STRESS: PHYSICAL DIMENSION							
CYPD2103 (7F64100A)	4524074	611607212	AH-TAIWAN	COMP	30	0	
CYPD2104 (7F64100A)	4524074	611607213	AH-TAIWAN	COMP	30	0	
CYPD2103 (7F64100A)	4524074	611607214	AH-TAIWAN	COMP	30	0	
CP8645XTT (8F44320CB)	3708108	611709436	AH-TAIWAN	COMP	30	0	
CP8645XTT (8F44320CB)	3708108	611709434	AH-TAIWAN	COMP	30	0	
CP8645XTT (8F44320CB)	3708108	611709435	AH-TAIWAN	COMP	30	0	
CP8645XTT (8F44320CB)	3708108	611709437	AH-TAIWAN	COMP	30	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709440	AH-TAIWAN	COMP	30	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709439	AH-TAIWAN	COMP	30	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709438	AH-TAIWAN	COMP	30	0	
CYPDC1186 (7F64361A)	3731012	611729308	AH-TAIWAN	COMP	20	0	
CYPDC1186 (7F64361A)	3731012	611731662	AH-TAIWAN	COMP	20	0	
CYPDC1186 (7F64361A)	3731012	611731178	AH-TAIWAN	COMP	20	0	



Reliability Test Data
QTP #: 191401

<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: PRESSURE COOKER TEST (121C, 100%RH, 15 Psig), PRE COND 168 HR 85C/85%RH (MSL1)							
CYPD2103 (7F64100A)	4524074	611607212	AH-TAIWAN	96	76	0	
CYPD2104 (7F64100A)	4524074	611607213	AH-TAIWAN	96	79	0	
CYPD2103 (7F64100A)	4524074	611607214	AH-TAIWAN	96	79	0	
STRESS: SOLDER BALL/BUMP SHEAR							
CYPD2103 (7F64100A)	4524074	611607212	AH-TAIWAN	COMP	5	0	
CYPD2104 (7F64100A)	4524074	611607213	AH-TAIWAN	COMP	5	0	
CYPD2103 (7F64100A)	4524074	611607214	AH-TAIWAN	COMP	5	0	
CP8645XTT (8F44320CB)	3708108	611709436	AH-TAIWAN	COMP	25	0	
CP8645XTT (8F44320CB)	3708108	611709434	AH-TAIWAN	COMP	25	0	
CP8645XTT (8F44320CB)	3708108	611709435	AH-TAIWAN	COMP	25	0	
CP8645XTT (8F44320CB)	3708108	611709437	AH-TAIWAN	COMP	25	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709440	AH-TAIWAN	COMP	5	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709439	AH-TAIWAN	COMP	5	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709438	AH-TAIWAN	COMP	5	0	
CYPDC1186 (7F64361A)	3731012	611729308	AH-TAIWAN	COMP	25	0	
CYPDC1186 (7F64361A)	3731012	611731662	AH-TAIWAN	COMP	25	0	
CYPDC1186 (7F64361A)	3731012	611731178	AH-TAIWAN	COMP	25	0	
STRESS: SOLDERABILITY TEST							
CYPD2103 (7F64100A)	4524074	611607212	AH-TAIWAN	COMP	5	0	
CYPD2104 (7F64100A)	4524074	611607213	AH-TAIWAN	COMP	5	0	
CYPD2103 (7F64100A)	4524074	611607214	AH-TAIWAN	COMP	5	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709440	AH-TAIWAN	COMP	5	0	
CYPDC1186 (7F64361A)	3737039	611736463	AH-TAIWAN	COMP	5	0	
CYPDC1186 (7F64361A)	3742149	611743512	AH-TAIWAN	COMP	5	0	
CYPDC1186 (7F64361A)	3742149	611743513	AH-TAIWAN	COMP	5	0	



Reliability Test Data

QTP #: 191401

<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. B -55C TO 125C, PRE COND 168 HRS 85C/85%RH, MSL1							
CYPD2103 (7F64100A)	4524074	611607212	AH-TAIWAN	700	89	0	
CYPD2104 (7F64100A)	4524074	611607213	AH-TAIWAN	700	87	0	
CYPD2103 (7F64100A)	4524074	611607214	AH-TAIWAN	700	87	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709440	AH-TAIWAN	1000	80	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709439	AH-TAIWAN	1000	80	0	
CY8C4146FNI2 (8F41005BB)	3708104	611709438	AH-TAIWAN	1000	80	0	
CYPDC1186 (7F64361A)	3737039	611736463	AH-TAIWAN	700	80	0	
CYPDC1186 (7F64361A)	3737039	611736463	AH-TAIWAN	1000	80	0	
CYPDC1186 (7F64361A)	3742149	611743512	AH-TAIWAN	700	80	0	
CYPDC1186 (7F64361A)	3742149	611743512	AH-TAIWAN	1000	80	0	
CYPDC1186 (7F64361A)	3742149	611743513	AH-TAIWAN	700	80	0	
CYPDC1186 (7F64361A)	3742149	611743513	AH-TAIWAN	1000	78	0	



Document History Page

Document Title: QTP# 191401: QUALIFICATION OF 20/25/34/35/45-BALL WAFER LEVEL CHIP SCALE PACKAGE (WLCSP), MSL1, 260C ASE-Taiwan (G/AH)
Document Number: 002-27107

Rev.	ECN No.	Orig. of Change	Description of Change
**	6553493	JYF	Initial release.

Marketing Part Number	Sample Order Part #	Package	Sample Availability
CY8C4024FNI-S402T	CY8C4024FNI-S402TKG	25-Ball WCLSP (2.02X1.93X0.48MM)	May-19
CY8C4024FNI-S412T	CY8C4024FNI-S412TKG	25-Ball WCLSP (2.02X1.93X0.48MM)	May-19
CY8C4025FNI-S402T	CY8C4025FNI-S402TKG	25-Ball WCLSP (2.02X1.93X0.48MM)	Subject to leadtime
CY8C4025FNI-S412T	CY8C4025FNI-S412TKG	25-Ball WCLSP (2.02X1.93X0.48MM)	Subject to leadtime
CY8C4045FNI-DS402T	CY8C4045FNI-DS402TKG	25-Ball WLCSP (2.07x2.11x0.55MM)	Subject to leadtime
CY8C4045FNI-S412T	CY8C4045FNI-S412TKG	25-Ball WCLSP (2.02X1.93X0.48MM)	Subject to leadtime
CY8C4124FNI-443T	CY8C4124FNI-443TKG	35-Ball WLCSP (3.23X2.10X0.55MM)	Subject to leadtime
CY8C4124FNI-S403T	CY8C4124FNI-S403TKG	35-Ball WLCSP (2.582X2.097X0.482MM)	Subject to leadtime
CY8C4124FNI-S413T	CY8C4124FNI-S413TKG	35-Ball WLCSP (2.582X2.097X0.482MM)	Subject to leadtime
CY8C4124FNI-S433T	CY8C4124FNI-S433TKG	35-Ball WLCSP (2.582X2.097X0.482MM)	Subject to leadtime
CY8C4125FNI-483T	CY8C4125FNI-483TKG	35-Ball WLCSP 3.23X2.10X0.55MM	Subject to leadtime
CY8C4125FNI-S413T	CY8C4125FNI-S413TKG	35-Ball WLCSP (2.582X2.097X0.482MM)	May-19
CY8C4125FNI-S423T	CY8C4125FNI-S423TKG	35-Ball WLCSP (2.582X2.097X0.482MM)	Subject to leadtime
CY8C4125FNI-S433T	CY8C4125FNI-S433TKG	35-Ball WLCSP (2.582X2.097X0.482MM)	Subject to leadtime
CY8C4146FNI-S423T	CY8C4146FNI-S423TKG	35-Ball WLCSP (2.582X2.097X0.482MM)	Subject to leadtime
CY8C4146FNI-S433T	CY8C4146FNI-S433TKG	35-Ball WLCSP (2.582X2.097X0.482MM)	May-19
CY8C4244FNI-443T	CY8C4244FNI-443TKG	35-Ball WLCSP (3.23X2.10X0.55MM)	Subject to leadtime
CY8C4245FNI-483T	CY8C4245FNI-483TKG	35-Ball WLCSP (3.23X2.10X0.55MM)	Subject to leadtime
CY8C4245FNI-DS402T	CY8C4245FNI-DS402TKG	25-Ball WLCSP (2.07x2.11x0.55MM)	Subject to leadtime
CY8C4246FNI-DS402T	CY8C4246FNI-DS402TKG	25-Ball WLCSP (2.07x2.11x0.55MM)	Subject to leadtime
CY8C4724FNI-S402T	CY8C4724FNI-S402TKG	25-Ball WCLSP (2.02X1.93X0.48MM)	Subject to leadtime
CY8C4725FNI-S402T	CY8C4725FNI-S402TKG	25-Ball WCLSP (2.02X1.93X0.48MM)	Subject to leadtime
CY8C4744FNI-S402T	CY8C4744FNI-S402TKG	25-Ball WCLSP (2.02X1.93X0.48MM)	Subject to leadtime
CY8C4745FNI-S402T	CY8C4745FNI-S402TKG	25-Ball WCLSP (2.02X1.93X0.48MM)	Subject to leadtime
CY8C4745FNI-S412T	CY8C4745FNI-S412TKG	25-Ball WCLSP (2.02X1.93X0.48MM)	Subject to leadtime