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# Cypress Semiconductor Package Qualification Report

**QTP# 053006 VERSION\*A**  
**September 2014**

**8/14/16/20/24/28-Lead TSSOP (173Mils)**  
**Pb-Free, MSL3**  
**235C & 260C Reflow**  
**OSE-Taiwan**

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

QUAL REPORT	DESCRIPTION OF QUALIFICATION PURPOSE	DATE COMP.
053006	8/14/16/20/24/28-Lead TSSOP (173Mils), Pb-Free, MSL1, 260C Reflow assembled at OSE-Taiwan	Aug 05
024701	Cypress established policy requiring MSL and Reflow Peak Temperature alignment for Cypress and its Assembly Subcontractors. Downgrade from MSL1 to MSL3	Nov 06

### MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION

<b>Package Designation:</b>	ZZ28
<b>Package Outline, Type, or Name:</b>	28-Lead Thin Shrunk Small Outline (173 Mils)
<b>Mold Compound Name/Manufacturer:</b>	CEL 9200HF / Hitachi
<b>Mold Compound Flammability Rating:</b>	UL94 – V0
<b>Oxygen Rating Index: &gt;28%</b>	None
<b>Leadframe Material:</b>	Cu Alloy
<b>Lead Finish, Composition / Thickness:</b>	NiPdAu - Ni -20-80uinch, Pd – 0.8-6.0uinch, Au – 0.1-0.6uinch
<b>Die Backside Preparation</b>	Grinding
<b>Die Separation Method:</b>	Sawing
<b>Die Attach Supplier:</b>	Hitachi
<b>Die Attach Material:</b>	EN 4900G
<b>Die Attach Method:</b>	Epoxy
<b>Wire Bond Method:</b>	Thermosonic
<b>Wire Material/Size:</b>	Au. 1.0 mil
<b>Thermal Resistance Theta JA C/W:</b>	89 °C/W
<b>Package Cross Section Yes/No:</b>	N/A
<b>Assembly Process Flow:</b>	49-35999M
<b>Name/Location of Assembly (prime) facility:</b>	OSE-Taiwan (T)
<b>MSL Level</b>	3
<b>Reflow Profile</b>	235C & 260C

### ELECTRICAL TEST / FINISH DESCRIPTION

<b>Test Location:</b>	CML-R
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### RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

Stress/Test	Test Condition (Temp/Bias)	Result P/F
Temperature Cycle	MIL-STD-883C, Method 1010, Condition C, -65 C to 150 C Precondition: JESD22 Moisture Sensitivity MSL1 168 Hrs 85°C/85%RH+3IR-Reflow, 260°C+0, -5°C	P
Pressure Cooker Test	121°C, 100%RH, 15 Psig Precondition: JESD22 Moisture Sensitivity MSL1 168 Hrs 85°C/85%RH+3IR-Reflow, 260°C+0, -5°C	P
High Accelerated Saturation Test (HAST)	130°C, 3.63V, 85%RH Precondition: JESD22 Moisture Sensitivity MSL1 168 Hrs 85°C/85%RH+3IR-Reflow, 260°C+0, -5°C	P
Acoustics Microscopy	J-STD-020	P
Adhesion of Lead Finish	MIL-STD-883, Method 2025	P
Ball Shear	JESD22-B116A	P
Bond Pull	MIL-STD-883 – Method 2011,	P
External Visual	MIL-PRF-38535, MILSTD-883, METHOD 2009	P
Internal Visual	MIL-STD-883-2014	P
Lead Integrity	JESD22-B105, MIL STD 883	P
Physical Dimension	MIL-STD-1835, JESD22-B100	P
Solderability	J-STD-002, JESD22-B102	P
Wetting Balance	Mil-Std-883F Method 2022.2	P
X-ray	MIL-STD-883 - 2012	P



## Reliability Test Data

**QTP #: 053006**

<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, MSL1</b>							
CYI5002ZXC (7C8C5002B)	9403158	610520657	TAIWN-T	COMP	15	0	
CYI5002ZXC (7C8C5002B)	9403158	610520658	TAIWN-T	COMP	15	0	
CYI5002ZXC (7C8C5002B)	9403158	610520659	TAIWN-T	COMP	15	0	
<b>STRESS: BALL SHEAR</b>							
CYI5002ZXC (7C8C5002B)	9403158	610520657	TAIWN-T	COMP	10	0	
<b>STRESS: BOND PULL</b>							
CYI5002ZXC (7C8C5002B)	9403158	610520657	TAIWN-T	COMP	10	0	
<b>STRESS: CROSS SECTION</b>							
CYI5002ZXC (7C8C5002B)	9403158	610520657	TAIWN-T	COMP	5	0	
CYI5002ZXC (7C8C5002B)	9403158	610520658	TAIWN-T	COMP	5	0	
CYI5002ZXC (7C8C5002B)	9403158	610520659	TAIWN-T	COMP	5	0	
<b>STRESS: EXTERNAL VISUAL</b>							
CYI5002ZXC (7C8C5002B)	9403158	610520657	TAIWN-T	COMP	15	0	
<b>STRESS: INTERNAL VISUAL</b>							
CYI5002ZXC (7C8C5002B)	9403158	610520657	TAIWN-T	COMP	5	0	
<b>STRESS: HI-ACCEL SATURATION TEST, 130C, 3.63V, 85%RH, PRE COND 168 HR 85C/85%RH, MSL1</b>							
CYI5002ZXC (7C8C5002B)	9403158	610520657	TAIWN-T	128	49	0	
<b>STRESS: LEAD FINISH ADHESION</b>							
CYI5002ZXC (7C8C5002B)	9403158	610520657	TAIWN-T	COMP	5	0	
CYI5002ZXC (7C8C5002B)	9403158	610520658	TAIWN-T	COMP	5	0	
CYI5002ZXC (7C8C5002B)	9403158	610520659	TAIWN-T	COMP	5	0	
<b>STRESS: LEAD INTEGRITY</b>							
CYI5002ZXC (7C8C5002B)	9403158	610520657	TAIWN-T	COMP	3	0	
<b>STRESS: PRESSURE COOKER TEST, 121C, 100%RH, 15 Psig, PRE COND 168H 85C/85%RH, MSL1</b>							
CYI5002ZXC (7C8C5002B)	9403158	610520657	TAIWN-T	168	49	0	
<b>STRESS: X-RAY</b>							
CYI5002ZXC (7C8C5002B)	9403158	610520657	TAIWN-T	COMP	15	0	



## Reliability Test Data

**QTP #: 053006**

<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>
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**STRESS: PHYSICAL DIMENSION**

CYI5002ZXC (7C8C5002B)	9403158	610520657	TAIWN-T	COMP	5	0	
CYI5002ZXC (7C8C5002B)	9403158	610520658	TAIWN-T	COMP	5	0	
CYI5002ZXC (7C8C5002B)	9403158	610520659	TAIWN-T	COMP	5	0	

**STRESS: SOLDERABILITY**

CYI5002ZXC (7C8C5002B)	9403158	610520657	TAIWN-T	COMP	5	0	
CYI5002ZXC (7C8C5002B)	9403158	610520658	TAIWN-T	COMP	5	0	
CYI5002ZXC (7C8C5002B)	9403158	610520659	TAIWN-T	COMP	5	0	

**STRESS: TC COND. C -65C TO 150C, PRE COND 168 HR 85C/85%RH, MSL1**

CYI5002ZXC (7C8C5002B)	9403158	610520657	TAIWN-T	300	50	0	
CYI5002ZXC (7C8C5002B)	9403158	610520658	TAIWN-T	300	50	0	
CYI5002ZXC (7C8C5002B)	9403158	610520659	TAIWN-T	300	49	0	

**STRESS: WETTING BALANCE**

CYI5002ZXC (7C8C5002B)	9403158	610520657	TAIWN-T	COMP	5	0	
CYI5002ZXC (7C8C5002B)	9403158	610520658	TAIWN-T	COMP	5	0	
CYI5002ZXC (7C8C5002B)	9403158	610520659	TAIWN-T	COMP	5	0	



## Document History Page

Document Title: QTP#053006: 8/14/16/20/24/28-Lead TSSOP (173Mils) Pb-Free, MSL3 235C & 260C Reflow OSE-Taiwan  
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Rev.	ECN No.	Orig. of Change	Description of Change
**	4142818	HSTO	Initial Spec Release Initiate report as per memo LGQ-629
*A	4516853	HSTO	Align qualification report based on the new template in the front page

Distribution: WEB

Posting: None