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Cypress Semiconductor Automotive Package Qualification Report

**QTP# 154605 VERSION **
November 2016**

**32L TSOP (400mil)
NiPdAu leadfinish, Au Wire
MSL3, 260C Reflow
OSE-Taiwan (T)**

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

QTP Number	Description of Qualification Purpose	Date
154605	Qualification of 32L-TSOP (400mil) Automotive Package in OSE-Taiwan (T) using 1.0mil Au wire with G700L mold compound, CRM-1076W die attach material, Roughened leadframe (PPF) and NiPdAu leadfinish at MSL3, 260C Reflow Temperature.	Oct 2016

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	ZW32
Package Outline, Type, or Name:	32L-TSOP (400mil)
Mold Compound Name/Manufacturer:	G700L / Sumitomo
Mold Compound Flammability Rating:	V-0
Mold Compound Alpha Emission Rate:	N/A (Not low alpha mold compound)
Oxygen Rating Index: >28%	54%
Lead Frame Designation:	Full Metal Pad
Lead Frame Material:	Copper
Substrate Material:	N/A
Lead Finish, Composition / Thickness:	Roughened-PPF NiPdAu
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Sawing
Die Attach Supplier:	Sumitomo
Die Attach Material:	CRM-1076W
Bond Diagram Designation	001-54166
Wire Bond Method:	Thermosonic
Wire Material/Size:	Au / 1 mil
Thermal Resistance Theta JA °C/W:	80.41
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	49-41999
Name/Location of Assembly (prime) facility:	OSE-Taiwan (T)
MSL LEVEL	3
REFLOW PROFILE	260C

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	CML (R)

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 Early Failure Rate	AEC-Q100-008 and JESD22-A108, 150°C Dynamic Operating Condition, Vcc Max = 2.3V	P
High Temperature Operating Life Latent Failure Rate	JESD22-A108, 150°C Dynamic Operating Condition, Vcc Max = 2.3V	P
High Accelerated Saturation Test (HAST)	JESD22-A110, 130C, 3.65V, 85%RH Precondition: JESD22-A113 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3IR-Reflow, 260°C+0, -5°C	P
Temperature Cycle	JESD22-A104, -65°C to 150°C Precondition: JESD22-A113 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3IR-Reflow, 260°C+0, -5°C	P
Pressure Cooker	JESD22-A102, 121C, 100%RH, 15 Psig Precondition: JESD22-A113 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3IR-Reflow, 260°C+0, -5°C	P
Acoustic	J-STD-020 Precondition: JESD22-A113 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3IR-Reflow, 260C+0, -5C	P
High Temp Storage	JESD22-A103: 150 C, no bias	P
Wire Bond Pull	Mil-Std 883, Method 2011	P
Post Temperature Cycle Wire Bond Pull	Mil-Std 883, Method 2011	P
Dye Penetrant Test	Criteria: No Package Crack	P
Electrical Distribution	AEC-Q100-009	P
Wire Ball Shear	AEC-Q100-001	P
Constructional Analysis	Criteria: Meet external and internal characteristics of Cypress package	P
Solderability	JESD22-B102	P



Reliability Test Data

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<i>Device</i>	<i>Package</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								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	COMP	22	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	COMP	22	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	COMP	22	0	
STRESS: BALL SHEAR								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	COMP	100	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	COMP	100	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	COMP	100	0	
STRESS: BOND PULL								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	COMP	100	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	COMP	100	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	COMP	100	0	
STRESS: CONSTRUCTIONAL ANALYSIS								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	COMP	5	0	
STRESS: DYE PENETRANT								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	COMP	15	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	COMP	15	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	COMP	15	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 150C, 2.3V, Vcc Max								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	48	800	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	48	798	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	48	796	0	
STRESS: ELECTRICAL DISTRIBUTION								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	COMP	30	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	COMP	30	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	COMP	30	0	



Reliability Test Data

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Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: HI-ACCEL SATURATION TEST, 130C, 3.65V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	96	80	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	96	80	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	96	80	0	
STRESS: HIGH TEMPERATURE STORAGE								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	1000	80	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 2.3V, Vcc Max								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	408	80	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	408	80	0	
STRESS: PRESSURE COOKER TEST								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	96	80	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	168	80	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	96	80	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	168	80	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	96	80	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	168	80	0	
STRESS: POST HIGH TEMPERATURE STORAGE BALL SHEAR								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	1000	5	0	
STRESS: POST HIGH TEMPERATURE STORAGE BOND PULL								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	1000	5	0	
STRESS: POST TCT BALL SHEAR								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	1000	5	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	1000	5	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	1000	5	0	
STRESS: POST TCT BOND PULL								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	1000	5	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	1000	5	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	1000	5	0	



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STRESS: POST PRESSURE COOKER BALL SHEAR								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	168	5	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	168	5	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	168	5	0	
STRESS: POST PRESSURE COOKER BOND PULL								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	168	5	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	168	5	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	168	5	0	
STRESS: POST HI-ACCEL SATURATION TEST BALL SHEAR								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	96	5	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	96	5	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	96	5	0	
STRESS: POST HI-ACCEL SATURATION TEST BOND PULL								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	96	5	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	96	5	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	96	5	0	
STRESS: POST TCT BOND PULL								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	500	5	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	500	5	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	500	5	0	
STRESS: PRE/POST LFR CRITICAL PARAMETERS								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	COMP	30	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	COMP	30	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	COMP	30	0	
STRESS: SOLDERABILITY								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	COMP	15	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	COMP	15	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	COMP	15	0	



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STRESS: TC COND. C -65C TO 150C, PRECONDITION 192 HRS 30C/60%RH								
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	500	85	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532738	OSE-T	1000	80	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	500	85	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532739	OSE-T	1000	79	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	500	85	0	
CY7C1019CV33 (7A1319GC)	ZW32	4503947	611532740	OSE-T	1000	80	0	



Document History Page

Document Title:QTP#154605: AUTOMOTIVE 32L TSOP (400mil) NiPdAu leadfinish, Au Wire MSL3, 260C Reflow OSE-Taiwan (T)

Document Number: 002-17025

Rev.	ECN No.	Orig. of Change	Description of Change
**	5516555	HSTO	Initial spec release