Document No.002-23216 Rev. **
ECN # 6085864

Cypress Semiconductor
Package Qualification Report

QTP# 174301 VERSION**
March 2018

32-Lead TSOP I (8x13.4x1.2mm)

Pure Sn leadfinish, Au and CuPdAu Wire

MSL3, 260°C Reflow

OSE – Taiwan (T)

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

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PACKAGE QUALIFICATION HISTORY

QTP Number	Description of Qualification Purpose	Date
120406	Qualification of 32L STSOP, 32L/48L TSOP, and 32L/44L TSOP II packages built at OSE(T)-Taiwan using 0.8mil Copper Wire, G631 mold compound, CRM1076 epoxy and NiPdAu/Pure Sn Leadfinish MSL3, 260C Reflow Temperature	June 2012
174301	Qualification of 32L TSOP I (ZB32) package assembled at OSE-Taiwan (T) using 0.8mil CuPdAu Wire, G631 mold compound, CRM1076 die attach material, Copper leadframe and Pure Sn leadfinish MSL3, 260C Reflow Temperature.	Jan 2017

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	ZT48A / ZW44A
Package Outline, Type, or Name:	48L-Thin Small Outline Package (2x18.4mm) 48L-Thin Small Outline Package Type II (15.74mm)
Mold Compound Name/Manufacturer:	G631 / Sumitomo
Mold Compound Flammability Rating:	V-0 / UL94
Mold Compound Alpha Emission Rate:	N/A
Oxygen Rating Index: >28%	50%
Lead Frame Designation:	FMP / RMP
Lead Frame Material:	Copper
Substrate Material:	N/A
Lead Finish, Composition / Thickness:	NiPdAu/ Pure Sn
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	SAW Process
Die Attach Supplier:	Sumitomo
Die Attach Material:	CRM-1076
Bond Diagram Designation	001-14702/001-11301/001-12825
Wire Bond Method:	Ultrasonic
Wire Material/Size:	0.8mil (20um) / 100% Cu
Thermal Resistance Theta JA °C/W:	60°C/W, 50.66°C/W
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	49-35999M
Name/Location of Assembly (prime) facility:	OSE(T)-Taiwan
MSL LEVEL	3
REFLOW PROFILE	260C

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	CML-R, G-Taiwan

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

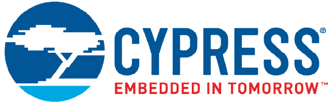
MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	ZB32 / ZB32F
Package Outline, Type, or Name:	32L- Thin Small Outline Package (8x13.4x1.2mm)
Mold Compound Name/Manufacturer:	G631SH / Sumitomo
Mold Compound Flammability Rating:	V-0 / UL94
Mold Compound Alpha Emission Rate:	N/A
Oxygen Rating Index: >28%	54%
Lead Frame Designation:	Full Metal Pad
Lead Frame Material:	Copper
Substrate Material:	N/A
Lead Finish, Composition / Thickness:	Pure Sn
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Wafer Saw
Die Attach Supplier:	Sumitomo
Die Attach Material:	CRM-1076
Bond Diagram Designation	002-21636
Wire Bond Method:	Thermosonic
Wire Material/Size:	Au and CuPdAu / 0.8mil (20um)
Thermal Resistance Theta JA °C/W:	38°C/W
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	49-35999M
Name/Location of Assembly (prime) facility:	OSE(T)-Taiwan
MSL LEVEL	3
REFLOW PROFILE	260C

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	CML-R, G-Taiwan, JT-China

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	Dynamic Operating Condition, Vcc = 3.8, 150 C JESD22-A108	P
High Temperature Operating Life Early Failure Rate	Dynamic Operating Condition, Vcc = 3.8, 150 C JESD22-A108	P
High Accelerated Saturation Test (HAST)	JEDEC STD 22-A110, 130 C, 85%RH, 3.1V/5.5V Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30 C°, 60% RH, 260C Reflow)	P
Pressure Cooker Test	JESD22-A102, 121 C, 100%RH, 15 PSIG Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30 C°, 60% RH, 260C Reflow)	P
Temperature Cycle	MIL-STD-883C, Method 1010, Condition C, -65 C to 150 C Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30 C°, 60% RH, 260C Reflow)	P
High Temp Storage	JESD22-A103, 150 C, no bias Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30 C°, 60% RH, 260C Reflow)	P
Acoustic Microscopy	J-STD-020 Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30 C°, 60% RH, 260C Reflow)	P
Ball Shear	JESD22-B116A, Cpk : 1.33, Ppk : 1.66	P
Bond Pull	MIL-STD-883 – Method 2011, Cpk : 1.33, Ppk : 1.66	P
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
Internal Visual	MIL-STD-883-2014	P
Final Visual Inspection	JESD22-B101B	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-883C, Method 1011, Condition B, -55 C to 125C and JESD22-A106B, Condition C, -55 C to 125C	P
X-Ray	MIL-STD-883 - 2012	P
Post Stress Ball Shear	JESD22-A116	P
Post Stress Bond Shear	MIL-STD-883 - 2011	P
Electrical Characterization	AEC-Q100-009	P



Reliability Test Data

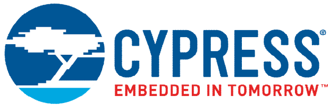
QTP #: 120406

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	COMP	15	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	COMP	15	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	COMP	15	0	
STRESS: BALL SHEAR							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	COMP	10	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	COMP	10	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	COMP	10	0	
STRESS: BOND PULL							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	COMP	10	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	COMP	10	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	COMP	10	0	
STRESS: CONSTRUCTIONAL ANALYIS							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	COMP	5	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	COMP	5	0	
STRESS: CROSS SECTION							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	COMP	5	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	COMP	5	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	COMP	5	0	
STRESS: DYE PENETRATION TEST							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	COMP	15	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	COMP	15	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	COMP	15	0	
STRESS: FINAL VISUAL							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	COMP	2599	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	COMP	879	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	COMP	997	0	

Reliability Test Data

QTP #: 120406

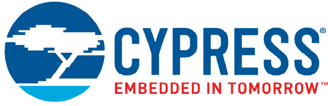
Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ELECTRICAL CHARACTERIZATION							
CY7C1061DV33 (7C1061N)	4127249	611156968	G-TAIWAN	COMP	10	0	
CY7C1061AV33 (7C1061A)	4143040	611158149	G-TAIWAN	COMP	10	0	
CY62167DV30LL (7G62164D)	4033059	611157746	G-TAIWAN	COMP	10	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (150, 3.8V, Vcc Max)							
CY2309CSXC (7C823C09A)	4132890	611200270	T-TAIWAN	48	1500	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (150C, 3.8V, Vcc Max)							
CY2309CSXC (7C823C09A)	4132890	611200270	T-TAIWAN	80	116	0	
CY2309CSXC (7C823C09A)	4132890	611200270	T-TAIWAN	500	116	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 3.1V/5.5V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	128	80	0	
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	192	25	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	128	80	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	192	25	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	128	80	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	192	25	0	
STRESS: HIGH TEMP STORAGE, 150C							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	500	95	0	
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	1000	85	0	
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	1500	75	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	500	95	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	1000	85	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	500	95	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	1000	85	0	
STRESS: INTERNAL VISUAL							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	COMP	5	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	COMP	5	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	COMP	5	0	



Reliability Test Data

QTP #: 120406

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: PRESSURE COOKER TEST (121C, 100%RH), 15 Psig, PRE COND 192 HR 30C/60%RH (MSL3)							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	168	95	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	168	95	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	168	95	0	
STRESS: PHYSICAL DIMENSION							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	COMP	30	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	COMP	30	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	COMP	30	0	
\STRESS: POST MSL3 BALL SHEAR							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	COMP	4	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	COMP	4	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	COMP	4	0	
STRESS: POST MSL3 BOND PULL							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	COMP	4	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	COMP	4	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	COMP	4	0	
STRESS: POST MSL3 CONSTRUCTIONAL ANALYSIS							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	COMP	3	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	COMP	3	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	COMP	3	0	
STRESS: POST HI-ACCEL SATURATION TEST BALL SHEAR							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	128	5	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	128	5	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	128	5	0	
STRESS: POST PRESSURE COOKER TEST BALL SHEAR TEST							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	168	5	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	168	5	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	168	5	0	



Reliability Test Data

QTP #: 120406

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: POST HIGH TEMP STORAGE BALL SHEAR							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	500	5	0	
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	1000	5	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	500	5	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	1000	5	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	500	5	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	1000	5	0	
STRESS: POST TC BALL SHEAR							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	500	5	0	
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	1000	5	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	500	5	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	500	5	0	
STRESS: POST HIGH TEMP STORAGE BOND PULL							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	500	5	0	
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	1000	5	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	500	5	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	1000	5	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	500	5	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	1000	5	0	
STRESS: POST HI-ACCEL SATURATION TEST BOND PULL							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	128	5	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	128	5	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	128	5	0	
STRESS: POST PRESSURE COOKER TEST BOND PULL TEST							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	168	5	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	168	5	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	168	5	0	

Reliability Test Data

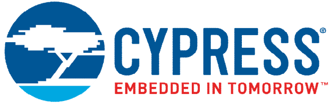
QTP #: 120406

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: POST TC BOND PULL							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	500	5	0	
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	1000	5	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	500	5	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	500	5	0	
STRESS: SOLDERABILITY TEST							
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	COMP	5	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	COMP	5	0	
STRESS: TC COND. C –65C TO 150C, PRE COND 192 HR 30C/60%RH, MSL3							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	500	95	0	
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	1000	85	0	
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	1500	75	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	500	95	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	1000	80	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	500	95	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	1000	80	0	
STRESS: THERMAL SHOCK							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	200	100	0	
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	1000	89	0	
STRESS: X-RAY							
CY62167ELL (7C62167F)	4138116	611200275	T-TAIWAN	COMP	15	0	
CY62167DV30LL (7C62164D)	4138864	611200272	T-TAIWAN	COMP	15	0	
CY7C1041D (7C1541N)	4034873	611200277	T-TAIWAN	COMP	15	0	

Reliability Test Data

QTP #: 174301

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3							
CY62138FV30LL (7C62138GC)	4722872	611741962	T-TAIWAN	COMP	22	0	



Document History Page

Document Title: QTP#174301: 32-Lead TSOP I (8x13.4x1.2mm) Pure Sn leadfinish, Au and CuPdAu Wire MSL3, 260C Reflow OSE Taiwan (T)
Document Number: 002-23216

Rev.	ECN No.	Orig. of Change	Description of Change
**	6085864	HSTO	Initial spec release