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Cypress Semiconductor
Package Qualification Report

QTP# 180701 VERSION*A
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
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Approved By:
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Reliability Director

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 / Au Wire, G631 mold compound, CRM1076 die attach material, Copper leadframe and Pure Sn leadfinish MSL3, 260C Reflow Temperature.	Jan 2018
180701	Qualification of 32L TSOP I (ZB32F) package assembled at OSE-Taiwan (T) using 0.8mil CuPdAu / Au Wire, G631 mold compound, CRM1076 die attach material, Copper leadframe and Pure Sn leadfinish MSL3, 260C Reflow Temperature	Mar 2018

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.

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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:	G631 / 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:	Laser Groove + 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
High Accelerated Saturation Test (HAST) – Unbiased	JEDEC STD 22-A110: 130°C, 85%RH Precondition: JESD22 Moisture Sensitivity Level 3 (192 Hrs., 30 °C, 60% RH, 260°C 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
Data Retention	JESD22-A117 and JESD22-A103, 150C, 500 Hours	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

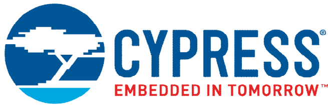
QTP #: 120406

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

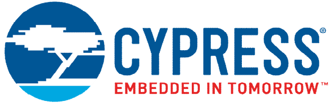
QTP #: 120406

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

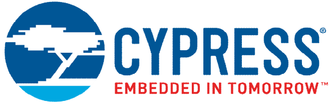
QTP #: 174301

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

Reliability Test Data

QTP #: 180701

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3							
FM28V100-TG (FP28V100GY)	2732008	611742211	T-TAIWAN	COMP	22	0	
STRESS: BALL SHEAR							
FM28V100-TG (FP28V100GY)	2732008	611742211	T-TAIWAN	COMP	30	0	
STRESS: BOND PULL							
FM28V100-TG (FP28V100GY)	2732008	611742211	T-TAIWAN	COMP	30	0	
STRESS: DIE SHEAR							
FM28V100-TG (FP28V100GY)	2732008	611742211	T-TAIWAN	COMP	10	0	
STRESS: DATA RETENTION (125C)							
FM28V100-TG (FP28V100GY)	2732008	611742211	T-TAIWAN	500	77	0	
FM28V100-TG (FP28V100GY)	2732008	611748330	JT-CHINA	500	77	0	(CONTROL LOT)
STRESS: ESD-CHARGE DEVICE MODEL							
FM28V100-TG (FP28V100GY)	2732008	611742211	T-TAIWAN	500	9	0	
FM28V100-TG (FP28V100GY)	2732008	611742211	T-TAIWAN	1000	3	0	
FM28V100-TG (FP28V100GY)	2732008	611742211	T-TAIWAN	1250	3	0	
STRESS: FINAL VISUAL INSPECTION							
FM28V100-TG (FP28V100GY)	2732008	611742211	T-TAIWAN	COMP	1997	0	
STRESS: UNBIASED HI-ACCEL SATURATION TEST (130C, 85%RH), PRE COND 192 HR 30C/60%RH (MSL3)							
FM28V100-TG (FP28V100GY)	2732008	611742211	T-TAIWAN	96	80	0	
STRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 3.63V), PRE COND 192 HR 30C/60%RH (MSL3)							
FM28V100-TG (FP28V100GY)	2732008	611742211	T-TAIWAN	96	30	0	
STRESS: TC COND. C –65C TO 150C, PRE COND 192 HR 30C/60%RH, MSL3							
FM28V100-TG (FP28V100GY)	2732008	611742211	T-TAIWAN	500	80	0	
STRESS: X-RAY							
FM28V100-TG (FP28V100GY)	2732008	611742211	T-TAIWAN	COMP	15	0	



Document History Page

Document Title: QTP#180701: 32-Lead TSOP I (8x13.4x1.2mm) Pure Sn leadfinish, Au and CuPdAu Wire MSL3, 260C Reflow OSE-Taiwan (T)

Document Number: 002-23375

Rev.	ECN No.	Orig. of Change	Description of Change
**	6100307	HSTO	Initial spec release
*A	6102182	HSTO	Corrected contact person (Reliability Manager) name