

Cypress Semiconductor Package Qualification Report

QTP# 111812 VERSION*C
July, 2014

**32 QFN (5X5X1.0 mm) /
40 QFN (6X6X1.0 mm)
NiPdAu, MSL3, 260°C Reflow
ASEK-Taiwan (G)**

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

Prepared By:
Josephine Pineda
Reliability Engineer

Reviewed By:
Rene Rodgers
Reliability Manager

Approved By:
Richard Oshiro
Reliability Director

PACKAGE QUALIFICATION HISTORY

QTP Number	Description of Qualification Purpose	Date
111812	Qualification of 32QFN 5X5X1 (LT32B) with 3.5X3.5 Epad size and 40QFN 6X6X1 (LT40A) with 3.5X3.5 Epad size packages at ASEKH (G) using G631 mold compound and EN-4900 epoxy	Jun 2011

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	LT32B / LT40A
Package Outline, Type, or Name:	32 Quad Flat No-Lead / 40 Quad Flat No-Lead
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 (typical) / 28 (Min. value)
Lead Frame Designation:	Full Metal Pad
Lead Frame Material:	Copper
Substrate Material:	N/A
Lead Finish, Composition / Thickness:	NiPdAu
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	SAW Process
Die Attach Supplier:	Hitachi
Die Attach Material:	EN-4900
Bond Diagram Designation	001-30999 / 001-44328
Wire Bond Method:	Thermosonic
Wire Material/Size:	0.8mil / Au
Thermal Resistance Theta JA °C/W:	22°C/W , 21.2°C/W
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	49-41999
Name/Location of Assembly (prime) facility:	G-ASEK Taiwan
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	Dynamic Operating Condition, Vcc = 5.5V, 125 C JESD22-A108	P
High Temperature Operating Life Latent Failure Rate	Dynamic Operating Condition, Vcc = 5.5V, 150 C JESD22-A108	P
High Accelerated Saturation Test (HAST)	JEDEC STD 22-A110, 130 C, 85%RH, 3.63V/5.25V 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-883, 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	P
Electrostatic Discharge Human Body Model (ESD-HBM)	(2200V) JEDEC EIA/JESD22-A114	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	(500V) JESD22-C101	P
Acoustic Microscopy	J-STD-020 Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30 C°, 60% RH, 260C Reflow)	P
Ball Shear	JESD22-B116, 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
Die Shear	MIL-STD-883, Method 2019 Per die size: <ul style="list-style-type: none"> • <3000 sq. mils = 1.2 kgf • 30001-5000 sq. mils = 1.2 kgf • >5001 sq. mils = 1.2 kgf 	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-B101	P
Physical Dimension	MIL-STD-1835, JESD22-B100	P
Thermal Shock	MIL-STD-883, Method 1011, Condition B, -55 C to 125C and JESD22-A106, Condition C, -55 C to 125C	P
Solderability, Steam Aged	J-STD-002, JESD22-B102 95% solder coverage minimum	P
X-Ray	MIL-STD-883 - 2012	P



Reliability Test Data

QTP #: 111812

<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: ACOUSTIC, MSL3							
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	COMP	15	0	
CY7C60323 (8C214340A)	4008254	611114333	G-TAIWAN	COMP	15	0	
CYRF6936B (7B6936B)	4022631	611114118	G-TAIWAN	COMP	15	0	
STRESS: BALL SHEAR							
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	COMP	10	0	
STRESS: BOND PULL							
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	COMP	10	0	
STRESS: CONSTRUCTIONAL ANALYSIS							
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	COMP	5	0	
CY7C60323 (8C214340A)	4008254	611114333	G-TAIWAN	COMP	5	0	
CYRF6936B (7B6936B)	4022631	611114118	G-TAIWAN	COMP	5	0	
STRESS: DYE PENETRATION TEST							
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	COMP	15	0	
CY7C60323 (8C214340A)	4008254	611114333	G-TAIWAN	COMP	15	0	
CYRF6936B (7B6936B)	4022631	611114118	G-TAIWAN	COMP	15	0	
STRESS: DIE SHEAR							
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	COMP	15	0	
STRESS: ESD-CHARGE DEVICE MODEL, (500V)							
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	COMP	9	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, 2,200V							
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	COMP	8	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 3.63V, 60%RH, PRE COND 192 HR 30C/60%RH, MSL3							
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	128	77	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 5.25V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3							
CY7C60323 (8C214340A)	4008254	611114333	G-TAIWAN	128	78	0	
STRESS: HIGH TEMP STORAGE, 150C							
CY7C60323 (8C214340A)	4008254	611114333	G-TAIWAN	500	80	0	
CY7C60323 (8C214340A)	4008254	611114333	G-TAIWAN	500	80	0	



Reliability Test Data

QTP #: 111812

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: INTERNAL VISUAL							
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	COMP	5	0	
CY7C60323 (8C214340A)	4008254	611114333	G-TAIWAN	COMP	5	0	
CYRF6936B (7B6936B)	4022631	611114118	G-TAIWAN	COMP	5	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 125C, 5.5V, Vcc Core							
CY7C60323 (8C214340A)	4008254	611114333	G-TAIWAN	96	1495	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 5.5V, Vcc Core							
CY7C60323 (8C214340A)	4008254	611114333	G-TAIWAN	80	116	0	
CY7C60323 (8C214340A)	4008254	611114333	G-TAIWAN	500	116	0	
STRESS: PRESSURE COOKER TEST (121C, 100%RH), 15 Psig, PRE COND 192 HR 30C/60%RH (MSL3)							
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	168	77	0	
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	288	77	0	
CY7C60323 (8C214340A)	4008254	611114333	G-TAIWAN	168	80	0	
CY7C60323 (8C214340A)	4008254	611114333	G-TAIWAN	288	80	0	
STRESS: PHYSICAL DIMENSION							
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	COMP	15	0	
STRESS: SOLDERABILITY							
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	COMP	3	0	
CY7C60323 (8C214340A)	4008254	611114333	G-TAIWAN	COMP	3	0	
CYRF6936B (7B6936B)	4022631	611114118	G-TAIWAN	COMP	3	0	
STRESS: TC COND. C -65C TO 150C, PRE COND 192 HR 30C/60%RH, MSL3							
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	500	77	0	
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	1000	77	0	
CY7C60323 (8C214340A)	4008254	611114333	G-TAIWAN	500	80	0	
CY7C60323 (8C214340A)	4008254	611114333	G-TAIWAN	1000	80	0	
CYRF6936B (7B6936B)	4022631	611114118	G-TAIWAN	500	80	0	
CYRF6936B (7B6936B)	4022631	611114118	G-TAIWAN	1000	80	0	



Reliability Test Data

QTP #: 111812

<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: THERMAL SHOCK							
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	200	77	0	
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	1000	77	0	
STRESS: X-RAY							
CYRF6936B (7B6936B)	4022630	611117174	G-TAIWAN	COMP	15	0	
CY7C60323 (8C214340A)	4008254	611114333	G-TAIWAN	COMP	15	0	



Document History Page

Document Title: QTP 111812: 32 QFN (5X5X1.0 MILS) / 40 QFN (6X6X1.0 MILS), NIPDAU, MSL3 260C
REFLOW ASEK- TAIWAN
Document Number: 001-70190

Rev.	ECN No.	Orig. of Change	Description of Change
**	3283659	NSR	Initial spec release
*A	3657926	NSR	Sunset Review. Remove the reference Cypress specs on the reliability test conditions and replace with the industry standards. Remove version 1.0 in the QTP# in title page.
*B	4055318	JYF	Sunset Review: Deleted revisions of ref. Jedec/Military standards in Reliability Tests Performed table. Revision changes from time to time.
*C	4450627	JYF	Sunset Review: Updated QTP title page for template alignment.

Distribution: WEB

Posting: None