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Cypress Semiconductor
Package Qualification Report

QTP# 170604 VERSION**
May 2017

16-Ball Wafer Level Chip Scale Package (WLCSP), 1.472 x 1.579 x 0.42 mm

MSL1, 260C

ASEK-Taiwan (G)

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

QTP Number	DESCRIPTION OF QUALIFICATION PURPOSE	Date
154802	New WLCSP Assembly Site Qualification at ASE-Taiwan (G) using 25-Ball WLCSP	Jan. 2016
170604	Qualification of 16-Ball WLCSP (1.472x1.579x0.42mm) Package at ASEK-Taiwan (G) using SAC405 Solder Finish at MSL1, 260C Reflow Temperature	May 2017

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	FN16A
Package Outline, Type, or Name:	16-Ball Wafer Level Chip Scale Package (WLCSP) (1.472x1.579x0.42mm)
Die Backside Preparation Method:	Backgrind
Die Separation Method:	Wafer Saw
Solder Ball/Bump Material:	SAC-405
Bonding Method:	Cu RDL trace
Bond Diagram Designation:	N/A
Thermal Resistance Theta JA °C/W:	90°C/W
Package Cross Section Yes/No:	N/A
Assembly Process Flow:	001-69882
Name/Location of Assembly (prime) facility:	ASE-Taiwan (G)
MSL Level	1
Reflow Profile	260C

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	ASE-Taiwan (G)

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENT

Stress/Test	Test Condition (Temp/Bias)	Result P/F
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
Electrostatic Discharge Charge Device Model (ESD-CDM)	500V//1,000V/1,250V JESD22-C101	P
Electrostatic Discharge Human Body Model (ESD-HBM)	1,100V/2,200V /3,300V JESD22, Method A114	P
External Visual	MIL-PRF-38535, MIL-STD-883,Method 2009	P
Final Visual	JESD22-B101	P
Functional Board Level Reliability Test	Temperature Cycle,-40°C to 85°C	P
High Accelerated Saturation Test (HAST)	JEDEC STD 22-A110: 130°C, 85%RH, 2.27V Precondition: JESD22 Moisture Sensitivity MSL 1 (168 Hrs.,85°C, 85%RH, 260°C Reflow)	P
High Accelerated Saturation Test (HAST) – Unbiased	JEDEC STD 22-A110: 130°C, 85%RH Precondition: JESD22 Moisture Sensitivity MSL 1 (168 Hrs.,85°C, 85%RH, 260°C Reflow)	P
High Temperature Operating Life Early Failure Rate	Dynamic Operating Condition, Vcc Max=1.8V, 125°C JESD22-A-108	P
High Temperature Operating Life Latent Failure Rate	Dynamic Operating Condition, Vcc Max=1.8V, 125°C JESD22-A-108	P
High Temperature Storage	150°C, no bias	P
Internal Visual	MIL-STD-883-2014	P
Physical Dimension	MIL-STD-1835, JESD22-B100	P
Pressure Cooker Test	JESD22-A102:121°C /100%RH, 15 PSIG Precondition: JESD22 Moisture Sensitivity Level 1 (168 Hrs.,85°C, 85%RH, 260°C Reflow)	P
Solder Ball/Bump Shear	JESD22-B117	P
Solderability Test	J-STD-002, JESD22-B102	P
Temperature Cycle	MIL-STD-883, Method 1010, Condition B, -55°C to 125°C Precondition: JESD22 Moisture Sensitivity MSL 1 (168 Hrs.,85°C, 85%RH, 260°C Reflow)	P

Reliability Test Data

QTP #: 154802

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: CONSTRUCTIONAL ANALYSIS							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	COMP	5	0	
STRESS: DYE PENETRANT TEST							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	COMP	15	0	
STRESS: ESD-CHARGE DEVICE MODEL							
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	500	9	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	1000	3	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	1250	3	0	
STRESS: ESD-HUMAN BODY MODEL PER JESD22, METHOD A114							
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	1100	3	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	2200	8	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	3300	3	0	
STRESS: EXTERNAL VISUAL							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	COMP	5811	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	COMP	5739	0	
STRESS: FINAL VISUAL							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	COMP	25	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	COMP	16	0	
CY8C4246FNI (8F480000A)	4528732	611533010	G-TAIWAN	COMP	18	0	
STRESS: FUNCTIONAL BOARD LEVEL RELIABILITY TEST, TC COND.N -40C TO 85C							
CY8C4247FNI (8F42478A)	4427504	611431846	DT-PHILS	256	502	0	
TRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 2.27V), PRE COND 168 HR 85C/85%RH (MSL1)							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	96	30	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	96	30	0	
STRESS: UNBIASED HI-ACCEL SATURATION TEST (130C, 85%RH), PRE COND 168 HR 85C/85%RH (MSL1)							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	96	80	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	96	80	0	
CY8C4246FNI (8F480000A)	4528732	611533010	G-TAIWAN	96	80	0	

Reliability Test Data

QTP #: 154802

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (125C, 1.8V, Vcc Max)							
MB9AF01AM	MIFS # 101	4K55169	G-TAIWAN	COMP	78	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (125C, 1.8V, Vcc Max)							
MB9AF01AM	MIFS # 101	4K55169	G-TAIWAN	COMP	75	0	
STRESS: HIGH TEMPERATURE STORAGE, 150C							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	500	80	0	
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	1000	80	0	
STRESS: PHYSICAL DIMENSION							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	COMP	30	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	COMP	30	0	
CY8C4246FNI (8F480000A)	4528732	611533010	G-TAIWAN	COMP	30	0	
STRESS: SOLDER BALL/BUMP SHEAR							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	COMP	5	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	COMP	5	0	
CY8C4246FNI (8F480000A)	4528732	611533010	G-TAIWAN	COMP	5	0	
STRESS: TC COND. B -55C TO 125C, PRE COND 168 HRS 85C/85%RH, MSL1							
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	500	80	0	
CY8C4246FNI (8F480000A)	4528732	611533008	G-TAIWAN	1000	80	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	500	80	0	
CY8C4246FNI (8F480000A)	4528732	611533009	G-TAIWAN	1000	80	0	
CY8C4246FNI (8F480000A)	4528732	611533010	G-TAIWAN	500	80	0	
CY8C4246FNI (8F480000A)	4528732	611533010	G-TAIWAN	1000	80	0	

Reliability Test Data

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Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: CONSTRUCTIONAL ANALYSIS							
CP8645XTT (8F44320CB)	3708108	611709436	G-TAIWAN	COMP	5	0	
STRESS: ESD-CHARGE DEVICE MODEL							
CP8645XTT (8F44320CB)	3708108	611709436	G-TAIWAN	500	9	0	
CP8645XTT (8F44320CB)	3708108	611709436	G-TAIWAN	1000	3	0	
CP8645XTT (8F44320CB)	3708108	611709436	G-TAIWAN	1250	3	0	
STRESS: PHYSICAL DIMENSION							
CP8645XTT (8F44320CB)	3708108	611709436	G-TAIWAN	COMP	30	0	
CP8645XTT (8F44320CB)	3708108	611709434	G-TAIWAN	COMP	30	0	
CP8645XTT (8F44320CB)	3708108	611709435	G-TAIWAN	COMP	30	0	
CP8645XTT (8F44320CB)	3708108	611709437	G-TAIWAN	COMP	30	0	
STRESS: SOLDER BALL/BUMP SHEAR							
CP8645XTT (8F44320CB)	3708108	611709436	G-TAIWAN	COMP	25	0	
CP8645XTT (8F44320CB)	3708108	611709434	G-TAIWAN	COMP	25	0	
CP8645XTT (8F44320CB)	3708108	611709435	G-TAIWAN	COMP	25	0	
CP8645XTT (8F44320CB)	3708108	611709437	G-TAIWAN	COMP	25	0	

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Document History Page

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**	5742185	HSTO	Initial spec release.