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Cypress Semiconductor Package Qualification Report

**QTP# 163610 VERSION **
September 2016**

**165-Ball FBGA (15x17x1.4mm)
SnPb & SAC-405 Solder Ball Finish,
CuPd Wire
MSL3, 260°C Reflow
BKK-Thailand (SB)**

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

QTP Number	Description of Qualification Purpose	Date
163610	Qualification of 165-Ball FBGA (15X17X1.4mm) at Cypress-Bangkok, Thailand (SB) using KMC-3580LVA Mold Compound, HR9050G Die Attach Film, SnPb and SAC-405 Solder Ball Finish, 0.8 mil CuPd Wire at MSL3, 260C Reflow Temperature	Sept 2016

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	BB165, BW165
Package Outline, Type, or Name:	165-Ball FBGA (Fine Ball Grid Array)
Mold Compound Name/Manufacturer:	KMC-3580LVA/ ShinEtsu
Mold Compound Flammability Rating:	V-0 / UL94
Oxygen Rating Index:	>40%
Substrate Material:	BT Resin
Lead Finish, Composition / Thickness:	SnPb Sn/Ag/Cu (SAC-405)
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Laser Groove + Saw
Die Attach Supplier:	Hitachi
Die Attach Material:	HR9050G
Bond Diagram Designation:	002-11054/002-10766
Wire Bond Method:	Thermosonic
Wire Material/Size:	CuPd, 0.8 mil
Thermal Resistance Theta JA °C/W:	12.3°C/W
Package Cross Section Yes/No:	No
Assembly Process Flow:	001-97055
Name/Location of Assembly (prime) facility:	BKK-Thailand (SB)
MSL Level	3
Reflow Profile	260C

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	CML-R, Chipmos-Taiwan (GO)

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

Stress/Test	Test Condition (Temp/Bias)	Result P/F
Acoustic Microscopy	J-STD-020 Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
Ball Shear	JESD22-B116	P
Bond Pull	MIL-STD-883 – Method 2011	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
Electrostatic Discharge Charge Device Model (ESD-CDM)	500V/1,000V/1,250V JESD22-C101	P
Final Visual	JESD22-B101	P
High Accelerated Saturation Test (HAST)	JEDEC STD 22-A110: 110°C, 85% RH, 1.95V/3.63V Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30 °C, 60% RH, 260°C Reflow)	P
High Temperature Storage	JESD22-A103:150°C No bias	P
Internal Visual	MIL-STD-883-2014	P
Physical Dimension	MIL-STD-1835, JESD22-B100	P
Pressure Cooker	JESD22-A102:121°C /100%RH, 15 PSIG Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30 °C, 60% RH, 260°C Reflow)	P
Solder Ball Shear	JESD22-B117	P
Solderability	J-STD-002, JESD22-B102	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, 260°C Reflow)	P
X-Ray	MIL-STD-883 - 2012	P



Reliability Test Data

QTP #: 163610

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3							
CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	COMP	15	0	
CY7C1625KV18 (7CD1625KO)	9545001	611605319	SB-Thailand	COMP	15	0	
CY7C1441KV33 (7CD1441KO)	9441004	611606644	SB-Thailand	COMP	15	0	
STRESS: BALL SHEAR							
CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	COMP	10	0	
CY7C1625KV18 (7CD1625KO)	9545001	611605319	SB-Thailand	COMP	10	0	
CY14B116S (7CD1456B14AC)	4522924	611604653	SB-Thailand	COMP	10	0	
STRESS: BOND PULL							
CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	COMP	10	0	
CY7C1625KV18 (7CD1625KO)	9545001	611605319	SB-Thailand	COMP	10	0	
CY14B116S (7CD1456B14AC)	4522924	611604653	SB-Thailand	COMP	10	0	
STRESS: CONSTRUCTIONAL ANALYSIS							
CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	COMP	5	0	
CY7C1625KV18 (7CD1625KO)	9545001	611605319	SB-Thailand	COMP	5	0	
CY14B116S (7CD1456B14AC)	4522924	611604653	SB-Thailand	COMP	5	0	
STRESS: DIE SHEAR							
CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	COMP	15	0	
CY7C1625KV18 (7CD1625KO)	9545001	611605319	SB-Thailand	COMP	15	0	
CY14B116S (7CD1456B14AC)	4522924	611604653	SB-Thailand	COMP	15	0	
STRESS: DYE PENETRANT TEST							
CY14B116S (7CD1456B14AC)	4522924	611604653	SB-Thailand	COMP	15	0	
STRESS: ESD-CHARGE DEVICE MODEL							
CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	500	9	0	
CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	1000	3	0	
CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	1250	3	0	

Reliability Test Data

QTP #: 163610

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: FINAL VISUAL

CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	COMP	403	0	
CY7C1625KV18 (7CD1625KO)	9545001	611605319	SB-Thailand	COMP	397	0	
CY14B116S (7CD1456B14AC)	4522924	611604653	SB-Thailand	COMP	322	0	

STRESS: HI-ACCEL SATURATION TEST (110C, 85%RH, 1.95V/3.63V), PRE COND 192 HR 30C/60%RH (MSL3)

CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	264	26	0	
CY7C1625KV18 (7CD1625KO)	9545001	611605319	SB-Thailand	264	26	0	
CY7C1441KV33 (7CD1441KO)	9441004	611606644	SB-Thailand	264	30	0	

STRESS: HIGH TEMPERATURE STORAGE, PLASTIC, 150C

CY7C1414KV18 (7CD1414K)	9314007	RFB2336	SB-Thailand	500	80	0	
CY7C1414KV18 (7CD1414K)	9314007	RFB2336	SB-Thailand	1000	80	0	

STRESS: INTERNAL VISUAL

CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	COMP	5	0	
CY7C1625KV18 (7CD1625KO)	9545001	611605319	SB-Thailand	COMP	5	0	
CY14B116S (7CD1456B14AC)	4522924	611604653	SB-Thailand	COMP	5	0	

STRESS: PHYSICAL DIMENSION

CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	COMP	403	0	
CY7C1625KV18 (7CD1625KO)	9545001	611605319	SB-Thailand	COMP	397	0	
CY14B116S (7CD1456B14AC)	4522924	611604653	SB-Thailand	COMP	322	0	

STRESS: PRESSURE COOKER TEST (121C, 100%RH, 15 Psig), PRE COND 192 HR 30C/60%RH (MSL3)

CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	96	80	0	
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STRESS: SOLDER BALL SHEAR

CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	COMP	5	0	
CY7C1625KV18 (7CD1625KO)	9545001	611605319	SB-Thailand	COMP	5	0	
CY14B116S (7CD1456B14AC)	4522924	611604653	SB-Thailand	COMP	5	0	

STRESS: SOLDERABILITY TEST

CY7C1441KV33 (7CD1441KO)	9441004	611606644	SB-Thailand	COMP	3	0	
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Reliability Test Data

QTP #: 163610

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: TEMPERATURE CYCLE COND. C -65C TO 150C, PRE COND 192 HRS 30C/60%RH, MSL3

CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	500	80	0	
CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	1000	80	0	
CY7C1625KV18 (7CD1625KO)	9545001	611605319	SB-Thailand	500	80	0	
CY7C1441KV33 (7CD1441KO)	9441004	611606644	SB-Thailand	500	80	0	

STRESS: X-RAY

CY7C2644KV18 (7CD2644KO)	9545001	611605316	SB-Thailand	COMP	24	0	
CY7C1625KV18 (7CD1625KO)	9545001	611605319	SB-Thailand	COMP	24	0	
CY14B116S (7CD1456B14AC)	4522924	611604653	SB-Thailand	COMP	24	0	

Document History Page

Document Title: QTP# 163610: 165-BALL FBGA (15X17X1.4MM) SNPB & SAC-405 SOLDER BALL FINISH,
CUPD WIRE, MSL3, 260C REFLOW, BKK-THAILAND (SB)
Document Number: 002-16614

Rev.	ECN No.	Orig. of Change	Description of Change
**	5435265	JYF	Initial spec release.