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Cypress Semiconductor Package Qualification Report

**QTP# 153605 VERSION **
June 2016**

**165-Ball FBGA (13x15x1.4mm)
SAC 405 and SnPb 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
153605	Qualification of 165-Ball FBGA (13x15x1.4mm) at Cypress Bangkok, Thailand (SB) using KMC-3580LVA Mold Compound, HR9050G Die Attach Film, SAC 405 and SnPb Solder Ball Finish, 0.8 mil CuPd Wire at MSL3, 260C Reflow Temperature	October 2015

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:	>54%
Substrate Material:	BT Resin
Lead Finish, Composition / Thickness:	Sn/Ag/Cu (SAC 405) and SnPb
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Laser Groove + Saw
Die Attach Supplier:	Hitachi
Die Attach Material:	HR9050G
Bond Diagram Designation:	001-98665
Wire Bond Method:	Thermosonic
Wire Material/Size:	CuPd, 0.8 mil
Thermal Resistance Theta JA °C/W:	25.03°C/W
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	002-03885 / 002-03884
Name/Location of Assembly (prime) facility:	BKK-Thailand (SB)
MSL Level	3
Reflow Profile	260C

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	CML-R

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/750V/1,000V/1,250V/1,500V/1,750V/2000V JESD22-C101	P
Final Visual	JESD22-B101	P
High Accelerated Saturation Test (HAST)	JEDEC STD 22-A110: 110°C, 85% RH, 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 #: 153605

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3							
CY7C1381KV33 (7CD1381K)	9527002	611526750	SB-Thailand	COMP	15	0	
CY7C1370KV25 (7CD13762K)	9527002	611526748	SB-Thailand	COMP	15	0	
CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	COMP	15	0	
CY7C13709KV25 (7CD13709K)	9527002	611526751	SB-Thailand	COMP	15	0	
STRESS: BALL SHEAR							
CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	COMP	30	0	
CY7C13709KV25 (7CD13709K)	9527002	611527912	SB-Thailand	COMP	30	0	
CY7C13709KV25 (7CD13709K)	9527002	611527913	SB-Thailand	COMP	30	0	
STRESS: BOND PULL							
CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	COMP	30	0	
CY7C13709KV25 (7CD13709K)	9527002	611527912	SB-Thailand	COMP	30	0	
CY7C13709KV25 (7CD13709K)	9527002	611527913	SB-Thailand	COMP	30	0	
STRESS: CONSTRUCTIONAL ANALYSIS							
CY7C1381KV33 (7CD1381K)	9527002	611526750	SB-Thailand	COMP	5	0	
STRESS: DIE SHEAR							
CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	COMP	10	0	
CY7C13709KV25 (7CD13709K)	9527002	611527912	SB-Thailand	COMP	10	0	
CY7C13709KV25 (7CD13709K)	9527002	611527913	SB-Thailand	COMP	10	0	
STRESS: DYE PENETRANT TEST							
CY7C1381KV33 (7CD1381K)	9527002	611526750	SB-Thailand	COMP	15	0	
CY7C1370KV25 (7CD13762K)	9527002	611526748	SB-Thailand	COMP	15	0	
CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	COMP	15	0	
STRESS: ESD-CHARGE DEVICE MODEL							
CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	500	9	0	
CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	750	3	0	
CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	1000	3	0	
CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	1250	3	0	

Reliability Test Data

QTP #: 153605

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: ESD-CHARGE DEVICE MODEL

CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	1500	3	0	
CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	1750	3	0	
CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	2000	3	0	

STRESS: FINAL VISUAL

CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	COMP	200	0	
CY7C13709KV25 (7CD13709K)	9527002	611527912	SB-Thailand	COMP	275	0	
CY7C13709KV25 (7CD13709K)	9527002	611527913	SB-Thailand	COMP	283	0	

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

CY7C1381KV33 (7CD1381K)	9527002	611526750	SB-Thailand	264	25	0	
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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

CY7C1381KV33 (7CD1381K)	9527002	611526750	SB-Thailand	COMP	5	0	
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STRESS: PHYSICAL DIMENSION

CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	COMP	200	0	
CY7C13709KV25 (7CD13709K)	9527002	611527912	SB-Thailand	COMP	275	0	
CY7C13709KV25 (7CD13709K)	9527002	611527913	SB-Thailand	COMP	283	0	

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

CY7C1381KV33 (7CD1381K)	9527002	611526750	SB-Thailand	168	77	0	
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STRESS: SOLDER BALL SHEAR

CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	COMP	25	0	
CY7C13709KV25 (7CD13709K)	9527002	611526751	SB-Thailand	COMP	5	0	
CY7C13709KV25 (7CD13709K)	9527002	611527912	SB-Thailand	COMP	25	0	
CY7C13709KV25 (7CD13709K)	9527002	611527913	SB-Thailand	COMP	25	0	

Reliability Test Data

QTP #: 153605

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: SOLDERABILITY TEST

CY7C1381KV33 (7CD1381K)	9527002	611526750	SB-Thailand	COMP	3	0	
CY7C1370KV25 (7CD13762K)	9527002	611526748	SB-Thailand	COMP	3	0	
CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	COMP	3	0	
CY7C13709KV25 (7CD13709K)	9527002	611526751	SB-Thailand	COMP	3	0	

STRESS: TEMPERATURE CYCLE COND. C -65C TO 150C, PRE COND 192 HRS 30C/60%RH, MSL3

CY7C1381KV33 (7CD1381K)	9527002	611526750	SB-Thailand	500	77	0	
CY7C1381KV33 (7CD1381K)	9527002	611526750	SB-Thailand	1000	77	0	
CY7C1370KV25 (7CD13762K)	9527002	611526748	SB-Thailand	500	80	0	
CY7C1370KV25 (7CD13762K)	9527002	611526748	SB-Thailand	1000	80	0	
CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	500	80	0	
CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	1000	80	0	

STRESS: X-RAY

CY7C1370KV25 (7CD13762K)	9527002	611526749	SB-Thailand	COMP	15	0	
CY7C13709KV25 (7CD13709K)	9527002	611527912	SB-Thailand	COMP	15	0	
CY7C13709KV25 (7CD13709K)	9527002	611527913	SB-Thailand	COMP	10	0	

Document History Page

Document Title: QTP# 153605: 165-BALL FBGA (13X15X1.4MM) SAC 405 AND SNPB SOLDER BALL FINISH,
CUPD WIRE, MSL3, 260C REFLOW, BKK-THAILAND (SB)
Document Number: 002-13978

Rev.	ECN No.	Orig. of Change	Description of Change
**	5314973	JYF	Initial spec release.