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Cypress Semiconductor Package Qualification Report

**QTP# 160703 VERSION **
March, 2016**

48 FBGA Package (6mm x 10mm x 1.2mm)

SAC105, CuPd

MSL3, 260C Reflow

BKK-SB / Thailand

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

QTP Number	Description of Qualification Purpose	Date
160703	Qualification of the 48 FBGA (6mm x 10mm x 1.2mm) Package for nvSRAM at BKK, using ShinEtsu KMC-3580LVA, Sumitomo CRM-1577DB, and 0.8 mil CuPd Wire with SAC105 Finish at MSL3	Mar 2016

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	BK48C
Package Outline, Type, or Name:	48 FBGA (6mm x 10mm x 1.2mm)
Mold Compound Name/Manufacturer:	KMC-3580LVA / ShinEtsu
Mold Compound Flammability Rating:	V-0 / UL94
Mold Compound Alpha Emission Rate:	0.002 C/cm ² h max
Oxygen Rating Index: >28%	>40%
Substrate Material:	BT Resin
Lead Finish, Composition / Thickness:	SAC105
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Saw
Die Attach Supplier:	Sumitomo
Die Attach Material:	CRM-1577DB
Bond Diagram Designation	001-98461 / 001-98460
Wire Bond Method:	Thermosonic
Wire Material/Size:	0.8 mil CuPd
Thermal Resistance Theta JA °C/W:	48.19
Package Cross Section Yes/No:	yes
Assembly Process Flow:	001-97055
Name/Location of Assembly (prime) facility:	BKK / Thailand
MSL LEVEL	MSL 3
REFLOW PROFILE	260C

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	CML, PHILIPPINES

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 Accelerated Saturation Test (HAST)	JEDEC STD 22-A110: 130C, 85%RH, 3.6V Precondition: JESD22 Moisture Sensitivity Level 3 (192 Hrs., 30 C°, 60% RH)	P
Pressure Cooker Test	JESD22-A102: 121 C, 100%RH, 15 PSIG Precondition: JESD22 Moisture Sensitivity Level 3 (192 Hrs., 30 C°, 60% RH)	P
Temperature Cycle	MIL-STD-883C, Method 1010, Condition C, -65 C to 150 C Precondition: JESD22 Moisture Sensitivity Level 3 (192 Hrs., 30 C°, 60% RH)	P
High Temp Storage	JESD22-A103: 150 C, no bias	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	(500V, 1,000V, 1250V) JESD22-C101	P
Acoustic Microscopy	J-STD-020 Precondition: JESD22 Moisture Sensitivity Level 3 (192 Hrs., 30 C°, 60% RH)	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
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
BGA Solder Ball Shear	JESD22-B117B Cpk : 1.33, Ppk : 1.66	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
X-Ray	MIL-STD-883 - 2012	P



Reliability Test Data

QTP #: 160703

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: Highly Accelerated Saturation Test (HAST), 130C, 85%RH, 3.6V (MSL 3 Preconditioning)

CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	96	25	0	
CY14V101LA-BA45XIKK	4523280	611534263	BKK-SG	96	25	0	
CY14B104NA-BA25XIKK	4523022	611534268	BKK-SG	96	27	0	

STRESS: Temperature Cycling Test (TCT), Condition C, -65 C to 150 C (MSL 3 Preconditioning)

CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	500	80	0	
CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	1000	80	0	
CY14V104NA-BA45XIKK	4522711	611534270	BKK-SG	500	80	0	
CY14V104NA-BA45XIKK	4522711	611534270	BKK-SG	1000	80	0	
CY14B104NA-BA25XIKK	4523022	611534268	BKK-SG	500	80	0	
CY14B104NA-BA25XIKK	4523022	611534268	BKK-SG	1000	80	0	

STRESS: Pressure Cooker Test (PCT), 121 C, 100%RH, 15 PSIG (MSL 3 Preconditioning)

CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	168	78	0	
CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	288	78	0	
CY14V101LA-BA45XIKK	4523280	611534263	BKK-SG	168	80	0	
CY14V101LA-BA45XIKK	4523280	611534263	BKK-SG	288	80	0	
CY14B104NA-BA25XIKK	4523022	611534268	BKK-SG	168	80	0	
CY14B104NA-BA25XIKK	4523022	611534268	BKK-SG	288	80	0	

STRESS: High Temperature Storage: 150C

CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	500	80	0	
CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	1000	80	0	

STRESS: Electrostatic Discharge- Charge Device Model (ESD-CDM): 48 BGA- 500V

CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	500V	9	0	
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STRESS: Electrostatic Discharge- Charge Device Model (ESD-CDM): 48 BGA- 1,000V

CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	1,000V	3	0	
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STRESS: Electrostatic Discharge- Charge Device Model (ESD-CDM): 48 BGA- 1,250V

CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	1,250V	3	0	
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STRESS: Acoustic Microscopy (MSL 3 Preconditioning)

CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	COMP	15	0	
CY14V101LA-BA45XIKK	4523280	611534263	BKK-SG	COMP	15	0	
CY14V104NA-BA45XIKK	4522711	611534270	BKK-SG	COMP	15	0	
CY14B104NA-BA25XIKK	4523022	611534268	BKK-SG	COMP	15	0	

STRESS: Wire Bond Shear

CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	COMP	30	0	
CY14V101LA-BA45XIKK	4523280	611534263	BKK-SG	COMP	30	0	
CY14V104NA-BA45XIKK	4522711	611534270	BKK-SG	COMP	30	0	
CY14B104NA-BA25XIKK	4523022	611534268	BKK-SG	COMP	30	0	

Reliability Test Data

QTP #: 160703

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: Wire Bond Pull							
CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	COMP	30	0	
CY14V101LA-BA45XIKK	4523280	611534263	BKK-SG	COMP	30	0	
CY14V104NA-BA45XIKK	4522711	611534270	BKK-SG	COMP	30	0	
CY14B104NA-BA25XIKK	4523022	611534268	BKK-SG	COMP	30	0	
STRESS: Constructional Analysis							
CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	COMP	5	0	
CY14V101LA-BA45XIKK	4523280	611534263	BKK-SG	COMP	5	0	
CY14B104NA-BA25XIKK	4523022	611534268	BKK-SG	COMP	5	0	
STRESS: Die Shear							
CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	COMP	10	0	
CY14V101LA-BA45XIKK	4523280	611534263	BKK-SG	COMP	10	0	
CY14V104NA-BA45XIKK	4522711	611534270	BKK-SG	COMP	10	0	
CY14B104NA-BA25XIKK	4523022	611534268	BKK-SG	COMP	10	0	
STRESS: Dye Penetrant Test							
CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	COMP	15	0	
CY14V101LA-BA45XIKK	4523280	611534263	BKK-SG	COMP	15	0	
CY14V104NA-BA45XIKK	4522711	611534270	BKK-SG	COMP	15	0	
CY14B104NA-BA25XIKK	4523022	611534268	BKK-SG	COMP	15	0	
STRESS: BGA Solder Ball Shear							
CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	COMP	25	0	
CY14V101LA-BA45XIKK	4523280	611534263	BKK-SG	COMP	25	0	
CY14V104NA-BA45XIKK	4522711	611534270	BKK-SG	COMP	25	0	
CY14B104NA-BA25XIKK	4523022	611534268	BKK-SG	COMP	25	0	
STRESS: Internal Visual Inspection							
CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	COMP	5	0	
STRESS: Final Visual Inspection							
CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	COMP	1233	0	
CY14V101LA-BA45XIKK	4523280	611534263	BKK-SG	COMP	326	0	
CY14V104NA-BA45XIKK	4522711	611534270	BKK-SG	COMP	655	0	
CY14B104NA-BA25XIKK	4523022	611534268	BKK-SG	COMP	652	0	
STRESS: Physical Dimensions							
CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	COMP	1233	0	
CY14V101LA-BA45XIKK	4523280	611534263	BKK-SG	COMP	326	0	
CY14V104NA-BA45XIKK	4522711	611534270	BKK-SG	COMP	655	0	
CY14B104NA-BA25XIKK	4523022	611534268	BKK-SG	COMP	652	0	
STRESS: Solderability- BGA							
CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	COMP	3	0	
CY14V101LA-BA45XIKK	4523280	611534263	BKK-SG	COMP	3	0	
CY14V104NA-BA45XIKK	4522711	611534270	BKK-SG	COMP	3	0	
STRESS: X-RAY							
CY14V101LA-BA45XIKK	4523280	611534262	BKK-SG	COMP	10	0	
CY14V101LA-BA45XIKK	4523280	611534263	BKK-SG	COMP	10	0	
CY14V104NA-BA45XIKK	4522711	611534270	BKK-SG	COMP	10	0	
CY14B104NA-BA25XIKK	4523022	611534268	BKK-SG	COMP	10	0	

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Document History Page

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Rev.	ECN No.	Orig. of Change	Description of Change
**	5171948	BECK	Initial Release.