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Cypress Semiconductor Package Qualification Report

QTP# 055103 VERSION*A
November 2014

<165-Ball Fine Pitch Ball Grid Array (FBGA)
(13 x 15 x 1.4mm)
(0.8mil wire)
MSL3, 220C Solder Reflow
CML-RA (Autoline)

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

Qual Report	Description of Qualification Purpose	Date Comp
055103	≤165-Ball FBGA (13 x 15 x 1.4mm), (0.8mil wire), SnPb, MSL3, 220C Reflow assembled at CML-RA (Autoline)	Jun 06

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	BB165
Package Outline, Type, or Name:	165-Ball Fine Pitch Ball Grid Array (FBGA)
Mold Compound Name/Manufacturer:	Cookson – CK-7000LA
Mold Compound Flammability Rating:	V-O per UL94
Oxygen Rating Index:	N/A
Substrate Material:	Bt Resin
Lead Finish, Composition / Thickness:	Sn/Pb
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	100% Saw Through
Die Attach Supplier:	Loctite
Die Attach Material:	QMI506
Die Attach Method:	Epoxy
Wire Bond Method:	Thermosonic
Wire Material/Size:	Au, 0.8 mil
Thermal Resistance Theta JA °C/W:	29.62 °C/W
Package Cross Section Yes/No:	N/A
Assembly Process Flow:	11-21099
Name/Location of Assembly (prime) facility:	CML-RA (Autoline)
MSL Level	3
Reflow Profile	220C

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	CML-R
Fault Coverage:	100%

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

Stress/Test	Test Condition (Temp/Bias)	Result P/F
Acoustic Microscopy Test	J-STD-020	P
Ball Shear	JESD22-B116A	P
Bond Pull	MIL-STD-883 – Method 2011	P
Die Shear	MIL-STD-883, Method 2019	P
High Temperature Operating Life Early Failure Rate	Dynamic Operating Condition, Vcc Max = 2.07V, 125°C	P
High Temperature Operating Life Latent Failure Rate	Dynamic Operating Condition, Vcc Max = 2.07V, 125°C	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	500V JESD22-C101	P
Electrostatic Discharge Human Body Model (ESD-HBM)	2,200V JESD22, Method A114-B	P
Electrostatic Discharge Human Body Model (ESD-HBM)	2,200V MIL-STD-883, Method 3015.7	P
External Visual	MIL-PRF-38535, MILSTD-883, METHOD 2009,	P
Internal Visual	MIL-STD-883-2014	P
High Accelerated Saturation	130°C, 2.07V, 85%RH Precondition: JESD22 Moisture Sensitivity MSL3 192 Hrs., 30°C/60%RH+3IR-Reflow, 220°C+0, -5°C	P
High Temperature Storage	150C, no bias	P
Physical Dimension	MIL-STD-1835, JESD22-B100	P
Pressure Cooker	121C, 100%RH, 15 Psig Precondition: JESD22 Moisture Sensitivity MSL3 192 Hrs., 30°C/60%RH+3IR-Reflow, 220°C+0, -5°C	P
Temperature Cycle	JEDEC22, Condition C, -65°C to 150°C Precondition: JESD22 Moisture Sensitivity MSL3 192 Hrs., 30°C/60%RH+3IR-Reflow, 220°C+0, -5°C	P
Thermal Shock	MIL-STD-883C, Method 1011	P
X-Ray	MIL-STD-883 - 2012	P

Reliability Test Data

QTP #: 055103

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3							
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	COMP	15	0	
CY7C1313AV18 (7R1313B)	4539953	610559350	CML-RA	COMP	15	0	
CY7C1313AV18 (7R1313B)	4539953	610559349	CML-RA	COMP	15	0	
STRESS: BOND PULL							
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	COMP	10	0	
STRESS: BALL SHEAR							
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	COMP	30	0	
STRESS: DIE SHEAR							
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	COMP	15	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 125C, 2.07V, Vcc Max							
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	48	1486	0	
CY7C1313AV18 (7R1313B)	4539953	610559350	CML-RA	48	744	0	
CY7C1313AV18 (7R1313B)	4539953	610559349	CML-RA	48	495	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 125C, 2.07V, Vcc Max							
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	80	126	0	
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	500	121	0	
CY7C1313AV18 (7R1313B)	4539953	610559350	CML-RA	80	126	0	
CY7C1313AV18 (7R1313B)	4539953	610559350	CML-RA	500	125	0	
STRESS: ESD-CHARGE DEVICE MODEL, 500V							
CY7C1313AV18 (7R1313B)	4536793	610546315	CML-RA	COMP	9	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-B, 2,200V							
CY7C1313AV18 (7R1313B)	4536793	610546315	CML-RA	COMP	9	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015, 2,200V							
CY7C1313AV18 (7R1313B)	4536793	610546315	CML-RA	COMP	3	0	
STRESS: EXTERNAL VISUAL							
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	COMP	15	0	
STRESS: INTERNAL VISUAL							
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	COMP	5	0	
STRESS: PHYSICAL DIMENSIONS							
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	COMP	5	0	

Reliability Test Data

QTP #: 055103

<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: HI-ACCEL SATURATION TEST (130C, 85%RH, 2.07V), PRE COND 192 HR 30C/60%RH, MSL3							
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	128	47	0	
CY7C1313AV18 (7R1313B)	4535671	610546317	CML-RA	128	50	0	
STRESS: HIGH TEMPERATURE STORAGE, PLASTIC, 150C							
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	500	45	0	
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	1000	45	0	
STRESS: PRESSURE COOKER TEST (121C, 100%RH, 15 Psig), PRE COND 192 HR 30C/60%RH, MSL3							
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	168	43	0	
CY7C1313AV18 (7R1313B)	4539953	610559350	CML-RA	168	44	0	
STRESS: TC COND. C -65C TO 150C, PRE COND 192 HRS 30C/60%RH, MSL3							
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	300	70	0	
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	500	70	0	
CY7C1313AV18 (7R1313B)	4539953	610559350	CML-RA	300	44	0	
CY7C1313AV18 (7R1313B)	4539953	610559349	CML-RA	300	45	0	
STRESS: THERMAL SHOCK							
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	100	45	0	
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	200	45	0	
STRESS: X-RAY							
CY7C1313AV18 (7R1313B)	4540176	610559351	CML-RA	COMP	15	0	
CY7C1313AV18 (7R1313B)	4539953	610559350	CML-RA	COMP	15	0	

Document History Page

Document Title: QTP# 055103: <165-Ball Fine Pitch Ball Grid Array (FBGA) (13 x 15 x 1.4mm) (0.8mil wire) MSL3, 220C
Solder Reflow CML-RA (Autoline)
Document Number: 001-90033

Rev.	ECN No.	Orig. of Change	Description of Change
**	4189323	HSTO	Initial Spec Release Initiate report as per memo LGQ-522.
*A	4558885	HSTO	Align qualification report based on the new template in the front page

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