Cypress Semiconductor
Package Qualification Report

QTP# 101204
March 2025

144- Ball Grid Array (BGA)
(13 x 13 x 1.6mm)
MSL3, 220C Solder Reflow
ASE-Taiwan (G)

CYPRESS TECHNICAL CONTACT FOR QUALIFICATION DATA:

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PACKAGE QUALIFICATION HISTORY

Qual Report		Description of Qualification Purpose		Date Comp
050704		165-Ball FBGA (15x17x1.4mm and 13x15x.1.4mm) using G2270 Mold Compound, Ablestik 2025D and Pb-free Solder Balls, MSL3, 260C Reflow assembled at ASE-Taiwan		Mar 08
101204		144-Ball FBGA (13x13x1.6mm) using G2270 Mold Compound, SnPb Solder Balls and Ablestik 2025D , MSL3, 220C Reflow assembled at ASE-Taiwan		Jun 10

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	BB144
Package Outline, Type, or Name:	144-Ball Grid Array (BGA)
Mold Compound Name/Manufacturer:	KE-G2270
Mold Compound Flammability Rating:	V-O per UL94
Mold Compound Alpha Emission Rate:	< 0.005 C/cm^2 hr
Oxygen Rating Index:	N/A
Substrate Material:	BT
Lead Finish, Composition / Thickness:	SnPb
Die Backside Preparation Method/Metallization:	Grinding
Die Separation Method:	Step Cut
Die Attach Supplier:	Ablestik
Die Attach Material:	2025D
Die Attach Method:	Silver Epoxy
Bond Diagram Designation:	10-06132
Wire Bond Method:	Thermosonic
Wire Material/Size:	Au, 1.0 mil
Thermal Resistance Theta JA °C/W:	16.3 °C/W
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	49-41999
Name/Location of Assembly (prime) facility:	ASE-Taiwan (G)

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	CML-R, ASE-TAIWAN

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, 260C Reflow)	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
Die Shear	MIL-STD-883, Method 2019 Per die size: <3000 sq. mils = 1.2 kgf 30001-5000 sq. mils = 1.2 kgf >5001 sq. mils = 1.2 kgf	P
Electrostatic Discharge Human Body Model (ESD-HBM)	2,200V JEDEC EIA/JESD22-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
High Accelerated Saturation	130°C, 3.6V/1.98V, 85%RH Precondition: JESD22 Moisture Sensitivity MSL3 192 Hrs., 30°C/60%RH+3IR-Reflow, **260°C**+5, -0°C	P
High Temperature Storage	150C, no bias	P
Internal Visual	MIL-STD-883-2014	P
Pressure Cooker	121C, 100%RH Precondition: JESD22 Moisture Sensitivity MSL3 192 Hrs., 30°C/60%RH+3IR-Reflow, **260°C**+5, -0°C	P
Solderability	J-STD-002, JESD22-B102 95% solder coverage minimum	P
Temperature Cycle	JEDEC22, Condition C, -65°C to 150°C Precondition: JESD22 Moisture Sensitivity MSL3 192 Hrs., 30°C/60%RH+3IR-Reflow, **260°C**+5, -0°C	P
Thermal Shock	MIL-STD-883C, Method 1011, Condition B, -55 C to 125C and JESD22-A106B, Condition C, -55 C to 125C	P
X-Ray	MIL-STD-883 - 2012	P

Reliability Test Data

QTP #: 050704

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3							
CY7C1470V33 (7C1470A)	4352891	*610457386*	TAIWAN-G	COMP	15	0	
CY7C1470V33 (7C1470A)	4414234	*610457387*	TAIWAN-G	COMP	15	0	
CY7C1470V33 (7C1470A)	4402400	*610500796*	TAIWAN-G	COMP	15	0	
CY7C1313AV18 (7C1313B)	4352777	*610419844*	TAIWAN-G	COMP	15	0	
STRESS: BOND PULL							
CY7C1470V33 (7C1470A)	4352891	*610457386*	TAIWAN-G	COMP	100	0	
CY7C1470V33 (7C1470A)	4414234	*610457387*	TAIWAN-G	COMP	100	0	
CY7C1470V33 (7C1470A)	4352890	*610457388*	TAIWAN-G	COMP	100	0	
STRESS: BALL SHEAR							
CY7C1470V33 (7C1470A)	4352891	*610457386*	TAIWAN-G	COMP	100	0	
CY7C1470V33 (7C1470A)	4414234	*610457387*	TAIWAN-G	COMP	100	0	
CY7C1470V33 (7C1470A)	4352890	*610457388*	TAIWAN-G	COMP	100	0	
STRESS: DIE SHEAR							
CY7C1470V33 (7C1470A)	4352891	*610457386*	TAIWAN-G	COMP	15	0	
CY7C1470V33 (7C1470A)	4414234	*610457387*	TAIWAN-G	COMP	15	0	
CY7C1470V33 (7C1470A)	4352890	*610457388*	TAIWAN-G	COMP	15	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-B, 2,200V							
CY7C1470V33 (7C1470A)	4352891	*610457386*	TAIWAN-G	COMP	9	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015, 2,200V							
CY7C1470V33 (7C1470A)	4352891	*610457386*	TAIWAN-G	COMP	3	0	
STRESS: EXTERNAL VISUAL							
CY7C1470V33 (7C1470A)	4352891	*610457386*	TAIWAN-G	COMP	315	0	
CY7C1470V33 (7C1470A)	4414234	*610457387*	TAIWAN-G	COMP	210	0	
CY7C1470V33 (7C1470A)	4352890	*610457388*	TAIWAN-G	COMP	106	0	
CY7C1313AV18 (7C1313B)	4352777	610419844	TAIWAN-G	COMP	15	0	

Reliability Test Data

QTP #: 050704

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 3.6V), PRE COND 192 HR 30C/60%RH, MSL3							
CY7C1470V33 (7C1470A)	4414234	*610457387*	TAIWAN-G	128	47	0	
STRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 1.98V), PRE COND 192 HR 30C/60%RH, MSL3							
CY7C1313AV18 (7C1313B)	4352777	*610419844*	TAIWAN-G	128	45	0	
STRESS: HIGH TEMPERATURE STORAGE, PLASTIC, 150C							
CY7C1470V33 (7C1470A)	4352890	*610457388*	TAIWAN-G	644	45	0	
CY7C1470V33 (7C1470A)	4352890	*610457388*	TAIWAN-G	1000	45	0	
STRESS: INTERNAL VISUAL							
CY7C1470V33 (7C1470A)	4352891	*610457386*	TAIWAN-G	COMP	5	0	
STRESS: PRESSURE COOKER TEST (121C, 100%RH), PRE COND 192 HR 30C/60%RH, MSL3							
CY7C1470V33 (7C1470A)	4352891	*610457386*	TAIWAN-G	168	48	0	
CY7C1470V33 (7C1470A)	4352891	*610457386*	TAIWAN-G	288	48	0	
CY7C1313AV18 (7C1313B)	4352777	*610419844*	TAIWAN-G	168	45	0	
STRESS: TC COND. C -65C TO 150C, PRECONDITION 192 HRS 30C/60%RH, MSL3							
CY7C1470V33 (7C1470A)	4352891	*610457386*	TAIWAN-G	300	48	0	
CY7C1470V33 (7C1470A)	4352891	*610457386*	TAIWAN-G	500	46	0	
CY7C1470V33 (7C1470A)	4352891	*610457386*	TAIWAN-G	1000	46	0	
CY7C1470V33 (7C1470A)	4414234	*610457387*	TAIWAN-G	300	48	0	
CY7C1470V33 (7C1470A)	4414234	*610457387*	TAIWAN-G	500	48	0	
CY7C1470V33 (7C1470A)	4414234	*610457387*	TAIWAN-G	1000	48	0	
CY7C1470V33 (7C1470A)	4402400	*610500796*	TAIWAN-G	300	49	0	
CY7C1470V33 (7C1470A)	4402400	*610500796*	TAIWAN-G	500	49	0	
CY7C1313AV18 (7C1313B)	4352777	*610419844*	TAIWAN-G	300	44	0	
STRESS: THERMAL SHOCK							
CY7C1470V33 (7C1470A)	4352891	*610457386*	TAIWAN-G	100	50	0	
CY7C1470V33 (7C1470A)	4352891	*610457386*	TAIWAN-G	200	50	0	

Reliability Test Data

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Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: X-RAY							
CY7C1470V33 (7C1470A)	4352891	*610457386*	TAIWAN-G	COMP	76	0	
CY7C1470V33 (7C1470A)	4414234	*610457387*	TAIWAN-G	COMP	76	0	
CY7C1470V33 (7C1470A)	4352890	*610457388*	TAIWAN-G	COMP	76	0	
CY7C1313AV18 (7C1313B)	4352777	*610419844*	TAIWAN-G	COMP	15	0	

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Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: SOLDERABILITY							
144 Ball FBGA	NA	NA	TAIWAN-G	COMP	9	0	

Document History Page

Document Title: 101204: 144- BALL GRID ARRAY (BGA) (13 X 13 X 1.6MM) MSL3, 220C SOLDER REFLOW ASE-TAIWAN (G)
Document Number: 001-62057

Rev.	ECN No.	Orig. of Change	Description of Change
**	2942302	HGA	Initial spec release
*A	2981424	HGA	Update reflow temp from 260C to 220C Update QTP number from page 5-7 Update spec title to replace 260C with 220C Removed obsolete spec 24-00018 & 25-00038 and replaced with 12-000292.
*B	3599524	HGA	Spec Sunset review. Remove obsolete document(s) as references; 12-00215 24-00002 25-00017 Removed references to 25-00014. Added reference to12-00103.
*C	4040635	NSR	Added ASE-TAIWAN in Test Lcation. Removed reference Cypress Specs and retain the reference industry standards in Reliability Tests performed table.
*D	8113666	HSTO	Sunset review