CYPRESS
EMBEDDED IN TOMORROW™

Document No.002-23005 Rev. *A
ECN # 6082298

Cypress Semiconductor
Package Qualification Report

QTP# 174601 VERSION*A
February 2018

104-Ball Molded Wafer Level Chip Scale Package (M-WLCSP), 3.841 x 5.00 x0.65 mm MSL1, 260C Stats ChipPAC-Singapore (HS)

FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT reliability@cypress.com or via a CYLINK CRM CASE

Prepared By:
Honesto Sintos (HSTO)
Reliability Engineer

Reviewed By:
Lorena Zapanta (ILZ)
Reliability Manager

Approved By:
David Hoffman (DHH)
Reliability Director

PACKAGE QUALIFICATION HISTORY

QTP Number	DESCRIPTION OF QUALIFICATION PURPOSE	Date
173901	Qualification of 104-Ball M-WLCSP (3.841x5.00x0.65mm) Package at Stats ChipPAC-Singapore (HS) using SAC405 Solder Finish at MSL3, 260C Reflow Temperature	Jan 2018
174601	Qualification of 104-Ball M-WLCSP (3.841x5.00x0.65mm) Package at Stats ChipPAC-Singapore (HS) using SAC405 Solder Finish at MSL1, 260C Reflow Temperature	Jan 2018

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	FM104
Package Outline, Type, or Name:	104-Ball Molded Wafer Level Chip Scale Package (M-WLCSP) (3.841x5.00x0.65mm)
Die Backside Preparation Method:	Backgrind
Die Separation Method:	Laser Grooving + Wafer Saw
Solder Ball/Bump Material:	SAC-405
Bonding Method:	RDL routing
Bond Diagram Designation:	002-20113
Thermal Resistance Theta JA °C/W:	33.7 C/W
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	002-22489M
Name/Location of Assembly (prime) facility:	Stats ChipPAC-Singapore (HS)
MSL Level	1
Reflow Profile	260C

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	CML-Philippines (RA), ASE-Taiwan (G), BKK-Thailand

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENT

Stress/Test	Test Condition (Temp/Bias)	Result P/F
Constructional Analysis	Criteria: Meet external and internal characteristics of Cypress package	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 JESD22-C101	P
Final Visual	JESD22-B101	P
High Accelerated Saturation Test (HAST)	JEDEC STD 22-A110: 130°C, 85%RH, 3.63V Precondition: JESD22 Moisture Sensitivity MSL 1 (168 Hrs.,85°C, 85%RH, 260°C Reflow)	P
High Accelerated Saturation Test (HAST)	JEDEC STD 22-A110: 130°C, 85%RH, 3.63V Precondition: JESD22 Moisture Sensitivity MSL 3 (192 Hrs., 30 °C, 60% RH, 260°C Reflow)	P
High Accelerated Saturation Test (HAST) – Unbiased	JEDEC STD 22-A110: 130°C, 85%RH Precondition: JESD22 Moisture Sensitivity MSL 1 (168 Hrs.,85°C, 85%RH, 260°C Reflow)	P
High Accelerated Saturation Test (HAST) – Unbiased	JEDEC STD 22-A110: 130°C, 85%RH Precondition: JESD22 Moisture Sensitivity MSL 3 (192 Hrs., 30 °C, 60% RH, 260°C Reflow)	P
High Temperature Storage	150°C, no bias	P
Physical Dimension	MIL-STD-1835, JESD22-B100	P
Solder Ball Shear	JESD22-B117	P
Acoustic Microscopy	J-STD-020 Precondition: JESD22 Moisture Sensitivity Level3 (192 Hrs., 30 °C, 60% RH, 260°C Reflow)	P
Solderability Test	J-STD-002, JESD22-B102	P
Temperature Cycle	MIL-STD-883, Method 1010, Condition B, -55°C to 125°C Precondition: JESD22 Moisture Sensitivity MSL 1 (168 Hrs.,85°C, 85%RH, 260°C Reflow)	P
Temperature Cycle	MIL-STD-883, Method 1010, Condition B, -55°C to 125°C Precondition: JESD22 Moisture Sensitivity Level 3 (192 Hrs., 30 °C, 60% RH, 260°C Reflow)	P

Reliability Test Data

QTP #: 173901

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC							
CY8C68237FM (8CS40002AO)	9645007	611716136	HS-STATS	COMP	22	0	
CY8C68237FM (8CS40002AO)	9645007	611716137	HS-STATS	COMP	22	0	
CY8C68237FM (8CS40002AO)	9645007	611716191	HS-STATS	COMP	22	0	
STRESS: CONSTRUCTIONAL ANALYSIS							
CY8C68237FM (8CS40002AO)	9645007	611716136	HS-STATS	COMP	5	0	
STRESS: DYE PENETRANT TEST							
CY8C68237FM (8CS40002AO)	9645007	611716136	HS-STATS	COMP	15	0	
CY8C68237FM (8CS40002AO)	9645007	611716137	HS-STATS	COMP	15	0	
CY8C68237FM (8CS40002AO)	9645007	611716191	HS-STATS	COMP	15	0	
STRESS: ESD-CHARGE DEVICE MODEL							
CY8C68237FM (8CS40002AO)	9645007	611726415	HS-STATS	500	9	0	
CY8C68237FM (8CS40002AO)	9645007	611726415	HS-STATS	750	3	0	
STRESS: FINAL VISUAL							
CY8C68237FM (8CS40002AO)	9645007	611716136	HS-STATS	COMP	610	0	
CY8C68237FM (8CS40002AO)	9645007	611716137	HS-STATS	COMP	611	0	
CY8C68237FM (8CS40002AO)	9645007	611716191	HS-STATS	COMP	593	0	
STRESS: UNBIASED HI-ACCEL SATURATION TEST (130C, 85%RH), PRE COND 192 HR 30C/60%RH (MSL3)							
CY8C68237FM (8CS40002AO)	9645007	611716136	HS-STATS	96	79	0	
CY8C68237FM (8CS40002AO)	9645007	611716136	HS-STATS	192	79	0	
CY8C68237FM (8CS40002AO)	9645007	611716137	HS-STATS	96	80	0	
CY8C68237FM (8CS40002AO)	9645007	611716137	HS-STATS	192	80	0	
CY8C68237FM (8CS40002AO)	9645007	611716191	HS-STATS	96	78	0	
CY8C68237FM (8CS40002AO)	9645007	611716191	HS-STATS	192	78	0	
STRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 3.63V), PRE COND 192 HR 30C/60%RH (MSL3)							
CY8C68237FM (8CS40002AO)	9645007	611716136	HS-STATS	96	29	0	
CY8C68237FM (8CS40002AO)	9720019	611729541	HS-STATS	96	30	0	
STRESS: HIGH TEMPERATURE STORAGE, 150C							
CY8C68237FM (8CS40002AO)	9645007	611716136	HS-STATS	500	80	0	
CY8C68237FM (8CS40002AO)	9645007	611716136	HS-STATS	1000	80	0	

Reliability Test Data

QTP #: 173901

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: PHYSICAL DIMENSION							
CY8C68237FM (8CS40002AO)	9645007	611716136	HS-STATS	COMP	45	0	
CY8C68237FM (8CS40002AO)	9645007	611716137	HS-STATS	COMP	45	0	
CY8C68237FM (8CS40002AO)	9645007	611716191	HS-STATS	COMP	45	0	
CY8C68237FM (8CS40002AO)	9720019	611729541	HS-STATS	COMP	15	0	
CY8C68237FM (8CS40002AO)	9722030	611730077	HS-STATS	COMP	15	0	
CY8C68237FM (8CS40002AO)	9720018	611726415	HS-STATS	COMP	15	0	
STRESS: SOLDER BALL							
CY8C68237FM (8CS40002AO)	9645007	611716136	HS-STATS	COMP	5	0	
CY8C68237FM (8CS40002AO)	9645007	611716137	HS-STATS	COMP	5	0	
CY8C68237FM (8CS40002AO)	9645007	611716191	HS-STATS	COMP	5	0	
STRESS: SOLDERABILITY							
CY8C68237FM (8CS40002AO)	9645007	611716136	HS-STATS	COMP	5	0	
CY8C68237FM (8CS40002AO)	9645007	611716137	HS-STATS	COMP	5	0	
CY8C68237FM (8CS40002AO)	9645007	611716191	HS-STATS	COMP	5	0	
STRESS: TC COND. B -55C TO 125C, PRE COND 192 HR 30C/60%RH (MSL3)							
CY8C68237FM (8CS40002AO)	9645007	611716136	HS-STATS	500	80	0	
CY8C68237FM (8CS40002AO)	9645007	611716136	HS-STATS	1000	78	0	
CY8C68237FM (8CS40002AO)	9645007	611716137	HS-STATS	500	76	0	
CY8C68237FM (8CS40002AO)	9645007	611716137	HS-STATS	1000	76	0	
CY8C68237FM (8CS40002AO)	9645007	611716191	HS-STATS	500	80	0	
CY8C68237FM (8CS40002AO)	9645007	611716191	HS-STATS	1000	80	0	

CYPRESS EMBEDDED IN TOMORROW™

Reliability Test Data

QTP #: 174601

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC							
CY8C68237FM (8CS40002AO)	9720018	611726415	HS-STATS	COMP	22	0	
CY8C68237FM (8CS40002AO)	9720019	611729541	HS-STATS	COMP	22	0	
CY8C68237FM (8CS40002AO)	9722030	611730077	HS-STATS	COMP	22	0	
STRESS: FINAL VISUAL							
CY8C68237FM (8CS40002AO)	9720018	611726415	HS-STATS	COMP	1000	0	
CY8C68237FM (8CS40002AO)	9720019	611729541	HS-STATS	COMP	1305	0	
CY8C68237FM (8CS40002AO)	9722030	611730077	HS-STATS	COMP	10590	0	
STRESS: UNBIASED HI-ACCEL SATURATION TEST (130C, 85%RH), PRE COND 168 HR 85C/85%RH (MSL1)							
CY8C68237FM (8CS40002AO)	9720018	611726415	HS-STATS	96	80	0	
CY8C68237FM (8CS40002AO)	9720018	611726415	HS-STATS	192	80	0	
CY8C68237FM (8CS40002AO)	9720019	611729541	HS-STATS	96	78	0	
CY8C68237FM (8CS40002AO)	9720019	611729541	HS-STATS	192	76	0	
CY8C68237FM (8CS40002AO)	9722030	611730077	HS-STATS	96	80	0	
CY8C68237FM (8CS40002AO)	9722030	611730077	HS-STATS	192	80	0	
STRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 3.63V), PRE COND 168 HR 85C/85%RH (MSL1)							
CY8C68237FM (8CS40002AO)	9720018	611726415	HS-STATS	96	30	0	
CY8C68237FM (8CS40002AO)	9720018	611726415	HS-STATS	192	30	0	
CY8C68237FM (8CS40002AO)	9720019	611729541	HS-STATS	96	29	0	
CY8C68237FM (8CS40002AO)	9720019	611729541	HS-STATS	192	28	0	
CY8C68237FM (8CS40002AO)	9722030	611730077	HS-STATS	96	30	0	
CY8C68237FM (8CS40002AO)	9722030	611730077	HS-STATS	192	29	0	
STRESS: TC COND. B -55C TO 125C, PRE COND 168 HRS 85C/85%RH, MSL1							
CY8C68237FM (8CS40002AO)	9720018	611726415	HS-STATS	500	80	0	
CY8C68237FM (8CS40002AO)	9720018	611726415	HS-STATS	1000	80	0	
CY8C68237FM (8CS40002AO)	9720019	611729541	HS-STATS	500	80	0	
CY8C68237FM (8CS40002AO)	9720019	611729541	HS-STATS	1000	80	0	
CY8C68237FM (8CS40002AO)	9722030	611730077	HS-STATS	500	79	0	
CY8C68237FM (8CS40002AO)	9722030	611730077	HS-STATS	1000	78	0	

Document History Page

Document Title: QTP#174601: 104-Ball Molded Wafer Level Chip Scale Package (M-WLCSP), 3.841 x 5.00 x0.65 mm MSL1, 260C Stats ChipPAC-Singapore (HS)

Document Number: 002-23005

Rev.	ECN No.	Orig. of Change	Description of Change
**	6060158	HSTO	Initial spec release.
*A	6082298	HSTO	Update Assembly Process Flow and MSL level