

# Cypress Semiconductor Automotive Package Qualification Report

**QTP# 164804 VERSION \*\***  
**April 2017**

**100L-TQFP (14x14x1.4mm)**  
**Pure Sn leadfinish, Au Wire**  
**MSL3, 260C Reflow**  
**ASEK-Taiwan (G)**

**FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT**  
**[reliability@cypress.com](mailto:reliability@cypress.com) or via a CYLINK CRM CASE**

**Prepared By:**  
Honesto Sintos  
Reliability Engineer

**Reviewed By:**  
Lorena Zapanta  
Reliability Manager

**Approved By:**  
David Hoffman  
Reliability Director

**PACKAGE QUALIFICATION HISTORY**

<b>QTP Number</b>	<b>Description of Qualification Purpose</b>	<b>Date</b>
163803	Qualification of Automotive 100L-TQFP (14x14x1.4mm) Package using Fab25 wafers at ASEK-Taiwan (G) using 0.8mil Au wire with EME-G631 mold compound, CRM-1076 die attach material, Copper with Ag plating leadframe material and Pure Sn leadfinish at MSL3, 260C Reflow Temperature.	Feb 2017
164804	Qualification of Automotive 100L-TQFP (14x14x1.4mm) Package using Fab25 wafers at ASEK-Taiwan (G) using 0.8mil Au wire with EME-G631 mold compound, CRM-1076 die attach material, Copper with Ag plating leadframe material and Pure Sn leadfinish at MSL3, 260C Reflow Temperature.	Mar 2017

<b>MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION</b>	
Package Designation:	AZ0AB
Package Outline, Type, or Name:	100-Lead TQFP 14x14x1.4mm
Mold Compound Name/Manufacturer:	EME-G631 / Sumitomo
Mold Compound Flammability Rating:	UL-94 V-0
Mold Compound Alpha Emission Rate:	N/A (Not low alpha mold compound)
Oxygen Rating Index: >28%	54%
Lead Frame Designation:	Full Metal Pad
Lead Frame Material:	Copper
Substrate Material:	N/A
Lead Finish, Composition / Thickness:	Pure Sn
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Wafer Saw
Die Attach Supplier:	Sumitomo
Die Attach Material:	CRM-1076
Bond Diagram Designation	002-15599 / 002-15758
Wire Bond Method:	Thermosonic
Wire Material/Size:	Au / 0.8mil
Thermal Resistance Theta JA °C/W:	38
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	49-41999M
Name/Location of Assembly (prime) facility:	ASEK-Taiwan (G)
MSL LEVEL	3
REFLOW PROFILE	260C

<b>ELECTRICAL TEST / FINISH DESCRIPTION</b>	
Test Location:	CML (R)

**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 Temperature Operating Life Early Failure Rate	AEC-Q100-008 and JESD22-A108, 150°C Dynamic Operating Condition, Vcc Max = 2.07V	P
Endurance /High Temperature Operating Life Latent Failure Rate	JESD22-A108, 150°C Dynamic Operating Condition, Vcc Max = 2.07V	P
High Accelerated Saturation Test (HAST)	JESD22-A110, 130C, 5.5V, 85%RH Precondition: JESD22-A113 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3IR-Reflow, 260°C+0, -5°C	P
Temperature Cycle	JESD22-A104, -65°C to 150°C Precondition: JESD22-A113 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3IR-Reflow, 260°C+0, -5°C	P
Pressure Cooker	JESD22-A102, 121C, 100%RH, 15 Psig Precondition: JESD22-A113 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3IR-Reflow, 260°C+0, -5°C	P
Acoustic	J-STD-020 Precondition: JESD22-A113 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3IR-Reflow, 260C+0, -5C	P
High Temp Storage	JESD22-A103: 150 C, no bias	P
Wire Bond Pull	Mil-Std 883, Method 2011	P
Post Temperature Cycle Wire Bond Pull	Mil-Std 883, Method 2011	P
Dye Penetrant Test	Criteria: No Package Crack	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	AEC-Q100-011 250V/500V/ 750V (corner pins)	P
Electrostatic Discharge Human Body Model (ESD-HBM)	AEC-Q100-002 500V/1000V/2000V	P
Static Latch-up	AEC-Q100-004, 125C, 100mA	P
Electrical Distribution	AEC-Q100-009	P
Wire Ball Shear	AEC-Q100-001	P
Final Visual	JESD22-B101B	P
Physical Dimensions	JESD22B100 and B108	P
Constructional Analysis	Criteria: Meet external and internal characteristics of Cypress package	P
Solderability	JESD22-B102	P



## Reliability Test Data

**QTP #: 163803**

<i>Device</i>	<i>Package</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>
<b>STRESS: ACOUSTIC, MSL3</b>								
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	COMP	22	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	COMP	22	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	COMP	22	0	
<b>STRESS: BALL SHEAR</b>								
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	COMP	5	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611634182	ASEK-G	COMP	5	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	COMP	5	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	COMP	5	0	
<b>STRESS: BOND PULL</b>								
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	COMP	5	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611634182	ASEK-G	COMP	5	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	COMP	5	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	COMP	5	0	
<b>STRESS: CONSTRUCTIONAL ANALYSIS</b>								
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	COMP	5	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	COMP	5	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	COMP	5	0	
<b>STRESS: DIE SHEAR</b>								
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	COMP	15	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611634182	ASEK-G	COMP	15	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	COMP	15	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	COMP	15	0	
<b>STRESS: DYE PENETRANT</b>								
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	COMP	15	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	COMP	15	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	COMP	15	0	

## Reliability Test Data

**QTP #: 163803**

<i>Device</i>	<i>Package</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: ELECTRICAL DISTRIBUTION**

CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	COMP	80	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	COMP	80	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	COMP	80	0	

**STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 150C, 2.07V, Vcc Max**

CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	48	3333	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	48	3379	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	48	3395	0	

**STRESS: ENDURANCE / HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 2.07V, Vcc Max**

CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	408	80	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	408	80	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	408	80	0	

**STRESS: ESD-CHARGE DEVICE MODEL**

CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	250	3	0	
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	500	3	0	
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	750	3	0	

**STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22-A114-B**

CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	500	3	0	
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	1000	3	0	
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	2000	3	0	
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	4000	3	0	
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	6000	3	0	

**STRESS: FINAL VISUAL INSPECTION**

CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	COMP	4349	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611634182	ASEK-G	COMP	3405	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	COMP	7046	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	COMP	6516	0	

## Reliability Test Data

**QTP #: 163803**

<i>Device</i>	<i>Package</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, 5.5V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3**

CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	96	77	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	96	79	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	96	80	0	

**STRESS: HIGH TEMPERATURE STORAGE**

CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	1000	45	0	
------------------------	------	---------	-----------	--------	------	----	---	--

**STRESS: LEAD INTEGRITY**

CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	COMP	5	0	
------------------------	------	---------	-----------	--------	------	---	---	--

**STRESS: PRESSURE COOKER TEST**

CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	96	80	0	
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	168	80	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	96	80	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	168	80	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	96	80	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	168	80	0	

**STRESS: PHYSICAL DIMENSION**

CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	COMP	10	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611634182	ASEK-G	COMP	10	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	COMP	10	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	COMP	10	0	

**STRESS: POST TCT BOND PULL**

CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	500	5	0	
------------------------	------	---------	-----------	--------	-----	---	---	--

**STRESS: PRE/POST LFR CRITICAL PARAMETERS**

CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	COMP	82	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	COMP	82	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	COMP	82	0	

## Reliability Test Data

**QTP #: 163803**

<i>Device</i>	<i>Package</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>
<b>STRESS: SOLDERABILITY</b>								
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	COMP	15	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	COMP	15	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	COMP	15	0	
<b>STRESS: TC COND. C -65C TO 150C, PRECONDITION 192 HRS 30C/60%RH</b>								
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	500	85	0	
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	1000	80	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	500	95	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	1000	95	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	500	83	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	1000	83	0	
<b>STRESS: X-RAY</b>								
CYAT81688 (8A206802BB)	AZ0A	3629023	611627389	ASEK-G	COMP	15	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611634182	ASEK-G	COMP	15	0	
CYAT81688 (8A206802BB)	AZ0A	3632047	611630353	ASEK-G	COMP	15	0	
CYAT81688 (8A206802BB)	AZ0A	3634008	611631857	ASEK-G	COMP	15	0	





## Reliability Test Data

**QTP #: 164804**

<i>Device</i>	<i>Package</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>
<b>STRESS: ACOUSTIC, MSL3</b>								
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	COMP	22	0	
<b>STRESS: CONSTRUCTIONAL ANALYSIS</b>								
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	COMP	5	0	
<b>STRESS: DYE PENETRANT</b>								
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	COMP	15	0	
<b>STRESS: ENDURANCE / DATA RETENTION TEST</b>								
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	1000	77	0	
<b>STRESS: ESD-CHARGE DEVICE MODEL</b>								
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	250	3	0	
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	500	3	0	
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	750	3	0	
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22-A114-B</b>								
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	500	3	0	
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	1000	3	0	
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	2000	3	0	
<b>STRESS: HI-ACCEL SATURATION TEST, 130C, 5.5V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3</b>								
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	96	80	0	
<b>STRESS: LEAD INTEGRITY</b>								
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	COMP	5	0	
<b>STRESS: PRESSURE COOKER TEST</b>								
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	96	80	0	
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	168	80	0	
<b>STRESS: POST TCT BOND PULL</b>								
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	500	3	0	
<b>STRESS: STATIC LATCH-UP TESTING, +/-100mA 125C</b>								
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	COMP	6	0	

## Reliability Test Data

**QTP #: 164804**

<i>Device</i>	<i>Package</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>
<b>STRESS: SOLDERABILITY</b>								
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	COMP	15	0	
<b>STRESS: TC COND. C -65C TO 150C, PRECONDITION 192 HRS 30C/60%RH</b>								
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	500	85	0	
CYAT81658 (8A206205DB)	AZ0A	3626124	611637045	ASEK-G	1000	80	0	



## Document History Page

Document Title: QTP#164804: AUTOMOTIVE 100L-TQFP (14X14X1.4MM) PURE SN LEADFINISH, AU WIRE  
MSL3, 260C REFLOW ASEK-TAIWAN (G)  
Document Number: 002-19344

Rev.	ECN No.	Orig. of Change	Description of Change
**	5684673	HSTO	Initial spec release