

Cypress Semiconductor Automotive Package Qualification Report

**QTP# 151313 VERSION **
June 2016**

**56L QFN (8x8x1.0mm)
Pure Sn leadfinish, Au Wire
MSL3, 260C Reflow
ASEK-Taiwan (G)**

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

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QTP Number	Description of Qualification Purpose	Date
151313	Qualification of 56-lead QFN (8x8x1.0mm) Automotive (LT56B) Package in ASEK-Taiwan (G) using 1.0mil Au wire with G700LA mold compound, EN4900F die attach material, CuAg (C194) leadframe and Pure Sn leadfinish at MSL3, 260C Reflow Temperature.	Jan 2016

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	LT56B
Package Outline, Type, or Name:	56L –QFN (8x8x1.0mm)
Mold Compound Name/Manufacturer:	G700 / Sumitomo
Mold Compound Flammability Rating:	N/A (not low alpha mold compound)
Mold Compound Alpha Emission Rate:	UL-94 V-0
Oxygen Rating Index: >28%	54%
Lead Frame Designation:	Full Metal Pad
Lead Frame Material:	Copper
Lead Finish, Composition / Thickness:	Pure Sn
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Saw
Die Attach Supplier:	Hitachi
Die Attach Material:	EN4900F
Bond Diagram Designation	001-71358
Wire Bond Method:	Thermosonic
Wire Material/Size:	Au / 1 mil
Thermal Resistance Theta JA °C/W:	22
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	002-03305
Name/Location of Assembly (prime) facility:	ASEK-Taiwan (G)
MSL LEVEL	3
REFLOW PROFILE	260C

ELECTRICAL TEST / FINISH DESCRIPTION	
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, 125°C Dynamic Operating Condition, Vcc Max = 5.5V	P
High Temperature Operating Life Latent Failure Rate	JESD22-A108, 125°C Dynamic Operating Condition, Vcc Max = 5.5V	P
High Accelerated Saturation Test (HAST)	JESD22-A110, 130C, 5.25V, 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
Constructional Analysis	Criteria: Meet external and internal characteristics of Cypress package	P
Solderability	JESD22-B102	P
Electrostatic Discharge Human Body Model (ESD-HBM)	AEC-Q100-002 500V/1000V/2000V	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	AEC-Q100-011 250V/500V/ 750V (corner pins)	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



Reliability Test Data

QTP #: 151313

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3								
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	COMP	22	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446486	ASE-G	COMP	22	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446485	ASE-G	COMP	22	0	
STRESS: BALL SHEAR								
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	COMP	100	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446486	ASE-G	COMP	100	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446485	ASE-G	COMP	100	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611510324	ASE-G	COMP	100	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611510325	ASE-G	COMP	100	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611510326	ASE-G	COMP	100	0	
STRESS: BOND PULL								
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	COMP	100	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446486	ASE-G	COMP	100	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446485	ASE-G	COMP	100	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611510324	ASE-G	COMP	100	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611510325	ASE-G	COMP	100	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611510326	ASE-G	COMP	100	0	
STRESS: CONSTRUCTIONAL ANALYSIS								
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	COMP	5	0	
STRESS: DYE PENETRANT								
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	COMP	15	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446486	ASE-G	COMP	15	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446485	ASE-G	COMP	15	0	
STRESS: ELECTRICAL DISTRIBUTION								
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	COMP	30	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446486	ASE-G	COMP	30	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446485	ASE-G	COMP	30	0	



Reliability Test Data

QTP #: 151313

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 125C, 5.5V, Vcc Max								
CY8C24894 (8A24894AC)	LT56B	4438109	611510324	ASE-G	96	800	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611510325	ASE-G	96	800	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611510326	ASE-G	96	800	0	
STRESS: ESD-CHARGE DEVICE MODEL								
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	250	3	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	500	3	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	759	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT								
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	500	3	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	1000	3	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	2000	3	0	
STRESS: ESD-MACHINE MODEL								
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	50	3	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	100	3	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	150	3	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	200	3	0	
STRESS: FINAL VISUAL								
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	COMP	798	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446486	ASE-G	COMP	672	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446485	ASE-G	COMP	651	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611510324	ASE-G	COMP	750	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611510325	ASE-G	COMP	663	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611510326	ASE-G	COMP	645	0	



Reliability Test Data

QTP #: 151313

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: HI-ACCEL SATURATION TEST, 130C, 5.25V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3								
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	96	80	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446486	ASE-G	96	78	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446485	ASE-G	96	75	0	
STRESS: HIGH TEMPERATURE STORAGE								
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	1000	80	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 125C, 5.5V, Vcc Max								
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	1000	120	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446486	ASE-G	1000	120	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446485	ASE-G	1000	120	0	
STRESS: PRESSURE COOKER TEST								
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	96	80	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	168	80	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446486	ASE-G	96	80	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446486	ASE-G	168	80	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446485	ASE-G	96	80	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446485	ASE-G	168	80	0	
STRESS: PHYSICAL DIMENSION								
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	COMP	30	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446486	ASE-G	COMP	30	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611446485	ASE-G	COMP	30	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611510324	ASE-G	COMP	30	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611510325	ASE-G	COMP	30	0	
CY8C24894 (8A24894AC)	LT56B	4438109	611510326	ASE-G	COMP	30	0	
STRESS: POST TCT BOND PULL								
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	500	5	0	



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<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 Failure Mechanism</i>
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STRESS: SOLDERABILITY

CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	COMP	15	0
CY8C24894 (8A24894AC)	LT56B	4438109	611446486	ASE-G	COMP	15	0
CY8C24894 (8A24894AC)	LT56B	4438109	611446485	ASE-G	COMP	15	0

STRESS: TC COND. C -65C TO 150C, PRECONDITION 192 HRS 30C/60%RH

CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	500	85	0
CY8C24894 (8A24894AC)	LT56B	4438109	611446484	ASE-G	1000	80	0
CY8C24894 (8A24894AC)	LT56B	4438109	611446486	ASE-G	500	80	0
CY8C24894 (8A24894AC)	LT56B	4438109	611446486	ASE-G	1000	80	0
CY8C24894 (8A24894AC)	LT56B	4438109	611446485	ASE-G	500	80	0
CY8C24894 (8A24894AC)	LT56B	4438109	611446485	ASE-G	1000	80	0



Document History Page

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Rev.	ECN No.	Orig. of Change	Description of Change
**	5309477	HSTO	Initial spec release