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Cypress Semiconductor Automotive Package Qualification Report

**QTP# 151312 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

QTP Number	Description of Qualification Purpose	Date
151312	Qualification of 56-lead QFN Automotive (LT56) 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.	June 2016

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	LT56
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	001-71362
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 = 3.8V	P
High Temperature Operating Life Latent Failure Rate	JESD22-A108, 150°C Dynamic Operating Condition, Vcc Max = 3.8V	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
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 #: 151312

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej Failure Mechanism
STRESS: ACOUSTIC, MSL3							
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	COMP	22	0
CY7C65630 (7A65630CC)	LT56	4418540	611446482	ASE-G	COMP	22	0
CY7C65630 (7A65630CC)	LT56	4418540	611446483	ASE-G	COMP	22	0
STRESS: BALL SHEAR							
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	COMP	100	0
CY7C65630 (7A65630CC)	LT56	4418540	611446482	ASE-G	COMP	100	0
CY7C65630 (7A65630CC)	LT56	4418540	611446483	ASE-G	COMP	100	0
CY7C65630 (7A65630CC)	LT56	4418540	611510328	ASE-G	COMP	100	0
CY7C65630 (7A65630CC)	LT56	4418540	611510329	ASE-G	COMP	100	0
CY7C65630 (7A65630CC)	LT56	4418540	611510327	ASE-G	COMP	100	0
STRESS: BOND PULL							
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	COMP	100	0
CY7C65630 (7A65630CC)	LT56	4418540	611446482	ASE-G	COMP	100	0
CY7C65630 (7A65630CC)	LT56	4418540	611446483	ASE-G	COMP	100	0
CY7C65630 (7A65630CC)	LT56	4418540	611510328	ASE-G	COMP	100	0
CY7C65630 (7A65630CC)	LT56	4418540	611510329	ASE-G	COMP	100	0
CY7C65630 (7A65630CC)	LT56	4418540	611510327	ASE-G	COMP	100	0
STRESS: CONSTRUCTIONAL ANALYSIS							
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	COMP	5	0
STRESS: DYE PENETRANT							
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	COMP	15	0
CY7C65630 (7A65630CC)	LT56	4418540	611446482	ASE-G	COMP	15	0
CY7C65630 (7A65630CC)	LT56	4418540	611446483	ASE-G	COMP	15	0
STRESS: ELECTRICAL DISTRIBUTION							
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	COMP	30	0
CY7C65630 (7A65630CC)	LT56	4418540	611446482	ASE-G	COMP	30	0
CY7C65630 (7A65630CC)	LT56	4418540	611446483	ASE-G	COMP	30	0



Reliability Test Data

QTP #: 151312

<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>
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 125C, 3.8V, Vcc Max							
CY7C65630 (7A65630CC)	LT56	4418540	611510328	ASE-G	96	779	0
CY7C65630 (7A65630CC)	LT56	4418540	611510329	ASE-G	96	790	0
CY7C65630 (7A65630CC)	LT56	4418540	611510327	ASE-G	96	798	0
STRESS: ESD-CHARGE DEVICE MODEL							
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	250	3	0
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	500	3	0
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	750	3	0
STRESS: ESD-HUMAN BODY CIRCUIT							
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	500	3	0
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	1000	3	0
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	2000	3	0
STRESS: ESD-MACHINE MODEL							
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	50	3	0
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	100	3	0
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	150	3	0
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	200	3	0
STRESS: FINAL VISUAL							
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	COMP	963	0
CY7C65630 (7A65630CC)	LT56	4418540	611446482	ASE-G	COMP	982	0
CY7C65630 (7A65630CC)	LT56	4418540	611446483	ASE-G	COMP	889	0
CY7C65630 (7A65630CC)	LT56	4418540	611510328	ASE-G	COMP	996	0
CY7C65630 (7A65630CC)	LT56	4418540	611510329	ASE-G	COMP	982	0
CY7C65630 (7A65630CC)	LT56	4418540	611510327	ASE-G	COMP	920	0



Reliability Test Data

QTP #: 151312

<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: HI-ACCEL SATURATION TEST, 130C, 5.5V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3

CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	96	80	0
CY7C65630 (7A65630CC)	LT56	4418540	611446482	ASE-G	96	79	0
CY7C65630 (7A65630CC)	LT56	4418540	611446483	ASE-G	96	80	0

STRESS: HIGH TEMPERATURE STORAGE

CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	1000	80	0
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STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 3.8V, Vcc Max

CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	1000	89	0
CY7C65630 (7A65630CC)	LT56	4418540	611446482	ASE-G	1000	86	0
CY7C65630 (7A65630CC)	LT56	4418540	611446483	ASE-G	1000	89	0

STRESS: PRESSURE COOKER TEST

CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	96	80	0
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	168	80	0
CY7C65630 (7A65630CC)	LT56	4418540	611446482	ASE-G	96	80	0
CY7C65630 (7A65630CC)	LT56	4418540	611446482	ASE-G	168	80	0
CY7C65630 (7A65630CC)	LT56	4418540	611446483	ASE-G	96	80	0
CY7C65630 (7A65630CC)	LT56	4418540	611446483	ASE-G	168	80	0

STRESS: PHYSICAL DIMENSION

CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	COMP	30	0
CY7C65630 (7A65630CC)	LT56	4418540	611446482	ASE-G	COMP	30	0
CY7C65630 (7A65630CC)	LT56	4418540	611446483	ASE-G	COMP	30	0
CY7C65630 (7A65630CC)	LT56	4418540	611510328	ASE-G	COMP	30	0
CY7C65630 (7A65630CC)	LT56	4418540	611510329	ASE-G	COMP	30	0
CY7C65630 (7A65630CC)	LT56	4418540	611510327	ASE-G	COMP	30	0

STRESS: POST TCT BOND PULL

CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	500	5	0
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Reliability Test Data

QTP #: 151312

<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: PRE/POST LFR CRITICAL PARAMETER

CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	COMP	30	0
CY7C65630 (7A65630CC)	LT56	4418540	611446482	ASE-G	COMP	30	0
CY7C65630 (7A65630CC)	LT56	4418540	611446483	ASE-G	COMP	30	0

STRESS: SOLDERABILITY

CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	COMP	15	0
CY7C65630 (7A65630CC)	LT56	4418540	611446482	ASE-G	COMP	15	0
CY7C65630 (7A65630CC)	LT56	4418540	611446483	ASE-G	COMP	15	0

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

CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	500	85	0
CY7C65630 (7A65630CC)	LT56	4418540	611446482	ASE-G	1000	80	0
CY7C65630 (7A65630CC)	LT56	4418540	611446481	ASE-G	500	80	0
CY7C65630 (7A65630CC)	LT56	4418540	611446482	ASE-G	1000	80	0
CY7C65630 (7A65630CC)	LT56	4418540	611446483	ASE-G	500	80	0
CY7C65630 (7A65630CC)	LT56	4418540	611446483	ASE-G	1000	80	0



Document History Page

Document Title: QTP#151312: Automotive 56L QFN (8x8x1.0mm) Pure Sn leadfinish, Au Wire MSL3, 260C
Reflow ASEK-Taiwan (G)
Document Number: 002-13836

Rev.	ECN No.	Orig. of Change	Description of Change
**	5305610	HSTO	Initial spec release