

Cypress Semiconductor Automotive Package Qualification Report

**QTP# 152606 VERSION **
January 2017**

**16L QFN (3x3x0.6mm)
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
152606	Qualification of 16-lead QFN (3x3x0.6mm) Automotive (LG16A) Package in ASEK-Taiwan (G) using 0.8mil Au wire with G700 mold compound, FH-900 die attach material, Cu with Ag-spot leadframe material and Pure Sn leadfinish at MSL3, 260C Reflow Temperature.	Jan 2017

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	LG16A
Package Outline, Type, or Name:	16L –QFN (3x3x0.6mm)
Mold Compound Name/Manufacturer:	G700 / 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 (roughened leadframe)
Lead Finish, Composition / Thickness:	Pure Sn
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Saw
Die Attach Supplier:	Hitachi
Die Attach Material:	FH-900
Bond Diagram Designation	001-70686
Wire Bond Method:	Thermosonic
Wire Material/Size:	Au / 0.8 mil
Thermal Resistance Theta JA °C/W:	Theta JA (□C/W) = 32.69
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	49-14999
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, 150°C Dynamic Operating Condition, Vcc Max = 2.1V	P
High Temperature Operating Life Latent Failure Rate	JESD22-A108, 150°C Dynamic Operating Condition, Vcc Max = 2.1V	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

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Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej Failure Mechanism
STRESS: ACOUSTIC, MSL3							
CY8C20236 (8A202662AC)	LG16A	4438109	611509837	ASE-G	COMP	22	0
CY8C20236 (8A202662AC)	LG16A	4333317	611509836	ASE-G	COMP	22	0
CY8C20236 (8A202662AC)	LG16A	4333317	611509835	ASE-G	COMP	22	0
STRESS: BALL SHEAR							
CY8C20236 (8A202662AC)	LG16A	4438109	611509837	ASE-G	COMP	100	0
CY8C20236 (8A202662AC)	LG16A	4333317	611509836	ASE-G	COMP	100	0
CY8C20236 (8A202662AC)	LG16A	4333317	611509835	ASE-G	COMP	100	0
STRESS: BOND PULL							
CY8C20236 (8A202662AC)	LG16A	4438109	611509837	ASE-G	COMP	100	0
CY8C20236 (8A202662AC)	LG16A	4333317	611509836	ASE-G	COMP	100	0
CY8C20236 (8A202662AC)	LG16A	4333317	611509835	ASE-G	COMP	100	0
STRESS: CONSTRUCTIONAL ANALYSIS							
CY8C20236 (8A202662AC)	LG16A	4438109	611509837	ASE-G	COMP	5	0
STRESS: DYE PENETRANT							
CY8C20236 (8A202662AC)	LG16A	4438109	611509837	ASE-G	COMP	15	0
CY8C20236 (8A202662AC)	LG16A	4333317	611509836	ASE-G	COMP	15	0
CY8C20236 (8A202662AC)	LG16A	4333317	611509835	ASE-G	COMP	15	0
STRESS: ELECTRICAL DISTRIBUTION							
CY8C20236 (8A202662AC)	LG16A	4521966	611610301	ASE-G	COMP	30	0
CY8C20236 (8A202662AC)	LG16A	4521966	611610302	ASE-G	COMP	30	0
CY8C20236 (8A202662AC)	LG16A	4521966	611610303	ASE-G	COMP	30	0
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 150C, 2.1V, Vcc Max							
CY8C20236 (8A202662AC)	LG16A	4438109	611509837	ASE-G	48	799	0
CY8C20236 (8A202662AC)	LG16A	4333317	611509836	ASE-G	48	800	0
CY8C20236 (8A202662AC)	LG16A	4333317	611509835	ASE-G	48	800	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</i>	<i>Failure Mechanism</i>
STRESS: ESD-CHARGE DEVICE MODEL								
CY8C20236 (8A202662AC)	LG16A	4521966	611610301	ASE-G	250	3	0	
CY8C20236 (8A202662AC)	LG16A	4521966	611610301	ASE-G	500	3	0	
CY8C20236 (8A202662AC)	LG16A	4521966	611610301	ASE-G	750	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT								
CY8C20236 (8A202662AC)	LG16A	4521966	611610301	ASE-G	500	3	0	
CY8C20236 (8A202662AC)	LG16A	4521966	611610301	ASE-G	1000	3	0	
CY8C20236 (8A202662AC)	LG16A	4521966	611610301	ASE-G	2000	3	0	
STRESS: FINAL VISUAL								
CY8C20236 (8A202662AC)	LG16A	4438109	611509837	ASE-G	COMP	1989	0	
CY8C20236 (8A202662AC)	LG16A	4333317	611509836	ASE-G	COMP	1473	0	
CY8C20236 (8A202662AC)	LG16A	4333317	611509835	ASE-G	COMP	1493	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 5.25V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3								
CY8C20236 (8A202662AC)	LG16A	4438109	611509837	ASE-G	96	80	0	
CY8C20236 (8A202662AC)	LG16A	4333317	611509836	ASE-G	96	80	0	
CY8C20236 (8A202662AC)	LG16A	4333317	611509835	ASE-G	96	69	0	
STRESS: HIGH TEMPERATURE STORAGE								
CY8C20236 (8A202662AC)	LG16A	4438109	611509837	ASE-G	1000	80	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 125C, 5.5V, Vcc Max								
CY8C20236 (8A202662AC)	LG16A	4438109	611509837	ASE-G	408	79	0	
CY8C20236 (8A202662AC)	LG16A	4333317	611509836	ASE-G	408	77	0	
CY8C20236 (8A202662AC)	LG16A	4333317	611509835	ASE-G	408	77	0	
STRESS: PRESSURE COOKER TEST								
CY8C20236 (8A202662AC)	LG16A	4438109	611509837	ASE-G	96	80	0	
CY8C20236 (8A202662AC)	LG16A	4333317	611509836	ASE-G	96	80	0	
CY8C20236 (8A202662AC)	LG16A	4333317	611509835	ASE-G	96	79	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>
STRESS: PHYSICAL DIMENSION							
CY8C20236 (8A202662AC)	LG16A	4438109	611509837	ASE-G	COMP	30	0
CY8C20236 (8A202662AC)	LG16A	4333317	611509836	ASE-G	COMP	30	0
CY8C20236 (8A202662AC)	LG16A	4333317	611509835	ASE-G	COMP	30	0
STRESS: POST TCT BOND PULL							
CY8C20236 (8A202662AC)	LG16A	4438109	611509837	ASE-G	500	5	0
CY8C20236 (8A202662AC)	LG16A	4333317	611509836	ASE-G	500	5	0
CY8C20236 (8A202662AC)	LG16A	4333317	611509835	ASE-G	500	5	0
STRESS: SOLDERABILITY							
CY8C20236 (8A202662AC)	LG16A	4521966	611610301	ASE-G	COMP	15	0
CY8C20236 (8A202662AC)	LG16A	4521966	611610302	ASE-G	COMP	15	0
CY8C20236 (8A202662AC)	LG16A	4521966	611610303	ASE-G	COMP	15	0
STRESS: TC COND. C -65C TO 150C, PRECONDITION 192 HRS 30C/60%RH							
CY8C20236 (8A202662AC)	LG16A	4521966	611610301	ASE-G	500	85	0
CY8C20236 (8A202662AC)	LG16A	4521966	611610301	ASE-G	1000	80	0
CY8C20236 (8A202662AC)	LG16A	4521966	611610302	ASE-G	500	85	0
CY8C20236 (8A202662AC)	LG16A	4521966	611610302	ASE-G	1000	80	0
CY8C20236 (8A202662AC)	LG16A	4521966	611610303	ASE-G	500	85	0
CY8C20236 (8A202662AC)	LG16A	4521966	611610303	ASE-G	1000	80	0



Document History Page

Document Title:QTP#152606: 16L QFN (3x3x0.6mm) Pure Sn leadfinish, Au Wire MSL3, 260C Reflow ASEK-Taiwan (G)
Document Number: 002-18389

Rev.	ECN No.	Orig. of Change	Description of Change
**	5580299	HSTO	Initial spec release