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Cypress Semiconductor Automotive Package Qualification Report

QTP# 094001
June 2013

Automotive 32-Lead TSOP II
NiPdAu, MSL3, 260C Reflow
OSE-Taiwan (T)

CYPRESS TECHNICAL CONTACT FOR QUALIFICATION DATA:

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PACKAGE QUALIFICATION HISTORY

Qual Report	Description of Qualification Purpose	Date Comp
094001	Qualify Automotive Package 32 TSOP II Fast Async device CY7C1019CV33 , CEL9200HF Mold Compound, 8340 epoxy, NiPdAu, MSL3/260C,OSE (T)	June 10

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	ZW32A
Package Outline, Type, or Name:	32-Lead TSOP II
Mold Compound Name/Manufacturer:	CEL9200HF
Mold Compound Flammability Rating:	V-O per UL94
Mold Compound Alpha Emission Rate:	Maximum 0.005 C/cm2.hr
Oxygen Rating Index:	50%
Lead Frame Material:	Copper
Lead Finish, Composition / Thickness:	NiPdAu
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Sawing
Die Attach Supplier:	Hitachi
Die Attach Material:	EN4900G
Die Attach Method:	Epoxy
Bond Diagram Designation:	001-54166
Wire Bond Method:	Thermosonic
Wire Material/Size:	Au, 1.0mil
Thermal Resistance Theta JA °C/W:	68.67
Package Cross Section Yes/No:	N/A
Assembly Process Flow:	49-35029
Name/Location of Assembly (prime) facility:	OSE (T)
MSL Level	3
Reflow Profile	260C

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	CML-R

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENT

Stress/Test	Test Condition (Temp/Bias)	Result P/F
High Temperature Operating Life Early Failure Rate	AEC-Q100-008 and JESD22-A108 Dynamic Operating Condition, Vcc Max = 2.07V, 150°C	P
High Temperature Operating Life Latent Failure Rate	JESD22-A108, 150 C Dynamic Operating Condition, Vcc = 2.75V, 150C	P
High Accelerated Saturation Test (HAST)	JESD22-A110, 130C, 3.63V, 85%RH Precondition: JESD22-A113 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3IR-Reflow, 260°C+0, -5°C	P
High Temperature Storage Life Test	JESD22-A103, 150 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
Electrostatic Discharge Human Body Model (ESD-HBM)	AEC-Q100-002 500V/1000V/1500V/2000V	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	AEC-Q100-011 250V/500V/750V	P
Acoustic Microscopy	JEDEC JSTD-020	P
Ball Shear	AEC-Q100-001	P
Bond Pull	Mil-Std 883, Method 2011	P
Final Visual Inspection	JESD22-B101B	P
Lead Finish Adhesion	JESD22-B105, MIL STD 883	P
Physical Dimensions	JESD22-B100/108	P
Post Temp Cycle Wire Bond Pull	Mil-Std 883, Method 2011	P
Solderability	JESD22-B102	P
Static Latchup	AEC-Q100-004, 125C, 5.4V, ± 140mA	P
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

Reliability Test Data

QTP #: 094001

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	22	0	
CY7C1019CV33 (7A1319GC)	4935215	610940164	T-TAIWAN	COMP	22	0	
CY7C1019CV33 (7A1319GC)	4935215	610940165	T-TAIWAN	COMP	22	0	
STRESS: BALL SHEAR							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	5	0	
CY7C1019CV33 (7A1319GC)	4935215	610940164	T-TAIWAN	COMP	5	0	
CY7C1019CV33 (7A1319GC)	4935215	610940165	T-TAIWAN	COMP	5	0	
STRESS: BOND PULL							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	5	0	
CY7C1019CV33 (7A1319GC)	4935215	610940164	T-TAIWAN	COMP	5	0	
CY7C1019CV33 (7A1319GC)	4935215	610940165	T-TAIWAN	COMP	5	0	
STRESS: CONSTRUCTIONAL ANALYSIS							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	5	0	
STRESS: DYE PENETRANT TEST							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	15	0	
CY7C1019CV33 (7A1319GC)	4935215	610940164	T-TAIWAN	COMP	15	0	
CY7C1019CV33 (7A1319GC)	4935215	610940165	T-TAIWAN	COMP	15	0	
STRESS: ESD-CHARGE DEVICE MODEL, 250V							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	3	0	
STRESS: ESD-CHARGE DEVICE MODEL, 500V							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	3	0	
STRESS: ESD-CHARGE DEVICE MODEL, 750V							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22-A114-B, 500V							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22-A114-B, 1,000V							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	3	0	

Reliability Test Data

QTP #: 094001

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22-A114-B, 1,500V							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22-A114-B, 2,000V							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22-A114-B, 4,000V							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22-A114-B, 6,000V							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22-A114-B, 8,000V							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	3	0	
STRESS: STATIC LATCH-UP TESTING, 125C, 5.4V, +/- 140mA							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	6	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 150C, 2.07V, Vcc Max							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	48	2085	0	
CY7C1019CV33 (7A1319GC)	4935215	610940164	T-TAIWAN	48	2878	0	
CY7C1019CV33 (7A1319GC)	4935215	610940165	T-TAIWAN	48	2830	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 2.07V, Vcc Max							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	408	125	0	
CY7C1019CV33 (7A1319GC)	4935215	610940164	T-TAIWAN	408	125	0	
CY7C1019CV33 (7A1319GC)	4935215	610940165	T-TAIWAN	408	125	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 85%RH, 3.63V, PRE COND 192 HR 30C/60%RH, MSL3							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	96	80	0	
CY7C1019CV33 (7A1319GC)	4935215	610940164	T-TAIWAN	96	80	0	
CY7C1019CV33 (7A1319GC)	4935215	610940165	T-TAIWAN	96	80	0	
STRESS: HIGH TEMP STORAGE, 150C							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	1000	85	0	
STRESS: LEAD FINISH ADHESION							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	5	0	

Reliability Test Data

QTP #: 094001

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: PHYSICAL DIMENSIONS							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	10	0	
CY7C1019CV33 (7A1319GC)	4935215	610940164	T-TAIWAN	COMP	10	0	
CY7C1019CV33 (7A1319GC)	4935215	610940165	T-TAIWAN	COMP	10	0	
STRESS: PRESSURE COOKER TEST, 121C, 100%RH, 15 Psig, PRE COND 192 HR 30C/60%RH, MSL3							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	96	84	0	
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	168	84	0	
CY7C1019CV33 (7A1319GC)	4935215	610940164	T-TAIWAN	96	85	0	
CY7C1019CV33 (7A1319GC)	4935215	610940164	T-TAIWAN	168	85	0	
CY7C1019CV33 (7A1319GC)	4935215	610940165	T-TAIWAN	96	85	0	
CY7C1019CV33 (7A1319GC)	4935215	610940165	T-TAIWAN	168	85	0	
STRESS: SOLDERABILITY							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	COMP	15	0	
CY7C1019CV33 (7A1319GC)	4935215	610940164	T-TAIWAN	COMP	15	0	
CY7C1019CV33 (7A1319GC)	4935215	610940165	T-TAIWAN	COMP	15	0	
STRESS: TC COND. C -65C TO 150C, PRE COND 192 HRS 30C/60%RH, MSL3							
CY7C1019CV33 (7A1319GC)	4935215	610940163	T-TAIWAN	500	84	0	
CY7C1019CV33 (7A1319GC)	4935215	610940164	T-TAIWAN	500	85	0	
CY7C1019CV33 (7A1319GC)	4935215	610940165	T-TAIWAN	500	85	0	

History Page

Document Title: 094001: AUTOMOTIVE 32-LEAD TSOP II NIPDAU, MSL3, 260C REFLOW OSE-TAIWAN (T)
Document Number: 001-61954

Rev.	ECN No.	Orig. of Change	Description of Change
**	2938341	HGA	Initial spec release
*A	3599647	HGA	Spec Sunset review. Remove obsolete document as reference; 24-00002
*B	4041820	NSR	Removed reference Cypress specs and retain industry standards in reliability tests performed table.

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