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Cypress Semiconductor Automotive Package Qualification Report

**QTP# 092605 VERSION *C
September 2014**

**Automotive 48-Lead TSOP I
NiPdAu, MSL3, 260C Reflow
OSE-Taiwan (T)**

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

Qual Report	Description of Qualification Purpose	Date Comp
092605	Qualify Automotive Package 48-Lead TSOP I using device 7A62167FC , CEL9200HFU - Low Alpha Mold Compound, EN4900G Epoxy, NiPdAu at MSL 3, 260C, OSE-Taiwan (T)	Apr 10

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	ZT48
Package Outline, Type, or Name:	48-Lead TSOP I
Mold Compound Name/Manufacturer:	CEL9200HFU - Low Alpha
Mold Compound Flammability Rating:	14.3mm x 4.5g
Mold Compound Alpha Emission Rate:	Low Alpha
Oxygen Rating Index:	N/A
Lead Frame Material:	Copper
Lead Finish, Composition / Thickness:	NiPdAu
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Saw
Die Attach Supplier:	Hitachi
Die Attach Material:	EN-4900G
Die Attach Method:	Epoxy
Bond Diagram Designation:	001-48575
Wire Bond Method:	Ball and Wedge
Wire Material/Size:	Au, 1.0mil
Thermal Resistance Theta JA °C/W:	28.71°C/W
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	001-16674
Name/Location of Assembly (prime) facility:	OSE-Taiwan (T)
MSL Level:	3
Reflow Profile:	260C

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	CML-R, ChipMos

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 Dynamic Operating Condition, Vcc Max = 1.85V, 150C	P
High Temperature Operating Life Latent Failure Rate	JESD22-A108 Dynamic Operating Condition, Vcc Max = 1.85V, 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, 260C+0, -5C	P
Temperature Cycle	JESD22-A104, -65°C to 150°C Precondition: JESD22-A113 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3IR-Reflow, 260C+0, -5C	P
Pressure Cooker	JESD22-A102, 121C, 100%RH, 15 Psig Precondition: JESD22-A113 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH+3IR-Reflow, 260C+0, -5C	P
High Temperature Storage	JESD22-A103, 150 ± 5C no bias	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 200V/500V	P
Acoustic Microscopy	JEDEC JSTD-020	P
Wire Ball Shear	AEC-Q100-001	P
Wire Bond Pull	Mil-Std 883, Method 2011	P
Electrical Distribution	AEC-Q100-009	P
Final Visual	JESD22-B101B	P
Physical Dimensions	JESD22-B100/108	P
Post Temp Cycle Bond Pull	Mil-Std 883, Method 2011	P
Solderability	JESD22-B102	P
Static Latch-up	AEC-Q100-004, 125C, 5.4V, ± 200mA	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 #: 092605

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTICS							
CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	22	0	
CY62177EV30LL (7A62167F)	4836421	610854901	TAIWAN-T	COMP	22	0	
CY62177EV30LL (7A62167F)	4836814	610854902	TAIWAN-T	COMP	22	0	
STRESS: BALL SHEAR							
CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	30	0	
STRESS: BOND PULL							
CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	30	0	
STRESS: CONSTRUCTIONAL ANALYSIS							
CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	5	0	
STRESS: DYE PENETRATION TEST							
CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	15	0	
CY62177EV30LL (7A62167F)	4836421	610854901	TAIWAN-T	COMP	15	0	
CY62177EV30LL (7A62167F)	4836814	610854902	TAIWAN-T	COMP	15	0	
STRESS: POST TEMP CYCLE BOND PULL							
CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	5	0	
STRESS: ESD-CHARGE DEVICE MODEL, 500 V							
CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	3	0	
STRESS: ESD-CHARGE DEVICE MODEL, 1000V							
CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	3	0	
STRESS: ESD-CHARGE DEVICE MODEL, 1250V							
CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	3	0	
STRESS: ESD-CHARGE DEVICE MODEL, 750V, Corner Pins Only							
CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT, 500V							
CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT, 1,000V							
CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT, 1,500V							
CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	3	0	

Reliability Test Data

QTP #: 092605

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: ESD-HUMAN BODY CIRCUIT, 2,000V

CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	3	0	
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STRESS: ELECTRICAL DISTRIBUTIONS

CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	30	0	
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CY62177EV30LL (7A62167F)	4836421	610854901	TAIWAN-T	COMP	30	0	
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CY62177EV30LL (7A62167F)	4836814	610854902	TAIWAN-T	COMP	30	0	
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STRESS: PHYSICAL DIMENSIONS

CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	10	0	
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CY62177EV30LL (7A62167F)	4836421	610854901	TAIWAN-T	COMP	10	0	
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CY62177EV30LL (7A62167F)	4836814	610854902	TAIWAN-T	COMP	10	0	
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STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 150C, 1.85V, Vcc Max

CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	24	4249	0	
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CY62177EV30LL (7A62167F)	4836421	610854901	TAIWAN-T	24	3730	0	
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CY62177EV30LL (7A62167F)	4836814	610854902	TAIWAN-T	24	3295	0	
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STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 1.85V, Vcc Max

CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	432	100	0	
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CY62177EV30LL (7A62167F)	4836421	610854901	TAIWAN-T	432	99	0	
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CY62177EV30LL (7A62167F)	4836814	610854902	TAIWAN-T	432	100	0	
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STRESS: HIGH TEMPERATURE STORAGE, 150C, no bias

CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	1000	80	0	
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STRESS: HI-ACCEL SATURATION TEST, 130C, 85%RH, 3.6V, PRE COND 192 HR 30C/60%RH, MSL3

CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	96	79	0	
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CY62177EV30LL (7A62167F)	4836421	610854901	TAIWAN-T	96	79	0	
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CY62177EV30LL (7A62167F)	4836814	610854902	TAIWAN-T	96	80	0	
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Reliability Test Data

QTP #: 092605

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: PRESSURE COOKER TEST, 121C, 100%RH, 15 Psig, PRE COND 192 HR 30C/60%RH, MSL3

CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	96	80	0	
CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	168	80	0	
CY62177EV30LL (7A62167F)	4836421	610854901	TAIWAN-T	96	80	0	
CY62177EV30LL (7A62167F)	4836421	610854901	TAIWAN-T	168	80	0	
CY62177EV30LL (7A62167F)	4836814	610854902	TAIWAN-T	96	80	0	
CY62177EV30LL (7A62167F)	4836814	610854902	TAIWAN-T	168	80	0	

STRESS: TC COND. C -65C TO 150C, PRE COND 192 HRS 30C/60%RH, MSL3

CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	500	85	0	
CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	1000	79	0	
CY62177EV30LL (7A62167F)	4836421	610854901	TAIWAN-T	500	85	0	
CY62177EV30LL (7A62167F)	4836421	610854901	TAIWAN-T	1000	85	0	
CY62177EV30LL (7A62167F)	4836814	610854902	TAIWAN-T	500	85	0	
CY62177EV30LL (7A62167F)	4836814	610854902	TAIWAN-T	1000	85	0	

STRESS: STATIC LATCH-UP TESTING, 125C, ±200mA

CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	6	0	
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STRESS: SOLDERABILITY

CY62177EV30LL (7A62167F)	4838611	610854900	TAIWAN-T	COMP	15	0	
CY62177EV30LL (7A62167F)	4836421	610854901	TAIWAN-T	COMP	15	0	
CY62177EV30LL (7A62167F)	4836814	610854902	TAIWAN-T	COMP	15	0	

History Page

Document Title: 092605: AUTOMOTIVE 48-LEAD TSOP I NIPDAU, MSL3, 260C REFLOW OSE-TAIWAN (T)
Document Number: 001-63409

Rev.	ECN No.	Orig. of Change	Description of Change
**	3000707	HGA	Initial spec release
*A	3716028	NSR	Removed VERSION 1.0 in the title page. Removed reference Cypress spec in the reliability tests performed table and reflect the reference industry standards.
*B	4104446	HSTO	Sunset Review Updated test location facility based on current qualified test site
*C	4489422	HSTO	Align qualification report based on the new template in the front page

Distribution: WEB

Posting: None