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Cypress Semiconductor Automotive Package Qualification Report

QTP# 111411 VERSION *C
June 2014

**Automotive 32L SOIC (450 mils)
NiPdAu, MSL3, 260°C Reflow
JCET-China (JT)**

**FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT
reliability@cypress.com or via a CYLINK CRM CASE**

Prepared By:
Lorena R. Zapanta (ILZ)
Reliability Engineer

Reviewed By:
Rene Rodgers (RT)
Reliability Manager

Approved By:
Richard Oshiro(RGO)
Reliability Director

PRODUCT QUALIFICATION HISTORY

QTP Number	Description of Qualification Purpose	Date
111411	New Assembly Site (JCET) Qual – Automotive SOIC 32ld 450 mils body – Pb-free (KEG6000, QMI 509, 1.0 mil Wire, NiPdAu)	May 2011
115206	Qualification of Samsung as Alternate Leadframe for SZ324 Automotive Package built at JCET	Feb 2012

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	SZ324
Package Outline, Type, or Name:	32L SOIC
Mold Compound Name/Manufacturer:	KEG6000 / Kyocera
Mold Compound Flammability Rating:	V-O per UL94
Mold Compound Alpha Emission Rate:	0.002 CPH/cm2
Oxygen Rating Index: >28%	N/A
Lead Frame Designation:	Reduced Metal Pad
Lead Frame Material:	Copper: Sumiko / Samsung Techwin
Substrate Material:	N/A
Lead Finish, Composition / Thickness:	NiPdAu
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Wafersaw
Die Attach Supplier:	Henkel
Die Attach Material:	QMI509
Bond Diagram Designation	10-06640, 001-13601
Wire Bond Method:	Thermosonic
Wire Material/Size:	1.0 mil / Au
Thermal Resistance Theta JA °C/W:	N/A
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	001-67698
Name/Location of Assembly (prime) facility:	JT-JCET China
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
Electrostatic Discharge Human Body Model (ESD-HBM)	AEC-Q100-002	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	AEC-Q100-011	P
Latch-up Sensitivity	AEC-Q100-004	P
High Temperature Operating Life Early Failure Rate	AEC-Q100-008 and JESD22-A108, 150 C Dynamic Operating Condition, Vcc = 5.75V/1.85V	P
High Temperature Operating Life Latent Failure Rate	JESD22-A108, 150 C /125C Dynamic Operating Condition, Vcc = 5.75V/1.85, 150C	P
High Accelerated Saturation Test (HAST)	JESD22-A110, 130 C, 85%RH, 5.50V/3.6V Precondition: JESD22-A113 Moisture Sensitivity Level (192 Hrs., 30 C°, 60% RH)	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 Level (192 Hrs., 30 C°, 60% RH)	P
Post Temperature Cycle Wire Bond Pull	Mil-Std 883, Method 2011	P
Pressure Cooker Test	JESD22-A102, 121 C, 100%RH, 15 PSIG Precondition: JESD22-A113 Moisture Sensitivity Level (192 Hrs., 30 C°, 60% RH)	P
Wire Bond Shear	AEC Q100-001	P
Wire Bond Pull	Mil-Std 883, Method 2011	P
Solderability	JESD22-B102	P
Electrical Distributions	AEC Q100-009	P
Physical Dimensions	JESD22B100 and B108	P
Lead Integrity	JESD22-B105	P

Reliability Test Data

QTP #: 111411

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3							
CY62128BNLL (7A62128ZHC)	4037901	611109729	JT-CHINA	COMP	22	0	
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	COMP	22	0	
CY62128ELL (7A62128KC)	4022413	611109731	JT-CHINA	COMP	22	0	
STRESS: BOND SHEAR							
CY62128BNLL (7A62128ZHC)	4037901	611109729	JT-CHINA	COMP	30	0	
STRESS: BOND PULL							
CY62128BNLL (7A62128ZHC)	4037901	611109729	JT-CHINA	COMP	30	0	
STRESS: CONSTRUCTIONAL ANALYSIS							
CY62128BNLL (7A62128ZHC)	4037901	611109729	JT-CHINA	COMP	5	0	
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	COMP	5	0	
CY62128ELL (7A62128KC)	4022413	611109731	JT-CHINA	COMP	5	0	
STRESS: DYE PENETRATION TEST							
CY62128BNLL (7A62128ZHC)	4037901	611109729	JT-CHINA	COMP	15	0	
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	COMP	15	0	
CY62128ELL (7A62128KC)	4022413	611109731	JT-CHINA	COMP	15	0	
STRESS: ESD-CHARGE DEVICE MODEL, 250V							
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	COMP	3	0	
STRESS: ESD-CHARGE DEVICE MODEL, 500V							
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	COMP	3	0	
STRESS: ESD-CHARGE DEVICE MODEL, 750V							
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-E, (500V)							
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-E, (1000V)							
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-E, (1500V)							
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	COMP	3	0	

Reliability Test Data

QTP #: 111411

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-E, (2000V)							
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	COMP	3	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 150C, 1.85V, Vcc Core							
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	24	400	0	
CY62128ELL (7A62128KC)	4022413	611109731	JT-CHINA	24	400	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 150C, 5.75V, Vcc Core							
CY62128BNLL (7A62128ZHC)	4037901	611109729	JT-CHINA	24	400	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 1.85V, Vcc Core							
CY62128ELL (7A62128KC)	4022413	611105731	JT-CHINA	408	80	0	
CY62128ELL (7A62128KC)	4022413	611105732	JT-CHINA	408	80	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 5.75V, Vcc Core							
CY62128BNLL (7A62128ZHC)	4037901	611105730	JT-CHINA	408	80	0	
STRESS: STATIC LATCH-UP TESTING, 125C, +/-140ma							
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	COMP	6	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 5.5V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3							
CY62128BNLL (7A62128ZHC)	4037901	611109729	JT-CHINA	96	80	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 3.6V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3							
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	96	80	0	
CY62128ELL (7A62128KC)	4022413	611109731	JT-CHINA	96	80	0	
STRESS: HIGH TEMP STORAGE							
CY62128BNLL (7A62128ZHC)	4037901	611105730	JT-CHINA	1000	100	0	
STRESS: INTERNAL VISUAL							
CY62128BNLL (7A62128ZHC)	4037901	611109729	JT-CHINA	COMP	5	0	
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	COMP	5	0	
CY62128ELL (7A62128KC)	4022413	611109731	JT-CHINA	COMP	5	0	
STRESS: LEAD INTEGRITY							
CY62128BNLL (7A62128ZHC)	4037901	611109729	JT-CHINA	COMP	5	0	

Reliability Test Data

QTP #: 111411

<i>Device</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: PRESSURE COOKER TEST (121C, 100%RH), 15 Psig, PRE COND 192 HR 30C/60%RH (MSL3)							
CY62128BNLL (7A62128ZHC)	4037901	611109729	JT-CHINA	96	80	0	
CY62128BNLL (7A62128ZHC)	4037901	611109729	JT-CHINA	168	80	0	
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	96	80	0	
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	168	80	0	
CY62128ELL (7A62128KC)	4022413	611109731	JT-CHINA	96	80	0	
CY62128ELL (7A62128KC)	4022413	611109731	JT-CHINA	168	80	0	
STRESS: PHYSICAL DIMENSION							
CY62128BNLL (7A62128ZHC)	4037901	611109729	JT-CHINA	COMP	10	0	
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	COMP	10	0	
CY62128ELL (7A62128KC)	4022413	611109731	JT-CHINA	COMP	10	0	
STRESS: SOLDERABILITY							
CY62128BNLL (7A62128ZHC)	4037901	611109729	JT-CHINA	COMP	15	0	
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	COMP	15	0	
CY62128ELL (7A62128KC)	4022413	611109731	JT-CHINA	COMP	15	0	
STRESS: ELECTRICAL DISTRIBUTIONS							
CY62128ELL (7A62128KC)	4021671	611061014	CML-R	COMP	30	0	
CY62128ELL (7A62128KC)	4021671	611061016	CML-R	COMP	30	0	
CY62128ELL (7A62128KC)	4021671	611061015	CML-R	COMP	30	0	
STRESS: TC COND. C -65C TO 150C, PRE COND 192 HR 30C/60%RH, MSL3							
CY62128BNLL (7A62128ZHC)	4037901	611109729	JT-CHINA	500	85	0	
CY62128BNLL (7A62128ZHC)	4037901	611109729	JT-CHINA	1000	85	0	
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	500	80	0	
CY62128ELL (7A62128KC)	4022413	611109730	JT-CHINA	1000	80	0	
CY62128ELL (7A62128KC)	4022413	611109731	JT-CHINA	500	80	0	
CY62128ELL (7A62128KC)	4022413	611109731	JT-CHINA	1000	80	0	
STRESS: POST TCT BOND PULL							
CY62128BNLL (7A62128ZHC)	4037901	611109729	JT-CHINA	COMP	5	0	

Reliability Test Data

QTP #: 115206

<i>Device</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: ACOUSTIC, MSL3							
CY62128BNLL (7A62128NHC)	4105511	611158454	JT-CHINA	COMP	22	0	
CY62128BNLL (7A62128NHC)	4105511	611158455	JT-CHINA	COMP	22	0	
CY62128BNLL (7A62128NHC)	4105511	611158456	JT-CHINA	COMP	22	0	
STRESS: CONSTRUCTIONAL ANALYSIS							
CY62128BNLL (7A62128NHC)	4105511	611158454	JT-CHINA	COMP	5	0	
STRESS: DYE PENETRATION TEST							
CY62128BNLL (7A62128NHC)	4105511	611158454	JT-CHINA	COMP	15	0	
CY62128BNLL (7A62128NHC)	4105511	611158455	JT-CHINA	COMP	15	0	
CY62128BNLL (7A62128NHC)	4105511	611158456	JT-CHINA	COMP	15	0	
STRESS: PRESSURE COOKER TEST (121C, 100%RH), 15 Psig, PRE COND 192 HR 30C/60%RH (MSL3)							
CY62128BNLL (7A62128NHC)	4105511	611158454	JT-CHINA	96	80	0	
CY62128BNLL (7A62128NHC)	4105511	611158454	JT-CHINA	168	80	0	
CY62128BNLL (7A62128NHC)	4105511	611158455	JT-CHINA	96	80	0	
CY62128BNLL (7A62128NHC)	4105511	611158455	JT-CHINA	168	80	0	
CY62128BNLL (7A62128NHC)	4105511	611158456	JT-CHINA	96	80	0	
CY62128BNLL (7A62128NHC)	4105511	611158456	JT-CHINA	168	80	0	
STRESS: SOLDERABILITY							
CY62128BNLL (7A62128NHC)	4105511	611158454	JT-CHINA	COMP	15	0	
CY62128BNLL (7A62128NHC)	4105511	611158455	JT-CHINA	COMP	15	0	
CY62128BNLL (7A62128NHC)	4105511	611158456	JT-CHINA	COMP	15	0	
STRESS: TC COND. C -65C TO 150C, PRE COND 192 HR 30C/60%RH, MSL3							
CY62128BNLL (7A62128NHC)	4105511	611158454	JT-CHINA	500	80	0	
CY62128BNLL (7A62128NHC)	4105511	611158454	JT-CHINA	1000	80	0	
CY62128BNLL (7A62128NHC)	4105511	611158455	JT-CHINA	500	80	0	
CY62128BNLL (7A62128NHC)	4105511	611158455	JT-CHINA	1000	80	0	
CY62128BNLL (7A62128NHC)	4105511	611158456	JT-CHINA	500	80	0	
CY62128BNLL (7A62128NHC)	4105511	611158456	JT-CHINA	1000	80	0	

Document History Page

Document Title: QTP 111411: AUTOMOTIVE 32L SOIC (450 MILS) NIPDAU, MSL3, 260C REFLOW JCET-CHINA (JT) QUALIFICATION REPORT
Document Number: 001-69459

Rev.	ECN No.	Orig. of Change	Description of Change
**	3249473	NSR	Initial Spec Release
*A	3522163	NSR	Added QTP 115206 data for the alternate Samsung Leadframe. Removed QTP version in the tile page. Added 1000Cycles TCT robustness data on the initial package QTP 111411.
*B	3637238	NSR	Sunset Review. Added 1000Cycles TCT robustness data of the QTP 115206
*C	4417773	ILZ	Sunset spec review Updated front page to reflect new qualification report template per Spec 001-57717 Page 3 – Major package information table Replaced assembly process flow spec 001-64159 with 001-67698

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