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# **Cypress Semiconductor Automotive Package Qualification Report**

**QTP# 111804  
June 2013**

**Automotive 44L SOJ (400 Mils)  
NiPdAu, MSL3, 260°C Reflow  
JCET-China (JT)**

## **CYPRESS TECHNICAL CONTACT FOR QUALIFICATION DATA:**

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## PRODUCT QUALIFICATION HISTORY

QTP Number	Description of Qualification Purpose	Date
111804	New Assembly Site (JCET) Qual – Automotive SOJ 44ld, 400 mils body – Pb-free (KEG6000, QMI 509, 1.0 mil Wire, NiPdAu)	May 2011

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	VZ444
Package Outline, Type, or Name:	400L SOJ
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
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	10-06636, 10-06645
Wire Bond Method:	Thermosonic
Wire Material/Size:	1.0 mil / Au
Thermal Resistance Theta JA °C/W:	11.3 C/W
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	001-64159
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
High Temperature Operating Life Early Failure Rate	AEC-Q100-008 and JESD22-A108, 150 C Dynamic Operating Condition, Vcc = 2.3 / 3.8V	P
High Temperature Operating Life Latent Failure Rate	JESD22-A108, 150 C Dynamic Operating Condition, Vcc = 2.3 / 3.8V	P
High Accelerated Saturation Test (HAST)	JESD22-A110, 130 C, 85%RH, 3.65V / 5.5V 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
Physical Dimensions	JESD22B100 and B108	P
Electrical Distributions	AEC Q100-009	P
Lead Integrity	JESD22-B105	P



## Reliability Test Data

**QTP #: 111804**

<b>Device</b>	<b>Fab Lot #</b>	<b>Assy Lot #</b>	<b>Assy Loc</b>	<b>Duration</b>	<b>Samp</b>	<b>Rej</b>	<b>Failure Mechanism</b>
<b>STRESS: ACOUSTIC, MSL3</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	COMP	22	0	
CY7C1021BN (7A1021SF)	4032689	611109974	JT-CHINA	COMP	22	0	
CY7C1021CV26 (7A122101G)	4036217	611109973	JT-CHINA	COMP	22	0	
<b>STRESS: BOND SHEAR</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	COMP	30	0	
<b>STRESS: BOND PULL</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	COMP	30	0	
<b>STRESS: CONSTRUCTIONAL ANALYSIS</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	COMP	5	0	
CY7C1021BN (7A1021SF)	4032689	611109974	JT-CHINA	COMP	5	0	
CY7C1021CV26 (7A122101G)	4036217	611109973	JT-CHINA	COMP	5	0	
<b>STRESS: DYE PENETRATION TEST</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	COMP	15	0	
CY7C1021BN (7A1021SF)	4032689	611109974	JT-CHINA	COMP	15	0	
CY7C1021CV26 (7A122101G)	4036217	611109973	JT-CHINA	COMP	15	0	
<b>STRESS: ESD-CHARGE DEVICE MODEL, 250V</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	COMP	3	0	
<b>STRESS: ESD-CHARGE DEVICE MODEL, 500V</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	COMP	3	0	
<b>STRESS: ESD-CHARGE DEVICE MODEL, 750V</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	COMP	3	0	
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-E, (500V)</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	COMP	3	0	
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-E, (1000V)</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	COMP	3	0	
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-E, (1500V)</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	COMP	3	0	



## Reliability Test Data

### QTP #: 111804

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-E, (2000V)</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	COMP	3	0	
<b>STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 150C, 2.3V, Vcc Core</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	24	800	0	
CY7C1021CV26 (7A122101G)	4036217	611109973	JT-CHINA	24	800	0	
<b>STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 150C, 3.8V, Vcc Core</b>							
CY7C1021BN (7A1021SF)	4032689	611109974	JT-CHINA	24	792	0	
<b>STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 2.3V, Vcc Core</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	408	80	0	
CY7C1021CV26 (7A122101G)	4036217	611109973	JT-CHINA	408	78	0	
<b>STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 3.8V, Vcc Core</b>							
CY7C1021BN (7A1021SF)	4032689	611109974	JT-CHINA	408	80	0	
<b>STRESS: HI-ACCEL SATURATION TEST, 130C, 3.65V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	96	80	0	
CY7C1021CV26 (7A122101G)	4036217	611109973	JT-CHINA	96	80	0	
<b>STRESS: HI-ACCEL SATURATION TEST, 130C, 5.5V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3</b>							
CY7C1021BN (7A1021SF)	4032689	611109974	JT-CHINA	96	80	0	
<b>STRESS: HIGH TEMP STORAGE</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	1000	80	0	
<b>STRESS: LEAD INTEGRITY</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	COMP	5	0	
<b>STRESS: PRESSURE COOKER TEST (121C, 100%RH), 15 Psig, PRE COND 192 HR 30C/60%RH (MSL3)</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	96	80	0	
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	168	80	0	
CY7C1021BN (7A1021SF)	4032689	611109974	JT-CHINA	96	80	0	
CY7C1021BN (7A1021SF)	4032689	611109974	JT-CHINA	168	80	0	
CY7C1021CV26 (7A122101G)	4036217	611109973	JT-CHINA	96	80	0	
CY7C1021CV26 (7A122101G)	4036217	611109973	JT-CHINA	168	80	0	

## Reliability Test Data

### QTP #: 111804

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
<b>STRESS: PHYSICAL DIMENSION</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	COMP	10	0	
CY7C1021BN (7A1021SF)	4032689	611109974	JT-CHINA	COMP	10	0	
CY7C1021CV26 (7A122101G)	4036217	611109973	JT-CHINA	COMP	10	0	
<b>STRESS: SOLDERABILITY</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	COMP	15	0	
CY7C1021BN (7A1021SF)	4032689	611109974	JT-CHINA	COMP	15	0	
CY7C1021CV26 (7A122101G)	4036217	611109973	JT-CHINA	COMP	15	0	
<b>STRESS: TC COND. C -65C TO 150C, PRE COND 192 HR 30C/60%RH, MSL3</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	500	84	0	
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	1000	79	0	
CY7C1021BN (7A1021SF)	4032689	611109974	JT-CHINA	500	80	0	
CY7C1021BN (7A1021SF)	4032689	611109974	JT-CHINA	1000	80	0	
CY7C1021CV26 (7A122101G)	4036217	611109973	JT-CHINA	500	84	0	
CY7C1021CV26 (7A122101G)	4036217	611109973	JT-CHINA	1000	82	0	
<b>STRESS: POST TC BOND PULL</b>							
CY7C1041CV33 (7A134101F)	4043406	611110205	JT-CHINA	COMP	5	0	
<b>STRESS: ELECTRICAL DISTRIBUTIONS</b>							
CY7C1041CV33 (7C1341R)	4708689	610744774	CML-R	COMP	30	0	





## Document History Page

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*A	4026040	NSR	Removed VERSION 1.0 in the title page. Removed obsolete specs 10-06635.

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