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Cypress Semiconductor Automotive Package Qualification Report

QTP# 105206 VERSION *B
August 2018

Automotive 28L SOJ (300 mils)
NiPdAu, MSL3, 260°C Reflow
JCET-China (JT)

FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT
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PRODUCT QUALIFICATION HISTORY

QTP Number	Description of Qualification Purpose	Date
105206	New Assembly Site (JCET) Qual – Automotive SOJ 28ld 300 mils body – Pb-Free (KEG6000, QMI 509, 1.0 mil Wire, NiPdAu)	Feb 2011

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	VZ283
Package Outline, Type, or Name:	28L SOJ (300 mils)
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
Wire Bond Method:	Thermosonic
Wire Material/Size:	1.0 mil (25um) / Au
Thermal Resistance Theta JA °C/W:	Refer to Datasheet
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

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 = 3.80V	P
High Temperature Operating Life Latent Failure Rate	JESD22-A108, 150 C /125C Dynamic Operating Condition, Vcc = 3.80V,150C	P
High Accelerated Saturation Test (HAST)	JESD22-A110,130 C, 85%RH, 5.50V 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 #: 105206

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	22	0	
CY7C199CN (7A19903SMC)	4028258	611057995	JT-CHINA	COMP	22	0	
CY7C199CN (7A19903SMC)	4028258	611058008	JT-CHINA	COMP	22	0	
STRESS: BOND SHEAR							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	30	0	
CY7C199CN (7A19903SMC)	4028258	611057995	JT-CHINA	COMP	30	0	
CY7C199CN (7A19903SMC)	4028258	611058008	JT-CHINA	COMP	30	0	
STRESS: BOND PULL							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	30	0	
CY7C199CN (7A19903SMC)	4028258	611057995	JT-CHINA	COMP	30	0	
CY7C199CN (7A19903SMC)	4028258	611058008	JT-CHINA	COMP	30	0	
STRESS: CONSTRUCTIONAL ANALYIS							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	5	0	
STRESS: DYE PENETRATION TEST							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	15	0	
CY7C199CN (7A19903SMC)	4028258	611057995	JT-CHINA	COMP	15	0	
CY7C199CN (7A19903SMC)	4028258	611058008	JT-CHINA	COMP	15	0	
STRESS: ESD-CHARGE DEVICE MODEL, 250V							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	3	0	
STRESS: ESD-CHARGE DEVICE MODEL, 500V							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	3	0	
STRESS: ESD-CHARGE DEVICE MODEL, 750V							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	3	0	

Reliability Test Data

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Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-E, (500V)							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-E, (1000V)							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-E, (1500V)							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-E, (2000V)							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	3	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 150C, 3.8V, Vcc Core							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	48	797	0	
CY7C199CN (7A19903SMC)	4028258	611057995	JT-CHINA	48	799	0	
CY7C199CN (7A19903SMC)	4028258	611058008	JT-CHINA	48	799	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 3.8V, Vcc Core							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	408	80	0	
CY7C199CN (7A19903SMC)	4028258	611057995	JT-CHINA	408	80	0	
CY7C199CN (7A19903SMC)	4028258	611058008	JT-CHINA	408	80	0	
STRESS: STATIC LATCH-UP TESTING, 125C, 8,25V, +/-140Ma							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	6	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 5.50V, 85%RH, PRE COND 192 HR 30C/60%RH, MSL3							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	96	77	0	
CY7C199CN (7A19903SMC)	4028258	611057995	JT-CHINA	96	77	0	
CY7C199CN (7A19903SMC)	4028258	611058008	JT-CHINA	96	77	0	
STRESS: HIGH TEMP STORAGE							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	1000	77	0	

Reliability Test Data

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Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: LEAD INTEGRITY							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	5	0	
STRESS: PRESSURE COOKER TEST (121C, 100%RH), 15 Psig, PRE COND 192 HR 30C/60%RH (MSL3)							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	96	77	0	
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	168	77	0	
CY7C199CN (7A19903SMC)	4028258	611057995	JT-CHINA	96	77	0	
CY7C199CN (7A19903SMC)	4028258	611057995	JT-CHINA	168	77	0	
CY7C199CN (7A19903SMC)	4028258	611058008	JT-CHINA	96	77	0	
CY7C199CN (7A19903SMC)	4028258	611058008	JT-CHINA	168	77	0	
STRESS: PHYSICAL DIMENSION							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	30	0	
CY7C199CN (7A19903SMC)	4028258	611057995	JT-CHINA	COMP	30	0	
CY7C199CN (7A19903SMC)	4028258	611058008	JT-CHINA	COMP	30	0	
STRESS: SOLDERABILITY							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	15	0	
CY7C199CN (7A19903SMC)	4028258	611057995	JT-CHINA	COMP	15	0	
CY7C199CN (7A19903SMC)	4028258	611058008	JT-CHINA	COMP	15	0	
STRESS: TC COND. C –65C TO 150C, PRE COND 192 HR 30C/60%RH, MSL3							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	500	90	0	
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	1000	85	0	
CY7C199CN (7A19903SMC)	4028258	611057995	JT-CHINA	500	89	0	
CY7C199CN (7A19903SMC)	4028258	611057995	JT-CHINA	1000	89	0	
CY7C199CN (7A19903SMC)	4028258	611058008	JT-CHINA	500	90	0	
CY7C199CN (7A19903SMC)	4028258	611058008	JT-CHINA	1000	90	0	

Reliability Test Data

QTP #: 105206

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: POST TCT BOND PULL							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	5	0	
STRESS: ELECTRICAL DISTRIBUTIONS							
CY7C199CN (7A19903SMC)	4028258	611057994	JT-CHINA	COMP	30	0	
CY7C199CN (7A19903SMC)	4028258	611057995	JT-CHINA	COMP	30	0	
CY7C199CN (7A19903SMC)	4028258	611058008	JT-CHINA	COMP	30	0	

Document History Page

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Rev.	ECN No.	Orig. of Change	Description of Change
**	3178043	NRG	Initial Spec Release
*A	4364818	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
*B	6275621	JYF FRA	Sunset Review: Deleted obsolete spec# 001-12259 and aligned spec with the current Qualification Report template Removed Distribution: WEB and Posting: None in document history page.