Package Qualification Report

Reliability By Design

Qualification Description:

The information contained herein represents proof of Reliability and Performance of the Package Series listed below in accordance with the Qualification Plan and test methods referenced in Section 7.0, after exposure to a variety of environments and mechanical events that occur during installation and operational lifetime of the product. Upon conclusion of the testing the product continued to operate within specification limits, demonstrating its capability of reliable operation throughout its lifetime.

The purpose of this report is to present Qualification Test results of the referenced Package Series. The Pericom product data presented in this report qualifies the products manufactured in this package configuration, using the same bill of materials and assembled by the identified subcontractor location. The report describes the qualification test program, procedures utilized, criteria enforced (at the time of product validation), and specific result data obtained during the testing of three lots of semiconductors. The three lots consist of an equal number of units from different date codes, from the same production line and SubContractor to ensure manufacturing repeatability.

Lot Background Information:

Qual Vehicle:	PI7C9X2G608GPANJE, OSE Customer PN	Qual Test Date:	Nov-2014 updated Apr-2017
Supplier (Code):	OSE (O)	Die Attach Material:	Ablestik 2300
Pkg Type - Code:	LBGA-196 (NJ196)	Wire Size & Material:	0.8mil PdCu
Outline Drawing:	PD-2160	Mold Compound:	Sumitomo E770
By Extension Pkg:	NJA196	Leadframe Material:	HL832NXA+AUS308
		Solder Balls:	NJ= 0.5mm Balls-SN96.5/Ag3.0/Cu0.5 NJA= 0.6mm Balls-SN96.5/Ag3.0/Cu0.5

Pericom's Qualification Test Results:

Stress Test	Test Procedure	Test Conditions	Duration	# of Lots	Samples per Lot	Results Pass/Fail
Preconditioning	JESD22-A113	MSL3	NA	3	154	462 / 0
CSAM	J-STD-020	No delamination of Die Top, Wire bond, Down bond areas	NA	3	22	66 / 0
PreCon UHAST NJ196	JESD22-A118	130°C, RH 85%, 33.3 psia, 0V	96 hrs	3	77	231 / 0
PreCon BHAST NJ196 QBE via OSE LFBGA-96 (Same BOM)	JESD22-A118	130°C, RH 85%, 2.4 atm, 1.8V	100 hrs	1	77	77 / 0
PreCon BHAST NJA196	JESD22-A118	130°C, RH 85%, 2.4 atm, 1.8V	100 hrs	1	77	in progress est TBD
PreCon Temp Cycle NJ196	JESD22-A104	-65°C to +150°C 500 Cycles	500 cycles	3	77	231 / 0
PreCon Temp Cycle NJA196	JESD22-A104	-65°C to +150°C 500 Cycles	500 cycles	1	77	in progress 03/03/17
HTS (no PreCon) NJ196	JESD22-A103	1000hrs, 0V, 150°C	1000 hrs	3	77	231 / 0
HTS (no PreCon) NJA196	JESD22-A103	1000hrs, 0V, 150°C	1000 hrs	1	77	in-progress est 3/20/17
High Temp Oper Life (PI7C9X2G304SLBQ)	JESD22-A108	1000hrs, 1.2V, 125C	1000 hrs	3	77	231 / 0
High Temp Oper Life (PI7C9X2G606PRD)	JESD22-A108	1000hrs, 1.2V, 125C	1000 hrs	1	77	in-progress est 5/15/17
Wire Strength, IMG NJ196	Pericom Std Test	After 1000 hours HTSL	NA	3	2	6 / 0
Wire Pull, Ball Shear, NJA196 Solder Ball Shear NJA196	Pericom Std Test	After Wire bonding	NA	1 1	20 8	20 / 0 8 / 0
Splash, Cratering	Pericom Std Test	After Wire bonding	NA	3	3	9 / 0
Physical Dimension	JESD22-B100	Per Datasheeet	NA	3	5	15 / 0
External Visual Insp	JESD22-B101	NA	NA	3	5	15 / 0
Warpage Test NJA196	NA	+25C to +260C	NA	1	5	5 / 0
Solderability NJA196	J-STD-020 JESD22-B102	Pb-Free Solder 245°C with Steam Age - 8 hours	NA	1	20	20 / 0

Qualificaton by Extension Information:

Where a product of interest is not sampled during this period, it is valid to use the reliability data of the particular process technology or package type family to which the part belongs. All parts within the same family are designed to the same rules, and manufacturing is controlled by SPC. Within a product family, a device can only be fabricated on one process technology/ option, and only assembled on one package type process.

If there are any questions about this qualification, please contact Quality Support at: customerquestion@diodes.com

Approval: SIGNATURE ON FILE **Raul Aman, Director - Quality Assurance, Diodes Incorporated**

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Date: **Nov-2014 updated Apr-2017**

PKG Type & Code: **LBGA-196 (NJ196)**

Assembler-Code: **OSE (O)**

Qual Device: **PI7C9X2G608GPANJE, OSE Customer PN**

By extension: Pericom active devices using the Fab/Process at the time of the Qualification:

NJ196	NJA196			
PI7C9X2G308GPANJE	PI7C9X2G606PRDNJAE			
PI7C9X2G308GPANJEX	PI7C9X2G606PRDNJAEX			
PI7C9X2G312GPBNJE	PI7C9X2G808PRBNJAE			
PI7C9X2G312GPBNJEX	PI7C9X2G808PRBNJAEX			
PI7C9X2G312GPNJE				
PI7C9X2G312GPNJEX				
PI7C9X2G606PRANJE				
PI7C9X2G606PRANJEX				
PI7C9X2G606PRCNJE				
PI7C9X2G606PRCNJEX				
PI7C9X2G608GPBNJE				
PI7C9X2G608GPBNJEX				
PI7C9X2G608GPNJE				
PI7C9X2G608GPNJEX				
PI7C9X2G612GPANJE				
PI7C9X2G612GPANJEX				
PI7C9X2G612GPCNJE				
PI7C9X2G612GPCNJEX				
PI7C9X2G612GPNJE				
PI7C9X2G612GPNJEX				
PI7C9X2G808PRANJE				
PI7C9X2G808PRANJEX				
PI7C9X2G912GPANJE				
PI7C9X2G912GPANJEX				
PI7C9X2G912GPNJE				
PI7C9X2G912GPNJEX				

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