DIODES INCORPORATED   PERICOM A PRODUCT LINE OF DIODES INCORPORATED — ENABLING SERIAL CONNECTIVITY

Process Qualification Report

Reliability By Design

Qualification Description:

The information contained herein represents proof of Reliability and Performance of the baseline process technology listed below in accordance with the Qualification Plan and test methods referenced in Section 8.0, after exposure to a variety of environments (electrical, thermal, humidity, etc) and mechanical events that may 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 of referenced process technology. The Pericom product data presented in this report qualifies all products manufactured using the exact semiconductor materials and processing techniques used in the baseline process and its off-shoot processes. The report describes the qualification test program, procedures used, criteria enforced (at the time of product validation), and the resulting test data obtained during the Qualification Test. The materials and processing techniques used in the baseline process are incorporated into the off-shoot processes, so the quality/integrity of the baseline and off-shoots (i.e.: 2PxM, 1PxM) processes will be equivalent.

Lot Background Information:

Qual Test Date:	30-Nov-16 updated 14-Mar-2017	By Ext. Process:	0.13um 1PxM
Process Technology:	0.13um 1P4M		
Foundry & Code:	SMIC (I)		
Qual Test Number:	QDI16005 SMIC WLR (QR-2011v0) SMIC WLR (QR-2033v0)	Qual Vehicle:	PI2EQX6804-ANJE R037 TQV 0.13um 1P8M R037A TQV 0.13um 1P8M

Pericom's Qualification Test Results:

Stress Test	Test Procedure	Test Conditions	Duration	# of Lots	Samples per Lot	Results Pass/Fail
Dynamic High Temp	JESD22-A108	1000 hrs 1.25V 125°C	168 hrs	3	80	240/ 0
Operating Life (DHTOL)		1000 hrs 1.25V 125°C	500 hrs	3	80	240 / 0
(PI2EQX6804-ANJE)		1000 hrs 1.25V 125°C	1000 hrs	3	80	240 / 0
Dynamic High Temp	JESD22-A108	1000 hrs 1.2~1.4V 125°C	168 hrs	3	129	387 / 0
Operating Life		1000 hrs 1.2~1.4V 125°C	500 hrs	3	129	387 / 0
(SMIC WLR R037 TQV)		1000 hrs 1.2~1.4V 125°C	1000 hrs	3	129	387 / 0
Dynamic High Temp	JESD22-A108	1000 hrs 1.2~1.4V 125°C	168 hrs	3	129	387 / 0
Operating Life		1000 hrs 1.2~1.4V 125°C	500 hrs	3	129	387 / 0
(SMIC WLR R037A TQV)		1000 hrs 1.2~1.4V 125°C	1000 hrs	3	129	387 / 0
	ELF based on 1,014 units after 168 hrs	**ELF Rate** (55C, 0.7 eV, 2.5V, 60% CL)	**60.1**			
	FIT based on 1,014 units after 1,000 hours	**FIT Rate** (55C, 0.7 eV, 2.5V, 60% CL)	**10.1**			
		Calculated MTBF (hours)	**99,083,429**			
Temp Cycle Test	JESD22-A104	-65°C to 150°C, 500cyc	100 cycles	3	80	240 / 0
(PI2EQX6804-ANJE)		-65°C to 150°C, 500cyc	500 cycles	3	80	240 / 0
Temp Cycle Test	JESD22-A104	-65°C to 150°C, 1000cyc	500 cycles	3	45	135 / 0
(SMIC WLR R037A TQV)		-65°C to 150°C, 1000cyc	1000 cycles	3	45	135 / 0
High Temp Storage	JESD22-A103	1000hrs, 0V, 150°C	168 hrs	3	80	240 / 0
(HTS)		1000hrs, 0V, 150°C	500 hrs	3	80	240 / 0
(PI2EQX6804-ANJE)		1000hrs, 0V, 150°C	1000 hrs	3	80	239 / 0 [1]
High Temp Storage	JESD22-A103	1000hrs, 0V, 150°C	168 hrs	3	45	135 / 0
(HTS)		1000hrs, 0V, 150°C	500 hrs	3	45	135 / 0
(SMIC WLR R037A TQV)		1000hrs, 0V, 150°C	1000 hrs	3	45	135 / 0
Latch Up Test	EIA JESD78	Pass, Report available by Device				
ESD-HBM Test	JESD22-A114	Pass, Report available by Device				

(1) 1 unit cannot be measured with missing BGA ball due to handling. The unit is removed from the data

Qualification by Extension Information:

It is valid to use the reliability data of a particular process technology and apply to all products within this process technology family. All parts within the same family are designed to the same rules (layout & electrical), and manufacturing is controlled by SPC. Within a product family, a device can only be fabricated on one process technology option.

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

PH: +408-232-9100 | FX: +408-434-1040 | 1545 Barber Lane, Milpitas, CA 95035 U.S.A.

Date: **30-Nov-16 updated 14-Mar-2017**
Subject: **Process Qualification Report**
Mfg-Fab-Process: **SMIC (I) 0.13um 1P4M**
Qual Vehicle: **PI2EQX6804-ANJE, SMIC WLR R037, SMIC WLR R037A**

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

PI2EQX5964ZLE				
PI2EQX5964ZLEX				
PI2EQX5984ZLE				
PI2EQX5984ZLEX				
PI2EQX6804-ANJE				
PI2EQX6804-ANJEX				
PI2EQX6812ZHE				
PI2EQX6812ZHEX				
PI2EQX6814NJE				
PI2EQX6814NJEX				
PI2EQX6874ZFE				
PI2EQX6874ZFEX				
PI2EQX5904NJE				
PI2EQX5904NJEX				
PI3EQX5801ZDE				
PI3EQX5801ZDEX				
PI3EQX6741STZDE				
PI3EQX6741STZDEX				
PI3EQX6801ZDE				
PI3EQX6801ZDEX				
PI3EQX7841ZDE				
PI3EQX7841ZDEX				

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