

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:	April-2011 updated: Jul-2017	By Ext. Process:	0.18um 1PxM
Process Technology:	0.18um 1P6M	Qual Vehicles:	PI3USB32224AXEAE, PI3USB32224BXEAE, PI6LC48H02QLE, PI2EQXDP101ZFE, PI3USB30532ZLE, PI6CG18801ZLE, PI3USB32324XEAE, PI3USB32324AXEAE, PI6LC48S25ZBBIE, PI3DBS12612ZTFE, PI3USB32212ZLE,
Foundry & Code:	MGN (G)		
Qual Test Numbers:	QDG010014, QPG15016, QQG14005, QDG14027, QPG16017, QPG16010, QPG16018, QPG16015, QDG17013, QDG17019, QDG17004, QDG17017,		

Pericom's Qualification Test Results:

Stress Test	Test Procedure	Test Conditions	Duration	# of Lots	Samples per Lot	Results Pass/Fail
Dynamic HTOL	JESD22-A108	1000 hrs 2.75V 150°C	168 hrs	2	80	160 / 0
PI2EQXDP101ZFE - D82X		1000 hrs 2.75V 150°C	1000 hrs	2	80	160 / 0
Dynamic HTOL	JESD22-A108	1000 hrs 3.6V 125°C	168 hrs	3	112	336 / 0
(WLR - HTOL)		1000 hrs 3.6V 125°C	1000 hrs	3	112	336 / 0
Dynamic HTOL	JESD22-A108	1000 hrs 3.8V 125°C	168 hrs	3	77	231 / 0
PI6LC48H02QLE - SPLL QQG14005		1000 hrs 3.8V 125°C	1000 hrs	3	77	231 / 0
Dynamic HTOL	JESD22-A108	1000 hrs 3.8V 125°C	168 hrs	8	80	640 / 0
PI3USB32224AXEAE(3) PI3USB32224BXEAE(1) - U24B QPG14027/QPG16017		1000 hrs 3.8V 125°C	500 hrs	8	80	640 / 0
PI3USB32324XEAE(1) PI3USB32324AXEAE(3) - U324 QPG16010/QPG16018		1000 hrs 3.8V 125°C	1000 hrs	8	80	640 / 0
Dynamic HTOL	JESD22-A108	1000 hrs 3.6V 125°C	168 hrs	1	80	80 / 0
PI3USB30532ZLE - UC38 QPG16015		1000 hrs 3.6V 125°C	1000 hrs	1	80	80 / 0
Dynamic HTOL	JESD22-A108	1000 hrs 1.9V 125°C	168 hrs	1	80	80 / 0
PI6CG18801ZLE - CG04 QDG17013		1000 hrs 1.9V 125°C	1000 hrs	1	80	80 / 0
Dynamic HTOL	JESD22-A108	1000 hrs 3.6V 125°C	168 hrs	1	80	80 / 0
PI6LC48S25ZBBIE - LC9X_LC9W QDG17019		1000 hrs 3.6V 125°C	1000 hrs	1	80	80 / 0
Dynamic HTOL	JESD22-A108	1000 hrs 3.6V 125°C	168 hrs	1	80	80 / 0
PI3DBS12612ZTFE - F628 QDG17004		1000 hrs 3.6V 125°C	1000 hrs	1	80	80 / 0
Dynamic HTOL	JESD22-A108	1000 hrs 3.6V 125°C	168 hrs	1	80	80 / 0
PI3USB32212ZLE - F228 QDG17017		1000 hrs 3.6V 125°C	1000 hrs	1	80	80 / 0
		ELFR after 168hrs = 1767pcs ELFR after 48hrs = 4000 pcs HTOL Qty = 1767 units FIT is based 1,000 hrs	ELFR (55C, 0.7 eV, 3.8V, 60% CL)	26.9		
			FIT Rate (55C, 0.7 eV, 3.8V, 60% CL)	4.2		
			Calculated MTBF (hours)	237,705,400		
Early Life Failure (ELFR)						
(PI3USB32224AXEAE = 3) (PI3USB32224BXEAE = 1)	JESD22-A108	48hrs, 3.8V, 125°C	48 hrs	4	1000	4000 / 0
Temp Cycle Test	JESD22-A104	-65°C to 150°C, 500cyc	100 cycles	2	80	160 / 0
(PI2EQXDP101ZFE)		-65°C to 150°C, 500cyc	500 cycles	2	80	160 / 0
Temp Cycle Test	JESD22-A104	-65°C to 150°C, 500cyc	100 cycles	3	45	90 / 0
(WLR - TC)		-65°C to 150°C, 500cyc	500 cycles	3	45	90 / 0
High Temp Storage (HTS)	JESD22-A103	1000hrs, 0V, 150°C	168 hrs	9	77	693 / 0
PI2EQXDP101ZFE(2) PI3USB32224XEAE(3) PI3USB32224BXEAE(1)		1000hrs, 0V, 150°C	500 hrs	9	77	693 / 0
PI3USB32324XEAE(1) PI3USB32324AXEAE(2)		1000hrs, 0V, 150°C	1000 hrs	9	77	693 / 0
High Temp Storage	JESD22-A103	1000hrs, 0V, 150°C	168 hrs	3	22	44 / 0
(WLR - HTS)		1000hrs, 0V, 150°C	504 hrs	3	22	44 / 0
Latch Up Test	EIA JESD78	Report available by Device				
ESD-HBM Test	JESD22-A114	Report available by Device				

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:

pca_customerquestion@diodes.com

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

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Date: **April-2011 updated: Jul-2017**

Subject: **Pericom Process Qualification Report**

Mfg-Fab-Process: **MGN (G) 0.18um 1P6M**

Qual Vehicle(s): **PI2EQXDP101ZFE, PI3USB32224AXEAE, PI3USB32224BXEAE, PI6LC48H02ZDE,
PI3USB30532ZLE, PI6CG18801ZLE, PI3USB32324/AXEAE, PI6LC48S25ZBBIE,
PI3DBS12612ZTFE, PI3USB32212ZLE,**

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

PI2EQXDP101-AZFE	PI3PCIE3422AZHEX	PI6C4911505-07LIE	PI6LC48L0201AZHIE	PI7C8952AFAE
PI2EQXDP101-AZFEX	PI3PCIE3422ZHE	PI6C4911505-07LIEEX	PI6LC48L0201AZHIEEX	PI7C8952AFAEX
PI3DBS12212AXUAEX	PI3PCIE3422ZHEX	PI6C4911505LIE	PI6LC48L0201LIE	PI7C8954AFHE
PI3DBS12212AZBSEX	PI3PCIE3442AZHE	PI6C4911505LIEEX	PI6LC48L0201LIEEX	PI7C8958AFHE
PI3DBS12412AZHE	PI3PCIE3442AZHEX	PI6C4911506-06LIE	PI6LC48P0101LIE	PI7C9X1170ABLE
PI3DBS12412AZHEX	PI3PCIE3442AZLE	PI6C4911506-06LIEEX	PI6LC48P0101LIEEX	PI7C9X1170ABLEX
PI3DBS12412AZLE	PI3PCIE3442AZLEX	PI6C4911506LIE	PI6LC48P0201AZHIE	PI7C9X1170ACLE
PI3DBS12412AZLEX	PI3PCIE3442ZHE	PI6C4911506LIEEX	PI6LC48P0201AZHIEEX	PI7C9X1170ACLEX
PI3DBS12612ZTFE	PI3PCIE3442ZHEX	PI6C4911510-05FAIE	PI6LC48P0201LIE	PI7C9X1170BBLE
PI3DBS12612ZTFEX	PI3PCIE3442ZLE	PI6C4911510-05FAIEEX	PI6LC48P0201LIEEX	PI7C9X1170BBLEX
PI3DDR4212NMEX	PI3PCIE3442ZLEX	PI6C4911510FAEIE	PI6LC48P02LIE	PI7C9X1170BZDE
PI3HDMI511AZLE	PI3USB302-AZBEX	PI6C4911510FAEIEEX	PI6LC48P02LIEEX	PI7C9X1170BZDEX
PI3HDMI511AZLEX	PI3USB304ZHE	PI6C4911510FAIE	PI6LC48P0301AZHE	PI7C9X1170CZDE
PI3HDMI511ZLE	PI3USB304ZHEX	PI6C4911510FAIEEX	PI6LC48P0301AZHEX	PI7C9X1170CZDEX
PI3HDMI511ZLEX	PI3USB30532ZLE	PI6C4911510ZHIE	PI6LC48P0301AZHIE	PI7C9X1172BLE
PI3HDMI521FBE	PI3USB30532ZLEX	PI6C4911510ZHIEEX	PI6LC48P0301AZHIEEX	PI7C9X1172BLEX
PI3HDMI521FBEX	PI3USB31532ZLE	PI6C4921506LIE	PI6LC48P0301LE	PI7C9X1172BZHE
PI3HDX412BDZBE	PI3USB31532ZLEX	PI6C4921506LIEEX	PI6LC48P0301LEX	PI7C9X1172BZHEX
PI3HDX412BDZBEX	PI3VDP1431AZLSE	PI6C4931502-04LIE	PI6LC48P0301LIE	PI7C9X1172CLE
PI3HDX414FCEE	PI3VDP1431AZLSEX	PI6C4931502-04LIEEX	PI6LC48P0301LIEEX	PI7C9X1172CLEX
PI3HDX414FCEEX	PI3VDP1431ZLSE	PI6C4931504-04LIE	PI6LC48P03AZHIE	PI7C9X1172CZHE
PI3HDX511AZLSE	PI3VDP1431ZLSEX	PI6C4931504-04LIEEX	PI6LC48P03AZHIEEX	PI7C9X1172CZHEX
PI3HDX511AZLSEX	PI3WVR31212AZLE	PI6C49S1504LIE	PI6LC48P03LE	PI7C9X752FAEX
PI3HDX511DZLEX	PI3WVR31212AZLEX	PI6C49S1504LIEEX	PI6LC48P03LEX	PI7C9X754FCGX
PI3HDX511EZLSE	PI3WVR31212ZLE	PI6C49S1506FAIE	PI6LC48P03LIE	PI7C9X754FFEX
PI3HDX511EZLSEX	PI3WVR31212ZLEX	PI6C49S1506FAIEEX	PI6LC48P03LIEEX	PI7C9X754ME
PI3HDX511FZLE	PI3WVR31310AZLE	PI6C49S1510ZDIE	PI6LC48P0401LE	PI7C9X754ZBEX
PI3HDX511FZLEX	PI3WVR31310AZLEX	PI6C49S1510ZDIEEX	PI6LC48P0401LEX	PI7C9X760ABLE
PI3HDX511FZLIE	PI3WVR31313AZLE	PI6CXG06F62AFBEIE	PI6LC48P0401LIE	PI7C9X760ABLEX
PI3HDX511FZLIEEX	PI3WVR31313AZLEX	PI6CXG06F62AFBEIEEX	PI6LC48P0401LIEEX	PI7C9X760BBLE
PI3HDX621FBE	PI5USB30213XEAE	PI6CXG06F62BFBEIE	PI6LC48P0405LIE	PI7C9X760BBLEX
PI3HDX621FBEX	PI5USB31213XEAE	PI6CXG06F62BFBEIEEX	PI6LC48P0405LIEEX	PI7C9X760BCLE
PI3PCIE3212XUAEX	PI6C48535-01BLIE	PI6LC48C21LE	PI6LC48P04LIE	PI7C9X760BCLEX
PI3PCIE3212ZBEX	PI6C48535-01BLIEEX	PI6LC48C21LEX	PI6LC48P04LIEEX	PI7C9X760BZDE
PI3PCIE3242AZLEX	PI6C48535-11BLIE	PI6LC48C21LIE	PI6LC48P25104LE	PI7C9X760BZDEX
PI3PCIE3242ZLEX	PI6C48535-11BLIEEX	PI6LC48C21LIEEX	PI6LC48P25104LEX	PI7C9X760CZDE
PI3PCIE3412AZHEX	PI6C48535-11CLIE	PI6LC48C51LE	PI6LC48P25104LIE	PI7C9X760CZDEX
PI3PCIE3412ZHE	PI6C48535-11CLIEEX	PI6LC48C51LEX	PI6LC48P25104LE	PI7C9X762BLE
PI3PCIE3412ZHEX	PI6C4911504-01LIE	PI6LC48C51LIE	PI6LC48S04ZHIE	PI7C9X762BLEX
PI3PCIE3413AZHEX	PI6C4911504-01LIEEX	PI6LC48C51LIEEX	PI6LC48S04ZHIEEX	PI7C9X762BZHE
PI3PCIE3412ZHE	PI6C48535-11CLIEEX	PI6LC48C51LEX	PI6LC48P25104LE	PI7C9X762BLE
PI3PCIE3412ZHEX	PI6C4911504-01LIE	PI6LC48C51LIE	PI6LC48S04ZHIE	PI7C9X762BLEX
PI3USB32212ZLE - F22	PI6C4911504-01LIEEX	PI6LC48C51LIEEX	PI6LC48S04ZHIEEX	PI7C9X762BZHE
PI3PCIE3413ZHE	PI6C4911504-03LIE	PI6LC48H02-01LIE	PI6LC48S25AZBBIE	PI7C9X762BZHEX
PI3PCIE3413ZHEX	PI6C4911504-03LIEEX	PI6LC48H02-01LIEEX	PI6LC48S25AZBBIEEX	PI7C9X762CLE
PI3PCIE3415AZHE	PI6C4911504D2LIE	PI6LC48H02LIE	PI6LC48S25ZBBE	PI7C9X762CLEX
PI3PCIE3415AZHEX	PI6C4911504D2LIEEX	PI6LC48H02LIEEX	PI6LC48S25ZBBEX	PI7C9X794FCGX
PI3PCIE3415ZHE	PI6C4911505-04LIE	PI6LC48H04LIE	PI6LC48S25ZBBIE	PI7C9X798ME
PI3PCIE3415ZHEX	PI6C4911505-04LIEEX	PI6LC48H04LIEEX	PI6LC48S25ZBBIEEX	