PERICOM Semiconductor Corporation

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PRODUCT/PROCESS CHANGE NOTICE (PCN)

PCN Number: **05-16**

Date Issued: **November 4, 2005**

Product(s) Affected: **PI3L301D (all package types)**

Manufacturing Location Affected: **N/A**

Date Effective: **February 4, 2006 – standard 90 day waiting period (some customers may require longer timeframes)**

Means of Distinguishing Changed Devices:

☐ Product Mark:

☐ Back Mark

☒ Date Code: *

☐ Other

* **"A" prefix letter before the datecode**

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Attachment: ☒ Yes; ☐ No

See attached Characterization Comparison Data. Data confirms that the smaller die size has no significant performance differences than the previous version.

Samples: **Request from Pericom Sales Representatives**

Description and Purpose of Change:

The change represents a die layout optimization that reduces chip size by ≈ 27%, while using the same MagnaChip 0.5-µm wafer fab process and design rules. The new die size is now 1.02 x 2.41 mm, compared to the previous version's 1.19 x 2.85 mm.

☐ Die Technology

☐ Wafer Fabrication

☐ Assembly Process

☐ Equipment

☐ Material

☐ Testing

☐ Manufacturing Site

☐ Data Sheet

☒ Other: **Die size shrink/optimization**

Reliability/Qualification Summary: **N/A – same process as previously used (**http://www.pericom.com/pdf/gen/rel_PI3L301D.pdf**)**

Customer Acknowledgement of Receipt:

Customer: _____

Name: _____

Title: _____

Date: _____

E-Mail: _____

Phone: _____

Fax: _____

☐ Approval for shipments prior to effective date

Customer Comments (Optional): _____

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Subject: PI3L301D Characterization Comparison Report

Introduction:
Pericom's PI3L301D is a 3.3V, 16-Bit to 8-Bit, Mux/DeMux Gigabit Ethernet LAN Switch with Single Enable. This device uses the MagnaChip (formally known as Hynix) 0.5µm, CMOS, 1P3M process. The new A648 array and the previous 6V48 array were compared side by side for key AC and DC parameters. The wafer fab process remains the same, with an approximate 27% die size reduction; the new die array is 1.02 x 2.41 mm, and the old array is 1.19 x 2.85mm.

Reference: *Device Name:* **PI3L301D**
New Die Array: **A648**
Lot Number: ESHD0236.B
Date Code: 0527OG
Package: TSSOP (A48)

Old Die Array: **6V48**
Lot No: 261846.1
Date Code: 0429OG
Package: TSSOP (A48)

Equipment:
HP power supply & DMM
HP4285 LCR Meter
HP4145B DC Analyzer
HP4156B DC Analyzer
TDS7404 Oscilloscope with TEK P7240 Probes
HP8082A Pulse Generator
HP4396B Network/Spectrum/Impedance Analyzer, HP11667A Power Splitter
Thermo-stream TP034000-A

Tables:
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Table 8: Crosstalk vs. Frequency, 25C
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Conclusion:
1. Parts meet all datasheet parameter requirements.
2. Ron for both arrays is comparable.
3. New array has slightly lower Con and Coff.
4. New array has improved XTALK, OIRR & BW.

Table 1. DC Characteristics

Para-meter	Test Conditions	Vcc	A648 Array			6V48 Array			Min	Max	Units
			-40°C	25°C	90°C	-40°C	25°C	90°C			
VIH	Input High Voltage	3.0 V	1.355	1.355	1.360	1.330	1.340	1.355	2.0		V
VIH	Input High Voltage	3.3 V	1.465	1.470	1.475	1.445	1.455	1.470	2.0		V
VIH	Input High Voltage	3.6 V	1.580	1.580	1.590	1.560	1.580	1.590	2.0		V
VIL	Input Low Voltage	3.0 V	1.350	1.350	1.355	1.335	1.345	1.360		0.8	V
VIL	Input Low Voltage	3.3 V	1.460	1.460	1.470	1.450	1.460	1.475		0.8	V
VIL	Input Low Voltage	3.6 V	1.570	1.575	1.580	1.565	1.585	1.595		0.8	V
IIL	Vin=0V	3.6V	-1.47n	477p	-11.51n	-1.4n	-47p	-2.4n		± 5	µA
IIH	Vin=3.6V	3.6 V	623p	49.5p	14.71n	2.6n	26p	4.3n		± 5	µA
IOff	Vout=0V	0 V	215p	51.0p	13.0p	-36p	-31p	-16p		± 5	µA
IOff	Vout=3.6V	0 V	10.0n	395p	733p	35p	-18p	4p		± 5	µA
VIK	Iin=-18mA, SEL	3.0 V	-0.959	-0.863	-0.774	-0.96	-0.88	-0.80		-1.2	V
VIK	Iin=-18mA, A/B	3.0 V	-0.911	-0.813	-0.715	-0.90	-0.83	-0.72		-1.2	V
ICC	Vin =Gnd	3.6 V	445u	385u	340u	375u	340u	310u		800	µA
ICC	Vin =VCC	3.6 V	440u	390u	345u	375u	360u	310u		800	µA

Table 2. Ron Measurements Over Temperature Range, Vcc=3.0V

Para-meter	Test Conditions	A648 Array			6V48 Array			Limits	
		-40°C	25°C	90°C	-40°C	25°C	90°C	Max	Units
Ron	Vin=1.5, Iin=-40mA	3.81	4.28	4.94	3.85	4.39	5.15	8	Ω
Ron	Vin=3.0, Iin=-40mA	4.36	4.84	5.59	4.35	4.97	5.83	8	Ω
Ron	Vin=1.25V, Iin=-10mA	3.66	4.18	4.88	3.86	4.48	5.14	8	Ω
Ron	Vin=3.0, Iin=-10mA	4.24	4.83	5.63	4.30	5.10	5.80	8	Ω
Ron	Vin=1.25V, Iin=-30mA	3.68	4.21	4.87	3.80	4.41	5.09	8	Ω
Ron	Vin=3.0, Iin=-30mA	4.24	4.84	5.60	4.33	4.97	5.83	8	Ω
Rflat	Vin=1.5 & 3.0V, Iin=-40mA	0.55	0.56	0.65	0.50	0.58	0.68	1(typ)	Ω
Rflat	Vin=1.25 & 3.0V, Iin=-10mA	0.58	0.65	0.75	0.44	0.62	0.66	1(typ)	Ω
Rflat	Vin=1.25 & 3.0V, Iin=-30mA	0.56	0.63	0.73	0.53	0.56	0.74	1(typ)	Ω

Table 3: A648 Array Ron Measurement, all paths at 25C

	Iin=-40mA		Iin=-10mA		Iin=-30mA		Units
Channel	Vin=1.5V	Vin = 3.0V	Vin =1.25V	Vin= 3.0V	Vin=1.25V	Vin= 3.0V	
A0-0B1	4.04	4.58	3.95	4.57	3.96	4.56	Ω
A0-0B2	4.28	4.84	4.18	4.83	4.21	4.84	Ω
A1-1B1	4.21	4.77	4.12	4.73	4.15	4.75	Ω
A1-1B2	4.24	4.82	4.19	4.85	4.20	4.83	Ω
A2-2B1	4.35	4.92	4.26	4.92	4.27	4.90	Ω
A2-2B2	4.29	4.87	4.19	4.84	4.20	4.84	Ω
A3-3B1	4.32	4.88	4.26	4.90	4.25	4.89	Ω
A3-3B2	4.22	4.80	4.16	4.82	4.18	4.81	Ω
A4-4B1	4.30	4.88	4.24	4.89	4.23	4.88	Ω
A4-4B2	4.26	4.84	4.19	4.85	4.20	4.84	Ω
A5-5B1	4.29	4.86	4.21	4.87	4.23	4.87	Ω
A5-5B2	4.19	4.77	4.12	4.77	4.14	4.77	Ω
A6-6B1	4.32	4.91	4.30	4.96	4.26	4.90	Ω
A6-6B2	4.27	4.84	4.21	4.85	4.21	4.83	Ω
A7-7B1	4.34	4.91	4.28	4.93	4.28	4.92	Ω
A7-7B2	4.11	4.67	4.04	4.68	4.05	4.67	Ω
Min	**4.04**	**4.58**	**3.95**	**4.57**	**3.96**	**4.56**	Ω
Max	**4.35**	**4.92**	**4.30**	**4.96**	**4.28**	**4.92**	Ω

Table 4: 6V48 Array Ron Measurement, all paths at 25C

	Iin=-40mA		Iin=-10mA		Iin=-30mA		Units
Channel	Vin=1.5V	Vin= 3.0V	Vin=1.25V	Vin= 3.0V	Vin=1.25V	Vin= 3.0V	
A0-0B1	3.96	4.53	3.98	4.60	3.92	4.53	Ω
A0-0B2	4.16	4.75	4.17	4.70	4.11	4.73	Ω
A1-1B1	4.17	4.72	4.21	4.70	4.14	4.73	Ω
A1-1B2	4.21	4.80	4.25	4.80	4.19	4.80	Ω
A2-2B1	4.39	4.97	4.48	5.10	4.41	4.97	Ω
A2-2B2	4.30	4.87	4.36	4.90	4.28	4.90	Ω
A3-3B1	4.27	4.85	4.30	4.90	4.25	4.87	Ω
A3-3B2	4.17	4.75	4.19	4.70	4.13	4.77	Ω
A4-4B1	4.26	4.85	4.28	4.80	4.22	4.83	Ω
A4-4B2	4.28	4.87	4.31	4.80	4.25	4.87	Ω
A5-5B1	4.18	4.85	4.27	4.80	4.21	4.83	Ω
A5-5B2	4.21	4.80	4.21	4.80	4.15	4.80	Ω
A6-6B1	4.16	4.75	4.18	4.70	4.12	4.77	Ω
A6-6B2	4.14	4.70	4.18	4.70	4.11	4.74	Ω
A7-7B1	4.10	4.68	4.11	4.70	4.04	4.60	Ω
A7-7B2	3.98	4.53	4.00	4.50	3.93	4.57	Ω
Min	**3.96**	**4.53**	**3.98**	**4.50**	**3.92**	**4.53**	Ω
Max	**4.39**	**4.97**	**4.48**	**5.10**	**4.41**	**4.97**	Ω

Table 5: Capacitance @ 25C

Symbol	Description	Vcc	A648 Array	6V48 Array	Typ.	Max	Units
Cin	SEL pin	3.0V	3.27	2.50	3.1	3.6	PF
Coff	Port B Capacitance, Switch Off	3.0V	2.45	3.10	2.8	6.0	pF
Con	A0-0B1 Switch On	3.0V	8.10	8.70	9.5	10.9	pF

Table 6. AC Characteristics

Symbol	Vcc	Load	A648 Array			6V48 Array			Typical	Units
			-40°C	25°C	90°C	-40°C	25°C	90°C		
tpZH	2.5V	Load A	9.41	10.23	11.45	4.91	5.44	6.67	15	ns
tpHZ	2.5V	Load A	2.63	2.75	2.92	2.19	2.36	2.52	9	ns
tpZL	2.5V	Load B	5.14	5.51	5.93	4.42	4.78	5.26	15	ns
tpLZ	2.5V	Load B	2.84	3.03	3.27	3.04	3.24	3.55	9	ns

Load A: 10pF//200Ω//200Ω
Load B: 10pF//200Ω, 200Ω to 6V

Table 7: Dynamic Electrical Characteristics @ 25C

Symbol	Description	Vcc	A648 Array	6V48 Array	Typical	Units
Xtalk	F=200MHz	3.0V	-43.5	-39.9	-27	dB
OIRR	F=200MHz	3.0V	-41.7	-37.2	-32	dB
BW	A7-7B2, -3dB	3.0V	710	591	350	MHz

Table 8. Crosstalk vs. Frequency, Vcc=3.0V, 25C

Frequency	Crosstalk		Unit
	A648 Array	6V48 Array	
100 MHz	-49.7	-46.8	dB
200 MHz	-43.5	-39.9	dB
500 MHz	-36.2	-32.7	dB
1000 MHz	-33.9	-32.0	dB

Table 9. Off Isolation vs. Frequency, Vcc=3.0V, 25C

Frequency	Off Isolation		Unit
	A648 Array	6V48 Array	
100 MHz	-49.0	-47.0	dB
200 MHz	-41.7	-37.2	dB
500 MHz	-30.7	-25.6	dB
1000 MHz	-24.9	-22.6	dB