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PRODUCT/PROCESS CHANGE NOTICE (PCN)

PCN Number: **05-07**
Date Issued: **February 24, 2005**
Product(s) Affected: **PI3B3244 (all packages)**
Manufacturing Location Affected: **N/A**
Date Effective: **May 24, 2005 – standard 90 day waiting period (some customers may require longer timeframes)**

Means of Distinguishing Changed Devices:

- Product Mark:
- Back Mark
- Date Code: *
- Other

* "A" letter in front of 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 approximately 25%, while using essentially the same 0.35-µm wafer fab process and design rules. The new die size is now 31 x 43 mils, compared to the previous version that was 40.2 x 59.8. This product was part of a die array that featured multiple device types from this switch family that were created by metal mask options. The other device type options were removed in order to decrease die size and increase die per wafer for this high volume product. No circuitry changes were made to the PI3B3244 product itself. This is the same type of change as the one noted in PCN 04-14 for the PI3B3257.

- 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**

Customer Acknowledgement of Receipt:

Customer: _____

Name: _____

Title: _____

Date: _____

E-Mail: _____

Phone: _____

Fax: _____

Approval for shipments prior to effective date

Customer Comments (Optional): _____

Date: February 4, 2005

Subject: PI3B3244 Product Characterization Report

Introduction:

The PI3B3244 is an 8-Bit, 2-Port Nano Switch. Characterization measurements of the 0.35-micron CSM-S Fab 2 die array were done side by side with the existing die array that uses essentially the same wafer fab and process. The new die array has been optimized by removal of circuitry used for other device types in this Switch family. This allowed a die size reduction with no circuitry of the PI3B3244 being changed.

Reference:

New Die Array:

Array Name: T24B3
Date Code: A0502XC
Package: TSSOP (L20)

Old Die Array:

Array Name: LVBS24
Date Code: Z0413XC
Package: TSSOP (L20)

Equipment:

HP power supply & DMM,
HP4145B DC Analyzer
HP4285A LCR Meter
TDS8000 Oscilloscope, TX P6209 Active Probe
HP8082A Signal Generator
HP8110A Pulse Generator
Temptronix X-Stream 4300

Tables:

Table 1: DC Characteristics
Table 2: Ron Measurements, all path, 25C
Table 3: Capacitance, 25C
Table 4: AC Characteristics
Table 5: Dynamic ICC, Vcc=3.6V, 25C

Conclusion:

1. Both versions meet all datasheet spec requirements.
2. New array has lower Ron, Con and Coff.

Table 1. DC Characteristics

			T24B3			LVBS24					
Parameter	Test Conditions	Vcc	-40°C	25°C	90°C	-40°C	25°C	90°C	Min Spec	Max Spec	unit
V _{IH}	Input High Voltage	3.0 V	1.380	1.405	1.430	1.340	1.360	1.385	2.0		V
V _{IH}	Input High Voltage	3.3 V	1.530	1.555	1.580	1.490	1.510	1.535	2.0		V
V _{IH}	Input High Voltage	3.6 V	1.685	1.710	1.735	1.640	1.660	1.685	2.0		V
V _{IL}	Input Low Voltage	3.0 V	1.505	1.500	1.505	1.440	1.480	1.480		0.8	V
V _{IL}	Input Low Voltage	3.3 V	1.680	1.675	1.685	1.600	1.650	1.650		0.8	V
V _{IL}	Input Low Voltage	3.6 V	1.850	1.845	1.865	1.775	1.825	1.815		0.8	V
V _H	Input Hysteresis	3.0 V	0.125	0.095	0.075	0.100	0.120	0.095	typ	0.15	V
V _H	Input Hysteresis	3.3 V	0.150	0.120	0.105	0.110	0.140	0.115	typ	0.15	V
V _H	Input Hysteresis	3.6 V	0.165	0.135	0.130	0.135	0.165	0.130	typ	0.15	V
R _{on}	I _{on} =48mA, V _{in} =0 V	3.0 V	3.49	4.00	4.74	4.14	4.80	5.61		7	Ω
R _{on}	I _{on} =15mA, V _{in} =2.4 V	3.0 V	6.93	8.27	9.73	8.33	9.87	11.30		15	Ω
I _{IL}	V _{in} = 0 V	3.6 V	-12.6n	-110.0p	-85.0p	240.0p	780.0p	-480.0p		-1	μA
I _{IH}	V _{in} = 3.6 V	3.6 V	4.71n	755.0p	3.09n	10.67n	195.0p	5.91n		1	μA
I _{IOZL}	V _{oz} = 0 V	3.6 V	-237.0p	1.50p	-490.0p	-975.0p	-27.5p	-930p		-1	μA
I _{IOZH}	V _{oz} = 3.6 V	3.6 V	12.80n	11.50p	10.37n	80.0p	187.5p	22.6n		1	μA
V _{IK}	I/O Pins, I=-18mA	3.0 V	-0.807	-0.774	-0.711	-0.778	-0.736	-0.685	typ	-1.2	V
V _{IK}	\BE Pin, I=-18mA	3.0 V	-0.895	-0.851	-0.783	-0.863	-0.818	-0.767	typ	-1.2	V
I _{ICCL}	V _{in} =0 V	3.6 V	92.31n	3.22n	211.7n	40.79n	18.06n	627.3n		3	μA
I _{ICCH}	V _{in} =3.6 V	3.6 V	63.01n	3.44n	223.0n	22.50n	8.86n	670.2n		3	μA
ΔICC	V _{in} =3.0 V	3.6 V	680.7n	6.75μ	32.01μ	1.92μ	13.66μ	49.05μ		750	μA

***Note: VIH/VIL Test Measurement Definition**

The Table 1 DC parametric data for VIH and VIL reflects the input switching threshold data for logic devices. When the measured value is compared to the VIH min or VIL max limits, the difference is the noise margin for that device's input; it does not mean the device is out of spec. This is a standard methodology for doing this type of design parameter test.

Table 2. Ron Measurement, all paths, Vcc=3.0V, 25C

Channel	T24B3		LVBS24		unit
	I _{on} =+48mA V _{in} =0V	I _{on} =+15mA V _{in} =2.4V	I _{on} =+48mA V _{in} =0V	I _{on} =+15mA V _{in} =2.4V	
1A0 – 1B0	4.00	8.27	4.80	9.87	Ω
1A1 – 1B1	3.97	8.14	4.75	9.81	Ω
1A2 – 1B0	3.91	8.20	4.71	9.67	Ω
1A3 – 1B1	3.95	8.27	4.86	9.87	Ω
2A0 – 2B0	4.00	8.33	4.91	10.00	Ω
2A1 – 2B1	3.97	8.20	4.71	9.73	Ω
2A2 – 2B2	3.91	8.14	4.67	9.54	Ω
2A3 – 2B3	3.96	8.20	4.69	9.60	Ω
Max	7.00	15.00	7.00	15.00	Ω

Table 3. Capacitance at 25C

Symbol	Description	Vcc	T24B3	LVBS24	Typ	Units
Cin	Control Input	3.3 V	2.26	1.20	3	pF
Coff	A Cap, Switch Off	3.3 V	3.45	8.50	8	pF
Coff	B Cap, Switch Off	3.3 V	3.40	7.45	8	pF
Con	A-B, Switch On	3.3 V	7.00	16.00	16	pF

HP4285A LCR Meter

Table 4. AC Characteristics

Symbol	Vcc	Load	T24B3			LVBS24			Max Spec	Units
			-40°C	25°C	90°C	-40°C	25°C	90°C		
tpZH	3 V	Load A	1.94	1.98	2.02	1.98	2.03	2.10	4.0	nS
tpHZ	3 V	Load A	2.48	2.59	2.71	2.40	2.53	2.68	4.5	nS
tpZL	3 V	Load B	1.61	1.68	1.72	1.71	1.78	1.83	4.0	nS
tpLZ	3 V	Load B	2.19	2.26	2.33	1.90	1.97	2.06	4.5	nS

Load A: 50pF//250Ω

Load B: 50pF//500Ω, 500Ω to 6V

Table 5. Dynamic Icc, Vcc=3.6V

Frequency	T24B3	LVBS24	Units
1MHZ	0.057	0.058	mA
5MHZ	0.283	0.286	mA
10MHZ	0.565	0.575	mA
20MHZ	1.126	1.146	mA
30MHZ	1.679	1.715	mA