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PRODUCT/PROCESS CHANGE NOTICE (PCN)

PCN Number: **04-14**
Date Issued: **September 21, 2004**
Product(s) Affected: **PI3B3257 (all packages)**
Manufacturing Location Affected: **N/A**
Date Effective: **December 21, 2004 – 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 the same 0.35- μ m 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 PI3B3257 product itself.

- 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: April 17, 2004

Subject: PI3B3257 Characterization Report

Introduction

The PI3B3257 is a Quad 2:1 Mux/Demux Bus 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 the same wafer fab and process. The new die array has been optimized by removal of circuitry used for other device types. This allowed a die size reduction with no circuitry of the PI3B3257 being changed.

Reference

New Die Array:

Array name: T24B3
Date Code: 0410
Package: QSOP (Q16)

Old Die Array:

Array name: LVBS24
Date Code: 0410
Package: QSOP (Q16)

Equipment

Agilent power supply & DMM
HP4145B DC Analyzer
BK815 Capacitance Meter
TDS694C Oscilloscope
HP8082A Pulse Generator
Thermostream TP041000-A

Tables

Table 1: DC Characteristics
Table 2: Ron Measurements, all paths, 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 is somewhat faster than the old array.
3. New array consumes less current.

Table 1: DC Characteristics

| Param. | Test Conditions | Vcc | T24B3 | | | LVBS24 | | | Spec | | |
|-------------|-----------------------|------|--------|---------|---------|--------|---------|---------|------|------|-------|
| | | | -10°C | 25°C | 90°C | -10°C | 25°C | 90°C | Min | Max | Units |
| VIH | Input High Volt. | 3.0V | 1.310 | 1.315 | 1.325 | 1.335 | 1.340 | 1.355 | 2.0 | | V |
| VIH | Input High Volt. | 3.3V | 1.460 | 1.455 | 1.460 | 1.475 | 1.480 | 1.490 | 2.0 | | V |
| VIH | Input High Volt. | 3.6V | 1.620 | 1.605 | 1.600 | 1.610 | 1.615 | 1.630 | 2.0 | | V |
| VIL | Input Low Volt. | 3.0V | 1.305 | 1.310 | 1.320 | 1.330 | 1.335 | 1.350 | | 0.8 | V |
| VIL | Input Low Volt. | 3.3V | 1.455 | 1.450 | 1.455 | 1.470 | 1.475 | 1.485 | | 0.8 | V |
| VIL | Input Low Volt. | 3.6V | 1.615 | 1.600 | 1.595 | 1.605 | 1.610 | 1.625 | | 0.8 | V |
| IIL | Vin=0V | 3.6V | -179 p | 559 p | 83.5 p | 895 p | 238 p | -1.08 n | | ± 1u | A |
| IIH | Vin=3.6V | 3.6V | 508 p | 781 p | 2.35 n | -964 p | -1.07 n | 2.95 n | | ± 1u | A |
| IOZL | Vout=0V | 3.6V | -705 p | -1.04 n | -6.21 n | 201 p | -1.01 n | -2.54 n | | ± 1u | A |
| IOZH | Vout=3.6V | 3.6V | 974 p | -747 p | 8.41 n | 877 p | -682 p | 6.54 n | | ± 1u | A |
| VIK | Iin=-18mA, /E | 3.0V | -0.80 | -0.75 | -0.67 | -0.85 | -0.83 | -0.78 | | -1.2 | V |
| VIK | Iin=-18mA, In | 3.0V | -0.89 | -0.85 | -0.78 | -0.75 | -0.73 | -0.69 | | -1.2 | V |
| ICCL | Vin=0V | 3.6V | 3.77 n | 4.59 n | 193 n | 5.15 n | 3.59 n | 49.9 n | | 3.0 | uA |
| ICCH | Vin=3.6V | 3.6V | -200 p | 11.0 n | 266 n | 4.17 n | -5.81 n | 48.3 n | | 3.0 | uA |
| ΔICC | Vin=3.0V | 3.6V | 8.03 u | 20.5 u | 46.4 u | 1.98 u | 5.70 u | 20.8 u | | 750 | uA |
| Ron | Ion = 48/64mA, Vin=0V | 3.0V | 4.59 | 4.79 | 5.20 | 5.67 | 6.05 | 6.46 | | 8 | Ω |
| Ron | Ion = 15mA, Vin=2.4V | 3.0V | 7.85 | 8.36 | 9.09 | 10.7 | 11.1 | 12.2 | | 17 | Ω |

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

| Channel | T24B3 | | | LVBS24 | | | Units |
|---------|--------------------|--------------------|----------------------|--------------------|--------------------|----------------------|-------|
| | Ion=64mA Vin=0V | Ion=48mA Vin=0V | Ion=15mA Vin=2.4V | Ion=64mA Vin=0V | Ion=48mA Vin=0V | Ion=15mA Vin=2.4V | |
| IA0-YA | 4.92 | 4.89 | 9.52 | 5.96 | 5.57 | 11.0 | Ω |
| IA1-YA | 4.55 | 4.50 | 9.42 | 5.10 | 5.04 | 10.7 | Ω |
| IB0-YB | 4.81 | 4.74 | 8.41 | 6.05 | 6.24 | 11.3 | Ω |
| IB1-YB | 4.38 | 4.32 | 8.31 | 5.60 | 5.52 | 11.0 | Ω |
| IC0-YC | 4.87 | 4.84 | 8.35 | 5.78 | 5.75 | 11.1 | Ω |
| IC1-YC | 4.47 | 4.41 | 8.19 | 5.26 | 5.17 | 11.0 | Ω |
| ID0-YD | 4.81 | 4.74 | 8.37 | 5.74 | 5.63 | 11.0 | Ω |
| ID1-YD | 4.34 | 4.28 | 8.13 | 5.04 | 4.99 | 10.5 | Ω |

Table 3: Capacitance at 25C

| Symbol | Description | Vcc | T24B3 | LVBS24 | Typ | Units |
|-------------|--------------------|-------|-------|--------|------|-------|
| Cin | Enable Input | 3.3 V | 1.3 | 2.3 | 3.0 | pF |
| Cin | Select Input | 3.3 V | 1.9 | 2.8 | 3.0 | pF |
| Coff | Yn Cap, Switch Off | 3.3 V | 6.9 | 14.5 | 17.0 | pF |
| Coff | In Cap, Switch Off | 3.3V | 3.7 | 8.4 | 8.5 | pF |
| Con | I-Y, Switch On | 3.3 V | 11.1 | 24.3 | 25.0 | pF |

BK815 Capacitance Meter

Table 4: AC Characteristics, Vcc=3.0V

| Symbol | Vcc | Load | T24B3 | | | LVBS24 | | | Max Spec | Units |
|--------|------|--------|-------|------|------|--------|------|------|----------|-------|
| | | | -10°C | 25°C | 90°C | -10°C | 25°C | 90°C | | |
| tsLH* | 3.0V | Load A | 2.16 | 2.22 | 2.40 | 2.36 | 2.40 | 2.60 | 4.5 | ns |
| tsHL* | 3.0V | Load A | 2.70 | 2.78 | 2.90 | 2.86 | 2.90 | 3.04 | 4.5 | ns |
| tpZH | 3.0V | Load B | 2.66 | 2.70 | 2.74 | 2.76 | 2.76 | 2.84 | 4.5 | ns |
| tpHZ | 3.0V | Load B | 2.92 | 2.92 | 3.00 | 2.82 | 3.04 | 3.18 | 4.5 | ns |
| tpZL | 3.0V | Load C | 2.28 | 2.48 | 2.54 | 2.58 | 2.60 | 2.66 | 4.8 | ns |
| tpLZ | 3.0V | Load C | 2.48 | 2.52 | 2.74 | 2.40 | 2.52 | 2.94 | 4.8 | ns |

*Bus Select Time

Load A: 47pF//510Ω

Load B: 47pF//510Ω//510Ω

Load C: 47pF//510Ω, 510Ω to 2Vcc

Table5: Dynamic Icc, Vcc=3.6V

| Frequency | T24B3 | LVBS24 | Units |
|-----------|-------|--------|-------|
| 0 MHz | 0.003 | 0.199 | mA |
| 1 MHz | 0.078 | 0.272 | mA |
| 5 MHz | 0.343 | 0.516 | mA |
| 10 MHz | 0.679 | 0.869 | mA |
| 20 MHz | 1.380 | 1.606 | mA |