Migrating to the Tsi352™ PCI-to-PCI Bridge

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1. Migrating to the Tsi352 PCI-to-PCI Bridge

This application note explains the differences between the Tsi352 and specific PCI-to-PCI bridges. It is intended to help users migrate designs to the Tsi352 by highlighting any differences between the devices.

This document discusses the requirements when migrating to the Tsi352 from the following devices:

- "Pericom PI7C8152A"
- "Texas Instruments PCI2250"
- "Intel 21152A"
- "PLX PCI6152"

1.1 Overview

The Tsi352 can be used to easily migrate from many existing PCI-to-PCI Bridge designs. The following sections describe design differences or design requirements when migrating from the Pericom, Texas Instruments, Intel, or PLX PCI-to-PCI bridges to the Tundra Tsi352.

1.2 Pericom PI7C8152A

Migrating designs from the Pericom P17C8152A to the Tsi352 requires no changes to the existing design. The following sections outline any differences between the two devices, but there is no design impact.

The information on the Pericom P17C8152A was sourced from the *PI7C8152A & PI7C8152B 2-Port PCI-to-PCI Bridge (Revision 1.11)* data sheet.

1.2.1 Pin Differences

The following table shows the signal differences between the Tsi352 and the P17C8152A.

Table 1: Signal Differences

Pin Number	Tsi352	P17C8152A
5	S_MFUNC	S_LOCK_L
62	SCAN_EN/HS_LED_OUT	SCAN_EN
102	P_MFUNC	P_LOCK_L

Table 1: Signal Differences *(Continued)*

Pin Number	Tsi352	P17C8152A
120	MS0	VDD
159	MS1/BPCC	BPCCE

1.2.2 Design Implications

The Tsi352 functions the same as the PI7C8152 even with some slight pin differences because of the following:

- When Tsi352 is installed on a board designed for PI7C8152, the MS0 pin is tied to VDD. This forces Tsi352 in a mode where S_MFUNC functions as S_LOCK_L and P_MFUNC functions as P_LOCK_L. When MS0 is high, the MS1/BPCC pin functions as BPCCE.
- The Tsi352 SCAN_EN/HS_LED_OUT pin is an active output driven low. PI7C8152's SCAN_EN is also an output (driven low).

1.2.3 DC Specification Differences

There are no DC differences between the two devices.

1.2.4 AC Specification Differences

There are no AC differences between the two devices.

1.2.5 Package Differences

There are no package differences between the two devices.

1.3 Texas Instruments PCI2250

Migrating designs from the Texas Instruments PCI2250 to the Tsi352 requires no changes to the existing design. The following sections outline any differences between the two devices, but there is no design impact.

The information on the Texas Instruments PCI2250 was sourced from the *PCI2250 PCI-to-PCI Bridge Data Manual (1999).*

1.3.1 Pin Differences

The following table shows the signal differences between the Tsi352 and the PCI2250.

Table 2: Signal Differences

Pin Number	Tsi352	PCI2250
62	SCAN_EN/HS_LED_OUT	NO/HSLED
63	SCAN_TM_b	GOZ

1.3.2 Design Implications

The Tsi352 functions the same as the PCI2250 even with some slight pin differences because of the following:

- When Tsi352 is installed on a board designed for PCI2250, SCAN_EN/HS_LED_OUT performs the same function as the PCI2250's HSLED and uses the same polarity.
- SCAN_TM_b and GOZ have the same function and the same polarity.

1.3.3 DC Specification Differences

The following table shows the DC differences between the Tsi352 and the PCI2250.

Table 3: DC Specification Differences

Parameter	Tsi352	PCI2250
Max power 3.3V at 33 MHz	1.0 W	0.86 W[a]
Maximum VCCP	5.5 V	5.25 V
Minimum PCI Vih at VCCP=5V	1.65 V	2.0 V
Maximum PCI Vil at VCCP=5V	1.0 V	0.8 V
Minimum TTL Vih	2.0 V	2.25 V
Maximum TTL Vil	1.0 V	0.75 V

a. Power measured in identical conditions for Tsi352 and PCI2250.

1.3.4 AC Specification Differences

The following table shows the AC differences between the Tsi352 and the PCI2250.

Table 4: AC Specification Differences

Parameter	Tsi352	PCI2250
Minimum PCLK period	15 ns	30 ns

1.3.5 Package Differences

The following table shows the package differences between the Tsi352 and the PCI2250.

Table 5: Package Differences

Parameter	Tsi352	PCI2250
Ambient temperature range	0–85	0–70

1.4 Intel 21152A

Migrating designs from the Intel 21152A to the Tsi352 requires no changes to the existing design. The following sections outline any differences to the two devices, but there is no design impact.

The information on the Intel 21152A was sourced from the *21152 PCI-to-PCI Bridge Datasheet, rev002*.

1.4.1 Pin Differences

The following table shows the signal differences between the Tsi352 and the 21152A.

Table 6: Signal Differences

Pin Number	Tsi352	21152A
5	S_MFUNC	S_LOCK_L
62	SCAN_EN/HS_LED_OUT	NAND_OUT
63	SCAN_TM_b	GOZ_L
102	P_MFUNC	P_LOCK_L
120	MS0	VDD
159	MS1/BPCC	BPCC

1.4.2 Design Implications

The Tsi352 functions the same as the 21152A even with some slight pin differences because of the following:

- When Tsi352 is installed on a board designed for 21152A, the MS0 pin gets tied to VDD. This forces Tsi352 into a mode where S_MFUNC functions as S_LOCK_L and P_MFUNC functions as P_LOCK_L. When MS0 is high, the MS1/BPCC pin functions as BPCC.
- SCAN_TM_b performs the same function as the 21152A's GOZ_L and uses the same polarity. SCAN_EN/HS_LED_OUT and NAND_OUT are both outputs when SCAN_TM_b is de-asserted.

1.4.3 DC Specification Differences

The following table shows the DC differences between the Tsi352 and the 21152A.

Table 7: DC Specification Differences

Parameter	Tsi352	21152A
Max power 3.3V at 33 MHz	1.0 W	0.93 W[a]

a. Power measured in identical conditions for Tsi352 and 21152A.

1.4.4 AC Specification Differences

The following table shows the AC differences between the Tsi352 and the 21152A.

Table 8: AC Specification Differences

Parameter	Tsi352	21152A
Minimum PCLK period	15 ns	30 ns

1.4.5 Package Differences

The following table shows the package differences between the Tsi352 and the 21152A.

Table 9: Package Differences

Parameter	Tsi352	21152A
Ambient temperature range	0–85	0–70
Maximum package overall height	4.1 mm	4.5 mm

1.4.6 Design Implications

The change in package size might impact the assembly flow for the existing design.

1.5 PLX PCI6152

Migrating designs from the PLX PCI6152 to the Tsi352 requires a slight design change because of a pin difference (see “Design Implications” on page 9).

The following sections outline any differences to the two devices.

The information on the PLX PCI6152 was sourced from the *PCI 6152 (HB1-SE) PCI-to-PCI Bridge Data Book (Version 2.0)*.

1.5.1 Pin Differences

The following table shows the signal differences between the Tsi352 and the PCI6152.

Table 10: Signal Differences

Pin Number	Tsi352	PCI6152
5	S_MFUNC	NC
49	S_CFN_b	NC
62	SCAN_EN/HS_LED_OUT	NAND_OUT
63	SCAN_TM_b	GOZ_L
102	P_MFUNC	NC
120	MS0	VDD
125	VDD	NC
159	MS1/BPCC	BPCC_EN

1.5.2 Design Implications

There are some pin differences between the two devices, but only the S_CFN_b difference will cause a board modification (see “S_CFN_b”).

S_CFN_b

When Tsi352 is installed on a board designed for the PCI6152, S_CFN_b is likely to be floating. Since it is an input used to enable the internal PCI arbiter on Tsi352, in a Tsi352 design the signal must be tied low.

MS0 Signal

The MS0 pin is tied to VDD in a PCI6152 design. This forces the Tsi352 in a mode where S_MFUNC becomes an output (S_LOCK_L) and P_MFUNC becomes an output (P_LOCK_L). Because MS0 is high, MS1/BPCC functions as the PCI6152’s BPCC_EN.

These outputs should not be connected on the PLX design because those PCI6152 defines those pins as no connects.

SCAN_TM

SCAN_TM_b performs the same function as PCI21152’s GOZ_L and uses the same polarity. SCAN_EN/HS_LED_OUT and NAND_OUT are both outputs when SCAN_TM_b is de-asserted.

VDD

It is acceptable to leave Tsi352’s VDD pin (pin 125) floating on a PLX PCI6152 design.

1.5.3 DC Specification Differences

The following table shows the DC differences between the Tsi352 and the PCI6152.

Table 11: DC Specification Differences

Parameter	Tsi352	PCI6152
Max power 3.3V at 33 MHz	1.0 W	0.75 W[a]
Minimum Voh at 5V signaling	2.4 V	2.7 V

a. Power measured in identical conditions for Tsi352 and PCI6152.

1.5.4 AC Specification Differences

There are no AC differences between the two devices.

1.5.5 Package Differences

The following table shows the package differences between the Tsi352 and the PCI6152.

Table 12: Package Differences

Parameter	Tsi352	PCI6152
Ambient temperature range	0–85	0–70
Maximum Package overall height	4.1 mm	4.45 mm
Minimum Package standoff height	0.25 mm	0.35 mm
Maximum Package thickness	3.6 mm	3.8 mm
Package overall width and length	31.20 mm	32.0mm

1.5.5.1 Design Implications

The change in package size might impact the assembly flow for the existing design.

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