Features

The DNPCIEXT-S3/5 64-bit, 66MHz Active PCI Extender, includes the following features:

- Active PCI Extender PWB with three 32/64-bit slots
- PCI frequencies up to 66 MHz
- Universal 64-bit PCI connector on Primary supports any of the following PCI bus configurations:
  +3.3V, 32/64-bit
  +5V, 32/64-bit
- Fully compliant to the PCI Local Bus Specification Revision 2.1 and later
- Intel 21154BC PCI-to-PCI Bridge
- +3.3V Regulator provides up to 10A local power to secondary PCI slots. (+3.3V is not needed on backplane!)
- LEDs provide quick system status:
  +3.3V, +5V, +12V, -12V, VAUX, RST*, 66MHz (primary), 66MHz (secondary), Primary PCI I/O Voltage +3.3V/+5V, Secondary PCI I/O Voltage +3.3V/+5V, PCI bus activity (5 LEDs)

![Diagram of primary and secondary PCI connections](image)

Figure 1. Location of Key Controls and Indicators
• Up to 5 amps of +3.3V may be driven onto the backplane with a resettable fuse for overload protection.
• Clearly labeled test posts for all PCI signals

Description

General

The DNPCIEXT-S3/5 is an extender card designed to aid in the debug and test of PCI-based circuit boards. This is an active extender card—meaning that an Intel 21154 PCI to PCI Bridge is used to isolate the Primary PCI bus from the three secondary PCI bus slots.

Since primary and secondary busses are electrically isolated, a much cleaner electrical signaling environment exists, and a single host slot can contain up to three plug-in PCI cards.

The primary PCI frequency can range from 0 to 66.66MHz. The secondary PCI frequency is automatically set to the primary bus frequency or one-half the primary bus frequency by observing the M66EN pin (B49) on the cards plugged into the secondary slots.

DIP switches are provided to force the primary or secondary busses to 33MHz.

PCI I/O Voltage Conversion

The universal fingers on the primary bus of the DNPCIEXT can be plugged into either the +5V or +3.3V I/O PCI bus slots with a width of 32 or 64-bits.

All forms of I/O voltage translation issues between +5V/ +3.3V I/O motherboards and +5.0V/3.3V plug-in boards can be solved with the DNPCIEXT-S3/5, but mechanical constraints on the PCI connectors limit the secondary bus slots to have either +5V I/O or +3.3V I/O only.

Two different mechanical versions of the DNPCIEXT-S3/ 5 are necessary to handle all possible PCI I/O voltage conversion issues. Table 1 describes which stuffing option is required for the various possibilities.

<table>
<thead>
<tr>
<th>Primary I/O Voltage</th>
<th>Secondary I/O Voltage</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>+5V</td>
<td>+5V</td>
<td>DNPCIEXT-S5</td>
</tr>
<tr>
<td>+5V</td>
<td>+3.3V</td>
<td>DNPCIEXT-S3</td>
</tr>
<tr>
<td>+3.3V</td>
<td>+5V</td>
<td>DNPCIEXT-S5</td>
</tr>
<tr>
<td>+3.3V</td>
<td>+3.3V</td>
<td>DNPCIEXT-S3</td>
</tr>
</tbody>
</table>

+3.3V Power

Since many host backplanes do not have +3.3V power, the DNPCIEXT-S3/5 provides two 5-amp regulators for the three secondary PCI slots, eliminating the need for the host system to provide this supply rail.

The regulators derive +3.3V from the +5V provided from the PCI backplane. A total of 10 amps of +3.3V can be driven to the secondary slots, 5A of which can be driven back onto the backplane via an optional jumper.

Observability - Headers and LEDs

Clearly labeled test headers are provided for all secondary PCI signals. The headers are 0.25” square and are on 0.1” centers. All headers are located on the component side of the board, and the PCI signal headers are at the top near the straddle mount connector for SLOT2. The placement and location of the headers eliminates the need to access the bottom of the PWB as some PCI extenders require.

Nineteen LEDs allow for a quick determination of system and board status. The LEDs for the following power supplies should always be lit:

- +12V
- -12V
- +5V
- +3.3V (secondary power)

An LED is provided to indicate if +3.3V power exists on the primary PCI connector. This signal is called +3.3VP on the schematic.

If VAUX is present on the DNPCIEXT-S3/5, then the corresponding VAUX LED will be lit. VAUX is unusual and
occasionally very dangerous. There are cases of systems that provide VAUX regardless of whether or not the system is on or off. There have been cases of PCI plug-in cards being smoked by removing them with VAUX still applied. VAUX may be disconnected from the secondary PCI slots by removing a jumper, thus eliminating the possibility of damaging the plug-in cards by this stray power.

In any event, a card should not be removed from the DNPCIEXT-S3/5 until all LEDs are deactivated.

Likewise, the DNPCIEXT-S3/5 should not be removed from the host connector until all the LEDs have deactivated.

Illustrations

Figure 2 shows the general construction layout of the DNPCIEXT-S3/5 board. Figures 3 through 6 show details of the board.
Figure 2. General Board Layout for DNPCIEXT-S3/5 Active PCI Extender
Figure 3. DNPCIEXT-S3 Board - Side View 1, Front

Figure 4. DNPCIEXT-S3 Board - Side View, Rear
Figure 5. DNPCIEXT-S3 Board - Side View 2, Front

Figure 6. DNPCIEXT-S3 Board - Side View 3, Front
Ordering Information
Should any additional DNPCIEXT boards or kits be needed, refer to Table 2 for the board description, part number, and price.

Table 2: Available DNPCIEXT Boards and Kit

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>66MHz, 64-bit Active PCI Extender Card +5V I/O on secondary PCI bus</td>
<td>DNPCIEXT-S5</td>
<td>$595.00</td>
</tr>
<tr>
<td>66MHz, 64-bit Active PCI Extender Card +3.3V I/O on secondary PCI bus</td>
<td>DNPCIEXT-S3</td>
<td>$595.00</td>
</tr>
<tr>
<td>Both DNPCIEXT-S3 and DNPCIEXT-S5 ordered simultaneously</td>
<td>DNPCIEXT-DUAL KIT</td>
<td>$1150.00</td>
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</tbody>
</table>

For technical applications and sales support, call (858)454-3419

1010 Pearl Street, Suite #6
La Jolla, CA 92037-5165

phone: (858)454-3419
fax: (858)454-1728
email: sales@dinigroup.com
web: http://www.dinigroup.com

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