Product Overview

Mini-Circuits’ ZT-24X8B is a high performance, 24 by 8 blocking switch matrix, covering the key worldwide telecoms bands from 600 MHz to 6GHz. The system is housed in a compact, 5U height, 19-inch rack-mountable chassis with 8 RF “A” ports on the front panel and 24 RF “B” ports on the rear, all SMA female.

This bi-directional, blocking configuration allows the 8 “A” ports to be connected to any combination of the 24 “B” ports in a one to one arrangement. Multiple ZT-24X8B matrices can be combined to construct complex, high volume test environments.

The system includes both USB and Ethernet control interfaces, providing a range of flexible control options. Software support is provided through our easy-to-use GUI application for remote control over a network, or local control through USB. ActiveX and .NET API objects (for Windows environments) and HTTP / Telnet support ensure compatibility with most common programming environments.
Functional Block Diagram
Mechanical Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typical</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>19” (W) x 5U (H) x 20” (D)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case Material</td>
<td>Aluminum (with protective coatings to prevent corrosion)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feet</td>
<td>3/4” x 3/4” Square Slides</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RF Connectors</td>
<td>SMA female</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front Panel Marking</td>
<td>Line 1: Mini-Circuits part number</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Line 2: 24 x 8 Switch Matrix (600-6000 MHz)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front panel</td>
<td>a) 8 x RF “inputs” (SMA female)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) ON/OFF switch with indicator light</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Carry handles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rear panel</td>
<td>a) 24 x RF “outputs” (SMA female)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) AC mains power supply input</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) USB &amp; RJ45 control connections</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) SPI In / SPI Out daisy-chain control connections</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>e) Label with date code/serial number/MCL part# for traceability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Interface</td>
<td>USB and Ethernet TCP/IP supporting HTTP and TELNET protocols</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>a) AC mains power supply (90-260 V, 47-63 Hz)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) 2A, 250V fuse rating</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temp</td>
<td>0° to +50° C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Electrical Specifications at 25°C

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typical</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>600 – 1200 MHz</td>
<td>7.0</td>
<td>8.0</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td></td>
<td>1200 – 2700 MHz</td>
<td>8.0</td>
<td>9.0</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td></td>
<td>2700 – 6000 MHz</td>
<td>11.0</td>
<td>12.5</td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Insertion Loss</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return Loss</td>
<td>12.0</td>
<td></td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Isolation</td>
<td>90.0</td>
<td></td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Input Power</td>
<td>Through Path</td>
<td></td>
<td>+27</td>
<td></td>
<td>dBm</td>
</tr>
<tr>
<td></td>
<td>Ex. A1 – B1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Into any Internal Termination.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ex. A1 to Internal Load of B1</td>
<td></td>
<td>+17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Typical Performance Data

Insertion Loss (A1 Paths)

- dB vs Frequency (MHz)

- A1 to B1
- A1 to B2
- A1 to B3
- A1 to B4
- A1 to B5
- A1 to B6
- A1 to B7
- A1 to B8
- A1 to B9
- A1 to B10
- A1 to B11
- A1 to B12

Insertion Loss (A1 Paths)

- dB vs Frequency (MHz)

- A1 to B13
- A1 to B14
- A1 to B15
- A1 to B16
- A1 to B17
- A1 to B18
- A1 to B19
- A1 to B20
- A1 to B21
- A1 to B22
- A1 to B23
- A1 to B24
Typical Performance Data

**Isolation**
(Between A Ports when Connected to Different B Ports)

![Graph showing isolation between A ports](image1)

**Isolation**
(Between B Ports when Connected to Different A Ports)

![Graph showing isolation between B ports](image2)
Typical Performance Data

Isolation
(Between B Ports when Connected to Same A Port)

Isolation
(From A to B Port when Path is Disconnected)
Typical Performance Data

Return Loss (A1 Paths)

Return Loss (A1 Paths)

Frequency (MHz)

Frequency (MHz)

dB

dB

A1 to B1
B1 to A1
B2 to A1
B3 to A1
B4 to A1
B5 to A1
B6 to A1
B7 to A1
B8 to A1
B9 to A1
B10 to A1
B11 to A1
B12 to A1
B13 to A1
B14 to A1
B15 to A1
B16 to A1
B17 to A1
B18 to A1
B19 to A1
B20 to A1
B21 to A1
B22 to A1
B23 to A1
B24 to A1
Software Specifications

Software & Documentation Download:

- Mini-Circuits’ full software and support package including user guide, Windows GUI, DLL files, programming manual and examples are available on request
- Please contact testsolutions@minicircuits.com for support

Minimum System Requirements:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>USB HID &amp; Ethernet (HTTP &amp; Telnet)</td>
</tr>
<tr>
<td>GUI</td>
<td>Windows 98 or later</td>
</tr>
<tr>
<td>USB API DLL</td>
<td>Windows 98 or later and programming environment with ActiveX or .NET support</td>
</tr>
<tr>
<td>USB Direct Programming</td>
<td>Linux; Windows 98 or later</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Windows, Linux or Mac computer with a network port and Ethernet TCP / IP support</td>
</tr>
<tr>
<td>Hardware</td>
<td>Pentium II or later with 256 MB RAM</td>
</tr>
</tbody>
</table>

Application Programming Interface (API)

Ethernet Support:

- Simple ASCII / SCPI command set for attenuator control
- Communication via HTTP or Telnet
- Supported by most common programming environments

USB Support (Windows):

- ActiveX COM DLL file for creation of 32-bit programs
- .NET library DLL file for creation of 32 / 64-bit programs
- Supported by most common programming environments (refer to application note AN-49-001 for summary of supported environments)

USB Support (Linux):

- Direct USB programming using a series of USB interrupt codes

Full programming instructions and examples available for a wide range of programming environments / languages.
Graphical User Interface (GUI) for Windows - Key Features

- Connect via USB or Ethernet
- Run GUI in "demo mode" to evaluate software without a hardware connection
- View and set all switch paths with simple button clicks
- Graphically view the active switch paths
- Configure Ethernet settings
- Upgrade firmware
- Send SCPI commands for custom control