

USB & Ethernet Controlled  
**24x48 Blocking Switch Matrix**

**ZT-24X48B**

50Ω 600-6000 MHz





## Typical Applications

- Cellular base-station certification
- Cellular handset qualification
- Production testing of multi-port devices
- Testing of multi-channel MIMO systems

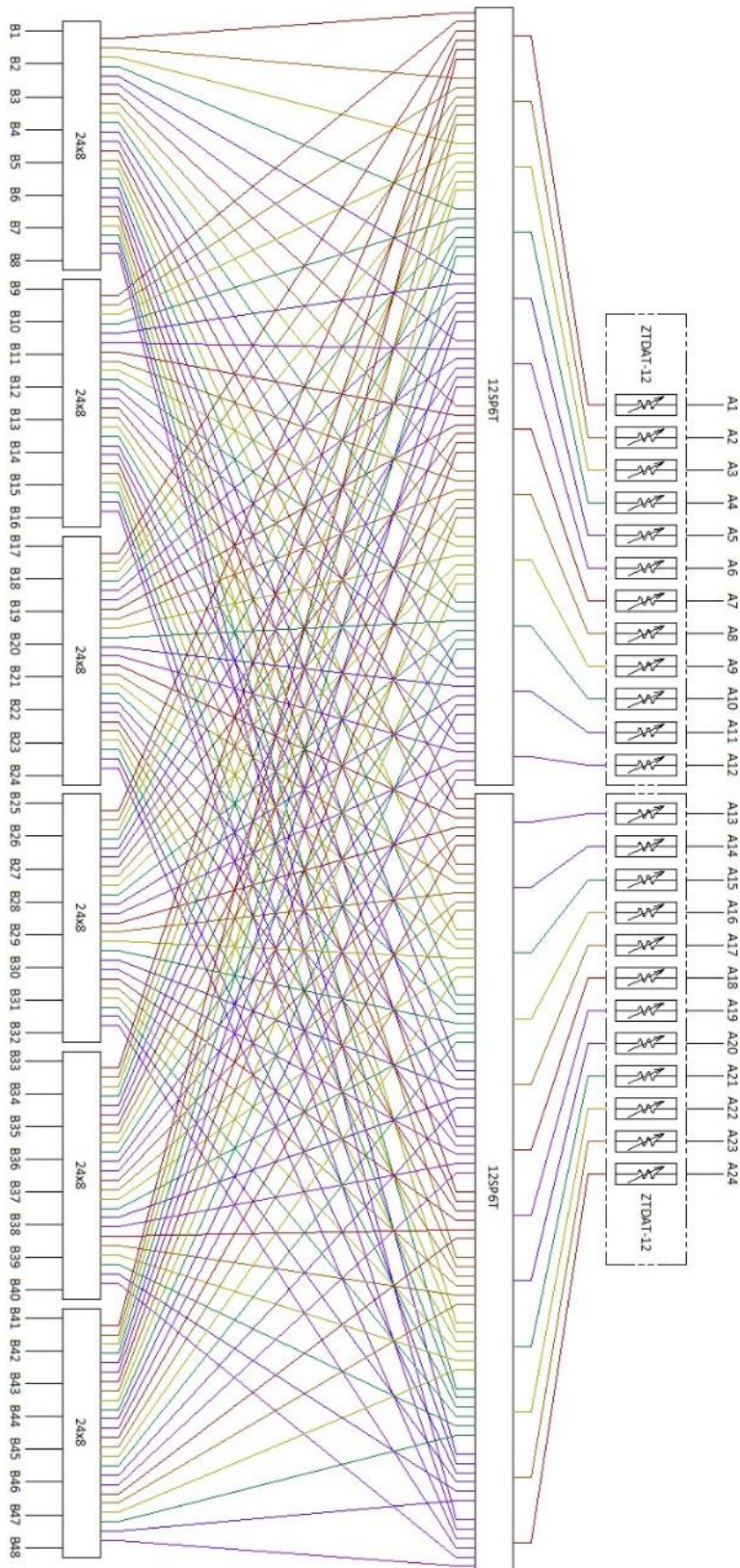
## Product Overview

Mini-Circuits' ZT-24X48B is a high performance, 24 by 48 blocking switch matrix, covering the key worldwide telecoms bands from 600 MHz to 6GHz. The system has been developed in a modular format for ease of deployment and expandability, and can be quickly installed on site by Mini-Circuits' expert engineers in the supplied 42U rack cabinet. All RF connections (SMA) are accessible from the front of the cabinet, with all system interconnections hidden from view at the rear.

This bi-directional switch matrix can be programmed to connect any of the 24 "A" ports to any combination of the 48 "B" ports, in a blocking configuration. In addition, programmable attenuators can be optionally included on the 24 "A" ports, allowing the signal loss to be independently varied by path, from 0 to 95 dB, in 0.25 dB steps. These combined features make the matrix ideally suited to a wide range of multi-user and multi-device test systems, particularly in the cellular base-station test market where multiple base-stations, access points and user equipment can be routed and re-routed between each other, with additional simulation of transmission loss.

The complete system is controlled via a single USB or Ethernet (supporting both HTTP and Telnet network protocols). Full software support is provided, including our user-friendly GUI application for Windows and a full API with programming instructions for Windows and Linux environments.

**Functional Block Diagram**



## Included Modules

Model Name	Quantity	Rack Height	Description
ZT-12SP6T-12R	2	4U each	12 x SP6T Switch Rack
ZT-24X8B	6	5U each	24 x 8 Blocking Switch Matrix
ZTDAT-12-6G95S	2	1U each	12-Channel 95dB Attenuator Rack
ULC Series	144	N/A	RF Interconnect Cables

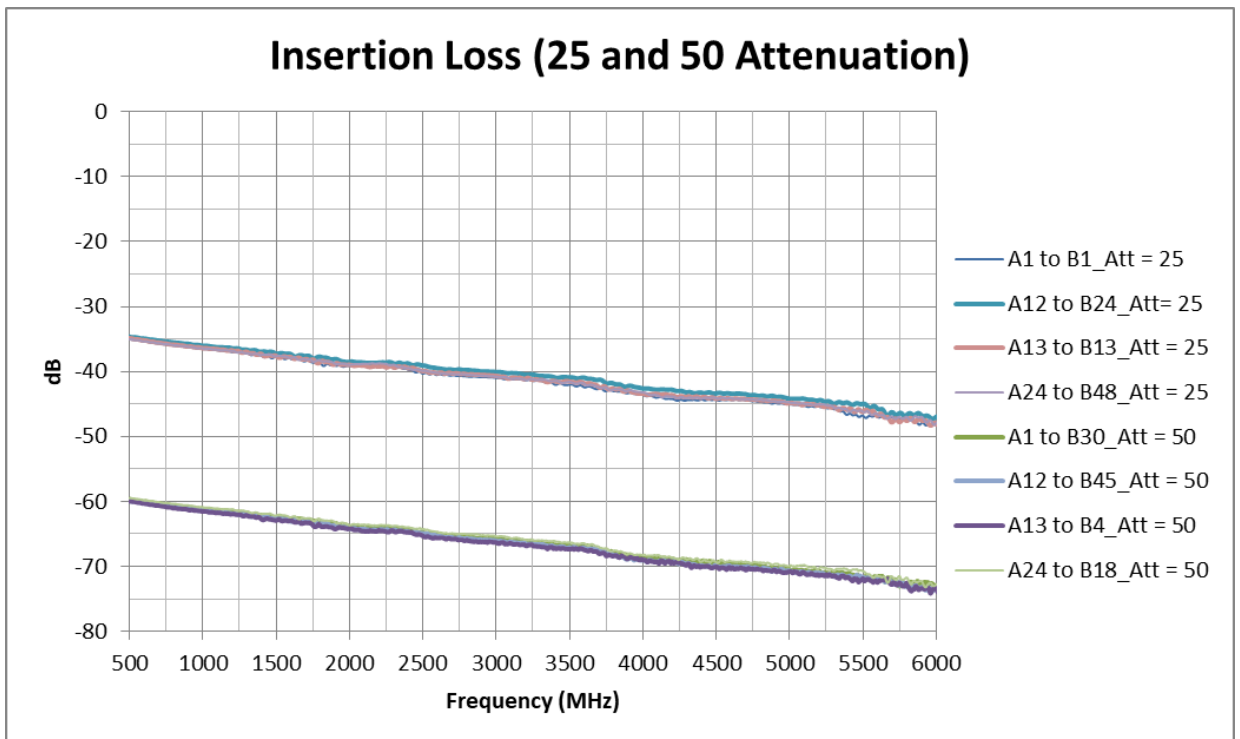
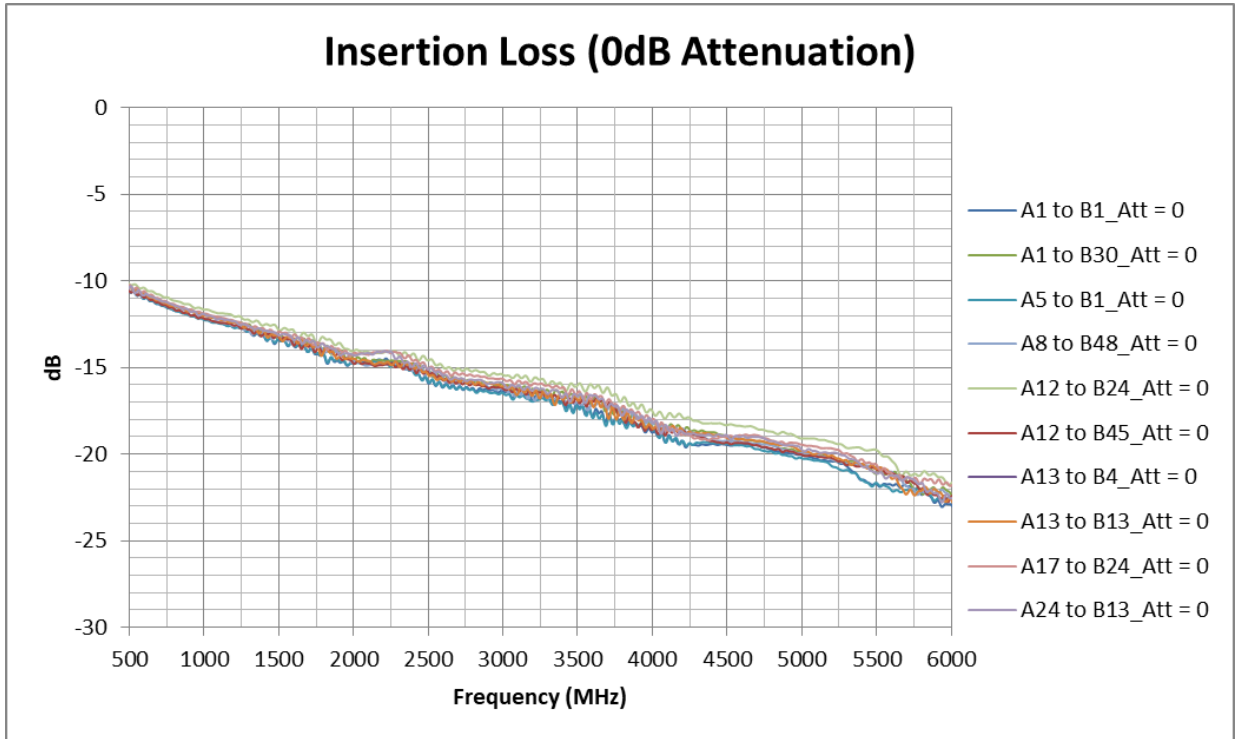
## System Mechanical Specifications

<b>Dimensions</b>	19" (W) x 42U (H) x 20" (D)
<b>System Drawing</b>	99-01-2572
<b>RF Connectors</b>	SMA female
<b>Power supply</b>	10 x AC mains power supply, 90-260 V, 47-63 Hz (to each module)
<b>Operating temp</b>	0° to +50° C

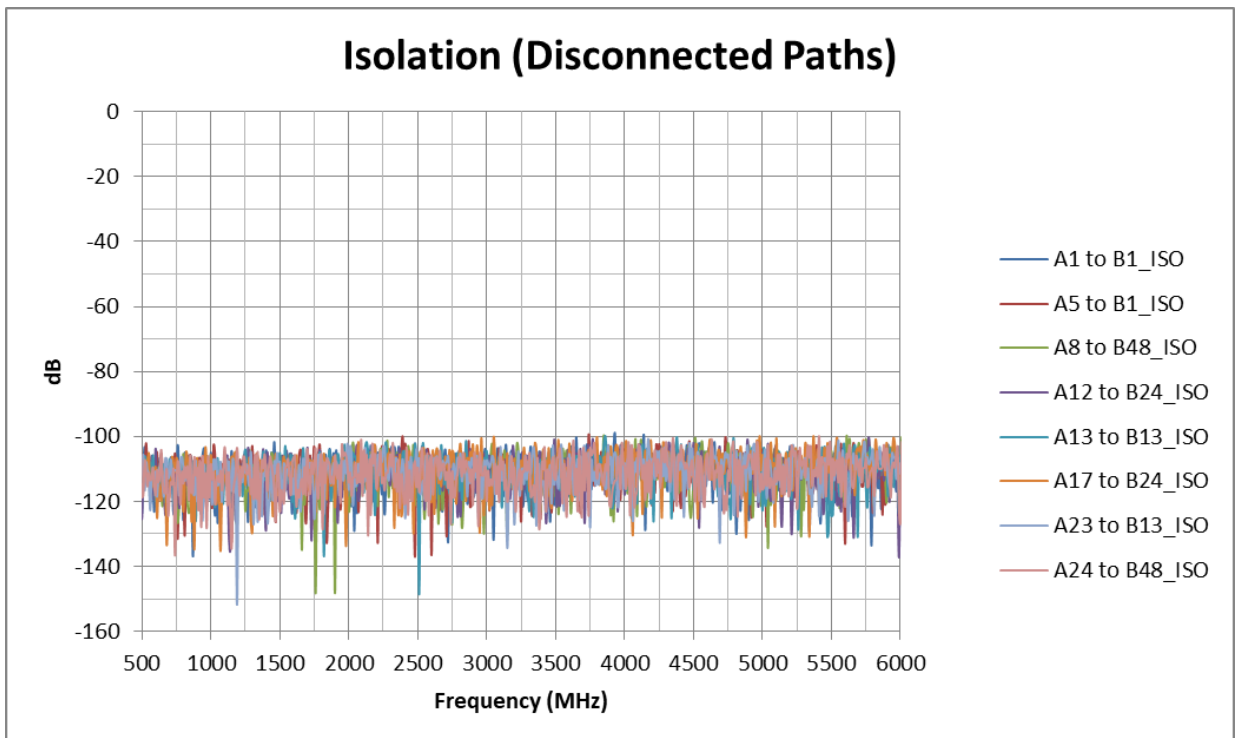
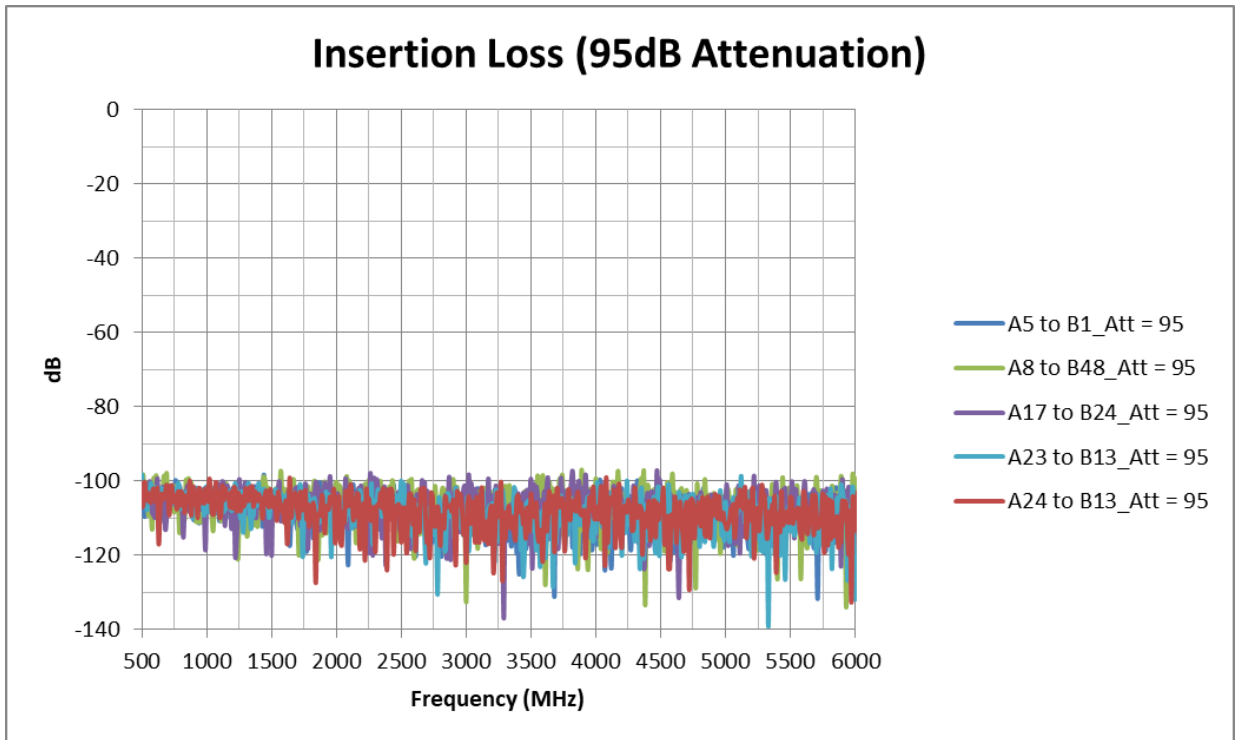
## Electrical Specifications at 25°C

Parameter	Value	Comments
<b>Frequency</b>	600-6000 MHz	
<b>Input Power</b>	+23 dBm max	Through path
	+17 dBm max	Into any internal termination
<b>Return Loss</b>	10 dB typ	
<b>Isolation</b>	80 dB typ	Between adjacent ports
	80 dB typ	"Input" to "output" in the "off" state
<b>Path Loss for 24 x 48 Switch Matrix Only</b>		
<b>Insertion Loss</b>	8.4 dB typ	@ 600 MHz
	12.1 dB typ	@ 2700 MHz
	17.1 dB typ	@ 6000 MHz
<b>Path Loss for Full System (24 x 48 Switch Matrix + Programmable Attenuator)</b>		
<b>Insertion Loss</b>	13.8 dB typ	@ 600 MHz
	20.3 dB typ	@ 2700 MHz
	26.7 dB typ	@ 6000 MHz

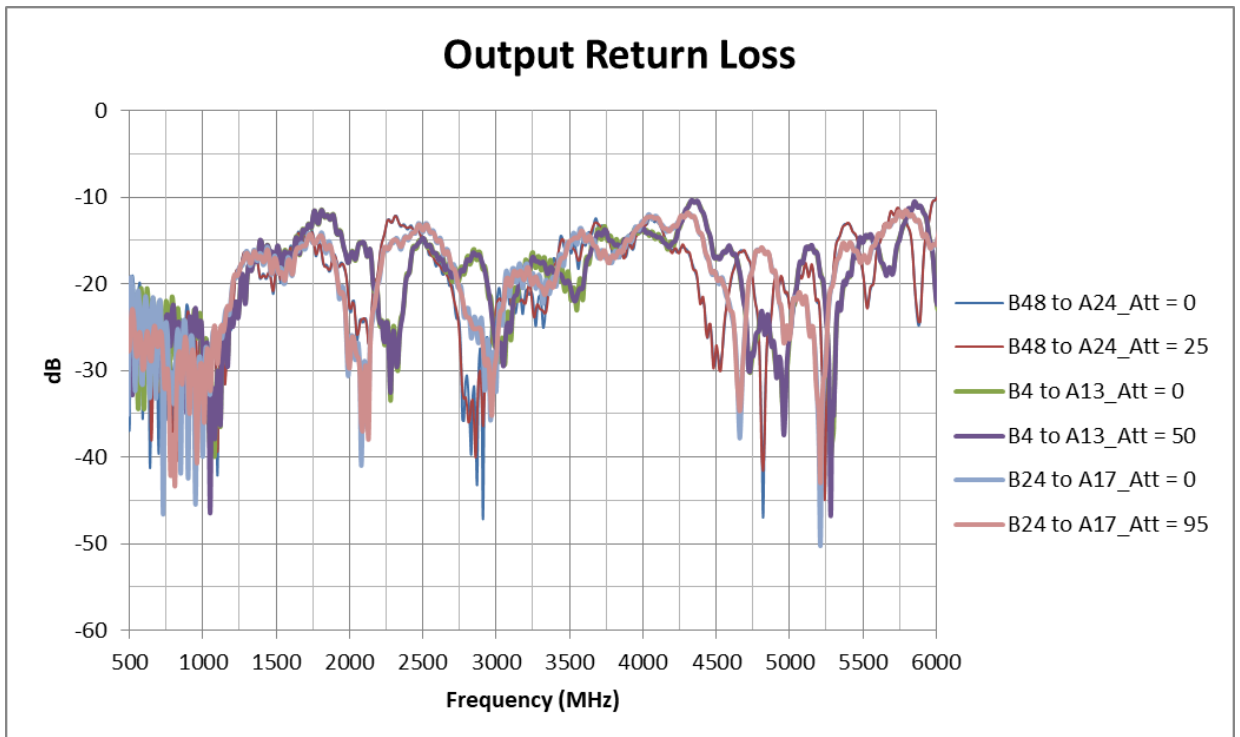
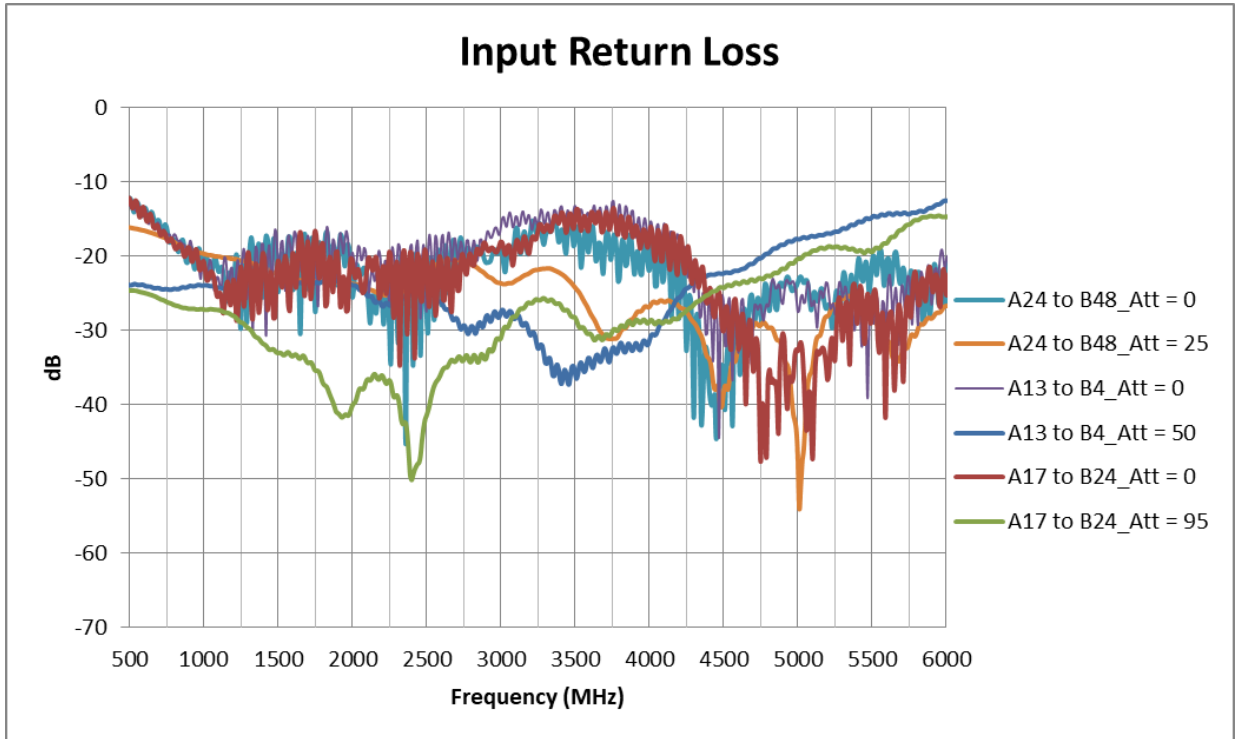
**Typical Performance Data**



**Typical Performance Data**



**Typical Performance Data**



## 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](mailto:testsolutions@minicircuits.com) for support

### Minimum System Requirements:

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

### 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
- Manually set or step the attenuation at any port or group of ports
- Graphically view the active switch paths
- Configure Ethernet settings
- Upgrade firmware
- Send SCPI commands for custom control

