

Product Overview

Mini-Circuits' ZTVX-12-12 is a flexible, 2 by 12 blocking switch matrix covering DC to 12 GHz with low insertion loss and high isolation. The compact 2U height, 19-inch rack-mountable chassis includes all RF connections (SMA) on the front panel. This system is ideal for expanding a standard 2 port VNA for multi-port or multi-device testing:

- Parallel testing of multiple 2 port devices such as filter or amplifier characterisation
- Production testing of splitter / combiner or switch components with high port counts
- Testing of MIMO systems with high channel counts

The system can be controlled via 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 (both 32-bit and 64-bit systems).

The full ZTVX series also includes options for both 50Ω and 75Ω testing over a range of frequency bands, with switch configurations from 2 x 8 up to 2 x 32.

Key Features

Feature	Advantages
High port counts	Bi-directional operation from 2 to 12 ports facilitates a wide range of switch applications
Compact package	The 2U height, rack-mountable chassis is easily located beneath a VNA or in a rack test environment.
Ethernet Control	Remote control from any computer or device with a network connection (HTTP or Telnet protocols).
USB HID (Human Interface Device)	Local control via USB connection with no driver installation required. Compatible with Windows® or Linux® operating systems using 32 and 64 bit architectures.
Full software support	The user friendly Windows GUI (graphical user interface automation) allows manual control straight out of the box. A full API (application programming interface), programming examples and manuals are provided to allow automation in most programming environments.

Please contact testsolutions@minicircuits.com for support

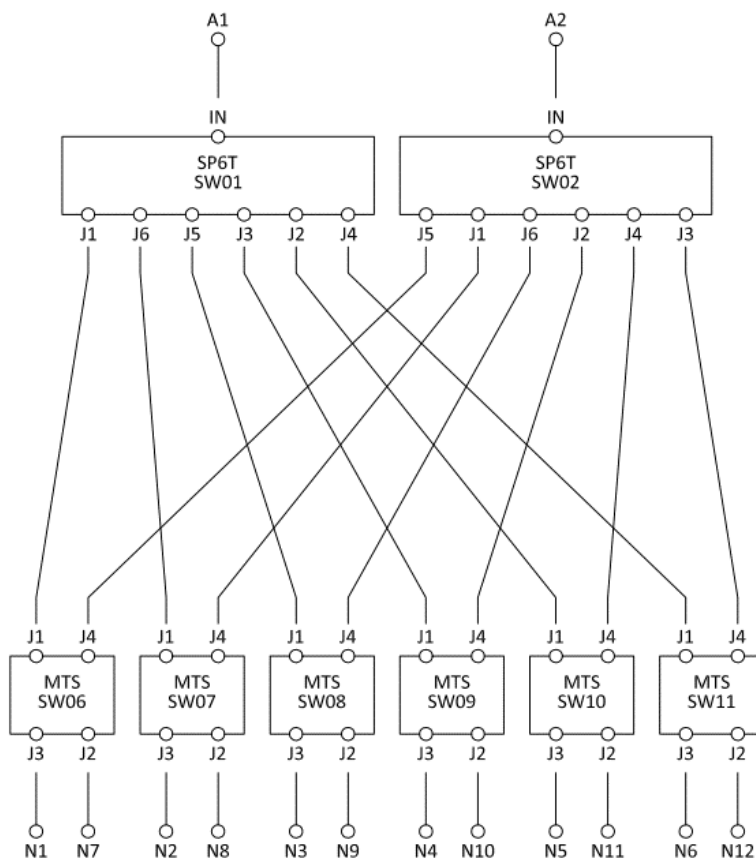
2 x 12 Blocking Switch Matrix

ZTVX-12-12-S

Mechanical Specifications

Dimensions	19" (W) x 2U (H) x 20" (D)			
Case Drawing	99-01-2961			
Case Material	<ul style="list-style-type: none"> • Aluminum (with protective coating to prevent corrosion) • Reinforced cover to support VNA mounted on top of switch matrix 			
RF Connectors	Panel	Connector	Quantity	Port Labels
	Front	SMA female	2 12	A1 – A2 N1 – N12
Panel Items	Front Panel		Rear Panel	
Panel Marking	<ul style="list-style-type: none"> • Model name • 2 x 12 Switch Matrix • DC - 12 GHz 		<ul style="list-style-type: none"> • CE • EAC • Serial number / date code / model name 	
Other Connectors			<ul style="list-style-type: none"> • AC mains power input (IEC C14 inlet) • USB type B socket • RJ45 (LAN) socket 	
Other	<ul style="list-style-type: none"> • Power on / off switch with LED • LED switch path indicators • Carry handles 		<ul style="list-style-type: none"> • Cooling fan 	
Power Supply	AC mains power input (90-260 V, 47-63 Hz)			
Fuse	2A, 250V rating			
Temperature	Operating: 0 to +50 °C			

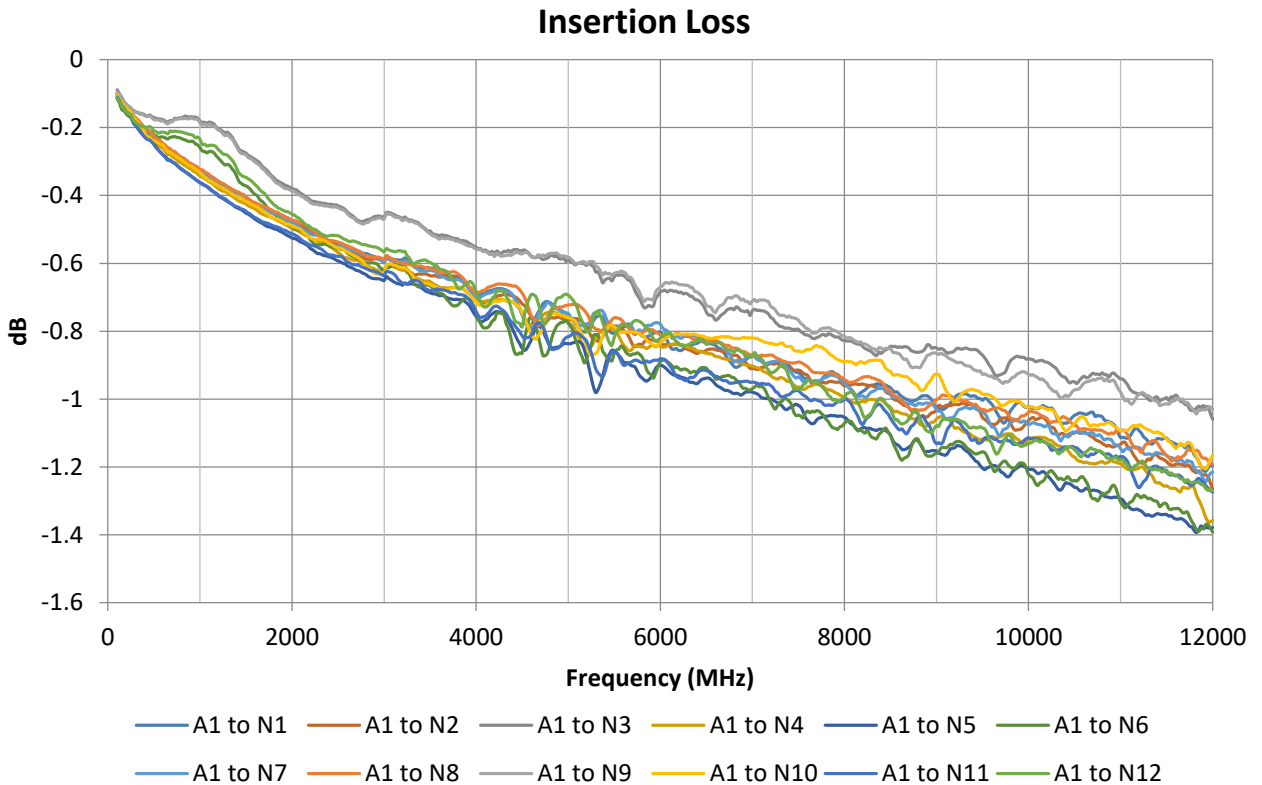
Block Diagram



Electrical Specifications at 25°C

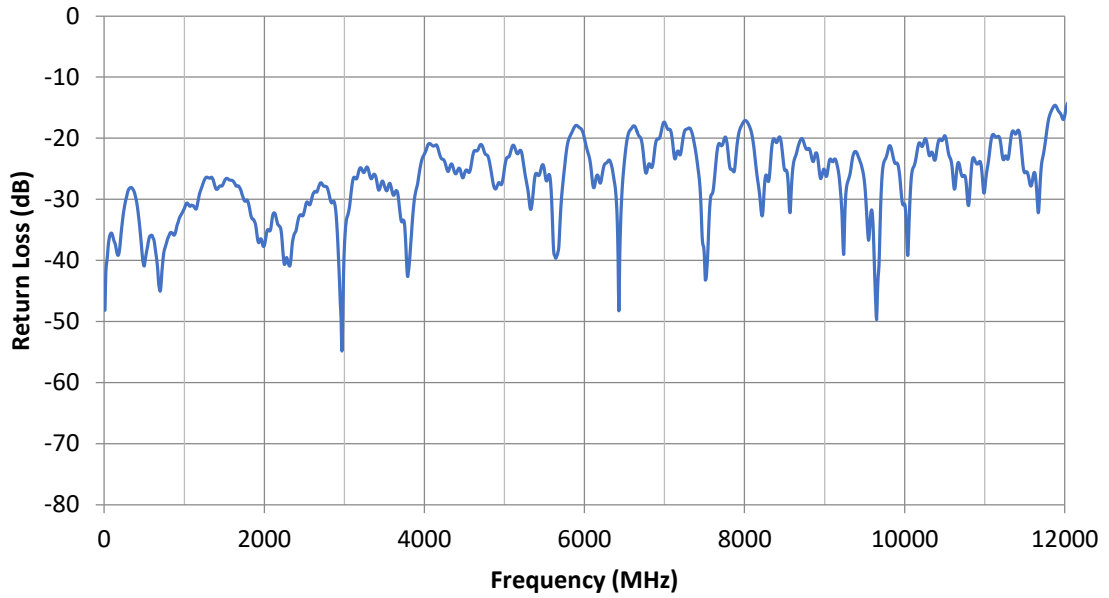
Parameter	Conditions	Min	Typ	Max	Units
Frequency		DC		12	GHz
Insertion Loss	DC - 6 GHz		1.0	1.4	dB
	6 - 12 GHz		1.6	2.0	
Return Loss	DC - 4 GHz		20		dB
	4 - 12 GHz		17		
Isolation	A _x to N _y when disconnected		100		dB
	A _x to A _y or N _x to N _y		100		
Input Power				+30	dBm

Typical Performance Data

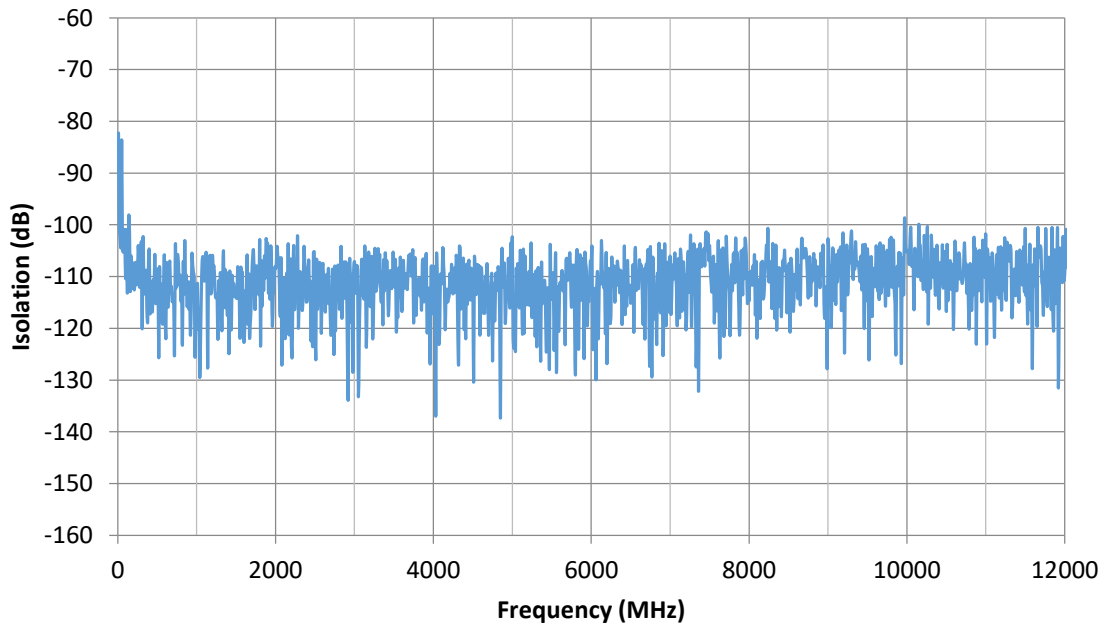


Typical Performance Data

Return Loss



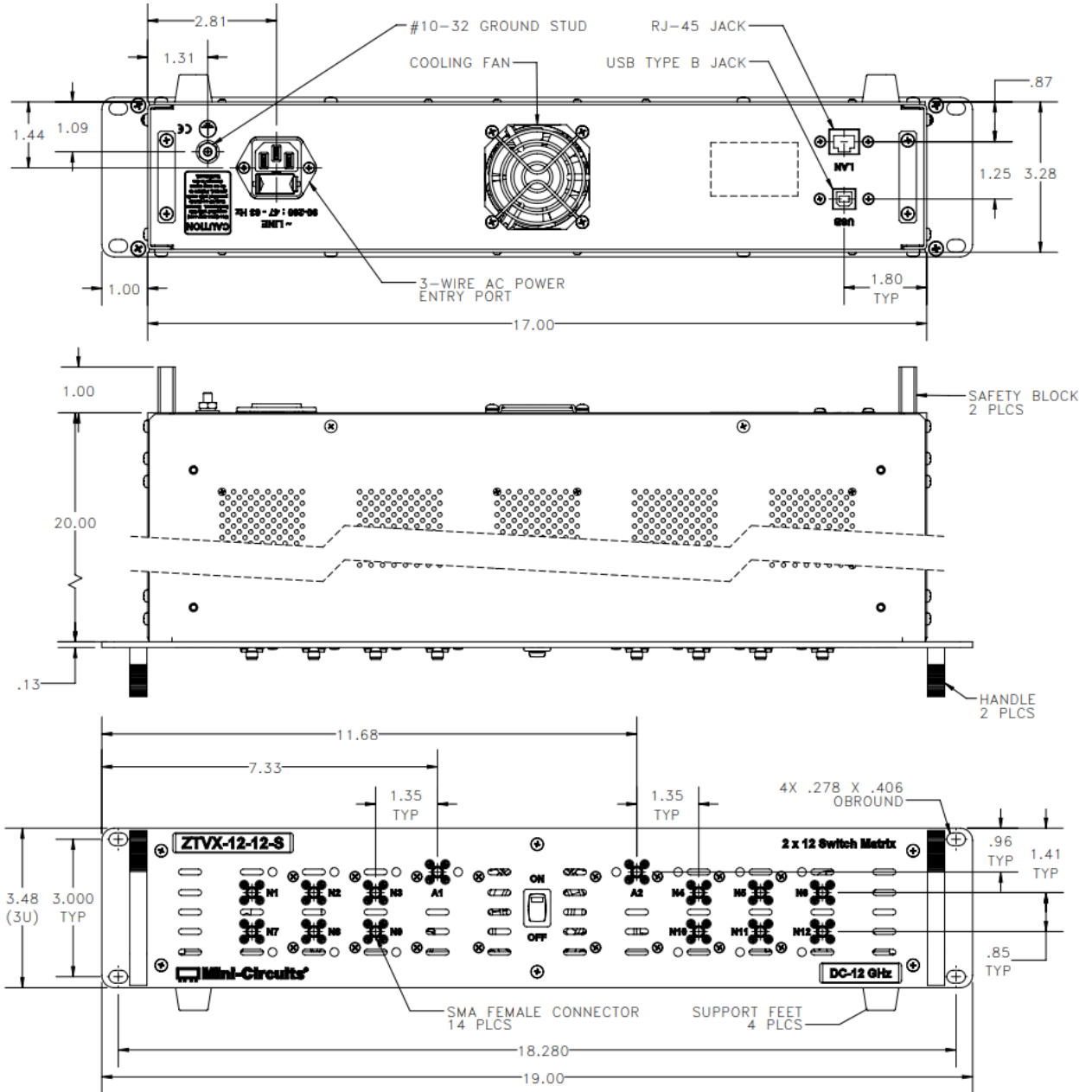
Isolation



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Outline Drawing



Software Specifications

- Please contact testsolutions@minicircuits.com for support

Ethernet Control	Supported Protocols	TCP / IP, HTTP, Telnet, DHCP, UDP
	Max Data Rate	10 Mbps (10Base-T Half Duplex)
USB Control	Supported Protocols	HID - Full Speed
	Min Communication Time	3 ms typ
Software Support	<ul style="list-style-type: none"> • Mini-Circuits' Universal GUI for USB & LAN control (Windows only) • ASCII / SCPI command syntax for LAN programming (all OS) • ActiveX / .Net DLL APIs for USB programming (Windows only) • Interrupt codes for direct USB programming (all OS) • Full programming instructions and examples for a wide range of languages 	
Downloads	Software & Documentation	https://www.minicircuits.com/softwaredownload/ztvx.html

Programming Commands

- The key ASCII / SCPI commands for control of the system are summarized below
- These can be sent via the USB or Ethernet API
- Please refer to the programming manual for full details

Command / Query	Description
:MN?	Read model name
:SN?	Read serial number
:FIRMWARE?	Read firmware version
:PATH:a_port:n_port	Set the path between 2 switch ports: <ul style="list-style-type: none"> • a_port = "Input" port • n_port = "Output" port • Example: :PATH:A1:N8 (connect A1 to N8)
:PATH:input?	Check which "output" is connected to a specified input port

Software Specifications

- Connect via USB or Ethernet
- Run GUI in “demo mode” to evaluate software without a hardware connection
- View and set all switch paths
- Configure Ethernet settings
- Upgrade firmware
- Send SCPI commands
- View temperature & fan status

The screenshot displays the ZTVX (Ver. A3X2) software interface. At the top, it features a 'Main Control' section with a 'Mini-Circuits' logo, a 'Help' icon, and a 'Block Diagram' icon. Below this, the 'Set Path' section includes 'From' and 'To' dropdown menus (set to A1 and N5), a 'Show Command' button, a 'Save to Quick Set Button', and a 'SEND' button. To the right, the 'Model Name' is 'ZTVX' and 'Serial Number' is 'Demo Mode'. There are fields for 'Protocol', 'IP', and 'Password', along with 'Firmware Upgrade' and 'Ethernet Config' buttons. The 'Connection Status' is 'Demo Mode'. On the far right, the 'Switch Status' table shows the following data:

Switch	State	Count
1	0	325
2	1	179
6	0	470
7	0	461
8	1	430
9	1	254
10	0	479

The 'Quick-Set Buttons' section shows a grid of buttons for paths like 'A1 -> N1' through 'A1 -> N16', with 'Query A1 Path' and 'EMPTY' buttons for others. A 'Configuration File' is set to 'FactoryDefault_2_16.txt'. Below this is the 'Manual Commands' section with dropdowns for 'Switch Commands', 'Switch States' (set to ':PATH:A1?'), 'Switch Counters', and 'Additional Commands'. A 'Command' field contains ':PATH:A1?' and a 'SEND' button. The 'Command History' at the bottom shows a log of successful SCPI commands. On the right side, the 'Connection Status' section shows 'A1 - NX' and 'A2 - NX'. The 'Temperature / Fans Status' table at the bottom right shows:

Temperature	Normal
Fan1 operation	OK
Fan2 operation	OK
Fans state	OFF

Ordering Information

Please contact Mini-Circuits' Test Solutions department for price and availability:

testsolutions@minicircuits.com

Included Accessories

Model Name	Quantity	Description
CBL-3W-xx*	1	AC power cord (IEC C13 connector to local plug)
USB-CBL-AB-7+	1	USB cable (6.8 ft)
CBL-RJ45-MM-5+	1	Ethernet cable (5 ft)
HT-4-SMA	1	SMA Cable Wrench (4 in)

Cable Model	Region
CBL-3W-US	USA
CBL-3W-EU	Europe
CBL-3W-IL	Israel
CBL-3W-UK	UK
CBL-3W-AU	Australia / China

*Please specify one option on the purchase order, at no charge

Additional Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp