USB & ETHERNET & DAISY-CHAIN

Blocking Switch Matrix ZTS-8X8B-18-S

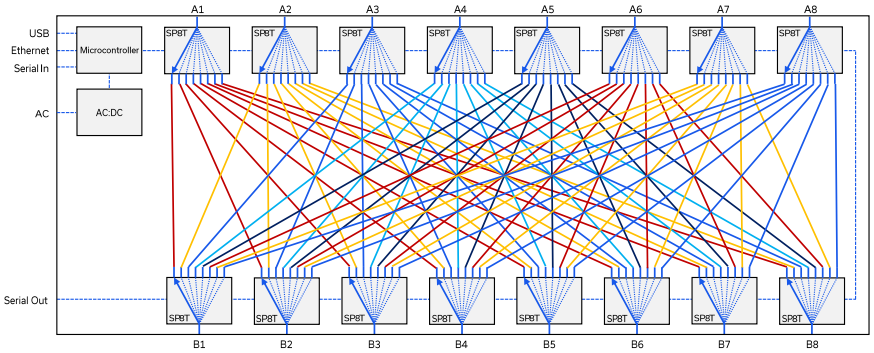
50 Ω 0.1 to 18 GHz 8 x 8 Rack-Mount SMA-Female

THE BIG DEAL

- Bi-directional, 8 x 8 blocking switch matrix
- One-to-one switch paths
- Low insertion loss between connected ports
- High isolation between disconnected ports
- SSH secure Ethernet communication
- Convenient rack-mountable chassis

Generic photo used for illustration purposes only

FUNCTIONAL BLOCK DIAGRAM



APPLICATIONS

- 5G FR1 & FR3, WiFi 6E MIMO, UWB, Bluetooth
- Military radio, radar & electronic warfare
- High throughput production testing
- RF test automation & signal routing
- MIMO antenna testing

PRODUCT OVERVIEW

Mini-Circuits' ZTS-8X8B-18-S is a high performance 8 by 8 blocking switch matrix operating over a wide bandwidth from 100 MHz to 18 GHz. The system is integrated into a compact 19-inch rack-mountable chassis with 8 RF ports (A1 to A8) on the front panel and 8 RF ports (B1 to B8) on the rear, all SMA female.

The blocking configuration supports 8 active switch paths at any time, with each of the 8 "A" ports able to connect to any of the 8 "B" ports in a one-to-one arrangement. The matrix is bi-directional so the "A" and "B" ports can be used interchangeably as both inputs and outputs.

The switch matrix can be controlled via USB or Ethernet (supporting SSH, 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.

The daisy-chain control interface further simplifies control integration by allowing multiple switch racks to be interconnected via their respective serial in and out connections. The complete set of daisy-chained matrices can then be independently controlled through a single USB / Ethernet connection.

KEY FEATURES

Feature	Advantages
Blocking	One-to-one switch paths with low loss when connected and high isolation when disconnected; minimizing the impact of the matrix itself on sensitive RF test results.
Solid-state switches	Mini-Circuits' solid-state switches provide high isolation between disconnected ports with fast switching time and exceptional reliability.
Secure Ethernet communication	Support for SSH (Secure Shell protocol) provides a means for secure communication over Ethernet networks with strict security policies. HTTP & Telnet communication via Ethernet are also supported.
Rack-mount chassis	Compact 3U height, 19" rack-mountable chassis suits integration in automated production test environments.
Integrated control & power	Easy to use on the lab bench or integrate into larger automated test systems without the need to develop custom control systems.

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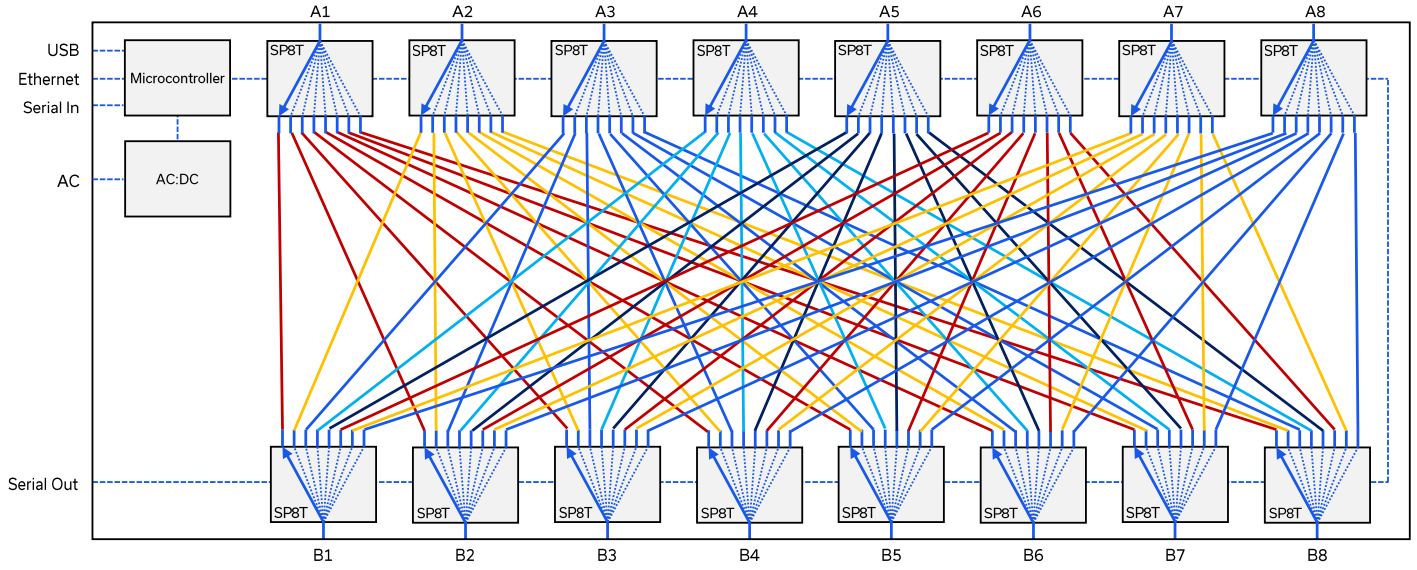
ELECTRICAL SPECIFICATIONS AT +25°C

Parameter	Conditions	Frequency	Min.	Typ.	Max.	Units
Frequency Range	-		0.1		18	GHz
Insertion Loss	Active paths	0.1 – 6 GHz		7.0	8.5	dB
		6 – 10 GHz		9.0	10.5	
		10 – 18 GHz		12.0	14.5	
Isolation	Inactive paths[1]	0.1 – 10 GHz	80	100		dB
		10 – 18 GHz	60	80		
	Between A ports[2]	0.1 – 10 GHz	80	100		
	Between B ports[2]	10 – 18 GHz	60	80		
Return Loss	All ports[3]	0.1 – 6 GHz		18		dB
		6 – 10 GHz		15		
		10 – 18 GHz		11		
Input Power	All ports - hot switching	0.1 – 18 GHz			+18	dBm
	All ports - cold switching	0.1 – 18 GHz			+24	

1. Isolation from input to output on a disconnected switch path. Example: A1 to B1 isolation is the leakage measured at B1 from a signal input at A1 when the switch in path is disconnected.
2. Isolation between any pair of A ports or between any pair of B ports for any combination of connected switch paths. This parameter is influenced by the isolation of the switch opposite.
3. Return loss in all switch path states

FUNCTIONAL BLOCK DIAGRAM



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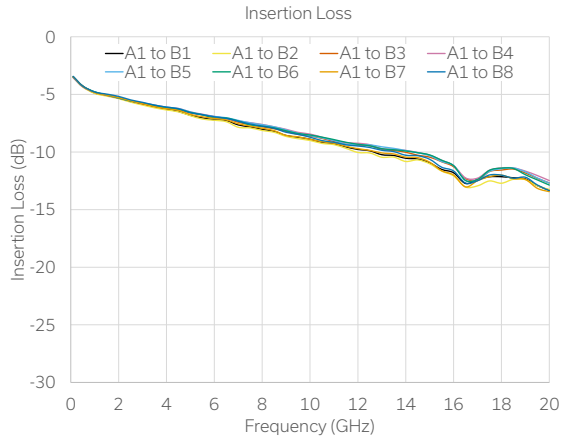
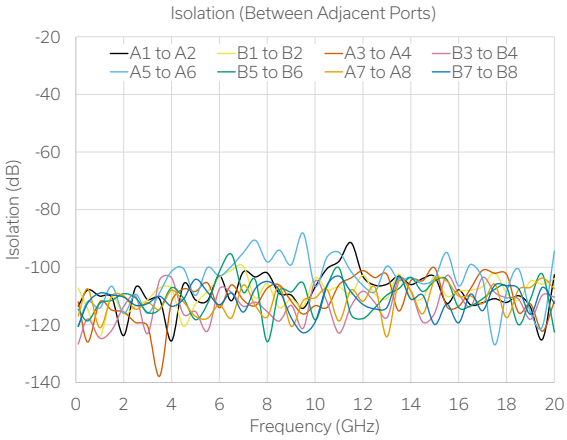
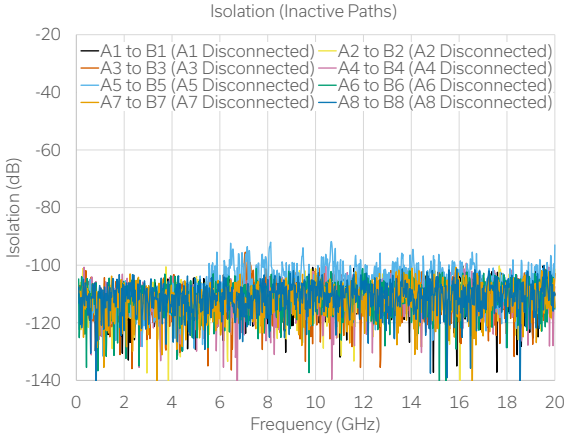
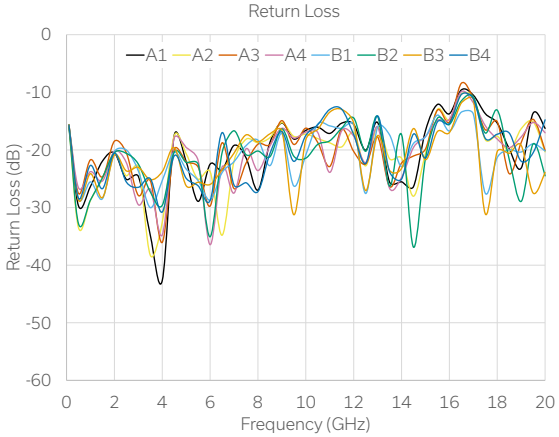
TYPICAL PERFORMANCE GRAPHS









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CONTROL INTERFACES

Ethernet Control	Supported Protocols	TCP / IP, SSH, HTTP, Telnet, DHCP, UDP (limited)
	Max Data Rate	100 Mbps (100 Base-T Full Duplex)
USB Control	Supported Protocols	HID – High Speed
	Min Communication Time[4]	400 µs typ

4. Based on the polling interval of the USB HID protocol (125 µs with 64 bytes per packet) and no other significant CPU or USB activity

SOFTWARE & DOCUMENTATION

Mini-Circuits' full software and support package including user guide, Windows GUI, API, programming manual and examples can be downloaded free of charge (refer to the last page for the download path).
A comprehensive set of software control options is provided:

- GUI for Windows – Simple software interface for control via Ethernet and USB
- Programming / automation via Ethernet
  - Complete set of control commands which can be sent via any supported protocol – simple to implement in the majority of modern programming environments

- Programming / automation via USB
  - DLL files provide a full API for Windows with a set of intuitive functions which can be implemented in any programming environment supporting .Net Framework or ActiveX
  - Direct USB programming is possible in any other environment (not supporting .Net or ActiveX)

Please contact testsolutions@minicircuits.com for support

MINIMUM SYSTEM REQUIREMENTS

Hardware	Intel i3 (or equivalent) or later
GUI (USB or Ethernet Control)	Windows 7 or later
USB API DLL	Windows 7 or later with support for Microsoft .Net Framework or ActiveX
USB Direct Programming	Windows 7 or later; Linux
Ethernet	Windows, Linux or macOS with Ethernet TCP / IP support

PROGRAMMING COMMANDS

The key ASCII / SCPI commands for control of the system for control via the Ethernet or USB API are summarized below (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]:[B_port]	Set a single switch path: • [A_port] = The A port number to connect (A1 to A8) • [B_port] = The B port to connect (B1 to B8) • Example :PATH:A1:B8
:PATH:[input]?	Check which port is connected to a specific input: • [input] = The port to check (A1 to A8 or B1 to B8) • Example :PATH:A1?

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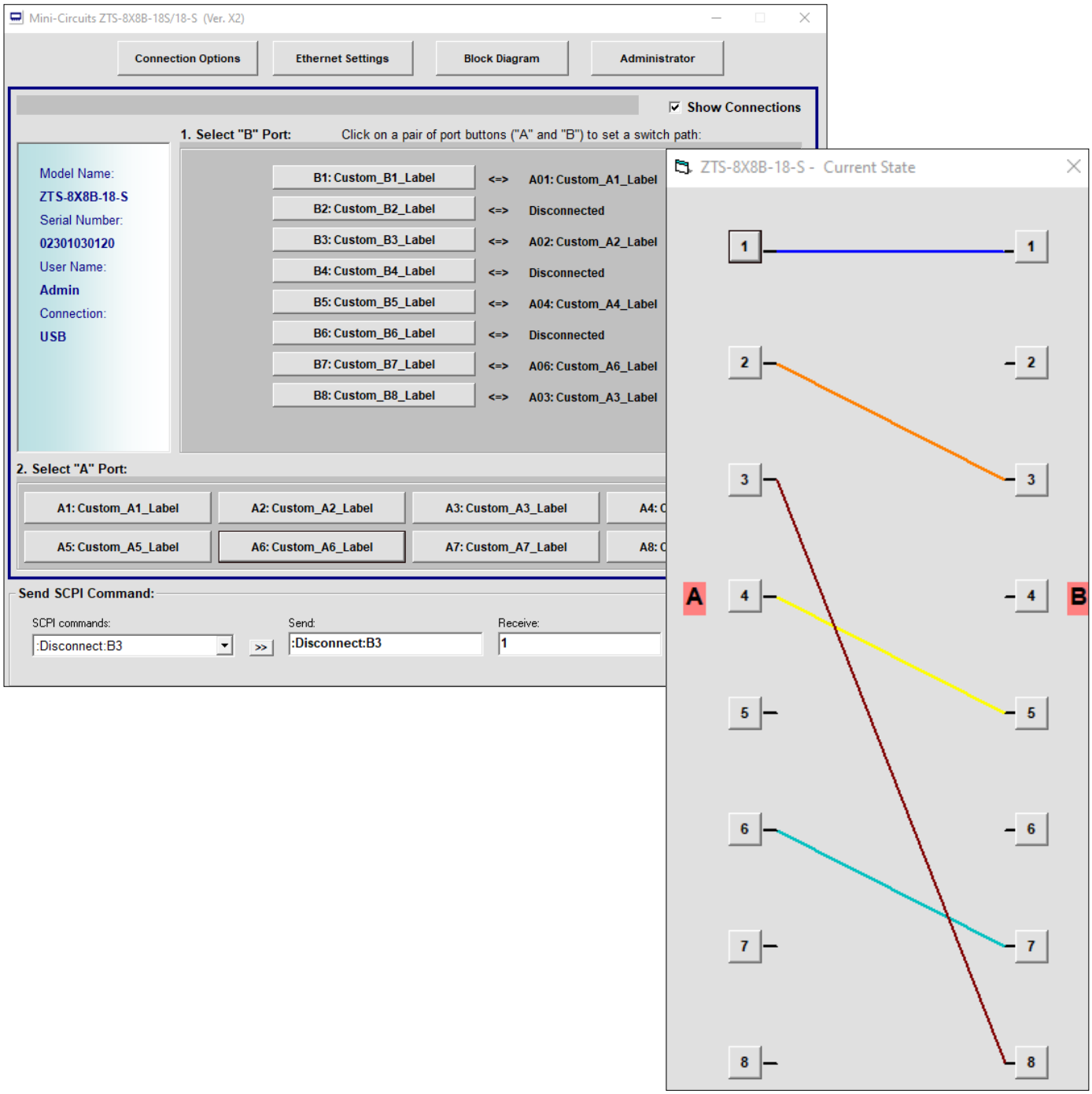
GRAPHICAL USER INTERFACE (GUI) FOR WINDOWS - KEY FEATURES

- Connect via USB or Ethernet
- Run GUI in demo mode to evaluate the software without a hardware connection
- View and set the switch state at the click of a button
- Configure automated switch sequences
- Update Ethernet settings and firmware



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ABSOLUTE MAXIMUM RATINGS

Parameter	Conditions	Limits	Units
Temperature	Operating	0 to +50	°C
	Storage	-20 to +60	
Input Power (No Damage)	Cold switching	+24	dBm
	Hot switching	+18	

Permanent damage may occur if any of these limits are exceeded. Operating in the range between operating power limits and absolute maximum ratings for extended periods of time may result in reduced life and reliability.

POWER SUPPLY

Power Supply	AC mains input: 100-240 V, 50 / 60 Hz
Fuse	2A, 250V rating
Power Consumption	150W maximum

CONNECTIONS

Port	Connector
A1-A8 & B1-B8	SMA female
USB	USB type B
Ethernet / LAN	RJ45
Serial In & Serial Out	D-sub 9-pin
AC Input	IEC C14 inlet

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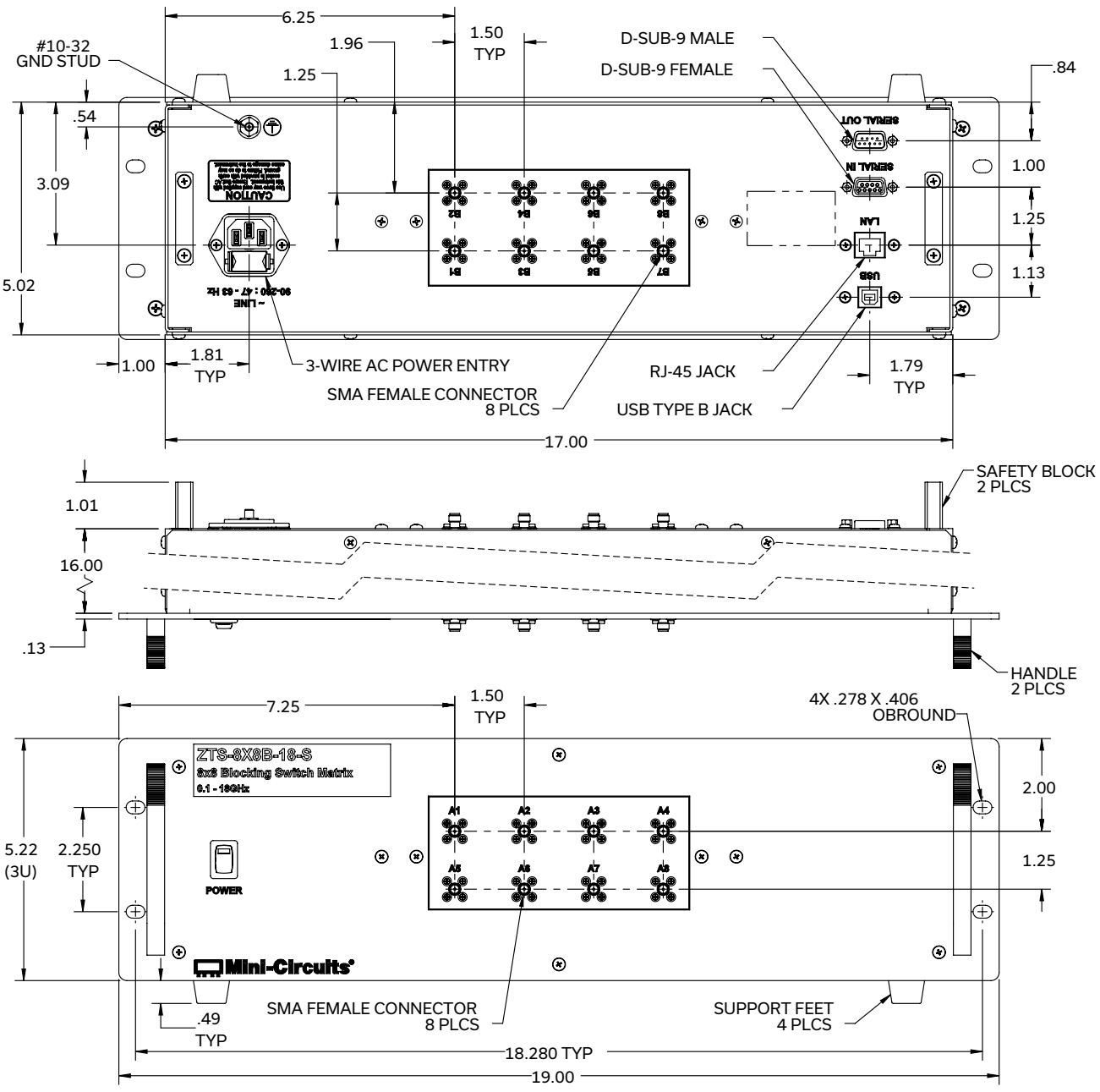
CASE STYLE DRAWING



PRODUCT MARKING*

Product Marking: ZTS-8X8B-18-S
Product Description: 8x8 Blocking Switch Matrix
Product Frequency: 0.1-18 GHz
Unit ID Label: Serial number and other identification marks
*Marking may contain other features or characters for internal lot control

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DETAILED MODEL INFORMATION IS AVAILABLE ON OUR WEBSITE CLICK HERE

Case Style	99-01-3696
Software, User Guide & Programming Manual	www.minicircuits.com/softwaredownload/zt/MCL_ZTS-8X8B-18S_Setup_X1.zip
Environmental Rating	ENV55
Regulatory Compliance	Refer to our website for compliance methodologies and qualifications CE UKCA www.minicircuits.com/quality/environmental_introduction.html

Contact Us: testsolutions@minicircuits.com

Included Accessories	Part Number	Description
	CBL-3W-xx	AC power cord (IEC C13 connector to local plug) Select one option from the list below. Please contact testsolutions@minicircuits.com if your region is not listed.
	USB-CBL-AB-7+	USB cable (6.8ft) type A to type B
	CBL-RJ45-MM-5+	Ethernet cable (5 ft)
	HT-4-SMA	SMA connector wrench (4" length)
	D-SUB9-MF-6+	D-Sub (9-pin) serial cable (6 ft)

AC Power Cord Options	Part Number	Description
	CBL-3W-US	USA NEMA 5-15 plug (type B) to IEC C13 connector
	CBL-3W-EU	Europe CEE 7/7 plug (type E/F) to IEC C13 connector
	CBL-3W-UK	UK BS-1363 plug (type G) to IEC C13 connector
	CBL-3W-AU	Australia & China AS/NZS 3112 plug (type I) to IEC C13 connector
	CBL-3W-IL	Israel SI-32 plug (type H) to IEC C13 connector

NOTES

A. 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.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. 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

Mini-Circuits

Environmental Specifications **ENV55**

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-0° to 50° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-20° to 60° C Ambient Environment	Individual Model Data Sheet
Operating and Storage Humidity	5% to 85% RH (non-condensing)	Ambient
Bench Handling Test	Bench Top Tip 45° & Drop	MIL-PRF-28800F
Transit Drop Test	Free Fall Drop, 20 cm (7.9 inches)	MIL-PRF-28800F Class 3