



Product Overview

Mini-Circuits’ ZTS series platform allows multiple solid-state switch types to be combined and integrated into a single rack-mount package with software control via USB and Ethernet.

ZTS-6SP8T-63RZ accommodates 6 independent SP8T switches, each operating from 10 MHz to 6 GHz with fast switching and high isolation. All SMA female RF connections (COM and ports 1-8 for each switch) are accessible on the rear of the 19-inch 3U height rack chassis.

The system is controlled and powered via USB, with no additional AC power supply required. 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).

Key Features

Feature	Advantages
High performance switches	Mini-Circuits’ high performance solid-state switch modules are used, combining fast switching with high isolation
Rack-mountable chassis	The 3U height, rack-mountable chassis allows easy integration into automated production test environments
USB HID (Human Interface Device)	Local control via USB connection. Plug-and-Play, no driver required. Compatible with Windows® or Linux® operating systems using 32 and 64 bit architectures.
USB powered	Power supply drawn via USB interface; no additional AC supply required
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

Mechanical Specifications

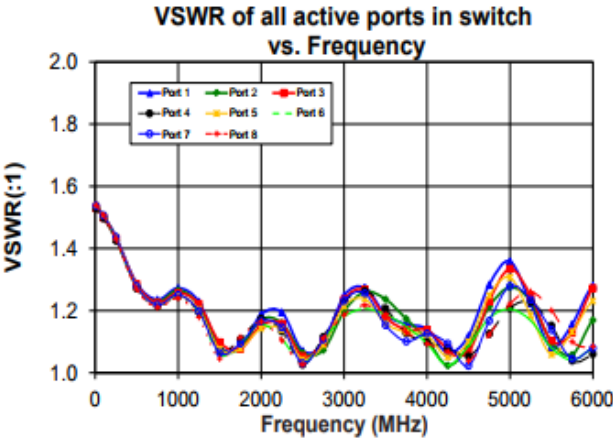
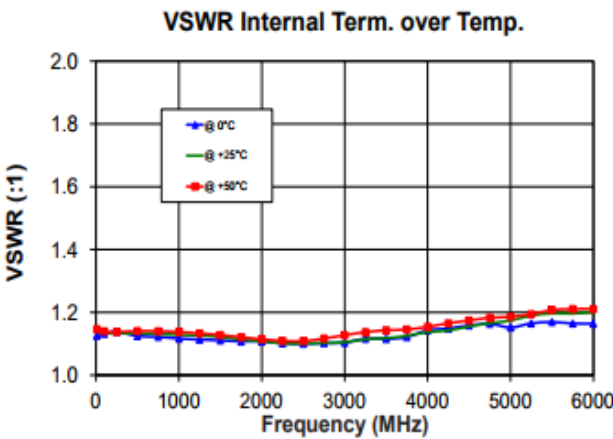
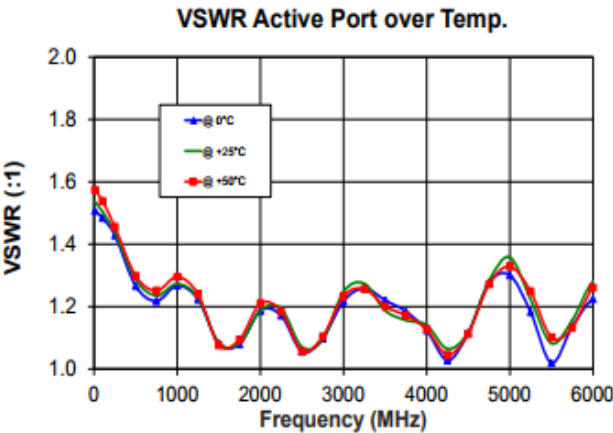
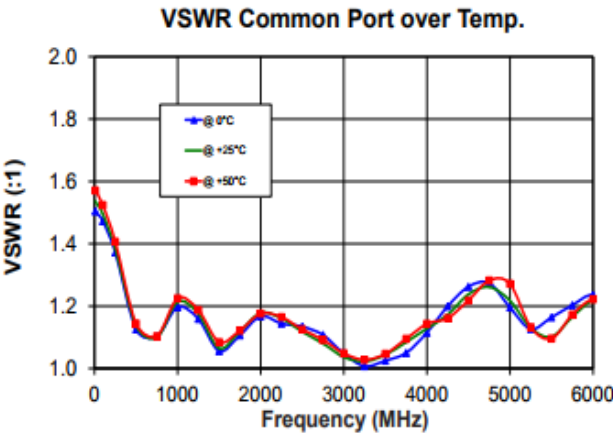
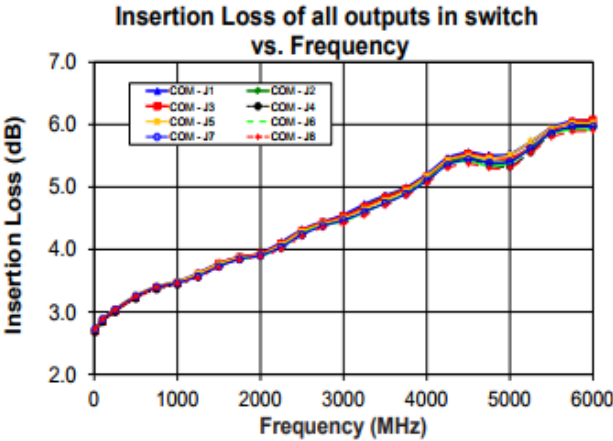
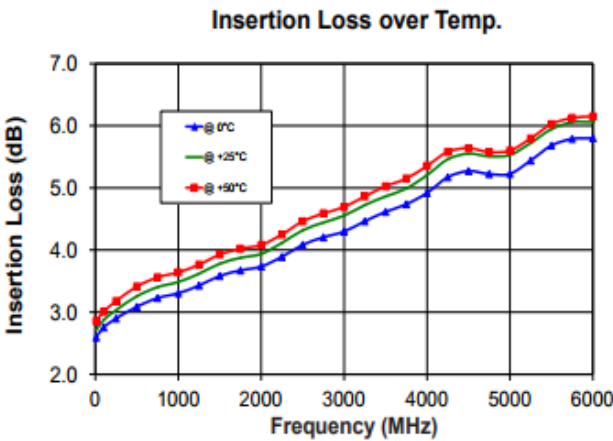
Dimensions	19" (W) x 3U (H) x 13" (D)
Case Material	Aluminum (with protective coatings to prevent corrosion)
Case Drawing	99-01-2872
RF Connectors	SMA female
Front panel	a) Carry handles
Rear panel	a) 6 x SP8T switches, each with ports COM and 1-8 b) USB type B interface for control & DC supply c) Label with date code/serial number/MCL part# for traceability
Control Interface	a) USB HID
Power supply	a) 5V DC via USB
Operating temp	0° to +50° C

Electrical Specifications at 25°C (per Switch)

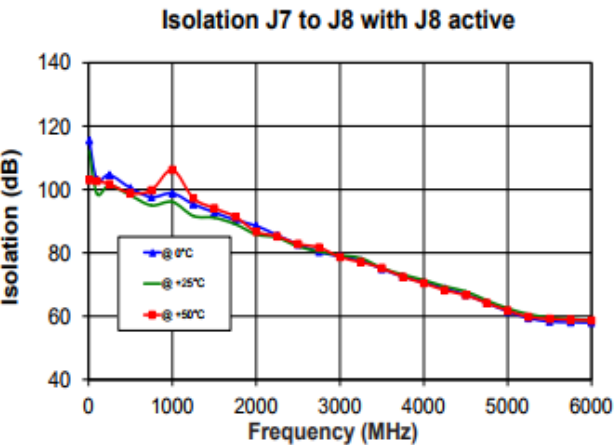
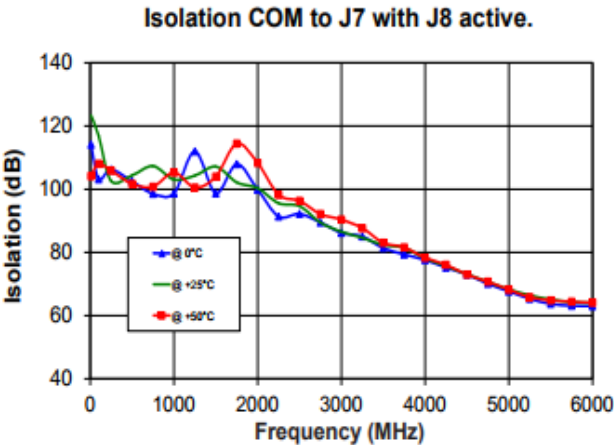
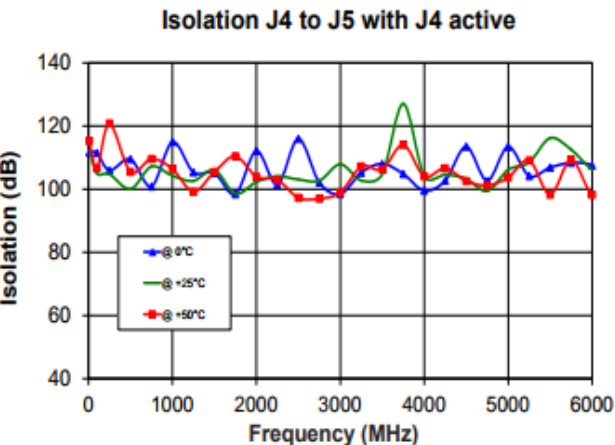
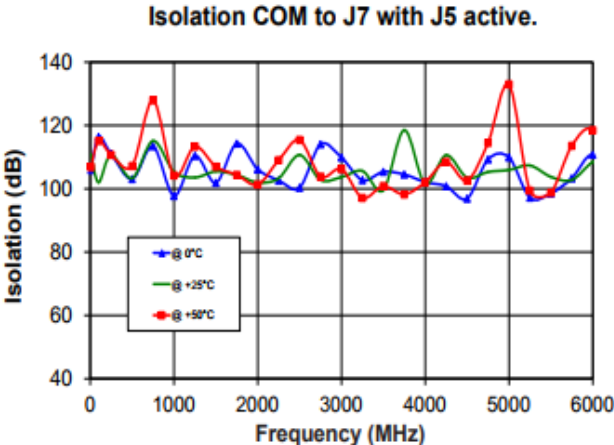
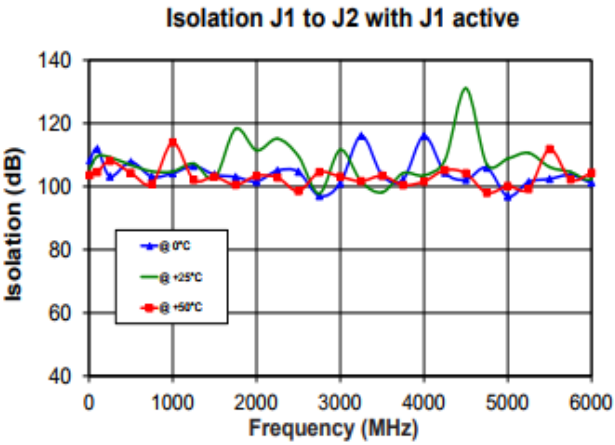
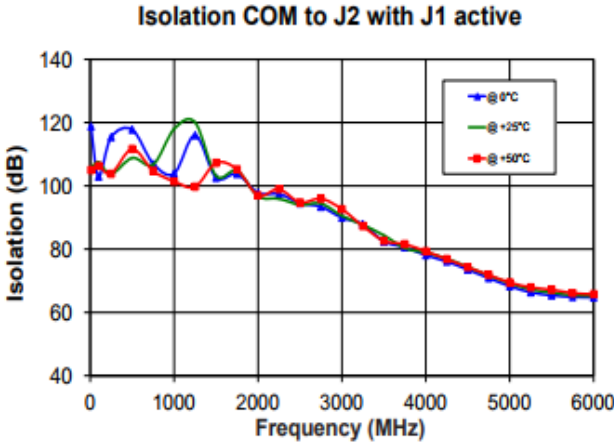
Parameter	Port	Conditions	Min.	Typ.	Max.	Units
Operating Frequency			10		6000	MHz
Insertion Loss	COM to any active port	10 to 700 MHz	–	3.2	4.5	dB
		700 to 2500 MHz	–	3.9	5.5	
		2500 to 5000 MHz	–	5.2	6.5	
		5000 to 6000 MHz	–	5.8	7.5	
Isolation	Between any of ports J1 to J8	10 to 700 MHz	80	100	–	dB
		700 to 2500 MHz	70	87	–	
		2500 to 5000 MHz	52	69	–	
		5000 to 6000 MHz	50	60	–	
	COM to any terminated port	10 to 700 MHz	78	100	–	
		700 to 5000 MHz	73	98	–	
		700 to 5000 MHz	58	76	–	
		5000 to 6000 MHz	54	65	–	
VSWR	COM port	10 to 700 MHz	–	1.40	–	:1
		700 to 2500 MHz	–	1.25	–	
		2500 to 5000 MHz	–	1.25	–	
		5000 to 6000 MHz	–	1.25	–	
	Any port connected to COM	10 to 700 MHz	–	1.45	–	
		700 to 2500 MHz	–	1.25	–	
		2500 to 5000 MHz	–	1.25	–	
		5000 to 6000 MHz	–	1.25	–	
	Any terminated port	10 to 700 MHz	–	1.15	–	
		700 to 2500 MHz	–	1.15	–	
		2500 to 5000 MHz	–	1.15	–	
		5000 to 6000 MHz	–	1.20	–	
Power Input @ 1 dB Compression ^{1,2}	COM to any active port	100 to 6000 MHz	–	35	–	dBm
IP3 ^{2,3}	COM to any active port	100 to 6000 MHz	–	50	–	dBm
Transition Time ⁴	–	–	–	200	300	ns
Minimum dwell time ⁵	High Speed Mode	–	–	25	–	µs
Switching Time (USB) ⁶	–	–	–	2	–	ms
Operating RF Input Power ¹	Any active port to COM port	Hot Switching	–	–	+23	dBm
	Any active port to COM port	Cold Switching	–	–	+30	
	Any terminated port	–	–	–	+23	
	COM to any port	–	–	–	+30	

¹ Max power at through path derates linearly from +30 dBm @ 40 MHz to +23 dBm @ 10 MHz² Compression and IP3 may degrade below 100 MHz.³ IP3 Tested with 1 MHz span between signals.⁴ Transition time spec represents the time that the RF signal paths are interrupted during switching and thus is specified without communication delays.⁵ Minimum dwell time is the shortest time that can be achieved between 2 switch transitions when programming an automated switch sequence.⁶ Switching time(USB) is the time from issuing a single software command via USB to the switch state changing. The most significant factor is the host PC, influenced by CPU load and USB protocol. The time shown is an estimate for a medium CPU load and USB 2.0 connection.

Typical Performance Data (per Switch)



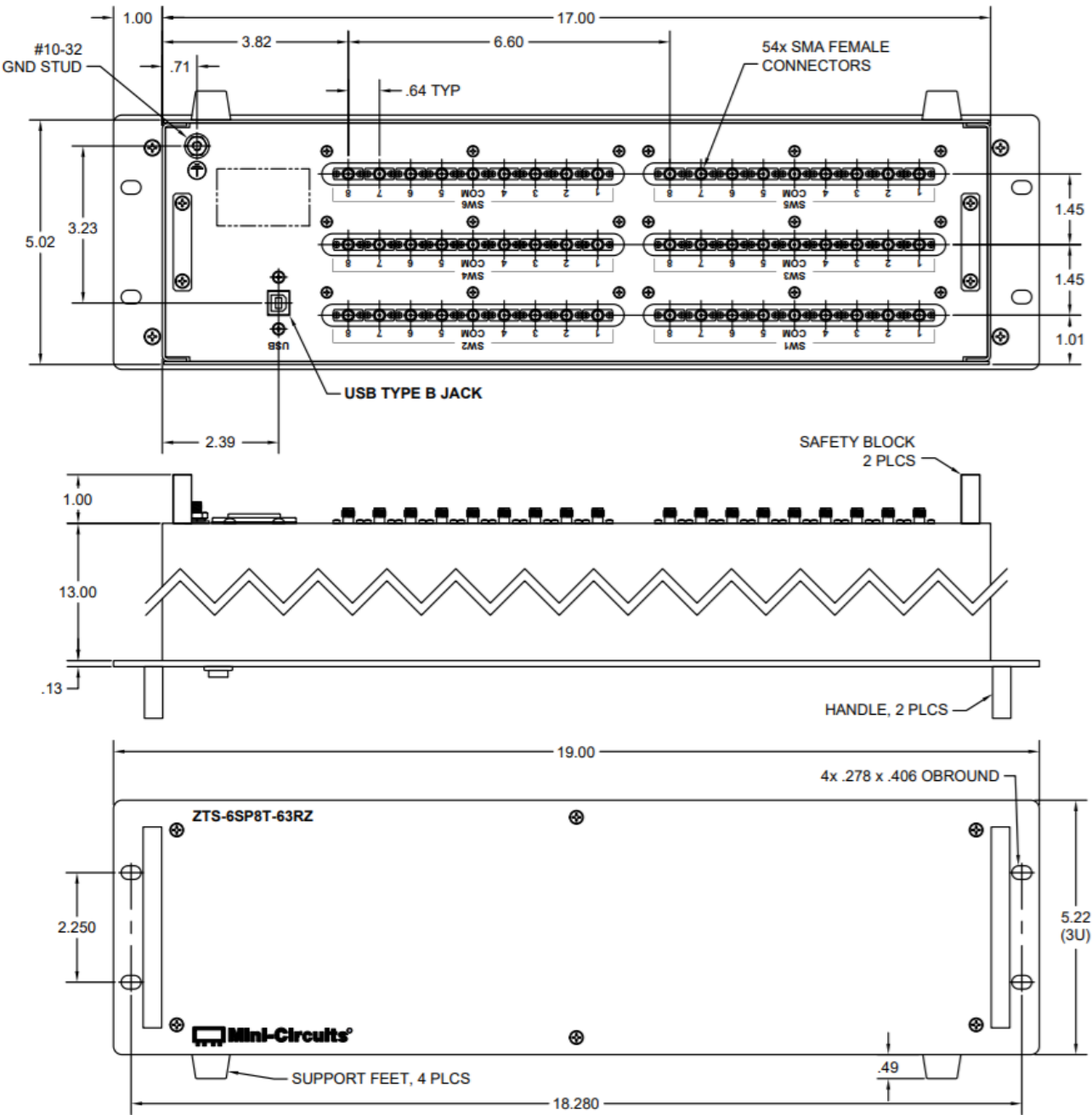
Typical Performance Data (per Switch)



Solid-State 6 x SP8T Switch Rack

ZTS-6SP8T-63RZ

Outline Drawing



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 for download from:
http://yoni-il.minicircuits.com/download/MCL_MsterSlaveSwitch_CD_A0.zip
- Please contact testsolutions@minicircuits.com for support

Minimum System Requirements:

Parameter	Requirements	
Interface	USB HID	
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
Hardware	Pentium II or later with 256 MB RAM	

Application Programming Interface (API)

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 states
- Upgrade firmware

Master Slave - Solid State Switches (Ver A0)

Master Model Name [Address 0]:

Demo Mode

Master Serial Number: (fw)

123450000

Existing Modules: 25

Current Address:

03

Current Model Name:

USB-1SP8T-63Z

Current Serial Number:

123450003

Address	Model Name	Serial Number
00	RCS-1SP2T-40R	123450000
01	USB-2SP2T-DCZ	123450001
02	USB-4SP2T-63Z	123450002
03	USB-1SP8T-63Z	123450003
04	USB-4SP2T-63Z	123450004
05	USB-2SP4T-63Z	123450005
06	RCS-1SP2T-40R	123450006
07	USB-2SP2T-DCZ	123450007
08	USB-4SP2T-63Z	123450008
09	USB-1SP8T-63Z	123450009
10	USB-1SP16T-83Z	123450010
11	USB-2SP2T-DCZ	123450011
12	RCS-1SP2T-40R	123450012
13	USB-2SP2T-DCZ	123450013
14	USB-4SP2T-63Z	123450014
15	USB-2SP4T-63Z	123450015
16	USB-4SP2T-63Z	123450016
17	USB-2SP2T-DCZ	123450017
18	RCS-1SP2T-40R	123450018
19	USB-2SP2T-DCZ	123450019
20	USB-1SP16T-83Z	123450020
21	USB-1SP8T-63Z	123450021
22	USB-4SP2T-63Z	123450022
23	USB-2SP2T-DCZ	123450023
24	RCS-1SP2T-40R	123450024

SP8T

Connect COM to ...

1

2

3

4

5

6

7

8

Current State:

COM to 1