



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-1SP8T-63 comprises a single high performance SP8T switch, operating from 10 MHz to 6 GHz with fast switching and high isolation. All SMA female RF connections (COM and ports 1-8) are accessible on the front of the 19-inch 1U 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 switch	Mini-Circuits’ high performance solid-state switch modules are used, combining fast switching with high isolation
Rack-mountable chassis	The 1U 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 1U (H) x 10" (D)
Case Material	Aluminum (with protective coatings to prevent corrosion)
Case Drawing	99-01-2461
RF Connectors	SMA female
Front panel	a) Carry handles b) Ports COM and 1-8 (SMA female)
Rear panel	a) USB type B interface for control & DC supply b) 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

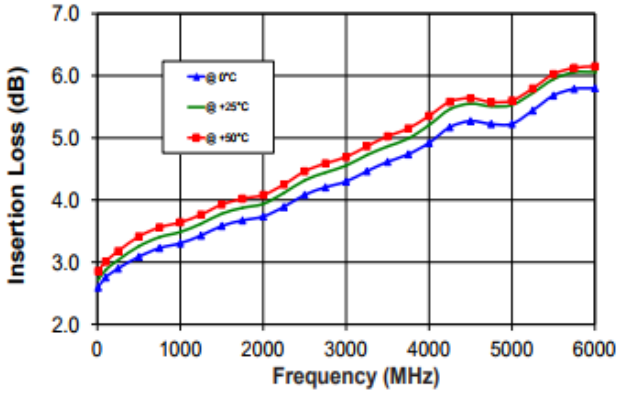
Electrical Specifications at 25°C

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	

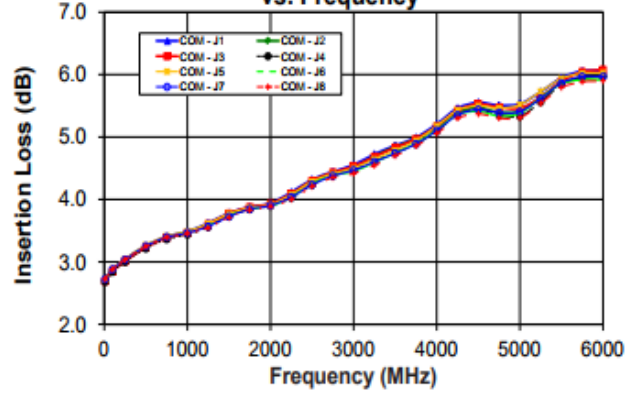
¹ Max power at through path derates linearly from +30 dBm @ 40 MHz to +23 dBm @ 10 MHz² Compression and IP3 may degrade below 100 MHz.³ IP3 Tested with 1 MHz span between signals.⁴ Transition time spec represents the time that the RF signal paths are interrupted during switching and thus is specified 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

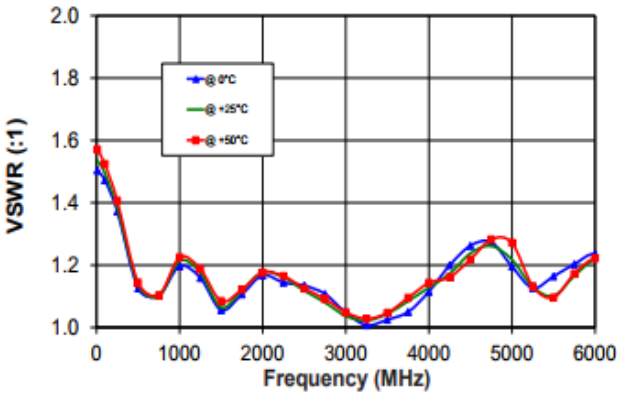
Insertion Loss over Temp.



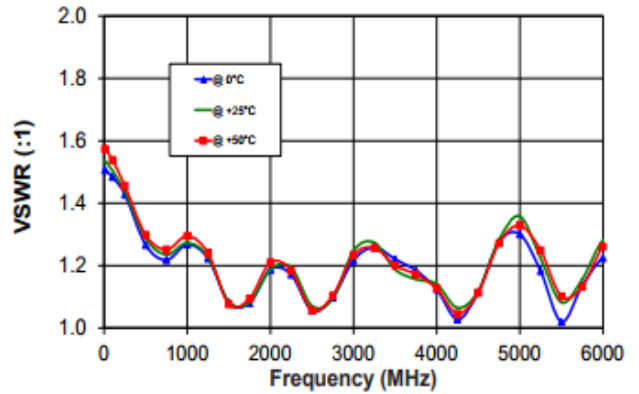
Insertion Loss of all outputs in switch vs. Frequency



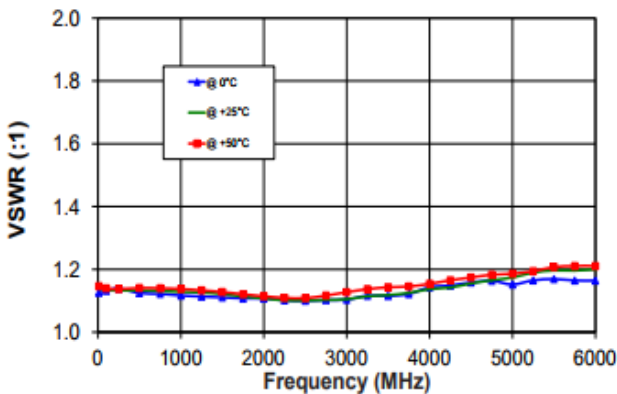
VSWR Common Port over Temp.



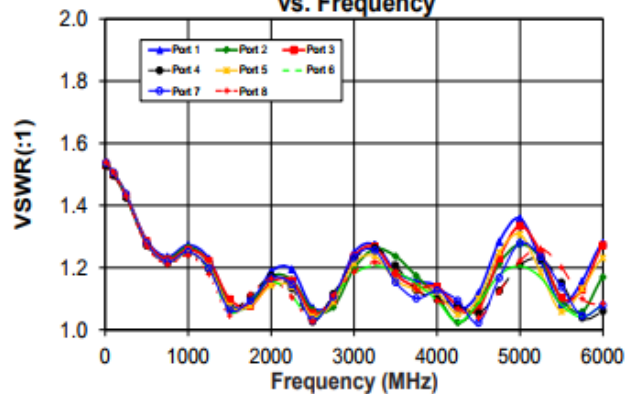
VSWR Active Port over Temp.



VSWR Internal Term. over Temp.

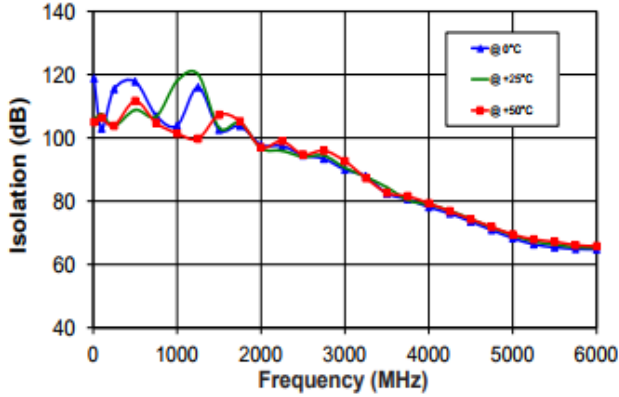


VSWR of all active ports in switch vs. Frequency

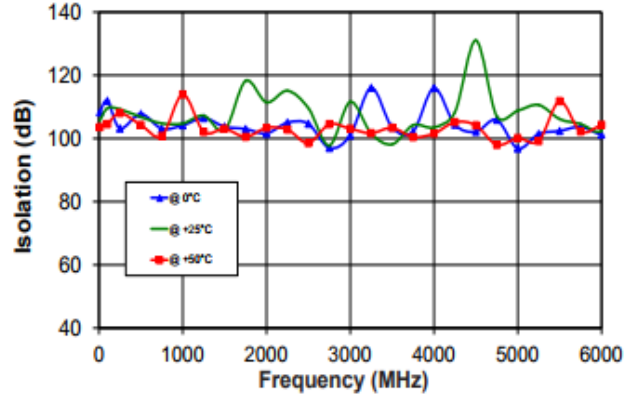


Typical Performance Data

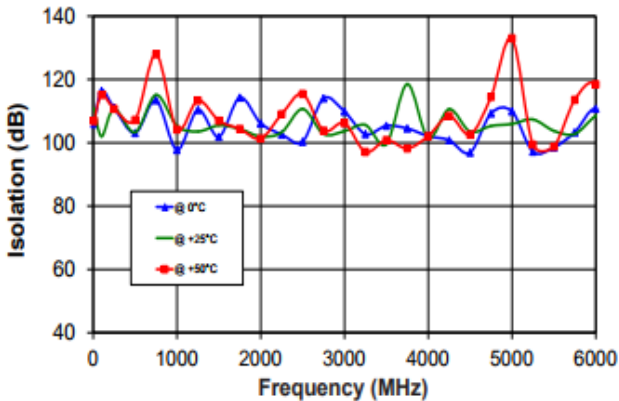
Isolation COM to J2 with J1 active



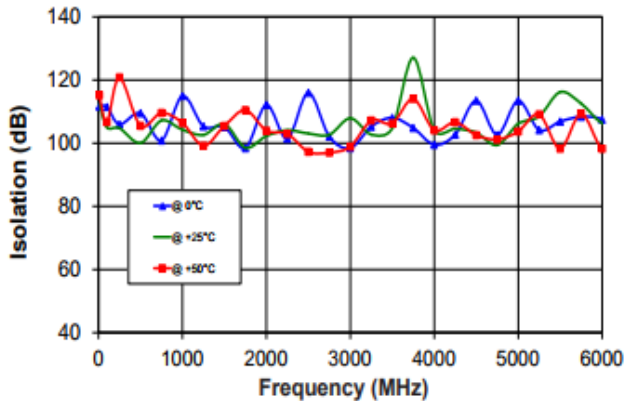
Isolation J1 to J2 with J1 active



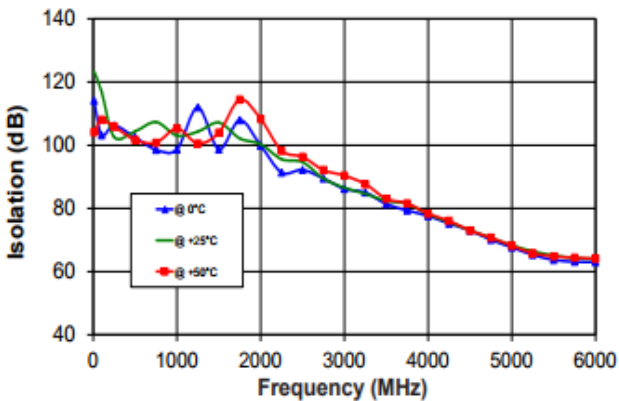
Isolation COM to J7 with J5 active.



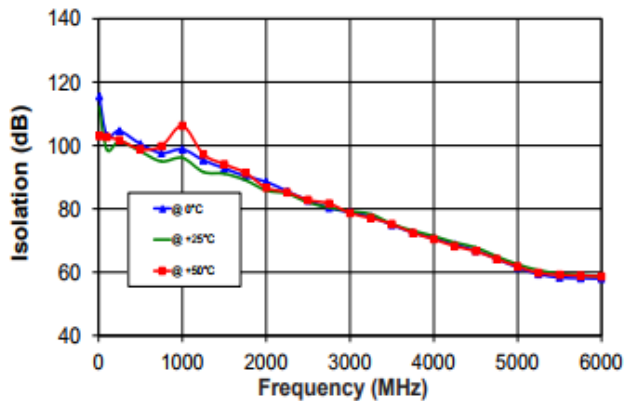
Isolation J4 to J5 with J4 active



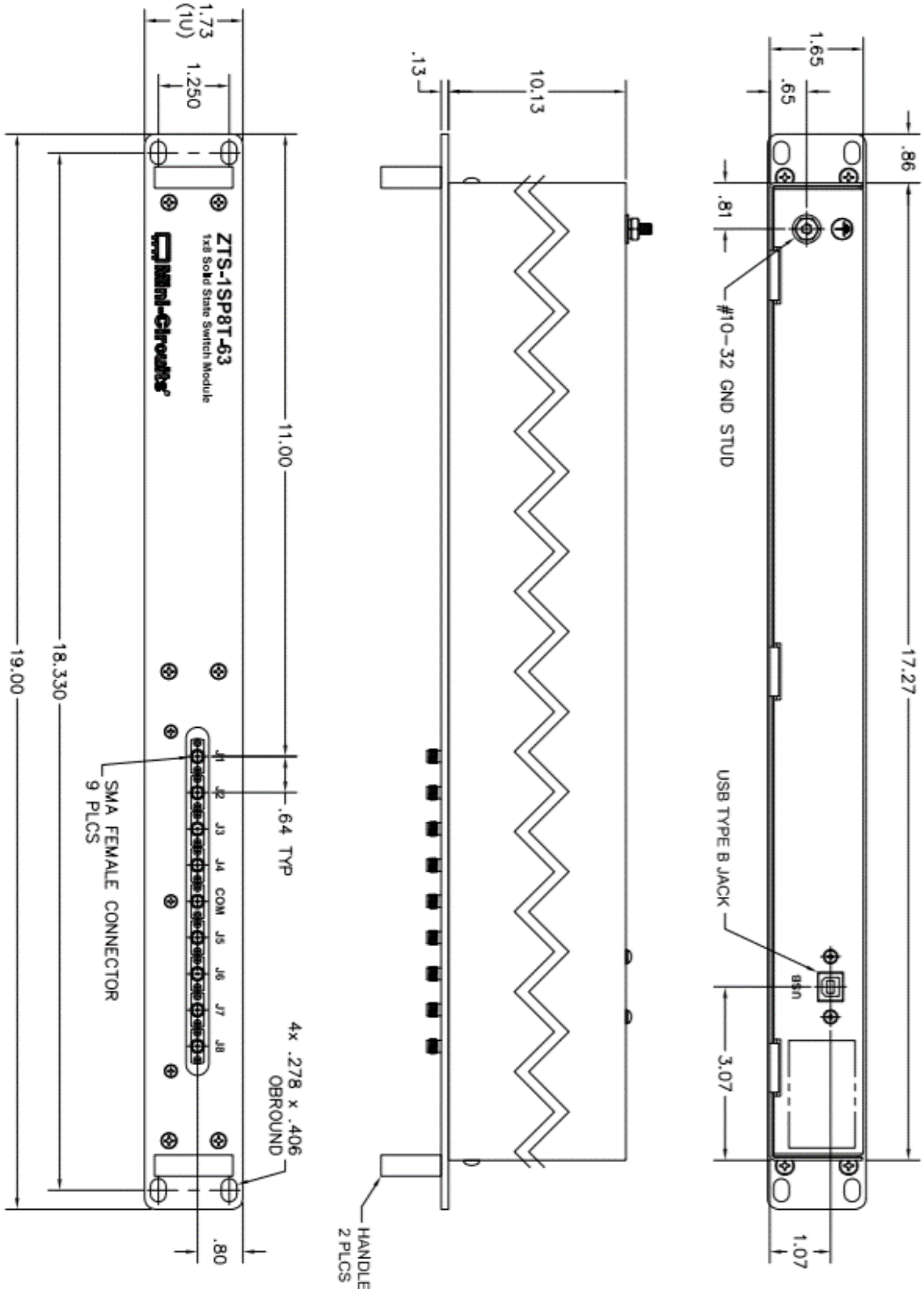
Isolation COM to J7 with J8 active.



Isolation J7 to J8 with J8 active



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:
<https://www.minicircuits.com/softwaredownload/solidstate.html>
- 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

