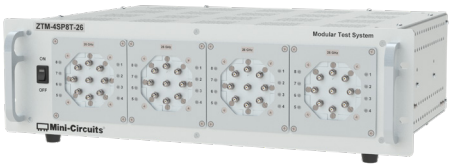
RACK MOUNTED | USB & ETHERNET CONTROL

RF SP8T Switch Matrix ZTM-4SP8T-26

50Ω DC to 26.5 GHz

THE BIG DEAL

- 4 x mechanical SP8T absorptive switches
- Excellent performance to 26.5 GHz
- Convenient rack-mountable chassis
- Ethernet & USB control



CASE STYLE: YD2861

DOWNLOAD SOFTWARE PACKAGE

Refer to our website for compliance methodologies and qualifications

CE UKCA

APPLICATIONS

- Benchtop and rack mounted automated test systems
- 5G FR1, WiFi 6E, UWB, Bluetooth
- Military radio, radar & electronic warfare
- Test & measurement systems
- Fail-safe / redundancy switching

PRODUCT OVERVIEW

Mini-Circuits' ZTM-4SP8T-26 comprises 4 independently controlled, electro-mechanical SP8T switches. Each switch operates over a wide bandwidth, from DC to 26.5 GHz, with high isolation and low insertion loss. The absorptive switches are of a failsafe / normally open and break-before-make-configuration with a lifetime of 2 million switching cycles when used within the noted specifications.

The switch system is housed in a rugged 19" rack chassis, 3U height, with all SMA (f) RF connectors and LED switch position indicators on the front panel. The modular design of the ZTM series switch rack supports easy maintenance and re-configuration in the field, without the need to return the whole system to a Mini-Circuits facility.

The switches are controlled via USB or Ethernet, allowing control directly from a PC, or remotely over a network. 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).

Custom switch configurations can be configured to fit any requirement, using Mini-Circuits' online configurator tool at www.minicircuits.com/WebStore/ztm.html.

KEY FEATURES

Feature	Advantages
High performance switches	Mechanical absorptive switches provide high reliability, repeatable high performance, and internal terminations of input signals on the disconnected paths.
Rack-mount chassis	Compact 3U height, 19" rack-mountable chassis with RF connections on the front, suits integration in automated production test environments.
Ethernet & USB control	USB HID and Ethernet (HTTP / Telnet) interfaces ensure compatibility with most software environments and connection requirements.

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ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Conditions	Min.	Typ.	Max.	Units
Frequency Range	-	DC	-	26.5	GHz
Insertion Loss	DC – 8 GHz	-	0.15	0.30	dB
	8 – 18 GHz	-	0.30	0.50	
	18 – 26.5 GHz	-	0.45	0.70	
Isolation[1] (Inactive Paths)	DC – 8 GHz	70	90	-	dB
	8 – 18 GHz	60	80	-	
	18 – 26.5 GHz	55	70	-	
Return Loss[2]	DC – 8 GHz	-	20	-	dB
	8 – 18 GHz	-	16	-	
	18 – 26.5 GHz	-	14	-	
Switching Time	-	-	25	-	ms
RF Input Power	Cold switching, DC – 8 GHz	-	-	20	W
	Cold switching, 8 – 18 GHz	-	-	10	
	Cold switching, 18 – 26.5 GHz	-	-	5	
	Hot switching[3]	-	-	0.1	
	Into internal termination[4]	-	-	1	
Switch Lifetime	-	-	2	-	million cycles

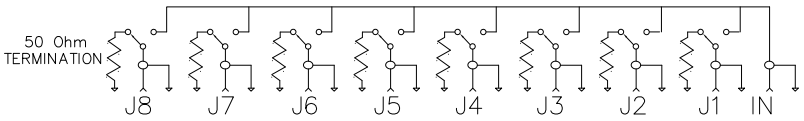
1. Isolation measured between Com and any disconnected port. Example: Isolation for Com to 1 is the leakage measured at port 1 from a signal input at Com when the active switch path is set to Com to 2
2. Return loss into Com when active or ports 1-6 in any state; Com is reflective when disconnected
3. Hot switching power above this level will degrade the switch lifetime
4. Maximum power into any internal termination is 1W per port, 3W total per switch

ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	0°C to 50°C
Storage Temperature	-20 to +60°C

SWITCHING CONFIGURATION:

- Normally open (all ports disconnected)
- Absorptive (internal terminations on ports J1-J8)



MECHANICAL & ENVIRONMENTAL SPECIFICATIONS

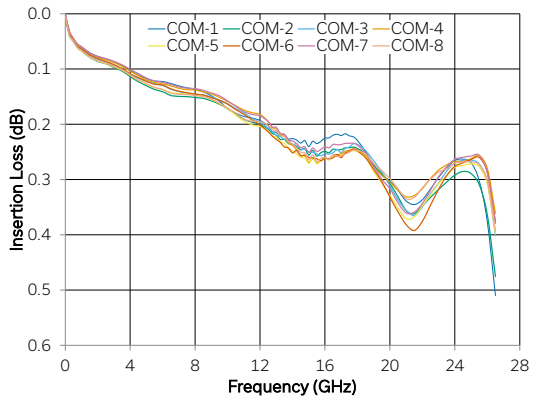
Dimensions	19" (W) x 3U (H) x 13" (D)			
Case Style	YD2681			
Case Material	Aluminum (with protective coating to prevent corrosion)			
RF Connectors	**Panel**	**Connector**	**Quantity**	**Port Labels**
	Front	SMA female	36	COM & 1-8 per switch
Panel Marking	**Front Panel**	**Rear Panel**		
	• ZTM-4SP8T-26 • Modular Test System	• CE / EAC / UKCA • Serial number / date code / model name		
Panel Items	• Power on / off switch with LED • LED switch position indicators • Carry handles	• AC mains power input (IEC C14 inlet) • USB type B socket • RJ45 (LAN) socket		
Power Supply	AC mains power input 100-240V, 50 / 60 Hz			
Fuse	2A, 250V rating			
Power Consumption	150 W max			
Temperature	Operating: 0 to +50 °C			

RF SP8T Switch Matrix ZTM-4SP8T-26

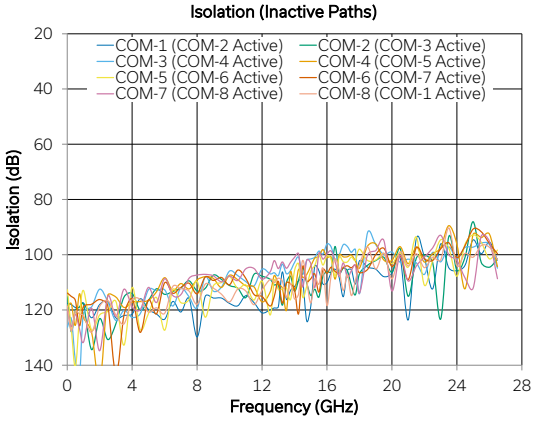
50Ω DC to 26.5 GHz

TYPICAL PERFORMANCE CURVES

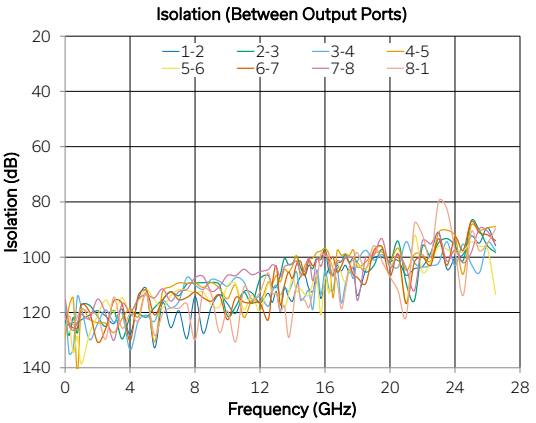
Insertion Loss



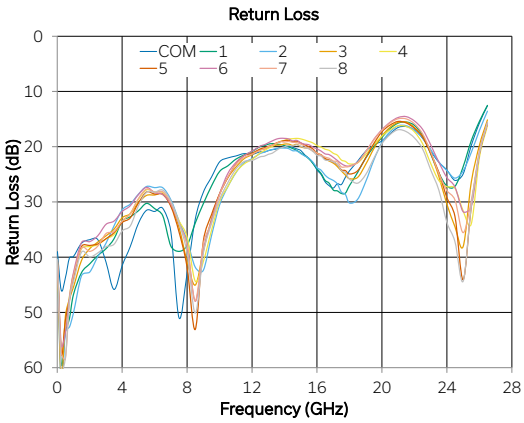
Isolation (Inactive Paths)



Isolation (Between Output Ports)



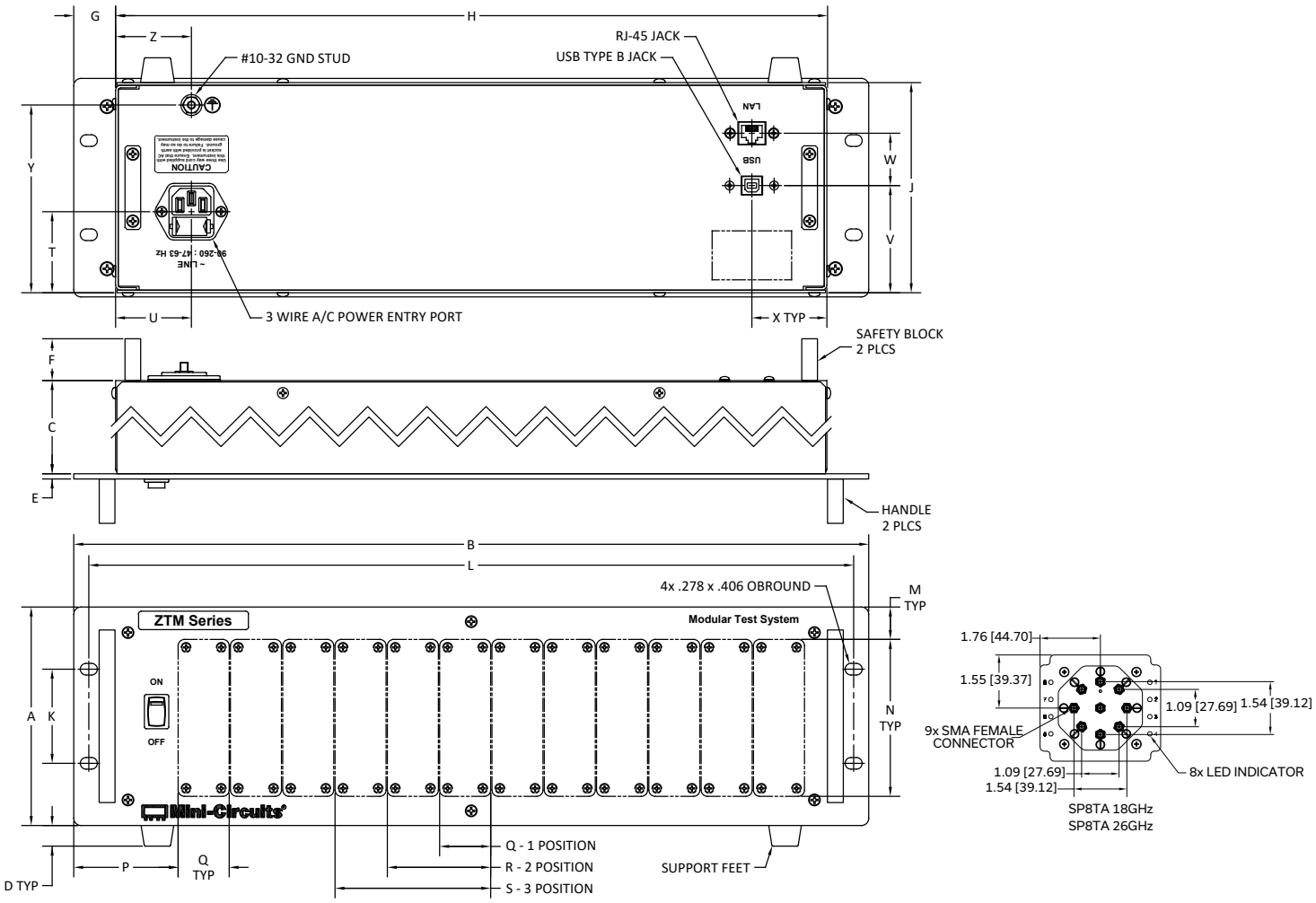
Return Loss



RF SP8T Switch Matrix ZTM-4SP8T-26

50Ω DC to 26.5 GHz

OUTLINE DRAWING



OUTLINE DIMENSIONS (Inch / mm)

A	B	C	D	E	F	G	H	J	K	L	M	N
5.22	19.00	13.00	0.49	0.13	1.00	1.000	0.95	17.00	5.02	2.25	18.28	3.75
132.6	482.6	330.2	12.45	3.30	25.4	25.4	24.13	431.8	127.5	57.2	464.3	95.3

P	Q	R	S	T	U	V	W	X	Y	Z		wt
2.50	1.22	2.47	3.72	1.94	1.81	2.56	1.25	1.79	4.49	1.81		grams
63.5	31.0	62.7	94.49	49.28	46.0	65.0	31.75	45.5	114.0	46.0		4535

RF SP8T Switch Matrix ZTM-4SP8T-26

50Ω DC to 26.5 GHz

SOFTWARE & CONTROL SPECIFICATIONS

- Mini-Circuits' full software and support package including user guide, Windows GUI, DLL files, programming manual and examples can be downloaded free of charge from:
- www.minicircuits.com/softwaredownload/ztm_rcm.html
- Please contact testsolutions@minicircuits.com for support

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

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

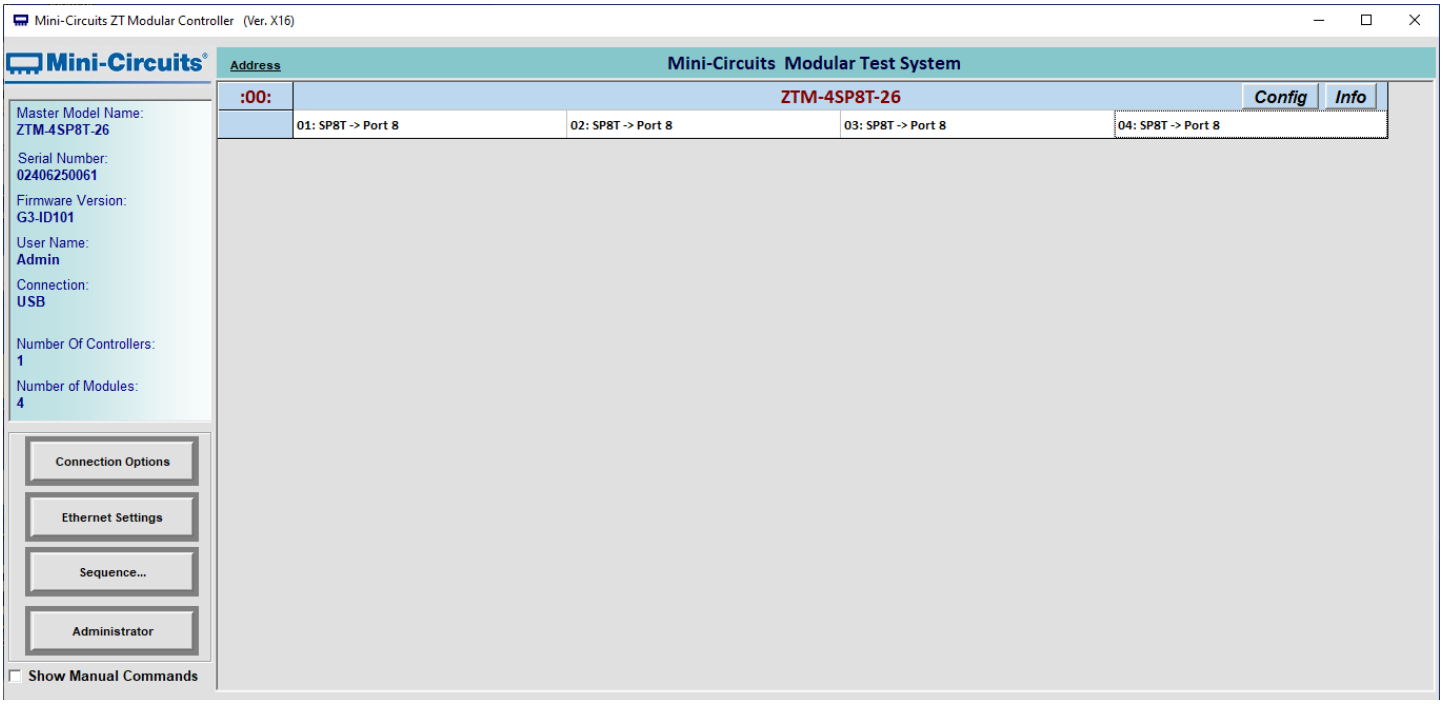
Command / Query	Description
:MN?	Read model name
:SN?	Read serial number
:FIRMWARE?	Read firmware version
:SP8T:sw_number:STATE:port	Set a single switch state: • sw_number = 1 to 4 • port = the switch state to set • :SP8T:1:STATE:2 (set switch 1 to state 2)
:Csw_number=port	Short-hand to set a single switch state: • sw_number = 1 to 4 • port = the switch state to set • C1=2 (set switch 1 to state 2)
:SP8T:sw_number:STATE?	Get the state of a single switch: • sw_number = 1 to n • :SP8T:1:STATE? (get the state of switch 1)

RF SP8T Switch Matrix ZTM-4SP8T-26

50Ω DC to 26.5 GHz

GRAPHICAL USER INTERFACE (GUI) FOR WINDOWS

- Connect via USB or Ethernet
- Run GUI in "demo mode" to evaluate software without a hardware connection
- View and set all switch states
- Configure Ethernet settings
- Upgrade firmware
- Send SCPI commands



RF SP8T Switch Matrix ZTM-4SP8T-26

50Ω DC to 26.5 GHz

ORDERING INFORMATION

Please contact Mini-Circuits' Test Solutions department for price and availability: testsolutions@minicircuits.com

Model	Description
ZTM-4SP8T-26	RF SP8T Switch Matrix

Included Accessories	Part No.	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)

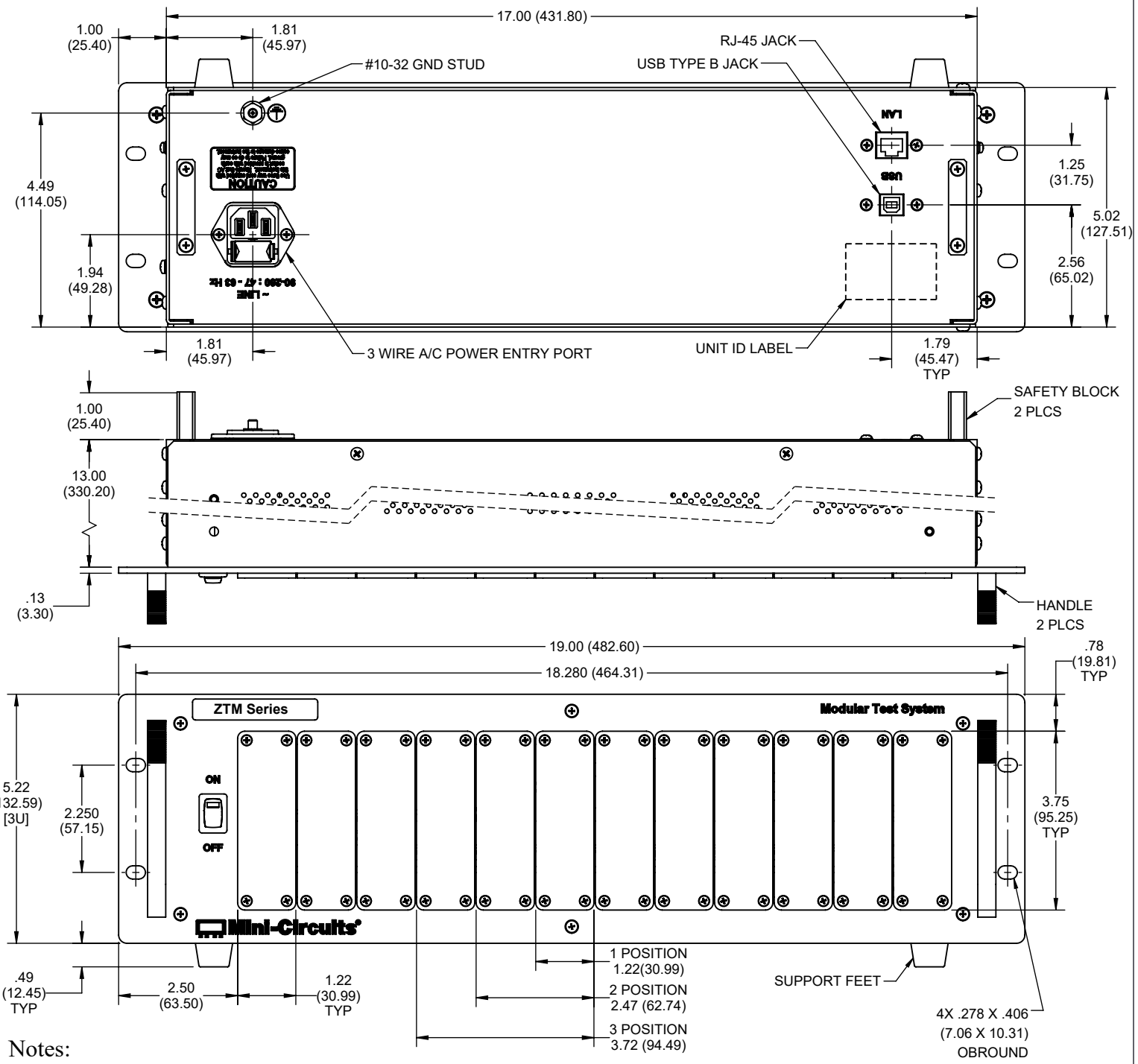
Cable Model	Region
CBL-3W-US	USA
CBL-3W-EU	Europe
CBL-3W-IL	Israel
CBL-3W-UK	UK
CBL-3W-AU	Australia / China

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/terms/viewterm.html

Case Style YD

Outline Dimensions YD2861



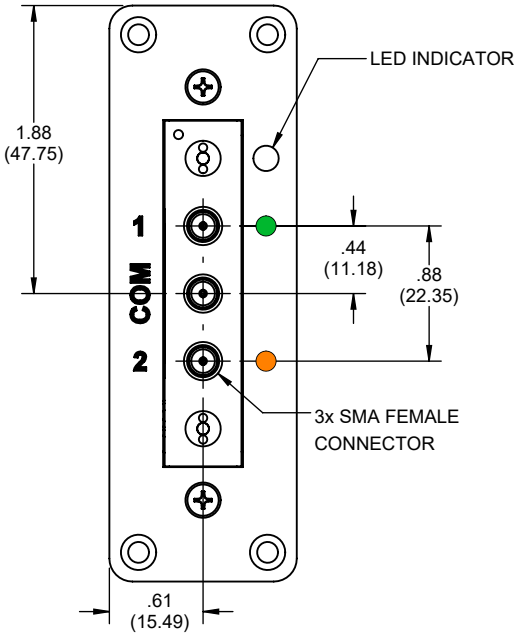
Notes:

1. Case material: Aluminum (with protective coating to prevent corrosion).
2. Dimensions are in inches (mm). Tolerances: 2 Pl. ±.03 inch; 3 Pl. ±.015 inch.
3. Weight: 4535 grams.
4. Marking may contain features or characters for internal lot control.

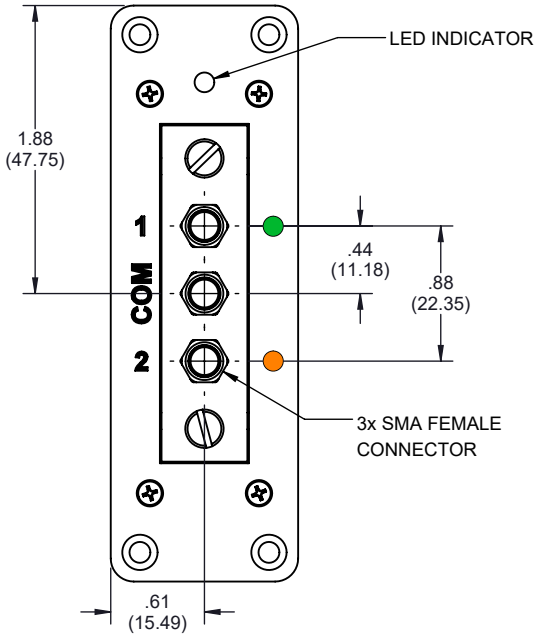
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RF/IF MICROWAVE COMPONENTS

Case Style YD

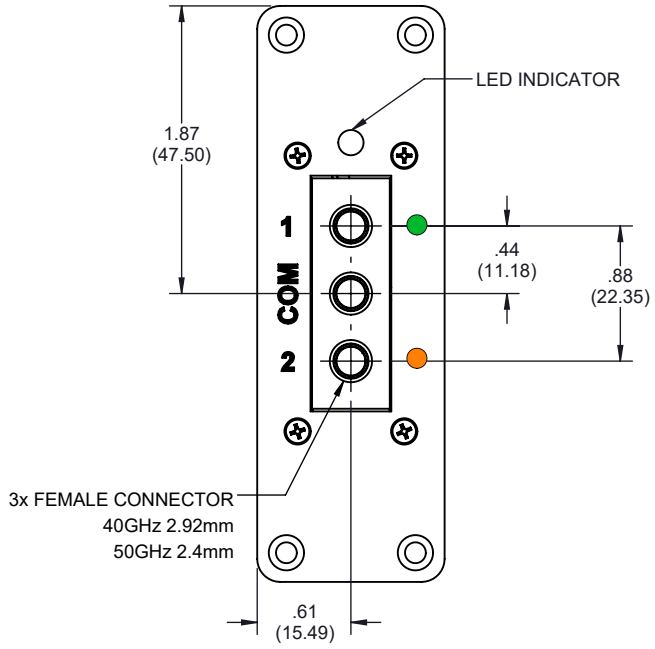
SPDT Switch Options: YD2861



SPDTA 18GHz



SPDTA 26GHz

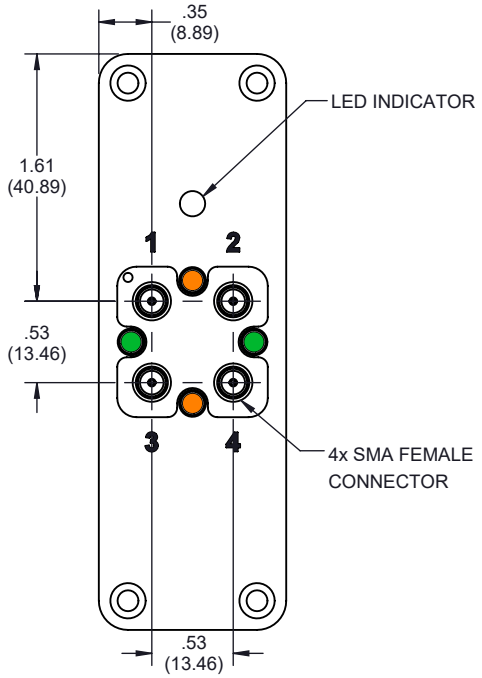


SPDT 40GHz
SPDT 50GHz

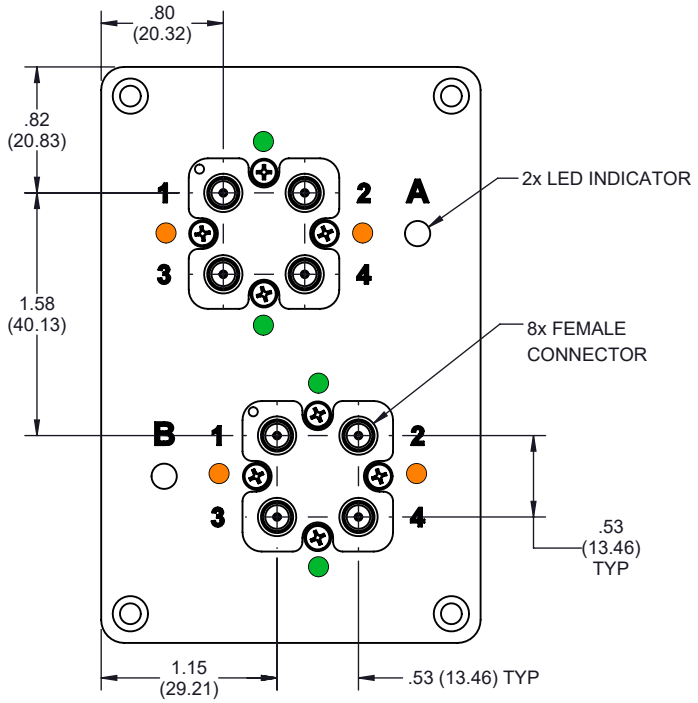
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MTS (Transfer) Switch Options:

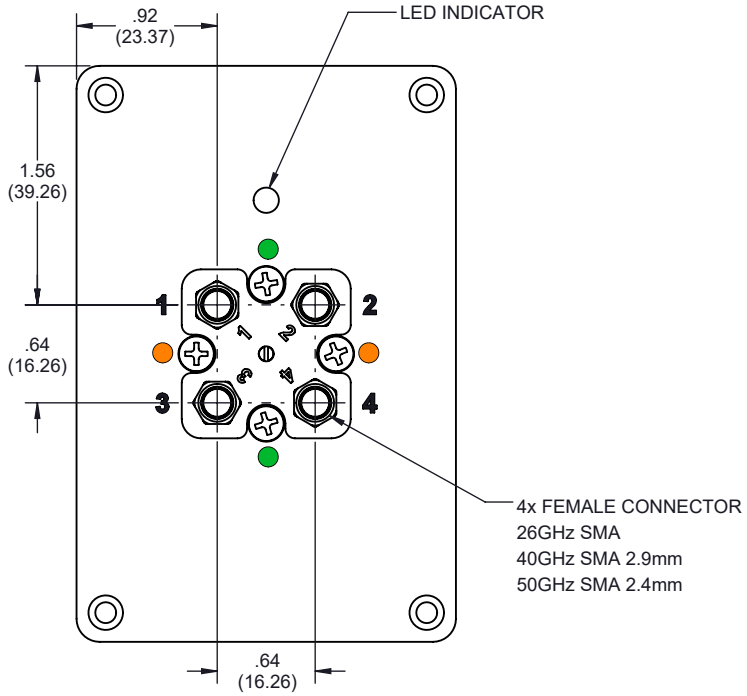
YD2861



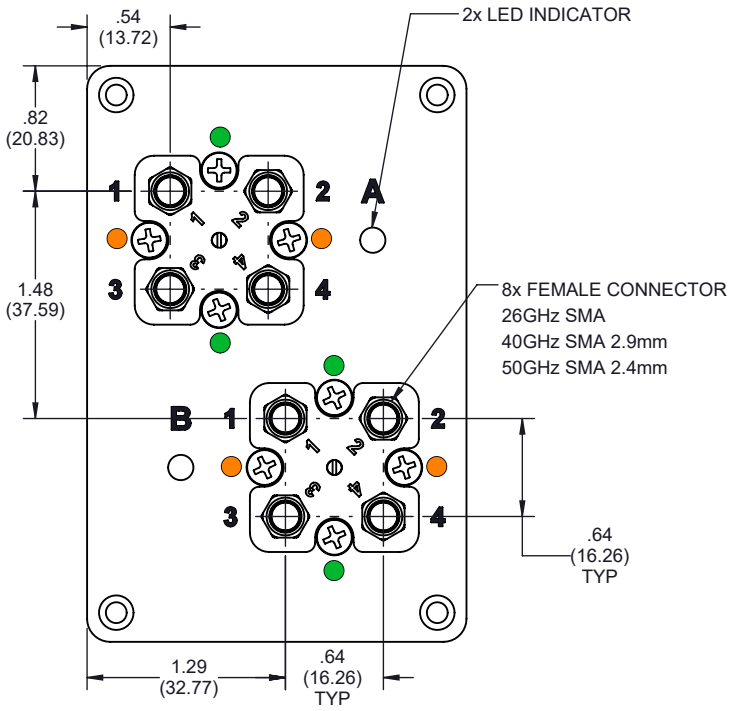
MTS 18GHz



MTS 18GHz



MTS 26GHz
MTS 40GHz
MTS 50GHz

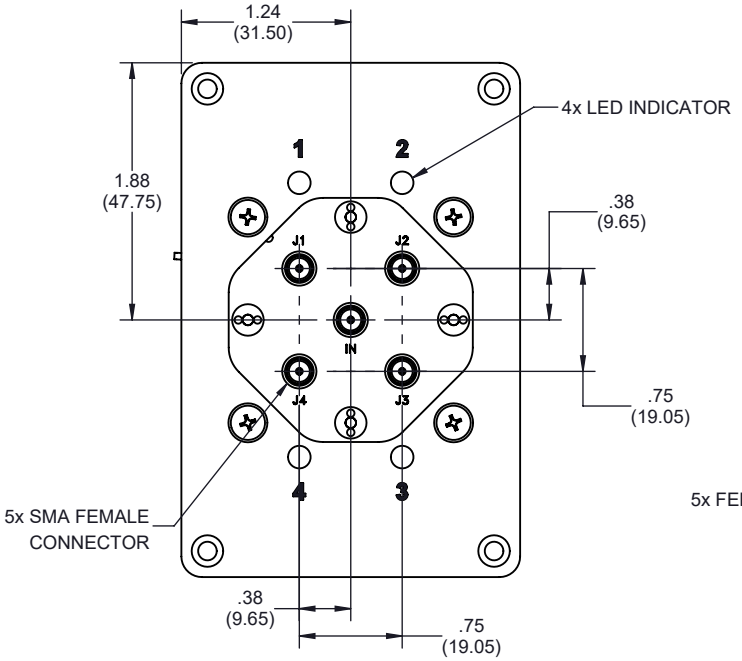


MTS 26GHz
MTS 40GHz
MTS 50GHz

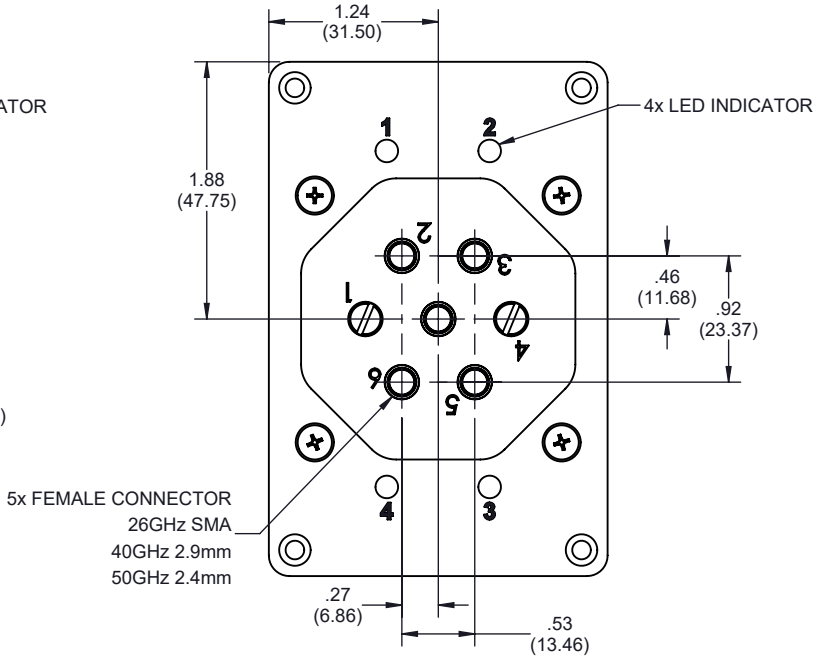
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Case Style YD

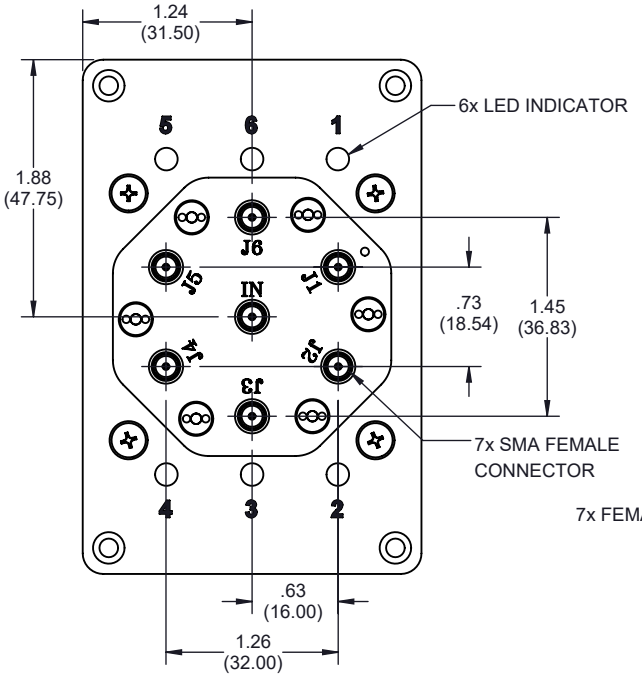
SP4T and SP6T Switch Options: YD2861



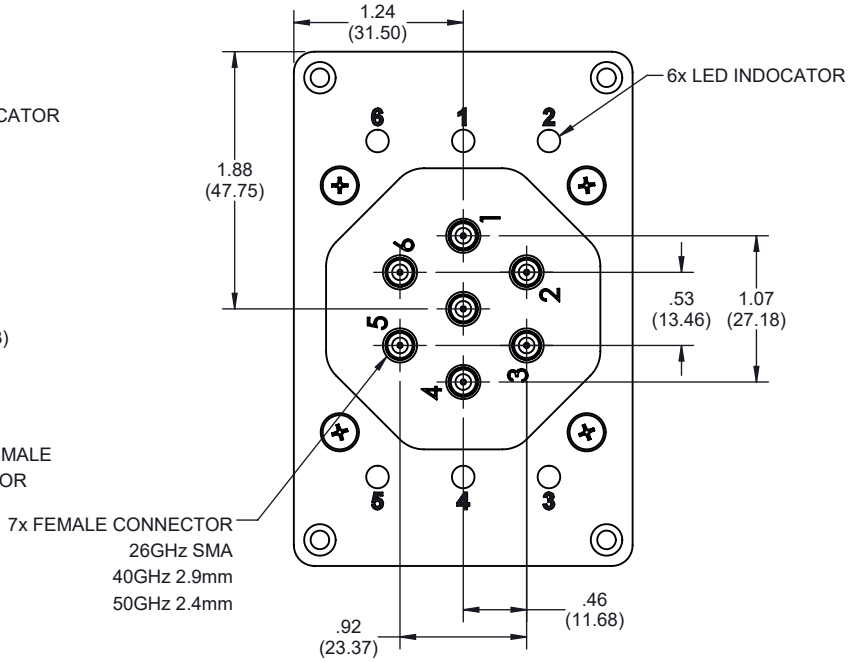
SP4TA 18GHz



SP4TA 26GHz
SP4TA 40GHz
SP4TA 50GHz



SP6TA 12GHz
SP6TA 18GHz

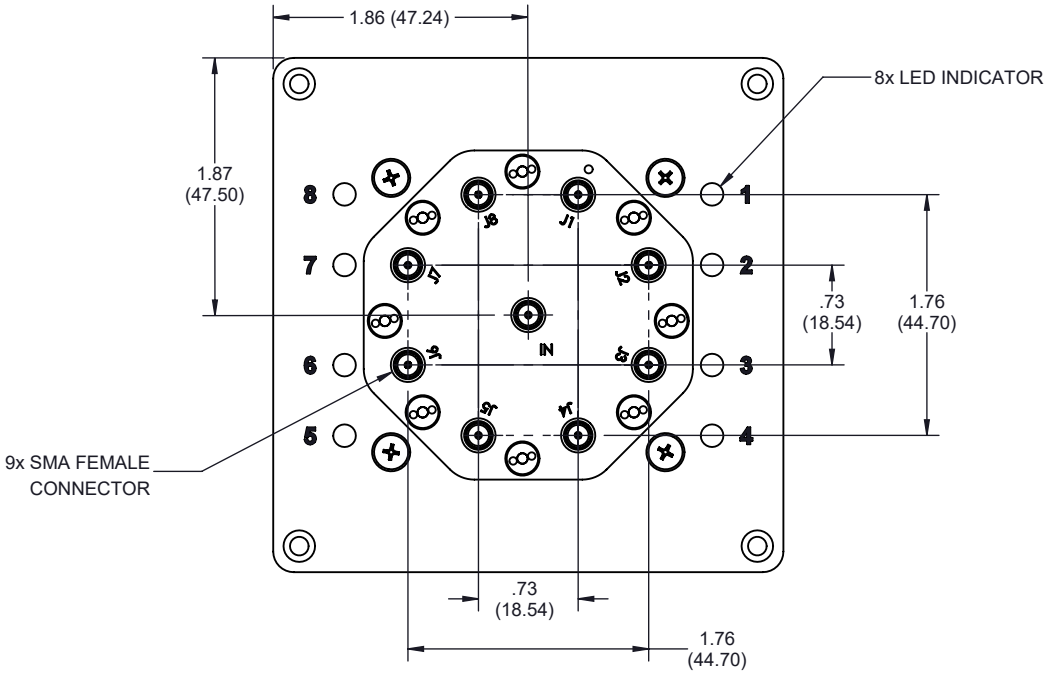


SP6TA 26GHz
SP6TA 40GHz
SP6TA 50GHz

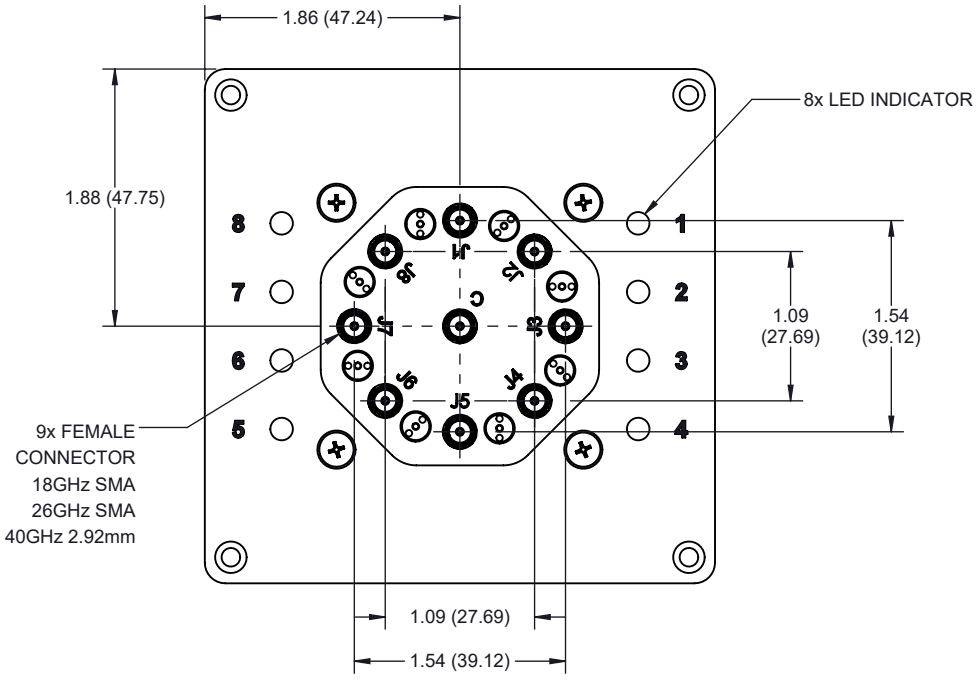
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Case Style YD

SP8T Switch Options: YD2861



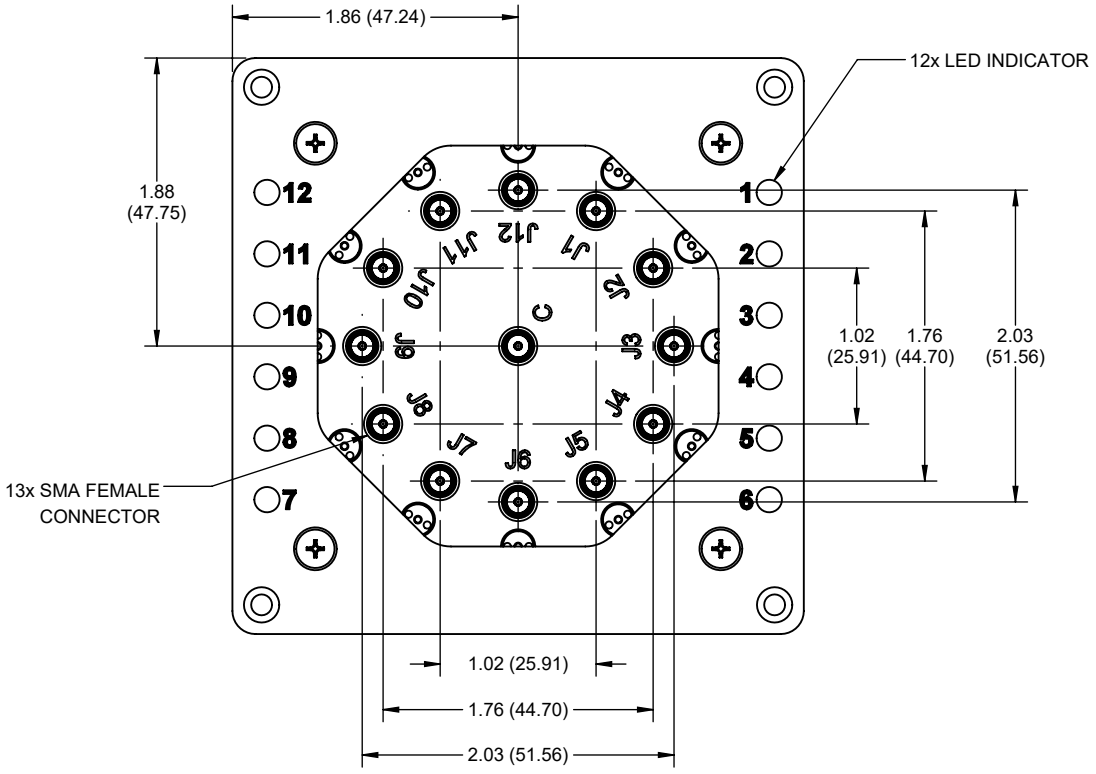
SP8TA 12GHz



SP8TA 18GHz
SP8TA 26GHz
SP8TA 40GHz

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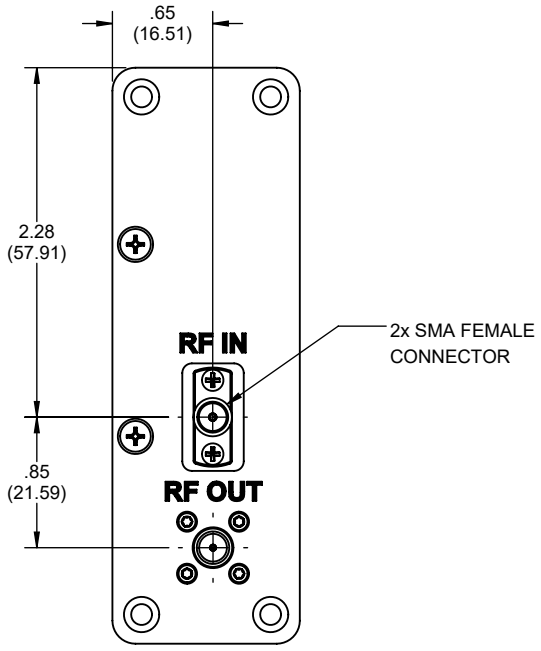
SP12T Switch Options: YD2861



SP12TA 18GHz

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RUDAT Options: YD2861



RUDAT 6GHz 110dB

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