



THE BIG DEAL

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

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.



CASE STYLE: YD2861



DOWNLOAD

SOFTWARE PACKAGE

Refer to our website for compliance methodologies and qualifications



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. |



ELECTRICAL SPECIFICATIONS AT 25°C

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|------------------------------|-----------------------------------|------|------|------|----------------|
| Frequency Range | - | DC | - | 26.5 | GHz |
| Insertion Loss | DC - 8 | - | 0.15 | 0.3 | dB |
| | 8 - 18 | - | 0.35 | 0.6 | |
| | 18 - 26.5 | - | 0.8 | 1.1 | |
| Isolation | DC - 8 | 70 | 80 | - | dB |
| | 8 - 18 | 60 | 75 | - | |
| | 18 - 26.5 | 55 | 70 | - | |
| Return Loss ³ | DC - 8 | - | 20 | - | :1 |
| | 8 - 18 | - | 16 | - | |
| | 18 - 26.5 | - | 14 | - | |
| Switching Time | - | - | 25 | - | ms |
| RF Input Power ¹ | DC - 8 | - | - | 20 | W |
| | 8 - 18 | - | - | 10 | |
| | 18 - 26.5 | - | - | 5 | |
| Switch Lifetime (per Switch) | 100 mW hot switching ² | 2 | - | - | million cycles |
| | 1W hot switching | - | 1 | - | |

1. Maximum power for any connected through path as stated; maximum power into any internal termination is 1W per port, 3W total.

2. Hot switching power above this level will degrade the switch lifetime.

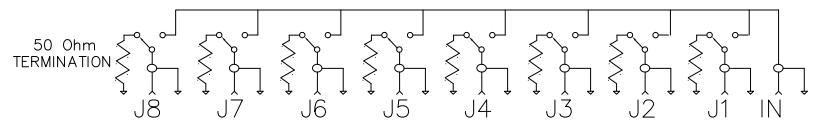
3. Ports 1-8 all states; Com in connected states only.

ABSOLUTE MAXIMUM RATINGS

| Parameter | Ratings |
|-----------------------|---------------|
| Operating Temperature | 0°C to 50°C |
| Storage Temperature | -15°C to 85°C |
| Supply Voltage | 260 Vac |

SWITCHING CONFIGURATION:

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

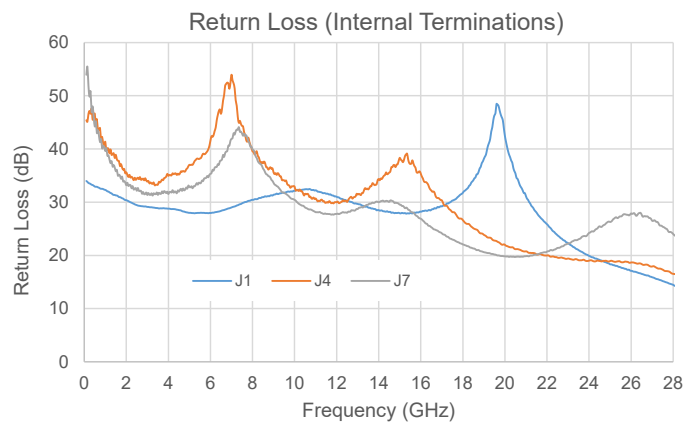
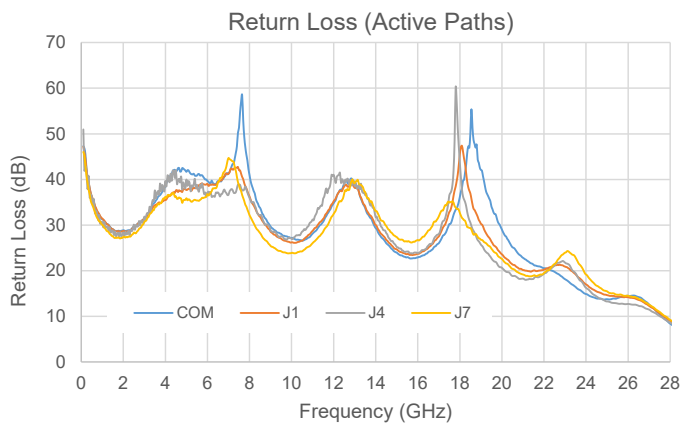
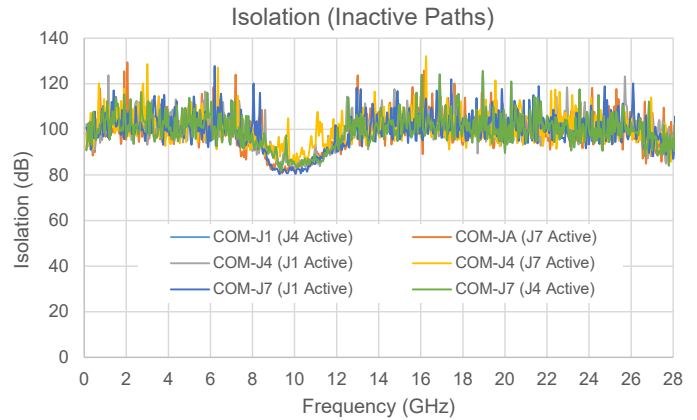
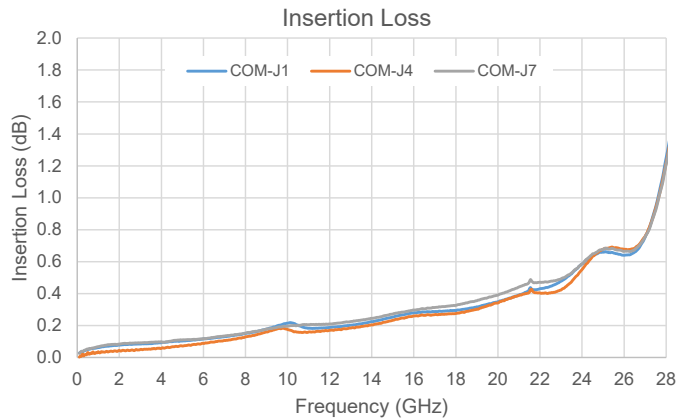


MECHANICAL & ENVIRONMENTAL SPECIFICATIONS

| | | | | |
|-------------------|---|--|----------|----------------------|
| 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 | | |
| | <ul style="list-style-type: none">• ZTM-4SP8T-26• Modular Test System | <ul style="list-style-type: none">• CE / EAC / UKCA• Serial number / date code / model name | | |
| Panel Items | <ul style="list-style-type: none">• Power on / off switch with LED• LED switch position indicators• Carry handles | <ul style="list-style-type: none">• AC mains power input (IEC C14 inlet)• USB type B socket• RJ45 (LAN) socket | | |
| Power Supply | AC mains power input (90-260 V, 47-63 Hz) | | | |
| Fuse | 2A, 250V rating | | | |
| Power Consumption | 150 W max | | | |
| Temperature | Operating: 0 to +50 °C | | | |



TYPICAL PERFORMANCE CURVES

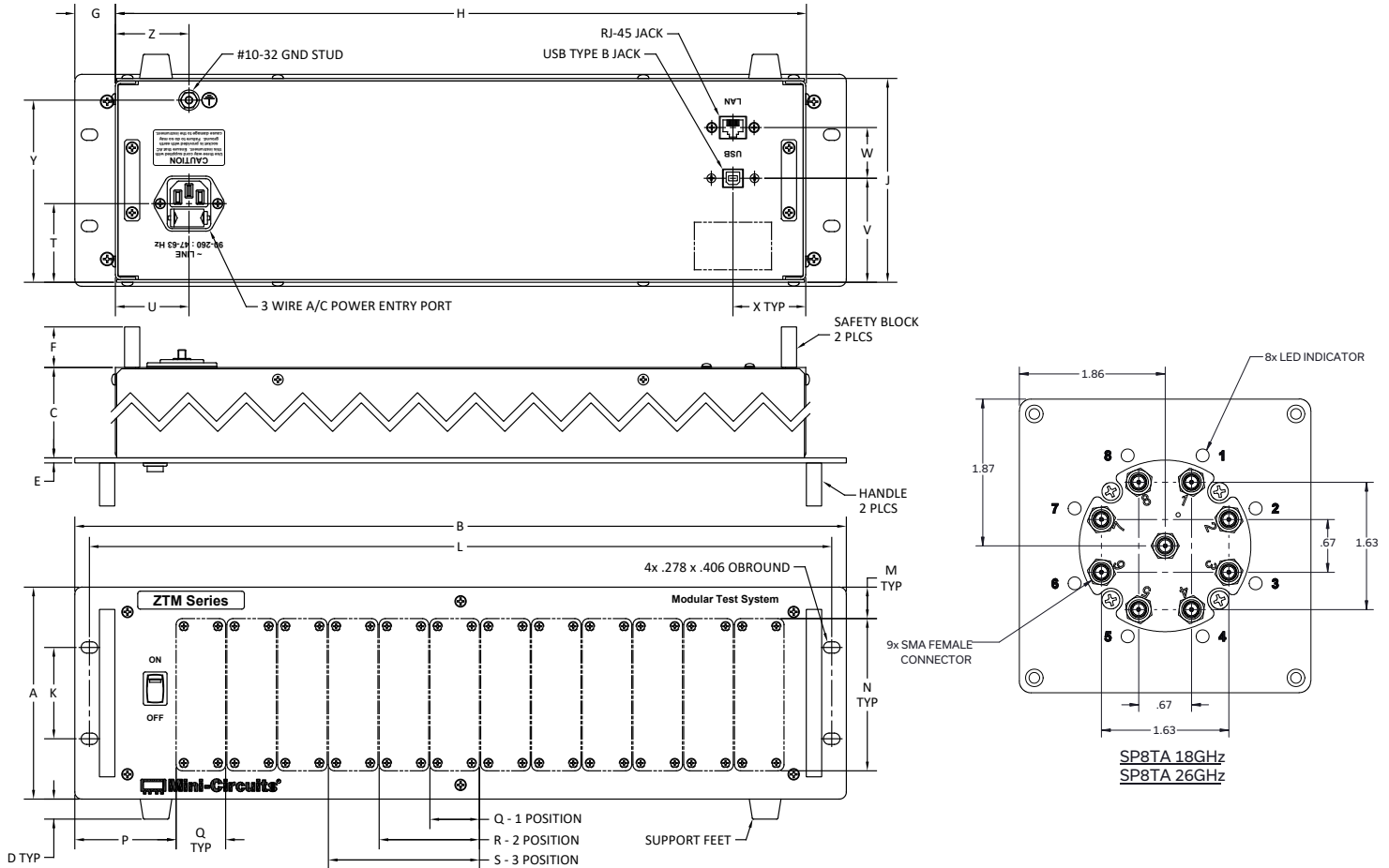




RF SP8T Switch Matrix

ZTM-4SP8T-26

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 | |

**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 μ s 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 | |

PROGRAMMING COMMANDS

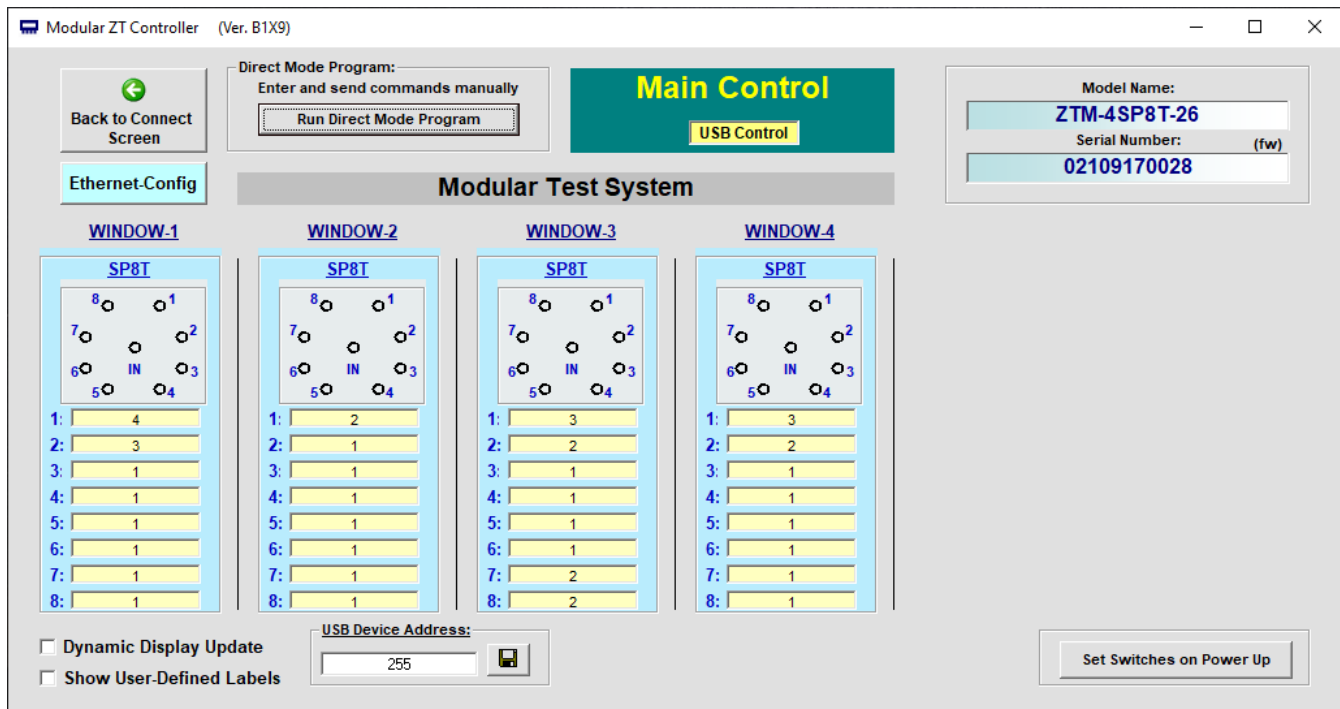
- The key ASCII / SCPI commands for control of the system are summarized below
- These can be sent via the USB or Ethernet API
- Please refer to the programming manual for full details

| 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • sw_number = 1 to n • :SP8T:1:STATE? (get the state of switch 1) |



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 INFORMATIONPlease 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) |

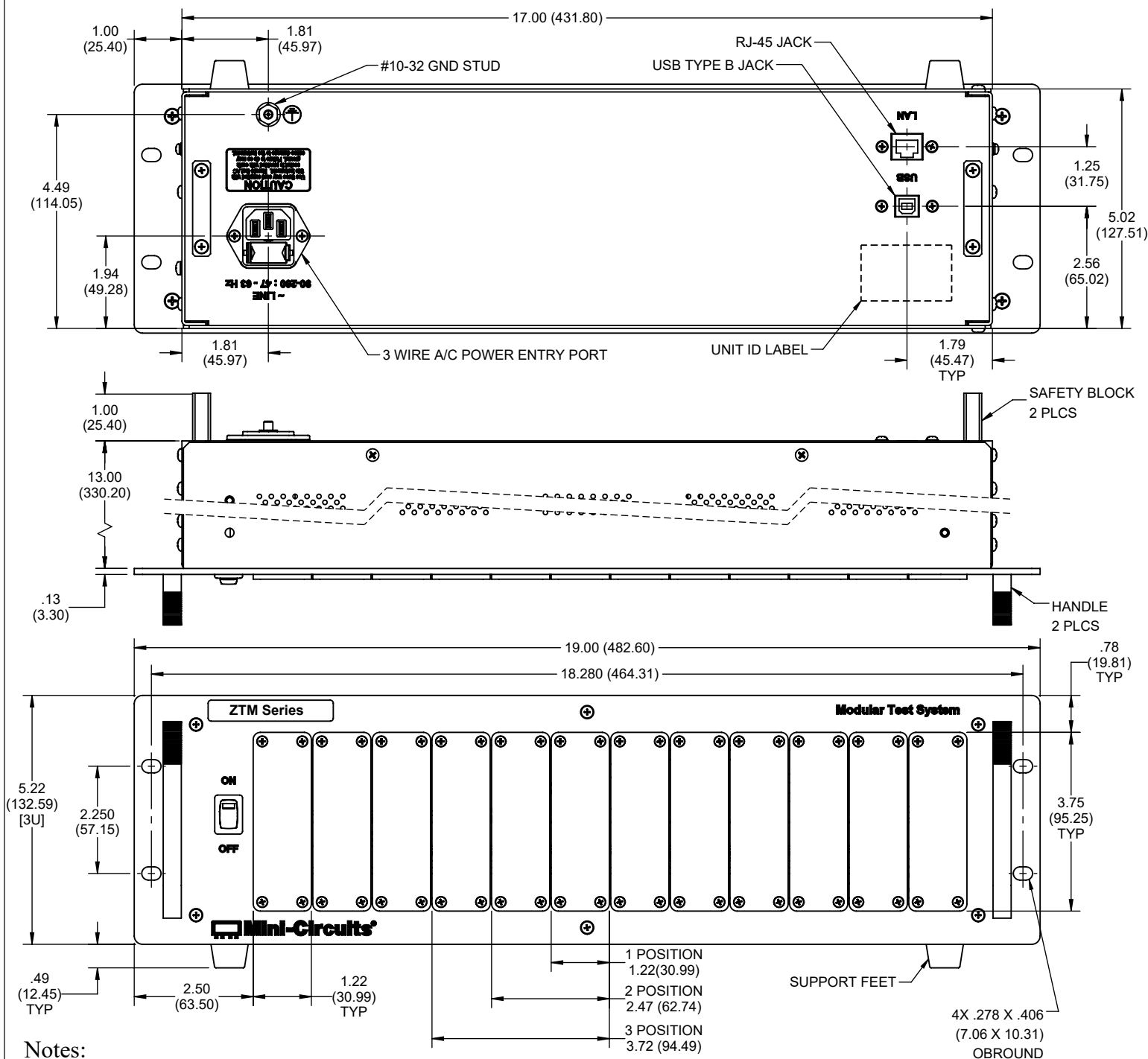
| Cable Model | Region |
|-------------|-------------------|
| CBL-3W-US | USA |
| CBL-3W-EU | Europe |
| CBL-3W-IL | Israel |
| CBL-3W-UK | UK |
| CBL-3W-AU | Australia / China |

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

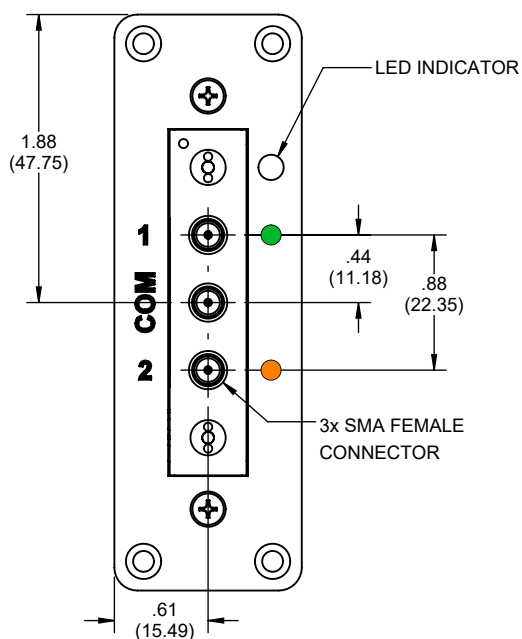
Outline Dimensions

YD2861

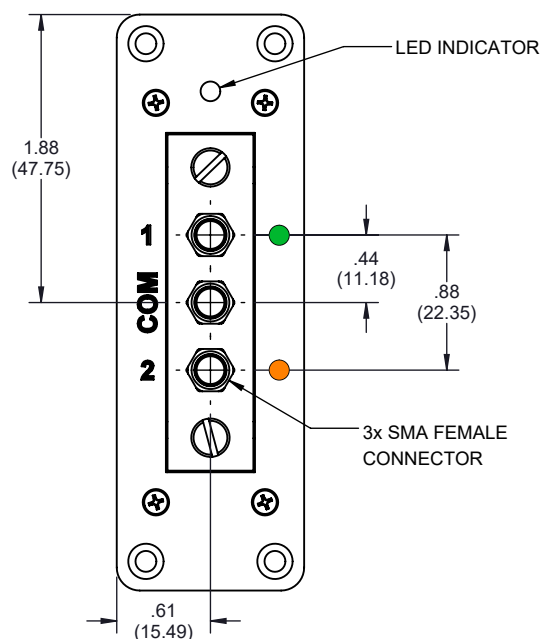


SPDT Switch Options:

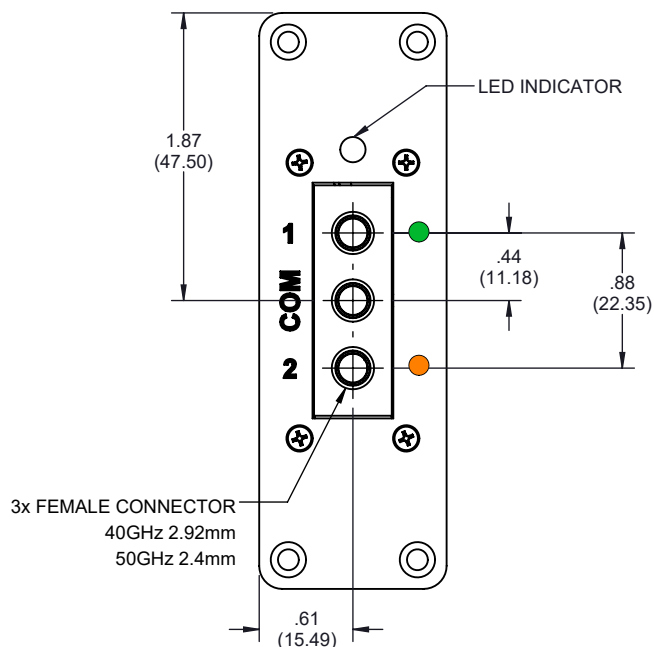
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SPDTA 18GHz



SPDTA 26GHz

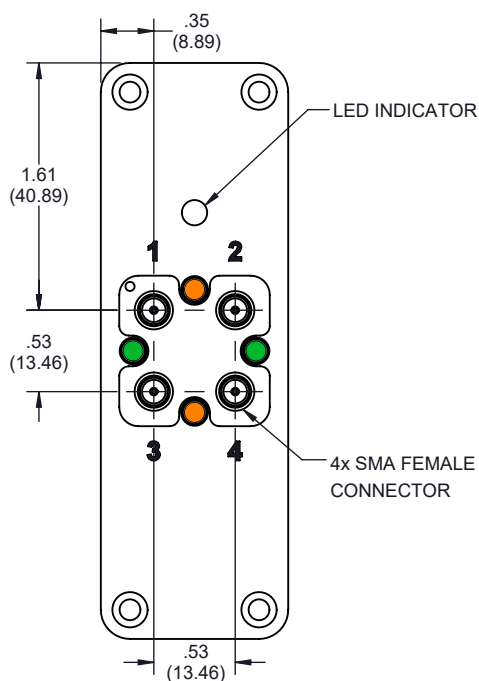


SPDT 40GHz

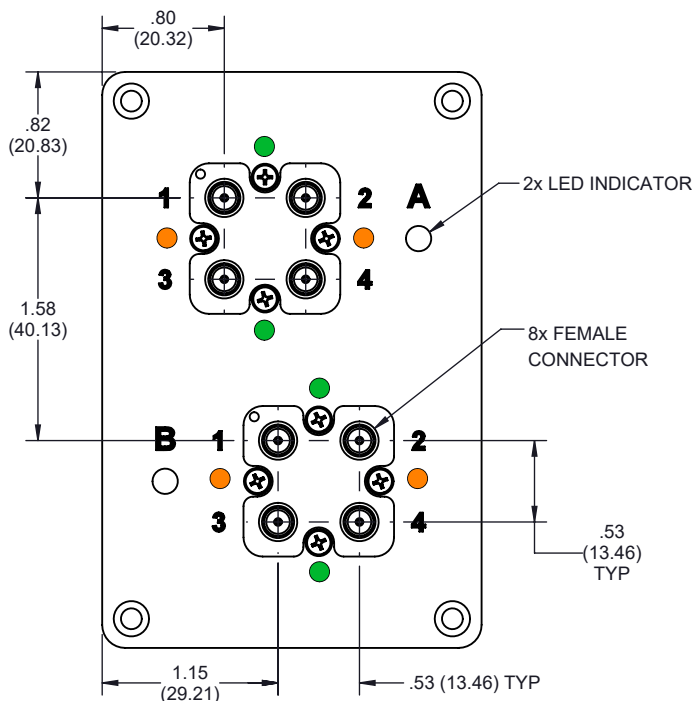
SPDT 50GHz

MTS (Transfer) Switch Options:

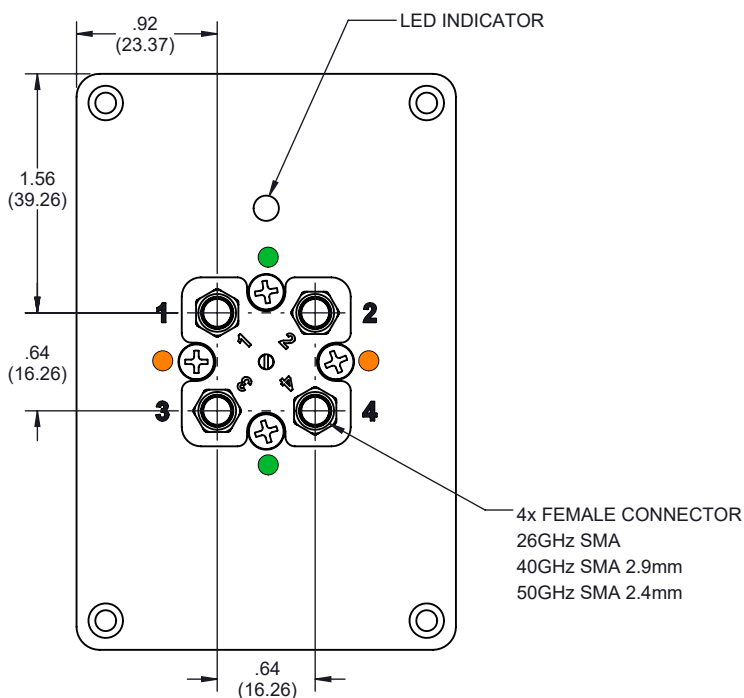
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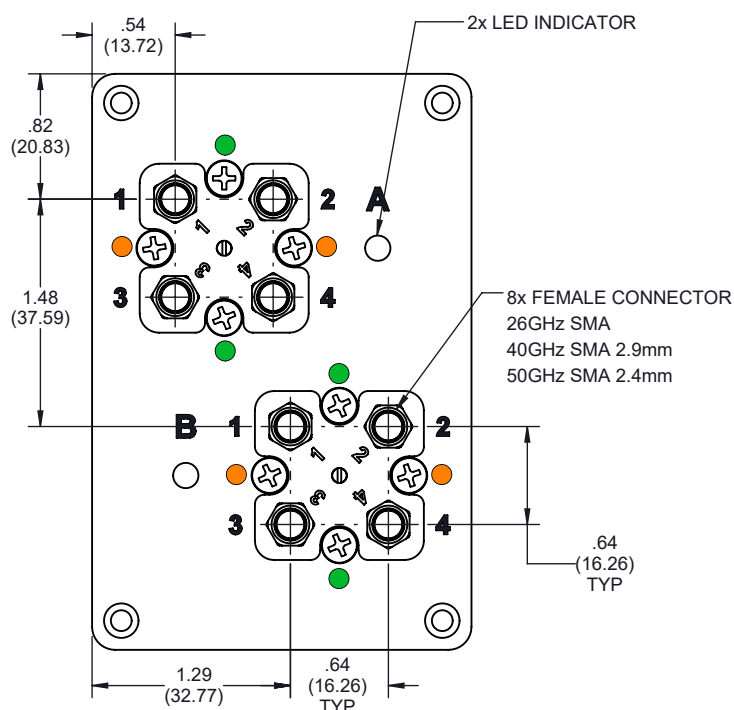
MTS 18GHz



MTS 18GHz



MTS 26GHz
MTS 40GHz
MTS 50GHz



MTS 26GHz
MTS 40GHz
MTS 50GHz

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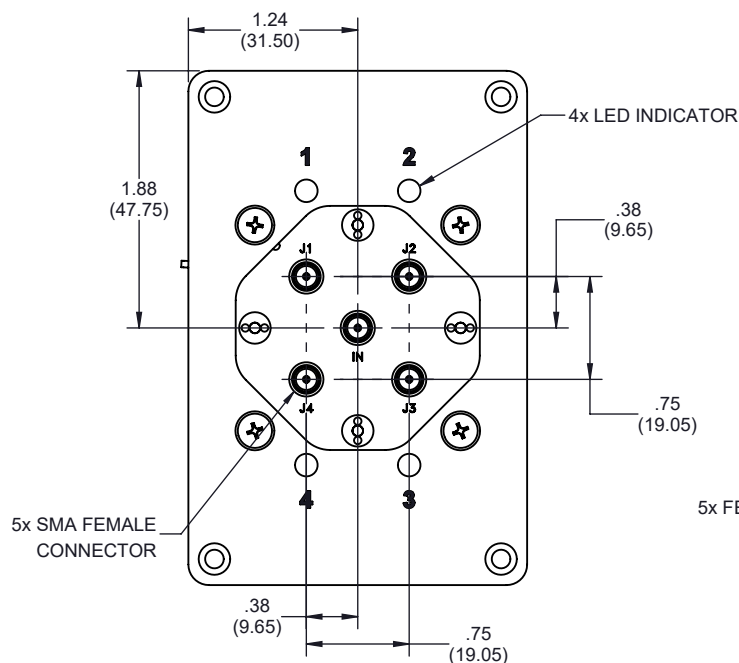


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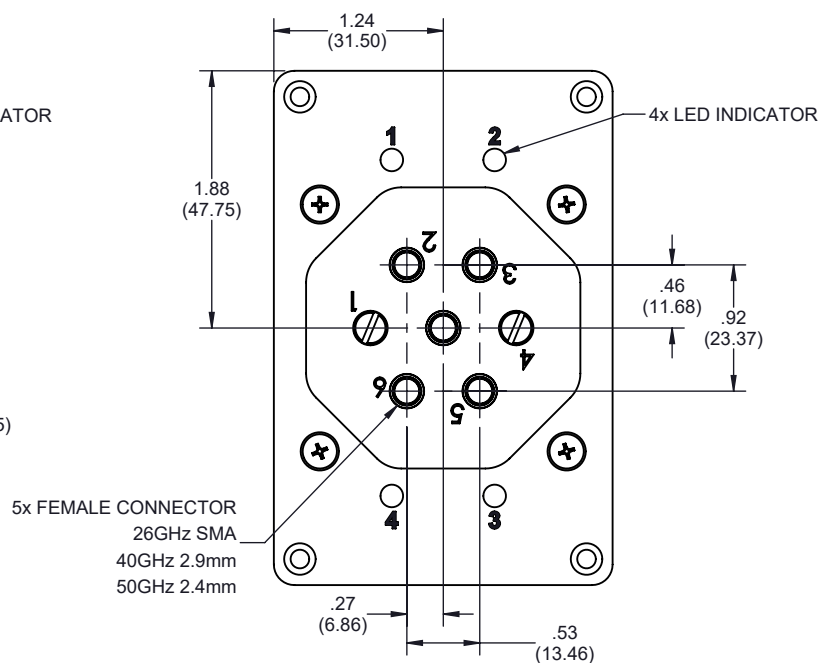
RF/IF MICROWAVE COMPONENTS

SP4T and SP6T Switch Options:

YD2861



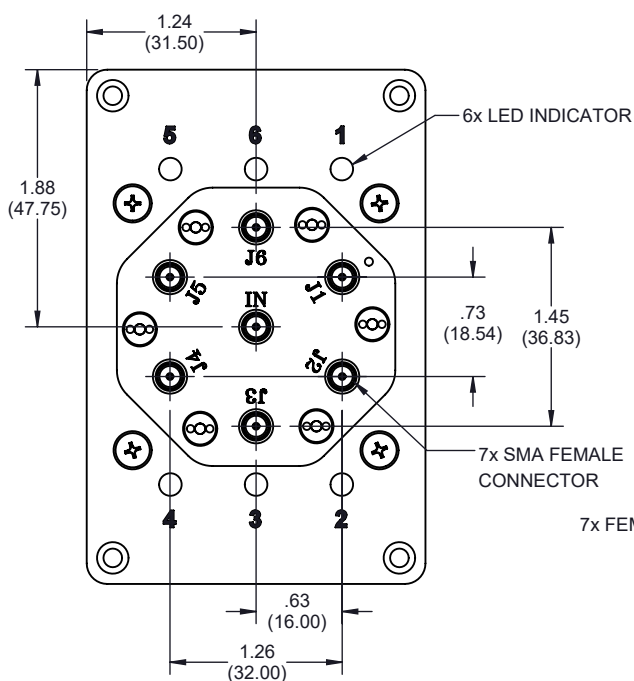
SP4TA 18GHz



SP4TA 26GHz

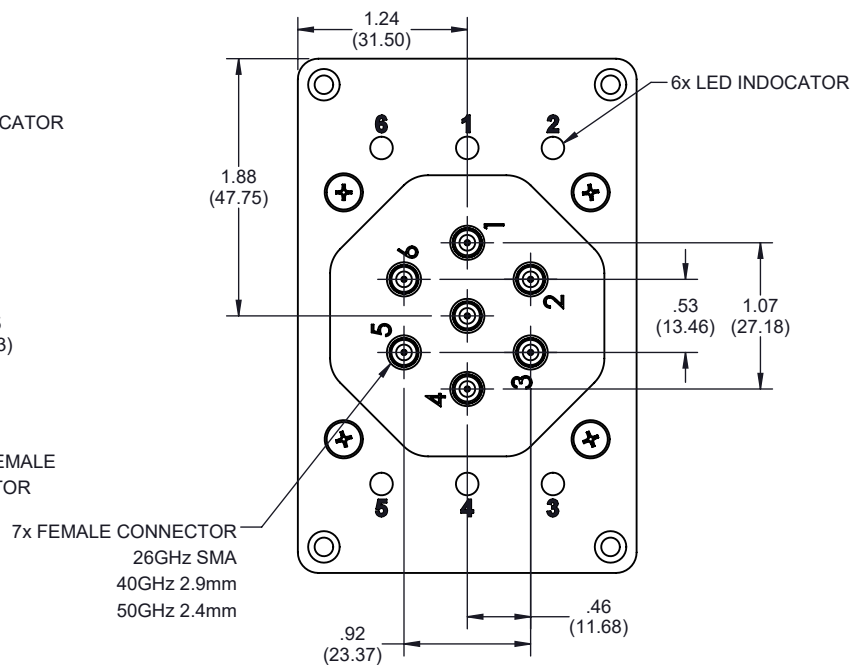
SP4TA 40GHz

SP4TA 50GHz



SP6TA 12GHz

SP6TA 18GHz



SP6TA 26GHz

SP6TA 40GHz

SP6TA 50GHz

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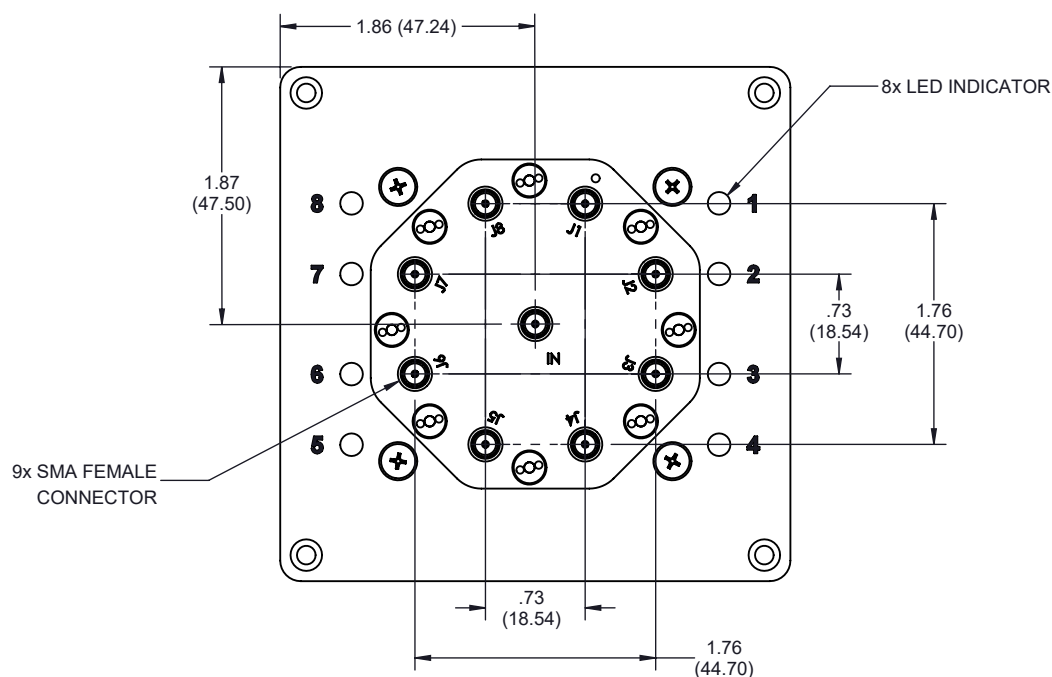


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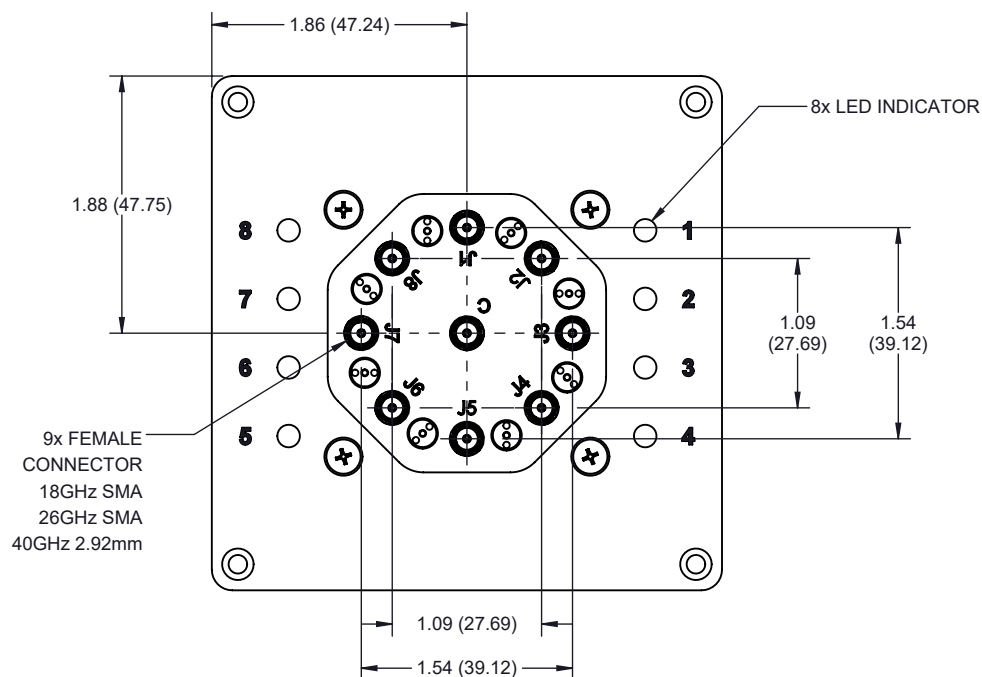
RF/IF MICROWAVE COMPONENTS

SP8T Switch Options:

YD2861



SP8TA 12GHz



SP8TA 18GHz

SP8TA 26GHz

SP8TA 40GHz



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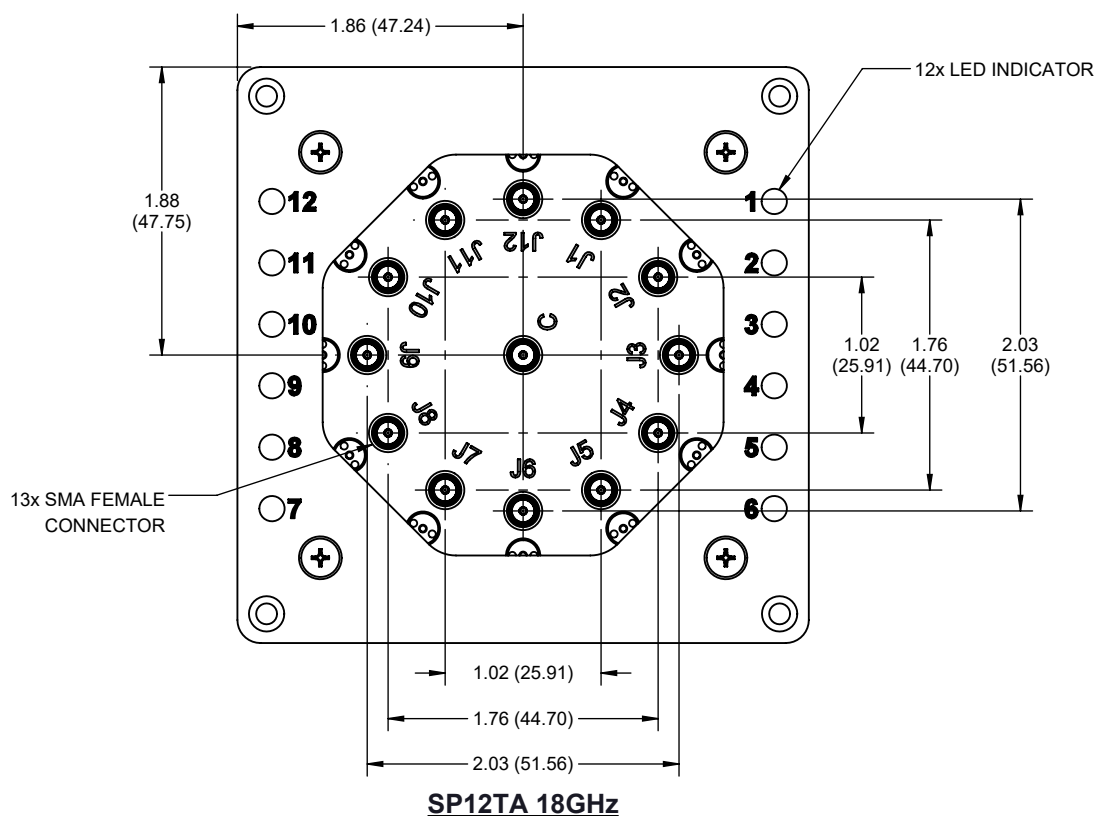


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RF/IF MICROWAVE COMPONENTS

SP12T Switch Options:

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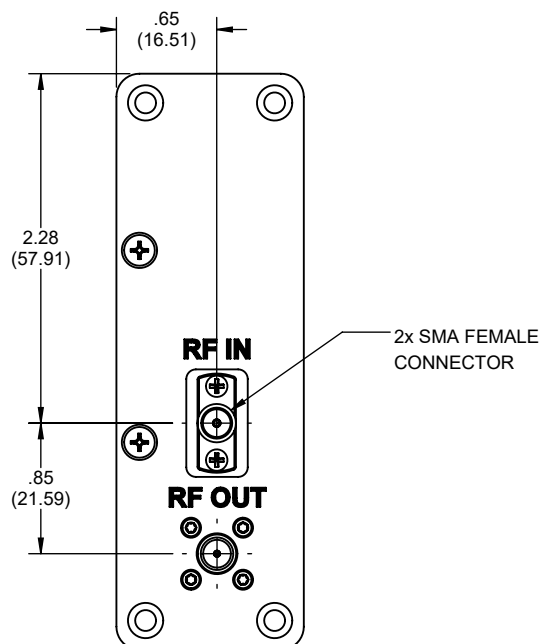


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RF/IF MICROWAVE COMPONENTS

RUDAT Options:

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RUDAT 6GHz 110dB



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RF/IF MICROWAVE COMPONENTS



Environmental Specifications ENV56

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 40° C Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -15° to 85° 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 |