



USB & ETHERNET CONTROLLED

# RF SP8T Switch Matrix **RCM-1SP8T-26**

Mini-Circuits

50Ω DC to 26.5 GHz

## THE BIG DEAL

- Mechanical SP8T switch
- Excellent performance to 26.5 GHz
- High reliability, 2 million switch cycles
- 5W power rating (cold switching)

## APPLICATIONS

- 5G node / device testing
- Automated test equipment
- Fail-safe / redundancy switching



CASE STYLE: UV2068

DOWNLOAD

SOFTWARE PACKAGE

**RoHS Compliant**

See our website for RoHS Compliance methodologies and qualifications

## PRODUCT OVERVIEW

Mini-Circuits' RCM-1SP8T-26 is a software controlled, electro-mechanical SP8T switch. It operates over an extremely wide bandwidth, from DC to 26.5 GHz with high isolation and low insertion loss. The absorptive switch is of a failsafe and break-before-make-configuration, with a minimum lifetime of 2 million switching cycles per switch position, when used within the noted specifications.

The switch box is constructed in a compact, rugged metal case (8.25 x 8.25 x 4.25") with all SMA (f) RF connectors on the front panel. 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).

## KEY FEATURES

| Feature                         | Advantages   |
|---------------------------------|--|
| Mechanical SP8T switch          | Mechanical absorptive switches provide high reliability, repeatable high performance and internal terminations of input signals on the disconnected paths  |
| Operation from DC to 26.5 GHz   | Supports a wide range of RF test and signal routing applications, including 2G, 3G, 4G, 5G, C / S / X / Ku bands with a single device.   |
| Break-before-make configuration | Prevents a momentary connection of the old and new signal paths, reducing the inconsistent transient effects that could otherwise be observed during switching   |
| USB & Ethernet control          | USB HID and Ethernet (HTTP / Telnet) interfaces provide easy compatibility with a wide range of software setups and programming environments   |
| Full software support           | User friendly Windows GUI (graphical user interface) allows manual control straight out of the box, while the comprehensive API (application programming interface) with examples and instructions allows easy automation in most programming environments |

REV. B  
ECO-024239  
RCM-1SP8T-26  
MCL NY  
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## ELECTRICAL SPECIFICATIONS AT +25°C

| Parameter                                    | Conditions (GHz)                  | Min. | Typ. | Max. | Units          |
|--|-----------------------------------|------|------|------|----------------|
| Frequency Range                              |                                   | DC   |      | 26.5 | GHz            |
| Insertion Loss                               | DC - 8                            | —    | 0.15 | 0.30 | dB             |
|  | 8 - 18                            | —    | 0.30 | 0.60 |                |
|  | 18 - 26.5                         | —    | 0.80 | 1.10 |                |
| Isolation                                    | DC - 26.5                         | 55   | 70   | —    | dB             |
| VSWR   | DC - 6                            | —    | 1.20 | —    | :1             |
|  | 6 - 18                            | —    | 1.35 | —    |                |
|  | 18 - 26.5                         | —    | 1.50 | —    |                |
| Switching Time                               | —                                 | —    | 25   | —    | ms             |
| RF Input Power (Cold Switching) <sup>1</sup> | DC - 8                            | —    | —    | 20   | W              |
|  | 8 - 18                            | —    | —    | 10   |                |
|  | 18 - 26.5                         | —    | —    | 5    |                |
| Switch Lifetime (per Switch)                 | 100 mW hot switching <sup>2</sup> | 2    | —    | —    | million cycles |
|  | 1W hot switching                  | —    | 1    | —    |                |
| Rated Voltage                                | 24V <sub>DC</sub> input           | 23   | 24   | 25   | V              |
|  | USB port                          | —    | 5    | —    |                |

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

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

## MAXIMUM RATINGS

| Parameters            | Ratings       |
|-----------------------|---------------|
| Operating Temperature | 0°C to 40°C   |
| Storage Temperature   | -15°C to 85°C |
| Supply Voltage        | 26V           |





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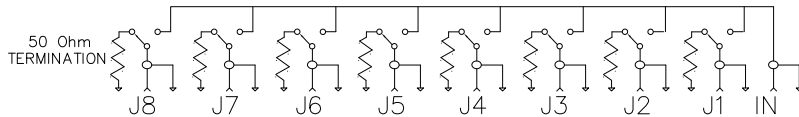
# RF SP8T Switch Matrix **RCM-1SP8T-26**

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## SWITCHING CONFIGURATION:

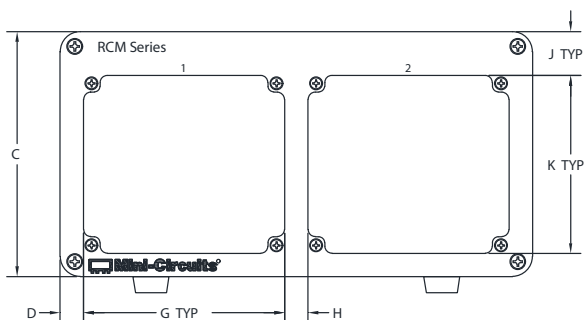
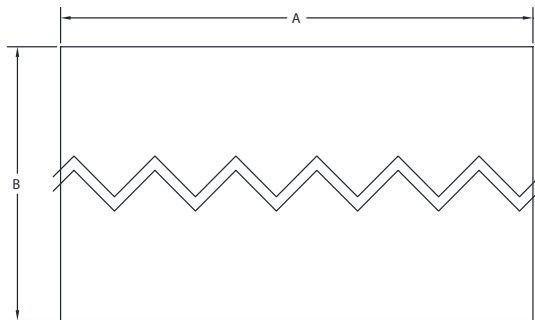
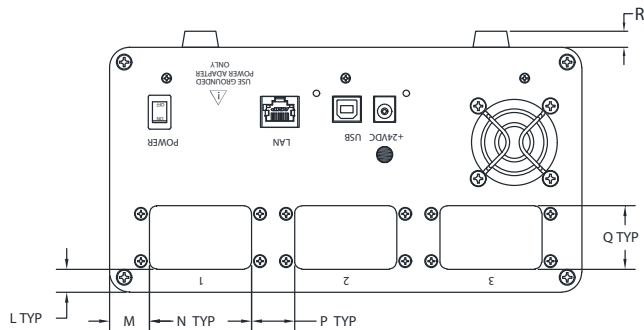
- Normally open (all port disconnected)
- Absorptive (internal terminations on ports J1-J8)



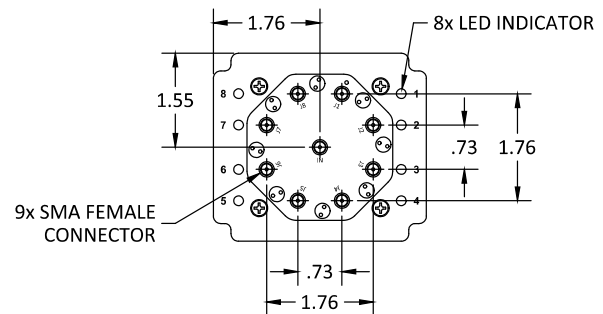
## CONNECTIONS

| Port Name               | Connector Type                  |
|-------------------------|---------------------------------|
| RF Switch A (Com & 1-8) | SMA female                      |
| USB                     | USB type-B                      |
| Ethernet / LAN          | RJ45                            |
| 24V <sub>DC</sub> Input | 2.1mm center positive DC socket |

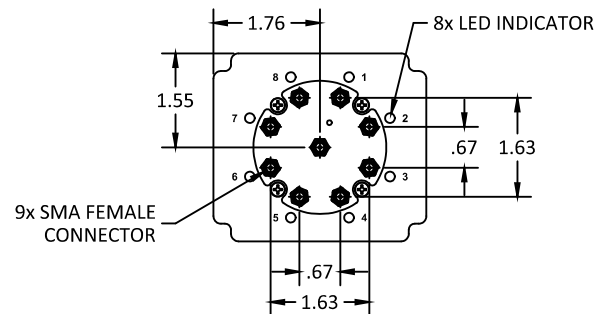
## OUTLINE DRAWING (UV2068)



FRONT PANEL FOR RCM WITH SP8T SWITCHES



SP8TA 12GHz



SP8TA 18GHz  
SP8TA 26GHz

## OUTLINE DIMENSIONS (Inches) mm

| A      | B      | C      | D     | E     | F    | J     | K     | L     | M     | N     | P     | Q     | R   | wt   |
|--------|--------|--------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-----|------|
| 8.25   | 8.25   | 4.25   | .41   | 2.36  | .18  | .76   | 3.09  | .40   | .70   | 1.78  | .76   | 1.10  | .28 | grms |
| 209.55 | 209.55 | 107.95 | 10.41 | 59.94 | 4.57 | 19.30 | 78.49 | 10.16 | 17.78 | 45.21 | 19.30 | 27.94 | 7.1 | 2350 |

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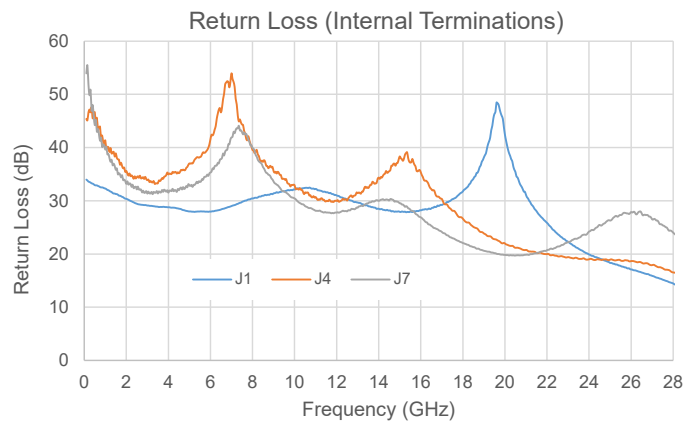
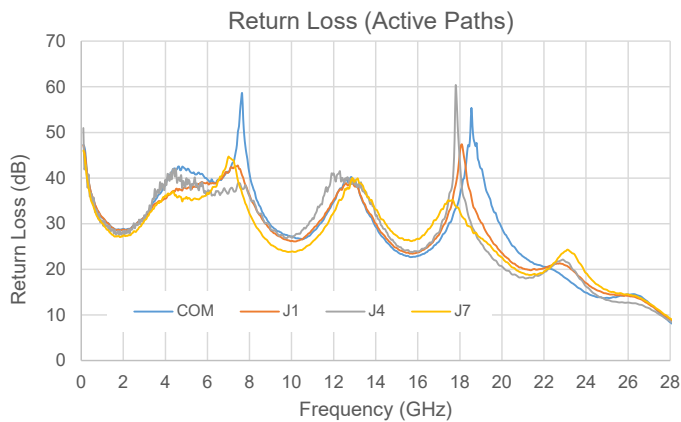
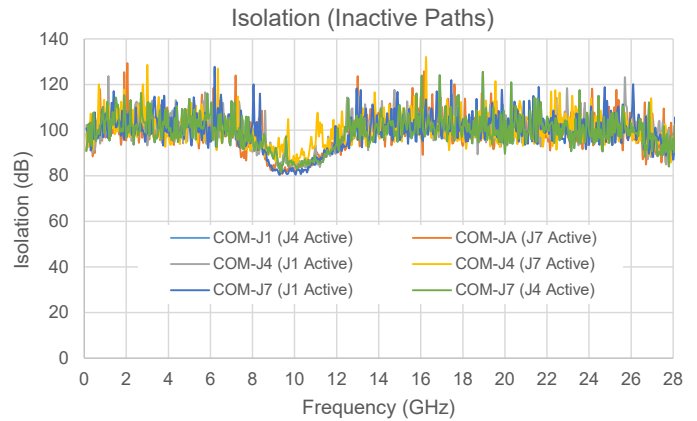
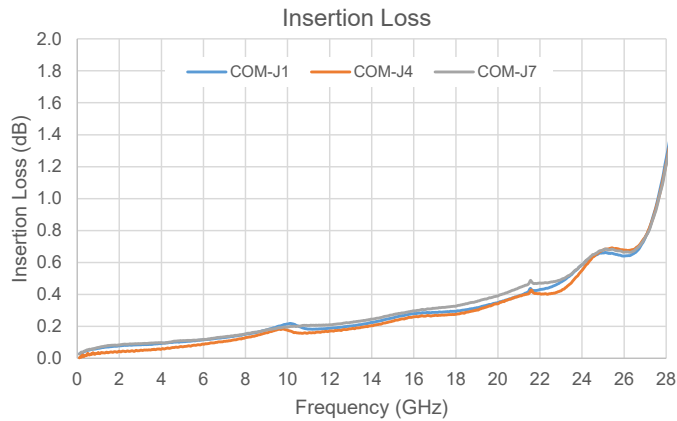
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## TYPICAL PERFORMANCE DATA (PER SWITCH)





## SOFTWARE SPECIFICATIONS

### SOFTWARE & DOCUMENTATION DOWNLOAD:

- 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](http://www.minicircuits.com/softwaredownload/ztm_rcm.html)
- Please contact [testsolutions@minicircuits.com](mailto:testsolutions@minicircuits.com) for support

### MINIMUM SYSTEM REQUIREMENTS:

| Parameter           | Requirements                        |  |
|---------------------|-------------------------------------|--|
| Interface           | USB HID & Ethernet (HTTP & Telnet)  |  |
| 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   |
|                     | Ethernet                            | Windows, Linux or Mac computer with a network port and Ethernet TCP/IP support |
| Hardware            | Pentium II or later with 256 MB RAM |  |

## APPLICATION PROGRAMMING INTERFACE (API)

### ETHERNET SUPPORT:

- Simple ASCII / SCPI command set for attenuator control
- Communication via HTTP or Telnet
- Supported by most common programming environments

### 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.



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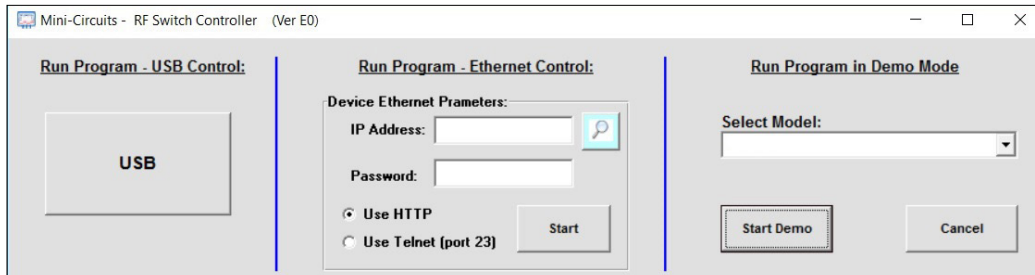
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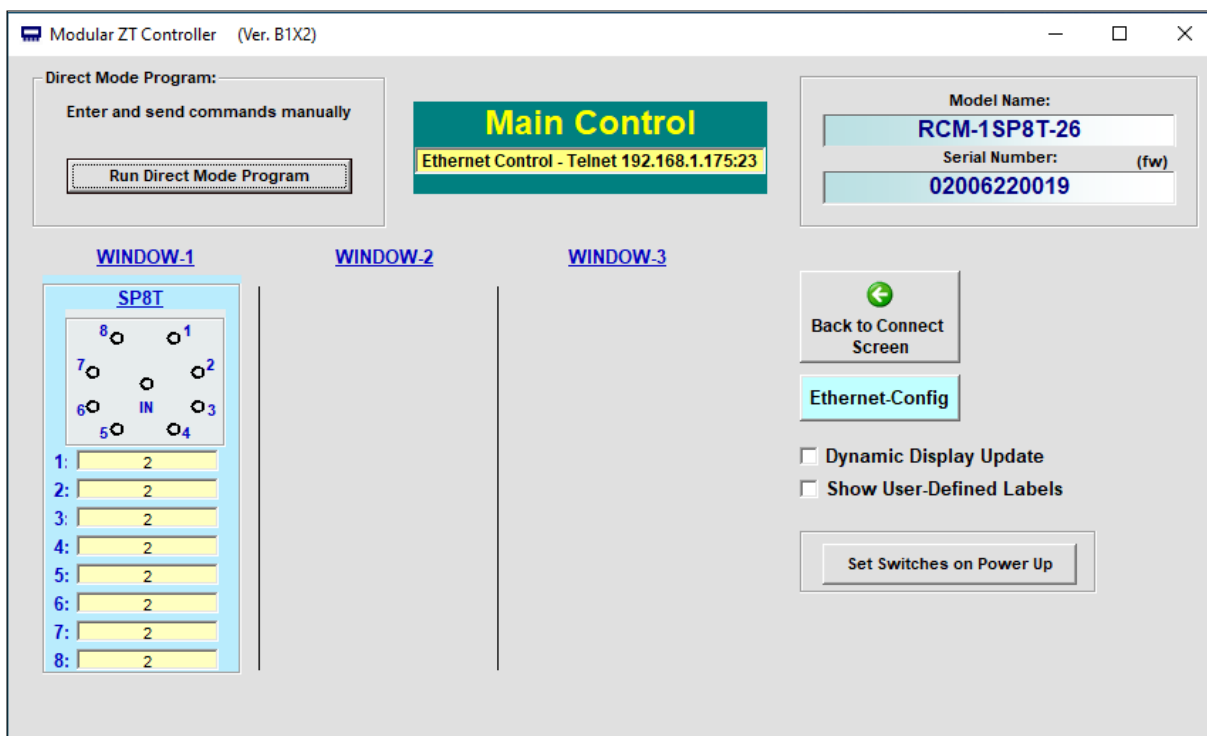
50Ω DC to 26.5 GHz

## 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 switch states at the click of a button
- Configure and run timed switching sequences
- Set start-up switch state
- Configure Ethernet IP settings



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50Ω DC to 26.5 GHz

**ORDERING INFORMATION**Please contact Mini-Circuits' Test Solutions department for price and availability: [testsolutions@minicircuits.com](mailto:testsolutions@minicircuits.com)

| Model        | Description                                  |
|--------------|--|
| RCM-1SP8T-26 | USB & Ethernet controlled SP8T switch matrix |

| Included Accessories  | Part No.      | Description  |
|---|---------------|--|
|  | AC/DC-24-3W1  | AC/DC 24V <sub>DC</sub> Grounded Power Adaptor.<br>Operating temperature: 0°C to +40°C, I <sub>Max</sub> =2.5A |
| See Below   | CBL-3W1-XX    | AC Power Cord (Select one power cord from below with each Switch Matrix box)                                   |
|  | USB-CBL-AB-3+ | 2.7 ft (0.8 m) USB Cable: USB type A(Male) to USB type B(Male)   |

| AC Power Cords <sup>5</sup>   | Part No.   | Description                        |
|---|------------|------------------------------------|
|  | CBL-3W1-US | Power Cord for United States       |
|  | CBL-3W1-EU | Power Cord for Europe              |
|  | CBL-3W1-UK | Power Cord for United Kingdom      |
|  | CBL-3W1-AU | Power Cord for Australia and China |
|  | CBL-3W1-IL | Power Cord for Israel              |

5. If you need a Power cord for a country not listed please contact [testsolutions@minicircuits.com](mailto:testsolutions@minicircuits.com)**OPTIONAL ACCESSORIES**

|                |  |
|----------------|--|
| USB-CBL-AB-3+  | 2.7 ft (0.8 m) USB Cable: USB type A(Male) to USB type B(Male)     |
| USB-CBL-AB-7+  | 6.8 ft (2.1 m) USB Cable: USB type A(Male) to USB type B(Male)     |
| USB-CBL-AB-11+ | 11 ft (3.4 m) USB Cable: USB type A(Male) to USB type B(Male)      |
| CBL-RJ45-MM-5+ | 5 ft (1.5 m) Ethernet cable: RJ45(Male) to RJ45(Male) Cat 5E cable |

**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](http://www.minicircuits.com/MCLStore/terms.jsp)

