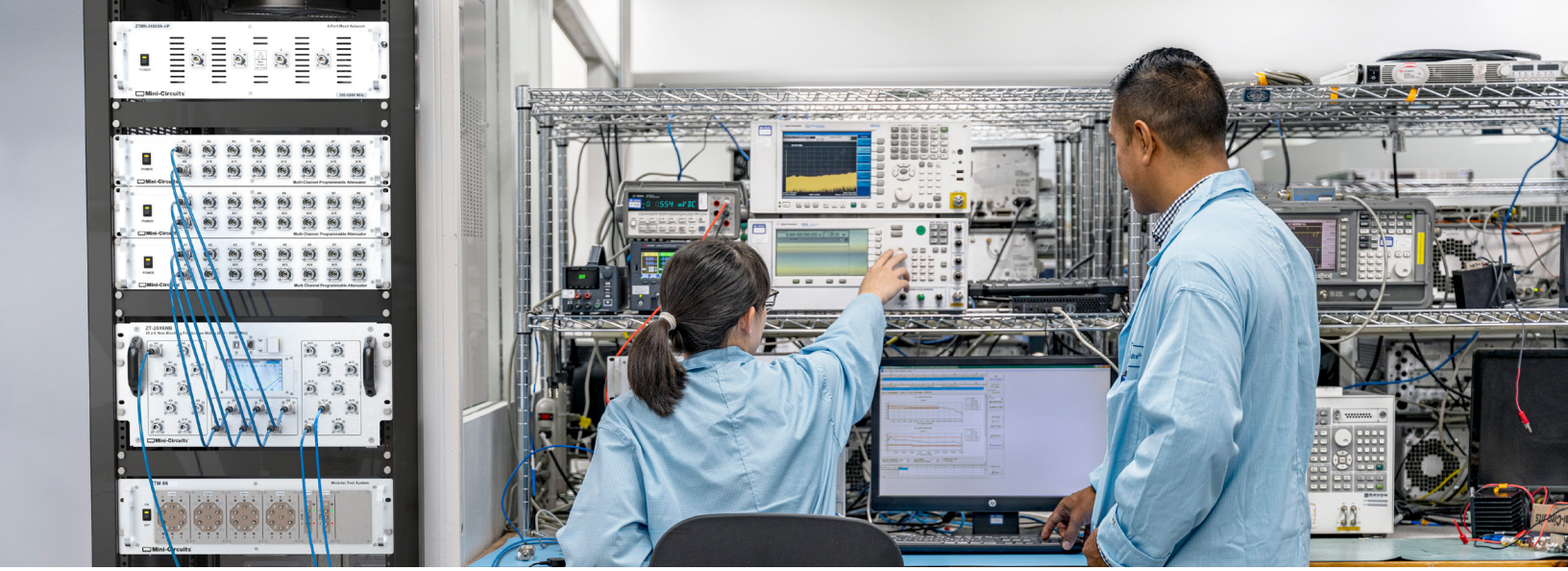
Mini-Circuits®

RF Test Solutions Overview

Built by the company that builds your RF components



VOLUME 01



Mini-Circuits is the world's trusted partner for RF components and sub-systems from DC to mmWave, supporting 20,000 customers with over 10,000 active products.

That's the same RF expertise now built into our test instrumentation. Our engineers understand measurement challenges and production requirements from both sides of the test setup — because they design the components being tested. The result: lab-grade signal generators, power sensors, switches and test systems at a fraction of the cost of traditional instrumentation vendors, backed by the applications support and sales channels you already rely on.

How can we help you?

- Reduce Capital Expenditure Costs
- Lower Total Cost of Ownership
- Simplify Supply Chains
- Automate Test Processes
- Increase Availability of Test Systems
- Improve Test Throughput
- Simplify Complex Test System Integration
- De-Clutter Lab Test Benches
- Minimize Maintenance Intervals
- Maximize Access to Critical Resources

Mini-Circuits Test Solutions

- Signal Generators
- Power Sensors
- Mechanical Switch Assemblies
- Solid-State & MEMS Switches
- Modular Test Systems
- Programmable Attenuators
- Switch Matrices
- Mesh Networks
- Butler Matrices
- Custom Integrated Test Solutions
- Try Before You Buy!
- Demo units available for evaluation – see real performance on your bench before you commit.

Try Before You Buy

Demo units available for evaluation – see real performance on your bench before you commit.

Contact

Website: minicircuits.com/products/PortableTestEquipment.html
Support: testsolutions@minicircuits.com

Test Instrumentation

Signal generators and power sensors are essential tools for any RF / microwave test engineer but traditional instrumentation vendors price them at a premium. Mini-Circuits delivers lab-grade performance and reliability at a fraction of the cost, in compact packages with flexible USB / Ethernet control and user-friendly software. Support for VISA, USB HID, SSH, HTTP, and Telnet interfaces enables seamless integration into existing software frameworks and automated test systems—allowing engineers to get up and running quickly without learning new programming languages or proprietary tools.

Flexible calibration options keep your instruments available, and your total cost of ownership low. Our approved partners provide local, ISO-17025 accredited service options with prompt turnaround. For time-critical or sensitive environments where equipment can't leave the lab, full calibration and correction data is available to support your preferred partner on-site.

PWR-18PWHS-RC	PWR-18RMS-RC	SSG-9GD-RC	SSG-44GHP-RC	RZ16-SYN-83-1
				
• Peak & Average Sensor • 50 MHz to 18 GHz • -60 to +20 dBm • 13 ns pulse resolution • 80 Msps Sampling • USB & Ethernet & LCD	• RMS Sensor • 50 MHz to 18 GHz • -60 to +20 dBm • USB & Ethernet & LCD	• Dual-Channel Sig Gen • 10 MHz to 9 GHz • -55 to +21 dBm • CW, Sweep & Hop, Pulse, Chirp, AM / FM • USB, Ethernet, Daisy-Chain & LCD	• Single-Channel Sig Gen • 100 MHz to 44 GHz • -40 to +23 dBm • CW, Sweep & Hop, Pulse • USB, Ethernet & Daisy-Chain	• 16-Channel Sig Gen • 7.7-8.7 GHz • -12 to +2 dBm • Custom frequency bands available • USB & Ethernet
Best For...				
Analysis of pulsed / modulated signals	Fast, accurate RMS power monitoring	Signal source with low cost per channel	mmWave signal generation	Dense multi-channel test environments

Full product range: minicircuits.com/WebStore/RF-Signal-Generation-Measurement.html

Programmable Attenuators

Mini-Circuits programmable attenuators provide a fast, reliable, and repeatable way to emulate real-world RF signal variations without manual intervention. They help test engineers increase automation, improve production efficiency, and reduce costly setup errors while enabling comprehensive validation of wireless devices across a wide range of operating conditions. With broad attenuation ranges and high-speed switching capabilities, they accurately replicate signal fading, path loss, and receiver sensitivity scenarios, ensuring products perform reliably before deployment.

RCDAT-8000-90	RCDAT-18G-63	EDAT-67G-60	RC8DAT-8G-95	ZT16DAT-8G-95
				
• Programmable Attenuator • 0-90 dB (0.25 dB Steps) • 1 MHz to 8 GHz • USB & Ethernet	• Programmable Attenuator • 0-63 dB (0.25 dB Steps) • 100 MHz to 18 GHz • USB, Ethernet, RS232 & TTL	• Programmable Attenuator • 0-63 dB (0.5 dB Steps) • 10 MHz to 67 GHz • USB, Ethernet & Daisy-Chain & LCD	• 8-Channel Attenuator • 0-95 dB (0.25 dB Steps) • 1 MHz to 8 GHz • USB & Ethernet	• 16-Channel Attenuator • 0-95 dB (0.25 dB Steps) • 1 MHz to 8 GHz • USB, Ethernet & Daisy-Chain

Full product range: minicircuits.com/WebStore/RF-Programmable-Attenuators.html

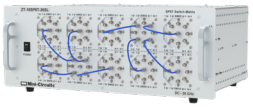
Switch Assemblies

RF switches are the key building block of any test environment — turning expensive test equipment into a shared resource, cutting capital expenditure and automating validation and production testing. Mini-Circuits offers the widest range of switch technologies in the industry, so you get the right trade-off of speed, lifetime and RF performance for your application, with USB / Ethernet control and a flexible API for fast, low-effort automation.

Mechanical Switch Assemblies

Mechanical switches are the standard for RF test systems: exceptionally wide bandwidth, low insertion loss, high linearity, and very high isolation. Direct metal-on-metal contact gives the closest approximation to a direct connection between two devices — minimizing the switch's own impact on your measurement data. Rated for millions of switch cycles, so maintenance intervals stay far apart.

Best For...
Applications where RF performance and measurement accuracy matter more than switching speed.

ZK-MSP8TA-12	RCM-2SP12T-18	RCMX-2SP6T-E67	ZT-10SP8T-26SL
			
• SP8T Absorptive • Normally Open • DC-12 GHz • TTL Control	• 2 x SP12T Absorptive • Normally Open • DC-18 GHz • USB & Ethernet	• 2 x SP6T Absorptive • Latching • DC-67 GHz • USB & Ethernet	• 10 x SP8T Absorptive • Normally Open • DC-26 GHz • USB & Ethernet

Full product range: minicircuits.com/WebStore/RF-Mechanical-Switch-Systems.html

Solid-State Switches

When switching speed or lifetime matters more than absolute RF performance, solid-state switches trade a small amount of insertion loss and isolation for switching times in the µs–ns range and no moving parts to wear out. That speed minimizes interruption to high-data-rate channels and extends usable service life — lowering the real cost of testing over time.

Best For...
Applications where RF performance and measurement accuracy matter more than switching speed.

USB-1SP16T-83H	TTL-1SP8T-183	USB-1SP2T-A44	RCS-1SP4T-A673	ZTS-1SP80T-852
				
• SP16T Absorptive • 1 MHz – 8 GHz • USB, TTL & Daisy-Chain	• SP8T Absorptive • 100 MHz – 18 GHz • TTL Control	• SPDT Absorptive • 100 MHz – 43.5 GHz • USB & Daisy-Chain	• SP4T Absorptive • 100 MHz – 67 GHz • USB & Daisy-Chain	• SP80T Absorptive • 10 MHz – 8.5 GHz • USB & Ethernet & Daisy-Chain

Full product range: minicircuits.com/WebStore/RF-Solid-State-Switch-Systems.html

MEMS Switch

MEMS switches close the gap between the two traditional technologies: RF performance close to mechanical switches, with the speed and reliability of solid-state. Rated for up to 30 billion switch cycles, they're built for applications with extremely high switch turnover.

Best For...
High cycle-count applications that can't compromise on RF performance.

MEM-1SP4T-A18



- SP4T Absorptive
- DC – 18 GHz
- Up to 30 billion switch cycles
- USB & Daisy-Chain

More information: minicircuits.com/WebStore/dashboard.html?model=MEM-SP4T-A18

Modular Test Systems

Build exactly the test system you need! Order any combination of switches, programmable attenuators, amplifiers, and passive components in a single modular chassis, cutting integration complexity, engineering effort, and total cost of ownership. As your test requirements change, your own engineering team can rearrange or replace modules directly — no returning equipment to a manufacturer, no waiting on service engineers.

RCM SERIES



- Compact Benchtop Chassis
- Up to 6 components per chassis

ZTM SERIES



- 3U Rack-Mount Chassis
- Up to 12 Components per Chassis

ZTM2 SERIES



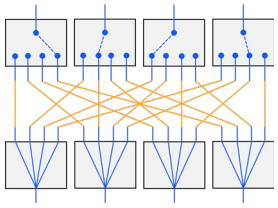
- 5U Rack-Mount Chassis
- Up to 24 Components per Chassis

Full product range: https://www.minicircuits.com/WebStore/RF-Modular-Test-Systems.html

Rack-Mounted Test Assemblies

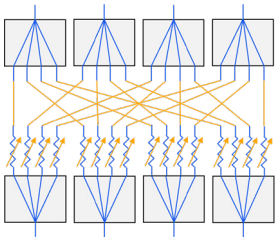
Focus your engineering effort on your product, not your test rack. Send us your requirements, and we'll propose the best combination from our range of standard building blocks — or, if the solution doesn't exist yet, our engineers will design a custom integrated test system to your block diagram.

SWITCH MATRICES



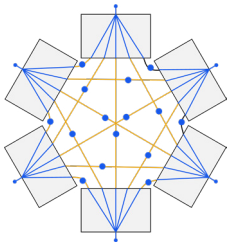
- Blocking & non-blocking switch matrices for reliable & repeatable signal routing
- Extend 2-port VNAs to multiple devices or channels
- Automate connections between combinations of test instruments & DUT

FULL FAN-OUT MATRICES



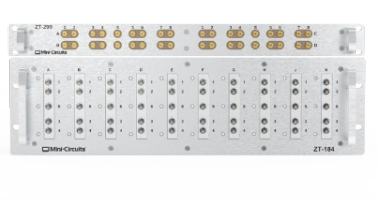
- Completely flexible matrices for routing between any combination of input & output ports
- Programmable attenuators give precise control of signal levels on each independent path
- Ideal for transceiver and cellular handover test applications

MESH NETWORKS



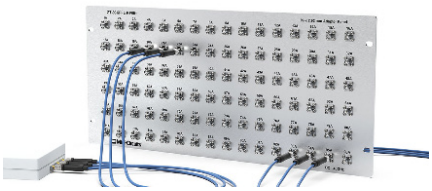
- 4 to 16-port mesh network emulators for characterizing wireless devices
- Simulate OTA connections with independently programmable attenuation on each path
- Ideal for R&D / qualification tests on VHF / UHF, ISM, Wi-Fi & Zigbee radios or IoT devices

ACTIVE & PASSIVE SPLITTERS



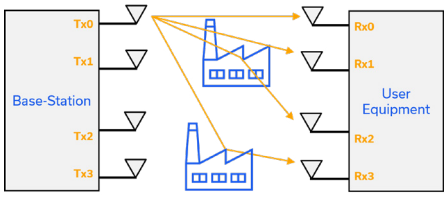
- Integrate signal routing components within the test rack to minimize clutter and error
- Leverage Mini-Circuits unmatched catalog of power splitters & combiners from DC to 67 GHz+
- Active splitters with unity gain and DC passing options for distribution of GPS timing and L-band satcom signals

PATCH PANELS



- Patch panels simplify cable organization and allow integration of RF accessories within the rack structure, for easier management and fault-finding in complex test environments

BUTLER MATRICES

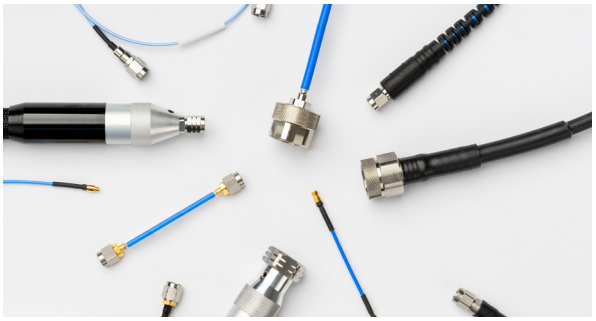


- 4x4 and 8x8 passive matrices with precise phase offsets between outputs
- Antenna beam-forming applications
- Simulate MIMO multi-path propagation effects for receive characterization

Full product range: minicircuits.com/products/PortableTestEquipment.html

Test Accessories & Components

Mini-Circuits simplifies RF test system design with a broad range of cables, adapters, attenuators, amplifiers, filters and other essential accessories. Combining excellent performance, fast delivery from stock and exceptional value, they help customers achieve accurate results while reducing procurement complexity and overall test costs.



RF CABLES

Precision test and interconnect cables for 50 Ω and 75 Ω systems, covering DC to 110 GHz. Choose from phase-stable, temperature-stable and low-loss cable types with connectors from SMA and N-Type through 2.92 mm to 1.0 mm. Custom assemblies are available to meet your exact requirements.



AMPLIFIERS

High-performance connectorized amplifiers for laboratory, production, and automated test applications. With hundreds of models available, customers can select the ideal combination of gain, output power, noise figure, linearity, and bandwidth. Rugged designs with integrated protection features deliver reliable operation, with performance ranging from ultra-low-noise amplifiers to high-power solutions up to 100 W and frequencies to 95 GHz.



ADAPTERS

Coaxial and waveguide adapters up to 110 GHz, including 1.35 mm, 1.85 mm, 2.4 mm, 2.4 mm NMD, 2.92 mm, 2.92 mm NMD, 3.5 mm, BNC, N-Type, SMA, SMP, WR19, WR22 and WR28. A wide choice of genders, mounting types and orientations makes it easy to connect any combination of instruments and DUTs.



FILTERS

Optimize signal integrity with one of the industry's broadest portfolios of RF and microwave filters. With more than 3,000 standard models available for same-day shipment, Mini-Circuits offers low-pass, high-pass, band-pass, band-stop, diplexer, and triplexer solutions. Technologies including patented reflectionless filters, cavity filters, suspended-substrate designs, and LTCC filters provide exceptional performance for applications through 58 GHz, with rapid custom solutions available when needed.



minicircuits.com
testsolutions@minicircuits.com

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