Mini-Circuits®

INDUSTRIAL ELECTRONICS

RELEASED
1ST QUARTER
2017

Coolest New PRODUCTS

CNP-Q1-2017

www.minicircuits.com

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What's New!

Coolest New PRODUCTS

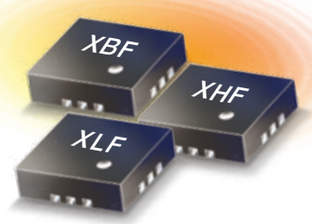
NOTE: Prices shown herein are effective as of the first date of publication of this material and may be subject to change at any time. Please refer to pricing on www.minicircuits.com for real time pricing and availability of these and other products in our catalog.

FILTERS
COOL NEW PRODUCTS

X-Series

Reflectionless **Filters**

50Ω *NOW* **DC to 30 GHz**



from $7.45 ea. (qty 500)

The Big Deal

- *Patented design eliminates in-band spurs*
- *Good impedance match in passband, stopband and transition*
- *Intrinsically cascadable*
- *High pass, low pass and band pass models*
- *RF power handling up to 2W*
- *Available in QFN and bare die form*

Product Overview

Mini-Circuits' X-series reflectionless filters employ a novel, patented filter topology which absorbs and terminates stopband signals internally rather than reflecting them back to the source. This new capability enables unique applications for filter circuits beyond those suited to traditional approaches. By eliminating signal reflections, these revolutionary products eliminate intermods, ripples and other systemic problems associated with conventional filters. They're perfect for pairing with non-linear devices such as mixers and multipliers, significantly reducing unwanted signals generated due to non-linearity and dramatically improving system dynamic range without isolation amplifiers or attenuators.

Now with new models covering passbands up to 30 GHz, they're available in tiny QFN packages and in bare die form. They'll change the way you think about using filters in your design. Need a custom design? Call us to talk to our engineers about a reflectionless filter for your system requirements.

ZVBP-Series

Cavity **Filters**

50Ω **909 to 11400 MHz**

from $199.95 ea.

The Big Deal

- *Outstanding selectivity*
- *Low insertion loss, from 0.5 dB*
- *High stopband rejection, up to 100 dB to 18 GHz*

Product Overview

Mini-Circuits' cavity filters are designed for narrow-band, high selectivity applications. They can provide bandwidths as narrow as 1% with very high selectivity and excellent low noise floor. These filters include a unique mechanical feature that prevents accidental detuning that would otherwise require expensive replacement or return to factory for re-tuning. This makes them very handy for field and lab applications where hard use is common. They come in rugged packages with a special powder-coated finish, which provides excellent protection against corrosion, tarnishing and scratching. They're tested for use in extreme temperatures up to 100°C. We offer cavity filters in a wide range of passbands from 900 MHz to 12 GHz. Contact apps@minicircuits.com with your custom requirements!

DLFCV-1000+

Dual/Differential **Low Pass Filter**

50Ω **DC to 1000 MHz**

Case Style: JC1210C-1

$4.45 ea. (qty 500)

The Big Deal

- *Dual filter in single 1210 ceramic package*
- *Low insertion loss, 1.2 dB*
- *High stopband rejection, 27 dB*
- *Excellent power handling, 8.5W each filter*

Product Overview

Mini-Circuits' DLFCV-1000+ is a dual low pass filter designed into a single 1210 ceramic package. This design allows customers to use a single unit in systems where two filters of the same passband are required, saving board space. The dual filter can also be used as a differential filter in differential circuits where interference and noise must be minimized. This model provides low passband insertion loss, high stopband rejection and steep roll off. It supports a wide range of applications and is ideal for minimizing interference at amplifier inputs and ADC outputs.

TPLX-Series

Surface Mount **Triplexers**

50Ω **1 to 2700 MHz**

Case Style: HP1156

Case Style: HR1843

from $20.45 ea. (qty 100)

The Big Deal

- *Low passband insertion loss, 0.8 to 1 dB*
- *Good co-channel rejection, 20 to 50 dB*
- *Miniature shielded package*

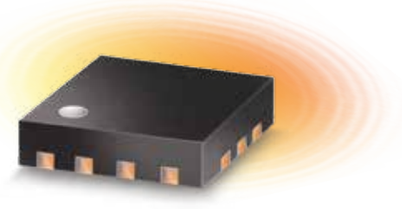
Product Overview

Mini-Circuits' TPLX-series of surface mount triplexers give designers a solution to split mixed signals into three, well isolated output channels. They provide low passband insertion loss and are capable of handling RF input power up to 2W. The come in miniature, shielded packages as small as 0.73 x 1.36 x 0.35" with wraparound terminations for excellent solderability. With channel splits spanning the 1 to 2700 MHz range, TPLX series triplexers support popular application bands for telecommunications and broadband as well as satellite communications.

PMA2-153LN+

Ultra-Wideband **MMIC LNA**

50Ω 0.5 to 15 GHz Matched



2mm x 2mm

$11.55 ea. (qty 500)

The Big Deal

- *Matched over full frequency range*
- *Low noise, 2.6 dB*
- *Flat gain, 16.7 ±3.3 dB*
- *+28 dBm IP3*
- *Tiny size, 2x2mm*

Product Overview

Mini-Circuits PMA2-153LN+ is an ultra-wideband MMIC LNA covering applications from 0.5 to 15 GHz, all with a single matching circuit. This model provides a unique combination of low noise, high IP3, and flat gain over a wide frequency range making it ideal for sensitive, high-dynamic-range receiver applications. It operates on a single 5V/6V supply and comes housed in a tiny 2x2mm MCLP package, allowing designers to embed the amplifier almost anywhere on their PCB.

PMA2-123LN+

Ultra-Wideband **MMIC LNA**

50Ω 0.5 to 12 GHz Matched

2mm x 2mm

$10.55 ea. (qty 500)

The Big Deal

- *Matched over full frequency range*
- *Low noise, 2.6 dB*
- *Flat gain, 17.6 ±2.0 dB*
- *+28 dBm IP3*
- *Tiny size, 2x2mm*

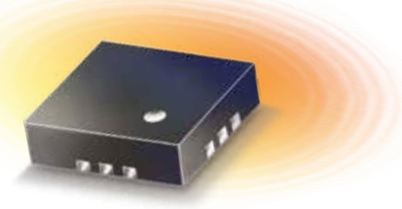
Product Overview

Mini-Circuits PMA2-123LN+ is an ultra-wideband MMIC LNA covering applications from 0.5 to 12 GHz, all with a single matching circuit. This model provides a unique combination of low noise, high IP3, and flat gain over a wide frequency range making it ideal for sensitive, high-dynamic-range receiver applications. It operates on a single 5V/6V supply and comes housed in a tiny 2x2mm MCLP package, allowing designers to embed the amplifier almost anywhere on their PCB.

PMA3-83LN+

Ultra-Wideband **MMIC LNA**

50Ω 0.5 to 8 GHz Matched



Case Style: DQ1225

$7.55 ea. (qty 500)

The Big Deal

- *Matched over full frequency range*
- *Low noise, 1.3 dB*
- *Flat gain, 21 ±0.7 dB**
- *+35 dBm IP3*
- *Tiny size, 3x3mm*

Product Overview

Low noise, high dynamic range, and flat gain from 0.5 to 8 GHz, all in a single amplifier! Mini-Circuits' popular PMA3-83LN+ is an ultra-wideband MMIC LNA comes in/out termination matched to 50Ω over its full frequency range, making it a snap to use for sensitive, high-dynamic-range receivers, instrumentation, defense systems, LTE, WiFi, S-Band and C-Band radar, SatCom and more! The amplifier operates on a single 5V/6V supply and comes housed in a tiny, 3x3mm MCLP package.

*Characterized from 0.5 to 7 GHz

ZX60-83LN+

Coaxial Ultra-Wideband **Low Noise Amplifiers**

50Ω 0.5 to 8 GHz Matched

Case Style: GC967

$139.95 ea. (qty 1-9)

The Big Deal

- *Matched over full frequency range*
- *Low noise, 1.4 dB*
- *Flat gain, 21 ±0.9 dB**
- *+34 dBm IP3*
- *Rugged connectorized package*

Product Overview

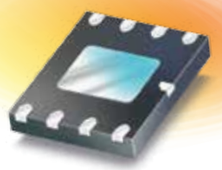
To facilitate your cable assemblies, the ZX60-83LN+ gives you the same, industry leading performance of the PMA3-83LN+ in a rugged, connectorized package (0.74 x 0.75 x 0.46") with SMA connectors. Mini-Circuits' rugged, unibody construction integrates the RF connector into the case body, providing high reliability and excellent survivability for critical applications in tough operating conditions.

*Characterized from 0.5 to 7 GHz

PHA-22H+

Dual Matched, High Dynamic Range **MMIC Amplifier**

50Ω 0.5 to 1.5 GHz



Case Style: DL1020

$6.95 ea. (qty 500)

The Big Deal

- *High IP3, +41 dBm*
- *High IP2, +81 dBm*
- *Low noise, 1.8 dB*
- *Ideal for balanced and push-pull amplifiers*

Product Overview

Mini-Circuits' PHA-22H+ is a dual matched, wideband MMIC amplifier fabricated using E-PHEMT technology. Usable in 50Ω and 75Ω systems, this model covers a wide range of applications from 0.5 to 3 GHz including cellular, CATV, PCS, WiMAX and more. Incorporating two well-matched dice in a single 5x6mm package, this design achieves very high IP3 and IP2 performance, ideal for suppressing unwanted harmonics and intermods in multiple carrier environments. Its combination of high IP3 and low noise figure make it an ideal candidate for use in balanced and push-pull configuration in sensitive, high-dynamic range receiver applications.

PHA-101+

Ultra-High Dynamic Range **MMIC Amplifier**

50Ω 0.5 to 1.5 GHz

SOT-89 Package

$5.25 ea. (qty 500)

The Big Deal

- *Very high IP3, +45 dBm*
- *High P1dB, +26 dBm*
- *Noise figure, 4.0 dB*
- *No external matching components required*
- *May be used as replacement for WJ AH101[a,b]*

Product Overview

Mini-Circuits' PHA-101+ E-PHEMT MMIC amplifier offers extremely high dynamic range from 0.5 to 1.5 GHz without any external matching components required. This model offers industry-leading IP3 performance with low DC power consumption (9V, 182mA), making it ideal for a variety of applications in complex signal environments. It comes housed in a tiny SOT-89 package with excellent thermal performance and offers repeatable performance from lot to lot.

a. *Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, compatibility with other components and environmental conditions and stresses.*

b. *The WJ AH101 part number is used for identification and comparison purposes only.*

HPA-272+

Rack Mount, High Power **Amplifier**

50Ω 700 to 2700 MHz

Case Style: NG1942

$8995.00 ea.

The Big Deal

- *High output power, 100W*
- *High gain, 48 dB*
- *High reverse isolation, 89 dB*
- *Excellent gain flatness, ±1.7 dB*
- *Operates from AC line power, 85-264V*
- *Bulit-in cooling fans and over-temperature protection*

Product Overview

Mini-Circuits' HPA-272+ high power amplifier is capable of amplifying signals up to 100W across its entire operating bandwidth from 700 to 2700 MHz. It delivers 48 dB gain with ±1.7 dB flatness, supporting a wide range of test applications including EMI, reliability testing, RF stress testing and more. The amplifier operates on a self-contained, 85-264V AC power supply, making setup quick and easy in most lab environments. Extensive safety features include over-temperature protection with automatic shut-off and the ability to withstand open and short loads while delivering saturated output power.

This model has become popular for cost-effective HTOL testing where it's often desirable to test large numbers of units simultaneously. The HPA-272+ can be used to drive up to 80 test channels for high-throughput production testing where parallel processing of many DUTs is a requirement.

ZHL-100W-272+

Space-Efficient, High Power **Amplifier Module**

50Ω 700 to 2700 MHz

Case Style: BT2247

$7995.00 ea.

The Big Deal

- *High output power, 100W*
- *High gain, 48 dB*
- *High reverse Isolation, 89 dB*
- *Excellent gain flatness, ±1.7 dB*
- *Compact module*

Product Overview

Mini-Circuits now offers our popular, wideband 100W amplifier in a space-efficient module for easy integration directly into customer systems. The ZHL-100W-272+ offers the same rugged design, reliability, and outstanding amplifier performance of the rack-mounted HPA-272+ but with the flexibility to accommodate your assembly layout. It comes housed in a rugged, compact aluminum alloy case (9.85 x 7.3 x 6.6") with SMA RF connectors, A D-sub 9 connector, and fan for efficient cooling.

TEST SOLUTIONS
COOL NEW PRODUCTS

SWITCHES

RC4DAT-6G-95

USB/Ethernet 4-Channel ***Programmable Attenuator***

50Ω 1 to 6000 MHz

Case Style: QE2249

$2765.00 ea.

The Big Deal

- *4 independently programmable channels in 1 compact device*
- *Attenuation range, 0 to 95 dB*
- *Small step size, 0.25 dB*

Product Overview

Mini-Circuits' RC4DAT-6G-95 USB/Ethernet controlled programmable attenuator provides four independently programmable channels in one device, supporting a wide range of test applications such as 4x4 MIMO testing, handover system evaluation and more. This model supports applications from 1 to 6000 MHz with an attenuation range from 0 to 95 dB in 0.25 dB steps. The device provides excellent attenuation accuracy of ±0.4 dB and fast attenuation transition time of just 650ns. USB control allows easy control from any Windows® or Linux® computer, while Ethernet control supports HTTP and Telnet protocols, allowing easy remote control and setup flexibility.

Mini-Circuits' user-friendly GUI software (included) provides independent point-and-click control of each of the four channels. Sweep and hop attenuation levels and even save and recall your own test profiles with specific attenuation patterns for R&D and production testing. DLLs for 32- and 64-bit systems and complete programming instructions for Windows® and Linux® environments are also included, allowing the same capabilities through your native test software. The device comes supplied everything you need to use it right out of the box – just plug and play!

MSP8TA-12-12D+

Extra-Long-Life Electromechanical ***SP8T Switch***

50Ω DC to 12 GHz 12 Volt

Rear View

Case Style: HJ2201

$1395.00 ea.

The Big Deal

- *Extra-long life, qualified to 5 million cycles*
- *Low insertion loss, 0.2 dB*
- *High isolation, 90 dB*
- *Reliable sleep-mode switching*

Product Overview

Mini-Circuits' MSP8TA-12-12D+ is an ultra-reliable, rugged-duty absorptive fail-safe SP8T switch designed in break-before-make configuration. Its patented switch design is comprised of very few, frictionless moving parts which enables optimum performance and provides industry-leading service life and reliability. Powered by +12VDC, the device has a typical switching speed of 20 milliseconds, insertion loss of 0.2 dB and high isolation of 90 dB. The MSP8TA-12-12D+ is suitable for use across a wide range of applications, including switching for automated test equipment and redundancy switching.

PWR-6LRMS-RC

High-Sensitivity USB/Ethernet True RMS ***Power Sensor***

50Ω 50 to 6000 MHz

$1595.00 ea.

The Big Deal

- *Measures CW and modulated signals*
- *55 dB dynamic range from -45 to +10 dBm*
- *Includes GUI measurement application software, simplifying complex measurements*

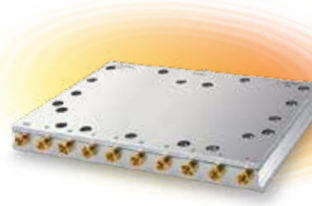
Product Overview

Mini-Circuits' PWR-6LRMS-RC is a USB/Ethernet controlled power sensor for high-sensitivity measurement of CW, multi-tone and modulated signals over frequencies from 50 to 6000 MHz with dynamic range from -45 to +10 dBm. The power sensor is provided with Mini-Circuits' user-friendly GUI control software which provides measurement averaging, time-scheduled measurements, and multi-sensor support (up to 24), as well as DLLs for 32- and 64-bit Windows® systems. The GUI also comes with a built-in library of measurement applications for RF testing of couplers, filters, amplifiers and many more. View data and plots on-screen, or export to Excel® for simple reporting and data analysis.

SPI-SP10T-63

Solid State SPI Controlled ***SP10T Switch***

50Ω 50 to 6000 MHz



Case Style: PM2137

$1295.00 ea.

The Big Deal

- *SPI interface allows daisy chain of multiple switches from one control line.*
- *High isolation, 80 dB*
- *Fast switching, 6µS*
- *High power handling, +27 dBm*

Product Overview

Mini-Circuits SPI-SP10T-63 is a high-speed, solid state SP10T absorptive switch supporting applications from 1 to 6000 MHz. This model features control and power supply via a digital snap fit connector and is operated using a 3-wire SPI interface compatible with TTL and LVTTL voltages, allowing connection of up to 50 units in series to the same control line in "daisy chain" configuration. The RF switch provides 80 dB isolation, fast switching time of just 6µs, and power handling up to +27 dBm. It comes housed in a rugged, aluminum alloy case (3.395 x 4.58 x 0.45") with SMP connectors.

SPLITTER COMBINERS
COOL NEW PRODUCTS

ZN2PD-K44+

*Ultra-Wideband 2-Way, 0° **Splitter/Combiner***

50Ω 10 to 40 GHz

Case Style: UU2234

$995.00 ea.

The Big Deal

- *Low insertion loss, 0.8 dB*
- *High isolation, 20 dB*
- *10W power handling as a splitter*

Product Overview

Mini-Circuits' ZN2PD-K44+ is an ultra-wideband coaxial 2-way 0˚ splitter/combiner providing coverage from 10 to 40 GHz, supporting a wide range of applications including 5G, Ku-Band, K-Band, and Ka-Band SatCom, microwave point-to-point backhaul, instrumentation and many more. This model provides 10W power handling as a splitter and very low insertion loss across the entire operating frequency range, minimizing power dissipation and delivering excellent signal power transmission from input to output. The ZN2PD-K44+ comes housed in a rugged aluminum alloy case measuring 3.5 x 2.0 x 0.5" with 2.92mm connectors.

ZN4PD1-183W+

*Ultra-Wideband 4-Way, 0° **Splitter/Combiner***

50Ω 4 to 18 GHz

Case Style: UU2303

$314.95 ea.

The Big Deal

- *Low insertion loss, 0.7 dB*
- *High power handling, 30W as a splitter*
- *Good isolation, 22 dB*
- *Low unbalance, 0.25 dB, 3°*

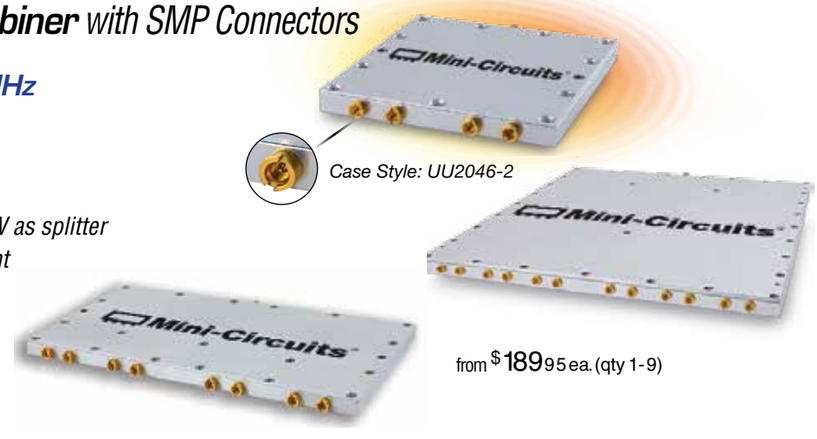
Product Overview

Mini-Circuits' ZN4PD1-183W+ is a 4-way 0˚ splitter/combiner covering a wide range of applications from 4 to 18 GHz including test and measurement, EW, SatCom and more. This model is capable of handling up to 30W RF input power as a splitter and passing up to 4A DC current from the sum port to all output ports (100mA each port). Its outstanding combination of high power and low loss minimize intrinsic losses and provide excellent signal fidelity from input to output. It also provides high port-to-port isolation, excellent VSWR and low amplitude and phase unbalance. It comes housed in a rugged aluminum alloy case with SMA connectors at all ports.

ZxPD-SMP+ Series

*Ultra-Thin **Splitter/Combiner** with SMP Connectors*

50Ω 500 to 3000 MHz



Case Style: UU2046-2

from $189.95 ea. (qty 1-9)

The Big Deal

- *Low insertion loss*
- *High power handling, 10W as splitter*
- *Ultra-thin case, 0.3" height*
- *SMP snap-on connectors*

Product Overview

To give you more options for your cable assemblies, Mini-Circuits has introduced a new family of connectorized splitter/combiners with SMP-snap on connectors and ultra-thin case styles, facilitating connections and saving space in crowded system layouts. These models provide broadband coverage, supporting a wide range of applications and are capable of handling up to 10W RF input power (as splitters) with low insertion loss, good isolation, and low unbalance. They're available off the shelf in a variety of N-way configurations to meet your needs.

EP-Series

*Ultra-Wideband MMIC **Splitter/Combiners***

50Ω Models from 1.8 to 26.5 GHz

Case Style: DG1847

from $5.85 ea.

The Big Deal

- *Bandwidths as wide as >4 octaves in a single model*
- *Power handling up to 2.5W*
- *Low insertion loss, 1.1 dB typ.*
- *Tiny size, 4x4mm and 5x5mm QFN*
- *Available in bare die form*

Product Overview

Our new EP-series ultra-wideband MMIC splitter/combiners are perfect for wideband systems like defense, instrumentation, and all cellular bands through LTE and WiFi. These models deliver consistent performance across the whole range, so you can reduce component counts on your bill of materials by using one part instead of many! They utilize GaAs IPD technology to achieve industry-leading performance, high power handling capability and efficient heat dissipation in a tiny device size, giving you a new level of capability and the flexibility to use them almost anywhere on your PCB!

75 OHM PRODUCTS
COOL NEW PRODUCTS

DPLB-Series

High-Performance **Surface Mount Diplexers**

from $3.35 ea. (qty 100)

75Ω DC to 1220 MHz

The Big Deal

- *Low insertion loss, 0.8 dB typ.*
- *High rejection, 50 dB typ.*
- *Good return Loss, 18 dB typ.*
- *Various channel splits available*

Product Overview

Mini-Circuits' DPLB series of 75Ω surface mount diplexers cover the DC to 1220 MHz band, offering a variety of channel splits with low passband insertion loss, high rejection in the stopband and excellent return loss. These new models are specially designed to meet requirements for DOCSIS® 3.1 compliant systems and equipment. All models provide excellent signal transmission and elimination of unwanted spurious signals. The diplexers come mounted on open style printed laminate measuring 1.18 x 1.18 x 0.28".

VAEQ-1220-75+

Surface Mount **Voltage-Variable Equalizer**

Case Style: HE1354

$9.75 ea. (qty 100)

75Ω 50 to 1220 GHz

The Big Deal

- *Adjustable attenuation slope*
- *High IP3, +50 dBm*
- *Minimal deviation from linear loss, ±0.5 dB*

Product Overview

Mini-Circuits' VAEQ-1220-75+ offers system designers and operators an equalizer whose attenuation slope is adjustable via an analog control signal. This component simplifies compensation for negative gain slope and frequency dependent cable loss and adds versatility under the widely-varied operating conditions to which CATV systems are subjected. An "intelligent" control system can tune the voltage-variable equalizer's frequency response on the fly, continually adapting to changes in operating parameters (temperature, humidity, etc.), and maintaining peak system performance. This model is specially designed for the requirements of DOCSIS® 3.1 systems and comes housed in a miniature, shielded package measuring 0.39 x 0.39 x 0.15".

PGA-122-75+

High Dynamic Range, Flat Gain **MMIC Amplifier**

SOT-89 Package

$3.38 ea. (qty 500)

75Ω 5 to 1500 MHz

The Big Deal

- *High IP3, +43 dBm*
- *Low noise, 2.9 dBm*
- *High IP2, +54 dBm*
- *Flat gain, 15.4 ±0.3 dB*

Product Overview

Mini-Circuits' PGA-122-75+ is a 75Ω MMIC amplifier with a frequency range from 40 to 1500 MHz, supporting bandwidth requirements for a wide range of CATV and broadband applications including DOCSIS 3.1 compliant systems and equipment. Fabricated using E-PHEMT technology, this model provides 15.5 dB gain with ±0.1 dB gain flatness, +43 dBm IP3, +54 dBm IP2, 21 dB reverse isolation and 2.9 dB noise figure. It operates on a single 9.0V supply and comes housed in a tiny SOT-89 package. An application circuit has been developed to provide outstanding amplifier performance for CATV upstream applications in the 5 to 200 MHz band (see application note AN-60-087).

Z7550-Series & SFMP-5075+

Matching Pads & Matching Transformers

Case Style: FF1891 *Case Style: H557-1*

$69.95 ea. (qty 1-9)

50/75Ω DC to 2500 MHz

The Big Deal

- *Variety of connector types*
- *1W power handling*
- *Supports DOCSIS® 3.1 bandwidth requirements*

Product Overview

The 75Ω equipment often used in CATV applications occupies a small enclave of a largely 50Ω world. Although dedicated 75Ω equipment does exist, its availability and its applicability to other test needs are limited; most general-purpose test and measurement equipment is designed for 50Ω use. Because of this, it can be difficult to create test setups entirely out of dedicated 75Ω test equipment. Mini-Circuits offers both matching transformers and minimum-loss resistive matching pads that can be used to interface 75Ω DUTs with Mini-Circuits' test and signal routing solutions to meet the diverse needs of a CATV test lab.

ADAPTERS
COOL NEW PRODUCTS

35M-35M50+

3.5mm-M to 3.5mm-M **Coaxial Adapter**

50Ω DC to 34 MHz

The Big Deal

- *Flat response*
- *Excellent VSWR, 1.03:1 up to 34 GHz*
- *Low insertion loss, 0.1 dB*

Case Style: DJ1863

$64.95 ea. (qty 1-9)

Product Overview

Mini-Circuits 35M-35M50+ is a coaxial 3.5mm-male to 3.5mm-male adapter supporting a wide range of applications from DC to 34 GHz. This model provides flat response, ideal for broadband and multi-band use, and it achieves very low insertion loss of 0.1 dB, excellent VSWR of 1.03:1, and excellent thermal stability from -55 to +100°C. The adapter features rugged, passivated stainless steel construction and measures only 0.86" (l) x 0.36" (dia.).

KF-KF50+ / KF-KM50+

2.92mm **Coaxial Adapters**

50Ω DC to 40 GHz

The Big Deal

- *Flat response*
- *Low insertion loss, 0.06 dB (F-F version)*
- *Excellent VSWR, 1.04:1 (F-F version)*

Case Style: DJ1860 *Case Style: DJ1861*

$56.95 ea. (qty 1-9)

Product Overview

For interconnection of your cable assemblies and test setups from DC up to 40 GHz, Mini-Circuits offers 2.92mm adapters in both Female-to-Female and Male-to-Female versions. Mini-Circuits' KF-KF50+ and KF-KM50+ adapters provide very low insertion loss (0.06 dB F-F version, 0.09 dB F-M version) with flat response and excellent VSWR of 1.04:1 up to 40 GHz. The units feature rugged, passivated stainless steel construction with connectors qualified to 500 mating cycles to ensure reliability you can count on.

CABLES

ULC-Series

Ultra-Flexible **Test Cables**

50Ω DC to 18 GHz

The Big Deal

- *Minimal performance change vs. flexure*
- *Tight bend radius, 2.0 inches*
- *Low insertion loss*
- *Good return loss*
- *Qualified to 20,000 bend cycles*

Case Style: NS2208

from $79.95 ea. (qty 1-9)

Product Overview

Featuring ultra-flexible construction, Mini-Circuits ULC-series test cables are highly popular for lab and production test applications where tight bends are needed. To give you more options and meet your needs, ULC-series models are now available in both SMA and N-Type connector options in a variety of lengths. All models are specially designed for stability of phase and amplitude versus flexure in bend radii as tight as 2 inches (2.0" minimum dynamic bend radius, 0.7" minimum static bend radius), making them ideal for demanding lab environments where frequent bending is common. Featuring rugged, triple-shielded cable construction with a unique molded boot, they give you the advantage of flexibility with outstanding reliability and durability for a long life of use. Like all Mini-Circuits test cables, the ULC-series models have been performance qualified to 20,000 bend cycles, so you can be confident you're getting reliable performance that lasts.

086-8SMPR+

HANDFLEX™ **Interconnect Cable** *with SMP Snap-On Connectors*

50Ω DC to 18 GHz

The Big Deal

- *Hand-formable*
- *Right-angle SMP-F blind mate snap-on connectors*
- *Low insertion loss, 0.8 dB @ 18 GHz*
- *Excellent return loss, 24 dB @ 18 GHz*
- *Ideal for connections in crowded layouts*

Case Style: FF1891

$22.15 ea. (qty 1-9)

Product Overview

Mini-Circuits' 086-8SMPR+ HandFlex™ interconnect cable gives you yet another option for your connection needs! This new model features right-angle SMP-F blind mate snap-on connectors, ideal for simplifying connection of adjacent modules in tight layouts without sacrificing high-frequency performance due to severe bending near the connector interface. Hand-formable cable construction with minimum bend radius of 6mm allows almost any shape without the need for bending tools, adapters or brackets. The connector interface meets MIL-STD-348 requirements, and an insulated outer jacket protects the cable from wear and tear. This model is 8 inches in length and provides 24 dB return loss, 0.8 dB insertion loss, good power handling, and operating temperature range from -55 to +105°C, making it suitable for a wide range of applications from military and aerospace systems to environmental test chambers and more. Other lengths available on request. It's a perfect companion product for Mini-Circuits' ultra-thin splitter combiners with SMP snap-on connectors (ZN2PD-622SMP+ and ZB3PD-63SMP+) and any cable assembly where reliable performance and easy connection in tight spaces are requirements.

COUPLERS
COOL NEW PRODUCTS

MBDA-30-451HP

High-Power Surface Mount **Bi-Directional Coupler**

50Ω 225 to 450 MHz

Case Style: PQ2074

from $26.95 ea. (qty 10-19)

The Big Deal

- *High power handling, 200W*
- *High directivity, 28 dB*
- *Small size, 1 x 1 x 0.05"*
- *Low cost*

Product Overview

Super high power handling in a tiny package! Mini-Circuits MBDA-451HP surface-mount bi-directional coupler utilizes stripline technology to achieve power handling up to 200W in a miniature, low-profile device, measuring only 1.0 x 1.0 x 0.05". This model provides 30 dB coupling with ±1.5 dB flatness, 0.15 dB mainline loss, 30 dB return loss, high directivity and excellent shielding. This coupler is ideal for a wide variety of applications from power amplifiers and antenna feeds to military applications and more!

MBDC-Series

High-Power Surface Mount **Dual-Directional Couplers**

50Ω 2000 to 6000 GHz

Case Style: PQ2099

from $26.95 ea. (qty 10-19)

The Big Deal

- *Wideband coverage*
- *High power handling, 100W*
- *Small size, 0.56 x 0.20 x 0.05"*
- *Low cost*

Product Overview

Mini-Circuits MBDC-Series surface-mount bi-directional couplers utilize stripline technology to achieve power handling up to 100W in a miniature, low-profile device, measuring only 0.56 x 0.20 x 0.05". They come in a variety of coupling values to meet your needs with excellent flatness flatness, 0.25 dB mainline loss, return loss up to 23 dB, high directivity and excellent shielding. These couplers are ideal for a wide variety of applications from SatCom to Wifi, Bluetooth, ZigBee and more!

ATTENUATORS

BW-K Series

Ultra-Wideband **Precision Fixed Attenuators**

50Ω DC to 40 GHz

Case Style: FF1653

$149.95 ea. (qty 1-24)

The Big Deal

- *Outstanding attenuation flatness*
- *Excellent VSWR, 1.2:1*
- *2.92mm-M to 2.92mm-F connectors*

Product Overview

Mini-Circuits has expanded our popular BW-K series of 40 GHz coaxial precision fixed attenuators with new models to give you a wider selection of attenuation values. The series now includes models with attenuation values of 1, 2, 3, 4, 5, 6, 10 and 20 dB, all with 2W power handling, 1.2:1 VSWR, and outstanding attenuation flatness from DC to 40 GHz. The attenuators feature 2.92mm male-to-female connectors allowing connection with SMA, K and 3.55mm connector types, and passivated stainless steel connector construction withstands harsh environmental conditions for high reliability and a long life of use. They're an ideal solution for a wide variety of applications including matching, instrumentation and more!

YAT-Series

MMIC **Precision Fixed Attenuators**

50Ω DC to 26.5 GHz

Case Style: MC1630

from $2.24 ea. (qty 500)

The Big Deal

- *Excellent attenuation flatness*
- *Good power handling, 2W*
- *Available in 2x2mm QFN or bare die*
- *Die form usable to 40 GHz!*

Product Overview

Mini-Circuits' YAT-series of fixed value, absorptive MMIC attenuators includes models with attenuation values from 0 to 10 dB (in 1 dB steps) and 12, 15, 20, and 30 dB, all with outstanding flatness, low VSWR and 2W power handling from DC to 26.5 GHz. These popular models are now available in both 2x2mm QFN packages and in unpackaged die form. The tiny packaged versions offer outstanding capability with minimal space requirements on your PCB, while unpackaged die form allows you to integrate the attenuators directly into hybrids where minimizing size and weight is critical. A simple modification, presented in application note AN-70-019, even enables excellent performance all the way up to 40 GHz, supporting applications in the millimeter wave region such as 5G systems.

Want to see more?

We're continuously releasing innovative new products to our catalog to meet your needs.

Visit www.minicircuits.com

To stay up to date on our latest new model releases.

Need a custom design?

Get in touch with our sales and applications teams listed below to discuss your requirements. We're here to support you!

Direct Sales

- **Brooklyn**
  sales@minicircuits.com
  1 718-934-4500
- **Missouri**
  sales@minicircuits.com
  1 417-335-5935
- **Europe**
  sales@uk.minicircuits.com
  44 1252-832600
- **Taiwan**
  robert@min-kai.com.tw
  886 3 318 4450

Technical Support

- **NORTH AMERICA**
  apps@minicircuits.com
  (718) 934-4500
- **SINGAPORE, INDONESIA MALAYSIA, THAILAND**
  sales@minicircuits.com.my
  (604) 646-2828
- **ISRAEL**
  app@ravon.co.il
  972 4 8749100
- **TAIWAN & PHILIPPINES**
  robert@min-kai.com.tw
- **EUROPE**
  apps@uk.minicircuits.com
  44 1252 832600
- **INDIA**
  apps@minicircuits.com
  91 44 2 2622575
- **CHINA**
  sales@mitron.cn
  86 591-8787 0001
  Or
  yuanzhong@minicircuits.com
  86 020-8734 0992