

RF Isolators and Circulators

Molex's RF Isolator and RF Circulator product portfolio with drop-in, surface-mount, custom integrations and waveguide categories offers more than 6,000 variants in frequencies from 380 MHz to 40 GHz, and they can be designed to match customer-specified mechanical, electrical and operational parameters.

Product Highlights

Frequency Availability:	Average Power Available:
380 MHz to 40 GHz	From 1 to 550W

Features and Benefits

Advanced technology solutions for wireless telecommunications

As a leader in RF isolator and RF circulator designs and manufacturing, we supply advanced technology solutions in ferrite components for the wireless telecommunications industry. In fact, Molex provides original ferrite isolator and circulator products designs that are protected by several patents.



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Customized solutions and new product introduction processes

Design time is dependent on the complexity of the request, in most cases typically a few weeks.

After technical approval of qualification samples, production volume shipments can launch within five to six weeks. With our large number of readily available and proven designs, we generally ship in one to two weeks, if only slight modifications are necessary.

Improve accuracy, efficiency and quality with automation

Molex provides automated manufacturing, which reduces the need for human intervention while increasing accuracy, yielding higher efficiency and improving quality. Additionally, our automation lines are flexible, and their setup can easily be changed to other products.

**Customizations available:**

Meets the electrical, thermal and mechanical requirements for almost any design

Devices as small as 6mm that meet customer requirements:

Enables more devices in smaller areas. In fact, OEMs are already pushing for small sizes.

Acceptable IMD and harmonics performance with proper frequency bandwidth:

Offers high-performance isolators/circulators despite small size

Constructed with raw materials having the appropriate properties, including operating temperature range:

Delivers high-performing high-power isolators/circulators

As part of mass-production runs, every port in each individual isolator is precisely tuned:

- Optimizes electrical performance
- Ensures unit-to-unit consistency

Devices with very wide frequency bands in small packages can be designed via patented technologies:

Provides the ability to combine multiple bands in a single radio in new radio designs

Overview

Automation equipment for isolators and circulators is not common. It requires very special customized equipment with significant investment. Molex has invested in the development of high-efficiency, flexible automated manufacturing equipment to produce high-production-volume isolators and circulators.

It is very challenging to meet required specifications such as those pertaining to insertion loss, return loss, power, IMD (passive intermodulation) and temperature stability in a small isolator and circulator package. Combining our experience with our patented technologies, Molex can provide isolators and circulators as small as 6mm while meeting customer requirements.

Power handling is very dependent on the circulator's mechanical design and ferrite material properties. Using high power increases temperature and, therefore, degrades performance. Molex engineers select raw materials with appropriate properties, including the required operating temperature range.

Low IMD is very important in systems and are not easily achieved in smaller devices. Low IMD usually requires larger isolators and circulators and thicker dimensions. Proper design through the application of Molex expertise, along with optimized selection of materials and dimensions, results in acceptable IMD and harmonics performance with proper frequency bandwidth to meet customer expectations.

New radio designs actively require very wide bandwidth devices in a single radio. Customers would like to combine multiple bands in order to have a more flexible radio system. Using Molex patented technologies, very wide band devices can be achieved in relatively small packages.

Applications by Industry

Telecommunications:

Antenna Array Systems (AASs)

Base Transceiver Stations (BTSs)
LTE, 4G and 5G Networks
Laboratory Test Applications
RF and Microwave Telecommunications
Radio Access Networks (RANs)
Remote Radio Heads (RRHs)
Small Cells (picocell, femtocell and microcell)

This is not a definitive list of applications for this product. It represents some of the more common uses.

Frequently Asked Questions

Where are RF Isolators and RF Circulators used?

Our RF Isolators and RF Circulators are predominantly used in telecommunications radios. They protect the equipment from reflected RF power, and they are key to helping reduce interference and ensuring system reliability.

How does Molex design and deliver high-performance isolators/circulators?

With more than 300 years of cumulative experience, Molex understands the relationship between the various key parameters. We choose the best balance to obtain the most favorable combination by optimizing these parameters combination to suit customer requirements, such as size, s-parameters, power and IMD.

What are some typical isolator/circulator applications?

Typical isolator/circulator applications include:

- Isolating the transmitter from the receiver
- Isolating receive from transmit, assists matching the amplifier output
- Isolating two stages of amplifier

Specifications

Drop-in Versions

- Low insertion loss (0.1 dB in some models)
- Standard or custom, mechanical and/or electrical available upon request

Surface Mount Versions

- PCB interface
- Frequencies up to 40 GHz
- Custom configurations
- Insertion loss <0.2 dB over temperature
- Isolation and return loss >23 dB over temperature

Waveguide Versions

- WR 229 to WR 22 sizes with EIA and IEC standard flanges available
- Frequencies up to 40 GHz
- Customized designs
- Integrated or external load options
- High performance
- High isolation
- Low insertion loss
- Low VSWR

General Features

- Fully RoHS compliant
- Environmental and reliability tested
- No neodymium magnets and BeO-free
- Low intermodulation (< -85 dBc in some models)



Part Number: 735912038

Engineering/Old PN: 801-340-380-VT040

Surface Mount Single Junction Isolator 3400-3800 MHz, Clockwise, 10.0mm Diameter



Part Number: 735912039

Engineering/Old PN: 811-340-380-VT040

Surface Mount Single Junction Isolator 3400-3800 MHz, Counterclockwise, 10.0mm Diameter



Part Number: 735912040

Engineering/Old PN: 802-340-380-VP040

Surface Mount Single Junction Circulator 3400-3800 MHz, Clockwise, 10.0mm Diameter



Part Number: 735912041

Engineering/Old PN: 812-340-380-VP040

Surface Mount Single Junction Circulator 3400-3800 MHz, Counterclockwise, 10.0mm Diameter



Part Number: 735912042

Engineering/Old PN: 802-515-592-VP040

Surface Mount Single Junction Circulator 5150-5925 MHz, Clockwise, 10.0mm Diameter



Part Number: 735912043

Engineering/Old PN: 802-350-410-VP040

Surface Mount Single Junction Circulator 3500-4100 MHz, Clockwise, 10.0mm Diameter



Part Number: 735912049

Engineering/Old PN: 812-330-380-VP040

Surface Mount Single Junction Circulator 3300-3800 MHz, Counterclockwise, 10.0mm Diameter



Part Number: 735912044

Engineering/Old PN: 802-340-360-VP040

Surface Mount Single Junction Circulator 3400-3600 MHz, Clockwise, 10.0mm Diameter



Part Number: 735912045

Engineering/Old PN: 812-340-360-VP040

Surface Mount Single Junction Circulator 3400-3600 MHz, Counterclockwise, 10.0mm Diameter



Part Number: 735912046

Engineering/Old PN: 802-249-269-VP040

Surface Mount Single Junction Circulator 2496-2690 MHz, Clockwise, 10.0mm Diameter



Part Number: 735912047

Engineering/Old PN: 812-249-269-VP040

Surface Mount Single Junction Circulator 2496-2690 MHz, Counterclockwise, 10.0mm Diameter



Part Number: 735912048

Engineering/Old PN: 802-330-380-VP040

Surface Mount Single Junction Circulator 3300-3800 MHz, Clockwise, 10.0mm Diameter



Part Number: 735912050

Engineering/Old PN: 802-230-240-VP040

Surface Mount Single Junction Circulator 2300-2400 MHz, Clockwise, 10.0mm Diameter



Part Number: 735912051

Engineering/Old PN: 812-230-240-VP040

Surface Mount Single Junction Circulator 2300-2400 MHz, Counterclockwise, 10.0mm Diameter



Part Number: 735912052

Engineering/Old PN: 802-450-500-VP040

Surface Mount Single Junction Circulator 4500-5000 MHz, Clockwise, 10.0mm Diameter



Part Number: 735912053

Engineering/Old PN: 812-450-500-VP040

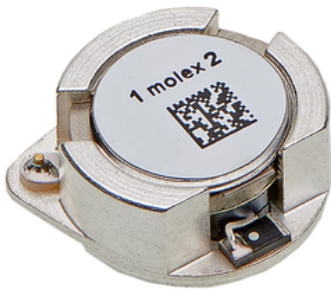
Surface Mount Single Junction Circulator 4500-5000 MHz, Counterclockwise, 10.0mm Diameter



Part Number: 735912054

Engineering/Old PN: 808-075-080-WR040

Surface Mount Single Junction Isolator 753-803 MHz, Clockwise, 23.0mm Diameter



Part Number: 735912056

Engineering/Old PN: 812-370-398-WP040

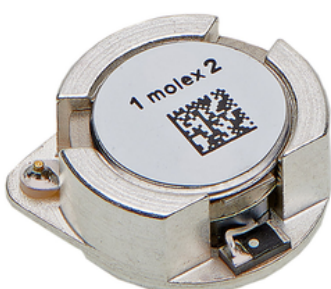
Surface Mount Single Junction Circulator 3700-3980 MHz, Counterclockwise, 15.0mm Diameter



Part Number: 735912057

Engineering/Old PN: 802-230-240-WP040

Surface Mount Single Junction Circulator 2300-2400 MHz, Clockwise, 15.0mm Diameter



Part Number: 735912058

Engineering/Old PN: 812-230-240-WP040

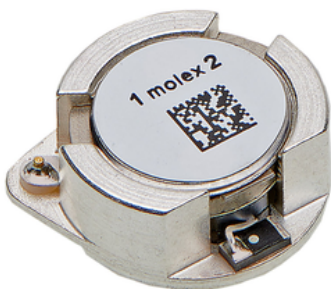
Surface Mount Single Junction Circulator 2300-2400 MHz, Counterclockwise, 15.0mm Diameter



Part Number: 735912059

Engineering/Old PN: 802-249-269-WP040

Surface Mount Single Junction Circulator 2496-2690 MHz, Clockwise, 15.0mm Diameter



Part Number: 735912060

Engineering/Old PN: 812-249-269-WP040

Surface Mount Single Junction Circulator 2496-2690 MHz, Counterclockwise, 15.0mm Diameter



Part Number: 735912061

Engineering/Old PN: 802-340-360-WP040

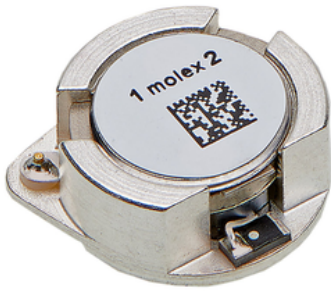
Surface Mount Single Junction Circulator 3400-3600 MHz, Clockwise, 15.0mm Diameter



Part Number: 735912055

Engineering/Old PN: 802-370-398-WP040

Surface Mount Single Junction Circulator 3700-3980 MHz, Clockwise, 15.0mm Diameter



Part Number: 735912062

Engineering/Old PN: 812-340-360-WP040

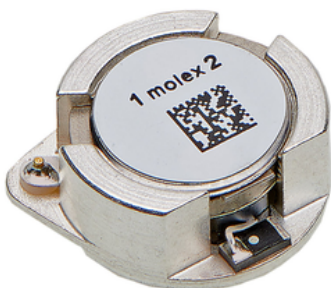
Surface Mount Single Junction Circulator 3400-3600 MHz, Counterclockwise, 15.0mm Diameter



Part Number: 735912063

Engineering/Old PN: 802-340-380-WP040

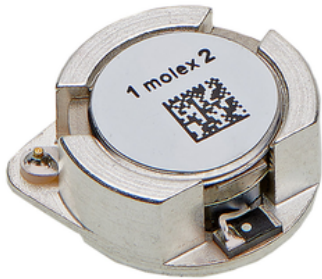
Surface Mount Single Junction Circulator 3400-3800 MHz, Clockwise, 15.0mm Diameter



Part Number: 735912064

Engineering/Old PN: 812-340-380-WP040

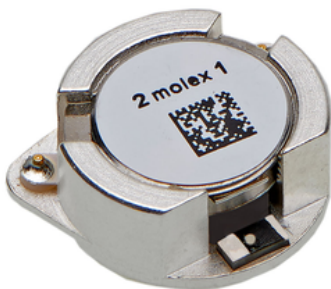
Surface Mount Single Junction Circulator 3400-3800 MHz, Counterclockwise, 15.0mm Diameter



Part Number: 735912081

Engineering/Old PN: 801-565-715-PT040

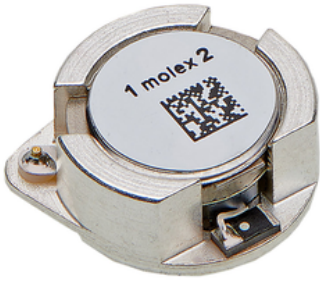
Surface Mount Single Junction Isolator 5650-7150 MHz, Clockwise, 11.0mm Diameter



Part Number: 735912082

Engineering/Old PN: 811-565-715-PT040

Surface Mount Single Junction Isolator 5650-7150 MHz, Counterclockwise, 11.0mm Diameter



Part Number: 735912083

Engineering/Old PN: 801-710-850-PT040

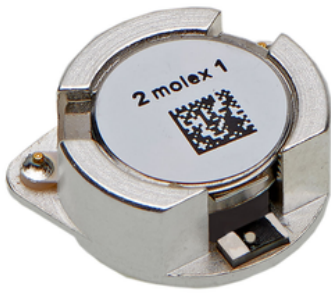
Surface Mount Single Junction Isolator 7100-8500 MHz, Clockwise, 11.0mm Diameter



Part Number: 735912089

Engineering/Old PN: 801-262-269-WC140

Surface Mount Single Junction Isolator 2620-2690 MHz, Clockwise, 18.0mm Diameter



Part Number: 735912084

Engineering/Old PN: 811-710-850-PT040

Surface Mount Single Junction Isolator 7100-8500 MHz, Counterclockwise, 11.0mm Diameter



Part Number: 735912085

Engineering/Old PN: 801-180-188-WC140

Surface Mount Single Junction Isolator 1805-1880 MHz, Clockwise, 18.0mm Diameter



Part Number: 735912086

Engineering/Old PN: 811-180-188-WC140

Surface Mount Single Junction Isolator 1805-1880 MHz, Counterclockwise, 18.0mm Diameter



Part Number: 735912087

Engineering/Old PN: 801-211-217-WC140

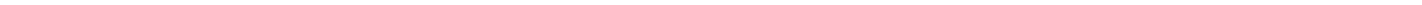
Surface Mount Single Junction Isolator 2110-2170 MHz, Clockwise, 18.0mm Diameter



Part Number: 735912088

Engineering/Old PN: 811-211-217-WC140

Surface Mount Single Junction Isolator 2110-2170 MHz, Counterclockwise, 18.0mm Diameter





Part Number: 735912090

Engineering/Old PN: 811-262-269-WC140

Surface Mount Single Junction Isolator 2620-2690 MHz, Counterclockwise, 18.0mm Diameter



Part Number: 735912091

Engineering/Old PN: 801-061-065-WB040

Surface Mount Single Junction Isolator 617-652 MHz, Clockwise, 23.0mm Diameter



Part Number: 735912092

Engineering/Old PN: 811-061-065-WB040

Surface Mount Single Junction Isolator 617-652 MHz, Counterclockwise, 23.0mm Diameter



Part Number: 735912093

Engineering/Old PN: 801-071-076-WB040

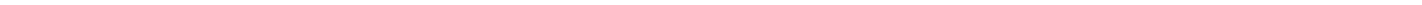
Surface Mount Single Junction Isolator 717-756 MHz, Clockwise, 23.0mm Diameter



Part Number: 735912094

Engineering/Old PN: 811-071-076-WB040

Surface Mount Single Junction Isolator 717-756 MHz, Counterclockwise, 23.0mm Diameter





Part Number: 735912095

Engineering/Old PN: 801-075-080-WB040

Surface Mount Single Junction Isolator 758-803 MHz, Clockwise, 23.0mm Diameter



Part Number: 735912101

Engineering/Old PN: 801-092-096-WB040

Surface Mount Single Junction Isolator 925-960 MHz, Clockwise, 23.0mm Diameter



Part Number: 735912096

Engineering/Old PN: 811-075-080-WB040

Surface Mount Single Junction Isolator 758-803 MHz, Counterclockwise, 23.0mm Diameter



Part Number: 735912097

Engineering/Old PN: 801-079-082-WB040

Surface Mount Single Junction Isolator 791-821 MHz, Clockwise, 23.0mm Diameter



Part Number: 735912098

Engineering/Old PN: 811-079-082-WB040

Surface Mount Single Junction Isolator 791-821 MHz, Counterclockwise, 23.0mm Diameter



Part Number: 735912099

Engineering/Old PN: 801-085-089-WB040

Surface Mount Single Junction Isolator 859-894 MHz, Clockwise, 23.0mm Diameter



Part Number: 735912100

Engineering/Old PN: 811-085-089-WB040

Surface Mount Single Junction Isolator 859-894 MHz, Counterclockwise, 23.0mm Diameter



Part Number: 735912102

Engineering/Old PN: 811-092-096-WB040

Surface Mount Single Junction Isolator 925-960 MHz, Counterclockwise, 23.0mm Diameter

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