RF CONNECTORS, RF CABLE ASSEMBLIES AND RF COMPONENTS

RF Filters

Molex designs and manufactures RF cavity filters used in numerous applications including wireless 4G LTE and 5G telecommunication infrastructure up to 50 GHz. Our filter portfolio is growing rapidly, specifically for sub-6 GHz cavity Multi-Input, Multi-Output (MIMO) filters used in 5G NR network deployments.

Product Highlights

Connectors	Integrated Components	Power
Output: 7/16 DIN 4.3-10 and 2.2-5 Input: SMA, SMP, PSMP, SMP-MAX	Connectors, Isolators, Circulators	Up to 650W

Features & Benefits

Design Capabilities of High-Performance and Low-Loss Filters

As the 5G network requirements and infrastructure of the radio and antenna architectures keep evolving to support cellular usage demands that new applications bring, so does the role of the RF filter. It is more critical now than ever to make filters with high performance, which in turn adds to the complexity of filter design. Consequently, it is imperative that our design engineers find the perfect combination of competing and interrelated parameters in meeting customer specifications. Molex has several decades of experience in this niche area of expertise, with a proven track record in providing custom, high-performance filters.

Reduced Design Cycle Time for New Product Introduction

We understand the value of time and cost savings in allowing our customers to successfully launch their new products. To address this pressure, our seasoned product and engineering teams work in close collaboration with our customers at the design concept phase to get a clear understanding of what is critical for them. We use electromagnetic (EM) simulation modelling software to accelerate design to prototype. We can also leverage our current reference designs for a ‘quick start’.

Optimized Filter Manufacturing Process

As part of our NPI and quality processes, filter prototypes undergo rigorous verification and qualification ahead of full production runs. We also use optimized tuning, screw assembly, soldering, testing and inspection processes to increase output capacity, reduce production time, improve electrical performance and reduce human error—which results in filter quality and uniformity. Test results are also shared with our customers from prototype to pre-production through to mass production. Molex filters can be die-cast for production runs.

Customizable designs include using various connectors, and wall, mast or rack mountable:
Optimized to suit the customer's requirements.
Examples of connectors used include:
- 7/16 DIN
- 4.3-10
- 2.2-5
- SMA
- SMP
- PSMP
- SMP-MAX

Rigorous verification and qualification before production:
Ensures reliable, fit-for-purpose filter products:
- Temperature cycling/thermal shock
- Temperature stress
- Operating climate
- Humidity
- Vibration/shock/bump
- Drop test
- Salt-fog/mist (accelerated corrosion test)

Designed to withstand harsh environmental conditions:
Meets demanding customer application needs :
- Built-in lightning protection options
- Built-in DC stop options
- Protection for indoor and/or outdoor applications (e.g., IP67 rating)

Industry-leading low PIM levels for small cell and base station product:
- Delivers signal integrity performance and low PIM, which are critical for LTE and 5G deployments.
- Support all major standards: 4G LTE, 5G NR and older versions.

Global development teams based in North America and China and industry-leading manufacturing capabilities:
- Enables quick turnaround of mid- to large-volume production runs
- Ensures cost-effective methods while maintaining quality and performance.

DC and Antenna Interface Standards Group (AISG) 2.0 compliant pass-through on selected ports:
- Supports industry 2.0 standards

High power handling up to 650W:
- Meets customer power needs

Overview

5G feature-rich devices and applications demand the introduction of new and higher frequencies with increased capacity. The RF cavity filter is often the largest single component in a radio and its size drives costs in other areas. Macro cells and small cells will have more channels to increase capacity requiring MIMO (Multiple In Multiple Out) filters. These high-performance filters must be Isolated from one another.

The demands of each radio platform create unique challenges that require customized RF filter solutions. Our RF filter design experts have experience in custom solutions for many years up to 80Ghz. DAS, small cell, macro cell, MIMO and Radio Link experiences give us confidence in finding an optimal solution. We use established in-house tools, procedures, and supply chain to meet reliable results.

As 5G applications are used more widely in conjunction with radar and satellite, the signal landscape will get more complex. For example, Interference in CBRS can potentially interfere with highly sensitive Aviation (altimeter) equipment. Planning and discussion between industry associations must be held in advance of implementation.

Higher demands for performance, reducing power where possible and avoiding mixing of signals and added noise are important goals. This must be done using the least expensive approaches from design to Die Casting and secondary CNC Milling, plating and then assembly and test. Molex provides cavity filters with low Insertion Loss, high Rejection, and ultra-low PIM. Many MIMO filters require high Isolation between channels.

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, O-RAN, V-RAN)
Remote Radio Heads (RRHs)
Small Cells (picocell, femtocell and microcell)