molex

MOUSER ELECTRONICS

Wired for Success: Advantages of Custom RF Cables over COTS and DIY

Mighty Guides

Webinar in a Book™

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Mighty Guides

Introduction

Radio-frequency (RF) communication plays an increasingly important role in modern technology. Game-changing technologies like 5G and critical national security applications in the military and aerospace sectors rely on RF as the technological backbone of modern communication.

The world depends heavily on RF communication, making signal integrity and reliability non-negotiable. RF cables serve as crucial components in ensuring effective and reliable signal transmission. However, engineers often need help to select the suitable RF cable that meets all the needs of a given use case.

This ebook examines why custom RF cables frequently outperform off-the-shelf and DIY cables. Whether you have years of experience as an engineer or are new to RF design, this guide will help you make informed decisions about your RF cabling needs.

Chapter 1

RF Cable Assembly Overview

The RF cable assembly selection world encompasses hundreds of variations, including commercial off-the-shelf (COTS) cables, custom cables, and do-it-yourself (DIY) cables. Coaxial cables are the most common type of RF cable, and manufacturers produce them in many different sizes, materials, and constructions.

Regardless of the assembly type, these factors determine several critical aspects of the cable:

1. Maximum operating frequency
2. Flexibility
3. Compatible connectors

As applications move higher in frequency, the design's margin for error decreases, and the demands on the cabling become more stringent. For these reasons, engineers must pay more attention to the cable and connectors' materials and construction at higher frequencies. However, the abundance

RF Cable Assembly Selection

Considerations for Off-the-Shelf versus Custom Cable Assemblies

- Selecting a RF cable assembly can include hundreds of variations whether OTS or Custom

- Coaxial cable comes in many different sizes, materials and constructions
- Higher RF frequencies require use of better materials and construction
- OTS cable assemblies are available in a large variety of frequencies and designs
- Custom cable assemblies are tailored to the needs of the intended application
  - Molex technical experts can recommend the optimum combination of cable, connectors and options to meet application requirements

of COTS options flooding the market can overwhelm engineers during the cable selection process. This diversity in RF cable assembly options can confuse engineers trying to choose an assembly that achieves optimal performance for a specific application.

Furthermore, many of the COTS solutions on the market are relatively generic, meant to meet the demands of broad applications but not necessarily the needs of your unique project. For example, an aerospace application might require a unique combination of operating frequency and flexibility that does not exist as a standard COTS solution. In situations like this, custom cabling is the preferred choice.

Custom cabling offers tailored specifications that ensure compatibility with specific operational requirements and environmental conditions. By working closely with a specialized manufacturer, you can design cables that precisely match your application's needs in ways that conventional COTS solutions can not.

For specialized requirements, Molex provides custom cable solutions. Technical experts can help fine-tune and identify the ideal connector-cable assembly combination to meet optimal performance needs for specific applications. Molex also offers a wide range of off-the-shelf cables through their distribution partners. The cables come in various frequencies, lengths, sizes, and connector options to suit different needs.

Chapter 2

Basic Coaxial Cable Construction

A coaxial cable transmission line has several key components, each offering different options for various applications.

Center Conductor

The center conductor in a coaxial cable carries the primary electrical signal and directly impacts signal integrity, impedance control, loss, and interference. Its quality and construction will significantly affect the efficiency and clarity of the transmitted signal.

The center conductor comes in two primary types:

1. **Solid conductors:** These are made of a single, solid piece of metal, providing better attenuation and higher signal integrity over longer distances. They are ideal for fixed installations where flexibility is less critical.
2. **Stranded conductors:** These consist of multiple thin wires twisted together. They offer greater flexibility and durability but have slightly higher attenuation than solid conductors.

COTS solutions force designers to choose between solid conductors' better performance and stranded conductors' better flexibility. However, custom solutions allow designers to balance these tradeoffs, providing the best of both worlds.

Dielectric Material

The dielectric material in a coaxial cable insulates the center conductor from the outer shield, maintaining the cable's impedance and preventing signal loss. It also reduces signal attenuation by minimizing energy loss within the cable, allowing for efficient and clear signal transmission.

Common dielectric material options include:

1. Polytetrafluoroethylene (PTFE)
2. Fluorinated ethylene propylene (FEP)
3. Polyethylene

Specific applications may entail unique dielectric requirements, including material type, thickness, and dielectric constant. Manufacturers can tailor custom cables to meet these specifications so that an application achieves optimal signal integrity, thermal management, and mechanical flexibility.

Shielding

The shielding in a coaxial cable protects the signal from external electromagnetic interference (EMI) and radio frequency interference (RFI). Shielding in coaxial cables varies in complexity and effectiveness. Options include:

1. **Wire braid:** The simplest form of shielding, wire braid consists of interwoven metal strands that provide moderate protection against EMI while maintaining flexibility. It is commonly used in applications with sufficient physical durability and moderate shielding effectiveness.

2. **Foil layer:** A more advanced design, the foil layer uses a thin sheet of metal, usually aluminum or plated copper, to provide excellent coverage and high-frequency shielding. This design effectively blocks RFI and is often used with other shielding methods to enhance overall performance.
3. **Combination of wire braid and foil:** The wire braid offers physical strength and flexibility, while the foil layer provides superior EMI and RFI protection, making this combination ideal for demanding applications requiring robust shielding.
4. **Tin-soaked braid:** This type of shielding offers unique properties by soaking the wire braid in tin, enhancing its resistance to corrosion and overall durability. It is particularly beneficial in harsh environmental conditions where long-term reliability and enhanced electrical conductivity are crucial.

Custom cables offer significant advantages by allowing for the precise selection and combination of shielding types to match the unique needs of each application. Consider the example in the aerospace industry, where a satellite communication system requires a coaxial cable with specific shielding characteristics to ensure reliable signal transmission in a harsh space environment.

OTS solutions may provide basic shielding but often fall short of addressing the unique demands of space, such as high radiation levels, extreme temperatures, and mechanical stress. A custom cable, however, can combine a tin-soaked wire braid for corrosion resistance with an aluminum foil layer for superior EMI and RFI protection, ensuring robust shielding while maintaining flexibility and durability.

Outer Jacket

The outer jacket of a coaxial cable protects the internal components from physical damage, environmental factors, and chemical exposure. It also provides additional insulation and helps maintain the cable's flexibility and mechanical strength.

The outer jacket of a coaxial cable can be made from various materials to suit different environmental and performance requirements. Options include:

1. FEP jackets
2. PTFE tape-wrapped jackets
3. PVC Extruded jackets
4. Polyethylenes

Custom cabling offers unique advantages, allowing for the precise selection of outer jacket materials to meet specific environmental and performance requirements. For example, a cable designed for harsh industrial environments might utilize a PTFE tape-wrapped jacket for its exceptional chemical resistance and high-temperature tolerance. In contrast, a cable intended for outdoor telecommunications could benefit from a polyethylene jacket, which provides excellent UV resistance and flexibility in cold temperatures.

When using COTS solutions, designers may be unable to choose materials that perfectly match their application's unique conditions. This could lead to premature cable failure, increased maintenance costs, and compromised system performance. Custom cables mitigate these risks by being tailored to the specific demands of the environment, ensuring optimal functionality and durability.

Each Component's Role

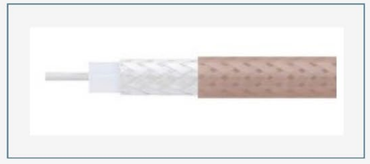
Each coaxial cable transmission line component contributes to its overall performance and suitability for specific applications. Each element's choice of materials and design allows for customization to meet diverse signal transmission needs.

By understanding these components and their variations, Molex can better appreciate how coaxial cables are tailored for different uses in signal transmission.

Coaxial Cable Construction

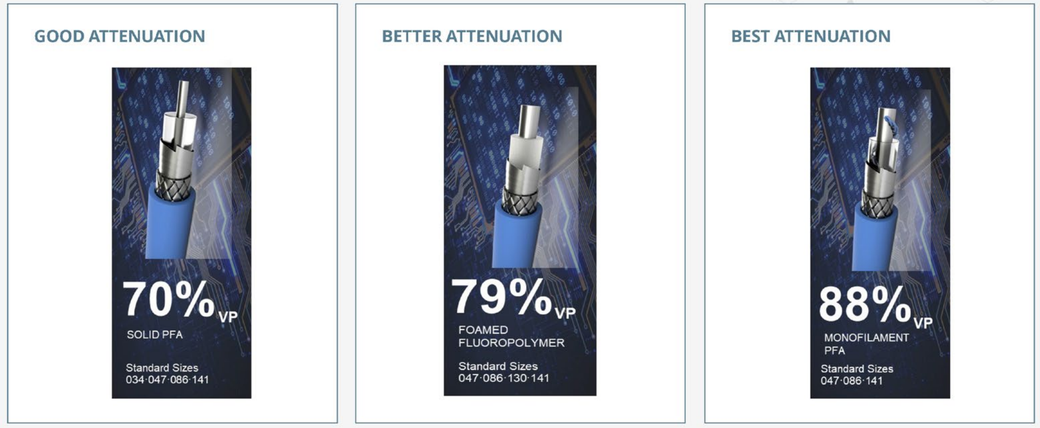
Typical Options

- Center Conductor
  - Solid
  - Stranded
- Dielectric Materials
  - PTFE
  - FEP
  - PE
  - Air enhanced
- Shielding
  - Wire braid
  - Foil
  - Tin-soaked braid
- Jacket
  - FEP
  - PTFE
  - PVC
  - Other



Molex High Performance Cable

Temp-Flex Coaxial Cable



Molex High-Performance Cables

Molex invested strategically years ago in Temp-Flex, a high-performance cable manufacturer based in South Grafton, Massachusetts, to provide customers with the best custom cabling solutions possible.

Temp-Flex produces leading high-performance coaxial cables that specifically excel in demanding technical environments. The company offers three distinct cable types, each with unique velocity of propagation characteristics:

1. **Solid PFA - Good Attenuation** Their first cable achieves 70% velocity of propagation. It utilizes solid PFA (perfluoroalkoxy alkane) or a modified Teflon material.
2. **Foamed Fluoropolymer - Better Attenuation** Their second cable, employing a foamed fluoropolymer material, reaches a velocity of propagation of 79%. This design provides better attenuation and lower signal loss than the first option.
3. **Monofilament PFA—Best Attenuation** Their premium cable boasts an 88% velocity of propagation. This design incorporates more air into the dielectric core by combining a filament with a dielectric sleeve.

With the technical and manufacturing expertise available through Temp-Flex, customers can create cable designs for applications requiring precise signal timing and minimal losses.

Chapter 3

Coaxial Connector Options

When evaluating design parameters for coaxial connectors, engineers must consider several key features.

Frequency

The operating frequency of the application is a crucial factor, as it determines the maximum frequency at which the cable assembly must function. Higher frequencies require connectors with tighter tolerances and superior materials to maintain signal integrity and prevent loss. For instance, applications involving high-frequency signals, such as satellite communications or RF broadcasting, necessitate connectors designed to handle these specific demands with minimal attenuation and reflection.

Coupling Style

The coupling style of the connector system is an important consideration, as it determines how the connectors mate and lock together, affecting both the ease of installation and the stability of the connection. Standard Options include:

- **Threaded connectors:** These are the most robust for high-vibration applications and often provide the best electrical performance.
- **Bayonet threaded connectors:** These feature a simple quarter-turn mechanism, similar to BNC connectors, making them easy to use.
- **Snap-on connectors:** These offer quick and simple connections.
- **Push-pull series:** Alternatives like 1.0/2.3 or QMA connectors enhance the ease of assembling cables into systems.

Attachment Method

Attachment methods for cable connectors vary:

- **Crimp-crimp:** Both center contact and braid are crimped.
- **Crimp-solder:** The center contact is soldered, and the braid is crimped.
- **Clamp-solder:** The braid is clamped, and the center contact is soldered.
- **Solder-solder:** Both center contact and braid are soldered.

The choice of attachment method depends on the connector size, cable size, and desired performance characteristics.

Gender

Connectors are available in male or female genders.

Size

Connectors come in various sizes.

Orientation

Orientation is another factor, with options for straight or right-angle connectors.

Balancing Tradeoffs and Custom Benefits

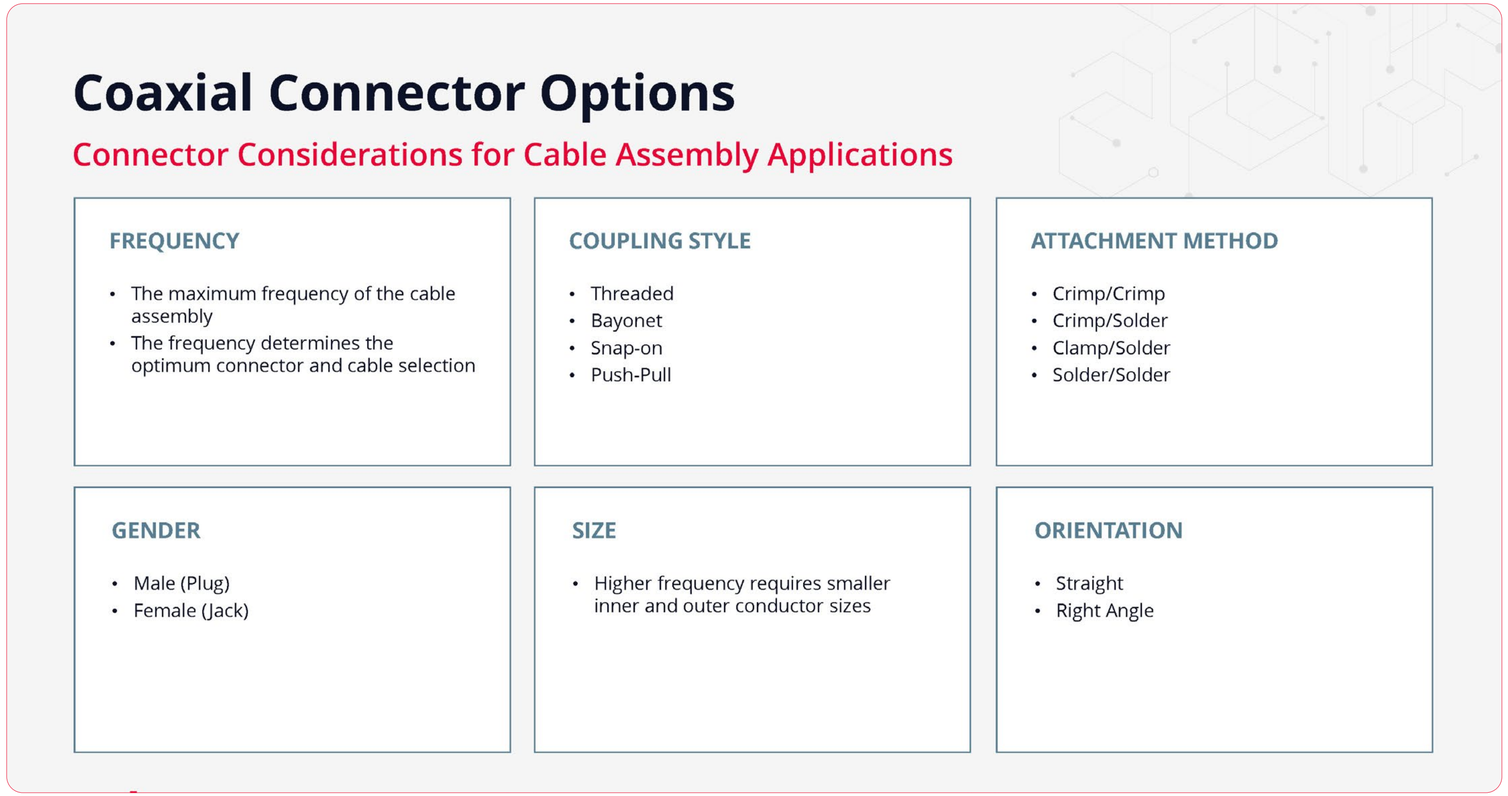
Choosing the right coaxial connector involves tradeoffs between the features above, each influencing the overall performance and usability of the connector in different ways.

For instance, threaded connectors provide robust mechanical stability and excellent electrical performance for high-vibration environments. However, their installation can be more time-consuming and complex than snap-on or push-pull connectors, which offer quicker and simpler connections. However, these easier-to-use connectors might provide a different level of security and durability in harsh conditions, potentially leading to signal loss or disconnections.

Similarly, choosing crimp-crimp and solder-solder attachment methods involves balancing ease of assembly and long-term reliability. Crimp methods are faster and often sufficient for many applications, but solder connections might offer better electrical performance and durability, which is important for high-frequency applications.

Whereas COTS solutions limit designers in which features they can achieve in a single cable solution, custom solutions can address these tradeoffs with tailored designs that meet specific application needs. By working closely with manufacturers, designers can select the precise coupling style, attachment method, and materials that best suit their operational environment and performance requirements.

For example, custom connectors can combine the ease of installation of snap-on mechanisms with the robustness of threaded designs where necessary or utilize specific attachment methods that optimize assembly efficiency and electrical performance. Additionally, custom designs can manage tradeoffs by incorporating unique features like specialized outer jackets for environmental protection or precise impedance matching for high-frequency applications.



Additional Connector Features

Body Materials

Coaxial connector manufacturers produce various body materials to suit different needs and performance requirements. Standard materials include brass, stainless steel, beryllium copper, and others.

Generally, designers should choose the material based on the specific application's needs. For instance, stainless steel offers greater durability than brass, making it suitable for applications requiring many mating cycles.

Plating Options

Manufacturers also provide various plating options for coaxial connectors. Standard plating materials include gold, nickel, white bronze alloy, silver, and tin. Manufacturers commonly use gold and nickel, with white bronze also frequently used.

Insulation

Manufacturers most commonly use PTFE (Polytetrafluoroethylene) as connector insulators. However, some high-performance, higher-frequency connectors employ a different design. These connectors use Ultem beads featuring air-articulated holes, which can enhance performance at higher frequencies.

Design Custom Solutions

When designing a custom coaxial connector, you must consider your application's specific requirements. The materials you choose for the body, plating, and insulator can significantly impact the connector's performance and durability. By understanding the properties of different materials, you can make informed decisions to ensure your coaxial connections meet your needs.

Additional Connector Features

Typical Material and Finish Options

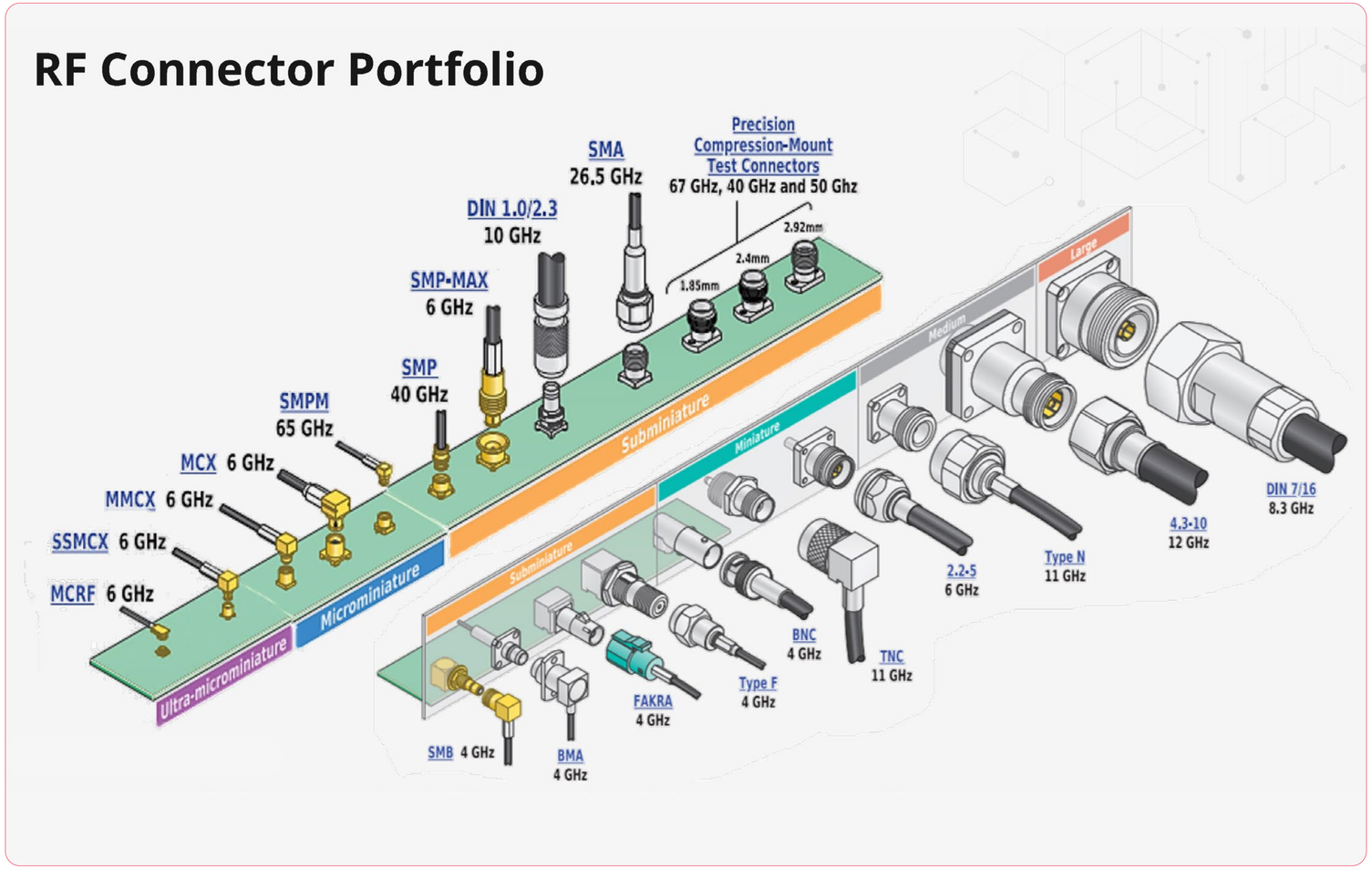
- Material
  - Brass
  - Stainless Steel
  - BeCu
- Plating
  - Gold
  - Nickel
  - White Bronze
  - Silver
  - Tin
- Insulators
  - PTFE
  - Ultem

Molex's RF Connector Portfolio

Molex.com offers a quick snapshot of their basic RF connector portfolio. This overview highlights some of their most standard connectors available today, though Molex provides other series beyond those displayed.

The portfolio covers various sizes and applications, from the very small MCRF to the Din 7/16 connector. The MCRF, the smallest offering, is designed specifically for cable-to-board connections. At the other end of the scale, the Din 7/16 finds common use in outside telecom applications requiring high power.

Each connector in this portfolio caters to specific needs within the RF connectivity landscape, from miniature board-level solutions to heavy-duty outdoor applications. This snapshot serves as a visual guide of their core RF connector offerings, though it doesn't encompass the entire range.



Chapter 4

RF Cable Assembly Options

Molex brings decades of expertise and experience to help customers navigate the complexities of designing custom RF cables. When selecting cable assemblies for specific applications, Molex technicians consider the following primary factors:

Frequency of Operation and Attenuation

As mentioned previously, frequency of operation and attenuation remain primary considerations. Molex often discovers that cables from different manufacturers exhibit slightly varying performance characteristics, including differences in attenuation and shielding effectiveness. Molex's experts leverage their knowledge and experience to choose the most suitable cable manufacturer based on the given application and requirements.

RF Connector Style

The selection of an RF connector style or series is also vital. Matching the connector series becomes essential if you need to attach or mate the cable to a device purchased elsewhere.

Flexibility

Flexibility is another key factor. Molex experts assess your application to understand how flexible the cable needs to be and how many flexes it must withstand. Factors such as whether the cable will be used in a static or dynamic environment also guide the mutual decision-making.

Weight and Operating Temperature

Weight can be critical in some applications, while operating temperature is equally important. For instance, a PVC jacket is unsuitable for environments with constant temperatures of 180 degrees Celsius.

Cost

Cost is always a factor, requiring a balance between performance (both mechanical and electrical) and price.

Molex's Approach

At Molex, experts use their extensive knowledge to balance these tradeoffs, helping customers select the optimal features for their needs. By understanding each application's unique challenges and requirements, Molex provides tailored solutions that enhance performance, reliability, and cost-efficiency. This holistic approach ensures that customers receive cable assemblies that are technically superior and perfectly aligned with their operational and budgetary constraints.

Additional Features

Other features considered in the custom cable decision-making process include the following.

Over-molding and Strain Relief

Depending on the configuration and needs, over-molding may be required. This process involves encapsulating the connector and a

RF Cable Assembly Options

Considerations for Design

- Frequency of operation
- Attenuation
- RF Connector style or series
- Shielding effectiveness
- Flexibility
- Weight
- Operating temperature
- Cost

portion of the cable with a durable material, providing enhanced strain relief, environmental protection, and mechanical durability. Over-molding can also improve the aesthetic appearance of the cable assembly and offer additional customization options, such as integrated grommets or sealing features, further ensuring the reliability and longevity of the connection in demanding applications.

Similarly, shrink tubing or strain relief behind the connector prevents tight bends behind the crimp tube or the solder joint, enhancing durability.

Labels, Markers, and Color Coding

Labels and markers can be added for identification, making tracking and managing cables within complex systems easier. This is particularly useful in environments with extensive cabling, like aerospace, where clear identification can prevent errors during installation and maintenance.

Similarly, color-coded cables enhance organization and efficiency by providing a visual reference that ensures the correct cable and connector are attached to the right port in systems with multiple cables. Customized labeling, including barcodes, serial numbers, or other unique identifiers, can facilitate asset management and inventory control.

Ferrite Beads

Ferrite beads may be incorporated into the cable to improve EMI filtering and meet EMC compliance regulations.

Ingress Protection

We offer cable assemblies with ingress protection connectors up to an IP68 rating.

Connector Clocking and Cable Harnessing

Connector clocking is available for two right-angle connectors, allowing positioning in the same direction, opposite directions, or at 90-degree angles. This flexibility in orientation allows connectors to fit precisely within the system's spatial constraints, optimizing cable routing and minimizing stress on the connectors and cables.

Similarly, manufacturers can combine multiple cables into a single harness with a mechanism to hold them together, streamlining installation and reducing clutter. This bundling approach improves the aesthetics of the cabling setup and enhances the overall reliability and durability by reducing the risk of individual cables getting tangled, damaged, or disconnected.

Phase Matching

Molex also provides phase matching of cables to a precise electrical length or within a group of cables. This process ensures that signals transmitted through multiple cables arrive simultaneously, critical in applications that depend on synchronization, such as in phased array antennas, high-speed digital communication systems, and precision measurement instruments. By carefully calibrating the electrical lengths of each cable, Molex minimizes phase discrepancies that can lead to signal distortion, timing errors, or reduced system performance.

Flexible Alternatives to Semi-Rigid Cables

While semi-rigid cables provide excellent RF leakage performance, they can be challenging to implement or bend into a package. Molex offers flexible alternatives to address these limitations.

Mechanical Crush Protection

Certain applications, such as benchtop automatic test equipment, may require mechanical crush protection to prevent damage and ensure longevity.

Custom Versus Off-The-Shelf

When selecting cable assemblies for a project, two main options are available: COTS and custom solutions. Each offers distinct advantages, and understanding these differences can inform the most appropriate choice for specific requirements.

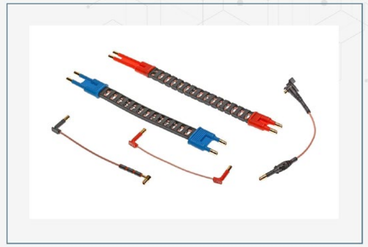
COTS Cable Assemblies

- Quick Availability: COTS cables offer short lead times, which is particularly advantageous during prototype or initial production run stages.
- Variety of Options: Various cable and connector combinations are readily available.
- Quality Assurance: COTS cables purchased from reputable distributors such as Mouser have typically undergone 100% HI-POT and continuity testing.

RF Cable Assembly Options

Additional Options to Consider

- Over-mold
- Shrink tubing – strain relief
- Labels and Markers
- Ferrite beads
- IP Sealed Connectors
- Connector clocking (orientation)
- Multi-cable harnesses
- Phase matching
- Flexible alternatives to Semi-rigid coax
- Color coding
- Mechanical crush protection



Custom Cable Assemblies

- Tailored Solutions: Manufacturers design and assemble custom cables to meet the specific requirements of an application or use case.
- Enhanced Features: Custom cables can incorporate additional features and configurations, such as specialized over-molding, to suit exact needs.
- Optimized Performance: Manufacturers design custom cables to optimize performance for particular applications.
- Comprehensive Testing: Custom cables can undergo 100% testing on a network analyzer, ensuring consistent RF electrical performance.

While COTS cables provide speed and convenience, custom cable assemblies offer a higher degree of specialization and performance optimization. Understanding these differences enables selecting the option that best aligns with project requirements, timeline, and budget.

Test and Measurement Assemblies

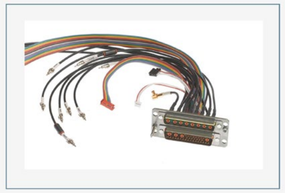
Test and measurement cables represent another category of off-the-shelf products, complementing the range of custom cable options. Molex's test and measurement cables have been recently introduced

Custom Versus Off-The-Shelf

Custom Cable Assemblies Address Application Needs

- Off-The-Shelf (OTS)
  - Short lead-time
  - Large assortment of cable and connector options
  - Hi-POT and Continuity Testing
  - Many variations available through distributors

- Custom
  - Assembly tailored to the application
  - Additional features/configuration
  - Engineered and optimized for performance
  - RF performance testing on a Network Analyzer



Test and Measurement Assemblies

Cardinal Flex and Cardinal Test Cables

- Off-The-Shelf High Frequency Test Cables
- Flexible, low-loss up to 110 GHz
- Crush Proof designs available
- Excellent Phase Stability
- 12”, 24” and 36” standard lengths
  - Other lengths available on request

to the distribution network, including Mouser and other franchised distributors. This expansion in availability enhances accessibility for customers seeking these specialized cable solutions.

Key Features

- Performance: Operates at frequencies up to 110GHz
- Design Options: Available in both crush-proof and flexible designs
- Specialized Use: Engineered specifically for test and measurement applications
- Applications: Suitable for production environments, in-line testing, and laboratory use
- Standard Lengths: Available in 12, 24, and 36 inches

Availability

Molex’s test and measurement cables have been recently introduced to the distribution network. This expansion in availability enhances accessibility for customers seeking these specialized cable solutions.
By offering custom cables and specialized off-the-shelf options like test and measurement cables, Molex has made a comprehensive range of solutions available to meet customers’ diverse project requirements in various industries.

Chapter 5

RF Assembly Builder & Demo

The Molex RF Assembly Builder, accessible via the Mouser and Molex websites, facilitates customers' custom RF cable assembly design. It offers an intuitive, step-by-step approach to creating tailored RF connector and cable combinations.

Understanding the RF Assembly Builder

The RF Assembly Builder is designed to streamline the selection of compatible RF connectors and cables. By employing selective filtering, the tool ensures you only choose connectors that fit your selected cable and vice versa. This feature significantly reduces the risk of errors in the selection process, saving you valuable time during the design phase.

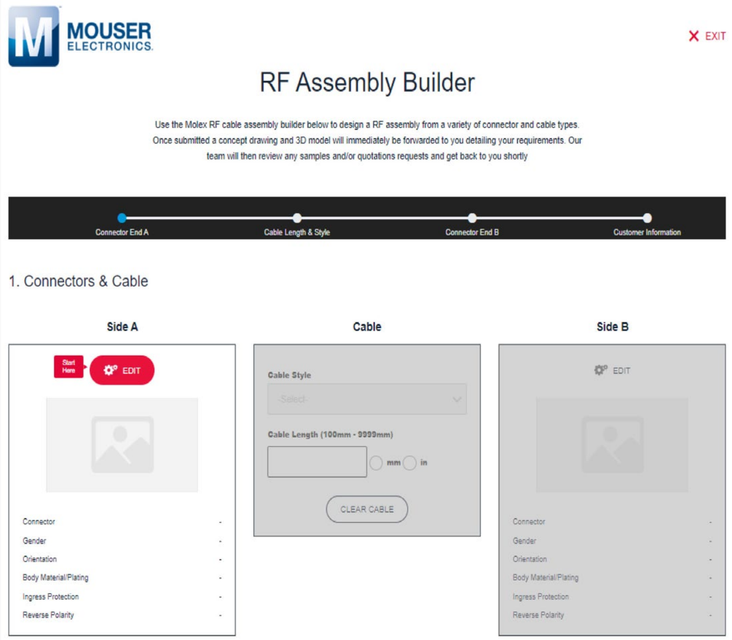
Key Features

- **Customization Options:** You can select various aspects of your RF assembly, including:

RF Assembly Builder

Available on molex.com

- Intuitive Selection Guide
  - Connector or Cable Selection limits based on compatibility
  - Prevents selecting a connector not made for cable chosen
- Connector Options
  - Gender
  - Orientation
  - Plating
  - Ingress Protection
  - Reverse Polarity
- Drawings automatically created after all selections made
- User can request
  - Drawing
  - Quotation
  - Samples



- Connector gender and orientation
- Plating options
- Ingress protection
- Reverse polarity options

- **Rapid Drawing Generation:** Within five minutes of completing your design criteria, the tool automatically generates detailed drawings of your custom assembly.
- **Additional Services:** In the Customer Information section, you can request price quotations and request a sample.

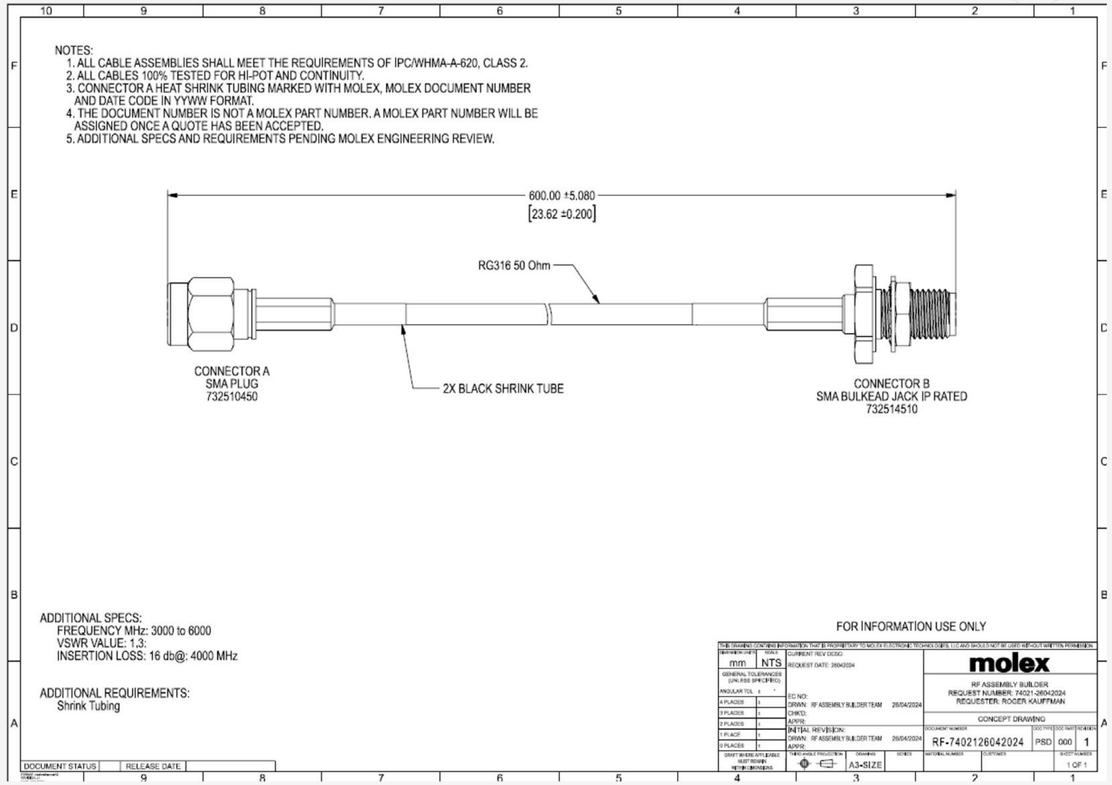
Drawing Example

You'll receive a detailed output that visualizes your custom cable assembly when you use the RF Assembly Builder. Let's break down the key components of this output:

- **Reference Number:** At the bottom of the drawing, you'll see a unique part number. It's important to note that this is not an orderable Molex part number but a reference number for your custom design.

Drawing Example

Auto Generated Drawing from the Molex RF Assembly Builder



- **Visual Representation:** The output provides a clear visual of your cable assembly, including:
  - Connectors on both ends
  - Cable length
  - Cable type
  - Optional features (e.g., shrink tubing, if selected)
- **Specifications:** In the lower-left corner, you'll find crucial specifications for your assembly:
  - **Operating Frequency Range:** In this example, it's 3000 to 6000 MHz.
  - **Desired VSWR (Voltage Standing Wave Ratio):** It's specified as 1.3 to 1.
  - **Insertion Loss:** The example shows 16 dB at 4000 MHz.

These detailed specifications ensure Molex can provide a cable assembly that meets your requirements. By inputting your exact needs into the RF Assembly Builder, you receive a custom solution tailored to your application's demands.

The comprehensive nature of this output facilitates clear communication between you and Molex's manufacturing team. It combines your custom RF assembly's physical characteristics and electrical specifications in one easy-to-understand document, helping eliminate potential misunderstandings and ensuring you get exactly what you need.

Demo: Using the RF Assembly Builder, A Step-by-Step Guide

Molex's live RF Assembly Builder is a powerful online tool that allows engineers and designers to create custom cable assemblies easily. This section will guide you through using this innovative tool, demonstrating its capabilities and highlighting its benefits.

Step 1: Selecting Connectors

Begin by choosing connectors for both ends of the cable assembly. Choose from the following specifications:

- Connector Type
- Gender
- Orientation
- Body Material and Plating
- Ingress Protection
- Reverse Polarity

After making these selections, save them.

For Side B, choose different specifications:

- Connector Type
- Gender
- Orientation
- Ingress Protection

Save these settings.

Step 2: Cable Selection

- Choose from various cable options, including Molex's high-performance Temp-Flex cable.
- Specify the desired cable length.

Step 3: Defining Electrical Parameters

Now, input the electrical specifications for the cable assembly:

- Frequency Range
- VSWR (Voltage Standing Wave Ratio)
- Insertion Loss

Step 4: Additional Requirements

The RF Assembly Builder provides a free text field for specifying any additional requirements. Here, you can enter details about:

- Labeling
- Shrink tubing
- Specific electrical specifications
- Power requirements

Any information entered in this field will appear on the final drawing.

Step 5: Customer Information and Project Details

Fill in your personal and project information:

1. Enter your first and last name.
2. Indicate whether you'd like to receive a drawing
3. Specify a project name
4. Set your target pricing
5. Define the project's lifetime
6. Select the project start date using the calendar feature
7. Provide an estimated annual volume

Step 6: Submission and Results

1. Click the submit button to process your request.
2. Within minutes, you'll receive a confirmation email verifying your input.
3. Shortly after, you'll receive the actual drawing and a step model.

Important Notes:

- The document number provided is a reference number, not an official Molex part number.
- Molex will assign an official part number after the customer accepts a quote.
- The output includes your additional specifications and the loaded configuration.

Conclusion

The Molex RF Assembly Builder offers a user-friendly, efficient way to design custom RF cable assemblies. With hundreds of configuration options, it guides users towards optimal solutions for their specific needs. While the tool is comprehensive, remember that Molex's technical experts can assist with specific or complex requirements, ensuring your final product meets all necessary specifications and performance criteria.

Combining the Assembly Builder's efficiency with Molex's expertise can streamline your RF assembly design process and achieve the best possible project results.

Chapter 6

Q&A

Q: How can a customer get a drawing if the RF assembly builder doesn't show an option or connector they need?

A: In such cases, the customer should contact their Mouser representative. The representative will then contact the product manager working with engineers to create a drawing. This process typically takes 24 to 48 hours.

Q: Can a customer place an order using the drawing number received from the RF assembly builder?

A: The RF assembly builder's comprehensive product database typically enables the company to provide quotations within 48 hours. This timeline assumes the customer has provided all necessary project information, such as estimated annual usage and volumes.

Q: How long does it take to get a quotation on a cable assembly from the RF assembly builder?

A: The RF assembly builder's comprehensive product database typically enables the company to provide quotations within 48 hours. This timeline assumes the customer has provided all necessary project information, such as estimated annual usage and volumes.