smiths interconnect

# EZiCoax

## Single-piece Coax for Interposer Solutions

# EZiCoax Technology

Smiths Interconnect is the world leader in spring contact probe design and the industry's expert in applying spring probes as connector contacts.
EZiCoax is a single piece, compression mount, RF Coax that transmits signals between two PCBs.


## Single-Piece Coax

EZiCoax utilizes spring probe technology for the center contact and shield which provides a compliant contact between two PCBs. Alignment is achieved with an Interposer that can integrate other features such as gaskets and bosses.

## Reliability in Harsh Environments

The durable nature of Smiths Interconnect spring probes ensures interposers that are designed for high performance in the harshest conditions. Whether environmental factors like shock, vibration, salt, sand, dust, heat or the vacuum of space, Smiths Interconnect delivers a reliable, fail-safe connection.

## Solderless Solution

EZiCoax requires no solder on the PCBs for connection. Each contact requires less than 5 oz. compression force to provide reliable contact.

## Lower Cost of Ownership

EZiCoax requires no assembly, it is sufficient to align to the PCB and compress. EziCoax interposers can be installed and uninstalled with minimum effort.

## Ideal for Blind Mate

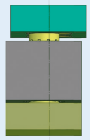
EZiCoax interposers are compliant, allowing unique blind mate capabilities. They are an ideal approach for quick disconnect applications for system repair or replacement.

## High Frequency

EZiCoax Interposers perform well out to 40 GHz with less than -1 dB of Insertion Loss. They have superior shielding from stray signals and provide excellent cross-talk characteristics.

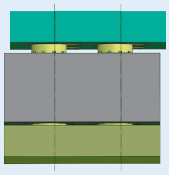
## Accommodates Target Misalignment

Spring probe connectors are compliant and require only a flat pad as their target. Contact is maintained as long as the probe tip touches any point within the target. This ensures forgiveness of any X, Y, Z and angular misalignment.



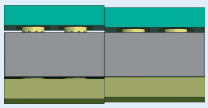
### X Misalignment

Contacts are moved from the x-axis but connection is not affected.



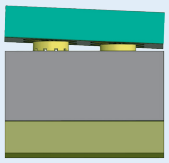
### Y Misalignment

Contacts are moved from the y-axis but connection is not affected.



### Z Misalignment

Contacts are engaged from different z-axis points without impacting performance



### Angular Misalignment

Contacts are engaged at varying angles.

Dimensions are in inches [mm]. Dimensions are for reference only and are subject to change.

# Technical Characteristics

| | |
|---|---|
| **Pitch** | 0.125 [3.20] |
| **Contact termination** | Compression Mount |
| **Coax Diameter** | 0.089 [2.25] |
| **Shield Diameter** | 0.066 [1.70] |
| **Compression Force** | < 5 oz.[141.8 g.] |

## Mechanical & Environmental

| | |
|---|---|
| **Temperature Rating** | -55° to 165°C |
| **Shock** | IEC 60068-2-27, Half sine, 100 g, 6 ms |
| **Vibration** | EIA-364-28, Test Condition VI, 53.79 G rms |
| **Contact Life Cycles** | 1000 |

## Material & Finishes

| | | |
|---|---|---|
| **Insulator** | TPX RT-18 | |
| **Signal & Shield Plunger** | Beryllium Copper | |
| **Contact Plating** | Gold over Nickel | |
| **Spring** | Stainless steel | |
| **Outgassing** | TML=0.50 | CVCM=0.17 |

## Electrical

| | |
|---|---|
| **Current Rating (*)** | 1.0 A at 30°C rise, nominal |
| **Bandwidth** | -1 dB at 40 GHz |
| **Nominal Impedence** | 50 Ω |
| **Insulation Resistance** | > 5,000 MΩ at 500 VDC |
| **DWV** | 500 V RMS |

*Qualification with reference to ESCC Specification No. 3402, Issue 5.
Qualification report available upon request.

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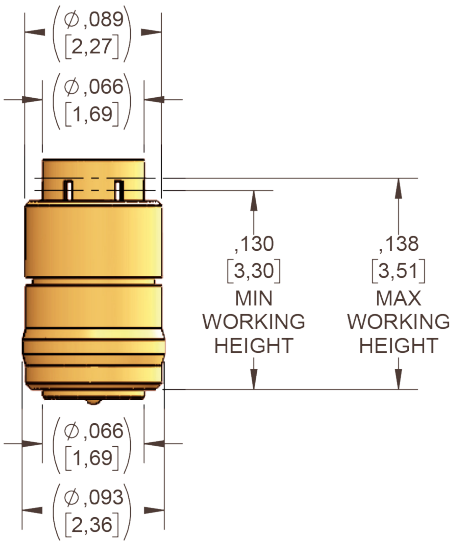
# EZiCoax Portfolio
## Dimensions and Specifications

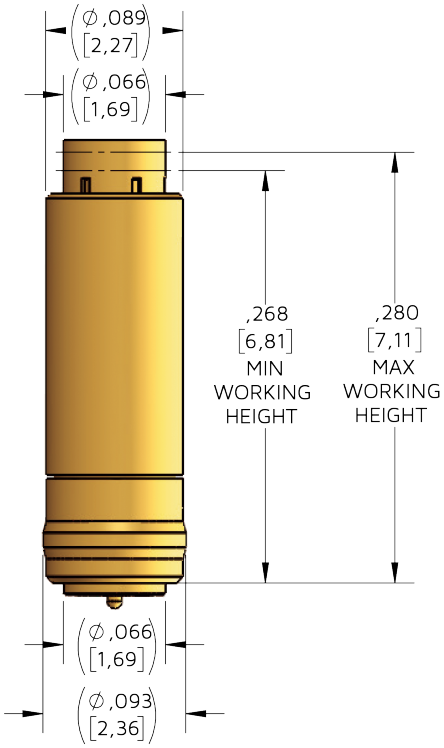
The following pages highlight Smiths Interconnect interposer EZiCoax portfolio. This information is intended as a reference for interposer design specification only, as these coaxes are not available for individual purchase. Other designs may be available. Consult a Smiths Interconnect technical expert for more information.

### 851-1001909-0130




| Coax Specifications | |
|---|---|
| Part Number | 851-1001909-0130 |
| Minimum Centers | 0.125 [3.2] |
| Current Rating | 1.0 A continuous<br>(individual probe in free air at ambient temperature) |
| Compression Force | 5 oz (141.8 g) @ .130 in. [3.3 mm] Working Height |
| Typical Impedance | 50 Ω |
| Working Range | 0.130 to 0.138 [3.3 to 3.5] |

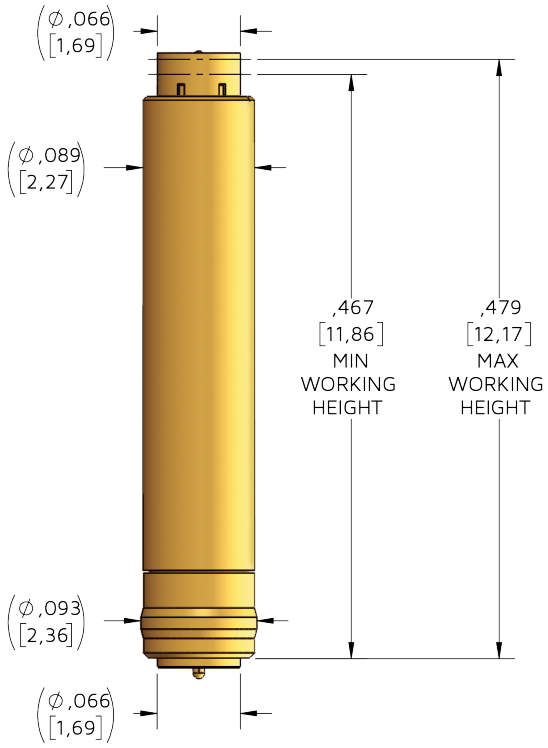
### 851-1001909-300




| Coax Specifications | |
|---|---|
| Part Number | 851-1001909-300 |
| Minimum Centers | 0.125 [3.2] |
| Current Rating | 1.0 continuous<br>(individual probe in free air at ambient temperature) |
| Compression Force | 5 oz (141.8 g) @ .268 in. [6.8 mm] Working Height |
| Typical Impedance | 50 Ω |
| Working Range | 0.268 to 0.280 [6.8 to 7.1] |

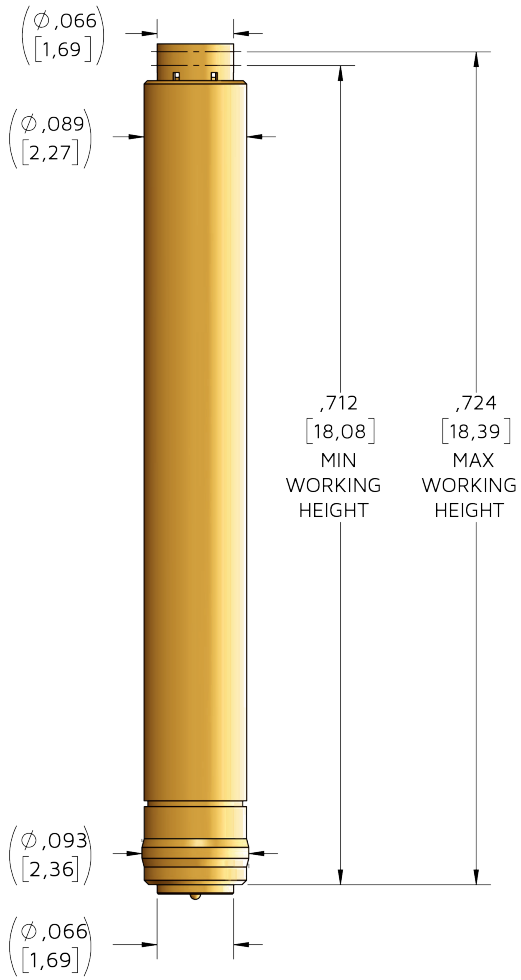
Dimensions are in inches [mm]. Dimensions are for reference only and are subject to change.

## 851-1001909-500




| Coax Specifications | |
|---|---|
| Part Number | 851-1001909-500 |
| Minimum Centers | 0.125 [3.20] |
| Current Rating | 1 A continuous<br>(individual probe in free air at ambient temperature) |
| Compression Force | 5 oz (141.8 g) @ .130 in. [3.3] Working Height |
| Typical Impedance | 50 Ω |
| Working Range | .467 to .479 [11.86 to 12.17] |

## 851-1001909-750




| Probe Specifications | |
|---|---|
| Part Number | 851-1001909-750 |
| Minimum Centers | 0.125 [3.20] |
| Current Rating | 1 A continuous<br>(individual probe in free air at ambient temperature) |
| Compression Force | 5 oz (141.8 g) @ .130 in. [3.3] Working Height |
| Typical Impedance | 50 Ω |
| Working Range | .712 to .724 [18.08 to 18.39] |

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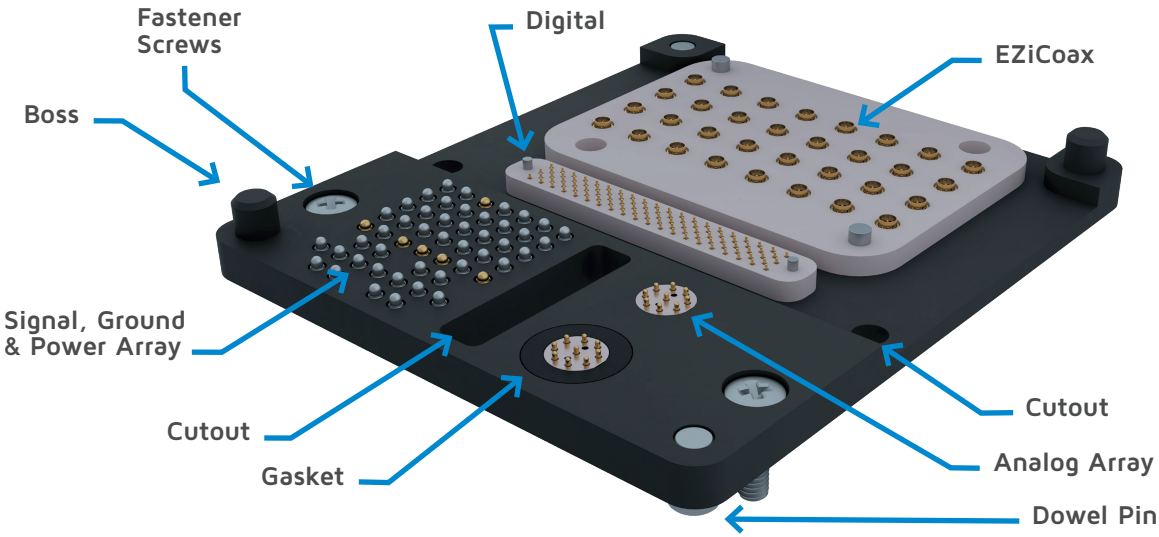
# Custom Interposer Features

## Alignment, Housing, Sealing & Termination Options

Smiths Interconnect custom interposers are designed to ensure industry-leading reliability and performance with the flexibility to incorporate application-specific features.

EZiCoax can be integrated into Spring Probe interposers to solve complex connections, featuring digital, signal and powers contacts in a single solution.




## Signal Patterns

In analyzing an application, specific probe and array configurations are recommended to perfectly balance the footprint requirements with optimal electrical performance.

### Coaxial Impedance
EZiCoax is designed to provide a 50 Ohm RF connection, alternatively, spring probes can be arranged to match any impedance for reliable RF transmission

### Digital
Two complimentary contacts with equal and opposite signals can be arranged to provide 100 Ohm impedance for data transmission.

### Spring Probe Arrays
Signal, power, ground/return pins, and mixed signal configurations.

## Alignment Features

To ensure compatibility with the customer's exact footprint, Smiths Interconnect utilizes precision-machined and molded housing features. This allows for accurate mating orientation, as well as clearance of board components.

### Dowel Pins
Stainless steel guide posts.

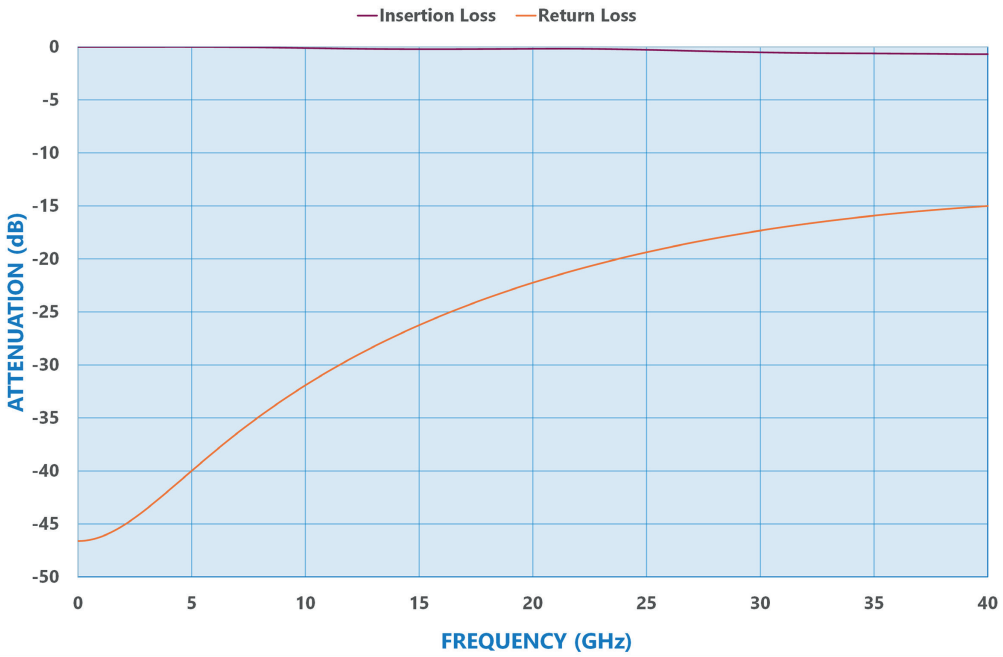
### Bosses
Molded stud features.

### Cutouts
Slot or hole which avoids a board feature or provides clearance for other components.

# Performance Results

## EZiCoax RF PERFORMANCE 0.130 [3.30] BOARD TO BOARD

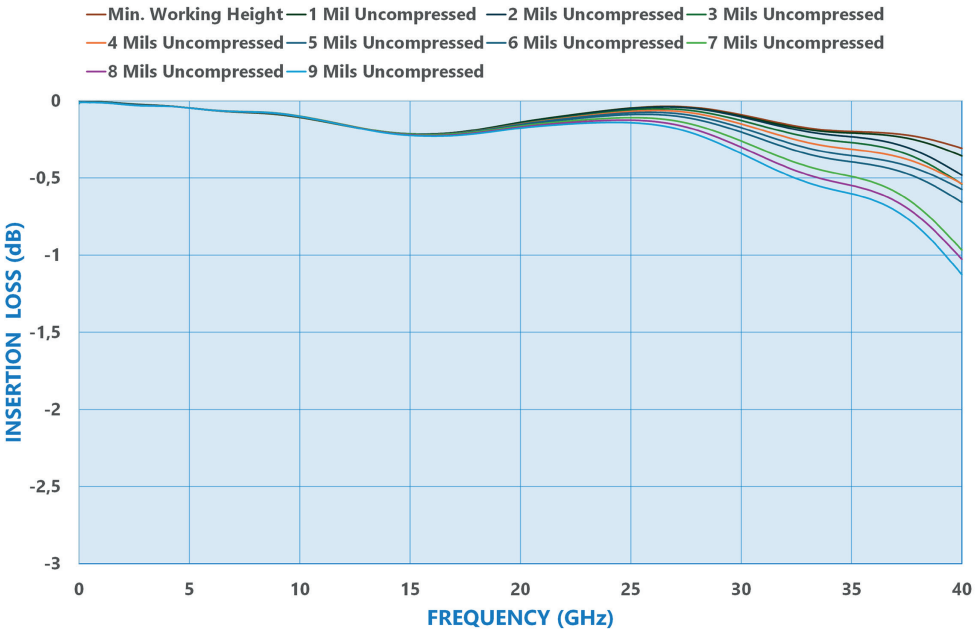
The top line in the graph (right) shows the Insertion Loss or Attenuation in dB versus Frequency. The bottom line shows the Return Loss versus Frequency. There is less than -1 dB Insertion Loss and greater than -15 dB of Return Loss through 40 GHz.




## AXIAL INSERTION LOSS 0.130 [3.30] HEIGHT

Axial Misalignment occurs when the board to board tolerance changes from the minimum working height of the coax to the maximum working height.

The graph (right) shows the Insertion Loss of the EZiCoax as the Axial alignment changes from the Minimum working height in 1 mil. increments

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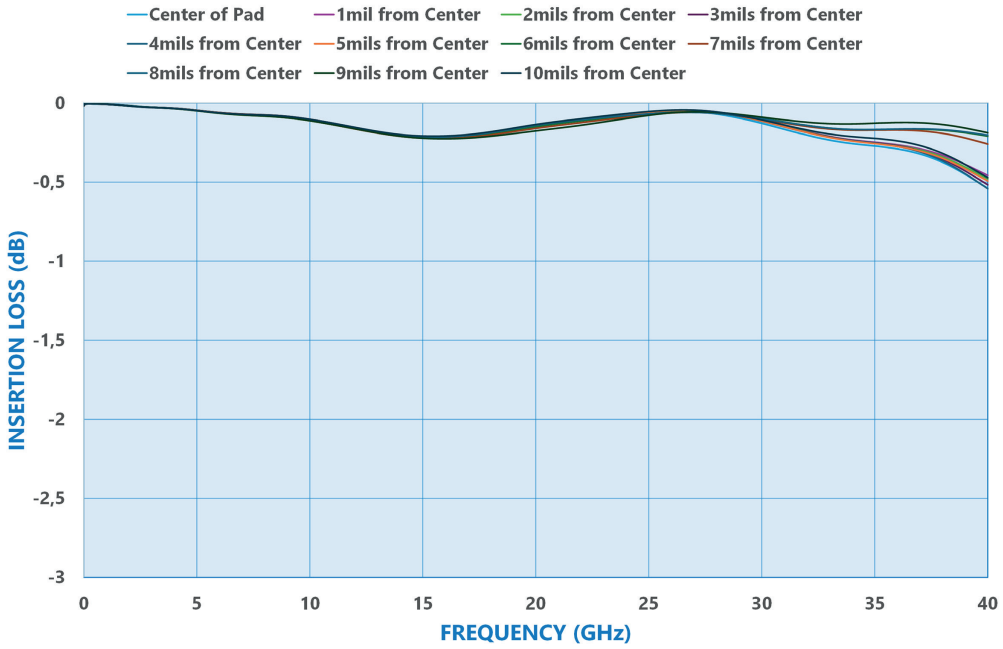
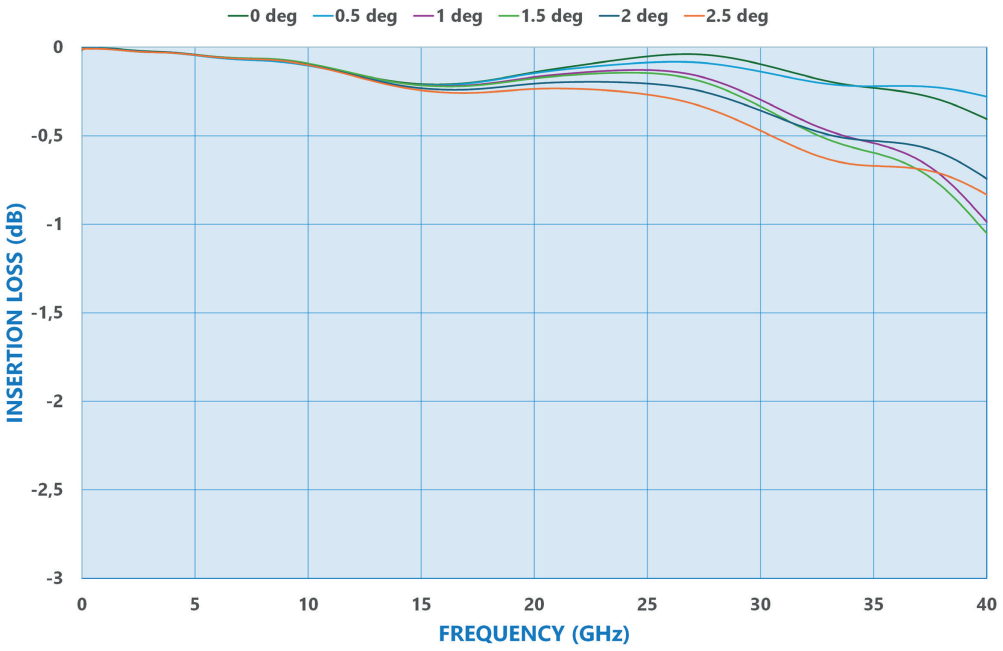
## RADIAL INSERTION LOSS 0.130 [3.30] HEIGHT

Radial Misalignment occurs when the coax deviates from the center of the PCB pad in the X or Y direction.
The graph (right) shows the change in the Insertion Loss as the alignment deviates in 1 mil increments. These results are only valid if using the suggested pad layout.




## ANGULAR INSERTION LOSS 0.130 [3.30] HEIGHT

Angular Misalignment occurs when the two PCBs are not parallel to each other.
The graph (right) shows the change in Insertion Loss as the angular alignment changes in half degree increments.

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# Notes

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# EZiCoax

One-Piece, Solder-less, Spring-Loaded Coax Connector

## Outstanding Performance

High-Speed Signaling to **40 GHz** with better than **–1 dB of Insertion Loss.**
Absorption of Axial (Z-axis) and Radial (X/Y) misalignment.
**Qualified to ESA ESCC 3402.**

## Ease of Assemby/Installation

Compression mounted, **no soldering**, quick and easy.
Interposer has special **alignment features.**
No special tools or post-soldering cleaning required.

## Mating/De-mating Forces

**Low mating force** (approx. 5 oz per coax).
No extraction force required for de-mating thanks to **Spring Probe Technology.**
Protects against PCB damage.

## Reworkability

Interposer can be assembled on and off the PCB many times **without special tooling**, minimizing risk of damage to the boards.
No need for soldering inspection.
**Lower Cost of Ownership.**

**Complete Interposer Solutions:**
Integrated Coax, Digital & Power Contacts

# Disclaimer

All of the information included in this catalogue is believed to be accurate at the time of printing. It is recommended, however, that users should independently evaluate the suitability of each product for their intended application and be sure that each product is properly installed, used and maintained to achieve desired results. Smiths Interconnect makes no warranties as to the accuracy or completeness of the information, and disclaims any liability regarding its use.

Smiths Interconnect reserves the right to modify design and specifications, in order to improve quality, keep pace with technological development or meet specific production requirements.

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