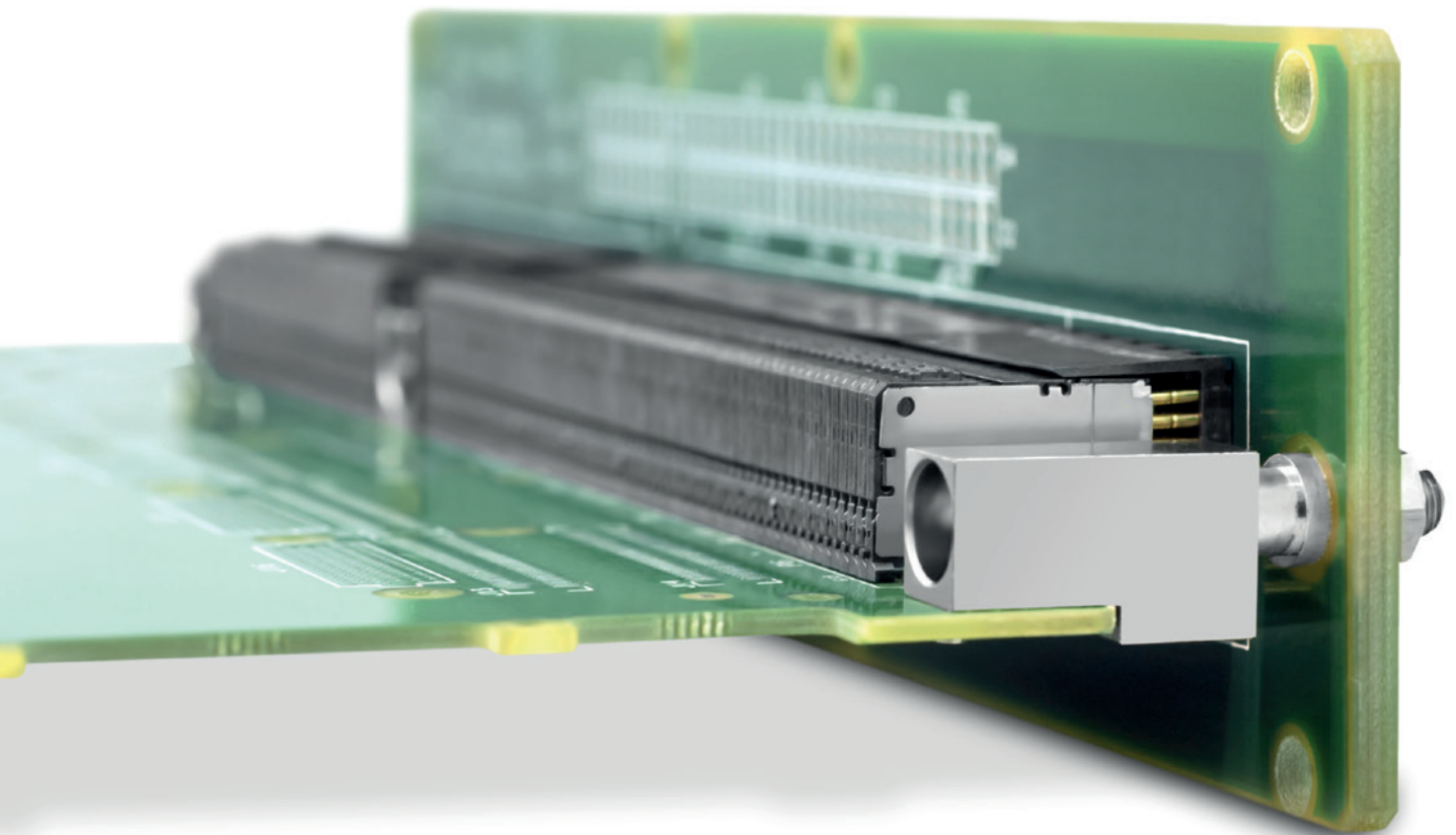


# KVPX Series

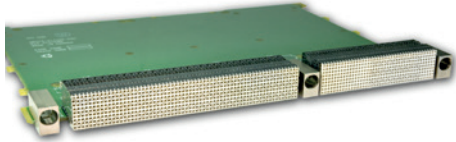
Rugged and high-speed backplane connector system



# Technologies

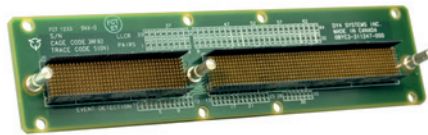
## Daughtercard

- **KX1HCP02C1TBH:**  
KVPX daughtercard half power module with Sn-Pb press-fit tails
- **KX1FCS02C1TBH:**  
KVPX daughtercard full single-ended module with Sn-Pb press-fit tails
- **KX1FCD02C1TBH:**  
KVPX daughtercard full differential pair module with Sn-Pb press-fit tails



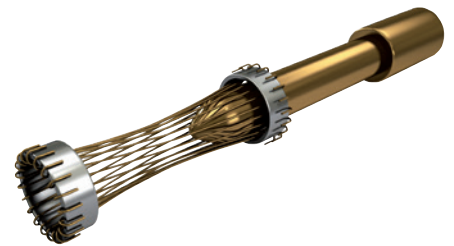
## Backplane

- **KX2HCU01C1TAH:**  
KVPX backplane half power module with gold press-fit tails
- **KX2FCU01C1TAH:**  
KVPX backplane full universal module with gold press-fit tails



## Hypertac® contacts

- Immunity to shock and vibration
- Low insertion/extraction forces
- Minimal contact resistance
- Industry leading mating cycles
- Self-clean wipe action for better signal integrity



# KVPX Series

**Resistant to shock and vibration**

**High speed up to 16 Gbps**

**Faceplate to protect daughtercard pins**

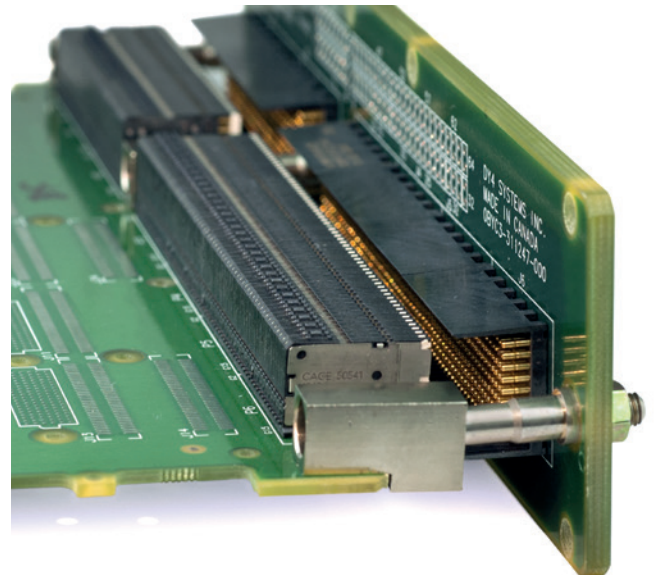
Smiths Interconnect's KVPX Series is an embedded interconnect system that provides unrivalled performance in harsh environments while adapting to the VITA standard design requirements. By utilizing the Hypertac® superior hyperboloid contact technology, the KVPX Series ensures exceptional tolerance to shock and vibration, low insertion forces, high current ratings and the lowest fretting corrosion available.

Fretting corrosion caused by the relative movement of contacts during continual shock and vibration in harsh environments is the leading cause of failure in aerospace, space, and defence systems platforms. This is especially problematic at the backplane interface of embedded computers such as avionics, radar, sensors, motor controls, weapon systems, and space applications such as launchers and satellites.

To solve this problem, Smiths Interconnect has integrated its legendary Hypertac contact system into a VITA 46/48 form factor by evolving its space proven cPCI connector technology. The KVPX interconnect system has been standardized into VITA 63 and meets all of the high-speed electrical requirements of VITA 46/48 while vastly increasing the mechanical reliability and physical ruggedness of unmated connectors and modules.

To that end, the KVPX utilizes a reverse gender versus other backplane connectors, further protecting the male pins from damage. KVPX connectors are qualified to EEE-INST-002 Level 1 and are equipped with Hypertac space-qualified 0.4 mm hyperboloid sockets and provide immunity to shock and vibration fretting, numerous linear paths of contact, low-forces, high mating cycles, and a self-wiping cleaning action that results in consistently better integrity in extreme environments.

The KVPX Series is highly engineered to guarantee top performance under the most severe condition in demanding applications where failure is not an option.



# Technical characteristics

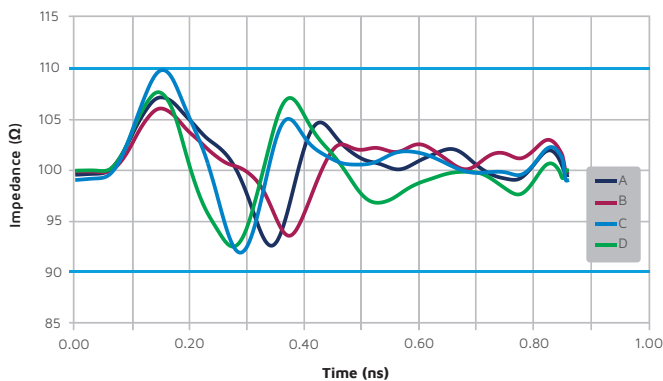
## Specifications

- **Number of contacts:** Half module - 72; Full module - 144
- **Pitch:** 1.8 mm
- **Current rating:** 1.5625 A per contact 12.5 A per power wafer (derated using a 30 °C temperature rise and 1 oz copper)
- **Extraction force:** 1.2 oz per contact typical
- **Temperature rating:** -55 °C to 125 °C
- **Insulator material:** LCP (liquid crystal polymer)
- **Contact plating:** 50 μin. gold over nickel
- **Flammability rating:** UL94-VO
- **Dielectric withstanding voltage:** 500 VAC
- **Low-level circuit resistance:** 8 mΩ maximum
- **Insulation resistance:** 500 MΩ maximum
- **Random vibration:** 15 Grms, 10 Hz to 2000 Hz for 90 min per axis per MIL-STD-1344, Method 2005, Test Condition III
- **Mechanical shock:** 100 G, 6 ms Sawtooth response per MIL-STD-1344, Method 2004, Test Condition G

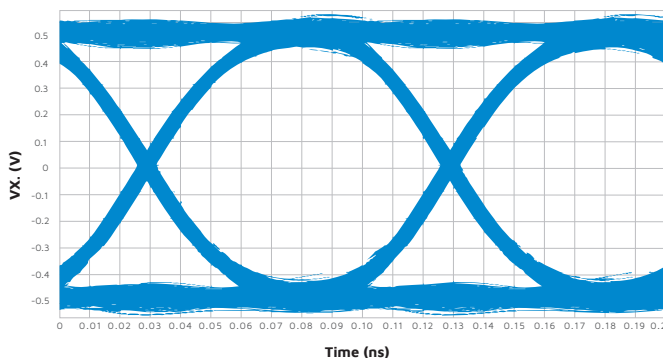
## Features

- Space qualified to EEE-INST-002 Level 1
- Compatible with VITA 46, 47, 63, and 78 (Space) standards
- Up to 16 Gbps data rate performance
- 100 Ω impedance for differential pair configuration
- Differential, single-ended, and power modules
- 0.56 mm (0.022 in.) diameter via for backplane connector
- Flexible modular design for standard 3U and 6U as well as custom configurations
- Press-fit termination
- Reliable Hypertac hyperboloid contact technology

## Performance



Measured impedance through TDR (50 ps rise time).



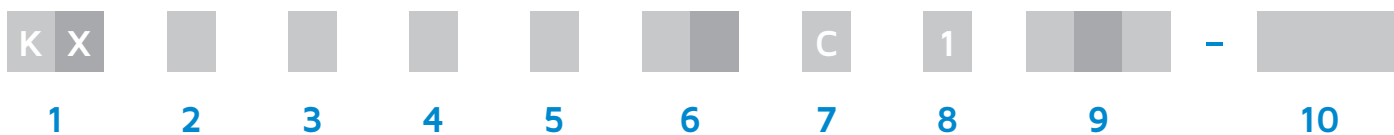
Eye diagram @10 Gbps.  
Crosstalk from 6 adjacent channels (NEXT and FEXT).






Speed is another critical factor when comparing VPX connector solutions and as technology evolution continues to push the limits. For system solution providers speed is a critical element in their ability to address the computation and I/O requirements of data driven applications. When evaluating the speed capability of a connector the key factors are impedance, return loss, insertion loss and crosstalk.

The use of impedance-controlled connectors is standard practice in radio frequency applications and is now being utilized for high-speed data transmission. In a transmission line, impedance matching is necessary to minimize reflections, to deliver the correct amplitude signal and to maximize power at the receiving end. To maximize signal performance, it is critical to maintain a differential impedance as close to 100 Ω as possible. The KVPX connector has an impedance variation <10% of the target 100 Ω with a 50 ps rise time (0%, no signal, to 100%, full signal) which is representative of the rise time of a 6 Gbps signal.

Due to the matched impedance profile and low loss performance of KVPX, signals travel with minimal disruption through it. The eye patterns of the intrinsic connector indicates a low amount of jitter and a wide eye opening which indicates that the KVPX connector is more than capable for 16 Gbps data rates. The eye pattern combines the impacts of impedance matching, return loss, insertion loss and crosstalk talk performance to ultimately determine the speed capability of the connector.

# How to order



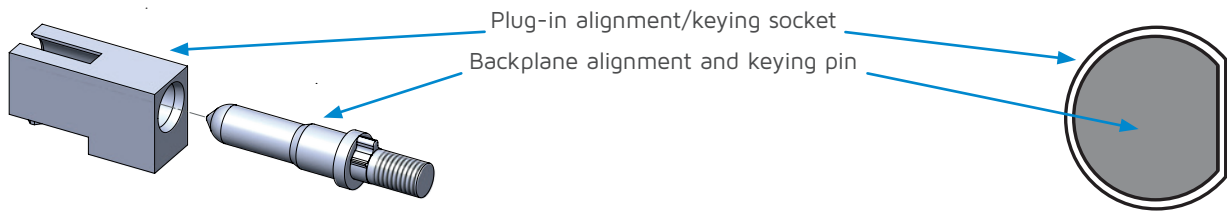
1 KVPX connector series (Fixed)	K X
2 Connector type	<p>1 Daughtercard</p> <p>2 Backplane</p>   <p style="text-align: center;">Daughtercard                      Backplane</p>
3 Module size	<p>H Half</p> <p>F Full</p>   <p style="text-align: center;">Half    Full</p>
4 Module style	<p>C Centre</p> <p>E End (includes end shield)</p>  <p style="text-align: center;">Perspective view is looking at the backplane</p>
5 Module type	<p>P Power/utility      D Differential pair                      S Single ended</p> <p>U Backplane</p>
6 Module type variant	<p>0 1 Backplane                                      0 2 Daughtercard</p>
7 Termination style (Fixed)	C Compliant press-fit
8 Termination length (Fixed)	1 Daughtercard length 1.8 mm Backplane length 3.3 mm
9 Termination plating	T B H 90% tin /10% lead (daughtercard)
	T A H Gold (backplane)
10 Space qualification (Optional)	S L 1 Space qualified: EEE-INST-002 Level 1 (leave blank for without space qualification).

# Guide hardware

Pin Part Number	Socket Part Number	Description
YGP064-001P	YGS064-004ANH	Left
	YGS064-005ANH	Centre (6U Only)
	YGS064-006ANH	Right

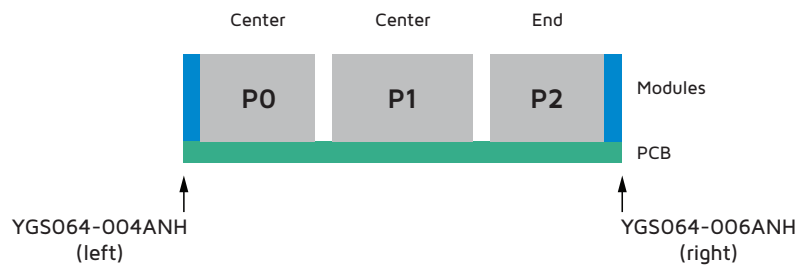
**Note** For keying options, add a "-" and the number below for keying angle at the end of the part numbers listed above.

Keying angle	No keying -Omit		3 0°	
	1 90°		4 315°	
	2 45°		5 270°	

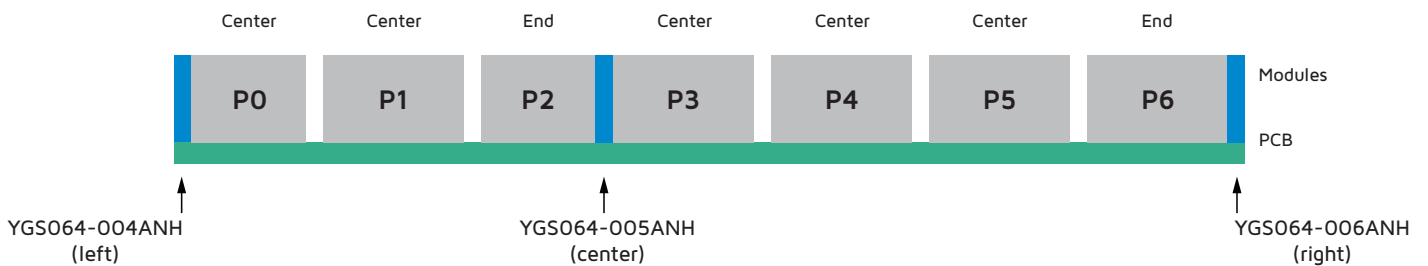


**Note** Mounting hardware is included with guide hardware.

## 3U socket configuration



## 6U socket configuration



**Note** Perspective view is looking at the backplane

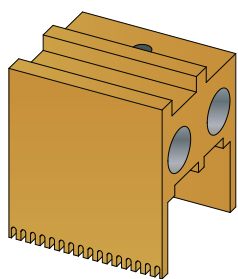
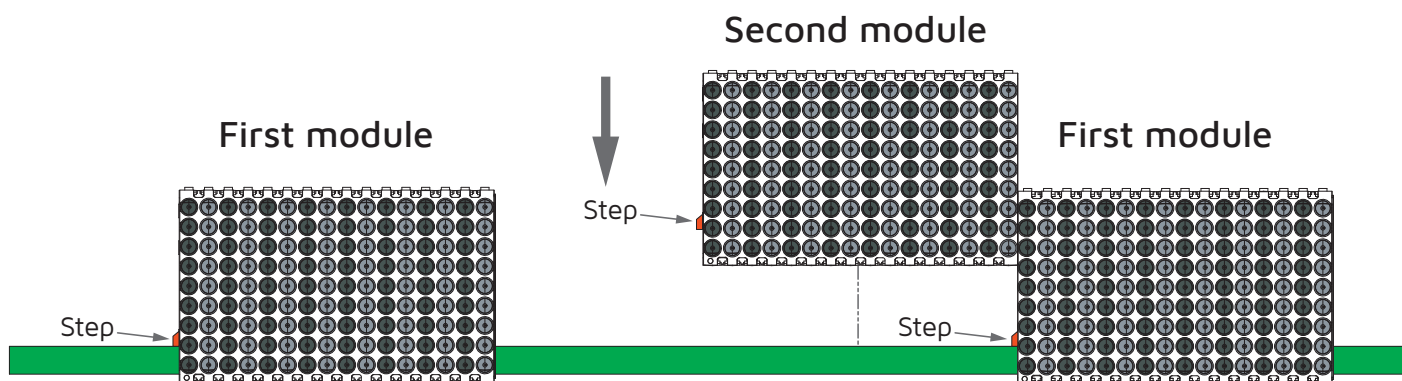
# Installation tooling

## Individual module tools

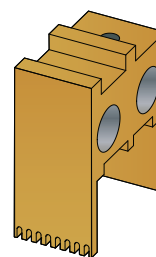
Part Number	Description	Compatible Modules
T3194-02	Daughtercard module installation tool, 144-pin*	KX1FCD02C1TBH
		KX1FED02C1TBH
		KX1FCS02C1TBH
		KX1FES02C1TBH
		KX1FCP02C1THB
		KX1FCH02C1THB
T3194-01	Daughtercard module installation tool, 72-pin*	KX1HCP02C1TBH
		KX1HEP02C1TBH
T3055	Backplane module installation tool, 144-socket**	KX2FCU01C1TAH
T3079	Backplane module installation tool, 72-socket**	KX2HCU01C1TAH

\* Only to be used with single module applications.

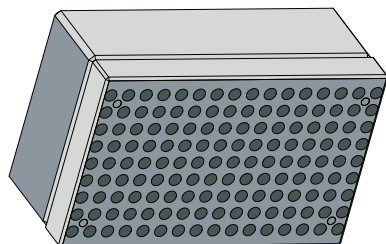
\*\* For applications with adjacent module it is necessary to ensure that the first module is installed with the plastic "step" on the inboard side of the connector. All adjacent modules are to be installed in order following the same rule. See below:



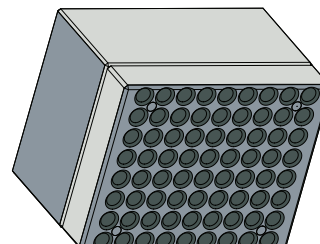
T3194-02



T3194-01



T3055

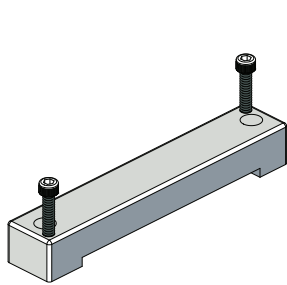


T3079

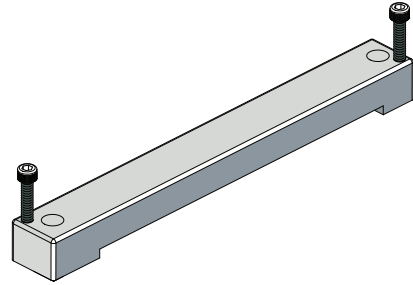


### 3U/6U tools

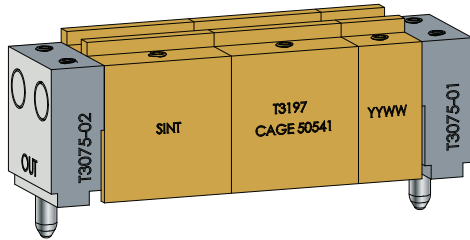
Part Number	Description
T3099	3U installation tool, backplane modules
T3099 & T3100	6U installation tools, backplane modules
T3197	3U installation tool, daughtercard module
T3197 & T3196	6U installation tools, daughtercard module



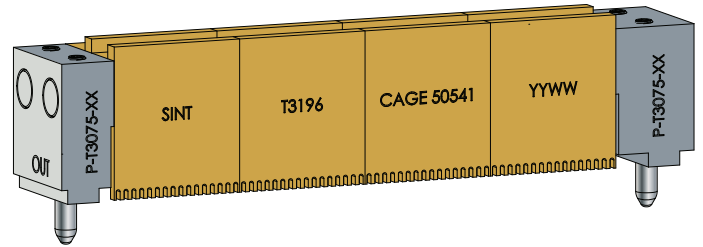
T3099



T3100



T3197



T3196

## 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.

No reproduction or use without express permission of editorial and pictorial content, in any manner.

# Worldwide Support

---

## Connectors

### Americas

#### Sales

connectors.uscsr@smithsinterconnect.com

#### Technical Support

connectors.ustechsupport@smithsinterconnect.com

### Europe

#### Sales

connectors.emeacsr@smithsinterconnect.com

#### Technical Support

connectors.emeatechsupport@smithsinterconnect.com

### Asia

#### Sales

asiacsr@smithsinterconnect.com

#### Technical Support

asiatechsupport@smithsinterconnect.com

---

## Fibre Optics & RF Components

### Americas

#### Sales

focom.uscsr@smithsinterconnect.com

#### Technical Support

focom.techsupport@smithsinterconnect.com

### Europe

#### Sales

focom.emeacsr@smithsinterconnect.com

#### Technical Support

focom.techsupport@smithsinterconnect.com

### Asia

#### Sales

focom.asiacsr@smithsinterconnect.com

#### Technical Support

focom.techsupport@smithsinterconnect.com

---

## Semiconductor Test

### Americas

#### Sales

semi.uscsr@smithsinterconnect.com

#### Technical Support

semi.techsupport@smithsinterconnect.com

### Europe

#### Sales

semi.emeacsr@smithsinterconnect.com

#### Technical Support

semi.techsupport@smithsinterconnect.com

### Asia

#### Sales

semi.asiacsr@smithsinterconnect.com

#### Technical Support

semi.techsupport@smithsinterconnect.com

---

## RF/MW Subsystems

### Americas, Europe & Asia

#### Sales

subsystems.csr@smithsinterconnect.com

#### Technical Support

subsystems.techsupport@smithsinterconnect.com

## Connecting Global Markets

more > [smithsinterconnect.com](https://www.smithsinterconnect.com)

