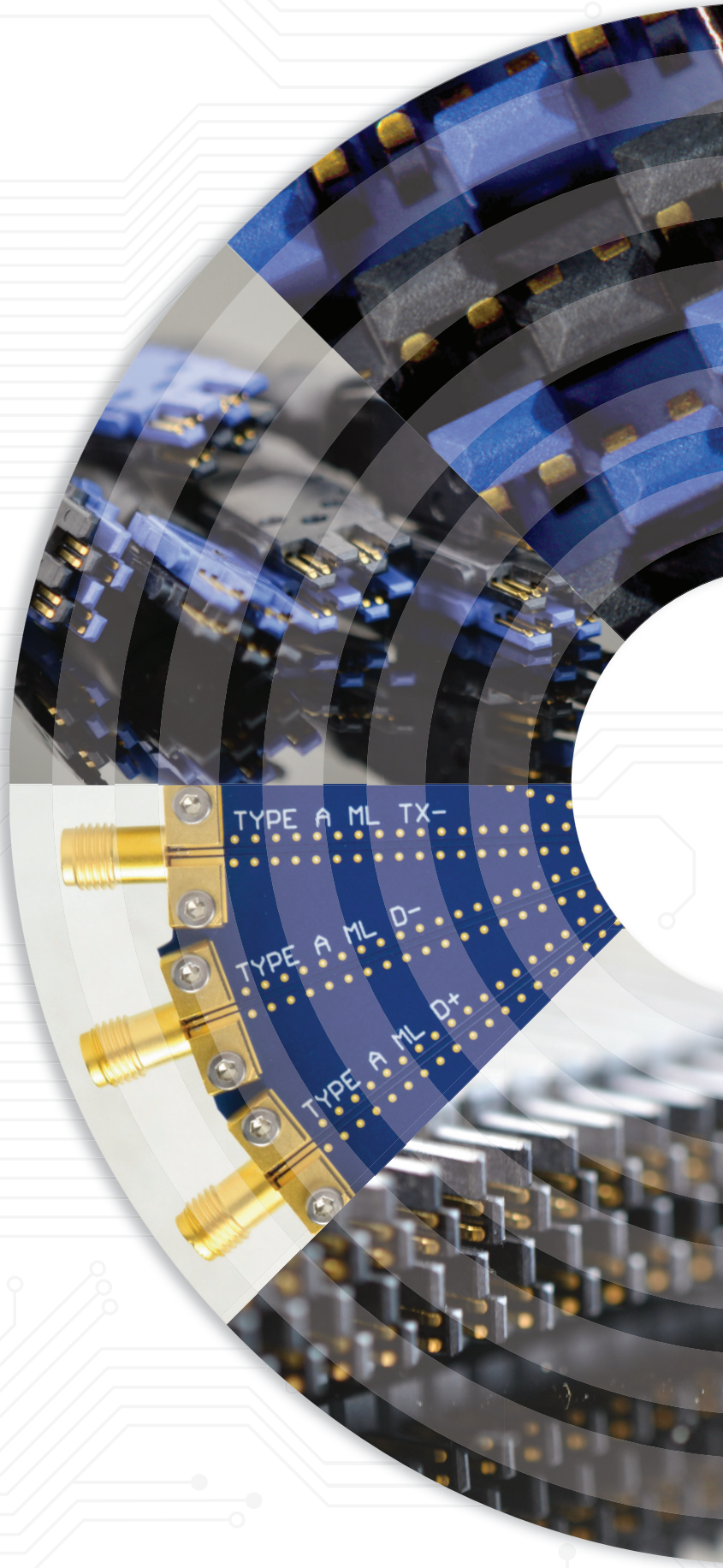
# VTAC HSD

STANDARD IN HIGH SPEED TESTING




Virginia Panel Corporation

# SETTING A NEW ***STANDARD***

Introducing **VTAC Right Angle inserts**. Following the success of VPC's VTAC High Speed Data (HSD) contact, our engineering team developed a new right angle PCB configuration that is capable of providing transfer speeds of more than **10 Gbps** per differential pair.

**100,000 Mating Cycles**

Broadband speeds are integral to projects that require large data acquisition, and **VTAC Right Angle** provides the signal integrity to keep up with those speeds.

VTAC contacts are uniquely situated in differential pairs that isolate signals to reduce signal cross talk and preserve signal integrity when transmitting at high data rates. To ensure the best signal performance, our engineers focused their efforts on matching impedance. The insert uses a precision-tuned signal routing to ensure that each differential pair has 100 Ohms of impedance, guaranteeing compatibility with other connectors of the same impedance. Since our team focused on quality and speed, test engineers can expect to use VTAC in their projects with minimal signal degradation.

VTAC Right Angle inserts are ideal for projects that require PCB solutions. The insert can transfer data at more than 10 Gbps per differential pair. When tested in our lab, our engineers have shown the same level of signal integrity, effectively cutting down signal disturbances like **crosstalk** and **insertion loss**.

High speed testing can be an expensive investment. The need for an economical alternative for high speed connectors influenced our engineers to make the solutions COTS-ready, highly serviceable, and modular. When used in PCB adapters, VTAC Right Angle inserts make pass-through connections easy to use. Should a contact fail, extraction tools are available to allow the user to replace a single insert instead of replacing the entire board.

VTAC Right Angle can be used anywhere that VTAC HSD has been used in the past. Our engineers designed the contact so the PCB version and cable version of VTAC can be intermixed in the same solution and even in the same module. VPC offers many variations of PCB solutions. Smaller versions that have only one protocol, like a single USB 3.0 connection, can be added to a module while the rest of the module is configured with patchcords. VTAC Right Angle is available as an individual insert or as a preconfigured circuit board to accommodate a multitude of high speed protocols.

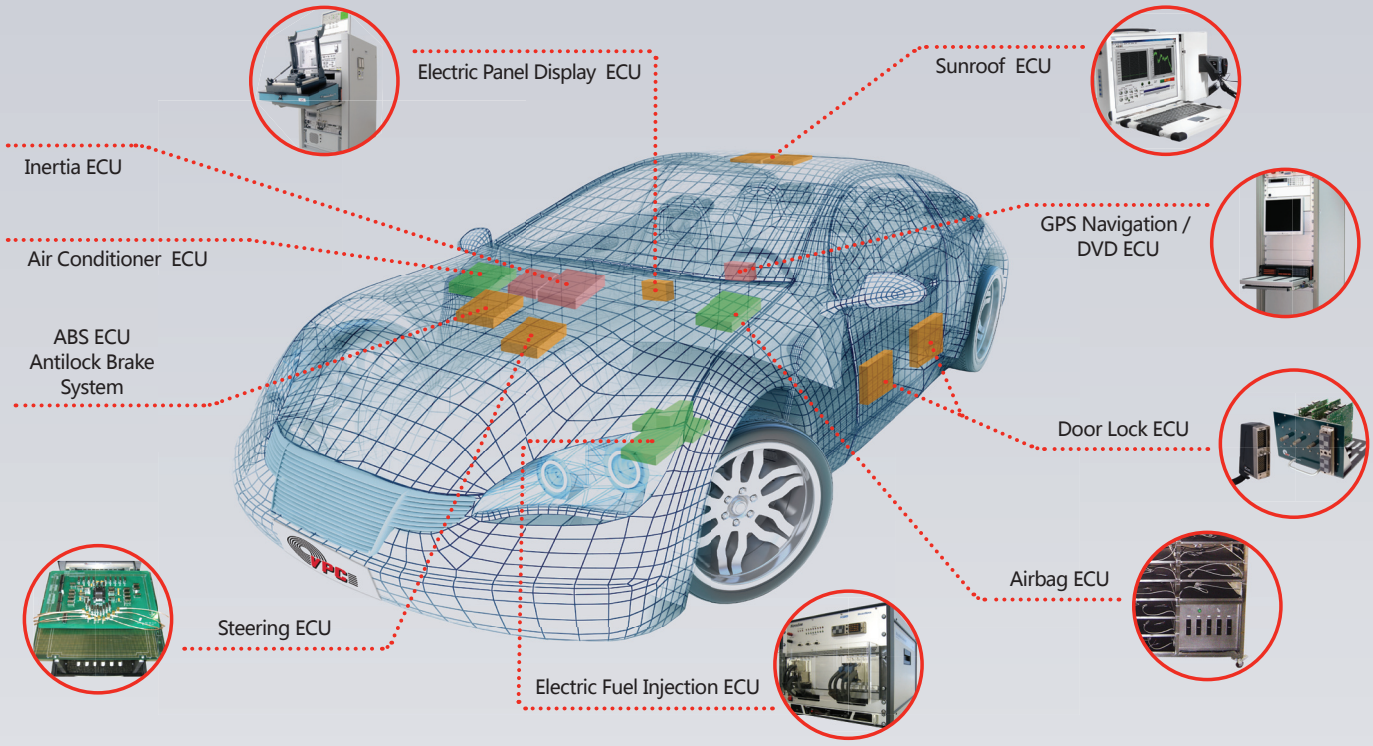
VTAC Right Angle inserts also double as a fast-break coupler. With a phillips head screw driver, the mounting bracket can be removed from the board, and the board can be removed from the module. A technician can service the board without disturbing the pass-through inserts that remain in the module.

VPC rates all VTAC contacts for **100,000 mating cycles**.

### Modular
SIM inserts are compatible in 90 Series modules and i2 MX modules

### Compatible
Compatible with multiple HSD standards USB 3.0, SATA, HDMI, DVI, Cat 6, QSFP, Twinax, and InfiniBand

### Serviceable
Replace contacts and inexpensive third-party cables instead of expensive printed circuit boards




# HOW IT'S USED

## HIGH SPEED AUTOMOTIVE APPLICATION

**Modular**

**Scalable**

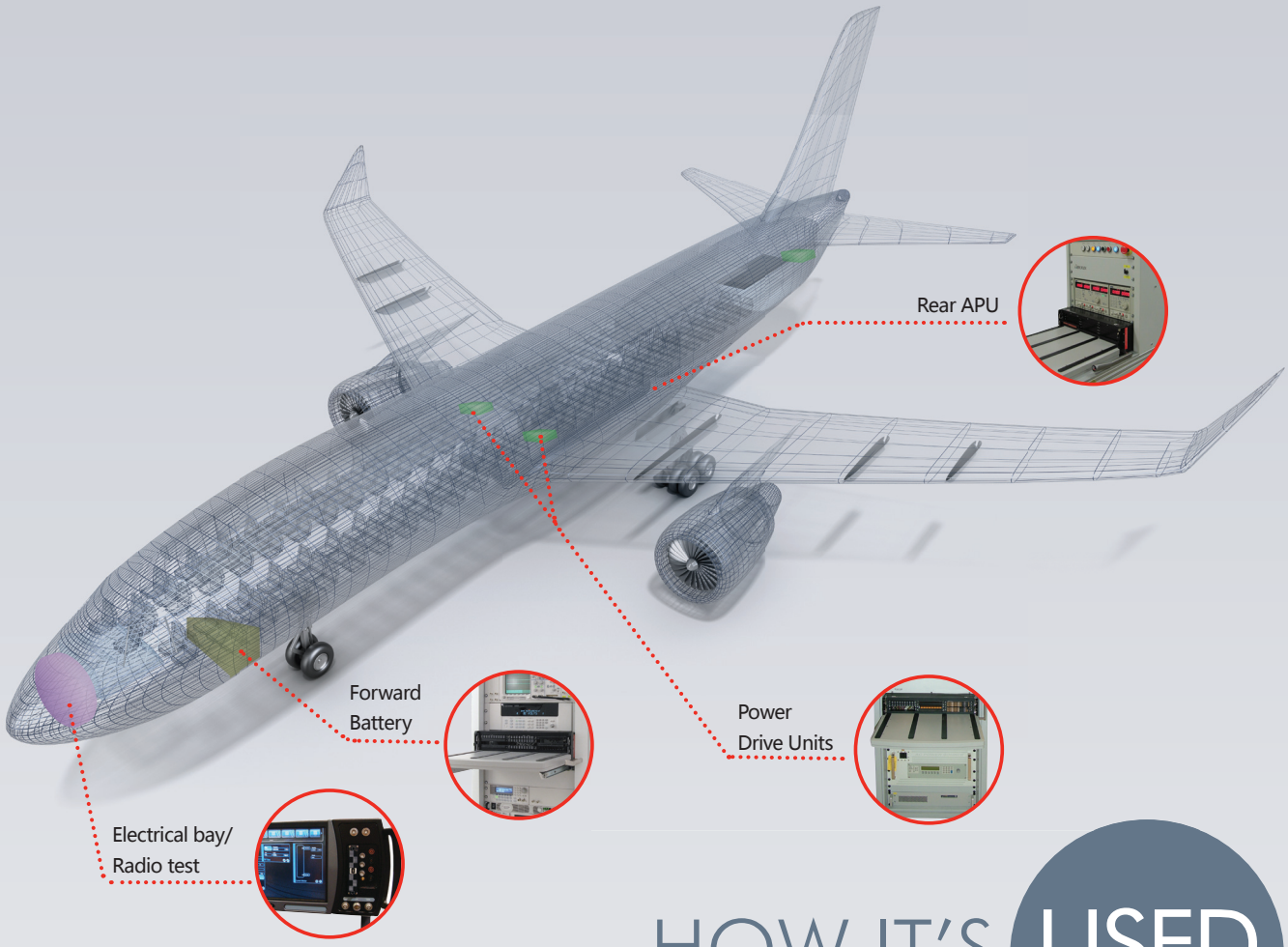
**+12.5 Gbps**

**Small I/O Connectors**

### INFOTAINMENT TESTING

GPS, eCall, and infotainment modules are regularly tested with VPC products. The VTAC connector is more than capable to handle the demands of high speed digital components. VTAC is configurable in small handheld iSeries connectors and 90 Series modules, making it flexible for on-vehicle diagnosis or on-rack monitoring and data downloading. VTAC is also PCB-mountable, so that docking type connectors can be used to conduct board tests.

An automated test company in Germany has used VTAC in its test stations to measure performance, communications, and functional tests with easy-to-engage mechanisms. The customer required a test station that would allow engineers to replace device testers for new test series with minimal time loss. While they report that their tests on infotainment features like backup cameras and GPS only require transfer speeds of approximately 3 Gbps now, they are confident that their need requirements will increase in the future and VTAC has future-proofed their test station design. VPC continues to innovate and develop new technologies that are both cost effective and cutting edge to remove the uncertainty of obsolescence.




# HOW IT'S USED

## HIGH SPEED AEROSPACE APPLICATION

### POWER DRIVE UNIT TESTING

One of our most celebrated connectors, the i2 MX, is used in the aerospace test community. Its greatest praise stems from its EMI capability and hybrid configuration with VTAC contacts.

A major European airline uses the connector with VTAC, power, and signal pins. The airline needed to test power drive units (PDUs), which convert electrical power to mechanical movement. These PDUs are responsible for a wide range of actuation systems, such as landing gear, wing flaps and slats, and braking mechanisms. To complete the test, the airline needed a connector that could use the standard power supply of an aircraft which supplies 400 Hz/115V DC or 230V AC. It also needed a connector that could use signal pins with discrete inputs/outputs. The airline was pleased that the i2 MX connector had intermixable module types, but the ability to limit eletromagnetic interference of the signal lines. The EMI backshell also helped to quell possible interference from other electrical drives aboard the aircraft.

Today, customers are using the connectors for RF, fiber optic, and high-speed test applications. There are four popular configurations, but more configurations are available.

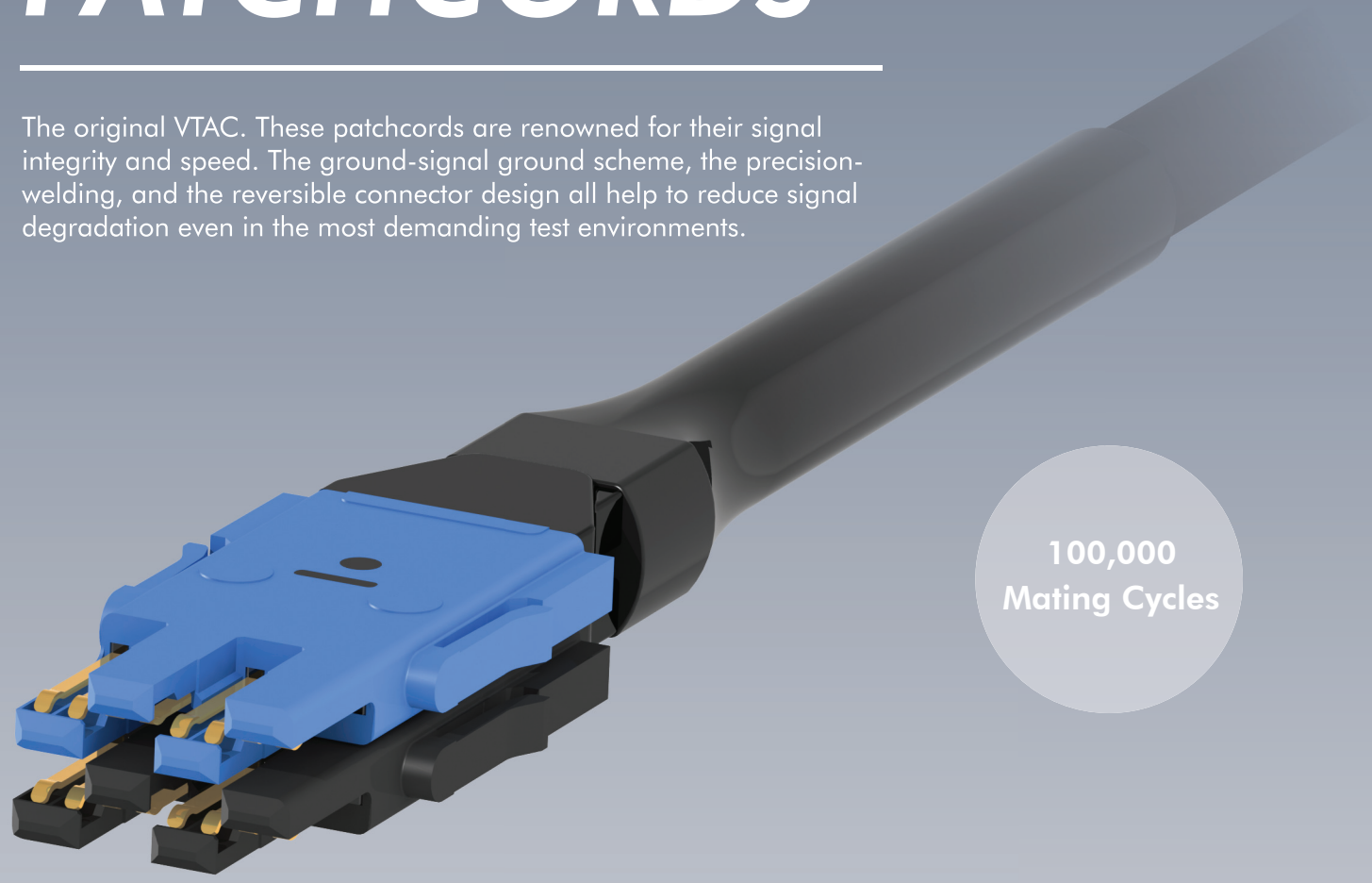
**Hybrid Configs**

**Signal Integrity**

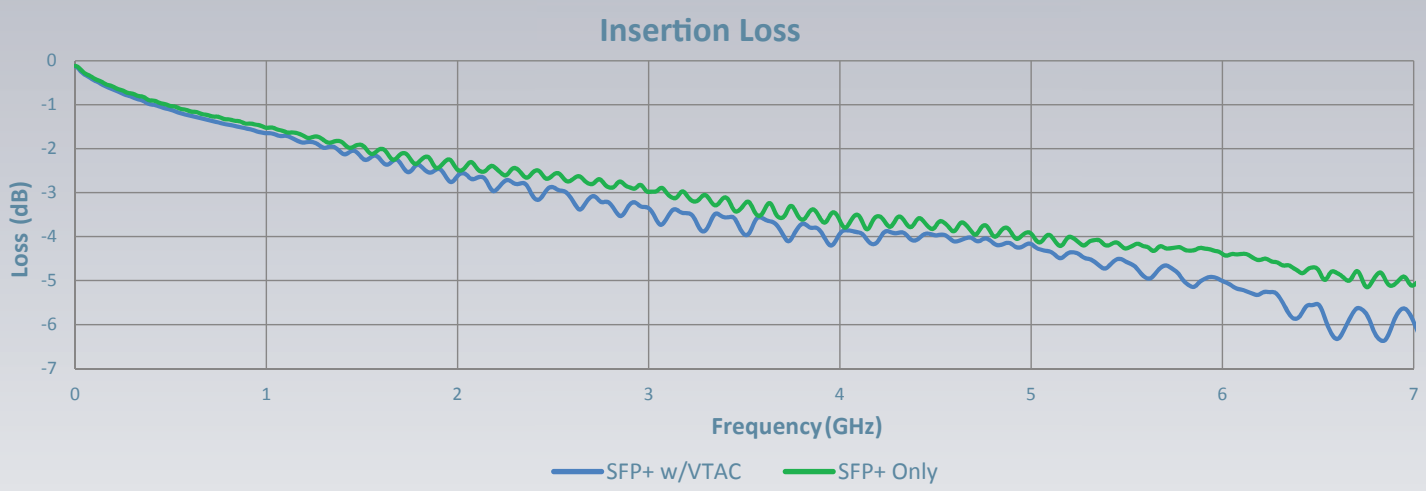
**EMI Connectors**

# HIGH SPEED DIGITAL
# ***PATCHCORDS***

The original VTAC. These patchcords are renowned for their signal integrity and speed. The ground-signal ground scheme, the precision-welding, and the reversible connector design all help to reduce signal degradation even in the most demanding test environments.



**100,000 Mating Cycles**



# The best performing patchcord available.

VTAC is quickly gaining market favor as multiple industries continue to adopt VTAC for high bandwidth data transmission and signal integrity testing. Its popularity is due in part to its compatibility with a variety of COTS digital protocols, such as: HDMI, USB 3.0, and Cat 6. VTAC's high data rate capability ensures that no matter which third-party connector your test station uses, you will be able to get the maximum data rate possible when transmitting with VTAC technology.

Customers have begun keeping VTAC as floor stock. Its reversible design and high cycle life lends itself well to floor stock since all patchcords can be used as male or female leads. Its features are exceptionally user-friendly. An engineer only has to push the VTAC insert into its module and it snaps into place; no additional tools are necessary for assembly. For disassembly, a simple extraction tool is used to compress the retaining clips for removal. Extraction tools can be stacked to remove multiple VTAC inserts simultaneously.

VTAC is rated for 100,000 cycles.

## INSERT SPECIFICATIONS

| | |
|---|---|
| Data rate | 12.5+ Gbps per differential pair |
| Crosstalk | -30 dB Min. |
| Characteristic impedance | 100 +/- 10 Ω per differential pair<br><br>50 +/- 5 Ω per single-ended |
| Contact resistance | 30 mΩ max. per mated contact |
| Insulation resistance | 1000 MΩ min. |
| Dielectric withstanding voltage | 1050 VDC min. |
| Mating force | 12 oz max. [0.34 kg] per insert |
| Insert material | Outer shell is black or blue LCP.<br>Male contact is alloy 7025 |
| Contact termination | Welded |
| Contact plating | 50μ" Au over 100μ" Ni |

# Experience minimal insertion loss.

VTAC reduces resistance and increases signal integrity with a seamless transition from wire to connector. Signal integrity is an important component to any test setup, especially when it comes to testing with broadband data. Properties of the signal transmission such as crosstalk, attenuation (insertion loss), return loss, impedance matching, and signal path are critical to successful testing. Additionally, connectors, printed circuit boards (PCB), and cables can have a significant effect on a signal's transmission speed and signal integrity. Each new connection creates an opportunity for signal degradation. Any failure to transmit or receive signals during a test creates potential for erroneous data that would otherwise indicate a system failure or other problem not caused by the device under test (DUT).

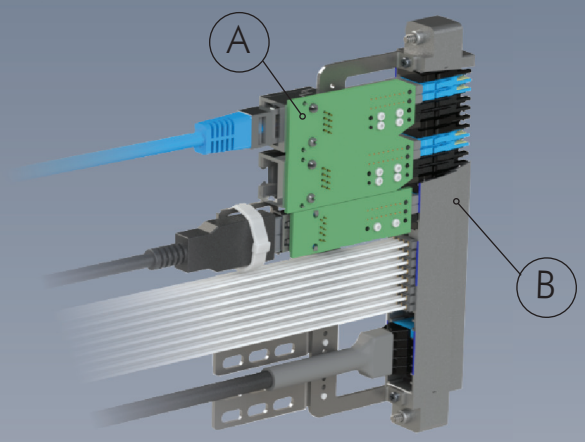
The figure to the left shows the insertion loss of a one-meter-long patchcord with SFP+ terminations on either end. The second data line shows the same patchcord that has been bisected and terminated with VTAC connectors in its center. The graph shows **no significant deviation** from the SFP signal until approximately 6.25 GHz. At 6.25 GHz, there is only -1dB of difference between the two patchcords, which is approximately a 10% loss.

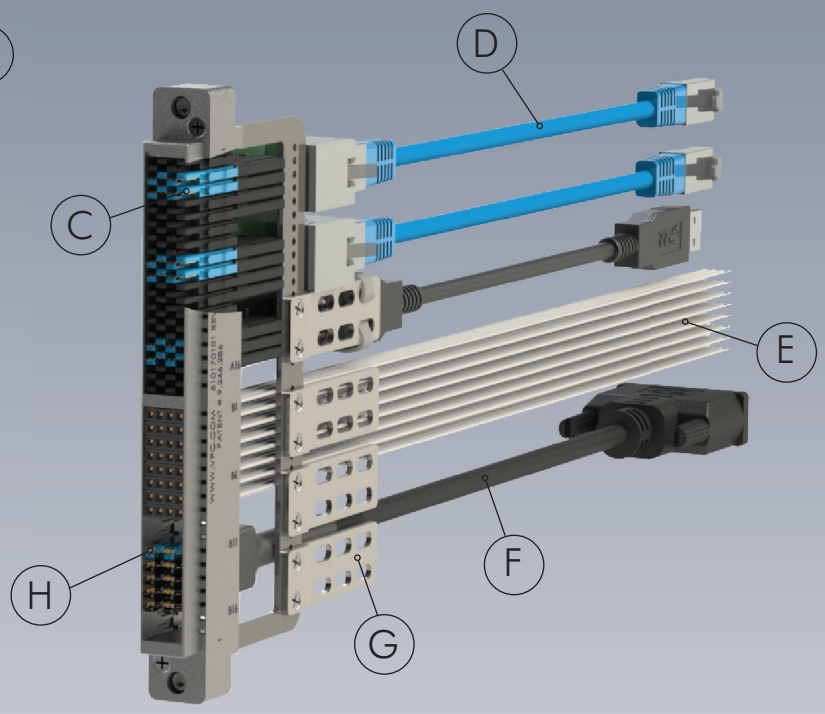
These results were consistent for 100,000 cycles.

# ADVANCING YOUR *SOLUTION*

Some of our customers do not require a full-length PCB solution, but instead prefer to use a PCB with a single high speed protocol that adapts to a VTAC connection. High Speed PCB Adapters provide our customers added modularity to ensure that they get the hybrid I/O they require for their test needs.

**www.VPC.com/RA**




High Speed PCB Adapters use VTAC Right Angle inserts and are available in small, single protocol sizes that can be used concurrently with patchcords. Our designers have developed modular strain relief plates to accommodate the intermixture of connections, and relieve stress on third-party vendor cables, PCB boards, and VPC patchcords simultaneously. VPC also offers VTAC inserts that can be configured with signal contacts for low rate transmission and blank VTAC inserts to remove gaps in SIM modules, restricting unnecessary air circulation in your test system. For more accessories, visit us online.

A. VTAC Right Angle PCB Adapters
B. SIM RCV Module
C. VTAC Double Ended Inserts
D. Third-Party COTS Cables
E. SIM VTAC QP Flying Leads
F. VTAC HSD Patchcords
G. VTAC Strain Relief Plate
H. VTAC HSD Inserts

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