

OPTIMIZING SIGNAL INTEGRITY

SAFEGUARDING PERFORMANCE AND RELIABILITY WITH MACHFORCE

Ensuring signal integrity is a formidable challenge in today's aerospace and defense applications. Due to the rapidly evolving avionic systems in the industry, there is a growing demand for faster data transmission that is reliable and secure. With these advancements it is paramount to manage your systems impedance, insertion loss, crosstalk, grounding, EMI, and signal reflections to optimize signal integrity in mission-critical operations.

MACHFORCE has the answer to help manage these complex connectivity issues. With superior electrical performance MACHFORCE's innovative High Speed Module (HSM) sets a new standard by ensuring impeccable signal integrity.

MACHFORCE HIGH SPEED MODULE (HSM)

This game changing HSM was engineered to help ensure your systems ability to manage interference and provide data integrity, reliability, and effectiveness in critical aerospace and defense systems through its:

1. LINEAR CONFIGURATION

Modules are configured in a linear pattern to improve electrical performance by maintaining consistent impedance to reduce signal reflection and insertion loss. This space saving design allows for more ports to be placed in a connector row compared to other D-38999 connectors on the market. MACHFORCE connectors delivers 10 ports in a size 25 connector and 4 ports in a size 17.

2. FINS

Vertical fins in the HSM create a shield between the twisted pairs and isolate each data pair from the next by reducing cross talk in your system.

3. GROOVES

Grooves in the HSM snap each contact into place to secure your connectivity in high-vibration environments. These grooves also isolate each wire in the data pair to maximize cross talk protection.

4. TWIST OF PAIRS MAINTAINED TO CONTACT

Sections where the cable runs are straight and parallel the assembly is susceptible to crosstalk. To prevent this, the HSM allows every twisted pair to maintain its twist right up to the contact to achieve unmatched impedance control.

5. CLAMPING DOOR

Under the clamping mechanism of the HSM, the cable's shielding is secured and grounded to the HSM. When the HSM is inserted into the MACHFORCE connector body, the grounding connection is passed through the entire solution (see fig.2). This contributes to better isolation of the twisted pair's signals.

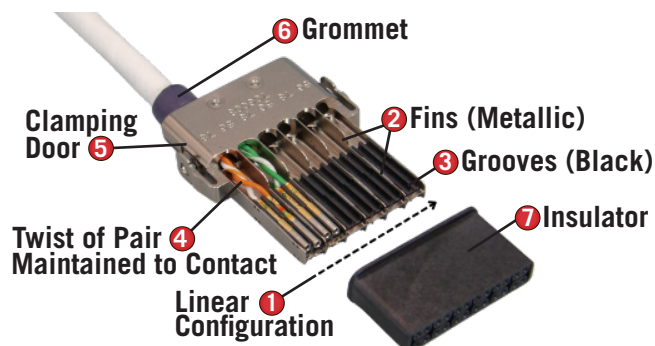


Figure 1: Terminated HSM with two open ports

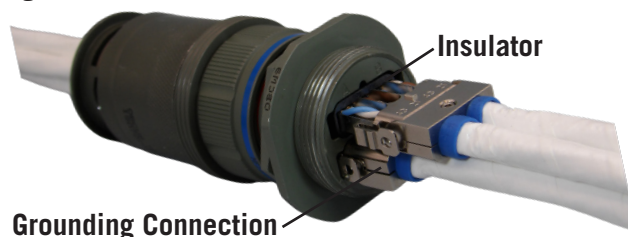
6. GROMMET

The rubber grommet in conjunction with the HSM clamping door provides strain relief to the cable and applies constant pressure to the cable's shielding which maintains contact with the HSM.

7. INSULATOR

The insulator maintains proper spacing for the 22D contacts when mated. When the HSM is inserted into the connector body the insulator electrically isolates the contacts from the connector body (see fig. 2). The dielectric constant of the insulator's material also boosts signal integrity.

Figure 2: HSM inserted into MACHFORCE



OPTIMIZING SIGNAL INTEGRITY

TESTED & VALIDATED PERFORMANCE

By making signal integrity a priority in the design, implementation, and maintenance of aerospace and defense systems, you can secure the reliability, resilience, and security needed for mission-critical operations.

Overall, the MACHFORCE high speed module is a game changer and makes it possible to design applications that previously were not possible. For example, we designed 24 & 26 AWG CAT6a assemblies with 5 connection breaks and passed a CAT6a channel test. The 24 AWG assembly maintained 10Gb signals and achieved lengths greater than 270 ft. (80m), while the 26 AWG cable passed at lengths up to 230 ft. (70m). Both assemblies showcased low insertion loss at these distances.

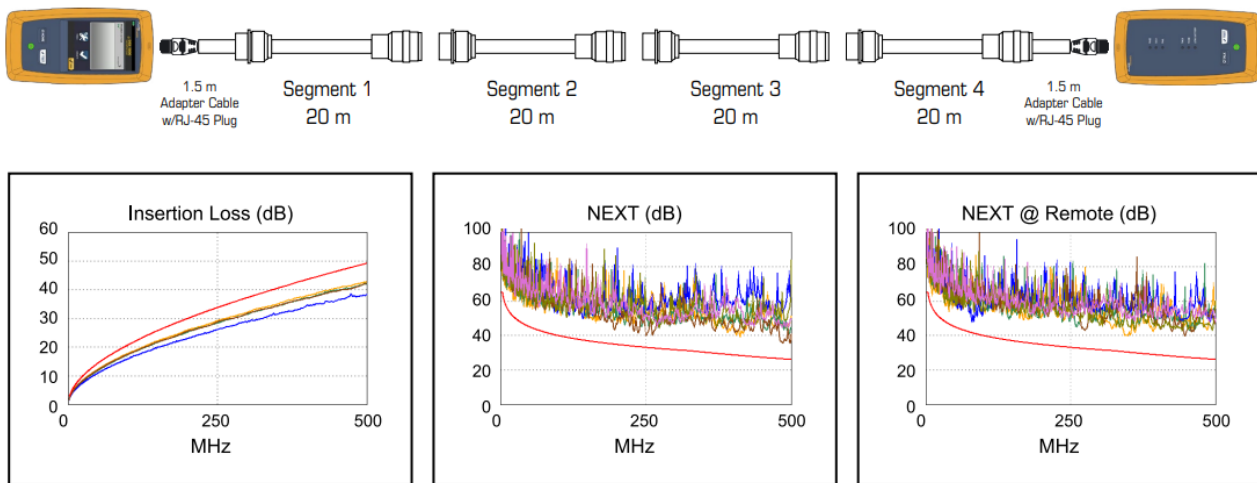


Figure 3: Testing Results for E6A6824

For more information on MACHFORCE or to create your own MACHFORCE part number for your system, please visit <https://picwire.com/High-Density-Connectors/MACHFORCE> or email us at sales@theangeluscorp.com.



Select Connector and/or Backshell Options to Build a Part Number

CONNECTOR OPTIONS:	BACKSHELL OPTIONS:
<input type="checkbox"/> Include Connector	<input type="checkbox"/> Include Backshell
Shell Type Select Shell Type	Shell Type Select Shell Type
Plating Olive Drab Cadmium	Plating Olive Drab Cadmium
Shell Style Select Shell Style	Shell Style Select Shell Style
Contact Select Contact	Angle Select Angle
Key Position Detail Select Key Position Detail	Cable Type Select Cable Type
Cable Type Select Cable Type	

GET PART NUMBER(S)

Figure 4: MACHFORCE Part Number Builder on PICWire.com