



Product Introduction / Comparison:

MULTI-BEAM XL Connector vs. MULTI-BEAM XLE Connector

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# MULTI-BEAM XL Connector Overview

## MULTI-BEAM XL Connector:

- Released in 2001
- Available with original 2-beam (dual-beam) or improved 8-beam (multi-beam) power contact
- Fully modular/scalable mold
- 35 amp power contact
- Passes mixed flowing gas testing only in mated condition
- 2 lb mating force per power contact
- Joint Qualification with FCI - August 2002



8-Beam Contact  
Latching Housing

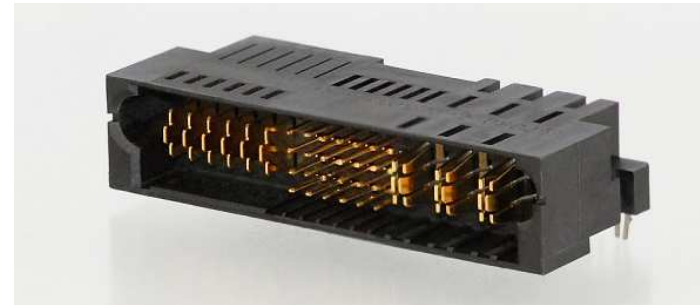


Dual-Beam Contact  
Blind-mate Housing

# MULTI-BEAM XLE Connector Overview

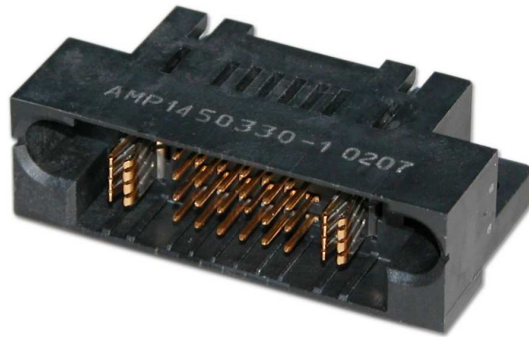
## MULTI-BEAM XLE Connector:

- Released in 2008
- Features two new power contacts:
  - High Power contact – rated at 50 Amps
  - Low Power contact – rated at 25 amps
  - Both pass UL Hot-Plug tests
- Passes mixed flowing gas testing in un-mated condition
  - Contacts treated with pore blocker
- Ventilated housings
- Slim guide pins – save approx. 5mm OAL
- Fully modular/scalable mold
- 1.1 lb mating force per high power contact

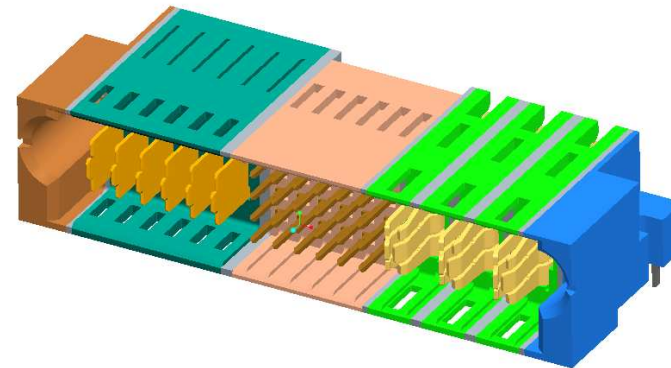


Blind-mate vented housing

## MULTI-BEAM XLE Connector Higher Reliability, Higher Density



MULTI-BEAM XL Connector



MULTI-BEAM XLE Connector

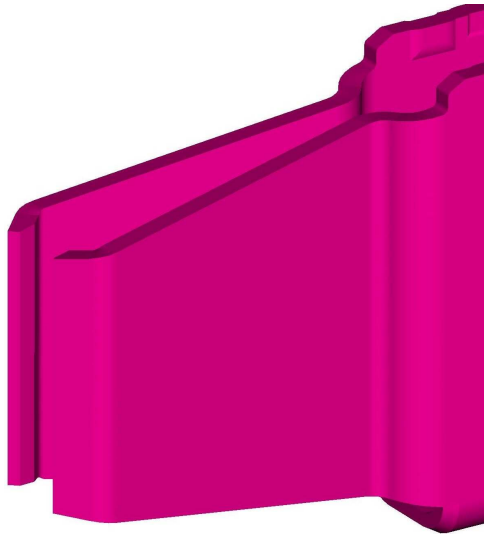
### Why create new Power Contacts?

- Customer requests for lower mating forces
- Customer requests for higher current carrying capability
- Customer requests for a more granular offering on power contacts
- Customer requests for true hot-plug power contacts

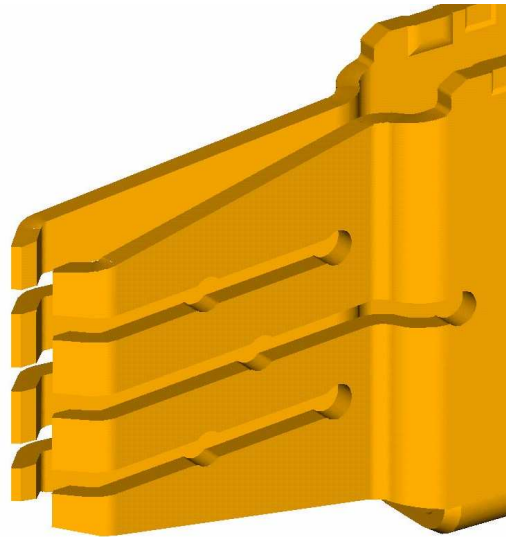
# MULTI-BEAM XL / XLE Connectors

## #1 - Power Contact Changes

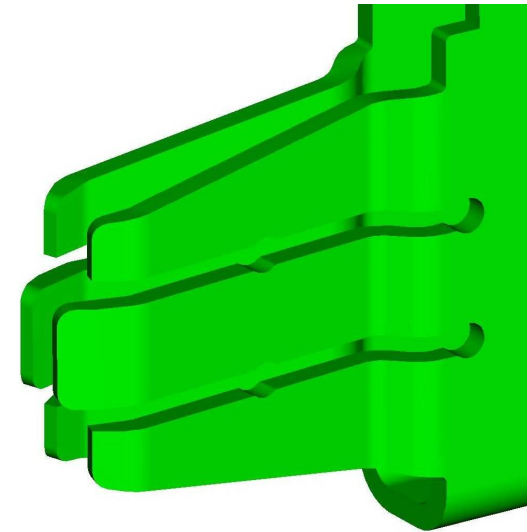
Original right angle PCB plug contact – dual beam design



New right angle plug contact – MULTI-BEAM XL design (8 beams)



Improved PCB and cable plug MULTI-BEAM XLE contact - 17% thicker material (6 beams)

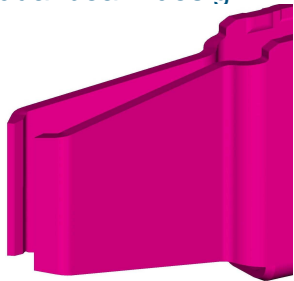


Made from higher conductivity metals – approx. 80% higher conductivity (IACS) than MULTI-BEAM XL Connector

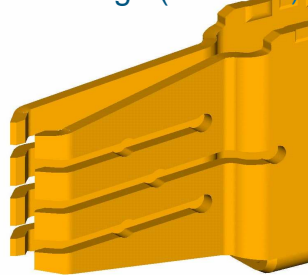
# MULTI-BEAM XL / XLE Connectors

## #1 - Power Contact Changes – Hot-Plug Feature

Original right angle PCB plug contact – dual beam design

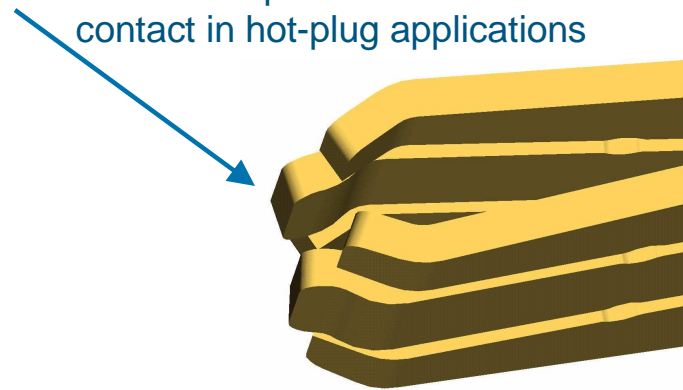


New right angle plug contact MULTI-BEAM XL design (8 beams)



Improved MULTI-BEAM XLE contact:

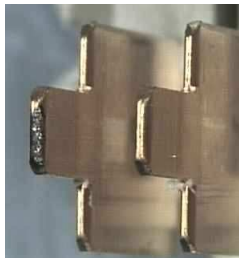
- 17% thicker material
- Multiple contact points (6 beams)
- Extended tip acts as sacrificial contact in hot-plug applications



Original designs were not designed for true-hot-plug applications.

- They have been submitted and pass the UL requirement at lower ratings, however, the entire leading edge of the contact is destroyed during the hot-mating

Low power contact – after hot-plug testing



High power contact

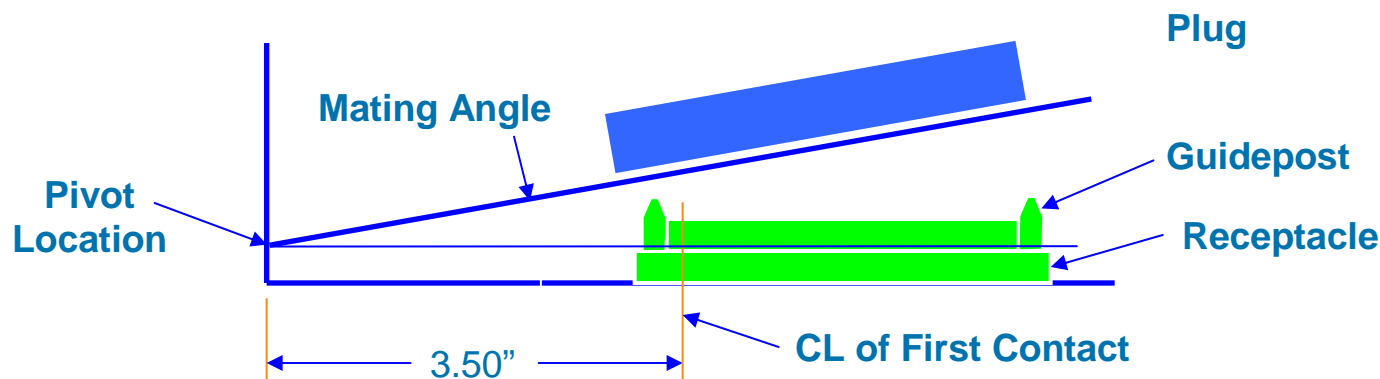


# MULTI-BEAM XLE Connector

## Damage from angular mating - eliminated

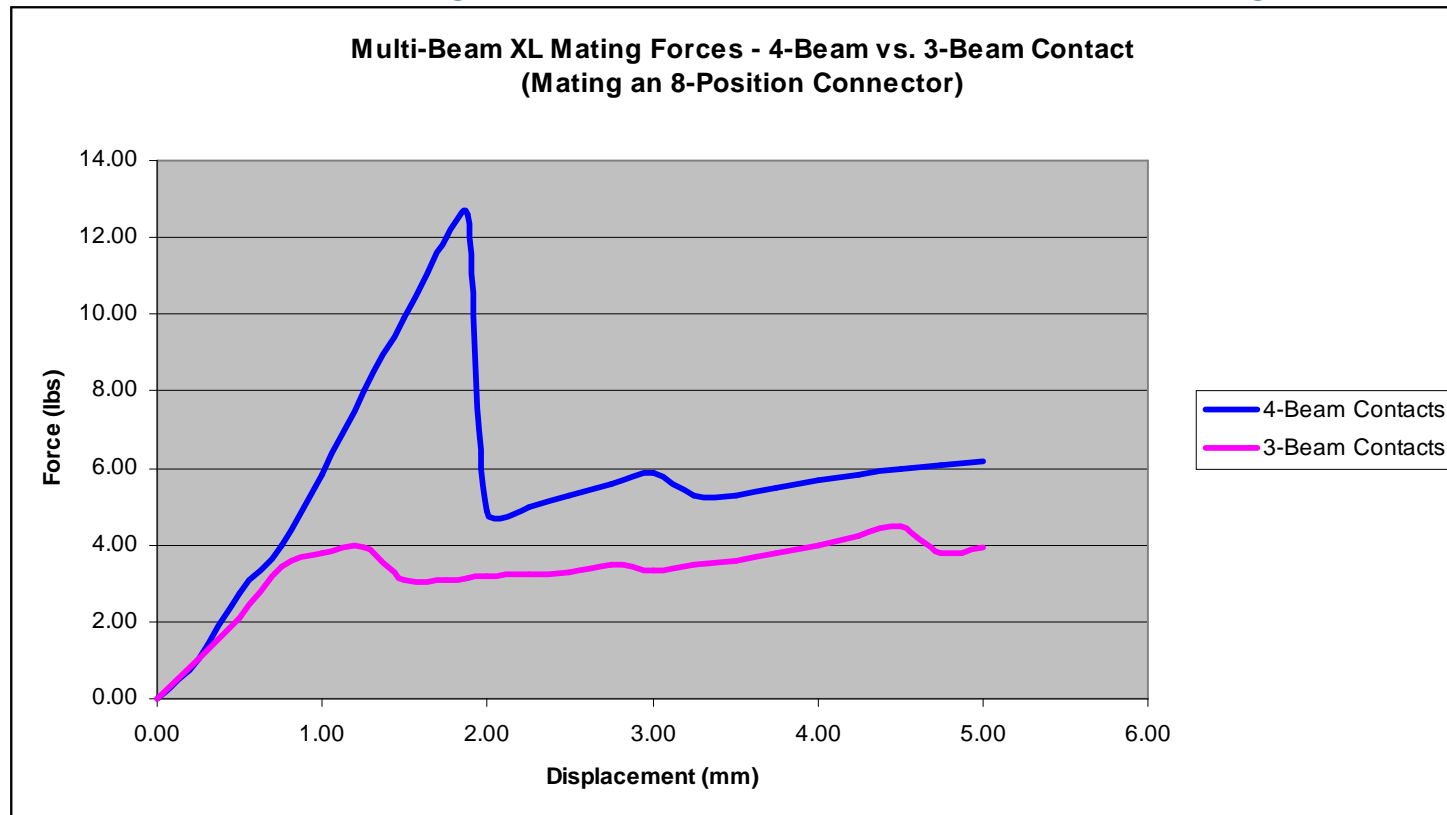
- Multi-Beam XL 4-beam (and single beam option) contacts were compared to the new 3-beam contact to determine the angular mating amount of improvement in the new design
- This study is specific to one angular mis-alignment set-up.
- Three scenarios were analyzed:
  - 1) Angular mating with the connectors aligned (no horizontal offset)
  - 2) Angular mating with header shifted to the right the maximum distance allowed by the clearance in the receptacle guide post
  - 3) Angular mating with header shifted to the left until contact begins to stub.

**Summary**  
The layouts created in the analysis show the mating angles where the first header contact initially touches the receptacle housing.  
The original design allowed mis-alignment of < 1.5 degrees.  
The new design allows mis-alignment up to 3.0 degrees, with greater axial ( x & y direction) off-set.  
The hardware used for this study has the centerline of the first contact position 3.5" from the pivot point. The pivot point is vertically located in line with the front edge of the header shroud.



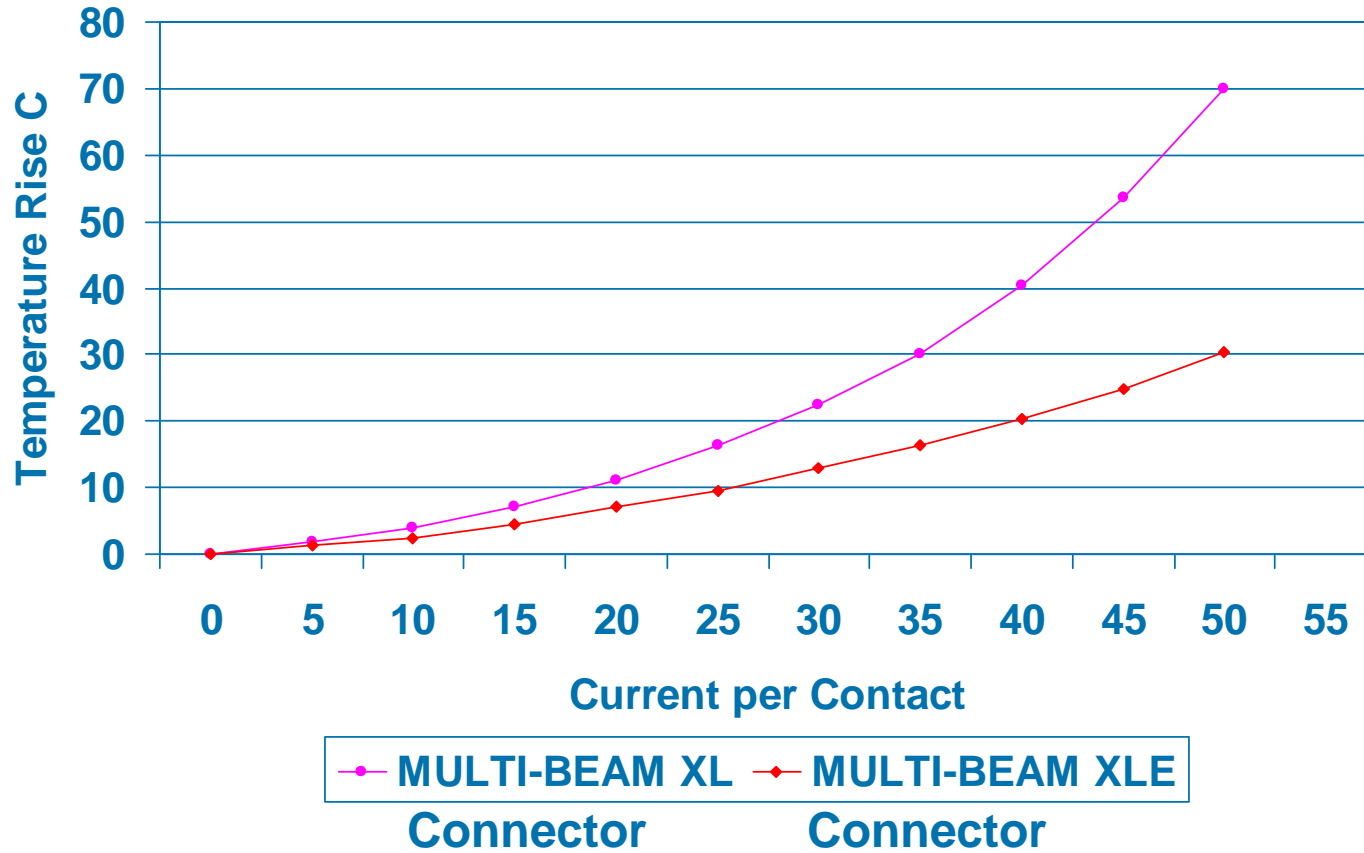
# Mating Forces Reduced

## Plots Comparing MULTI-BEAM XL/XLE Contact Designs



The higher mating force causes excessive plating wear on the MULTI-BEAM XL product. The new MULTI-BEAM XLE contacts offer significantly lower mating forces and longer durability life.

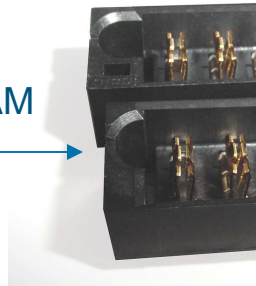
# MULTI-BEAM XL \ XLE Connector Current vs. T-Rise



NOTE: Higher current ratings (at 30°C T-Rise) have been achieved in specific tests/applications, with no airflow.

# MULTI-BEAM XLE Connector #2 – Guide Pin Changes

Slim guide modules  
featured on MULTI-BEAM  
XLE connector

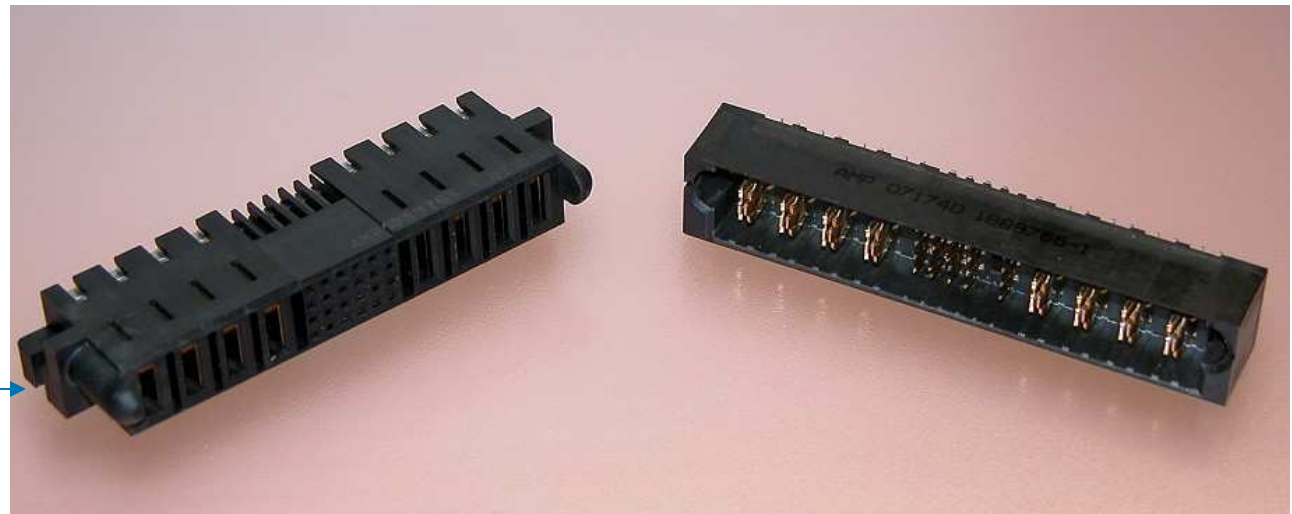


Original guide sockets on MULTI-BEAM XL  
connector

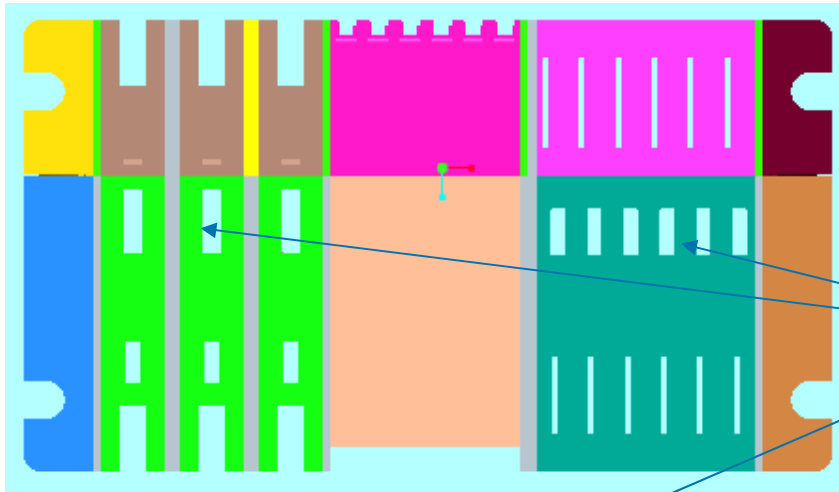
New thinner guide sockets on MULTI-BEAM  
XLE connector offer the same alignment in a  
smaller pcb footprint

MULTI-BEAM XLE  
Connector shown here in:

- Vertical PCB plugs
- Right angle PCB receptacles

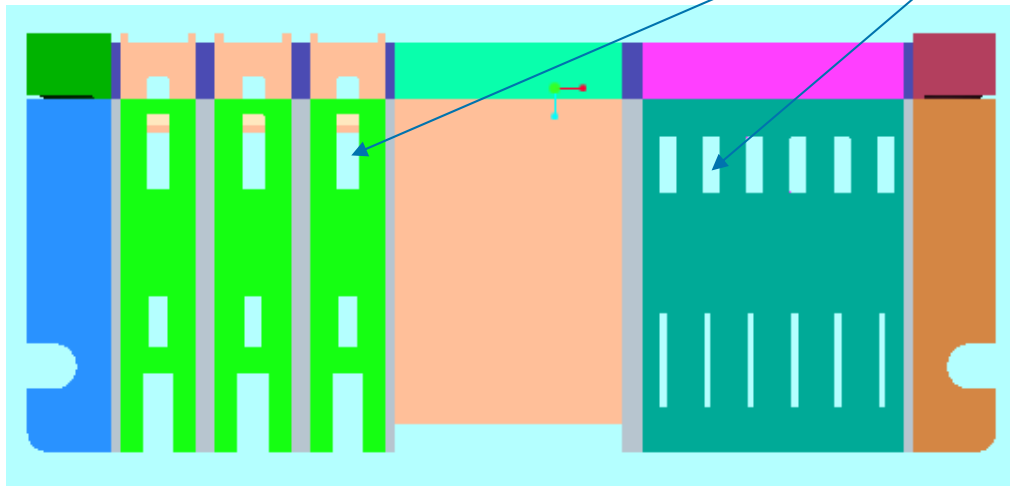


# MULTI-BEAM XLE Connector #3 – Ventilated Housings



Top view of mated plug and receptacle housings

- *Trapped heat generated at separable interface can now escape through slots/holes*
- *Above – right angle plug mated to right angle receptacle*
- *Left – right angle plug mated to vertical receptacle*

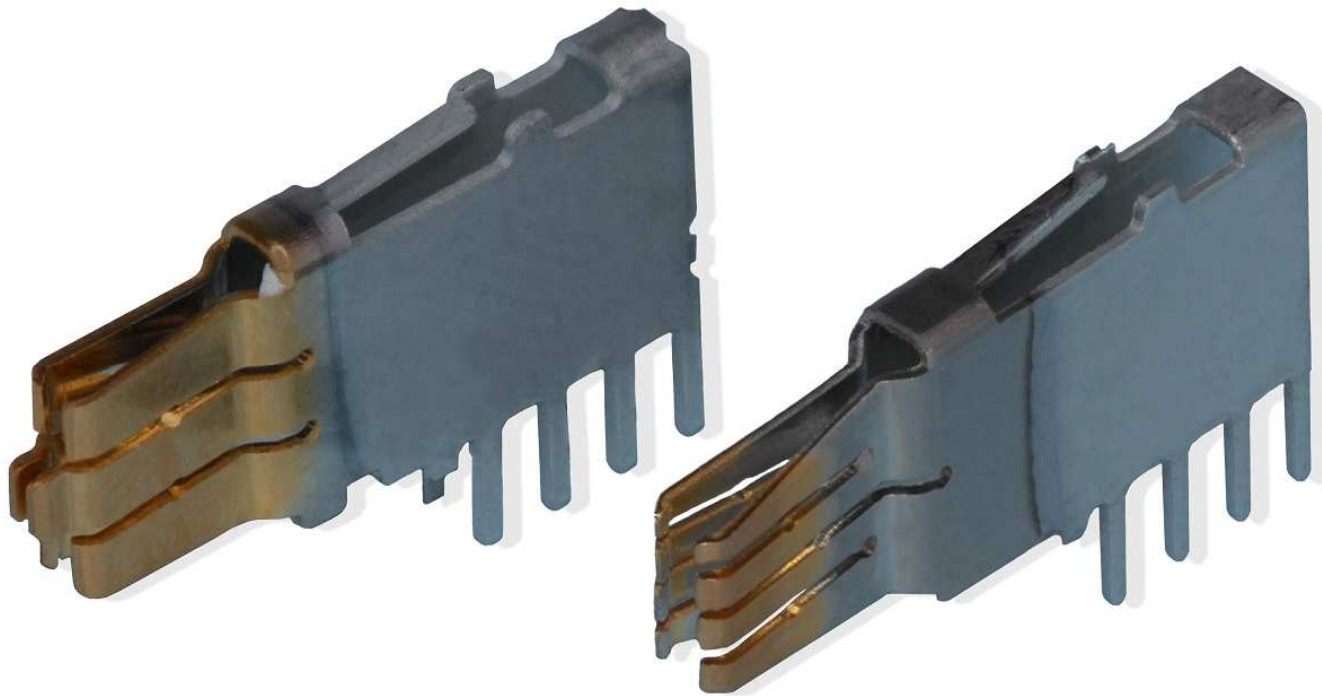


## MULTI-BEAM XL/XLE Signals Signal Receptacle Contact



- Long beam length provides more predictable/controlled forces
  - Normal forces > 50g
- Forgiving mating zone: generous lead-in, wide / smooth beam
- When installed in housing, contact is opened to provide a “pre-load”, to provide consistent forces
- Smooth contact surfaces for more durable mating interface
- Mating on rolled surface, not sheared surface

## MULTI-BEAM XLE Connector Higher Performance, Reliability, and Density



**The MULTI-BEAM XLE contact is wider, thicker, hot-pluggable and with larger pcb tails than the MULTI-BEAM XL contact**

## MULTI-BEAM XLE Connector

- Contacts:
  - Product Engineering – Suny Zhao
  - Product Management – Mike Blanchfield
- Available Samples
  - R/A PCB Plug - # 6450830-2
  - R/A Receptacle - # 6450880-1
  - Verticle Receptacle - # 6450850-2

## MULTI-BEAM XLE Connector

