



2mm High Power

Backpanel Connector Development
October 23, 2002



2mm High Power

- Design Objectives
- Product Design Overview
- Prototype Testing
- Project Status

2mm High Power - Design Objectives

- Right angle header on daughtercard to be offered in 1x2 and 2x2 press-fit configurations (same Metral 2x2 receptacle to be used for both)
- FCI will also tool a Millipacs 2x2 receptacle in early 2003. This will mate with the same 2mm headers (1x2 and 2x2) as the Metral version.
- Same press-fit hole size as Metral (0.65-0.80 finished hole diameter)
- Current carrying capacity (single 12mm module, all lines powered):
 - 2x2 configuration: 72A (18A per line); verified by pre-production product
 - 1x2 configuration: 80A (40A per line); not yet verified

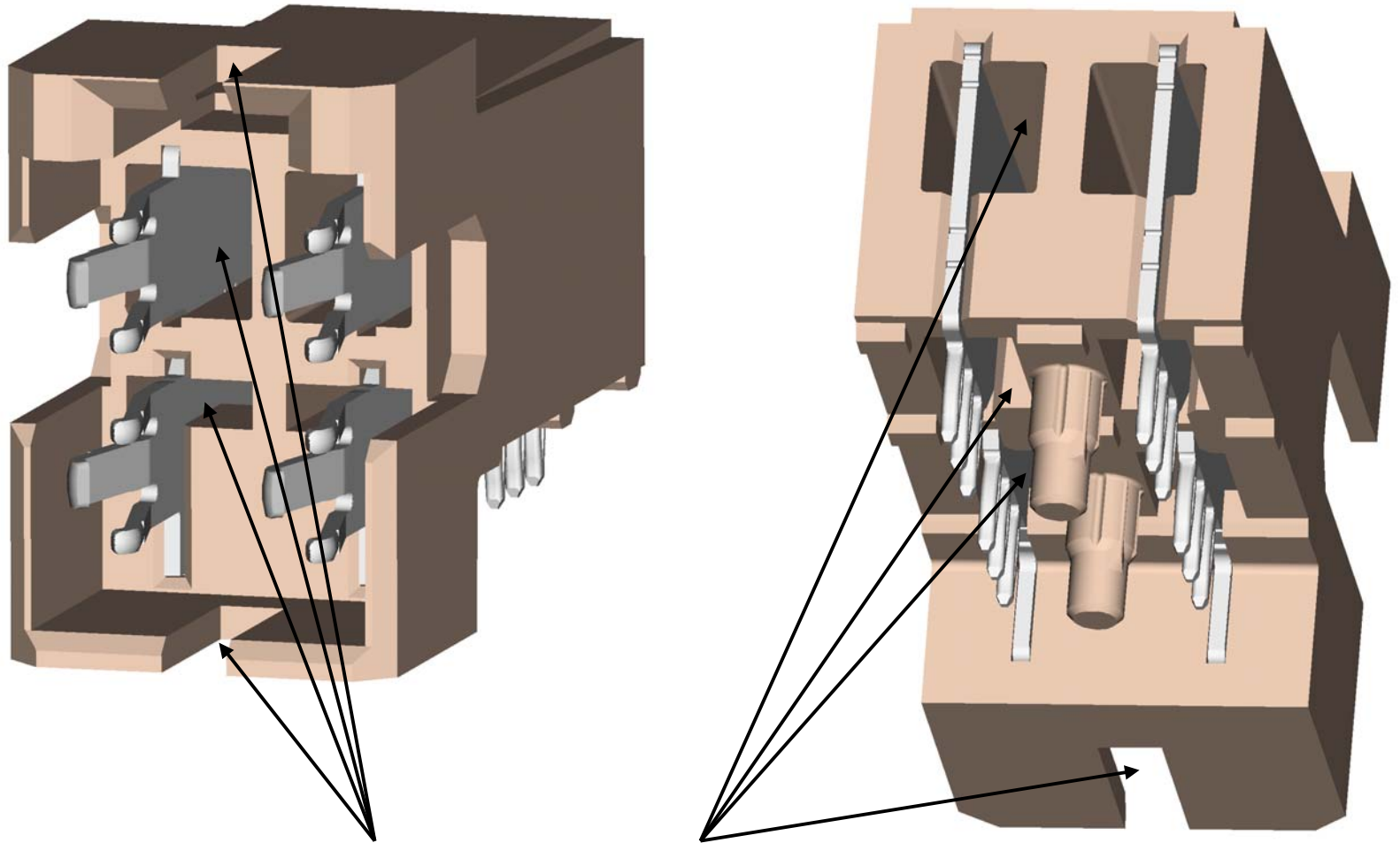
2mm High Power - Design Objectives

- Voltage rating: 150 V per UL 60950 and IEC 664-1 & 61984 specifications (1.6mm minimum creepage and clearance distances)
- Receptacle is UL 60950 compliant (Finger Probe)
- 3 possible mating lengths (2 longest being tooled initially) equal to those of Standard Metral 8.0, 6.5, and 5.0mm header pins; mating length is controlled on the receptacle side
- Same module size as 5-row Standard/1000/2000 Metral (10.8mm press height)
- All footprint hole spacing is on even multiples of 2mm

2mm High Power - Product Design Overview

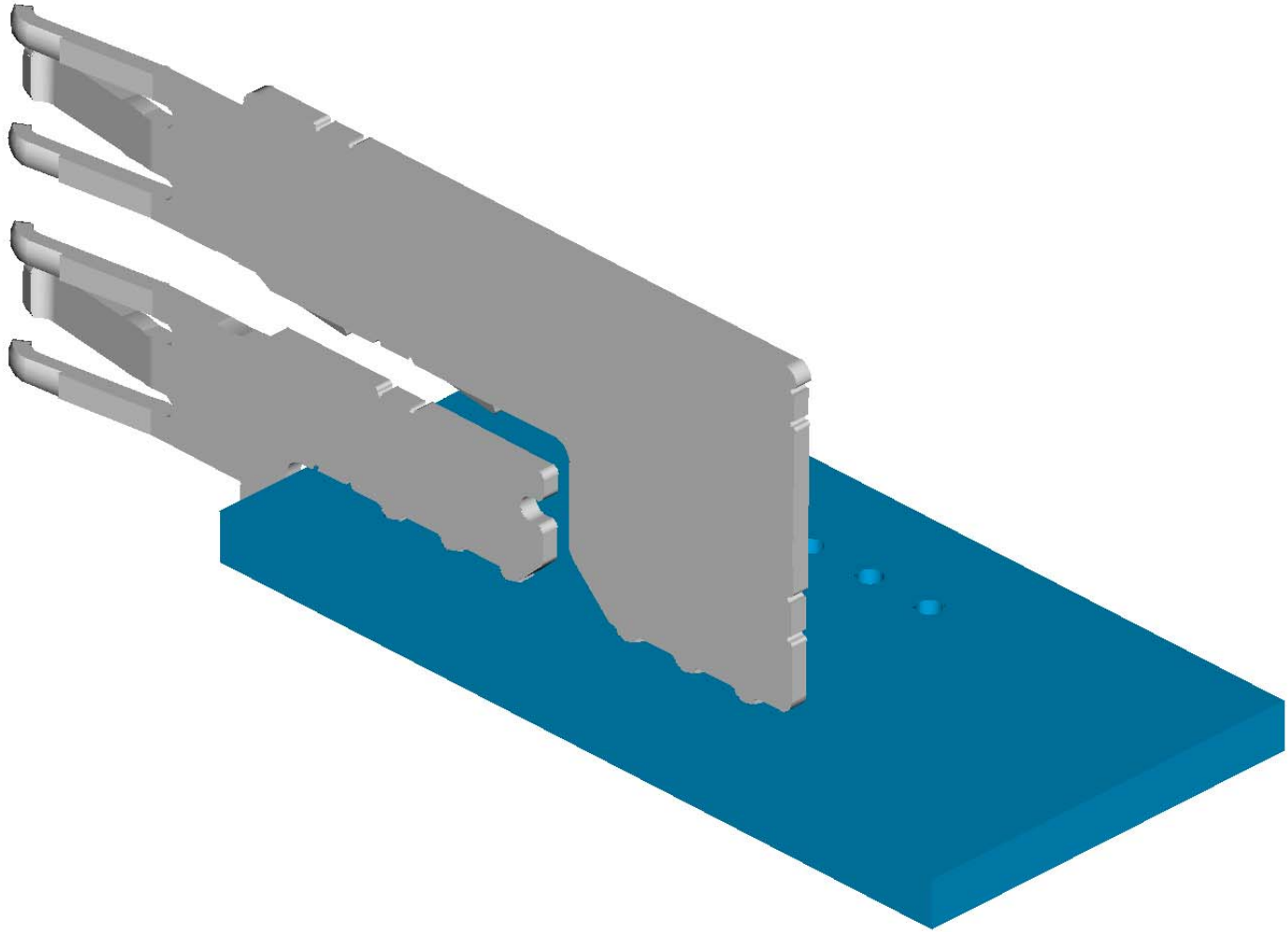
- All contacts are flat except for minimal forming on the header's mating interface
- Because minimal forming is necessary, less formable / higher conductivity materials may be used
- Air is able to access a large percentage of header contact surfaces. This will allow heat to escape more easily.
- Air is able to flow through the fully mated system
- EON is the same geometry as used in Metral Converged Headers
- FCI patent filed on May 23

2mm High Power - 2x2 header

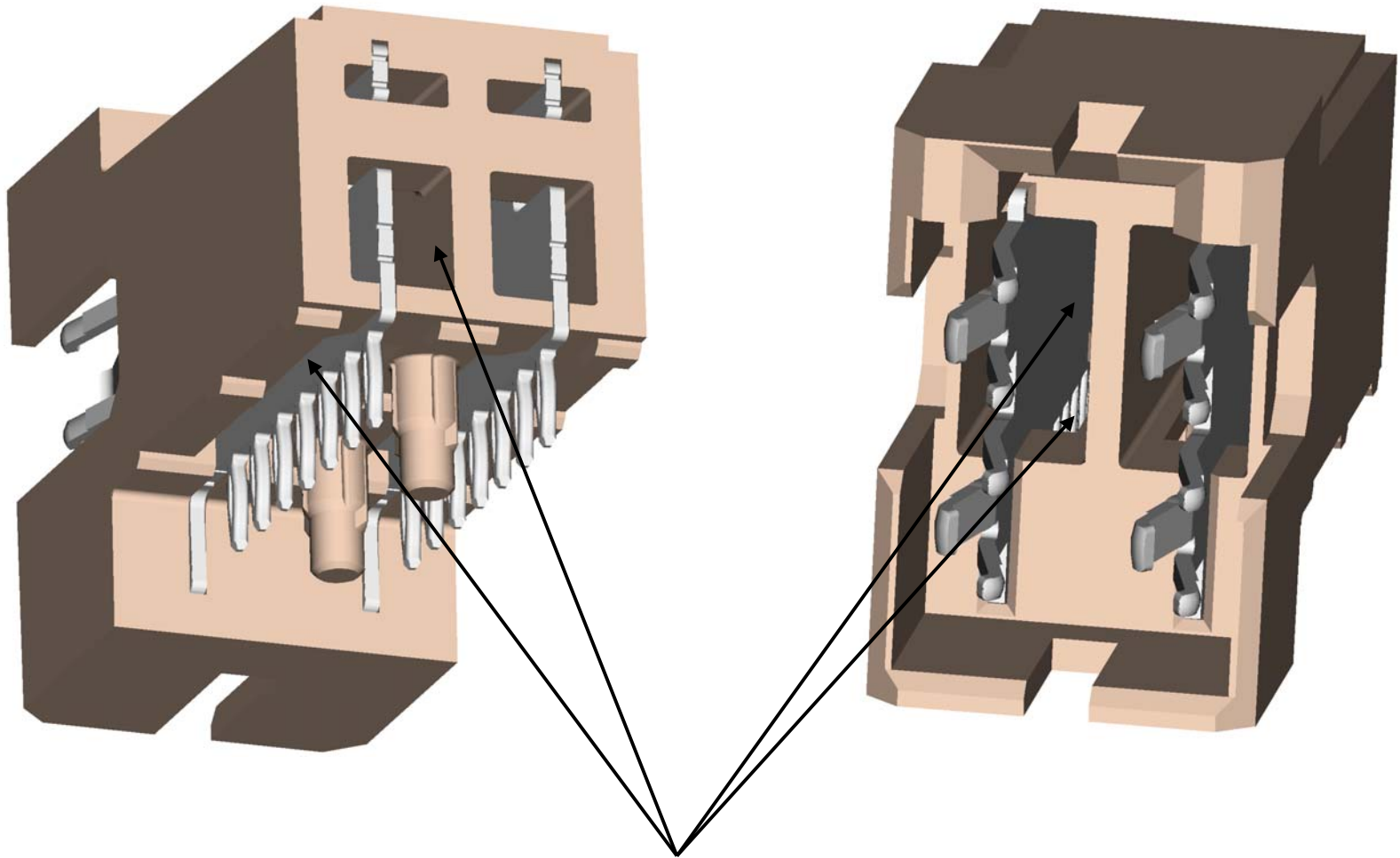


air flow passages

2x2 header top and bottom contacts

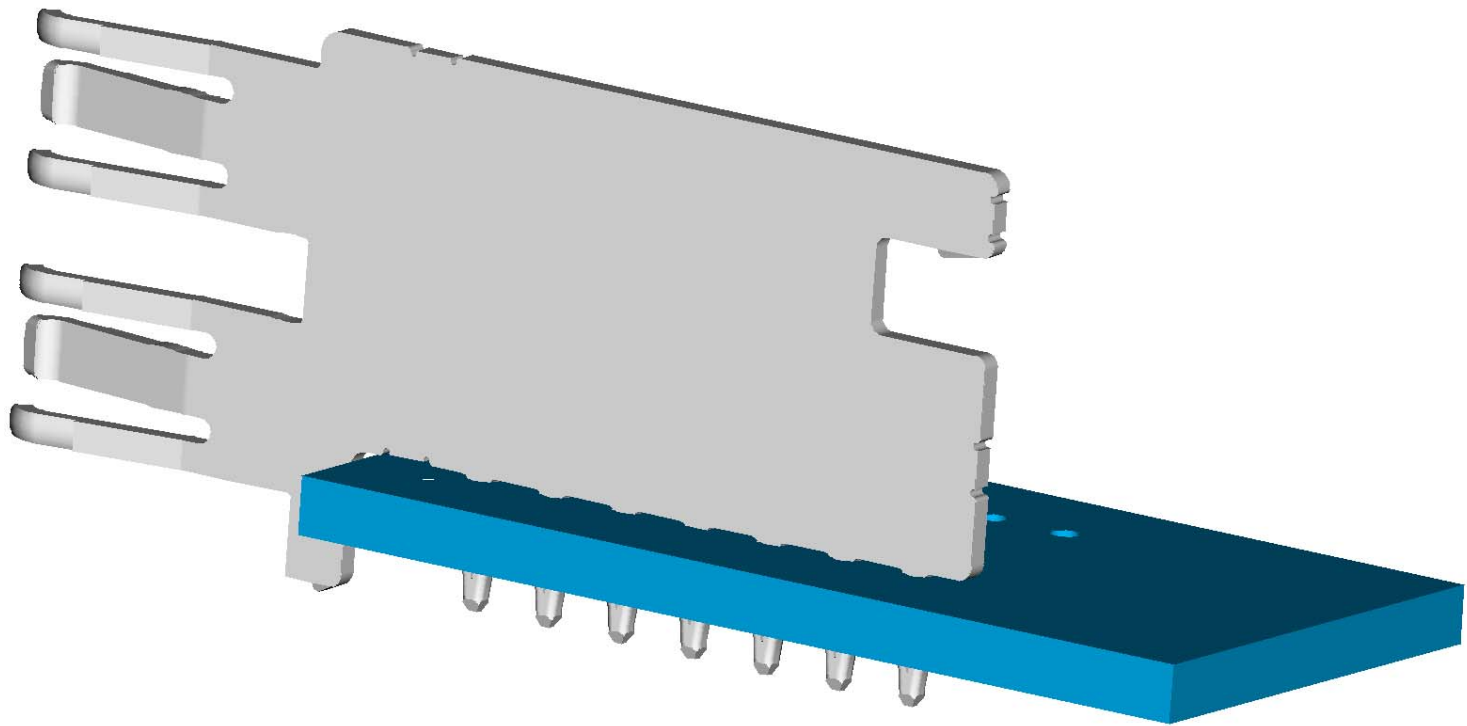


2mm High Power - 1x2 header

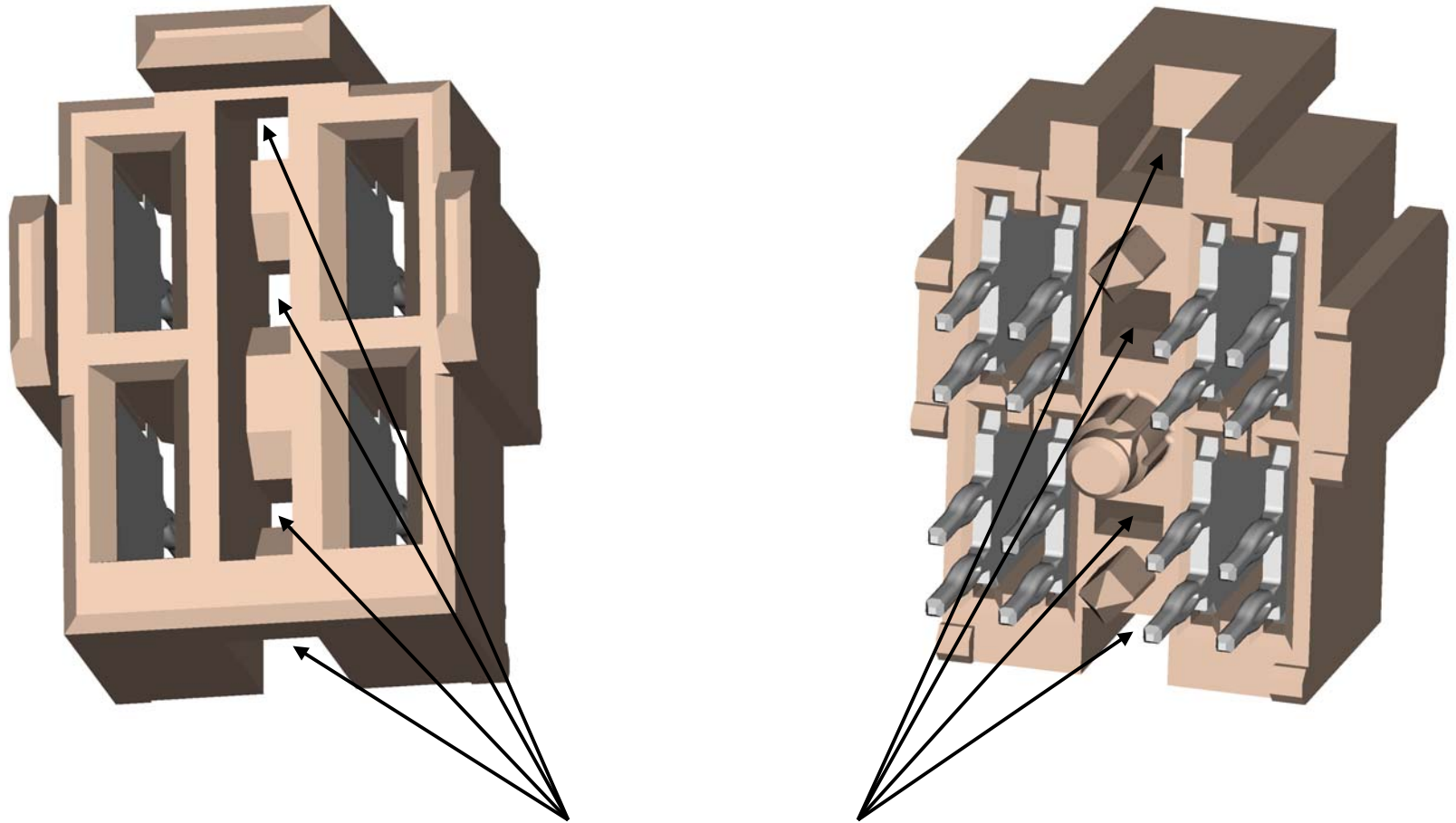


air flow passages

1x2 header contact

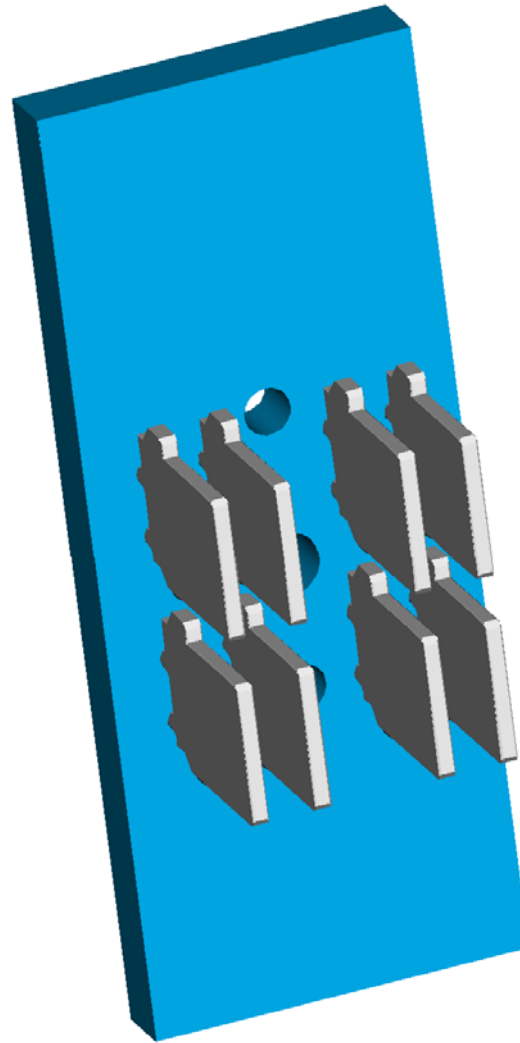


2mm High Power - Metral 2x2 receptacle

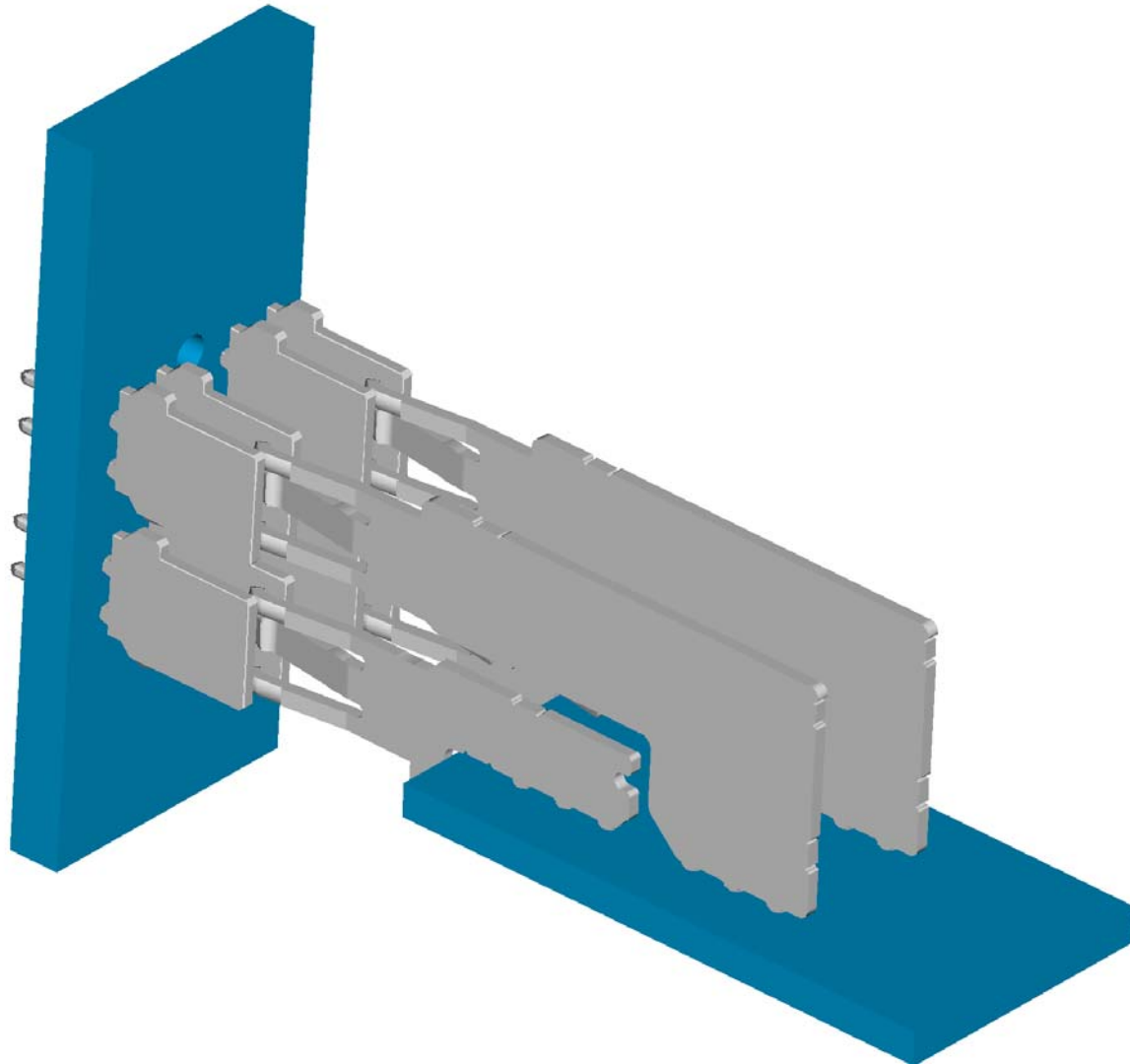


air flow passages

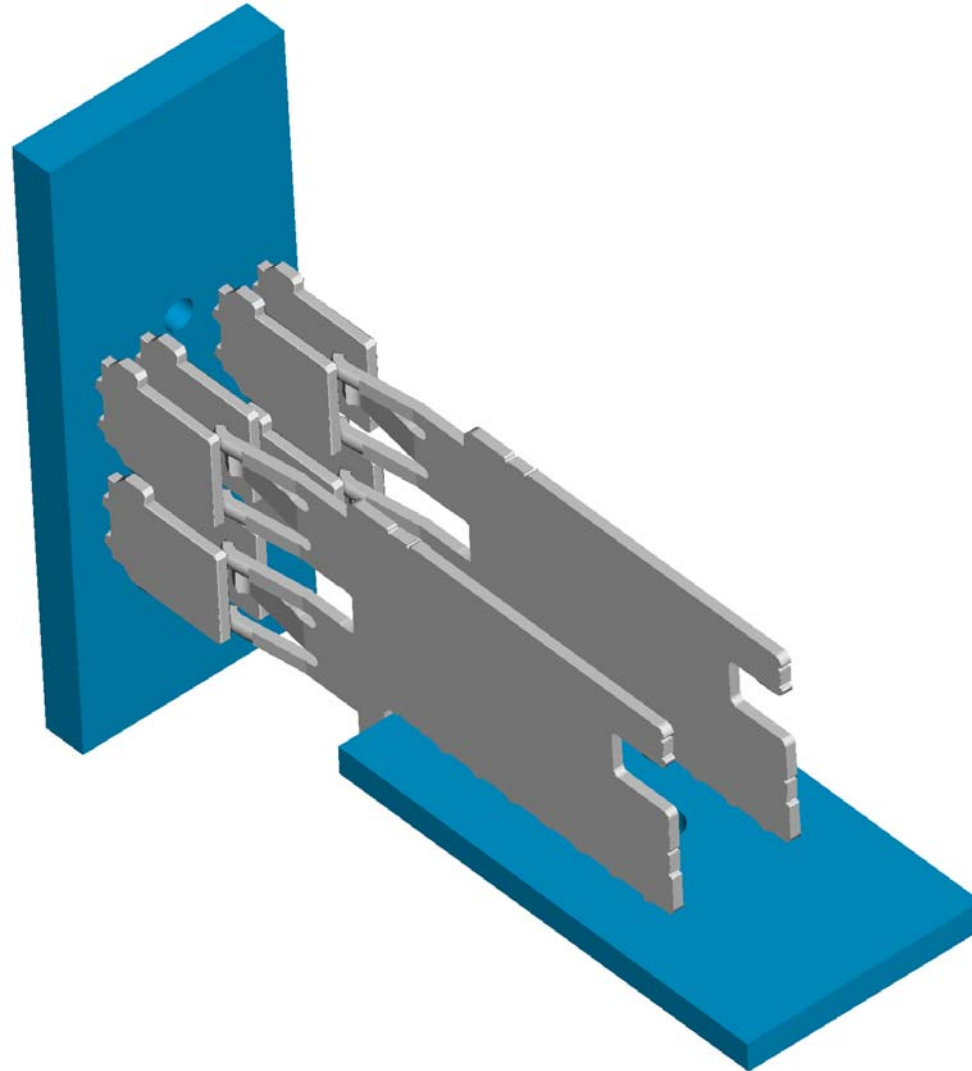
Metral 2x2 receptacle contacts



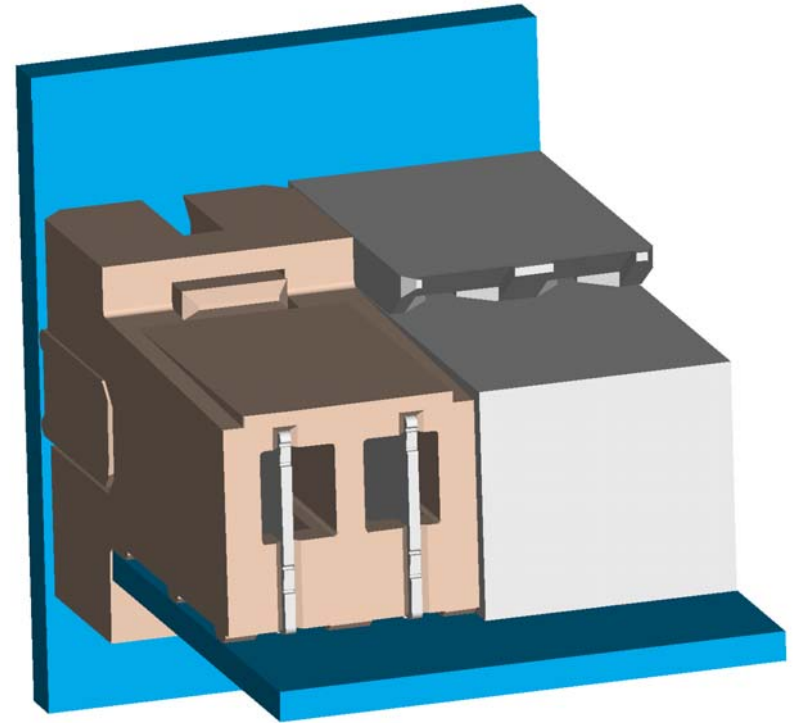
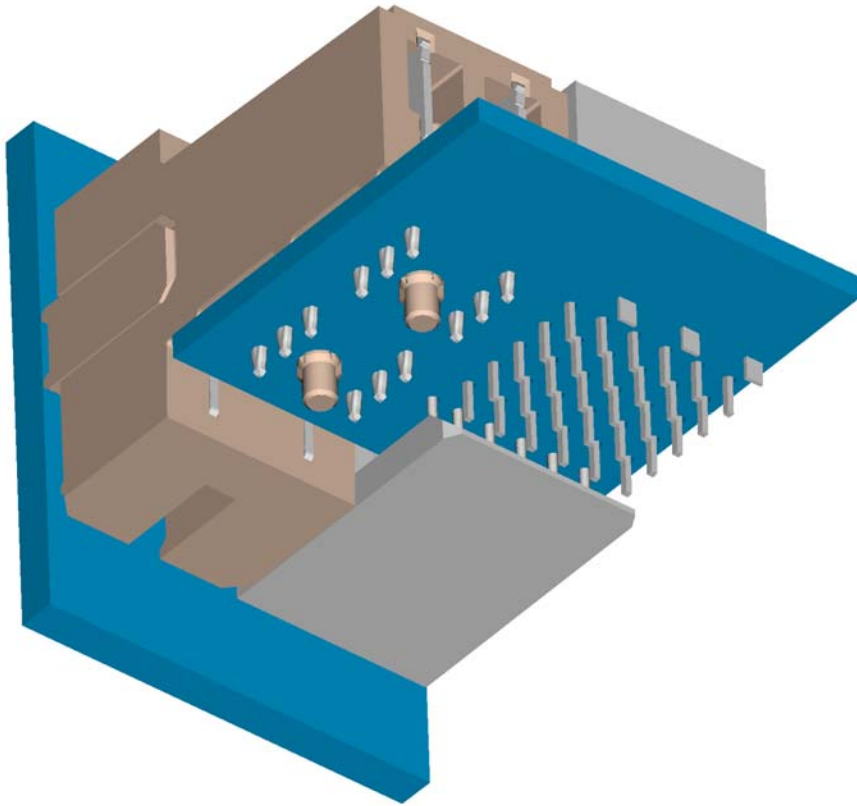
2x2 contact system, Metral version



1x2 contact system, Metral version

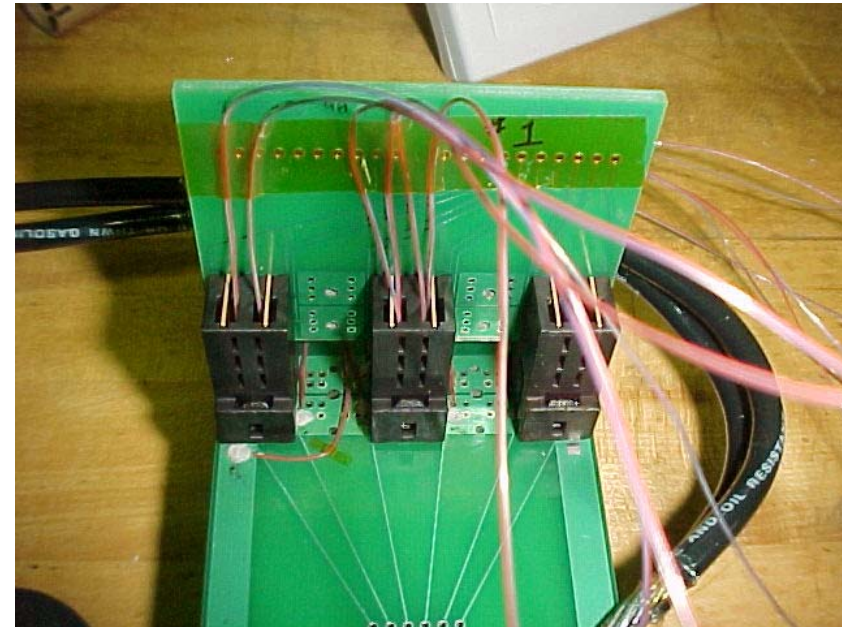


2mm High Power, Metral 2x2 version - Beside Metral 1000 (fully mated)



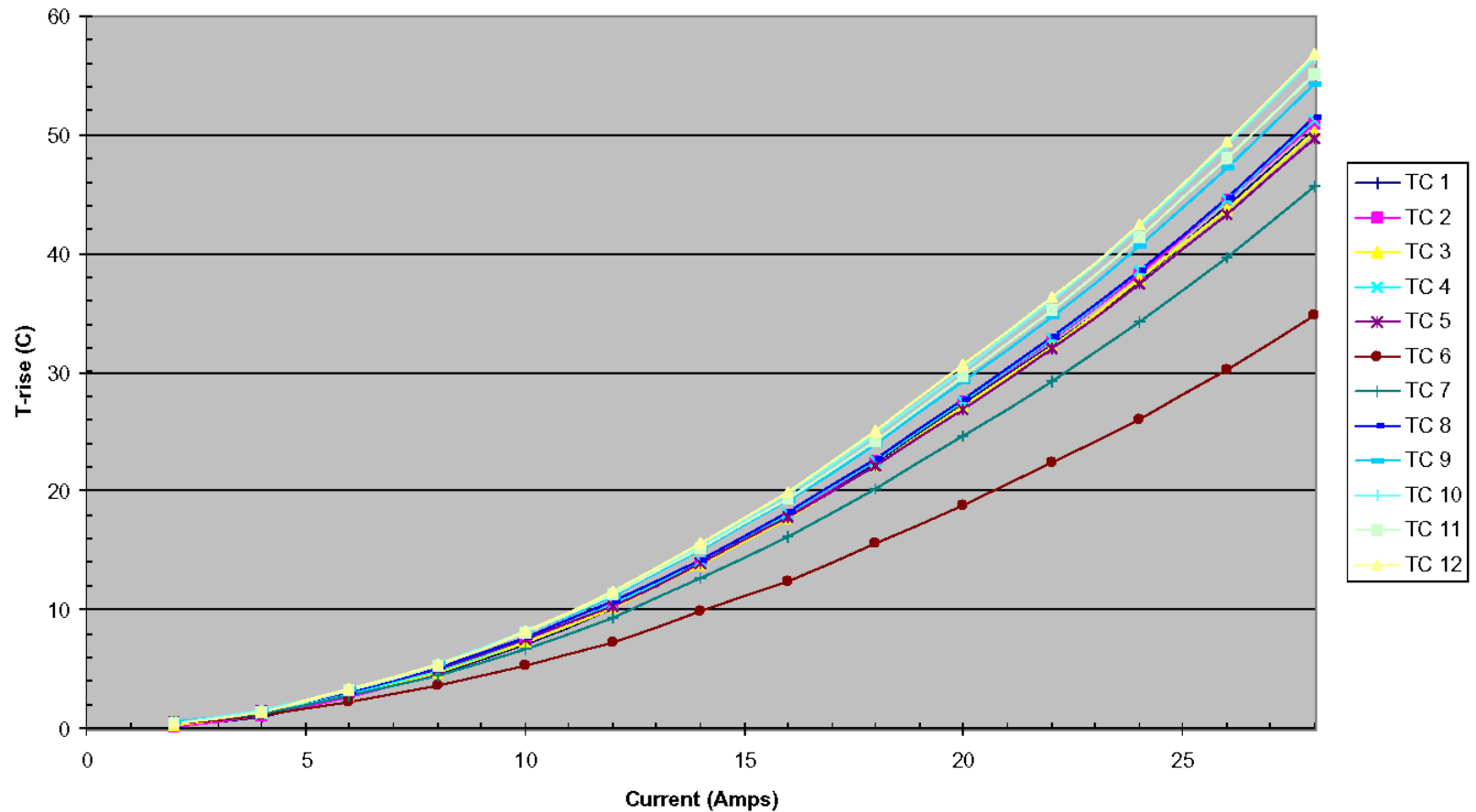
2mm High Power - Prototype Testing

- Prototype assemblies were made using SLA housings and wire EDM & gold plated STB-style terminals
- Test boards were designed following practices commonly used for PwrBlade products
- 2.4mm thick boards
- Double-sided 5 oz. & double-sided 2 oz. copper traces were tested
- Temperature rise vs. Applied current measured at 12 thermocouple locations (6 on contacts near mating areas and 6 on nearby PCB traces)



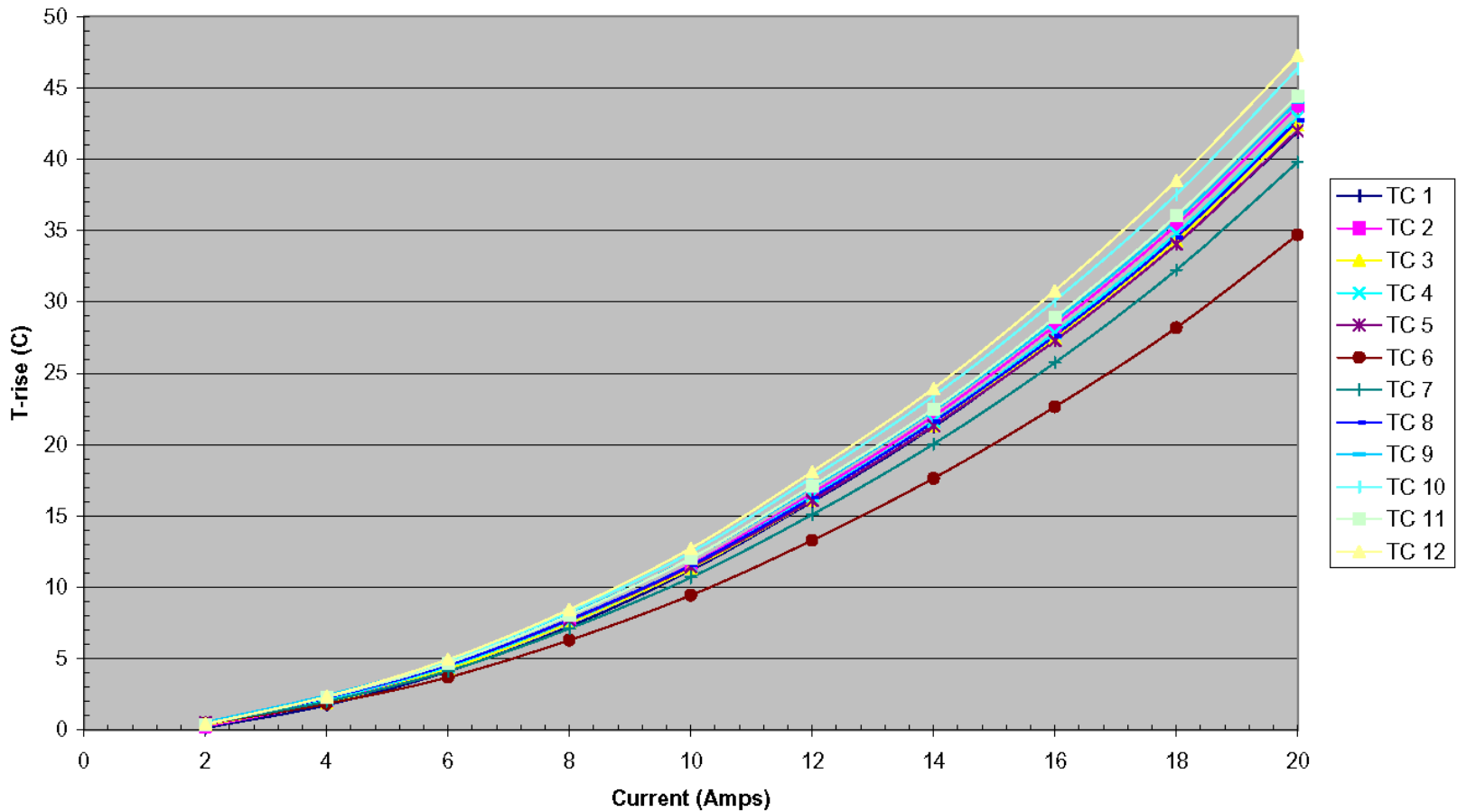
2mm High Power - Prototype Testing

Double-sided 5oz. copper traces



2mm High Power - Prototype Testing

Double-sided 2oz. copper traces



2mm High Power, Metral version - Project Status

- PACE Phase 0 (Concept) review: completed March 8, 2002
- PACE Phase 1 (Product Development) review: completed April 12, 2002
- Capital expenditures for tooling: approved May 23, 2002
- PACE Phase 2 (Process Development) review: completed June 19, 2002
- PACE Phase 3 review (Pre-Production release): October 15, 2002
- PACE Phase 4 complete (Qualified Production available): March, 2003