

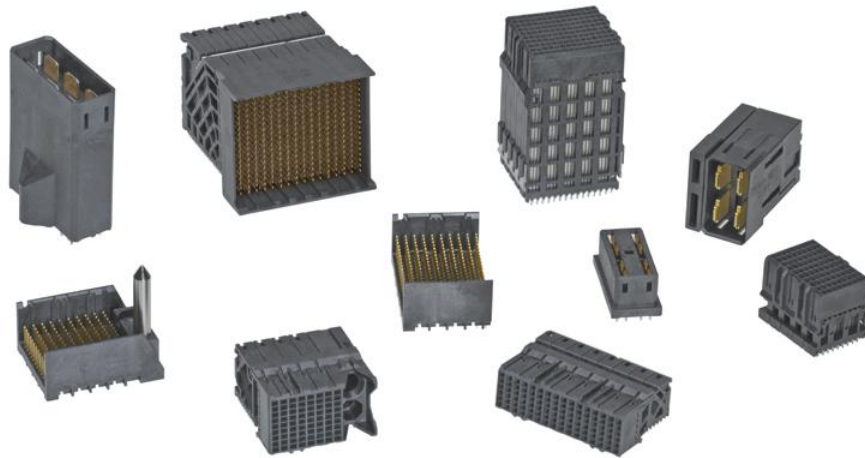


Application Specification

DESIGN GUIDE FOR



HIGH SPEED INTERCONNECT SYSTEMS



REVISION: B	ECR/ECN INFORMATION: EC No: UCP2016-0597 DATE: 08-07-2015	TITLE: DESIGN GUIDE FOR IMPACT™ INTERCONNECT SYSTEMS	SHEET No. 1 of 23
DOCUMENT NUMBER: AS-76060-9997	CREATED / REVISED BY: Billy Miller	CHECKED BY: Liz Hardin	APPROVED BY: Tim Elo



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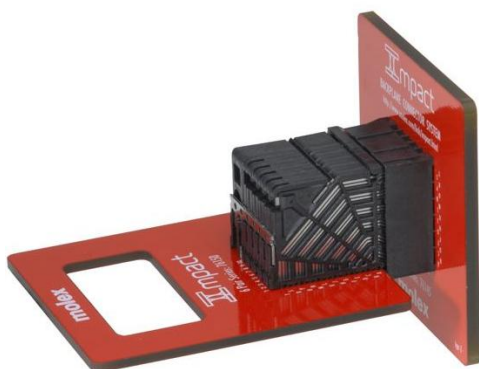
I : INTRODUCTION

A) IMPACT™ OVERVIEW

The Impact™ backplane connector system provides data rates up to 25 Gbps and superior signal density up to 80 differential pairs per inch. The Impact™ system's broad-edge-coupled technology enables low cross-talk and high signal bandwidth while minimizing channel performance variation across every differential pair within the system.

Molex's Impact™ system offers multiple compliant-pin design options on both the daughtercard and backplane connectors, providing customers ultimate flexibility to optimize their designs for superior mechanical and electrical performance.

The Impact™ backplane connector system is designed for traditional backplane and/or midplane architectures to meet the growing demands of next-generation telecommunication and data networking equipment manufacturers. The Impact™ backplane connector system is offered in 2 pair, 3 pair, 4 pair, 5 pair, and 6 pair traditional BP header and DC connector versions, with a complete range of guidance, power, coplanar, mezzanine, and high performance cable solutions.



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B) COMPONENT OVERVIEW (100 OHM AND 85 OHM)

BACKPLANE HEADER SIGNAL MODULES:

 Open	 Left Endwall, Right Open	 Right Endwall, Left Open
 Dual Endwall	 Left Guide, Right Open	 Left open, Right Guide
 Left Endwall, Right Guide	 Left Guide, Right Endwall	

DAUGHTERCARD RECEPTACLE SIGNAL MODULES:

 Left Guide	 Right Guide	 Open
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MEZZANINE RECEPTACLE SIGNAL MODULES:

 Left Guide	 Right Guide	 Open
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COPLANAR HEADER (RAM) SIGNAL MODULES:

 Open	 Left Endwall, Right Open
 Right Endwall, Left Open	 Dual Endwall
 Left Guide, Left Open	 Right Guide, Right Open
 Left Guide, Right Endwall	 Right Guide, Left Endwall

POWER HEADER (PLUG) MODULES:

 Right Angle (right hold down)	 Right Angle (left hold down)	 Vertical
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POWER RECEPTACLE MODULES:

 Right Angle (right hold down)	 Right Angle (left hold down)	 Vertical
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C) APPLICABLE DOCUMENTS

- a. Product Specification:
 - i. 100 Ohm: [PS-76060-999](#)
 - ii. 85 Ohm: [PS-170540-999](#)
- b. Routing Guide:
 - i. Standard: [AS-76060-999](#)
 - ii. Orthogonal: [AS-76850-990](#)
- c. Application Tooling Guide:
 - i. [TM-622018799](#)

D) DISCLAIMER

Detail included in the 2D sales drawings takes precedence over information included in the Design Guide document.

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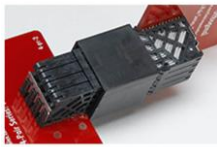


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II : INITIAL CONNECTOR SELECTION

A) SPEED: UP TO 25 GBPS

B) ORIENTATION:

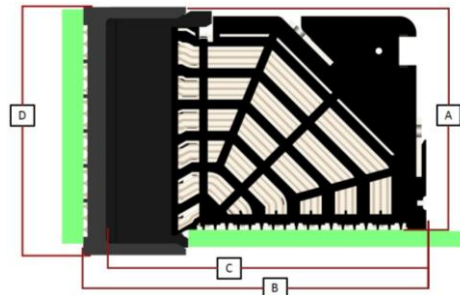
<u>Conventional Right Angle to Vertical</u>	<u>Orthogonal Direct</u>	<u>Mezzanine</u>
		
<u>Coplanar</u>	<u>Orthogonal Midplane</u>	<u>Cable Assemblies</u>
		

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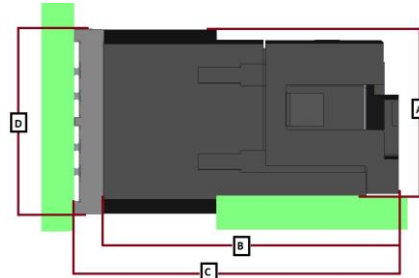
Application Specification

C) CONNECTOR ENVELOPE DIMENSIONS:



Signal Modules

Item	Signal Dimension	2-Pair	3-Pair	4-Pair	5-Pair	6-Pair
DC Height off Board (mm)	A	9.7	13.8	17.8	21.9	25.9
Mated Depth (mm)	B	22.8	26.8	30.9	34.9	40.0
DC Depth (mm)	C	20.1	24.2	28.2	32.3	37.3
Header Width (mm)	D	12.6	16.7	20.7	24.8	28.8



Power Modules

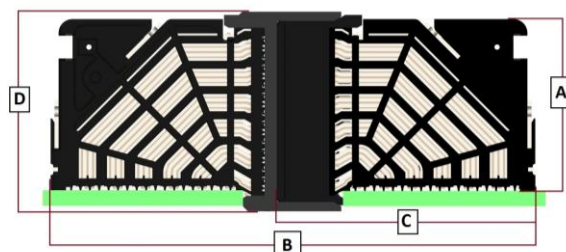
Item	Power Dimension	3-Pair	4-Pair	5-Pair	6-Pair
Plug height off board (mm)	A	13.5	20.0	22.8	26.9
Plug depth (mm)	B	24.0	28.0	32.1	36.1
Mated depth (mm)	C	26.7	30.8	34.6	38.6
Receptacle width (mm)	D	15.0	21.2	22.8	27.2

Figure 1: Conventional Right Angle to Vertical Application

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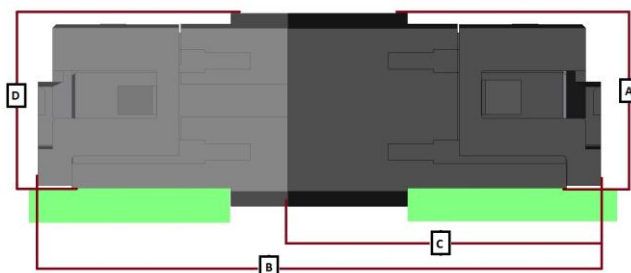


Application Specification



Signal Modules

Item	Signal Dimension	2-Pair	3-Pair	4-Pair	6-Pair
DC Height off Board (mm)	A	9.2	13.3	17.3	25.4
Mated Depth (mm)	B	35.4	43.5	51.6	69.8
DC Depth (mm)	C	20.1	24.1	28.2	37.3
RAM Header Width (mm)	D	12.7	16.7	20.8	28.9



Power Modules

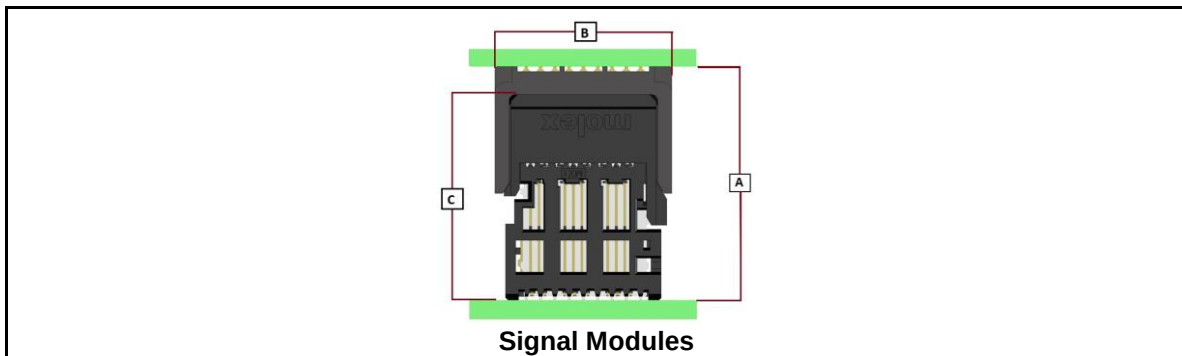
Item	Power Dimension	3-Pair	4-Pair
Plug height off board (mm)	A	13.5	20.0
Mated depth (mm)	B	43.4	51.6
Plug depth (mm)	C	24.0	28.0
Receptical Height off board (mm)	D	14.9	17.4

Figure 2: Coplanar Application

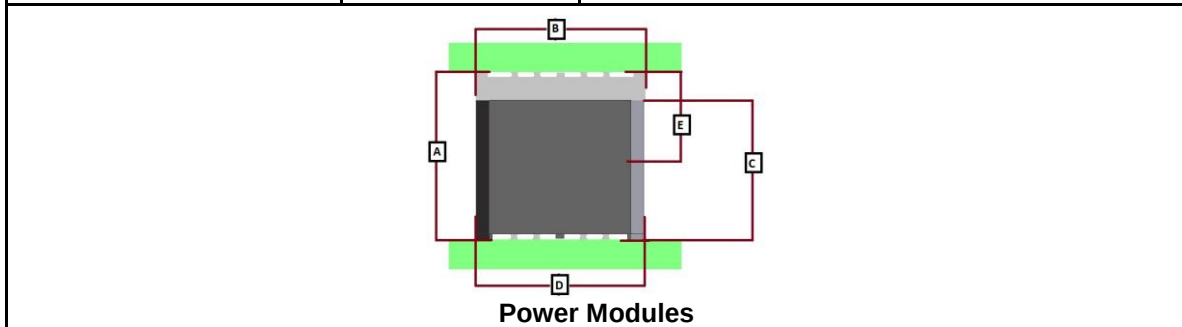
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Item	Signal Dimensions	3-Pair	4-Pair	5-Pair
Ohm		100	85	100
Stack Height (mm)	A	18, 22	18, 25, 37	28, 38, 40
Header Width (mm)	B	16.7	20.7	24.8
DC Depth (mm)	C	*Varies by stack height*		



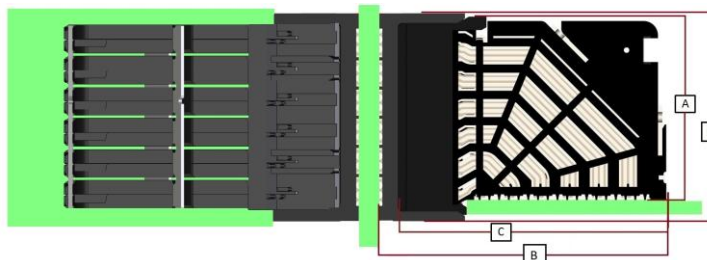
Item	Power Dimensions	3-Pair	5-Pair
Plug height off board (mm)	A	12.3	*Varies by stack height*
Plug width (mm)	B	14.9	20.8
Receptacle Height off board (mm)	C	9.8	9.8
Recept width (mm)	D	15.0	22.8
Mated depth (mm)	E	15.0	40.0

Figure 3: Mezzanine Application

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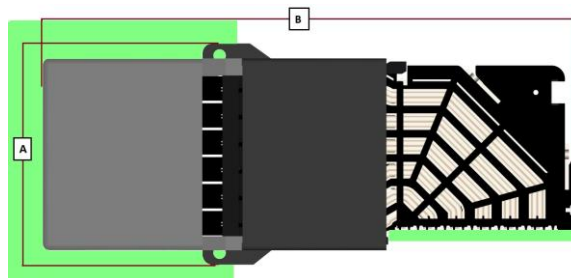


Application Specification



Item	Dimension	3-Pair	4-Pair	5-Pair	6-Pair
DC Height off Board (mm)	A	13.3	17.3	21.4	25.4
Mated Depth (mm)	B	26.8	30.6	34.9	39.9
DC Depth (mm)	C	24.1	28.2	32.2	37.3
Header Width (mm ± 0.3)	D	16.7	20.8	24.8	28.9

Figure 4: Orthogonal Signal Modules



Item	Dimension	3-Pair 6-Column	4-Pair 8-Column	5-Pair 10-Column	6-Pair 12-Column
RAM Header Width (mm)	A	21.1	25.2	29.2	33.3
Mated Depth (mm)	B	52.3	59.6	67.5	77.6

Figure 5: Orthogonal Direct Signal Modules

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D) CONNECTOR PART NUMBER SELECTION:

- a) Signal Types:
- a. Differential Pairs for High Speed
 - b. Single Ended pins for Low Speed
 - c. Low Power
 - i. 0.75A per signal pin
 - d. High Power Modules

RA Header		Vert Recept		RA Recept		Vert Header		
								
Component	3-Pair		4-Pair		5-Pair		6-Pair	
Current per Blade	15A		20A		25A		20A	
Current per Module	60A		80A		100A		120A	
# of Blades per Module	4		4		4		6	

Figure 6: High Power Modules

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Application Specification

- b) Pin Map Configurator – [Molex Pin Map Configurator](#)
 a. Customized Pin Maps for customer specific application

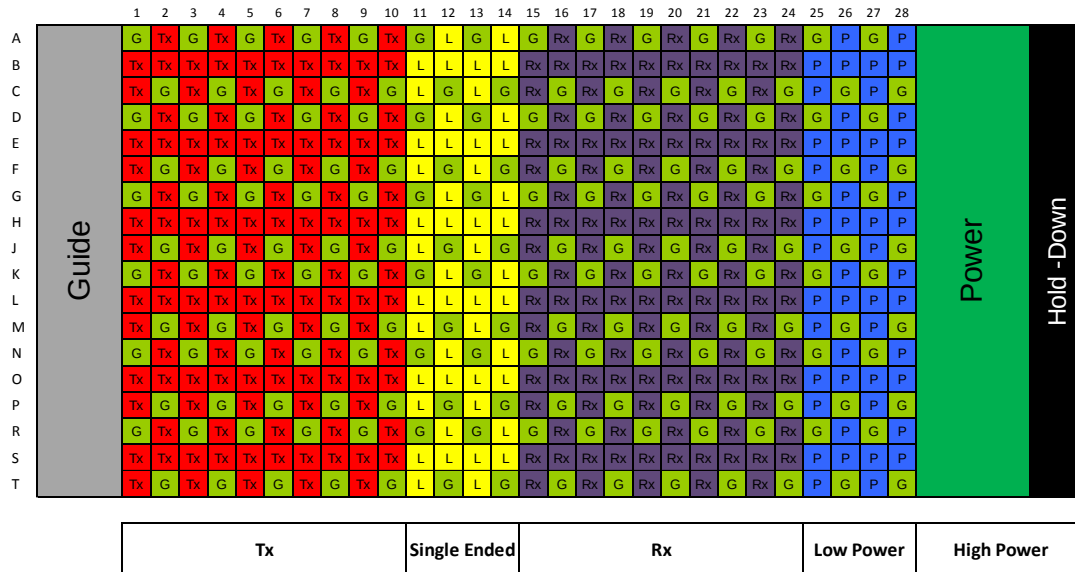


Figure 7: Custom Pin Map Example

- c) Part Number Selection - [Impact Part Number Logic Guide](#)
 a. Currently tooled Impact connector options and part numbering
- d) Plated Through Hole Dimension: Reference routing guide [AS-76060-9999](#) or [AS-76850-990](#) for further detail
 a. 0.39mm PTH
 b. 0.46mm PTH

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- e) Mating Pin Length
- a. 100 and 85 Ohm vertical headers
 - i. 3 length options available for standard product
 - ii. See Figure 8 for tooled lengths
 - b. Orthogonal Midplane, Orthogonal Direct RAM and RAM headers
 - i. 2 length options available for standard product
 - ii. See Figure 8 for tooled lengths
 - c. Custom pin length capability: Commonly used for detect signal
 - i. Vertical headers – any pin in the pin field can be specified as a shorter or longer length
 - ii. Orthogonal Midplane and Orthogonal Direct RAM headers – contact Molex for custom pin length capabilities
 - iii. RAM headers – any column in the connector can be specified as a shorter or longer length

Pin Length	Component Type				
	100 Ohm Vertical Header	85 Ohm Vertical Header	Orthogonal Midplane Header	Orthogonal Direct RAM	RAM Header
4.50mm	X	X			
4.90mm	X	X	X	X	X
5.50mm	X	X	X	X	X

Figure 8: Header Pin Length Options

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E) CONTACT WIPE

- a) Contact Molex for nominal wipe and mating sequence detail for Impact 100 Ohm and 85 Ohm
- b) See Figure 9 for minimum contact wipe detail

100 Ohm	Backplane Header Pin Lengths			
	Daughtercard Mating Point	4.5mm Pin	4.9mm Pin	5.5mm Pin
	➡ Long Ground	2.52 mm	2.92 mm	3.52 mm
	➡ Short Ground	1.52 mm	1.92 mm	2.52 mm
	➡ Long Signal	2.02 mm	2.42 mm	3.02 mm
85 Ohm	Backplane Header Pin Lengths			
	Daughtercard Mating Point	4.5mm Pin	4.9mm Pin	5.5mm Pin
	➡ Long Ground	2.92 mm	3.32 mm	3.92 mm
	➡ Short Ground	1.92 mm	2.32 mm	2.92 mm
	➡ Long Signal	2.52 mm	2.92 mm	3.52 mm
	➡ Short Signal	1.52 mm	1.92 mm	2.52 mm

Figure 9: Minimum Contact Wipe

**see Figure 10 below for short and long signal/ground*

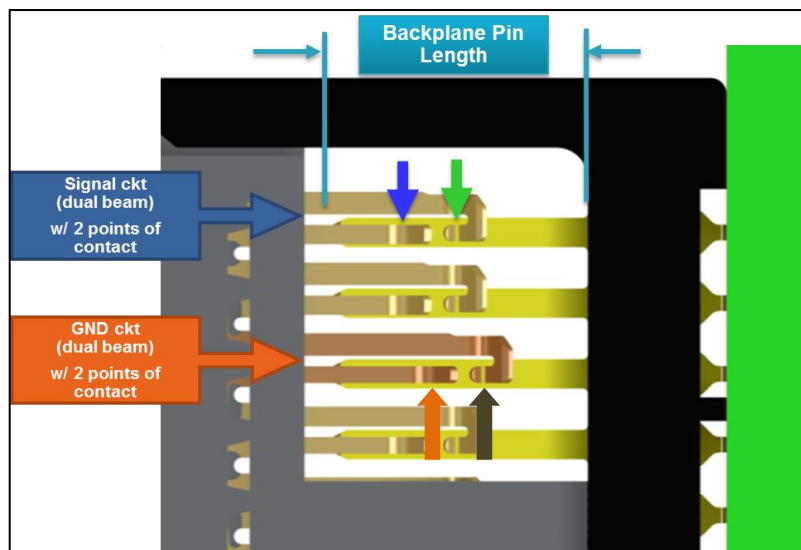


Figure 10: Short/Long Signal and Ground beam

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F) GUIDANCE AND ENDWALLS:

- a) Integrated Guidance available in all Headers, Orthogonal Mid-Plane, RAM, and Orthogonal Direct Assemblies, see Figure 11
- b) Integrated Keying available in Headers and RAM assemblies (not available in 2P Impact)
- c) Recommended that any exposed contact beams be enclosed by an endwall

GUIDE PIN RECOMMENDATIONS

DAUGHTERCARD CONNECTOR SPAN	DAUGHTERCARD WEIGHT	RECOMMENDED GUIDANCE (Minimum)
Less than 125mm	Less than 7 lbs	1 Standard Guide
	7 lbs – 14 lbs	2 Standard Guides or 1 Heavy Duty Guide
	14 lbs – 21 lbs	3 Standard Guides or 2 Heavy Duty Guides
	Over 21 lbs	Contact Molex Field Application Engineer
125mm – 250mm	Less than 14 lbs	2 Standard Guides
	14 lbs – 21 lbs	3 Standard Guides or 2 Heavy Duty Guides
	Over 21 lbs	Contact Molex Field Application Engineer
250mm – 375mm	Less than 21 lbs	3 Standard Guides
	Over 21 lbs	Contact Molex Field Application Engineer
Over 375mm	Any	Contact Molex Field Application Engineer

Figure 11: Guide Quantity Recommendations

G) POINT OF CONTACT WHEN FULLY MATED

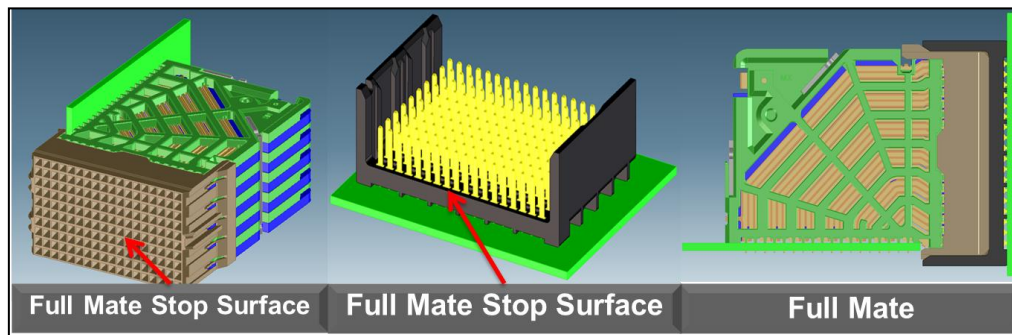


Figure 13: Mating Surfaces of Signal Modules

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III : MECHANICAL LAYOUT

A) SPACING BETWEEN MODULES

**values listed are minimum needed between modules*

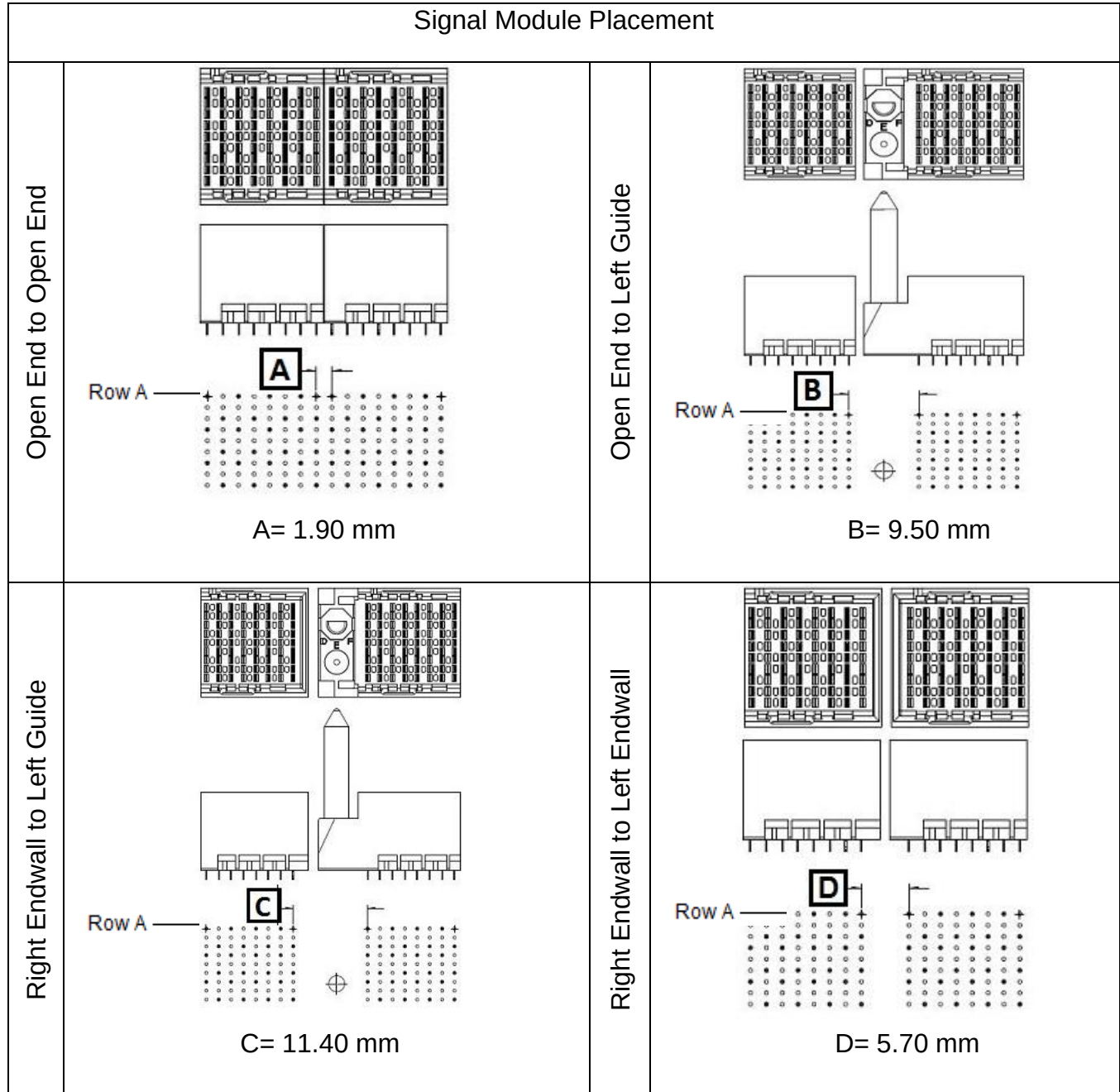


Figure 14: Signal Module Placement for Standard Modules

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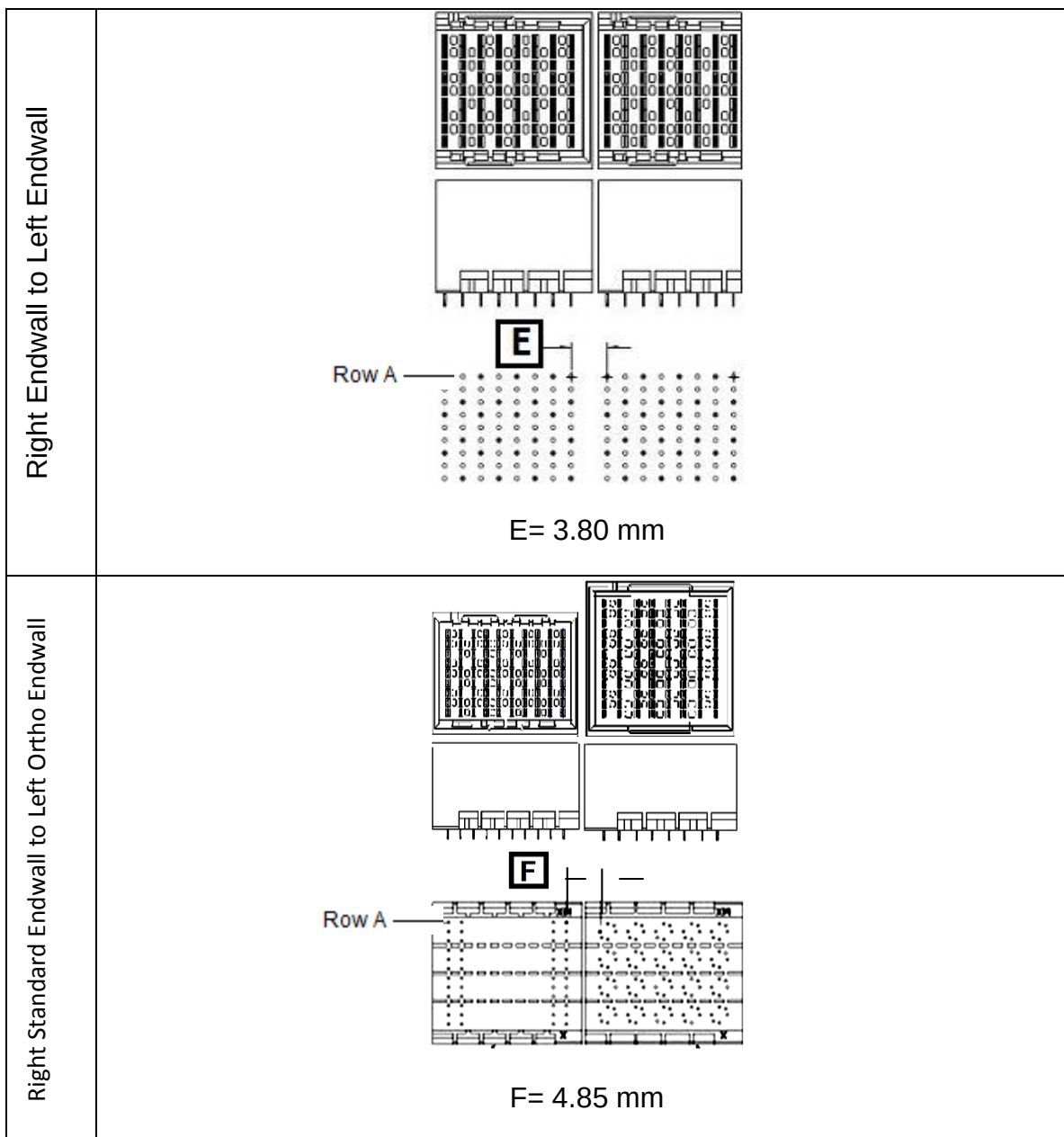


Figure 15: Signal Module Placement for Orthogonal Modules

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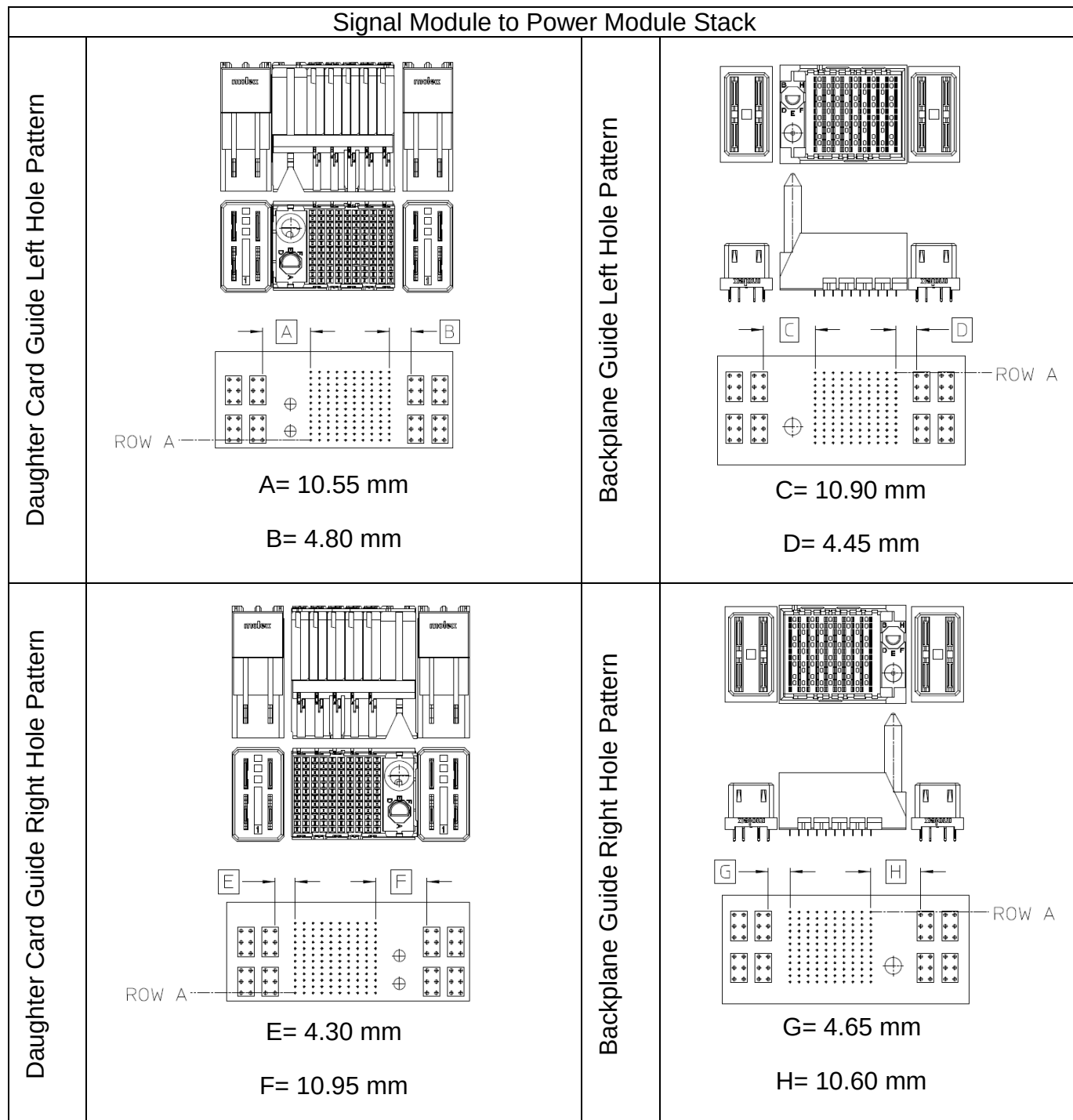


Figure 16: Signal to Power Module Placement

**These views mate to each other in conventional right angle to vertical application.*

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B) GATHERABILITY

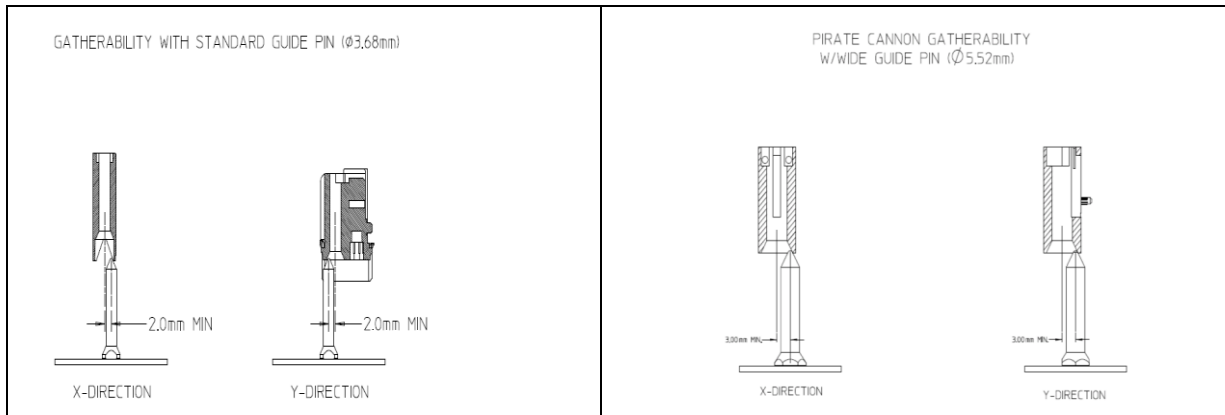


Figure 17: Gatherability of integrated and stand-alone guidance

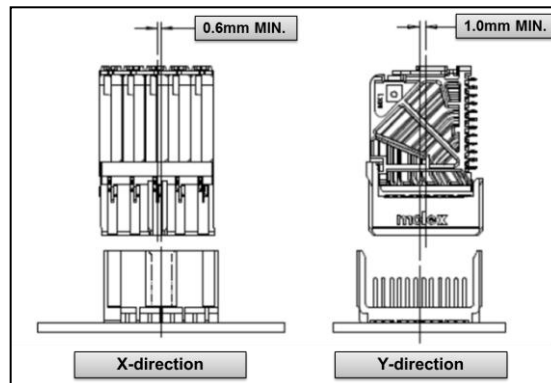


Figure 18: Gatherability of receptacle windows

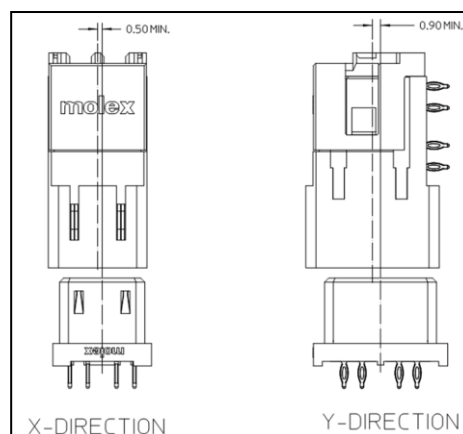


Figure 19: Gatherability of power modules

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C) ANGULAR MATING

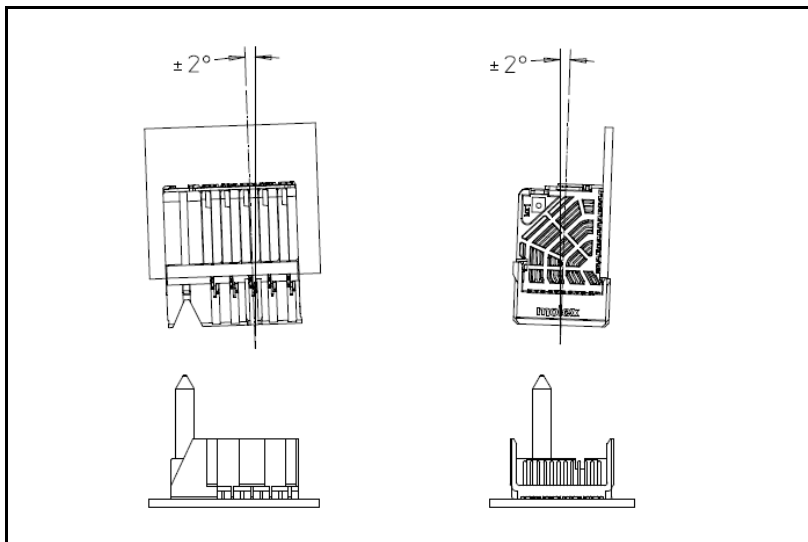


Figure 20: Angular mating tolerance of the connector

D) MATING FORCE

- a) 100 Ohm Impact - [PS-76060-999](#)
- b) 85 Ohm Impact – [PS-170540-999](#)

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III : PROCESSING

A) APPLICATION TOOL MANUAL - [TM-622018799](#)

B) APPLICATION TOOL RECOMMENDATIONS

** for all Molex Impact Application Tooling, see TM622018799 (link above)*

- a) Vertical Backplane Headers, Orthogonal Midplane Headers –
 - i. Recommend Molex design press-in tools, see Impact Application Tool Manual
- b) Daughtercard Receptacles, Mezzanine Receptacles, RAM Headers, OD RAM Headers –
 - i. Molex designed tool – reference Impact Application Tool Manual for part number
 - ii. If using Flat Rock– Do not make contact with front housing (see Figure 21)

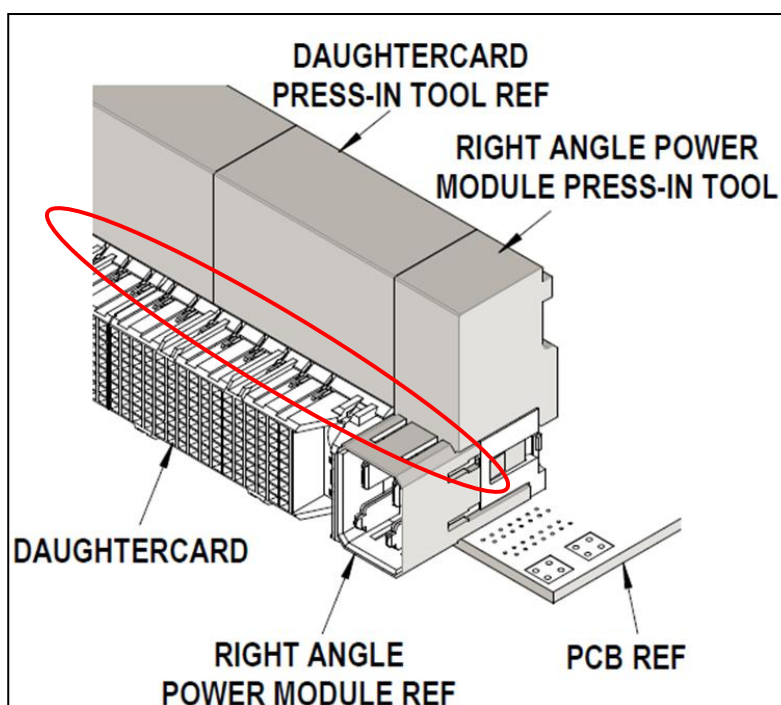


Figure 21: Correct tool or flat rock placement for right angle connectors – tool seated behind front housing ridge

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C) BOARD FABRICATION RECOMMENDATIONS

***See Impact Connector Routing Guide AS-76060-990 or AS-76060-990 for more detail on board fabrication, processing and design - [AS-76060-990.pdf](#) ; [AS-76850-990](#)**

- a) Plating thickness and type
 - i. Recommend refer to [AS-76060-990](#) or [AS-76850-990](#) for further detail
- b) Pre-Seat Process
 - i. Manual – Reference [AS-76150-9999](#)
 - ii. Visually check for bent pins prior to insertion (see Figure 22 below)

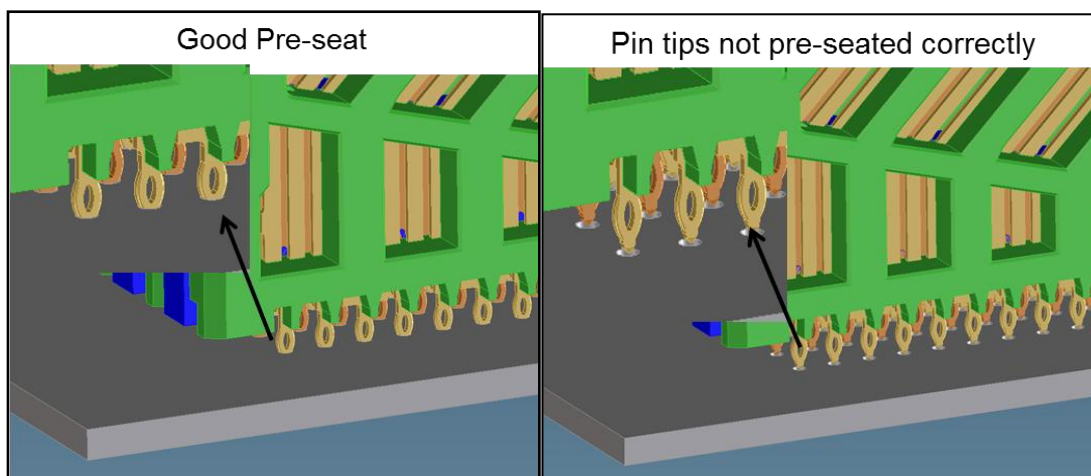


Figure 22: Pre-Seat Evaluation

- c) Seating Process –
 - i. Refer to Section 2 of [TM-622018799](#)
- d) Seating Depth
 - i. Minimum recommended depth 0.10mm from the bottom of the plastic housing to the board as noted in section 2 of [TM-622018799](#)
- e) Screw Application Spec – [AS-76060-9999](#)

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