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Approvals	Name	Date
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EC Number	Rev	Submitted By	Date	Approved By	Date
W16800	A	DJH	06/12/2012	DJH	06/12/2012
W18962	B	DJH	08/14/2012	DJH	08/14/2012
W29066	C	TKM	04/19/2013	DJH	05/09/2013
W45397	D	LJM	01/31/2014	LJM	01/31/2014
W46513	E	LJM	02/12/2014	LJM	02/12/2014
W47275	F	LJM	05/15/2014	LJM	05/15/2014
W50458	H	SEK	09/25/2015	TJW	09/25/2015
W56340	J	TJW	09/11/2017	TJW	09/11/2017
W62578	K	KCT	03/22/2021	KCT	03/22/2021

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verSI .050" [1.27mm] Open Pin Field

Please refer to this document for installation instructions and product specifications for the verSI Series Open Pin Field connector family.

Component Assemblies

VSM	Vertical Male	**VRM**	Ruggedized Vertical Male
VSF	Vertical Female	**VRF**	Ruggedized Vertical Female
VSRAM	Right Angle Male	**VRRAM**	Ruggedized Right Angle Male
VSRAF	Right Angle Female	**VRRAF**	Ruggedized Right Angle Female

Cable Assemblies:

VRD	Differential Pair Twinax Cable		
VRW	Discrete Wire	**VSX**	Flex Jumper Differential Signal

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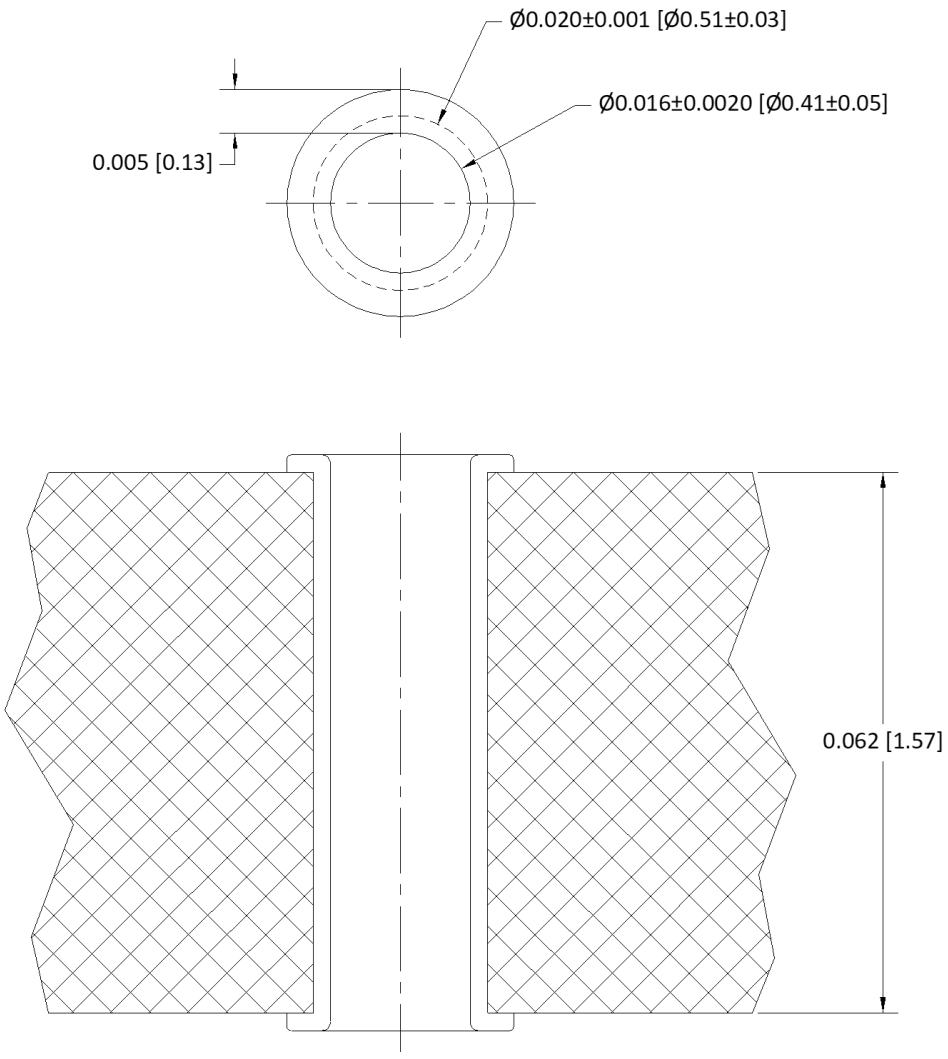
Press-Fit Technology

Recommended Hole Specification

Drill:	Ø.020±.001 [.050±0.02] thru
Finished Hole Size:	Ø.016±.002 [0.41±0.05]
Finish:	ENIG per IPC-4552
Annular Ring:	Ø 0.030 [0.76] to Ø.034 [0.86]
Minimum PCB Thickness:	0.062 [1.57]

Force Requirements

Maximum insertion force per contact in a Ø.014 hole = 4.0 lbs. [1814 grams]
Minimum retention force in a Ø.018 hole = .6 lbs. [272 grams]



Dimensions are shown in inches [mm]

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Press-Fit Technology

Installation Procedure

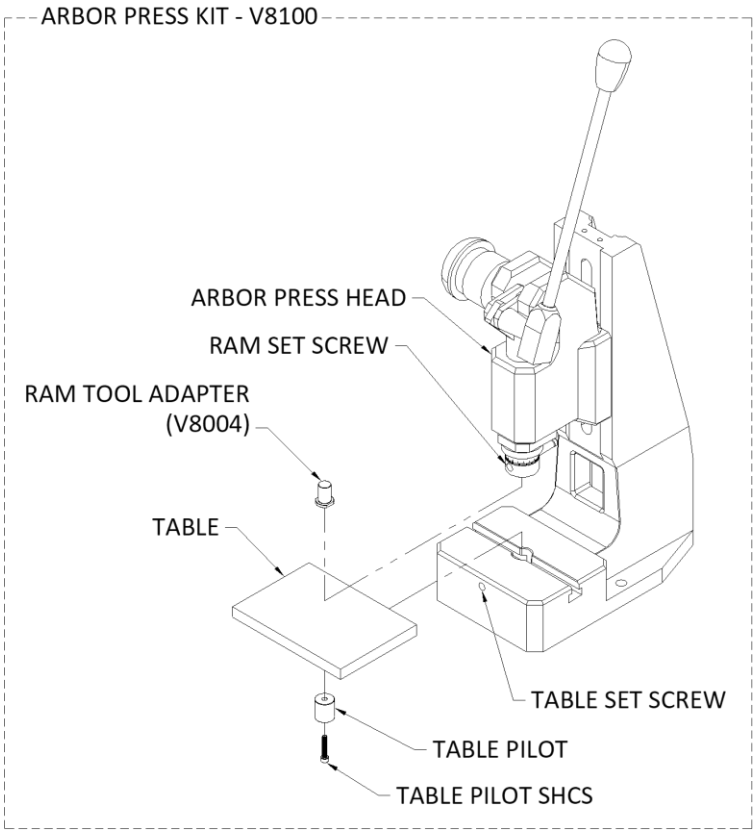
For the installation of press-fit verSI Series connectors, the following equipment is recommended:

- A hand operated press capable of supplying the required press-in force.
- A **V8000-XXXX** Press Tool that matches the component size by rows and columns (see table).

	10 Column	20 Column	30 Column	40 Column	50 Column
4 Row	V8000-0410	V8000-0420	V8000-0430	V8000-0440	V8000-0450
5 Row	V8000-0510	V8000-0520	V8000-0530	V8000-0540	V8000-0550
6 Row	V8000-0610	V8000-0620	V8000-0630	V8000-0640	V8000-0650
8 Row	V8000-0810	V8000-0820	V8000-0830	V8000-0840	V8000-0850
10 Row	V8000-1010	V8000-1020	V8000-1030	V8000-1040	V8000-1050

The following optional tools are recommended:

- **V8004** Ram Tool Adapter
- **V8100** Arbor Press Kit
  Kit includes arbor press and table.

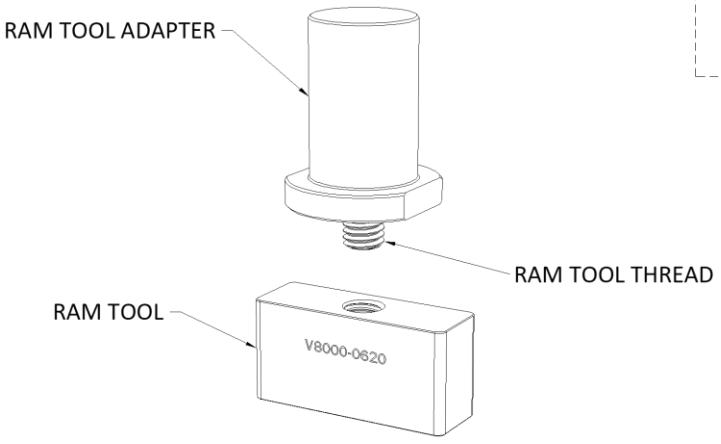


Arbor Press Setup

Table:
Assemble the table pilot to the table plate with the socket head capscrew included with the arbor press kit. Insert the pilot into the arbor press table bore and ensure the bottom table surface is resting squarely on the surface of the arbor press. Align the table with the front of the press and tighten the set screw in the front of the arbor press base to lock the table in position.

Ram Tool Adapter:
Thread ram tool to arbor press adapter hand tighten only. The thread in the adapter is locked in place and should not be removed.

Insert adapter with tool attached into arbor. Align to table and lock into position by tightening set screw in arbor press ram.



Press Head Height:
The arbor press head height should be adjusted so the tool is at the minimum allowable height with the assembly fully inserted into the PCB. This step will reduce the risk of insufficiently installed connectors or breakage due to any over-travel of the ram.

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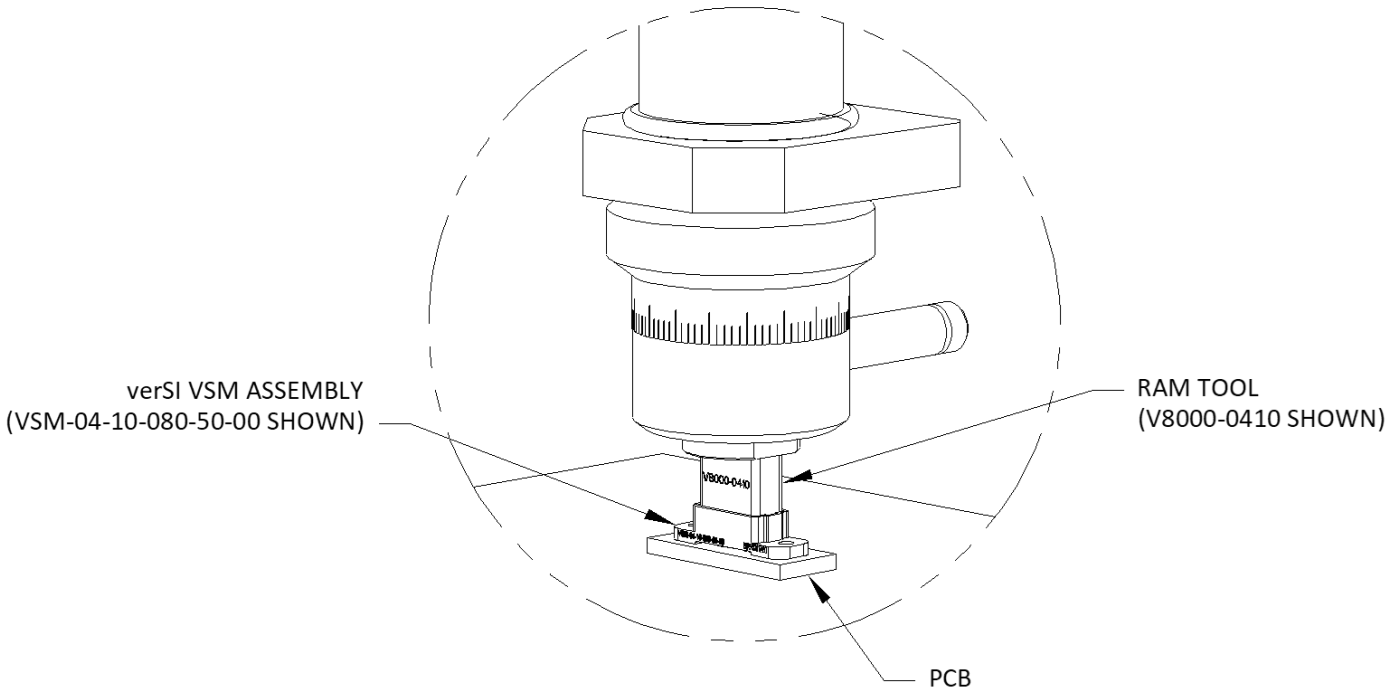
Press-Fit Technology

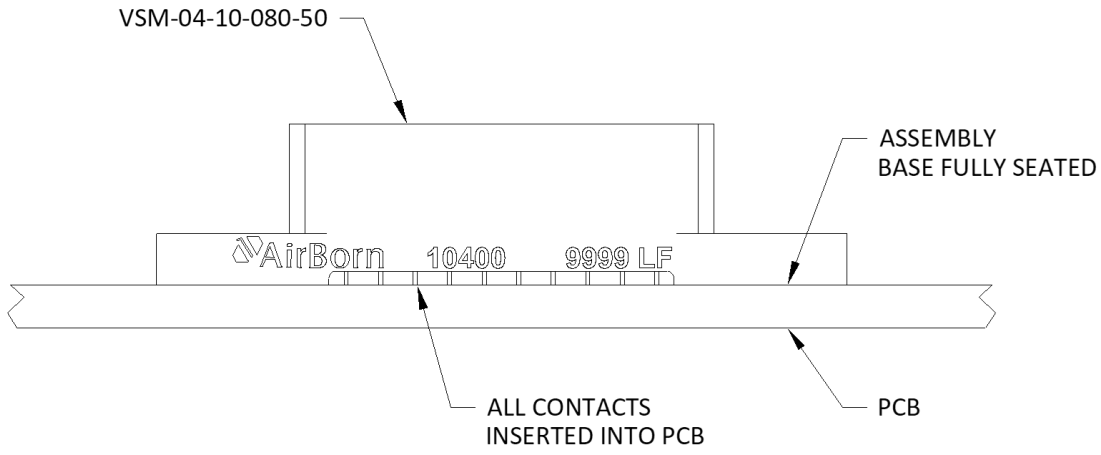
Installation

1. Correctly orient the connector to the PCB, do not force! The pins on the connector and PCB are polarized; male assemblies have offset pins.
2. Verify that all contacts are lined up with PCB holes.
3. Lower the ram and carefully align the press tool with the connector housing.
4. Firmly depress the arbor press handle through full travel.

Inspection



Verify all contacts are inserted into the PCB. If possible, inspect the press-fit tails by looking in the PTH from the backside of the PCB. Also, verify the base of the connector is fully seated on the surface of the PCB.



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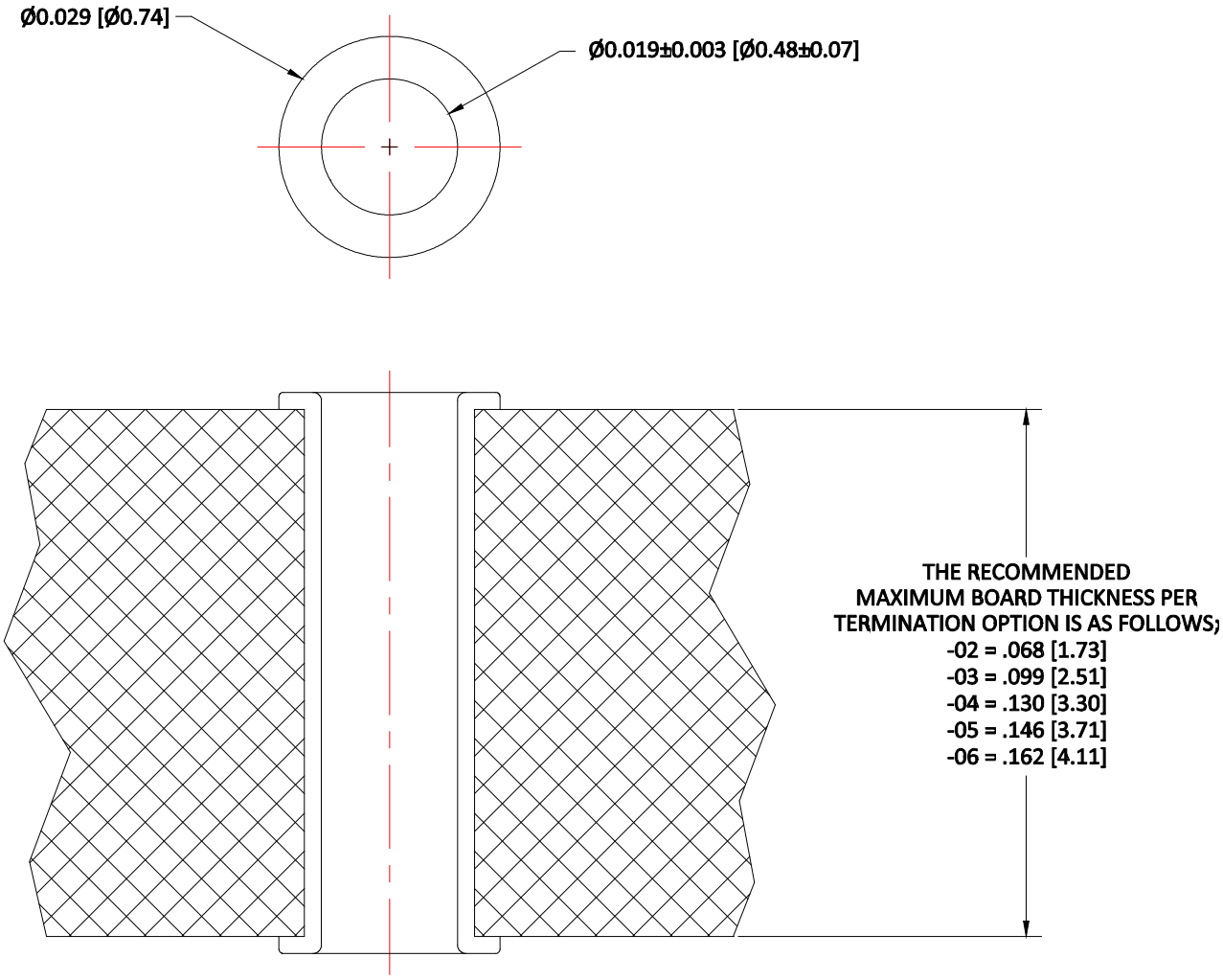
Plated-Through Hole Technology

Recommended Hole Specification

Finished Hole Size: Ø.019±.003 [.048±0.07]
Finish: ENIG per IPC-4552
Annular Ring Dia: Ø.029 [0.74] to Ø.033 [0.84]



Dimensions are shown in inches [mm]

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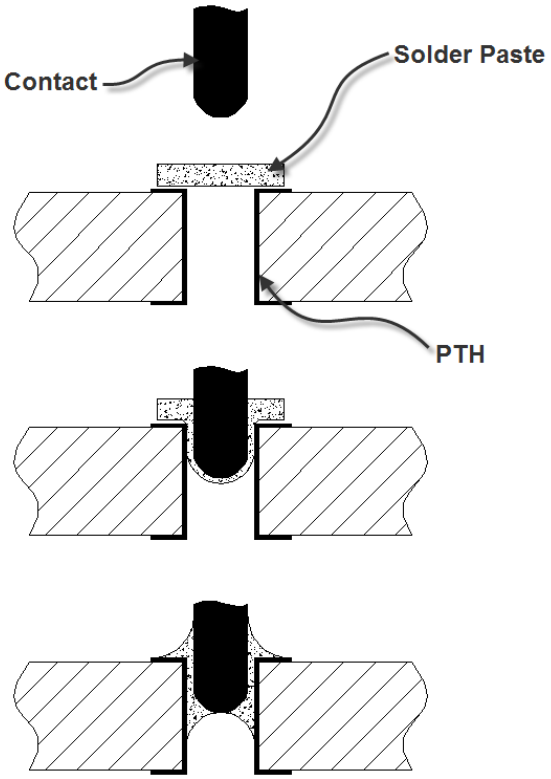
Paste-in-Hole Technology

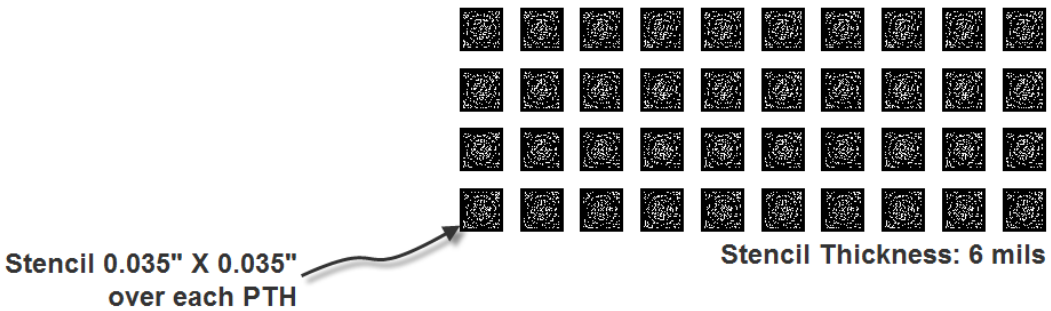
Overview

Paste-in-Hole technology (PIH), also known as intrusive reflow or pin-in-paste, is an SMT solder process that provides the robustness of a plated thru hole while allowing the user to process with conventional SMT equipment. PIH also provides the ability to inspect the solder joints visually without the need for costly X-Ray equipment.

Application

1. Stencil is placed on PCB.
2. Paste is applied using squeegee.
3. Stencil is removed.
4. Connector is placed onto the PCB and secured using appropriate hardware.
5. Solder is reflowed using SMT oven.





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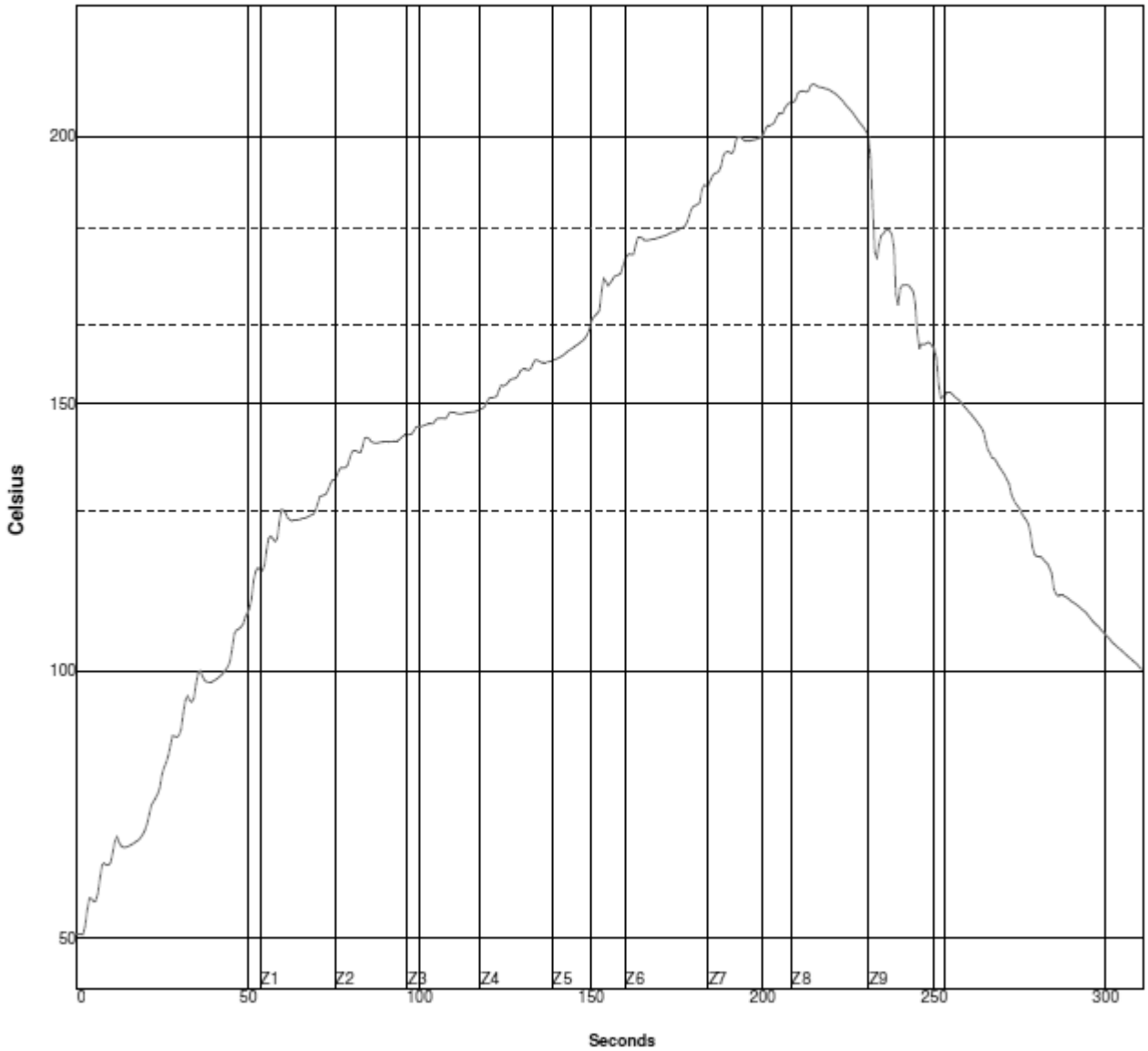
Paste-in-Hole Technology

Reflow Recommendations

Lead (Sn63Pb37)

- Max Rising Slope: 1.5-2.0°C /Sec.
- Soak: 130-165°C for 60 seconds
- Time Above Luquidous: 50-70 seconds

Setpoints (Celsius)									
Zone	1	2	3	4	5	6	7	8	9
Top	100	125	160	160	155	170	210	225	230
Bottom	100	125	160	160	155	170	210	225	230
Conveyor Speed (inch/min):	27.00								



PWI= 50%	Max Rising Slope		Soak Time 130-165C		Reflow Time /183C		Peak Temp	
Under Conn	1.63	9%	81.41	-29%	56.05	-13%	210.01	-50%

Example Lead (Sn63Pb37) Soak Reflow Profile

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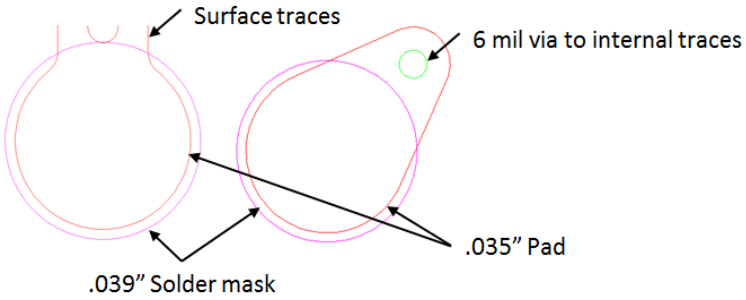
Surface-Mount Technology

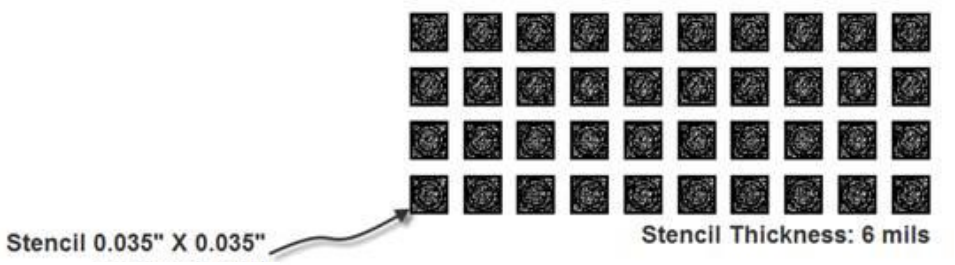
Note: This option only available for 4-Row Vertical VerSI Connectors (VSM/VSF/VRM/VRF) of any column size.

Recommended PCB pad layout:

- .035" diameter pad with .039" diameter solder mask.
- Finish: ENIG



Stencil Aperture: .035"x.035" square
Stencil Thickness: 6 mil
Solder Paste: Sn63Pb37 (PN WS483) and 42Sn/57.6Bi/0.4Ag (PN ALPHA CVP-520)



Reflow profiles on subsequent pages.

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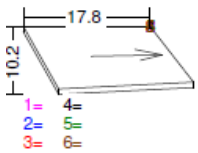
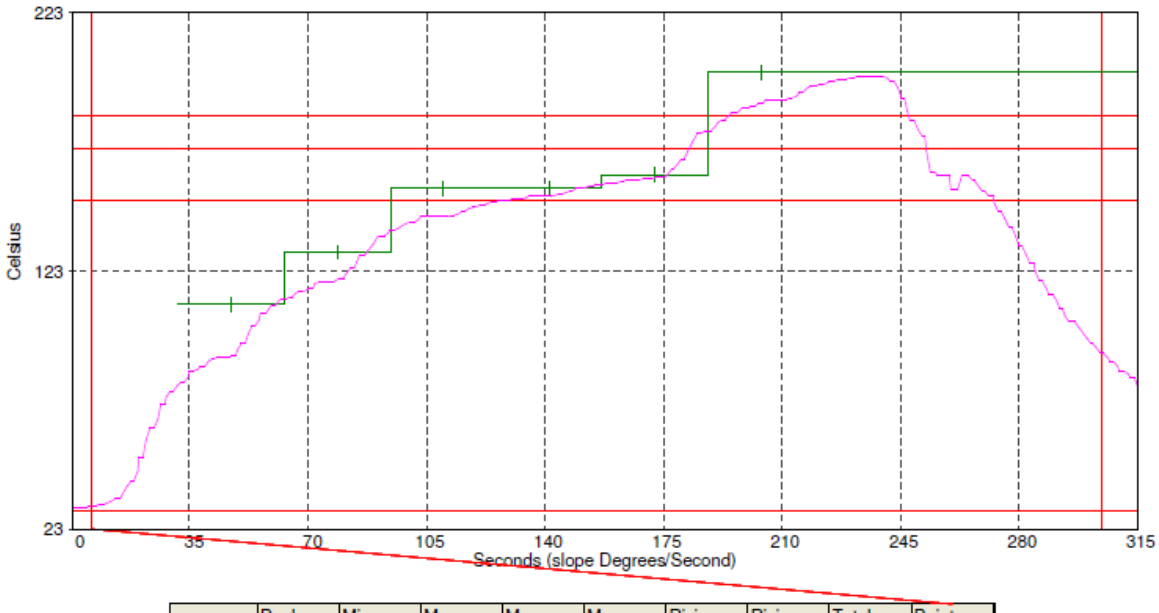
SMT Reflow Profile:

- Leaded Solder, 63Sn37Pb





	Peak	Min	Max Rising Slope	Max Falling Slope	Max Slope	Rising Time Above 30	Rising Time Between 150/170	Total Time Above 183	Pointer 5.8
1	198.2	31.4	3.79	-22.56	-22.56	232.14	56.13	53.09	31.9
2			0.00	0.00	0.00	0.00	0.00	0.00	
3			0.00	0.00	0.00	0.00	0.00	0.00	
4			0.00	0.00	0.00	0.00	0.00	0.00	
5			0.00	0.00	0.00	0.00	0.00	0.00	
6			0.00	0.00	0.00	0.00	0.00	0.00	
TC Mean	198.2	31.4	0.63	-3.76	-3.76	38.69	9.36	8.85	31.9
TC SD			1.55	9.21	9.21	94.77	22.92	21.67	
TC Range	0.0	0.0	3.79	22.56	22.56	232.14	56.13	53.09	0.0

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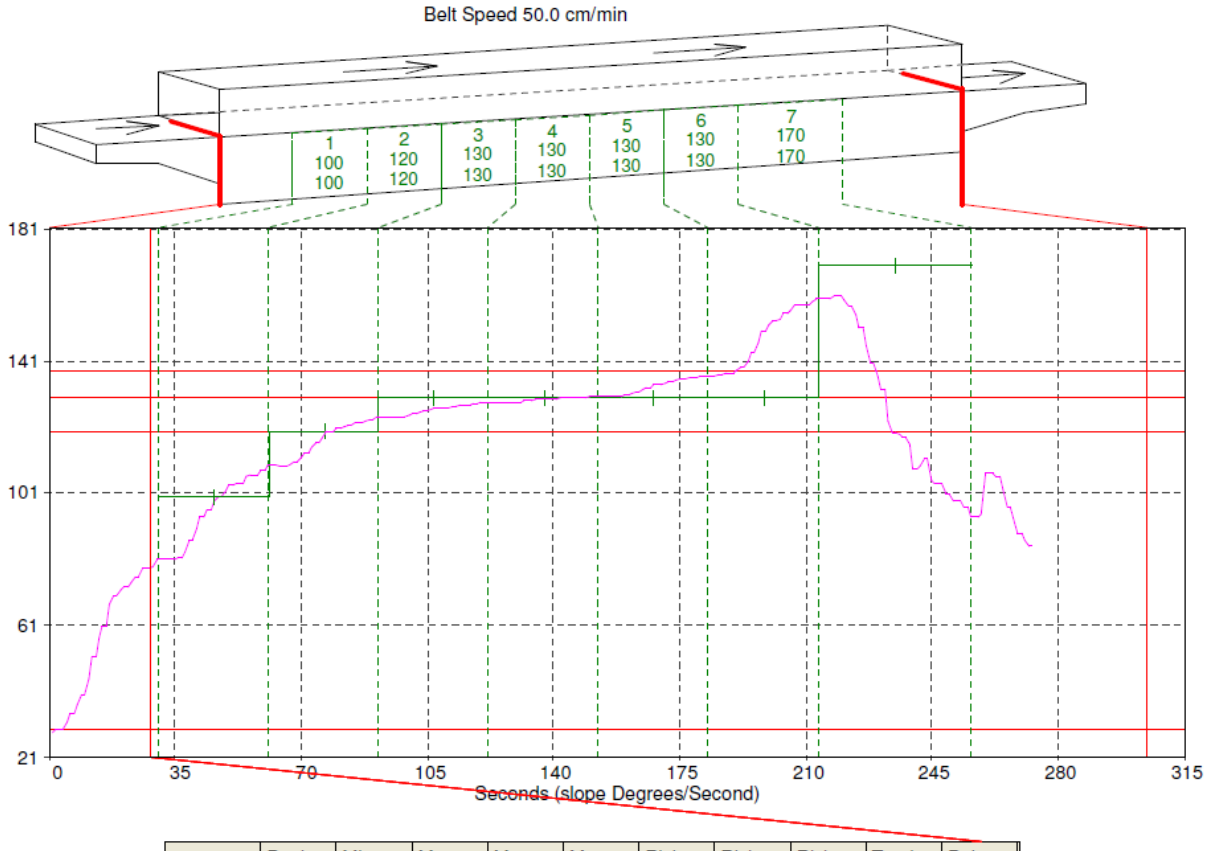
SMT Reflow Profile:

- Low Temp Lead-free Solder (Alpha CVP-520)



	Peak	Min	Max Rising Slope	Max Falling Slope	Max Slope	Rising Time Above 30	Rising Time Between 30/120	Rising Time Between 120/130	Total Time Above 138	Pointer 28.2
1	160.7	29.6	3.91	-4.01	-4.01	213.84	74.34	65.50	39.20	78.4
2			0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3			0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4			0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5			0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6			0.00	0.00	0.00	0.00	0.00	0.00	0.00	
TC Mean	160.7	29.6	0.65	-0.67	-0.67	35.64	12.39	10.92	6.53	78.4
TC SD			1.60	1.64	1.64	87.30	30.35	26.74	16.00	
TC Range	0.0	0.0	3.91	4.01	4.01	213.84	74.34	65.50	39.20	0.0

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Typical Contact Resistance

Typical Contact Resistance[1] in mΩ for 4, 5, 6, 8, and 10 row[2] right angle verSI™ male (plug) connectors. (VSRAM and VRRAM Series)		
	Termination type	
Row #	PTH & Paste-in-Hole (options 01 ,02, 03, 04, 05, 06)	Press-fit (option "00")
1	14.6	14.0
2	16.2	15.0
3	17.8	16.0
4	19.4	17.0
5	21.0	18.0
6	22.6	19.0
7	24.2	20.0
8	25.8	21.0
9	27.4	22.0
10	29.0	23.0

Typical Contact Resistance[1] in mΩ for 4, 5, 6, 8, and 10 row[2] right angle verSI™ female (receptacle) connectors. (VSRAF and VRRAF Series)		
	Termination type	
Row #	PTH & Paste-in-Hole (options 01 ,02, 03, 04, 05, 06)	Press-fit (option "00")
1	10.3	9.8
2	11.9	10.8
3	13.5	11.8
4	15.1	12.8
5	16.7	13.8
6	18.3	14.9
7	19.9	15.9
8	21.5	16.9
9	23.1	17.9
10	24.7	18.9

Typical Contact Resistance[1] in mΩ for vertical PCB/Mezzanine connectors (Male) (VSM and VRM Series)		
	Termination type	
Board spacing (mm)	PTH & Paste-in-Hole (options 01 ,02, 03, 04, 05, 06)	Press-fit (option "00")
8	6.7	3.0
10	8.5	3.6
12	10.3	4.2
16	14.0	5.4
20	17.6	6.6
25	22.2	8.1

Typical Contact Resistance[1] in mΩ for vertical PCB connectors (female) (VSF and VRF Series)	
Termination type	
PTH & Paste-in-Hole (options 01 ,02, 03, 04, 05, 06)	Press-fit (option "00")
8.8	8.8

[1] The values shown are also indicative of Low Level Contact Resistance (LLCR)

[2] For 4-row connectors, use the values for rows 1 - 4. For 5-row connectors, use the values for rows 1 - 5, etc.

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Guide Hardware

VSM and VSF, VRM and VRF

Installation

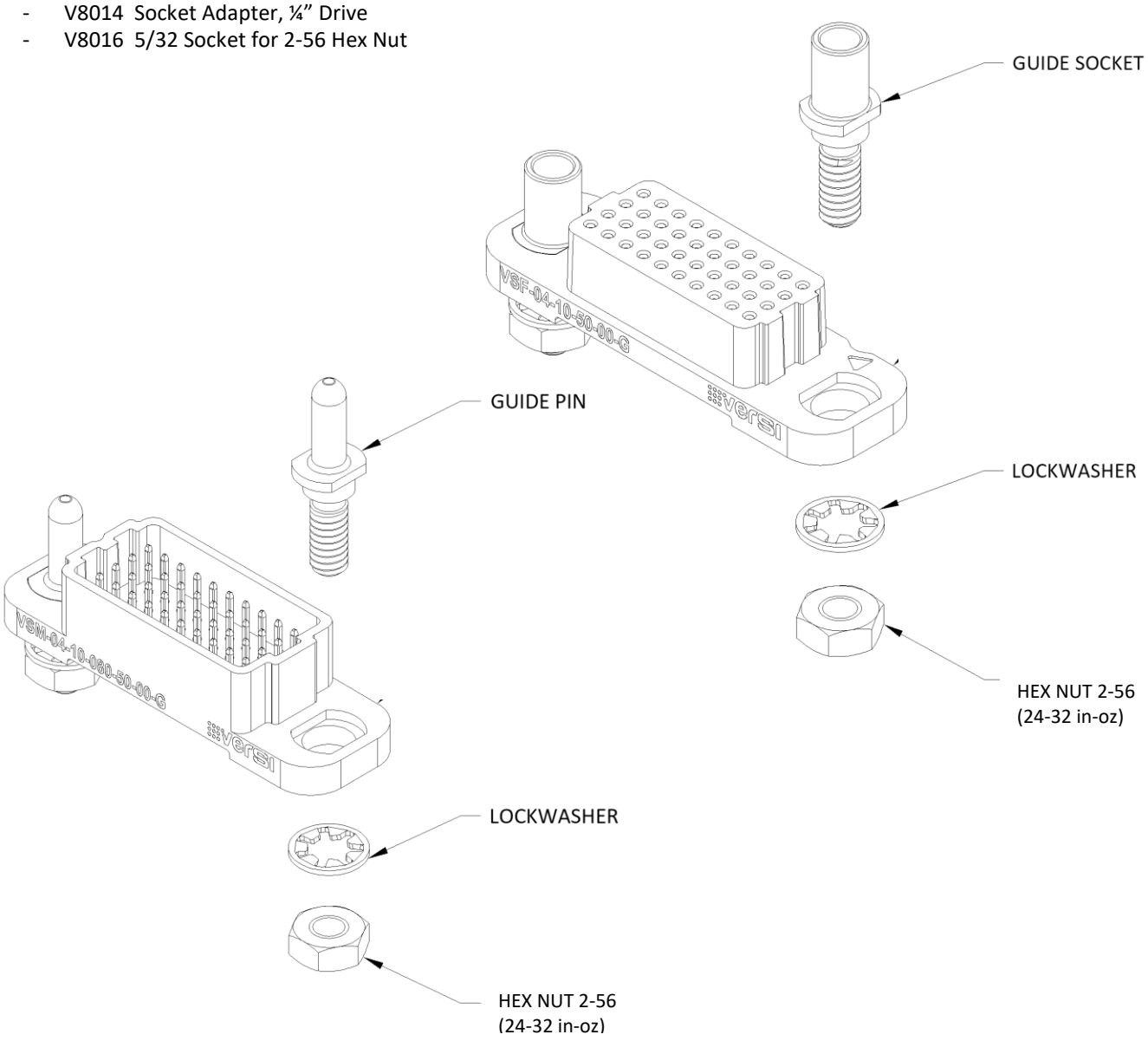
Note: Connector must be properly installed on PCB prior to installation of guide hardware.

Torque Requirements

PCB mounting; apply a torque to hex nuts of: 24 to 32 in-oz (1.5 to 2.0 in-lb)

Available for purchase from factory to achieve proper PCB mounting torque;

- V8013 Adjustable Torque Screwdriver Handle
- V8014 Socket Adapter, ¼" Drive
- V8016 5/32 Socket for 2-56 Hex Nut



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VSRAM and VSRAF, VRRAM and VRRAF

Installation

Note: Connector must be properly installed on PCB prior to installation of jacking / locking hardware.

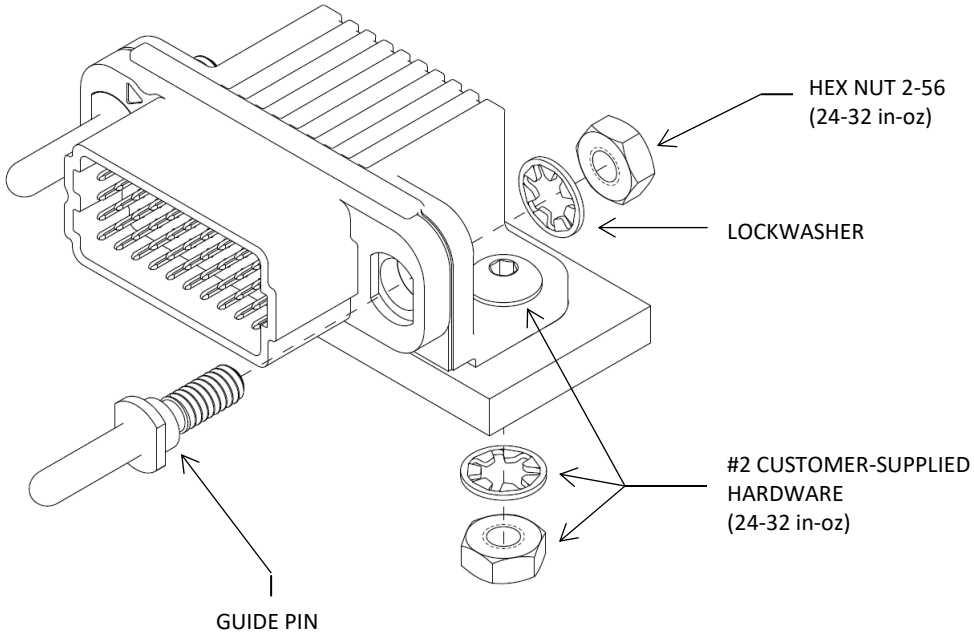
Torque Requirements

PCB mounting; apply a torque to hex nuts of: 24 to 32 in-oz (1.5 to 2.0 in-lb)

Mounting on right angle connector ; apply a torque to hex nuts of: 24 to 32 in-oz (1.5 to 2.0 in-lb)

Available for purchase from factory to achieve proper PCB mounting torque;

- V8013 Adjustable Torque Screwdriver Handle
- V8014 Socket Adapter, ¼" Drive
- V8016 5/32 Socket for 2-56 Hex Nut



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Jacking and Locking Hardware

VSM and VSF, VRM and VRF

Installation

Note: Connector must be properly installed on PCB prior to installation of jacking / locking hardware.

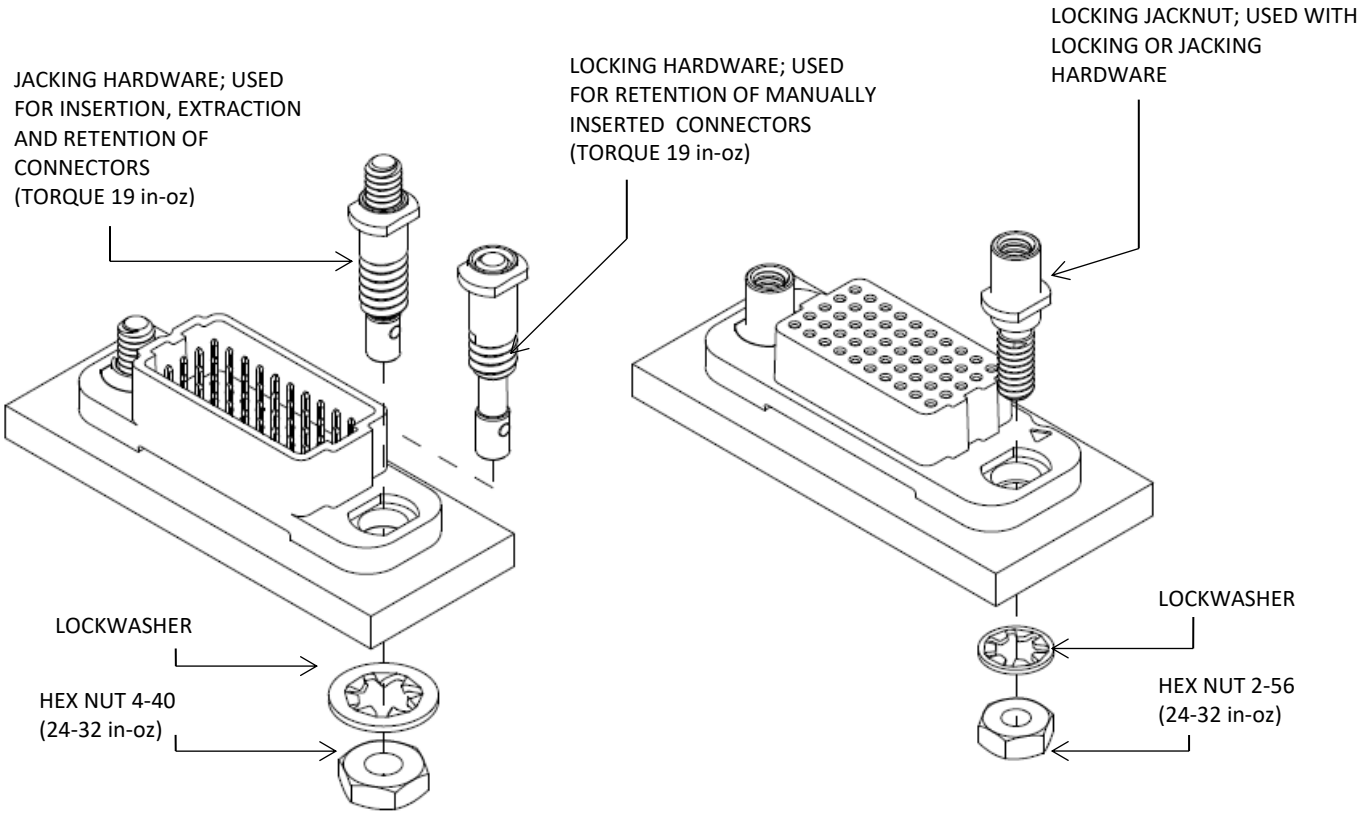
Torque Requirements

PCB mounting; apply a torque to hex nuts of: 24 to 32 in-oz (1.5 to 2.0 in-lb)
Available for purchase from factory to achieve proper PCB mounting torque;

- V8013 Adjustable Torque Screwdriver Handle
- V8014 Socket Adapter, ¼" Drive
- V8016 5/32 Socket for 2-56 Hex Nut
- V8030 3/16 Socket for 4-40 Hex Nut

Jacking / Locking hardware coupling; apply a torque of: 19 in. oz. maximum (1.2 in. lb.)
Available for purchase from factory to achieve proper jacking / locking torque;

- V8013 Adjustable Torque Screwdriver Handle
- V8017 Adapter, Micro Bit Holder
- V8031 Micro Bit, Hex Tip



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VSRAM and VSRAF, VRRAM and VRRAF

Installation

Note: Connector must be properly installed on PCB prior to installation of jacking / locking hardware.

Torque Requirements

PCB mounting; apply a torque to hex nuts of: 24 to 32 in-oz (1.5 to 2.0 in-lb)

Mounting on right angle connector ; apply a torque to hex nuts of: 24 to 32 in-oz (1.5 to 2.0 in-lb)

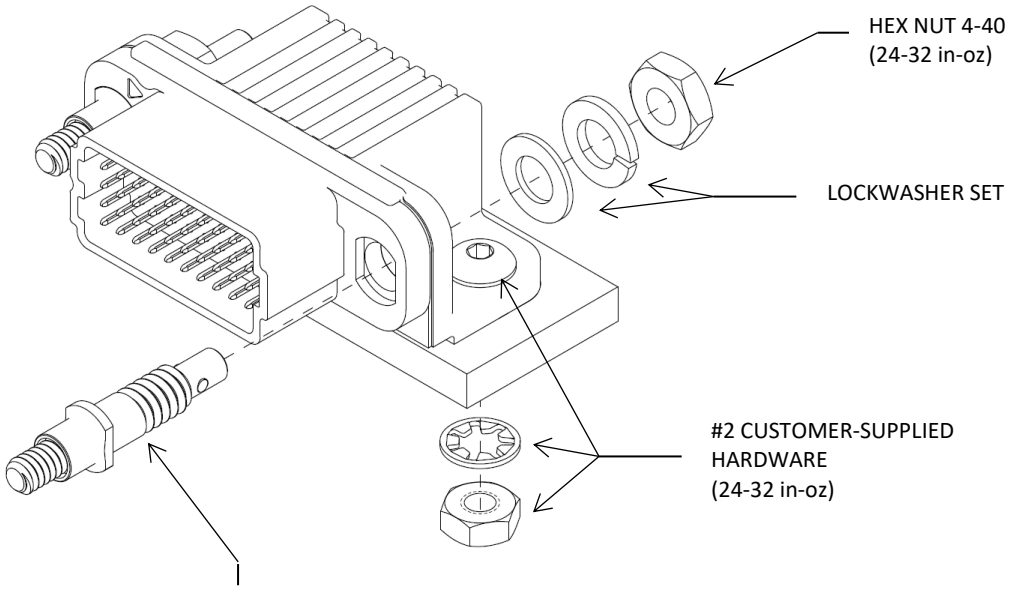
Available for purchase from factory to achieve proper PCB mounting torque;

- V8013 Adjustable Torque Screwdriver Handle
- V8014 Socket Adapter, ¼" Drive
- V8016 5/32 Socket for 2-56 Hex Nut
- V8030 3/16 Socket for 4-40 Hex Nut

Jacking / Locking hardware coupling; apply a torque of: 19 in. oz. maximum (1.2 in. lb.)

Available for purchase from factory to achieve proper jacking / locking torque;

- V8013 Adjustable Torque Screwdriver Handle
- V8017 Adapter, Micro Bit Holder
- V8031 Micro Bit, Hex Tip



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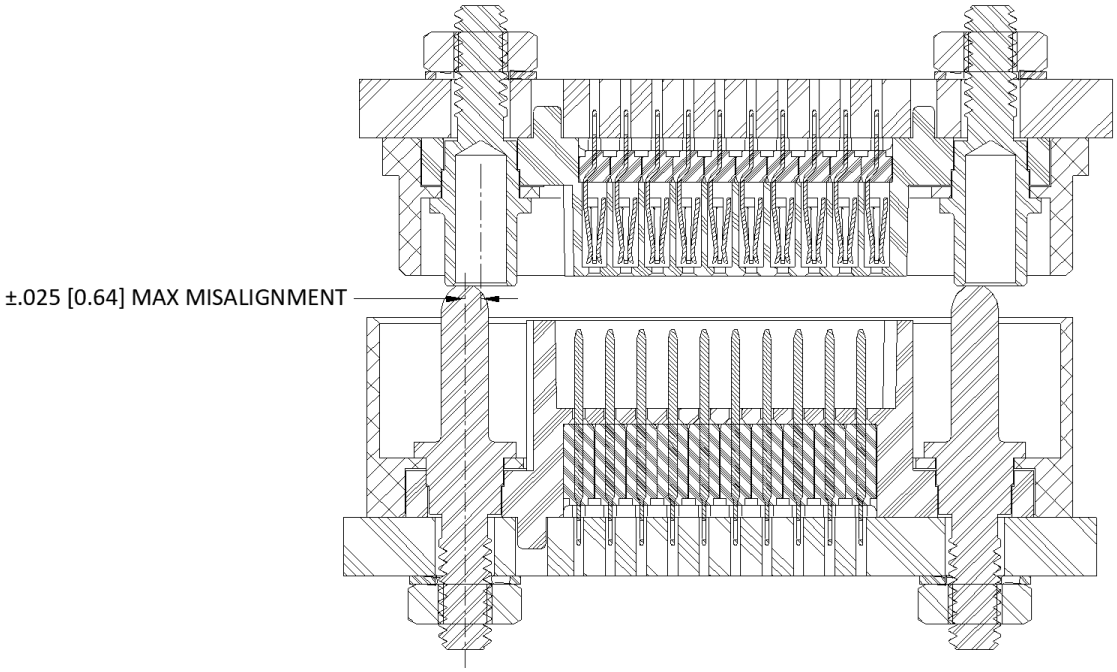
Mating Misalignment Tolerance for Guide Hardware

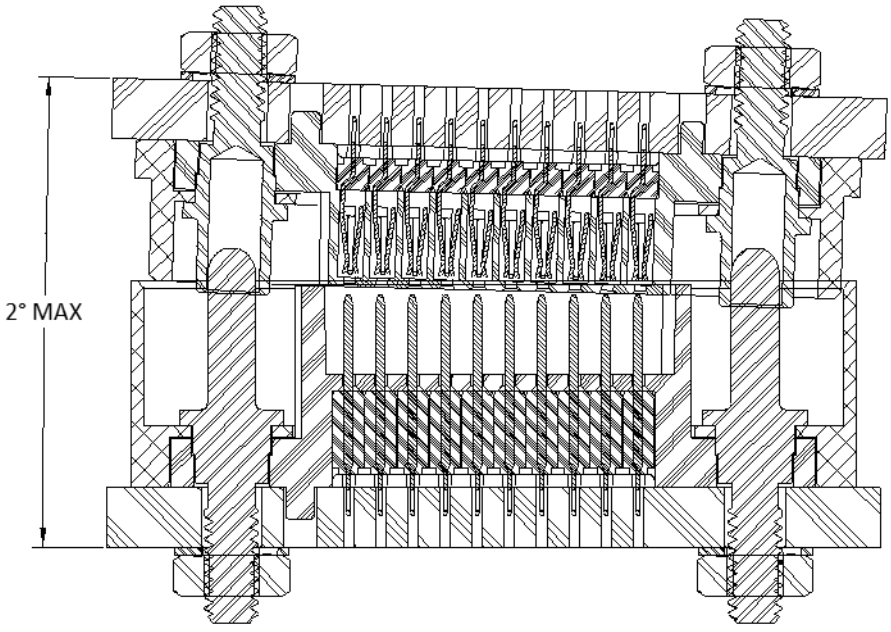
Linear

The maximum linear misalignment is ±.025 [0.64].



Angular

The maximum angular misalignment is 2°.



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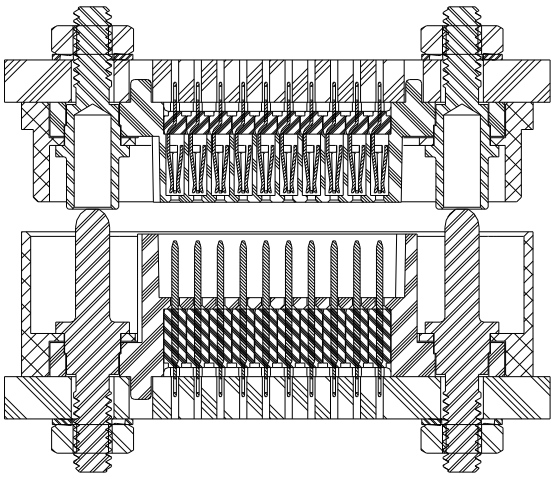
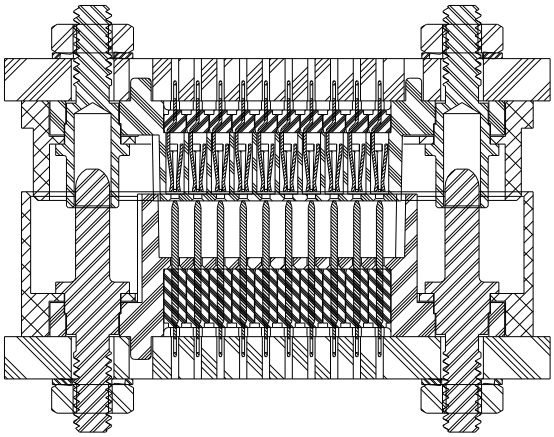
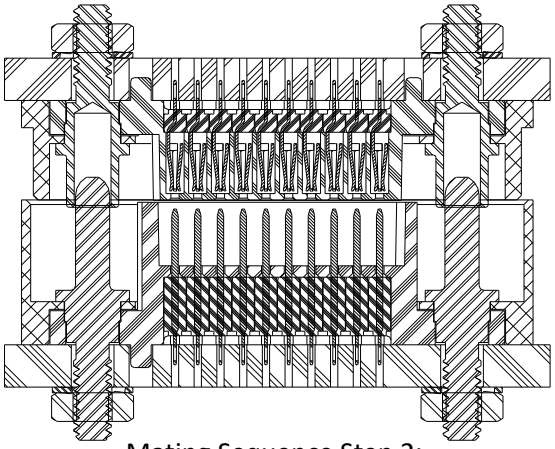
Mating Sequence for Guide Hardware



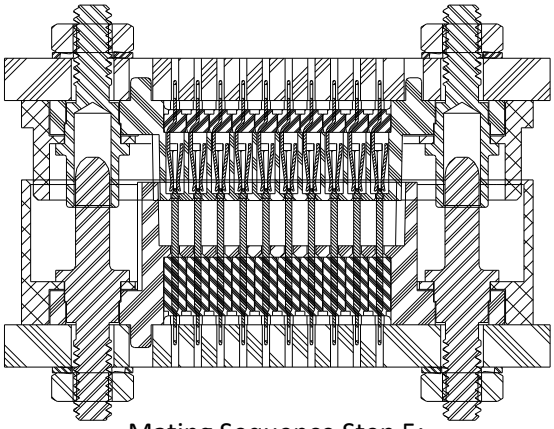
Mating Sequence Step 1:
Guide Hardware



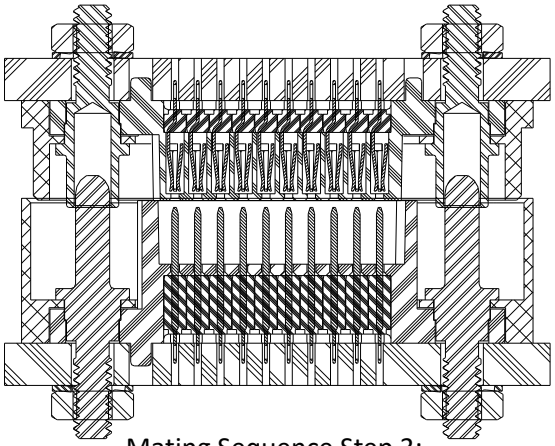
Mating Sequence Step 4:
Pin Contact to Socket Housing



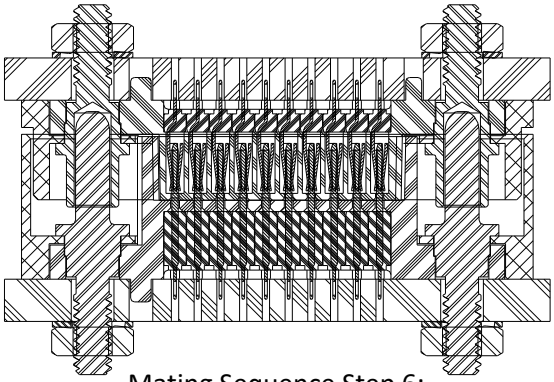
Mating Sequence Step 2:
Ruggedized Hoods



Mating Sequence Step 5:
Pin Contact to Socket Contact



Mating Sequence Step 3:
Pin Housing to Socket Housing



Mating Sequence Step 6:
Fully Seated

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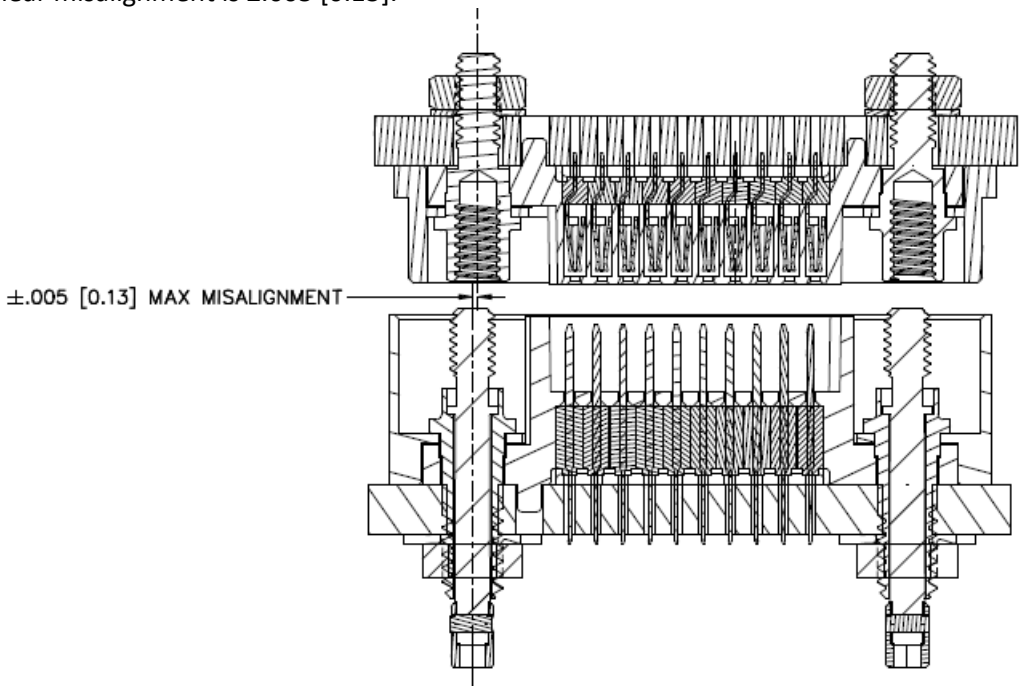
Mating Misalignment Tolerance for Jacking Hardware

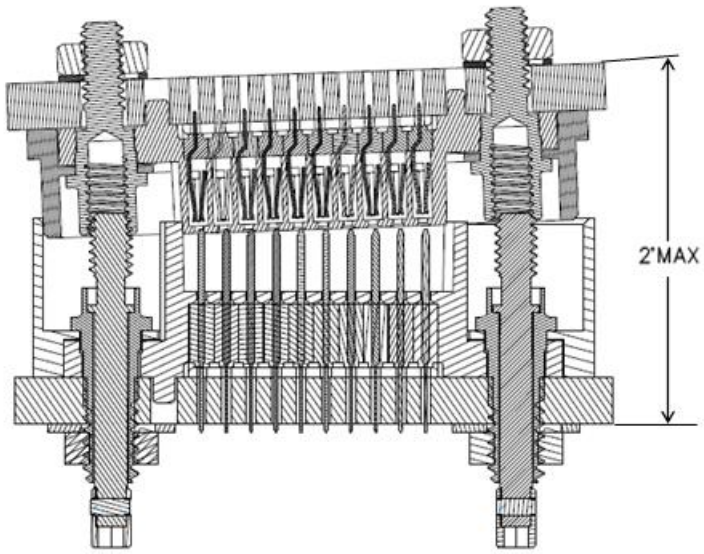
Linear

The maximum linear misalignment is ±.005 [0.13].



Angular

The maximum angular misalignment is 2 degrees.
It is recommended to turn jacking hardware 1 to 1-1/2 revolutions alternately per side until fully seated.



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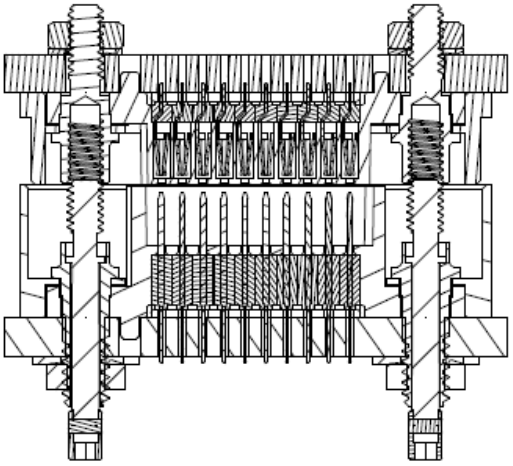
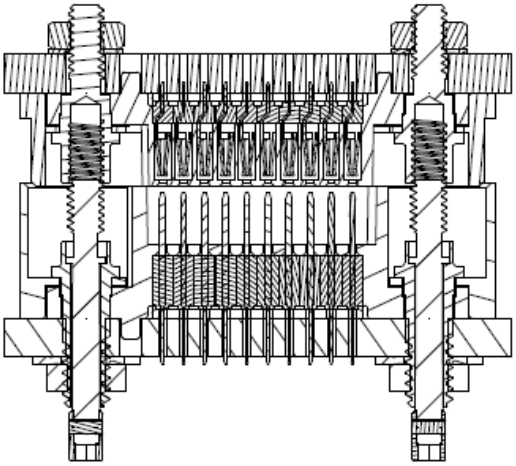
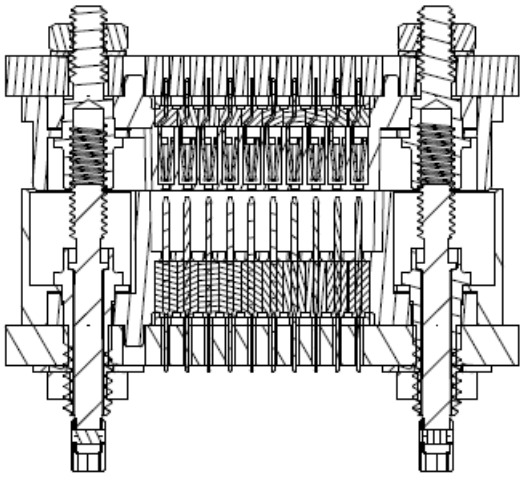
Mating Sequence for Jacking Hardware



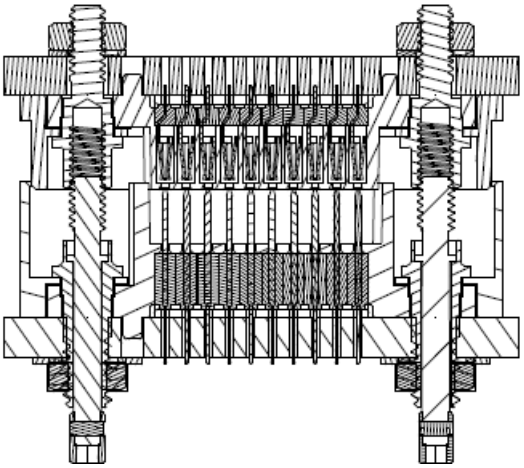
Mating Sequence Step 1:
Ruggedized Hoods



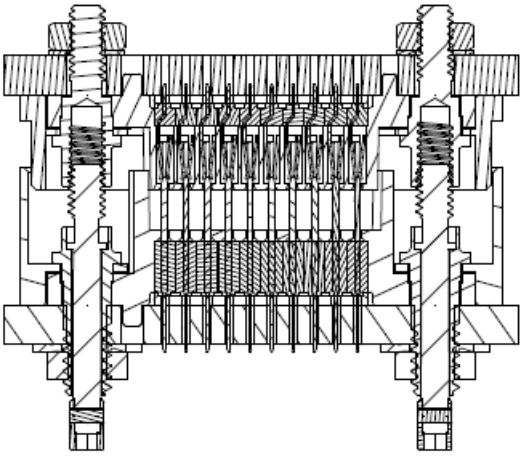
Mating Sequence Step 2:
Jacking Hardware



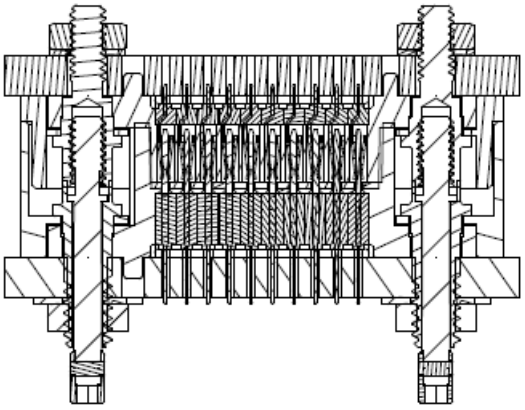
Mating Sequence Step 3:
Pin Housing to Socket Housing



Mating Sequence Step 4:
Pin Contact to Socket Housing



Mating Sequence Step 5:
Pin Contact to Socket Contact



Mating Sequence Step 6:
Fully Seated

Contact Wipe

Nominal Contact Wipe when fully mated: .072”

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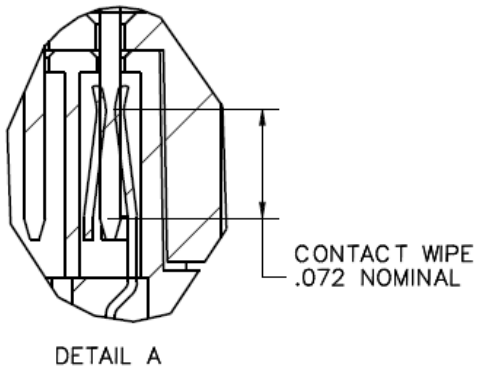
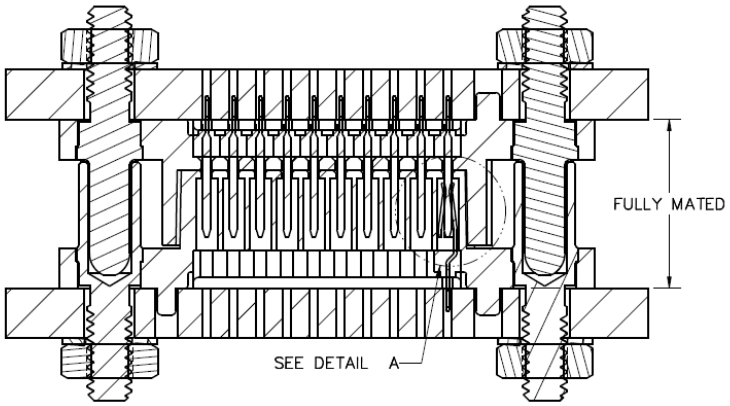
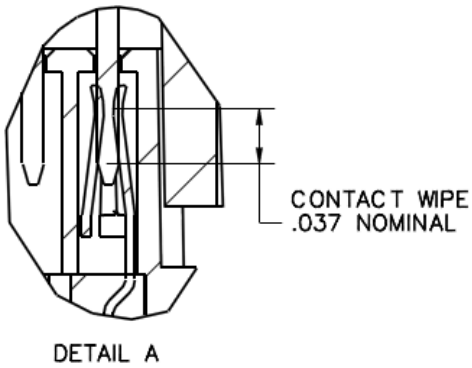
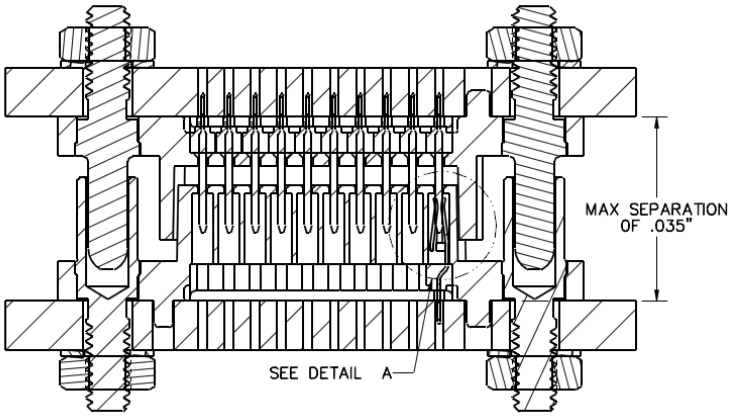




Nominal Contact Wipe at Max Connector Separation of .035": .037"





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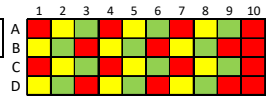
VRD Cable Pinouts

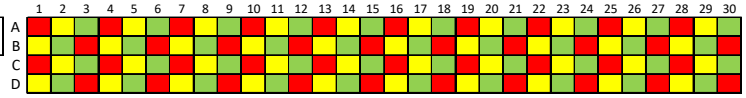
4 X 10, 20, 30, 40, 50

4 X 10
12 Differential Pairs

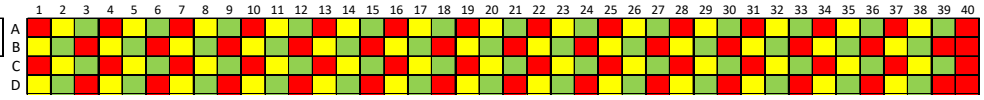


4 X 20
26 Differential Pairs

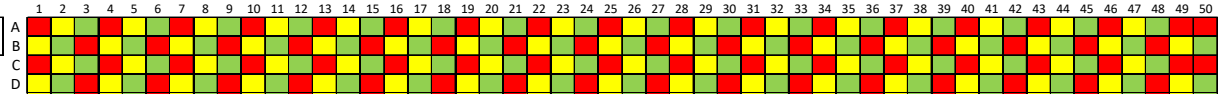
4 X 30
40 Differential Pairs



4 X 40
52 Differential Pairs

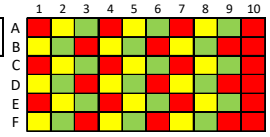


4 X 50
66 Differential Pairs

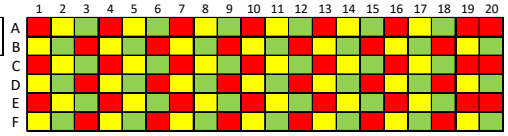


6 X 10, 20, 30, 40, 50

6X 10
18 Differential Pairs

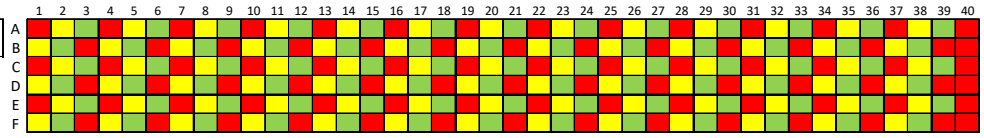


6 X 20
39 Differential Pairs

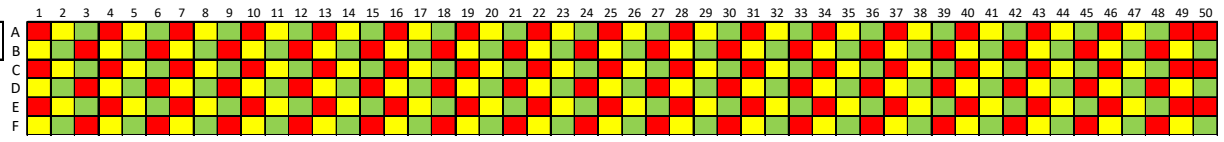


6 X 30
60 Differential Pairs

6 X 40
78 Differential Pairs



6 X 50
99 Differential Pairs



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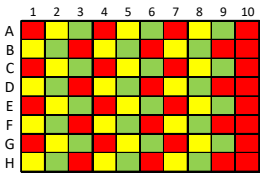
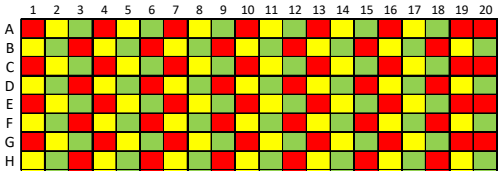
8 X 10, 20, 30, 40, 50

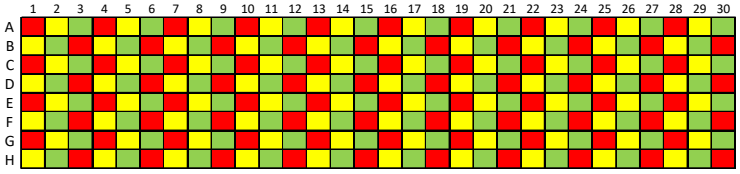
8X 10
24 Differential Pairs



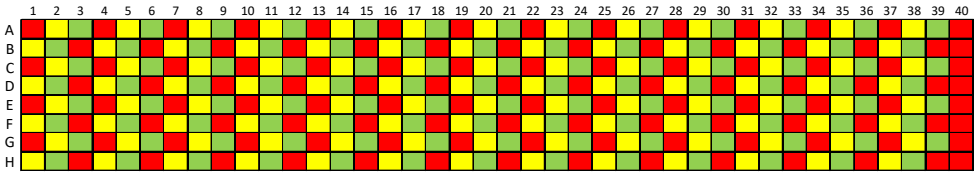
8 X 20
52 Differential Pairs



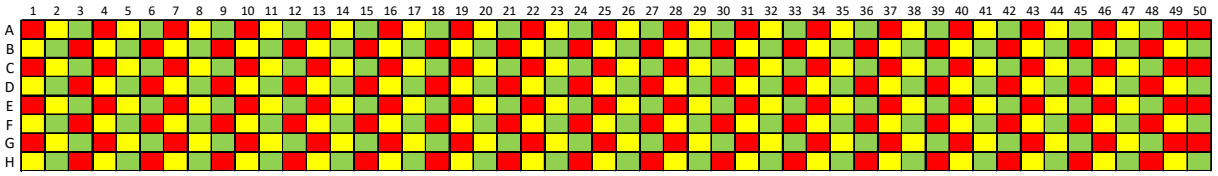
8 X 30
80 Differential Pairs



8 X 40
104 Differential Pairs



8 X 50
132 Differential Pairs



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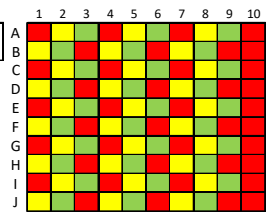
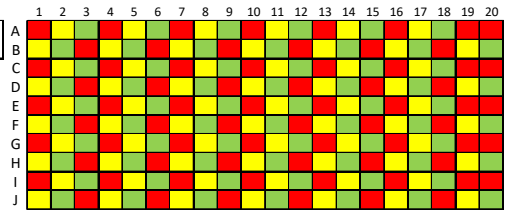
10 X 10, 20, 30, 40, 50

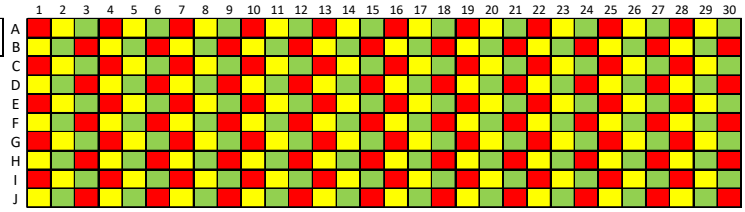
10 X 10
30 Differential Pairs



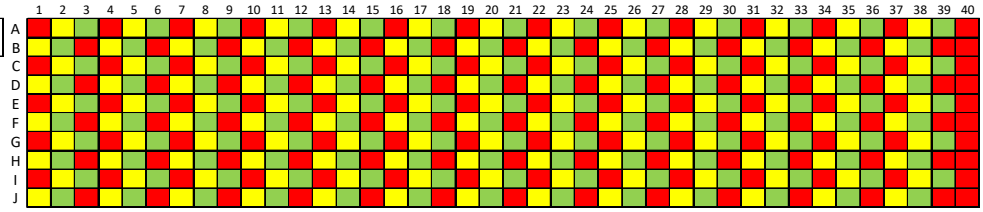
10 X 20
65 Differential Pairs



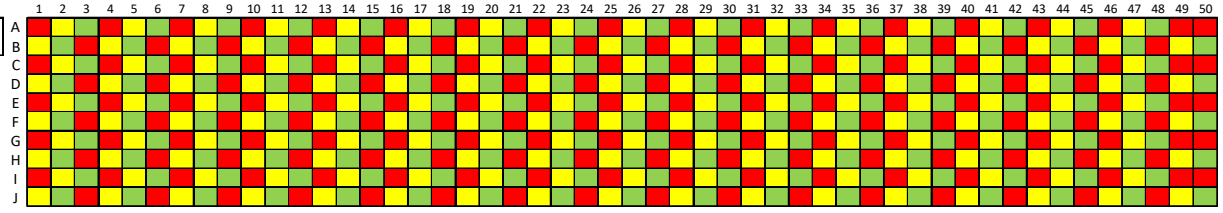
10 X 30
100 Differential Pairs



10 X 40
130 Differential Pairs



10 X 50
165 Differential Pairs



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Male to Female Jumper Assembly

P N GD

Row 1			Row 2			Row 3			Row 4			Row 5			Row 6			Row 7			Row 8			Row 9			Row 10		
M		F	M		F	M		F	M		F	M		F	M		F	M		F	M		F	M		F	M		F
A1		A1	B1		B1	C1		C1	D1		D1	E1		E1	F1		F1	G1		G1	H1		H1	I1		I1	J1		J1
A2		A2	B2		B2	C2		C2	D2		D2	E2		E2	F2		F2	G2		G2	H2		H2	I2		I2	J2		J2
A3		A3	B3		B3	C3		C3	D3		D3	E3		E3	F3		F3	G3		G3	H3		H3	I3		I3	J3		J3
A4		A4	B4		B4	C4		C4	D4		D4	E4		E4	F4		F4	G4		G4	H4		H4	I4		I4	J4		J4
A5		A5	B5		B5	C5		C5	D5		D5	E5		E5	F5		F5	G5		G5	H5		H5	I5		I5	J5		J5
A6		A6	B6		B6	C6		C6	D6		D6	E6		E6	F6		F6	G6		G6	H6		H6	I6		I6	J6		J6
A7		A7	B7		B7	C7		C7	D7		D7	E7		E7	F7		F7	G7		G7	H7		H7	I7		I7	J7		J7
A8		A8	B8		B8	C8		C8	D8		D8	E8		E8	F8		F8	G8		G8	H8		H8	I8		I8	J8		J8
A9		A9	B9		B9	C9		C9	D9		D9	E9		E9	F9		F9	G9		G9	H9		H9	I9		I9	J9		J9
A10		A10	B10		B10	C10		C10	D10		D10	E10		E10	F10		F10	G10		G10	H10		H10	I10		I10	J10		J10

P N GD

Row 1			Row 2			Row 3			Row 4			Row 5			Row 6			Row 7			Row 8			Row 9			Row 10		
M		F	M		F	M		F	M		F	M		F	M		F	M		F	M		F	M		F	M		F
A1		A1	B1		B1	C1		C1	D1		D1	E1		E1	F1		F1	G1		G1	H1		H1	I1		I1	J1		J1
A2		A2	B2		B2	C2		C2	D2		D2	E2		E2	F2		F2	G2		G2	H2		H2	I2		I2	J2		J2
A3		A3	B3		B3	C3		C3	D3		D3	E3		E3	F3		F3	G3		G3	H3		H3	I3		I3	J3		J3
A4		A4	B4		B4	C4		C4	D4		D4	E4		E4	F4		F4	G4		G4	H4		H4	I4		I4	J4		J4
A5		A5	B5		B5	C5		C5	D5		D5	E5		E5	F5		F5	G5		G5	H5		H5	I5		I5	J5		J5
A6		A6	B6		B6	C6		C6	D6		D6	E6		E6	F6		F6	G6		G6	H6		H6	I6		I6	J6		J6
A7		A7	B7		B7	C7		C7	D7		D7	E7		E7	F7		F7	G7		G7	H7		H7	I7		I7	J7		J7
A8		A8	B8		B8	C8		C8	D8		D8	E8		E8	F8		F8	G8		G8	H8		H8	I8		I8	J8		J8
A9		A9	B9		B9	C9		C9	D9		D9	E9		E9	F9		F9	G9		G9	H9		H9	I9		I9	J9		J9
A10		A10	B10		B10	C10		C10	D10		D10	E10		E10	F10		F10	G10		G10	H10		H10	I10		I10	J10		J10
A11		A11	B11		B11	C11		C11	D11		D11	E11		E11	F11		F11	G11		G11	H11		H11	I11		I11	J11		J11
A12		A12	B12		B12	C12		C12	D12		D12	E12		E12	F12		F12	G12		G12	H12		H12	I12		I12	J12		J12
A13		A13	B13		B13	C13		C13	D13		D13	E13		E13	F13		F13	G13		G13	H13		H13	I13		I13	J13		J13
A14		A14	B14		B14	C14		C14	D14		D14	E14		E14	F14		F14	G14		G14	H14		H14	I14		I14	J14		J14
A15		A15	B15		B15	C15		C15	D15		D15	E15		E15	F15		F15	G15		G15	H15		H15	I15		I15	J15		J15
A16		A16	B16		B16	C16		C16	D16		D16	E16		E16	F16		F16	G16		G16	H16		H16	I16		I16	J16		J16
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Row 1			Row 2			Row 3			Row 4			Row 5			Row 6			Row 7			Row 8			Row 9			Row 10		
M		F	M		F	M		F	M		F	M		F	M		F	M		F	M		F	M		F	M		F
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Row 1		Row 2		Row 3		Row 4		Row 5		Row 6		Row 7		Row 8		Row 9		Row 10	
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A40	A40	B40	B40	C40	C40	D40	D40	E40	E40	F40	F40	G40	G40	H40	H40	I40	I40	J40	J40

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Row 1			Row 2			Row 3			Row 4			Row 5			Row 6			Row 7			Row 8			Row 9			Row 10		
M		F	M		F	M		F	M		F	M		F	M		F	M		F	M		F	M		F	M		F
A1		A1	B1		B1	C1		C1	D1		D1	E1		E1	F1		F1	G1		G1	H1		H1	I1		I1	J1		J1
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A39		A39	B39		B39	C39		C39	D39		D39	E39		E39	F39		F39	G39		G39	H39		H39	I39		I39	J39		J39
A40		A40	B40		B40	C40		C40	D40		D40	E40		E40	F40		F40	G40		G40	H40		H40	I40		I40	J40		J40
A41		A41	B41		B41	C41		C41	D41		D41	E41		E41	F41		F41	G41		G41	H41		H41	I41		I41	J41		J41
A42		A42	B42		B42	C42		C42	D42		D42	E42		E42	F42		F42	G42		G42	H42		H42	I42		I42	J42		J42
A43		A43	B43		B43	C43		C43	D43		D43	E43		E43	F43		F43	G43		G43	H43		H43	I43		I43	J43		J43
A44		A44	B44		B44	C44		C44	D44		D44	E44		E44	F44		F44	G44		G44	H44		H44	I44		I44	J44		J44
A45		A45	B45		B45	C45		C45	D45		D45	E45		E45	F45		F45	G45		G45	H45		H45	I45		I45	J45		J45
A46		A46	B46		B46	C46		C46	D46		D46	E46		E46	F46		F46	G46		G46	H46		H46	I46		I46	J46		J46
A47		A47	B47		B47	C47		C47	D47		D47	E47		E47	F47		F47	G47		G47	H47		H47	I47		I47	J47		J47
A48		A48	B48		B48	C48		C48	D48		D48	E48		E48	F48		F48	G48		G48	H48		H48	I48		I48	J48		J48
A49		A49	B49		B49	C49		C49	D49		D49	E49		E49	F49		F49	G49		G49	H49		H49	I49		I49	J49		J49
A50		A50	B50		B50	C50		C50	D50		D50	E50		E50	F50		F50	G50		G50	H50		H50	I50		I50	J50		J50

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Same Gender Jumper Assembly

P N GD

Row 1	Row 2	Row 3	Row 4	Row 5	Row 6	Row 7	Row 8	Row 9	Row 10
A1 A10	B1 B10	C1 C10	D1 D10	E1 E10	F1 F10	G1 G10	H1 H10	I1 I10	J1 J10
A2 A9	B2 B9	C2 C9	D2 D9	E2 E9	F2 F9	G2 G9	H2 H9	I2 I9	J2 J9
A3 A8	B3 B8	C3 C8	D3 D8	E3 E8	F3 F8	G3 G8	H3 H8	I3 I8	J3 J8
A4 A7	B4 B7	C4 C7	D4 D7	E4 E7	F4 F7	G4 G7	H4 H7	I4 I7	J4 J7
A5 A6	B5 B6	C5 C6	D5 D6	E5 E6	F5 F6	G5 G6	H5 H6	I5 I6	J5 J6
A6 A5	B6 B5	C6 C5	D6 D5	E6 E5	F6 F5	G6 G5	H6 H5	I6 I5	J6 J5
A7 A4	B7 B4	C7 C4	D7 D4	E7 E4	F7 F4	G7 G4	H7 H4	I7 I4	J7 J4
A8 A3	B8 B3	C8 C3	D8 D3	E8 E3	F8 F3	G8 G3	H8 H3	I8 I3	J8 J3
A9 A2	B9 B2	C9 C2	D9 D2	E9 E2	F9 F2	G9 G2	H9 H2	I9 I2	J9 J2
A10 A1	B10 B1	C10 C1	D10 D1	E10 E1	F10 F1	G10 G1	H10 H1	I10 I1	J10 J1

P N GD

Row 1	Row 2	Row 3	Row 4	Row 5	Row 6	Row 7	Row 8	Row 9	Row 10
A1 A20	B1 B20	C1 C20	D1 D20	E1 E20	F1 F20	G1 G20	H1 H20	I1 I20	J1 J20
A2 A19	B2 B19	C2 C19	D2 D19	E2 E19	F2 F19	G2 G19	H2 H19	I2 I19	J2 J19
A3 A18	B3 B18	C3 C18	D3 D18	E3 E18	F3 F18	G3 G18	H3 H18	I3 I18	J3 J18
A4 A17	B4 B17	C4 C17	D4 D17	E4 E17	F4 F17	G4 G17	H4 H17	I4 I17	J4 J17
A5 A16	B5 B16	C5 C16	D5 D16	E5 E16	F5 F16	G5 G16	H5 H16	I5 I16	J5 J16
A6 A15	B6 B15	C6 C15	D6 D15	E6 E15	F6 F15	G6 G15	H6 H15	I6 I15	J6 J15
A7 A14	B7 B14	C7 C14	D7 D14	E7 E14	F7 F14	G7 G14	H7 H14	I7 I14	J7 J14
A8 A13	B8 B13	C8 C13	D8 D13	E8 E13	F8 F13	G8 G13	H8 H13	I8 I13	J8 J13
A9 A12	B9 B12	C9 C12	D9 D12	E9 E12	F9 F12	G9 G12	H9 H12	I9 I12	J9 J12
A10 A11	B10 B11	C10 C11	D10 D11	E10 E11	F10 F11	G10 G11	H10 H11	I10 I11	J10 J11
A11 A10	B11 B10	C11 C10	D11 D10	E11 E10	F11 F10	G11 G10	H11 H10	I11 I10	J11 J10
A12 A9	B12 B9	C12 C9	D12 D9	E12 E9	F12 F9	G12 G9	H12 H9	I12 I9	J12 J9
A13 A8	B13 B8	C13 C8	D13 D8	E13 E8	F13 F8	G13 G8	H13 H8	I13 I8	J13 J8
A14 A7	B14 B7	C14 C7	D14 D7	E14 E7	F14 F7	G14 G7	H14 H7	I14 I7	J14 J7
A15 A6	B15 B6	C15 C6	D15 D6	E15 E6	F15 F6	G15 G6	H15 H6	I15 I6	J15 J6
A16 A5	B16 B5	C16 C5	D16 D5	E16 E5	F16 F5	G16 G5	H16 H5	I16 I5	J16 J5
A17 A4	B17 B4	C17 C4	D17 D4	E17 E4	F17 F4	G17 G4	H17 H4	I17 I4	J17 J4
A18 A3	B18 B3	C18 C3	D18 D3	E18 E3	F18 F3	G18 G3	H18 H3	I18 I3	J18 J3
A19 A2	B19 B2	C19 C2	D19 D2	E19 E2	F19 F2	G19 G2	H19 H2	I19 I2	J19 J2
A20 A1	B20 B1	C20 C1	D20 D1	E20 E1	F20 F1	G20 G1	H20 H1	I20 I1	J20 J1

P N GD

Row 1	Row 2	Row 3	Row 4	Row 5	Row 6	Row 7	Row 8	Row 9	Row 10
A1 A20	B1 B20	C1 C20	D1 D20	E1 E20	F1 F20	G1 G20	H1 H20	I1 I20	J1 J20
A2 A19	B2 B19	C2 C19	D2 D19	E2 E19	F2 F19	G2 G19	H2 H19	I2 I19	J2 J19
A3 A18	B3 B18	C3 C18	D3 D18	E3 E18	F3 F18	G3 G18	H3 H18	I3 I18	J3 J18
A4 A17	B4 B17	C4 C17	D4 D17	E4 E17	F4 F17	G4 G17	H4 H17	I4 I17	J4 J17
A5 A16	B5 B16	C5 C16	D5 D16	E5 E16	F5 F16	G5 G16	H5 H16	I5 I16	J5 J16
A6 A15	B6 B15	C6 C15	D6 D15	E6 E15	F6 F15	G6 G15	H6 H15	I6 I15	J6 J15
A7 A14	B7 B14	C7 C14	D7 D14	E7 E14	F7 F14	G7 G14	H7 H14	I7 I14	J7 J14
A8 A13	B8 B13	C8 C13	D8 D13	E8 E13	F8 F13	G8 G13	H8 H13	I8 I13	J8 J13
A9 A12	B9 B12	C9 C12	D9 D12	E9 E12	F9 F12	G9 G12	H9 H12	I9 I12	J9 J12
A10 A11	B10 B11	C10 C11	D10 D11	E10 E11	F10 F11	G10 G11	H10 H11	I10 I11	J10 J11
A11 A10	B11 B10	C11 C10	D11 D10	E11 E10	F11 F10	G11 G10	H11 H10	I11 I10	J11 J10
A12 A9	B12 B9	C12 C9	D12 D9	E12 E9	F12 F9	G12 G9	H12 H9	I12 I9	J12 J9
A13 A8	B13 B8	C13 C8	D13 D8	E13 E8	F13 F8	G13 G8	H13 H8	I13 I8	J13 J8
A14 A7	B14 B7	C14 C7	D14 D7	E14 E7	F14 F7	G14 G7	H14 H7	I14 I7	J14 J7
A15 A6	B15 B6	C15 C6	D15 D6	E15 E6	F15 F6	G15 G6	H15 H6	I15 I6	J15 J6
A16 A5	B16 B5	C16 C5	D16 D5	E16 E5	F16 F5	G16 G5	H16 H5	I16 I5	J16 J5
A17 A4	B17 B4	C17 C4	D17 D4	E17 E4	F17 F4	G17 G4	H17 H4	I17 I4	J17 J4
A18 A3	B18 B3	C18 C3	D18 D3	E18 E3	F18 F3	G18 G3	H18 H3	I18 I3	J18 J3
A19 A2	B19 B2	C19 C2	D19 D2	E19 E2	F19 F2	G19 G2	H19 H2	I19 I2	J19 J2
A20 A1	B20 B1	C20 C1	D20 D1	E20 E1	F20 F1	G20 G1	H20 H1	I20 I1	J20 J1

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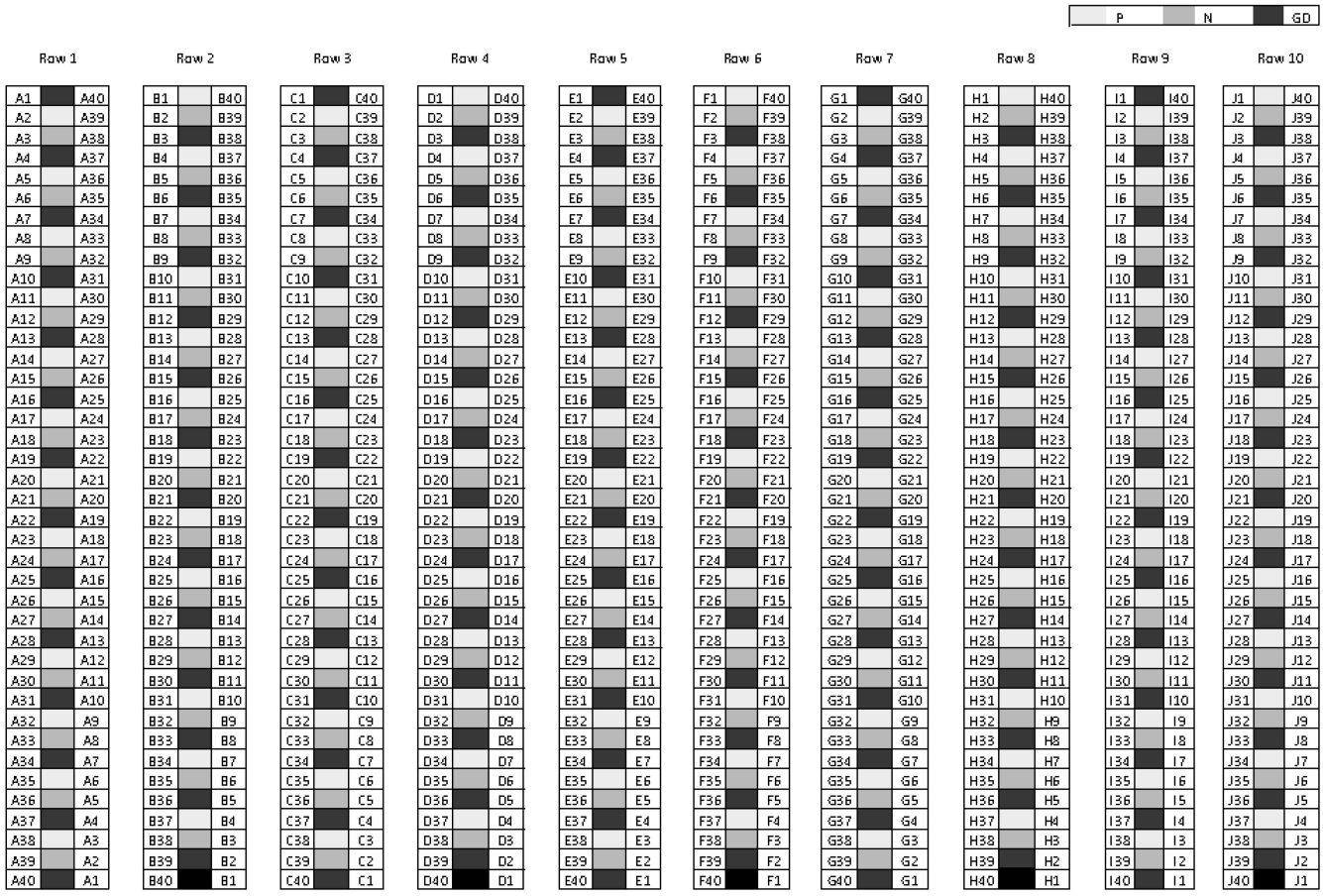

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P N GD

Row 1			Row 2			Row 3			Row 4			Row 5			Row 6			Row 7			Row 8			Row 9			Row 10		
A1		A50	B1		B50	C1		C50	D1		D50	E1		E50	F1		F50	G1		G50	H1		H50	I1		I50	J1		J50
A2		A49	B2		B49	C2		C49	D2		D49	E2		E49	F2		F49	G2		G49	H2		H49	I2		I49	J2		J49
A3		A48	B3		B48	C3		C48	D3		D48	E3		E48	F3		F48	G3		G48	H3		H48	I3		I48	J3		J48
A4		A47	B4		B47	C4		C47	D4		D47	E4		E47	F4		F47	G4		G47	H4		H47	I4		I47	J4		J47
A5		A46	B5		B46	C5		C46	D5		D46	E5		E46	F5		F46	G5		G46	H5		H46	I5		I46	J5		J46
A6		A45	B6		B45	C6		C45	D6		D45	E6		E45	F6		F45	G6		G45	H6		H45	I6		I45	J6		J45
A7		A44	B7		B44	C7		C44	D7		D44	E7		E44	F7		F44	G7		G44	H7		H44	I7		I44	J7		J44
A8		A43	B8		B43	C8		C43	D8		D43	E8		E43	F8		F43	G8		G43	H8		H43	I8		I43	J8		J43
A9		A42	B9		B42	C9		C42	D9		D42	E9		E42	F9		F42	G9		G42	H9		H42	I9		I42	J9		J42
A10		A41	B10		B41	C10		C41	D10		D41	E10		E41	F10		F41	G10		G41	H10		H41	I10		I41	J10		J41
A11		A40	B11		B40	C11		C40	D11		D40	E11		E40	F11		F40	G11		G40	H11		H40	I11		I40	J11		J40
A12		A39	B12		B39	C12		C39	D12		D39	E12		E39	F12		F39	G12		G39	H12		H39	I12		I39	J12		J39
A13		A38	B13		B38	C13		C38	D13		D38	E13		E38	F13		F38	G13		G38	H13		H38	I13		I38	J13		J38
A14		A37	B14		B37	C14		C37	D14		D37	E14		E37	F14		F37	G14		G37	H14		H37	I14		I37	J14		J37
A15		A36	B15		B36	C15		C36	D15		D36	E15		E36	F15		F36	G15		G36	H15		H36	I15		I36	J15		J36
A16		A35	B16		B35	C16		C35	D16		D35	E16		E35	F16		F35	G16		G35	H16		H35	I16		I35	J16		J35
A17		A34	B17		B34	C17		C34	D17		D34	E17		E34	F17		F34	G17		G34	H17		H34	I17		I34	J17		J34
A18		A33	B18		B33	C18		C33	D18		D33	E18		E33	F18		F33	G18		G33	H18		H33	I18		I33	J18		J33
A19		A32	B19		B32	C19		C32	D19		D32	E19		E32	F19		F32	G19		G32	H19		H32	I19		I32	J19		J32
A20		A31	B20		B31	C20		C31	D20		D31	E20		E31	F20		F31	G20		G31	H20		H31	I20		I31	J20		J31
A21		A30	B21		B30	C21		C30	D21		D30	E21		E30	F21		F30	G21		G30	H21		H30	I21		I30	J21		J30
A22		A29	B22		B29	C22		C29	D22		D29	E22		E29	F22		F29	G22		G29	H22		H29	I22		I29	J22		J29
A23		A28	B23		B28	C23		C28	D23		D28	E23		E28	F23		F28	G23		G28	H23		H28	I23		I28	J23		J28
A24		A27	B24		B27	C24		C27	D24		D27	E24		E27	F24		F27	G24		G27	H24		H27	I24		I27	J24		J27
A25		A26	B25		B26	C25		C26	D25		D26	E25		E26	F25		F26	G25		G26	H25		H26	I25		I26	J25		J26
A26		A25	B26		B25	C26		C25	D26		D25	E26		E25	F26		F25	G26		G25	H26		H25	I26		I25	J26		J25
A27		A24	B27		B24	C27		C24	D27		D24	E27		E24	F27		F24	G27		G24	H27		H24	I27		I24	J27		J24
A28		A23	B28		B23	C28		C23	D28		D23	E28		E23	F28		F23	G28		G23	H28		H23	I28		I23	J28		J23
A29		A22	B29		B22	C29		C22	D29		D22	E29		E22	F29		F22	G29		G22	H29		H22	I29		I22	J29		J22
A30		A21	B30		B21	C30		C21	D30		D21	E30		E21	F30		F21	G30		G21	H30		H21	I30		I21	J30		J21
A31		A20	B31		B20	C31		C20	D31		D20	E31		E20	F31		F20	G31		G20	H31		H20	I31		I20	J31		J20
A32		A19	B32		B19	C32		C19	D32		D19	E32		E19	F32		F19	G32		G19	H32		H19	I32		I19	J32		J19
A33		A18	B33		B18	C33		C18	D33		D18	E33		E18	F33		F18	G33		G18	H33		H18	I33		I18	J33		J18
A34		A17	B34		B17	C34		C17	D34		D17	E34		E17	F34		F17	G34		G17	H34		H17	I34		I17	J34		J17
A35		A16	B35		B16	C35		C16	D35		D16	E35		E16	F35		F16	G35		G16	H35		H16	I35		I16	J35		J16
A36		A15	B36		B15	C36		C15	D36		D15	E36		E15	F36		F15	G36		G15	H36		H15	I36		I15	J36		J15
A37		A14	B37		B14	C37		C14	D37		D14	E37		E14	F37		F14	G37		G14	H37		H14	I37		I14	J37		J14
A38		A13	B38		B13	C38		C13	D38		D13	E38		E13	F38		F13	G38		G13	H38		H13	I38		I13	J38		J13
A39		A12	B39		B12	C39		C12	D39		D12	E39		E12	F39		F12	G39		G12	H39		H12	I39		I12	J39		J12
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A41		A10	B41		B10	C41		C10	D41		D10	E41		E10	F41		F10	G41		G10	H41		H10	I41		I10	J41		J10
A42		A9	B42		B9	C42		C9	D42		D9	E42		E9	F42		F9	G42		G9	H42		H9	I42		I9	J42		J9
A43		A8	B43		B8	C43		C8	D43		D8	E43		E8	F43		F8	G43		G8	H43		H8	I43		I8	J43		J8
A44		A7	B44		B7	C44		C7	D44		D7	E44		E7	F44		F7	G44		G7	H44		H7	I44		I7	J44		J7
A45		A6	B45		B6	C45		C6	D45		D6	E45		E6	F45		F6	G45		G6	H45		H6	I45		I6	J45		J6
A46		A5	B46		B5	C46		C5	D46		D5	E46		E5	F46		F5	G46		G5	H46		H5	I46		I5	J46		J5
A47		A4	B47		B4	C47		C4	D47		D4	E47		E4	F47		F4	G47		G4	H47		H4	I47		I4	J47		J4
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A49		A2	B49		B2	C49		C2	D49		D2	E49		E2	F49		F2	G49		G2	H49		H2	I49		I2	J49		J2
A50		A1	B50		B1	C50		C1	D50		D1	E50		E1	F50		F1	G50		G1	H50		H1	I50		I1	J50		J1

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