smiths connectors

KVPX® APPLICATION GUIDE

## 1. PRODUCT INFORMATION

DAUGHTERCARD MODULES

| P.N.	Description	End Shield (Y/N)	Mating KX2 Module
KX1FCD01C1TBH	Daughtercard Center Differential Module	N	KX2FCU01C1TAH
KX1FED01C1TBH	Daughtercard End Differential Module	Y	
KX1FCS01C1TBH	Daughtercard Center Single Ended Module	N	
KX1FES01C1TBH	Daughtercard End Single Ended Module	Y	
KX1HCP01C1TBH	Daughtercard Center Utility Module	N	KX2HCU01C1TAH
KX1HEP01C1TBH	Daughtercard End Utility Module	Y	

BACKPLANE MODULES

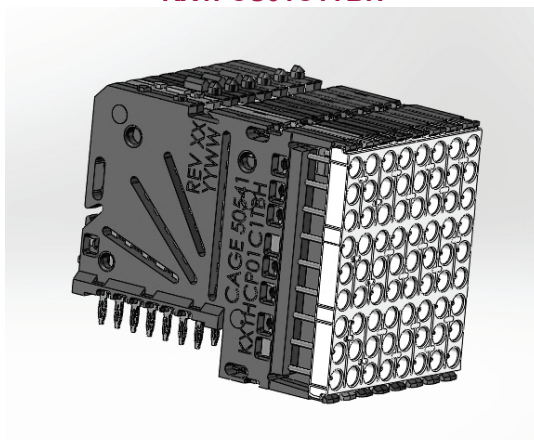| P.N.	Description	Equivalent Part Numbers
KX2FCU01C1TAH	144-Pin Female Connector	N/A
KX2HCU01C1TAH	72-Pin Female Connector	KX2HEP01C1TAH

DAUGHTERCARD MODULES
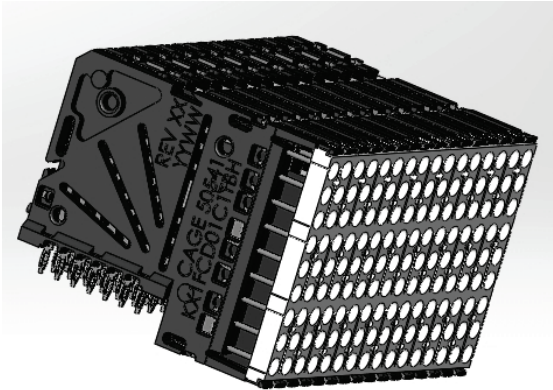
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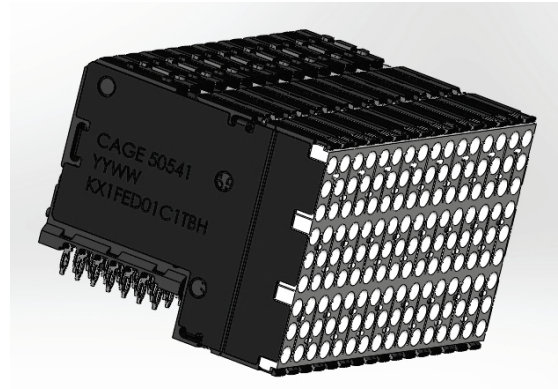
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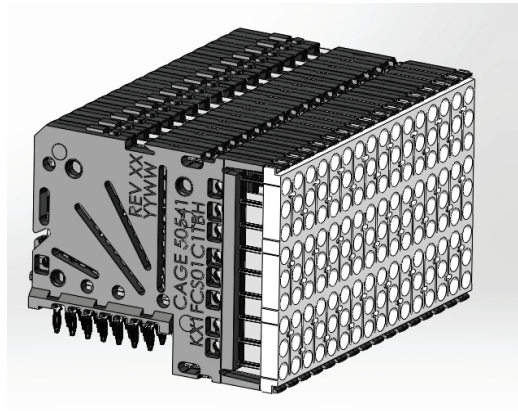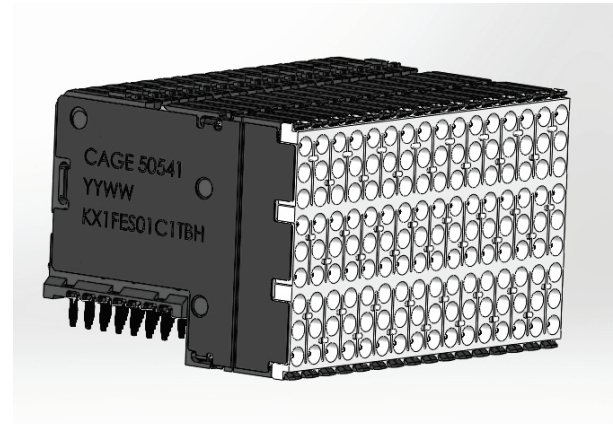
KX1FCS01C1TBH
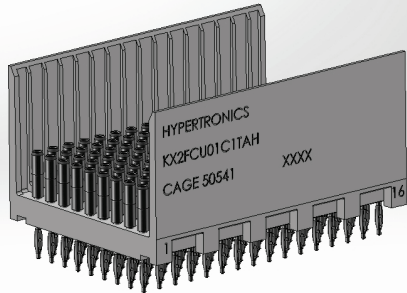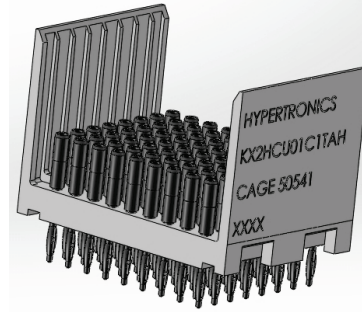

KX1FES01C1TBH

KX1HCP01C1TBH

KX1HEP01C1TBH

BACKPLANE MODULES

KX2FCU01C1TBH

KX2HCU01C1TBH

2. INSTALLATION TOOLING

INDIVIDUAL MODULE TOOLS

P.N.	Description	Compatible Modules
T3060-04	DAUGHTERCARD MODULE INSTALLATION TOOL, 144-PIN**	KX1FCD01C1TBH
		KX1FED01C1TBH
		KX1FCS01C1TBH
		KX1FES01C1TBH
T3060-03	DAUGHTERCARD MODULE INSTALLATION TOOL, 72-PIN**	KX1HCP01C1TBH
		KX1HEP01C1TBH
T3055	BACKPLANE MODULE INSTALLATION TOOL, 144-SOCKET*	KX2FCU01C1TAH
T3079	BACKPLANE MODULE INSTALLATION TOOL, 72-SOCKET *	KX2HCU01C1TAH

**Only to be used with single module applications.

*For applications with adjacent module it is necessary to ensure that the first module is installed with the plastic "step" on the inboard side of the connector. All adjacent modules are to be installed in order following the same rule. See below:

1st MODULE

2nd MODULE   1st MODULE

Inboard side.
"Step"
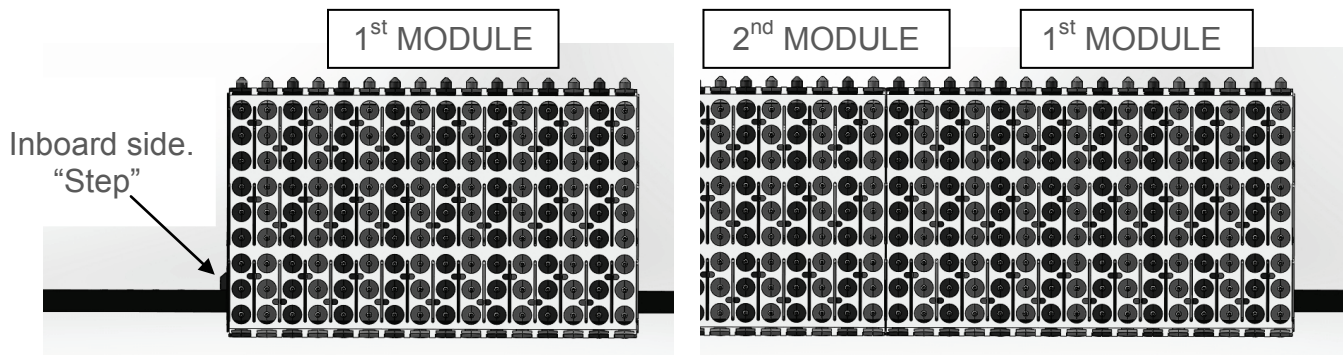
3U/6U TOOLS

P.N.	Description
T3099	3U INSTALLATION TOOL, BACKPLANE MODULES
T3099 & T3100	6U INSTALLATION TOOLS, BACKPLANE MODULES
T3102	3U INSTALLATION TOOL, DAUGHTERCARD MODULE
T3102 & T3103	6U INSTALLATION TOOLS, DAUGHTERCARD MODULE

APPLICATION FIXTURE

P.N.	Description
T3101	6U DAUGHTERCARD FIXTURE W/ BASE

TOOLS
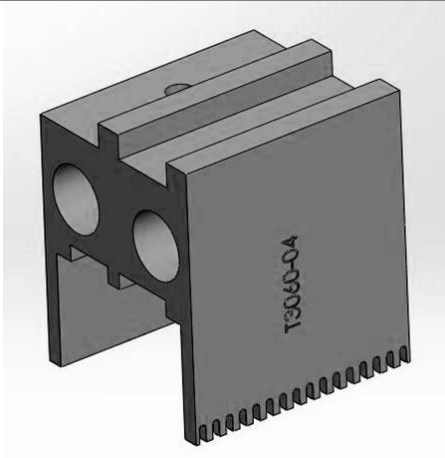
T3060-04

T3060-03

T3079

T3055

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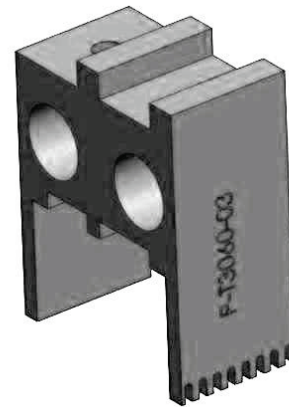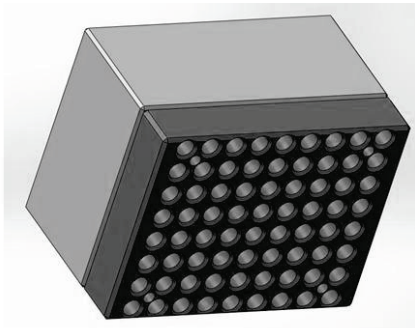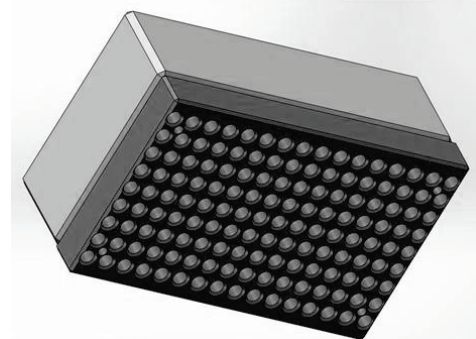
T3099
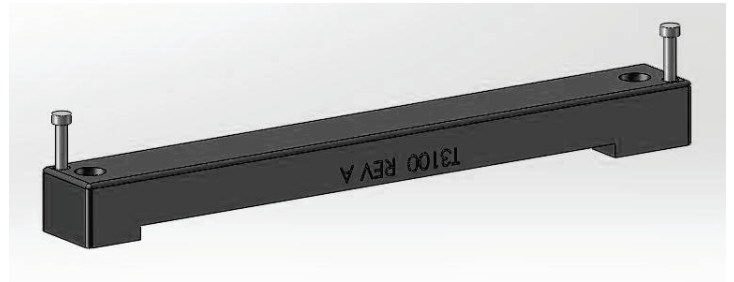
T3100
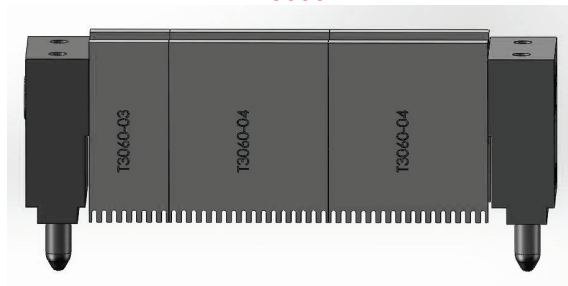
T3102
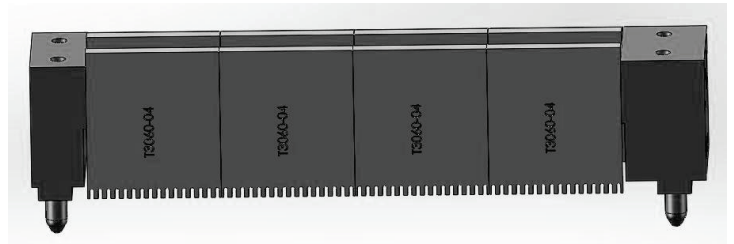
T3103

3. INSTALLATION *(Caution: please wear safety glasses)*

3.1 DAUGHTERCARD MODULE

3.1.1 Fit connector module to tool. Ensure that location posts fit into tool comb as shown.
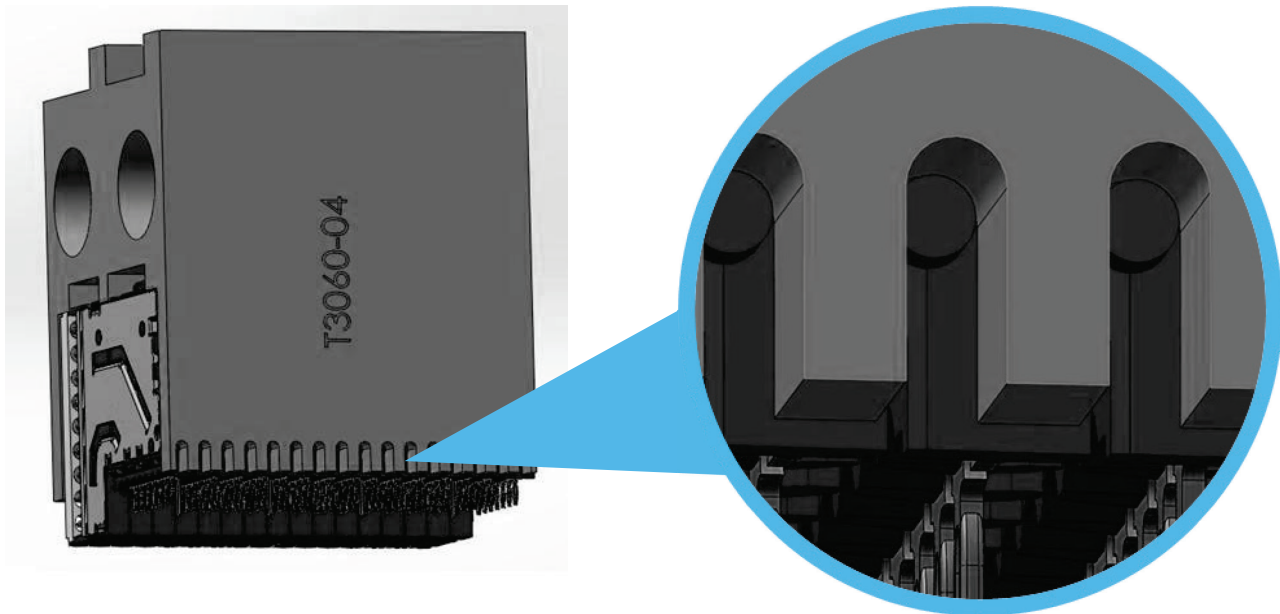
3.1.2 Align compliant terminals with printed circuit board.

Compliant terminals must be aligned with plated thru-holes

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NOT POPULATED

POPULATED
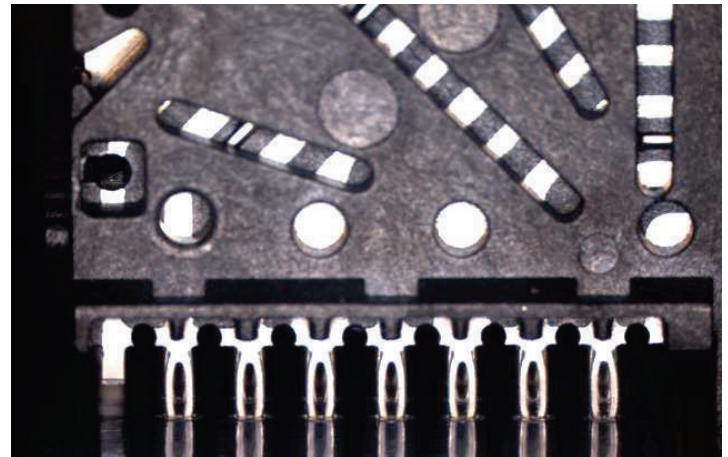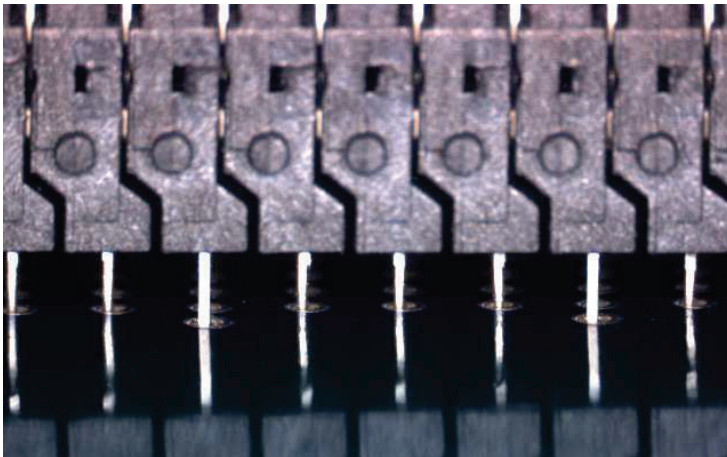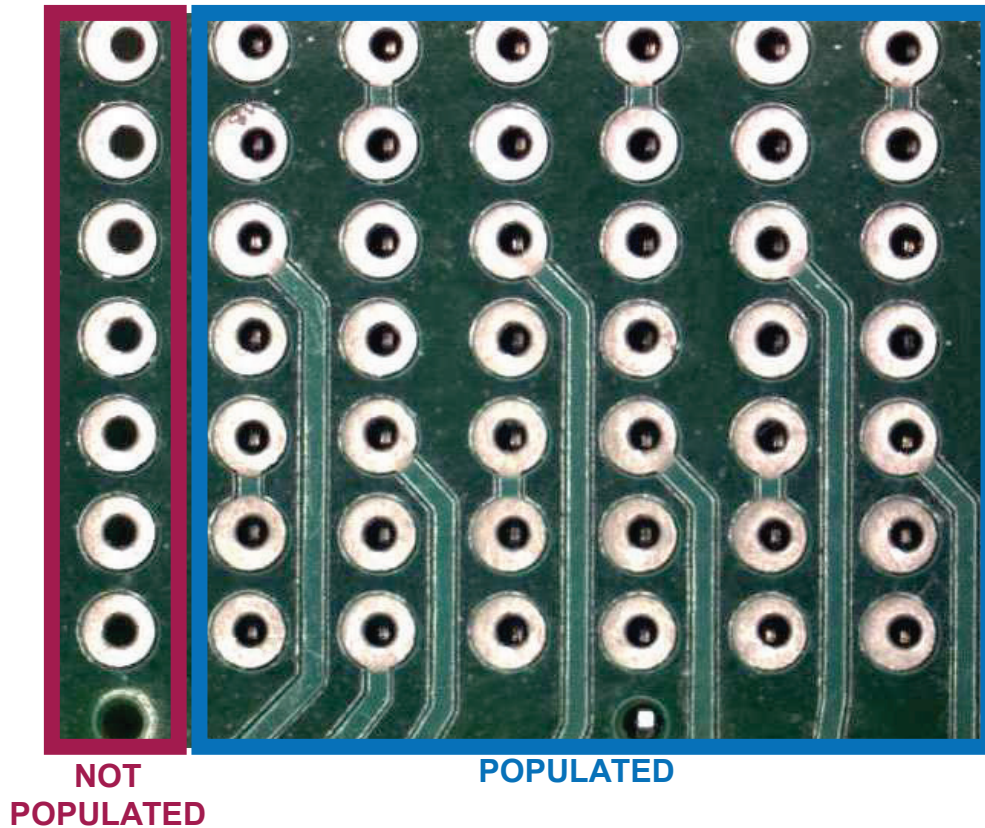
3.1.3 Mount PCB/Connector/Tool on application fixture. Application fixture is intended to provide proper alignment of tools and connectors during pressing operation. If pressing in a 3U/6U assembly, align dowel pins with holes on PCB and fixture.

NOTE: Application fixture is designed for PCB of 1.80-1.90mm thickness. For additional PCB thicknesses contact Smiths Connectors Technical Services.

3.1.4 Apply steady force to center of tool. Make certain that there is no gap between the PCB and connector. Approximate force per full 16 wafer module is:
250 lbsf (SnPb via)
350 lbsf (ENIG via)
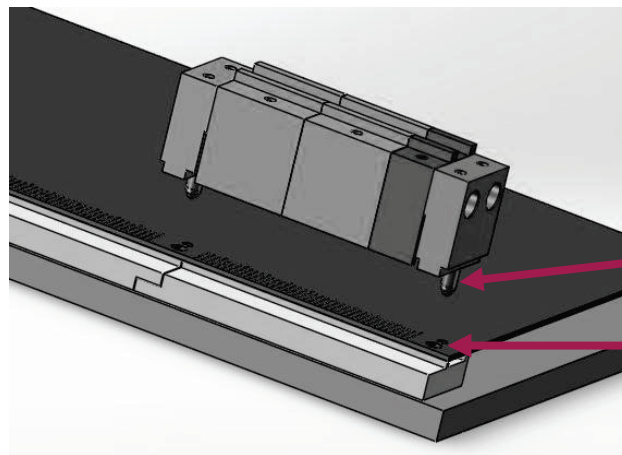
Align dowel pins with

PCB / fixture holes
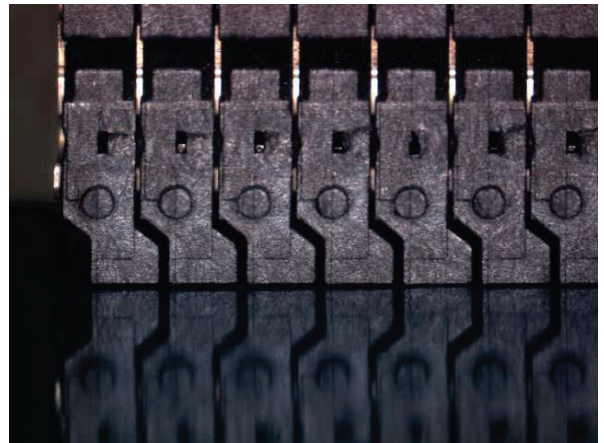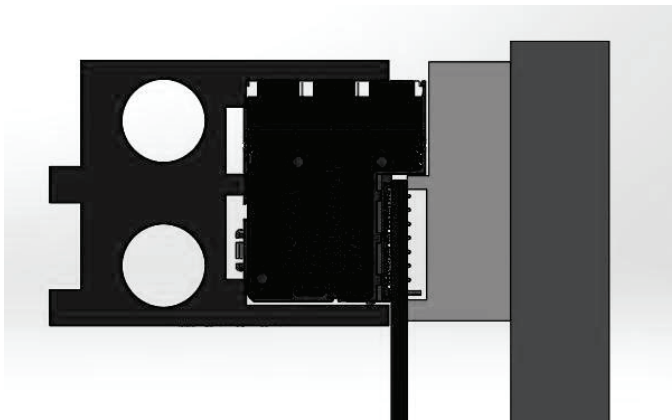
3.2 Backplane Module

Fit connector module(s) to tool. Sockets will fit into the tool cavities.
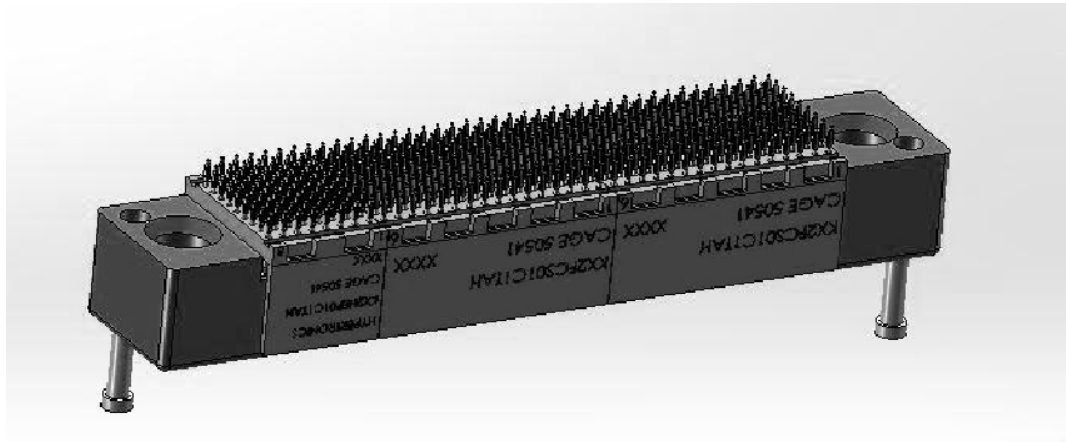
3.2.1 Align compliant terminals with PCB. Inspect PCB from reverse side and ensure that the compliant terminals are aligned with plated thru-holes. If pressing in a 3U/6U assembly, align assembly tool with guide pins on PCB.
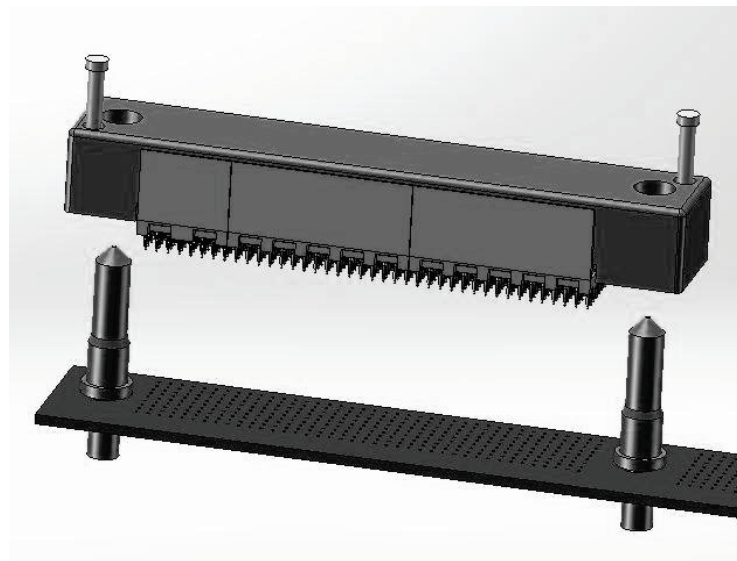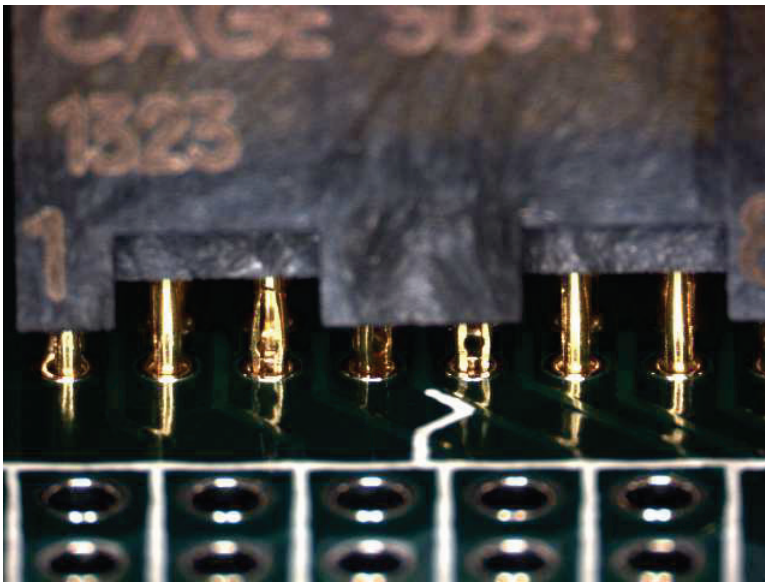
Compliant terminals must be aligned with plated thru-holes

NOT POPULATED

POPULATED

3.2.2 Apply steady force to center of tool. Make certain that there is no gap between the PCB and connector. To remove the tool, evenly lift tool off of the connector or, if using the optional jackscrews, evenly turn both extraction screws clockwise to press tool off of connector.

EXTRACTION SCREWS
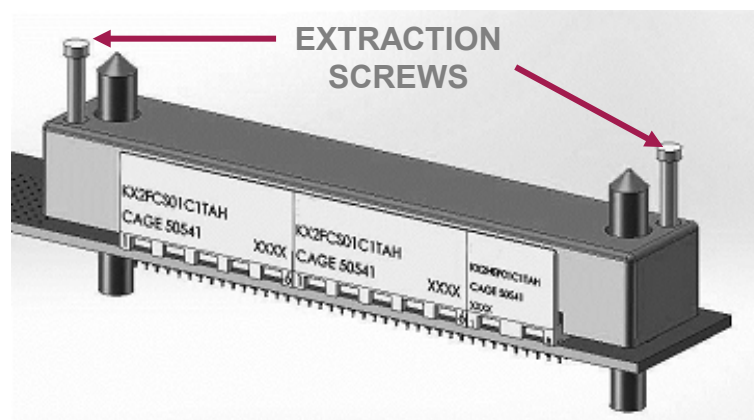
Approximate installation force per full 144 contact module:
75 lbsf (SnPb via)
125 lbsf (ENIG via)

4. PRINTED CIRCUIT BOARD

4.1 DAUGHTERCARD

4.1.1 PC Board: Minimum board thickness of 1.60mm [0.063in]. Maximum allowable bow of PCB shall be 0.03mm [0.001in] over the length of each individual module.

4.1.2 Manufacturing tolerance for ø0.46±0.05mm finished hole with SnPb plating:
Drilled Hole = ø0.55 ± 0.02mm
Cu Plating = 0.025 - 0.050mm
SnPb Plating = 0.0038mm - 0.0124mm

4.1.3 Manufacturing tolerance for ø0.46±0.05mm finished hole with ENIG plating:
Drilled Hole = ø0.55 ± 0.02mm
Cu Plating = 0.025 - 0.050mm
ENIG Plating = 0.0001 - 0.0005mm (Au) over 0.00127 - 0.0076mm (Ni)

4.1.4 Manufacturing tolerance for ø0.46±0.05mm finished hole with ENIG plating per IPC-4552:
Drilled Hole = ø0.55 ± 0.02mm
Cu Plating = 0.025 - 0.050mm
ENIG Plating = 0.00005 mm – no max (Au) over 0.0030 - 0.0060mm (Ni)

4.1.5 PCB mounting pattern:

DIFFERENTIAL MODULE
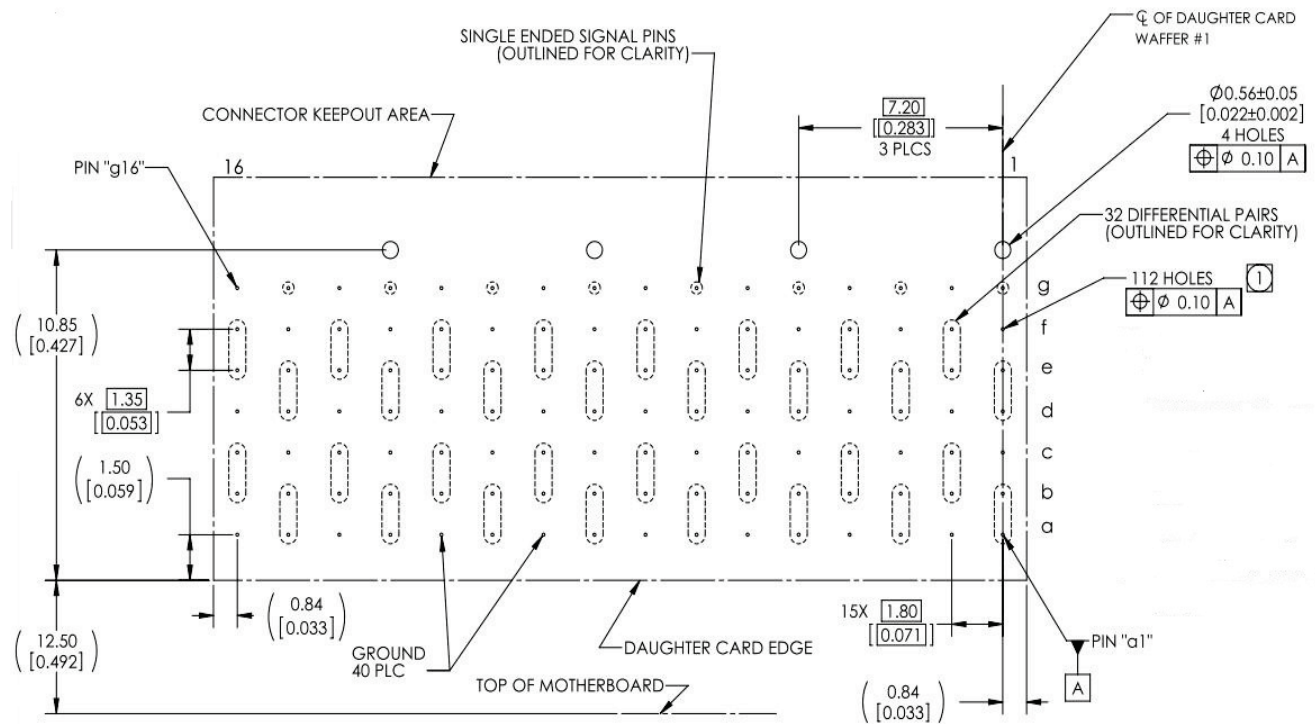
SINGLE-ENDED MODULE
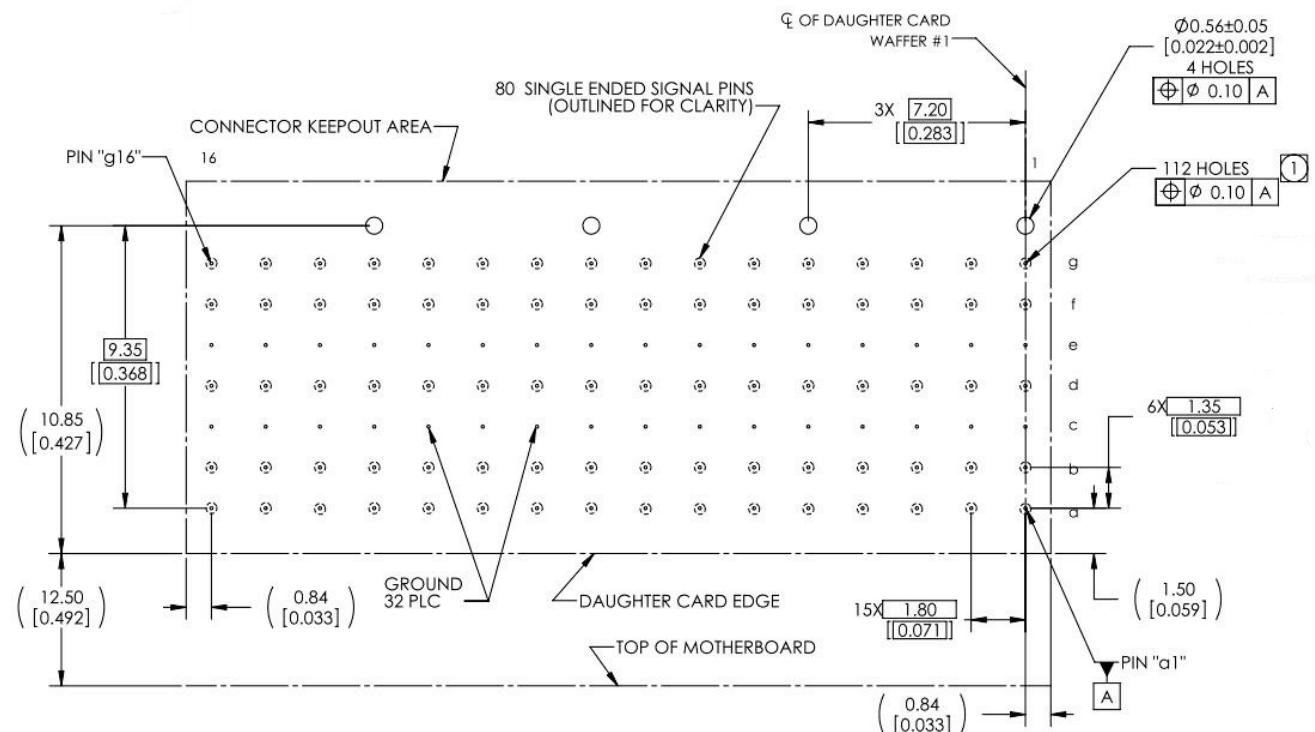
UTILITY MODULE
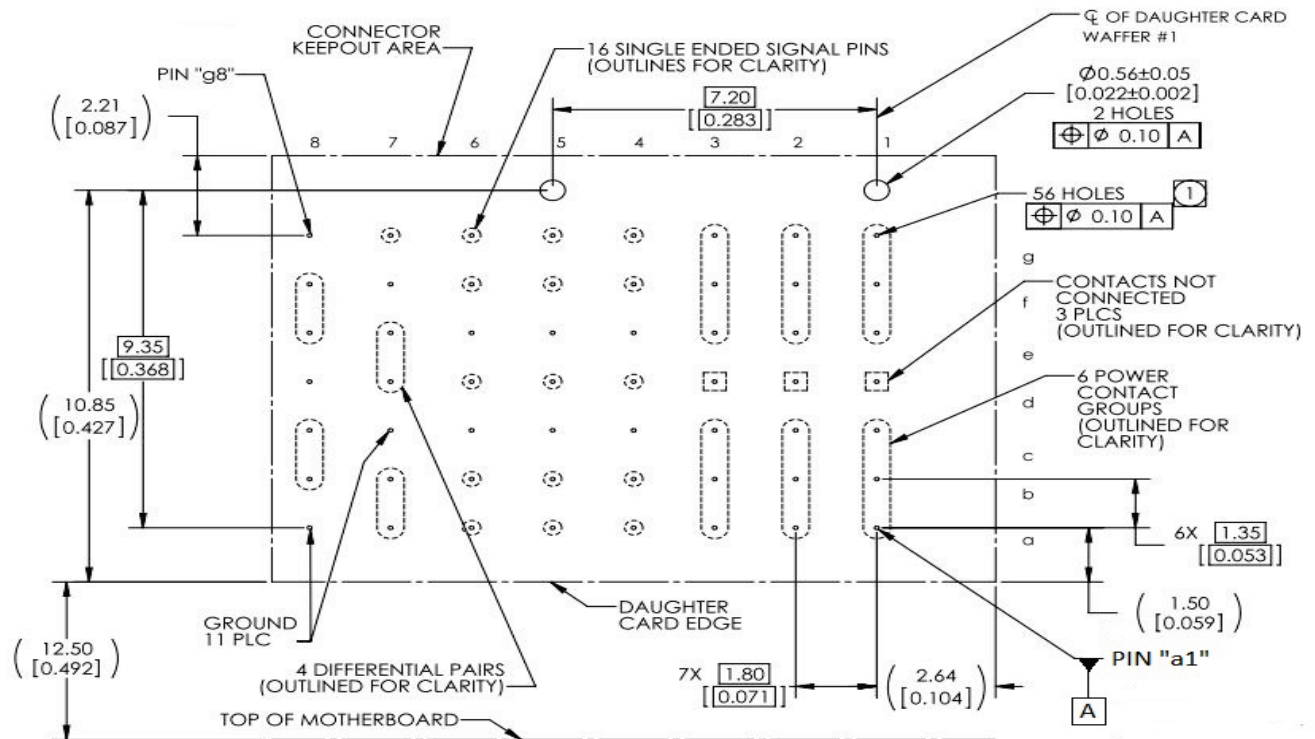
4.2 BACKPLANE

4.2.1 Manufacturing tolerance for ø0.56 ± 0.05mm finished hole with SnPb plating:
Drilled Hole = ø0.65 ± 0.02mm
Cu Plating = 0.025 - 0.050mm
SnPb Plating = 0.0038mm - 0.0124mm

4.2.2 Manufacturing tolerance for ø0.56 ± 0.05mm finished hole with ENIG plating:
Drilled Hole = ø0.65 ± 0.02mm
Cu Plating = 0.025 - 0.050mm
ENIG Plating = 0.0001 - 0.0005mm (Au) over 0.00127 - 0.0076mm (Ni)

4.2.3 Manufacturing tolerance for ø0.56 ± 0.05mm finished hole with ENIG plating per IPC-4552:
Drilled Hole = ø0.65 ± 0.02mm
Cu Plating = 0.025 - 0.050mm
ENIG Plating = 0.00005mm – no max (Au) over 0.0030 - 0.0060mm (Ni)

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4.2.4 PCB mounting pattern:

FULL MODULE

HALF MODULE

CONNECTOR KEEPOUT AREA

TYP. HOLES SEE NOTE 1 FOR DETAILS

⌖ ⌀ 0.10 A

1

16

2.80 [0.110]

ROWS SPACED EQUALLY
14.40 [0.567]

1.80 [0.071] TYP.

2.80 [0.110]

CONTACT LOCATION NUMBER 1a

A

0.87 [0.034]

1.80 [0.071] TYP.

12.60 [0.496]

PC BOARD LAYOUT (CONNECTOR SIDE)

14.33 [0.564]
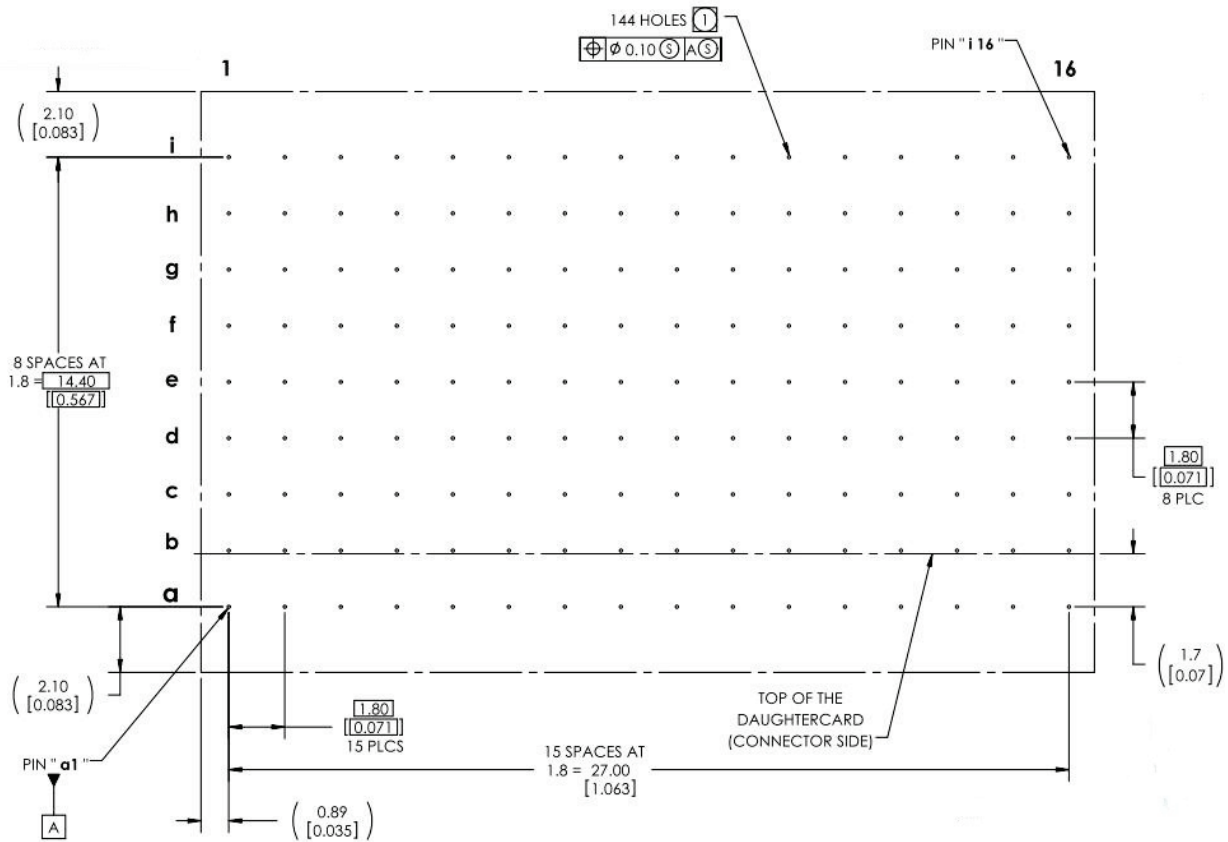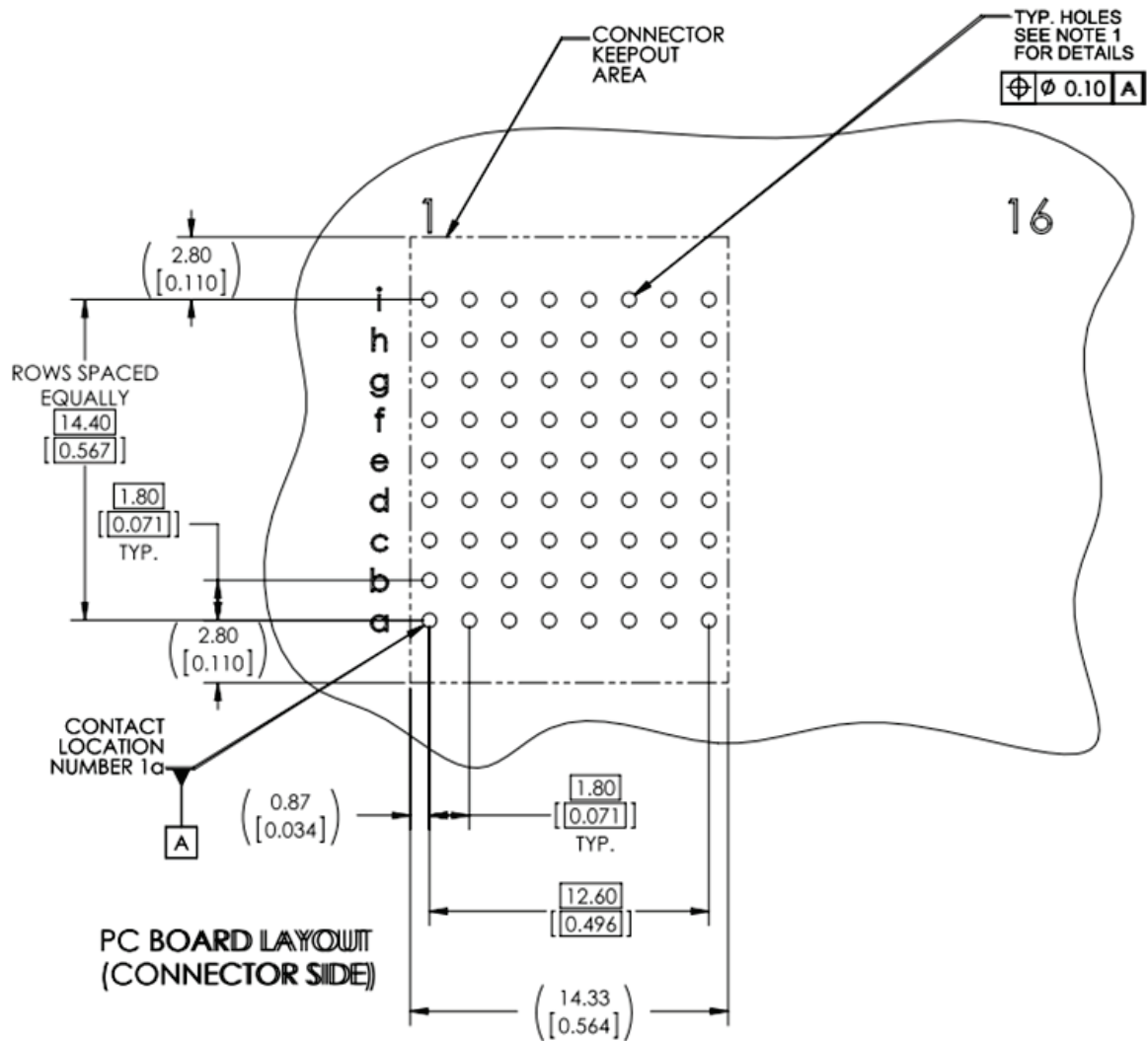
5. MODULE DETAILS

SINGLE ENDED

Single-ended wafer to backplane pin mapping

ODD WAFER
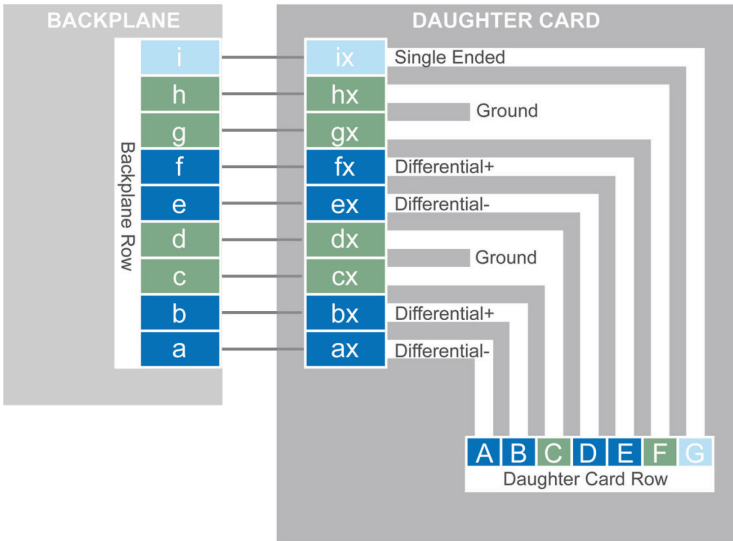
Odd differential wafer backplane pin mapping

EVEN WAFER
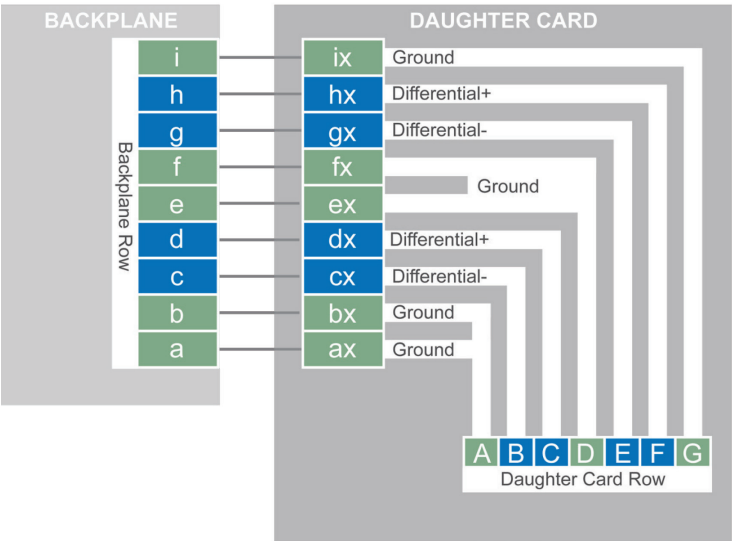
Even differential wafer backplane pin mapping

POWER
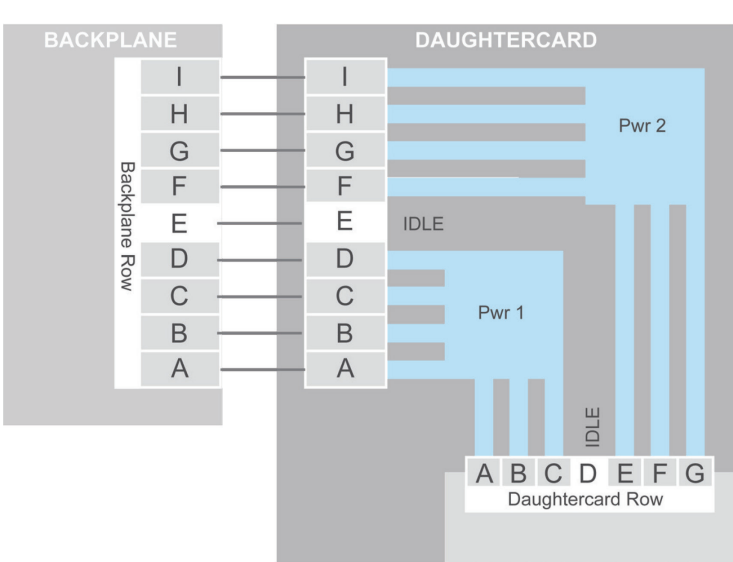
Power wafer backplane pin mapping

6. GUIDE HARDWARE

6.1 Guide sockets and pins are available in the following keying options, including without keying (no flats). It is important to make sure that pin angles are matched to sockets on the appropriate angles.

1 ▸ KVPX GUIDE HARDWARE SERIES *[Fixed]*

2 ▸ HARDWARE TYPE

P GUIDE PIN
S GUIDE SOCKET

3U SOCKET CONFIGURATION

Center	Center	End	
P0	P1	P2	Modules

PCB

YGS064-004ANH (LEFT)   YGS064-006ANH (RIGHT)

3 ▸ HARDWARE POSITION

1 UNIVERSAL (ALL GUIDE PINS)
4 LEFT (P0) (GUIDE SOCKET)
5 CENTER (GUIDE SOCKET)
6 RIGHT (GUIDE SOCKET)

6U SOCKET CONFIGURATION

Center	Center	End	Center	Center	Center	End	
P0	P1	P2	P3	P4	P5	P6	Modules

PCB

YGS064-004ANH (LEFT)   YGS064-005ANH (CENTER)   YGS064-006ANH (RIGHT)
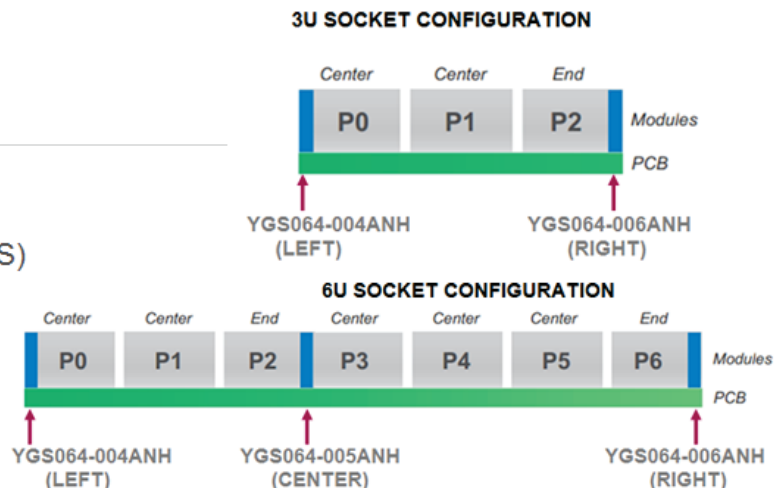
4 ▸ GUIDE HARDWARE MATERIAL

S 3 SILVER PLATED BRASS (GUIDE PIN)
P STAINLESS STEEL (GUIDE PIN)
A N H NICKEL (GUIDE SOCKET)

5 ▸ KEYING ANGLE
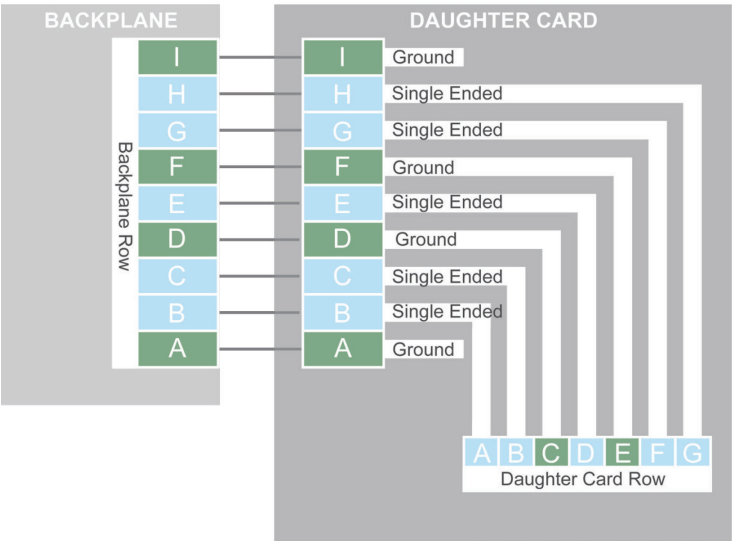
	No Keying - Omit	3	0 Degree
1	90 Degree	4	315 Degree
2	45 Degree	5	270 Degree

ALIGNMENT & KEYING SOCKET
ALIGNMENT & KEYING PIN

90°	45°	0°	315°	270°
1	2	3	4	5

ALIGNMENT & KEYING SOCKET

ALIGNMENT & KEYING PIN

90° 45° 0° 315° 270°
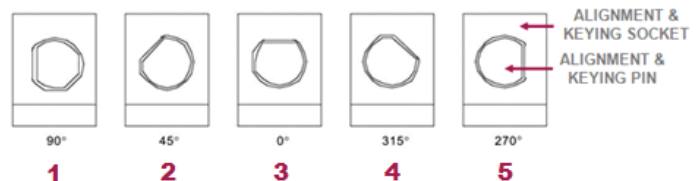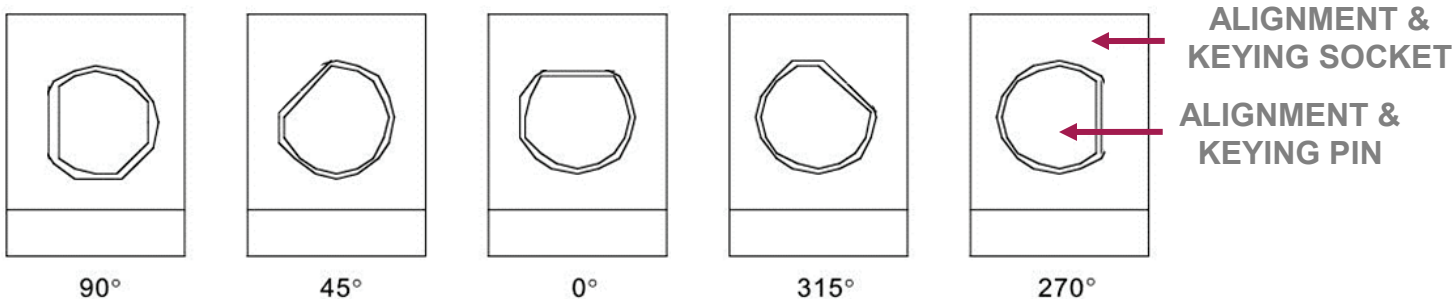
6.2 GUIDE SOCKET INSTALLATION

6.2.1 Press guide socket into PCB. Make certain there is no gap between PCB and guide socket. Install guide sockets in the arrangement indicated below (part number provided for reference). For custom configurations consult technical services.

3U SOCKET CONFIGURATION

YGS064-004ANH
(LEFT)

YGS064-006ANH
(RIGHT)

6U SOCKET CONFIGURATION

YGS064-004ANH
(LEFT)

YGS064-005ANH
(CENTER)

YGS064-006ANH
(RIGHT)

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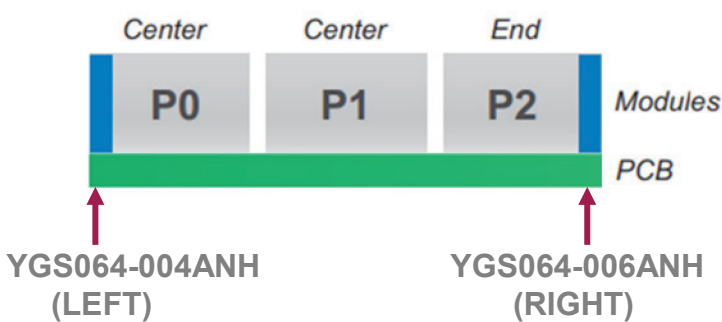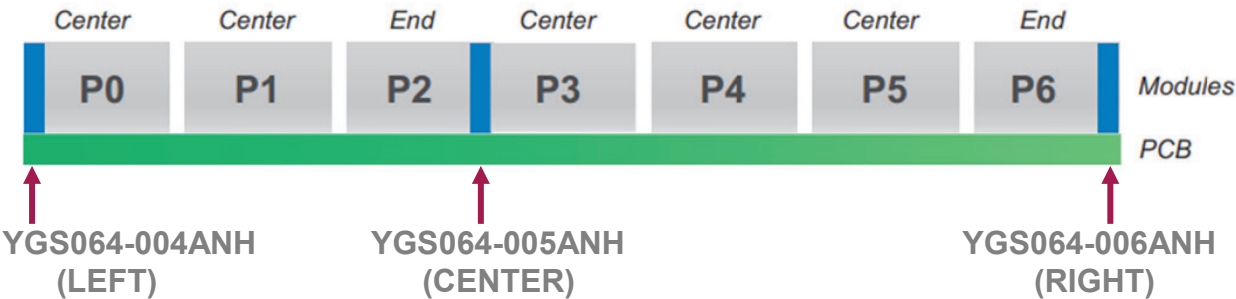
6.2.2 Apply thread locker to screw threads

6.2.3 Tighten screw to a maximum of 25 in-oz

6.3 Guide pin installation

6.3.1 Press guide pin into PCB. Make certain there is no gap between PCB and guide pin.

6.3.2 Apply thread locker to threads of hex nut.

6.3.3 Tighten hex nut to a maximum of 55 in-lbs.

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7. MATING SEQUENCE

Mating Sequence 1
(Guide pin engages guide socket)
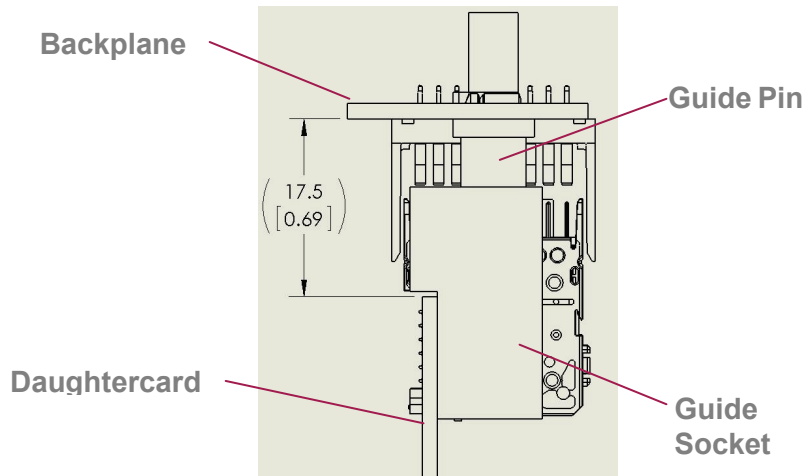
Mating Sequence 2
(ESD contacts engage)

Backplane

Guide Pin

$\left(\begin{array}{c}17.5 \\ [0.69]\end{array}\right)$

Daughtercard

Guide Socket

KX2 Connector

$\left(\begin{array}{c}15.90 \\ [0.626]\end{array}\right)$
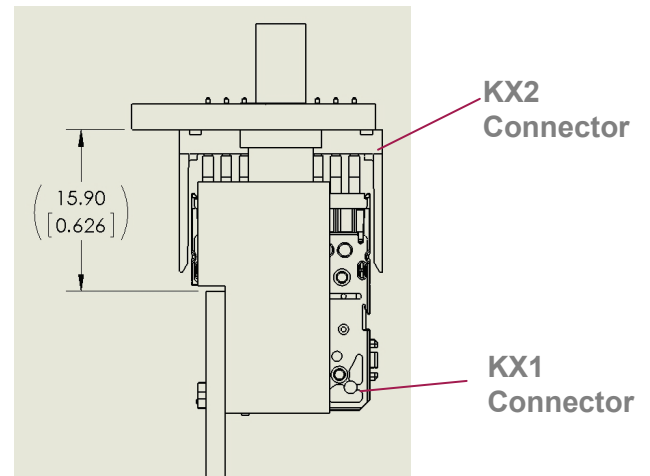
KX1 Connector

Mating Sequence 3
(Ground contacts engage)
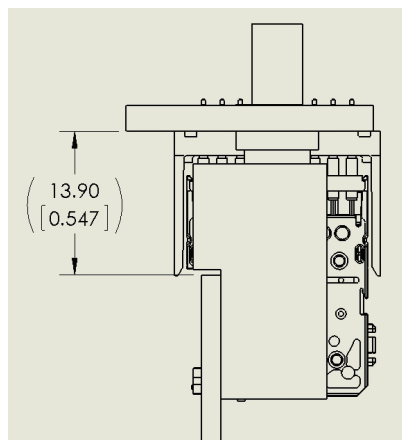
Mating Sequence 4
(Signal contacts fully engaged / fully mated)

$\left(\begin{array}{c}13.90 \\ [0.547]\end{array}\right)$

$\left(\begin{array}{c}10.40 \\ [0.409]\end{array}\right)$

$\left(\begin{array}{c}12.6 \\ [0.49]\end{array}\right)$

$\left(\begin{array}{c}24.75 \\ [0.974]\end{array}\right)$

$\left(\begin{array}{c}4.50 \\ [0.177]\end{array}\right)$

$\left(\begin{array}{c}15.50 \\ [0.610]\end{array}\right)$

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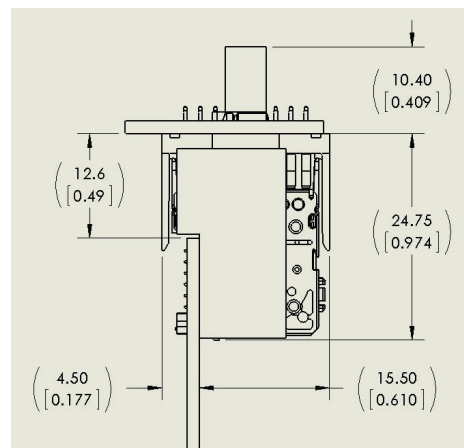
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SMITHS CONNECTORS
GLOBAL SUPPORT

EMEA

United Kingdom	44.208.236.2400
Italy	39.010.60361
Germany	49.991.250.120
France	33.2.3296.9176

AMERICAS

Hudson, MA	1.978.568.0451
Costa Mesa, CA	1.714.371.1100
Kansas City, KS	1.913.342.5544

info@smithsconnectors.com
www.smithsconnectors.com

ASIA

Shanghai, China	86.21.3318.4650
Suzhou, China	86.512.6273.1069
Singapore	65.6846.1655

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Revision No:	Revision Date:	Revised By:	Description:
A	6/23/2013	Ian Dower	Initial Release
B	10/31/13	Ian Dower	Changes made to pages 9, 12, 14, 15, 18 and 19. New pinouts added, PCB thickness for application fixture, Daughter Card PCB patterns updated (All proposed changes are temporarily outlined with red dotted lines)
C	6/12/2014	Zach Pokornowski	Overall format changes. Updated P/N's, tooling lists, KX2 keep out zones, and installation forces. Additional PCB plating types added. Additional clarification of the mating sequence.
D	7/29/2014	Zach Pokornowski	Corrected Backplane tooling labels. Additional guide socket and guide pin part numbers
E	3/30/2015	Zach Pokornowski	Added Guide Hardware How to Order Information and IPC-4552 Enig Plating Information. Clarrified torque for guide pin assembly.
F	6/8/2015	Ian Dower	Corrected installation force of KX1 module. Included ENIG forces. Added notes defining order of installation for KX1 modules.
G	7/17/2015	Ian Dower	Changed views to match description on pages 1 and 2 per attached markup file.
H	9/16/2015	Scott Horner	Via holes not supported – removed sections 4.1.3 & 4.2.2