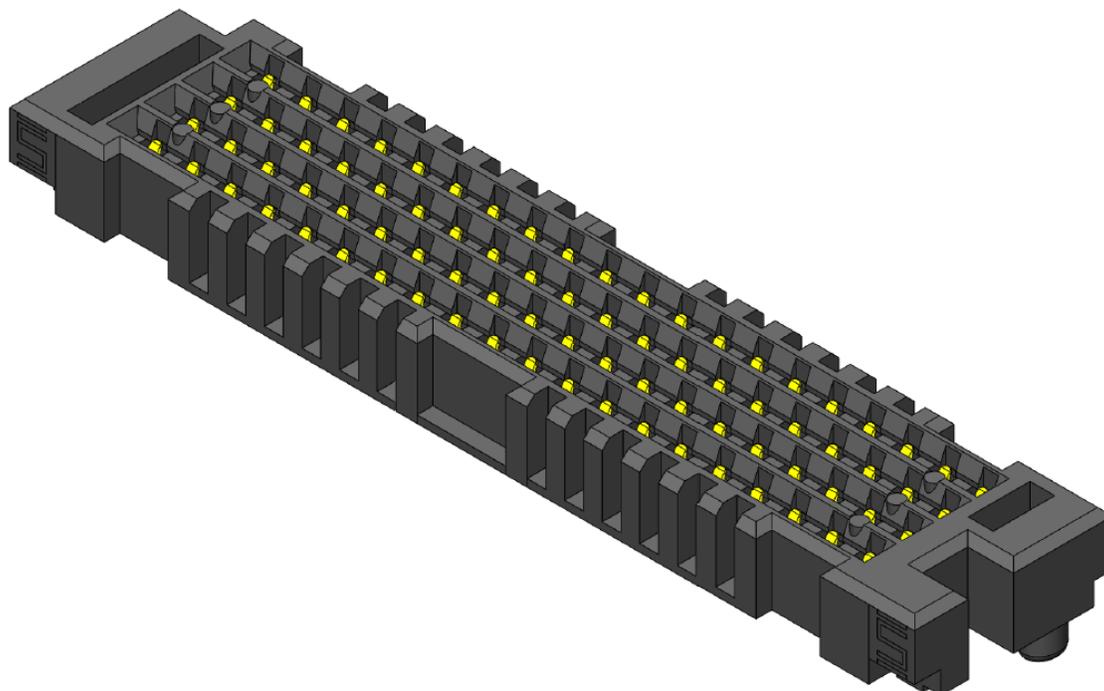
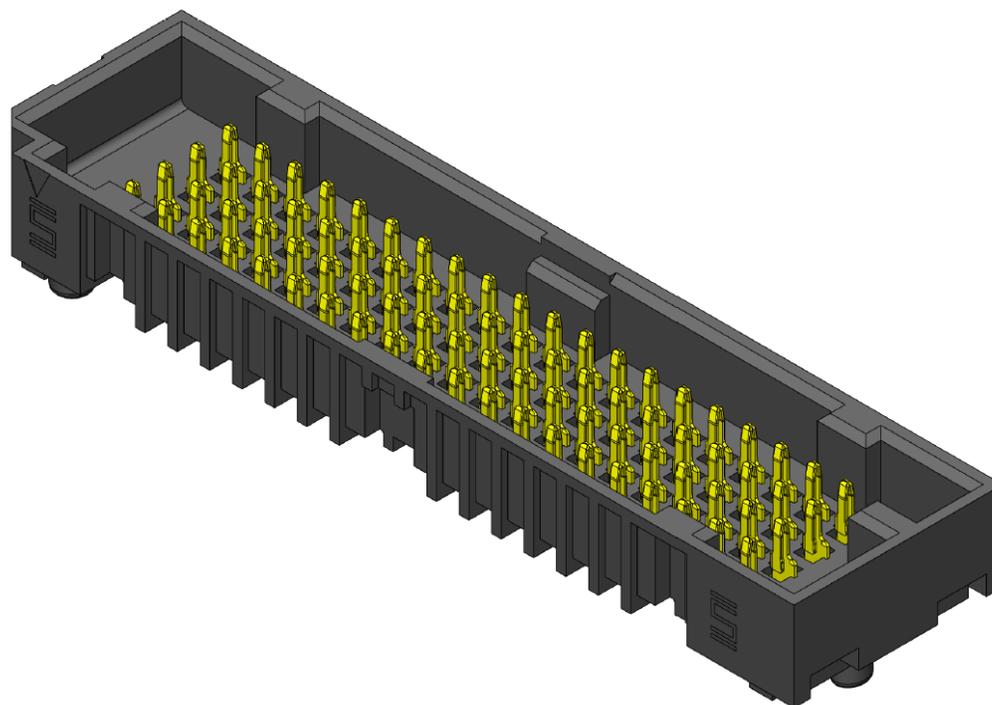


Series: **LPAF / LPAM** .050" (1,27 mm) SEARAY™ LP Low Profile High Speed Open Pin Field Array

LPAF Series – Socket, Vertical Orientation



LPAM Series – Terminal, Vertical Orientation



Series: LPAF / LPAM .050" (1,27 mm) SEARAY™ LP Low Profile High Speed Open Pin Field Array

1.0 SCOPE

1.1 This specification covers performance, testing and quality requirements for Samtec LPAF/LPAM Series .050" (1,27 mm) SEARAY™ LP Low Profile High Speed Open Pin Field Array connectors. All information contained in this specification is for a 4,00 mm mated height vertical configuration unless otherwise noted.

2.0 DETAILED INFORMATION

2.1 Product prints, footprints, catalog pages, test reports and other specific, detailed information can be found at www.samtec.com?LPAF and www.samtec.com?LPAM.

3.0 TESTING

3.1 Current Rating: 2.2A (8 adjacent pins powered)

3.2 Voltage Rating: 250 VAC

3.3 Operating Temperature Range: -55°C to +125°C

3.4 Electrical:

ITEM	TEST CONDITION	REQUIREMENT	STATUS
Withstanding Voltage	EIA-364-20 (No Flashover, Sparkover, or Breakdown)	750 VAC	Pass
Insulation Resistance	EIA-364-21 (5000 MΩ minimum)	45,000 MΩ	Pass
Contact Resistance (LLCR)	EIA-364-23	Δ 15 mΩ maximum (Samtec defined)/ No damage	Pass

3.5 Mechanical:

ITEM	TEST CONDITION	REQUIREMENT	STATUS
Durability	EIA-364-09C	100 cycles	Pass
Random Vibration	EIA-364-28 Condition V, Letter B 7.56 G 'RMS', 50 to 2000 Hz, 2 hours per axis, 3 axis total, PSD 0.04	Visual Inspection: No Damage LLCR: Δ 15 mΩ maximum Event Detection: No interruption > 50 nanoseconds	Pass
Mechanical Shock	EIA-364-27 100 G, 6 milliseconds, sawtooth wave, 11.3 fps, 3 shocks/direction, 3 axis (18 total shocks)	Visual Inspection: No Damage LLCR: Δ 15 mΩ maximum Event Detection: No interruption > 50 nanoseconds	Pass
Normal Force	EIA-364-04	30 gams minimum for Gold plating	Pass

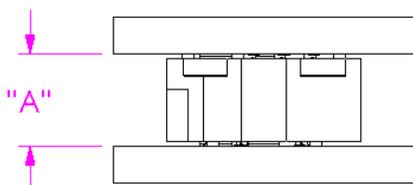
Series: **LPAF / LPAM** .050" (1,27 mm) SEARAY™ LP Low Profile High Speed Open Pin Field Array

3.6 Environmental:

ITEM	TEST CONDITION	REQUIREMENT	STATUS
Thermal Shock	EIA-364-32 Thermal Cycles: 100 (30 minute dwell) Hot Temp: 85°C Cold Temp: -55°C Hot/Cold Transition: Immediate	Visual Inspection: No Damage LLCR: Δ 15 m Ω DWV: 750 VAC IR: >45,000 M Ω	Pass
Thermal Aging (Temp Life)	EIA-364-17 Test Condition 4 @ 105°C Condition B for 250 hours	Visual Inspection: No Damage LLCR: Δ 15 m Ω	Pass
Cyclic Humidity	EIA-364-31 Test Temp: 25°C to 65°C Relative Humidity: 90 to 95% Test Duration: 240 hours	Visual Inspection: No Damage LLCR: Δ 15 m Ω DWV: 750 VAC IR: >45,000 M Ω	Pass
Gas Tight	EIA-364-36 Gas Exposure: Nitric Acid Vapor Duration: 60 min. Drying Temp.: 50°C +/- 3°C Measurements: Within 1 hour of Exposure	LLCR: Δ 15 m Ω	Pass

4.0 MATED SYSTEM

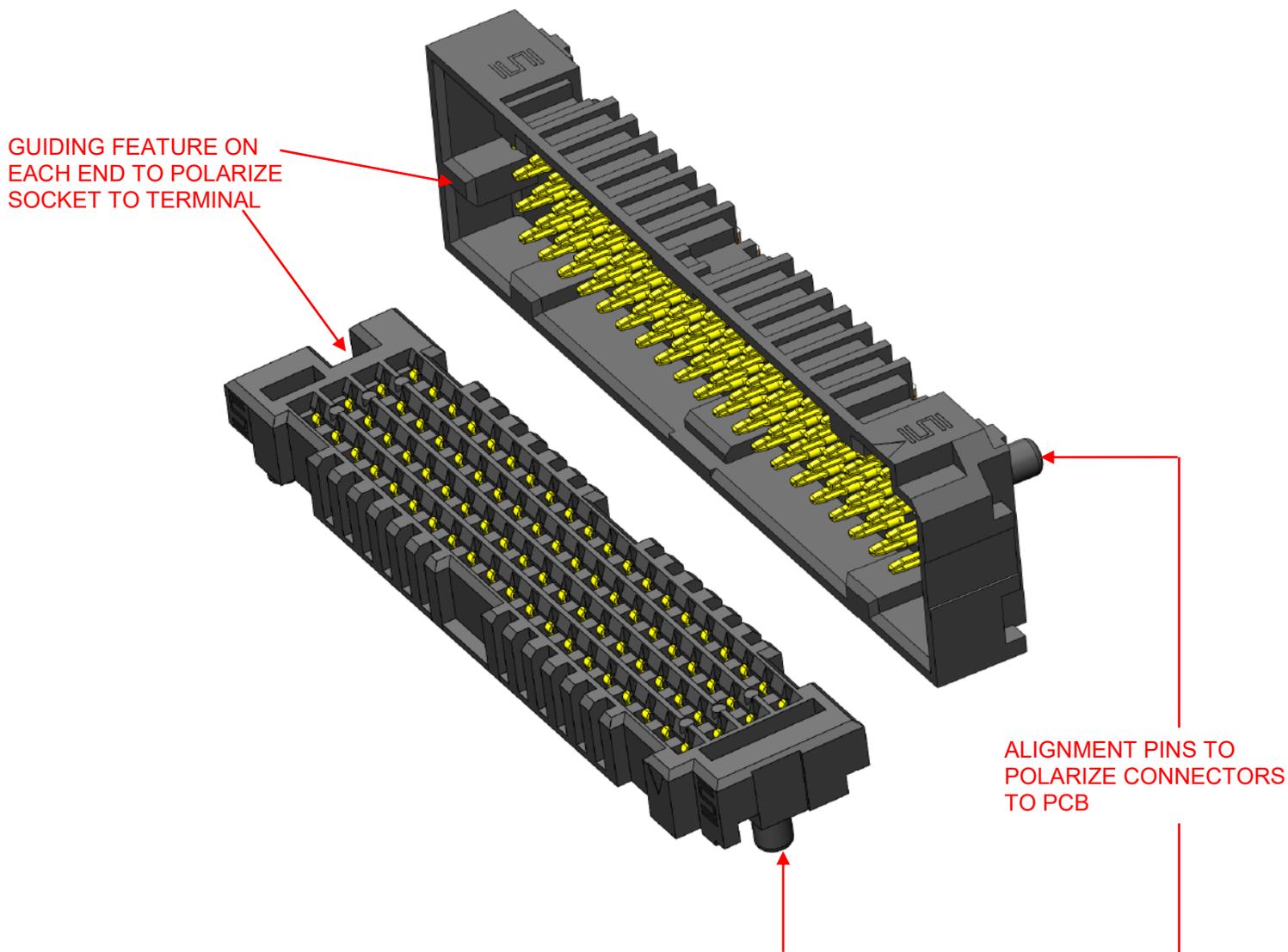
4.1 Stack Heights



LPAF	LPAM	
	"A"	
	-01.0	-01.5
-03.0	4.00[.158]	4.50[.177]
-03.5	4.50[.177]	5.00[.197]

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5.0 POLARIZING FEATURES



6.0 HIGH SPEED PERFORMANCE

6.1 Based on a 3 dB insertion loss

6.2 **System Impedance:** 50 ohm for single-ended and 100 ohm for differential pair

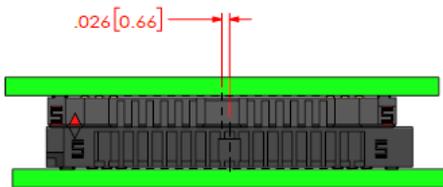
Stack Height	Single-Ended Signaling	Differential Pair Signaling
4 mm	17.00 GHz	18.50 GHz

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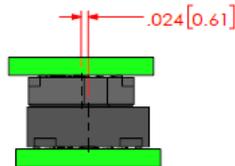
7.0 PROCESSING RECOMMENDATIONS

7.1 Mating Alignment Requirements:

7.1.1 Allowable initial linear misalignment.



INITIAL X AXIS LINEAR MISALIGNMENT

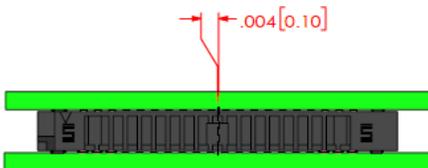


INITIAL Y AXIS LINEAR MISALIGNMENT

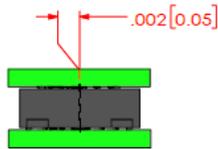
NOT APPLICABLE

INITIAL Z AXIS LINEAR MISALIGNMENT

7.1.2 Allowable final linear misalignment



FINAL X AXIS LINEAR MISALIGNMENT



FINAL Y AXIS LINEAR MISALIGNMENT

SEE MATED VIEWS

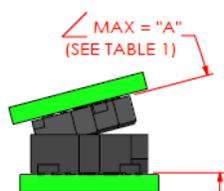
FINAL Z AXIS LINEAR MISALIGNMENT

Series: LPAF / LPAM .050" (1,27 mm) SEARAY™ LP Low Profile High Speed Open Pin Field Array

7.2 Mating Angle Requirements

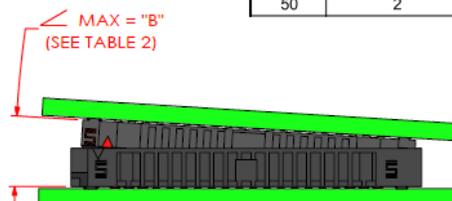
7.2.1 Allowable initial angular misalignment

ROWS	"A" = DEGREES
04	23
06	17
08	14



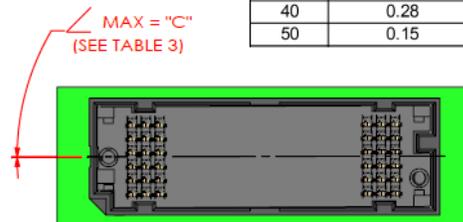
INITIAL X AXIS ANGULAR MISALIGNMENT

POS	"B" = DEGREES
10	8
20	5
30	3.5
40	3
50	2



INITIAL Y AXIS ANGULAR MISALIGNMENT

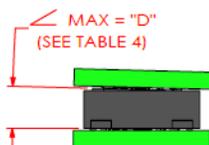
POS	"C" = DEGREES
10	0.88
20	0.68
30	0.48
40	0.28
50	0.15



INITIAL Z AXIS ANGULAR MISALIGNMENT

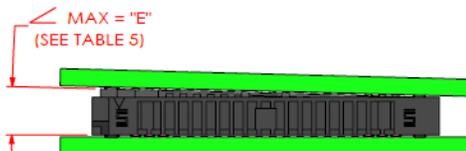
7.2.2 Allowable final angular misalignment

ROWS	"D" = DEGREES
04	4
06	3
08	2



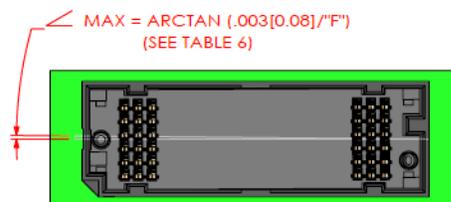
FINAL X AXIS ANGULAR MISALIGNMENT

POS	"E" = DEGREES
10	2.5
20	1.5
30	1
40	.1
50	0.4



FINAL Y AXIS ANGULAR MISALIGNMENT

POS	"F"
10	.704 [17.88]
20	1.204 [30.58]
30	1.704 [43.28]
40	2.204 [55.98]
50	2.704 [68.68]



FINAL Z AXIS ANGULAR MISALIGNMENT

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7.3 Due to variances in equipment, solder pastes and applications (board design, component density, etc.), Samtec does not specify a recommended reflow profile for our connectors. The processing parameters provided by the solder paste manufacturer should be employed and can usually be found on their website.

All of Samtec's surface mount components are lead free reflow compatible and compliant with the profile parameters detailed in IPC/JEDEC J-STD-020 which requires that components be capable of withstanding a peak temperature of 260°C as well as 30 seconds above 255°C.

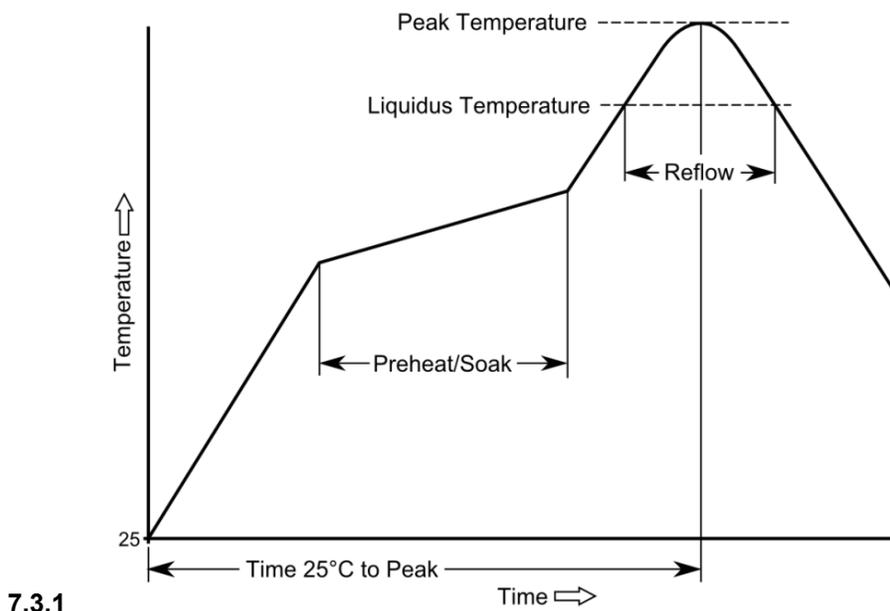
Samtec Recommended Temperature Profile Ranges (SMT)

Sn-Pb Eutectic Assembly

Preheat/Soak (100°C-150°C)	Max Ramp Up Rate	Reflow Time (above 183°C)	Peak Temp	Time within 5°C of 235°C	Max Ramp Down Rate	Time 25°C to Peak Temp
60-120 sec.	3°C/s max.	40-150 sec.	235°C	20 sec. max.	6°C/s max.	6 min. max.

Pb-Free Assembly

Preheat/Soak (150°C-200°C)	Max Ramp Up Rate	Reflow Time (above 217°C)	Peak Temp	Time within 5°C of 260°C	Max Ramp Down Rate	Time 25°C to Peak Temp
60-120 sec.	3°C/s max.	40-150 sec.	260°C	30 sec. max.	6°C/s max.	8 min. max.



These guidelines should not be considered design requirements for all applications. Samtec recommends testing interconnects on your boards in your process to guarantee optimum results.

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7.4 Maximum Reflow Passes: The parts can withstand three reflow passes at a maximum component temperature of 260°C.

7.5 Stencil Thickness: The stencil thickness is .006" (0,15 mm).

7.6 Placement: Machine placement of the parts is recommended.

7.7 Reflow Environment: Samtec recommends the use of a low level oxygen environment (typically achieved through Nitrogen gas infusion) in the reflow process to improve solderability.

7.8 Rework Guidelines: Samtec recommends following these rework guidelines as needed: [Reworking Grid Array Connectors](#)

7.8.1 Samtec recommends a minimum spacing of .125" (3,18mm) between adjacent connectors to allow adequate room for hot-air rework equipment.

7.9 Solder Screen Printing Process:

7.9.1 Complete solder pad coverage is critical. The recommended aperture size is intentionally larger than the pad to ensure that the solder charge comes into contact with the solder paste. If this does not occur, proper wetting will not be achieved. Automated inspection of each print is recommended. If solder paste does not completely cover the solder pad, the assembly should be rejected, cleaned and re-printed.

7.9.2 Stencil cleaning may need to be monitored more frequently to ensure complete solder pad coverage is maintained.

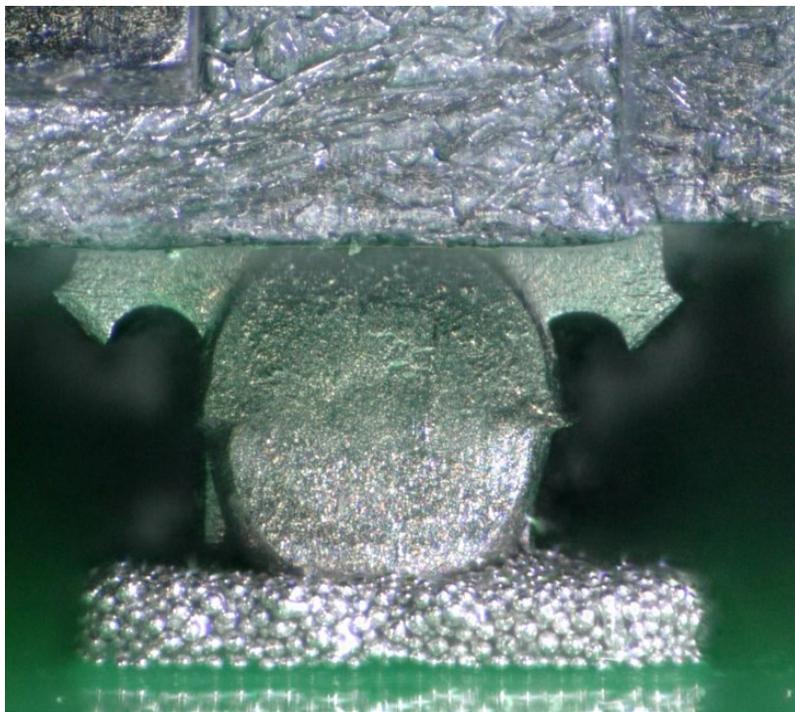


Fig. 7.9.3 - Solder crimp location relative to solder paste print. Notice good contact between solder crimp and solder paste.

Series: LPAF / LPAM .050" (1,27 mm) SEARAY™ LP Low Profile High Speed Open Pin Field Array

7.10 Handling:

- 7.10.1 These connectors are typically packaged in trays or tape-and-reel which protect the solder crimps from damage. They should be handled like any other BGA or IC device.
- 7.10.2 Avoid resting the connector on the solder crimps except during final placement onto the board.
- 7.10.3 When using tape-and-reel packaging, ensure the bottom of the pocket is protected as it travels through the feeder.
- 7.10.4 Avoid touching the solder crimps.
- 7.10.5 When a partially used tray needs to be stored, use the flat cover from the original shipment or an empty tray to cover connectors. Band trays using flex wrap or rubber bands.

7.11 Hardware: Board-to-board standoffs are recommended to provide a robust mechanical connection. Samtec offers two different types:

- 7.11.1 **Traditional Standoffs (SO)** – Rigid design to statically support board-to-board applications. See options here: [SO - Board Stacking Standoff](#)
- 7.11.2 **Jack Screw Standoffs (JSO)** – Serve same function as traditional standoffs but unique, nested construction facilitates the mating and unmating process. This is especially helpful for multiple connector applications where the mating and unmating forces increase with the number of connectors used. See options here: [JSO - Jack Screw Standoffs](#)

7.12 Cleaning: Samtec, Inc. has verified that our connectors may be cleaned in accordance with the solvents and conditions designated in the EIA-364-11 standard.

8.0 ADDITIONAL RESOURCES

- 8.1 For additional mechanical testing or product information, contact our Customer Engineering Support Group at CES@samtec.com
- 8.2 For additional information on high speed performance testing, contact our Signal Integrity Group at SIG@samtec.com
- 8.3 For additional processing information, contact our Interconnect Processing Group at IPG@samtec.com.
- 8.4 For RoHS, REACH or other environmental compliance information, contact our Product Environmental Compliance Group at PEC@samtec.com

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USE OF PRODUCT SPECIFICATION SHEET

This Product Specification Sheet (“PSS”) is a brief summary of information related to the Product identified. As a summary, it should only be used for the limited purpose of considering the purchase/use of Product. For specific, detailed information, including but not limited to testing and Product footprint, refer to Section 2.0 of this document and the links there provided to test reports and prints. This PSS is the property of Samtec, Inc. (“Samtec”) and contains proprietary information of Samtec, our various licensors, or both. Samtec does not grant express or implied rights or license under any patent, copyright, trademark or other proprietary rights and the use of the PSS for building, reverse engineering or replication is strictly prohibited. By using the PSS, the user agrees to not infringe, directly or indirectly, upon any intellectual property rights of Samtec and acknowledges that Samtec, our various licensors, or both own all intellectual property therein. The PSS is presented “AS IS”. While Samtec makes every effort to present excellent information, the PSS is only provided as a guideline and does not, therefore, warrant it is without error or defect or that the PSS contains all necessary and/or relevant information about the Product. The user agrees that all access and use of the PSS is at its own risk. **NO WARRANTIES EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY KIND WHATSOEVER ARE PROVIDED.**