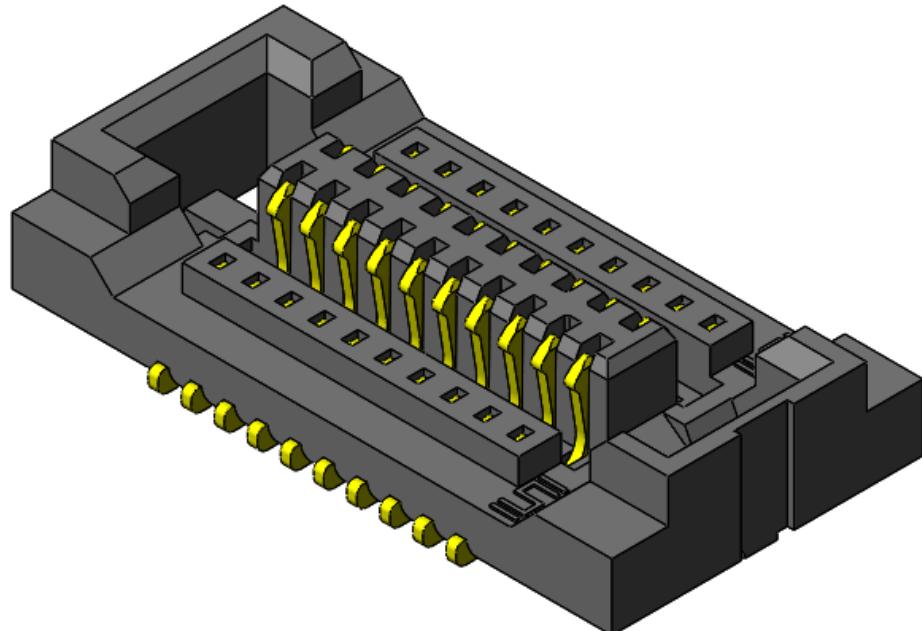
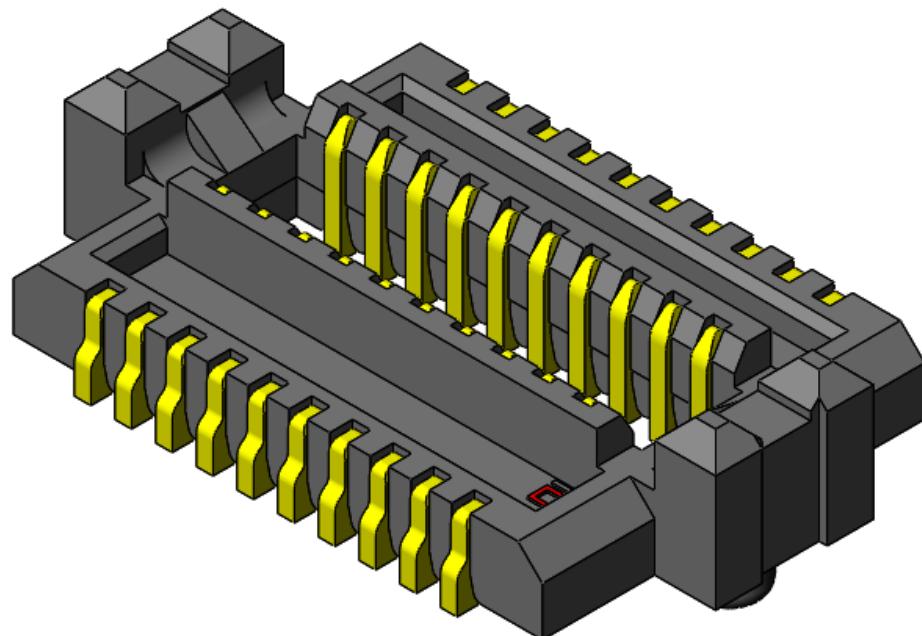


Series: [SLH / TLH](#) 0.50 mm (.0197") Razor Beam™ LP Ultra Low Profile Socket / Header

SLH Series – Socket, Vertical Orientation



TLH Series – Terminal, Vertical Orientation



See www.samtec.com for more information.

Series: [SLH](#) / [TLH](#) 0.50 mm (.0197") Razor Beam™ LP Ultra Low Profile Socket / Header

1.0 SCOPE

1.1 This specification covers performance, testing and quality requirements for Samtec SLH/TLH Series 0.50 mm (.0197") pitch Razor Beam™ LP Ultra Low Profile Socket / Header system. All information contained in this specification is for a 2 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?SLH and www.samtec.com?TLH.

3.0 TESTING

3.1 Current Rating: 2.1A (Gold plating, 6 adjacent contacts)

3.2 Voltage Rating: 195 VAC

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

3.4 Operating Humidity Range: up to 95% (Per EIA-364-31)

3.5 Electrical:

ITEM	TEST CONDITION	REQUIREMENT	STATUS
Withstanding Voltage	EIA-364-20 (No Flashover, Sparkover, or Breakdown)	590 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

3.6 Mechanical:

ITEM	TEST CONDITION	REQUIREMENT	STATUS
Durability	EIA-364-09C	25 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 grams minimum for gold interface	Pass

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3.7 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 mΩ DWV: 590 VAC IR: >45,000 MΩ	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 mΩ DWV: 590 VAC IR: >45,000 MΩ	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 mΩ DWV: 590 VAC IR: >45,000 MΩ	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 mΩ	Pass

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4.0 MATED SYSTEM

4.1 Stack Heights

STACK HEIGHT*	
SLH LEAD STYLE	TLH LEAD STYLE
	-0.50
-1.50	2.00mm [.079]
*Processing conditions will affect mated height.	

5.0 CREEPAGE AND CLEARANCE DISTANCES

5.1 Creepage = 0.35mm

5.2 Clearance = 0.35mm

6.0 HIGH SPEED PERFORMANCE

6.1 Based on a 3 dB insertion loss

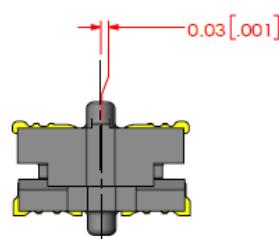
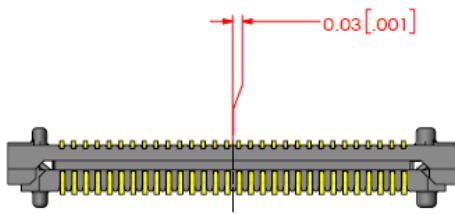
Stack Height	Single-Ended Signaling	Differential Pair Signaling
2 mm	18.5GHz / 37Gbps	16.5GHz / 33Gbps

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

7.0 PROCESSING RECOMMENDATIONS

7.1 Mating Alignment Requirements:

7.1.1 Allowable initial linear misalignment.



NOT APPLICABLE

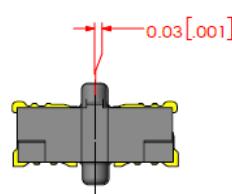
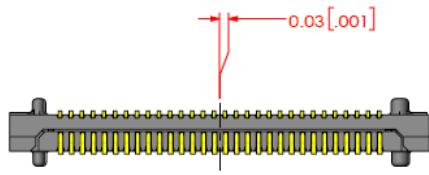
INITIAL X AXIS LINEAR MISALIGNMENT

INITIAL Y AXIS LINEAR MISALIGNMENT

INITIAL Z AXIS LINEAR MISALIGNMENT

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7.1.2 Allowable final linear misalignment



SEE MATED DOCUMENT

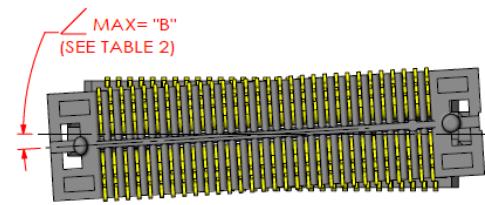
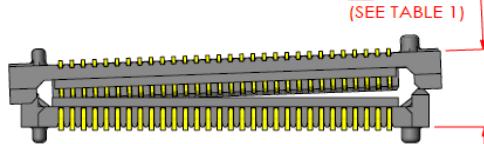
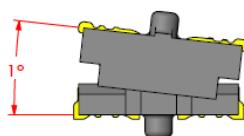
FINAL X AXIS LINEAR MISALIGNMENT

FINAL Y AXIS LINEAR MISALIGNMENT

FINAL Z AXIS LINEAR MISALIGNMENT

7.2 Mating Angle Requirements

7.2.1 Allowable initial angular misalignment

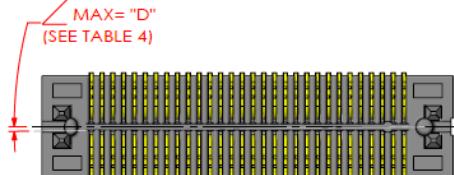
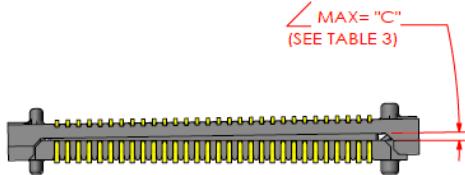
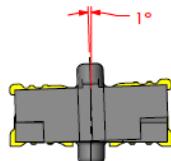


INITIAL X AXIS ANGULAR MISALIGNMENT

INITIAL Y AXIS ANGULAR MISALIGNMENT

INITIAL Z AXIS ANGULAR MISALIGNMENT

7.2.2 Allowable final angular misalignment



FINAL X AXIS ANGULAR MISALIGNMENT

FINAL Y AXIS ANGULAR MISALIGNMENT

FINAL Z AXIS ANGULAR MISALIGNMENT

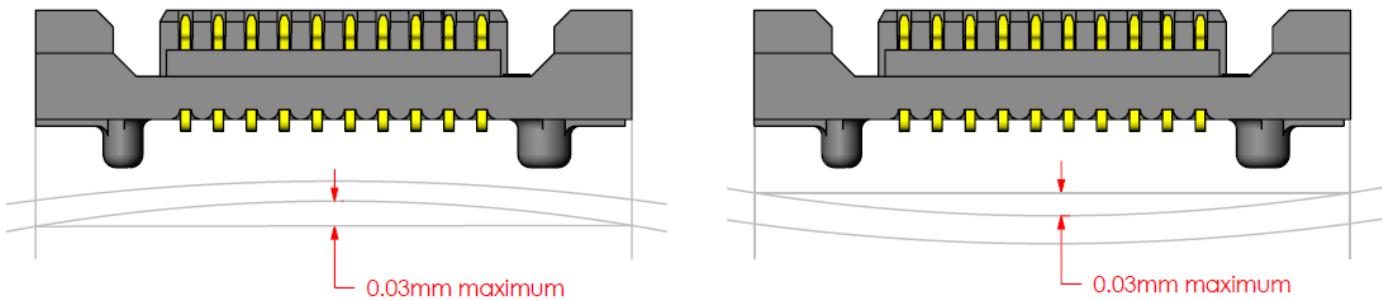
TABLE 1	
POS	"A" = DEGREES
-010	0.9
-020	0.5
-030	0.3
-040	0.2

TABLE 2	
POS	"B" = DEGREES
-010	0.25
-020	0.15
-030	0.1
-040	0.1

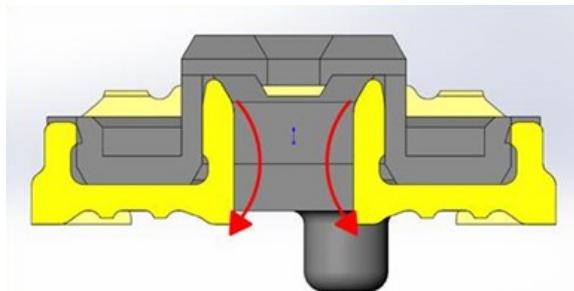
Series: SLH / TLH 0.50 mm (.0197") Razor Beam™ LP Ultra Low Profile Socket / Header

7.3 Multiple Connector Applications: For applications *requiring* two or more simultaneously mated connectors per board, please review the [Multiple XLH Connector Applications document](#). For more information, please contact IPG@Samtec.com.

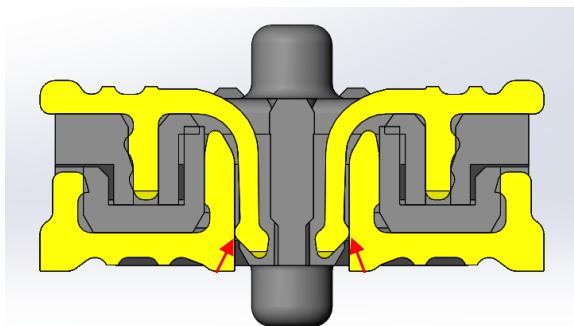
7.4 PCB Warp Requirements: Maximum of 0.03mm over the connector's length.



7.5 TLH PCB Layout Discussion: The TLH terminal design incorporates two points of contact with the PCB to prevent rotation during mating which, over time, could damage the solder joints. By using **Non-Solderable Structural Support Pads** for the inner rows (as opposed to solder mask), coplanarity between the inner and outer rows is achieved, ensuring optimal contact position for soldering. The red arrows shown in the image below depict the pin rotation that the support pads are designed to prevent.

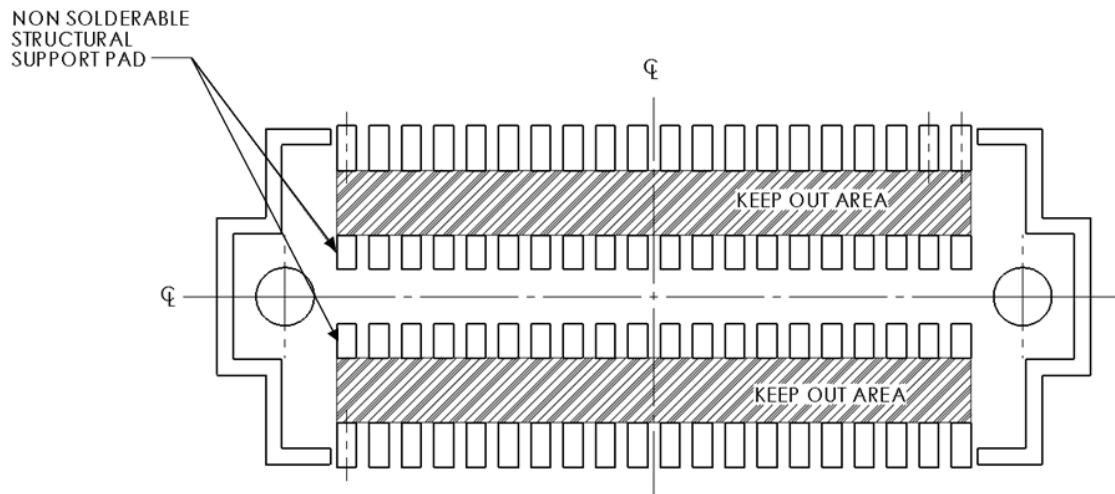


The inner pad rows *are not to be soldered* due to the proximity of the contact interface location (arrows below, with SLH mate shown). Normal solder wicking would likely reach and contaminate the contact interface location.



Below is the TLH Recommended PCB Layout highlighting the **Non-Solderable Structural Support Pad** rows.

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7.6 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)

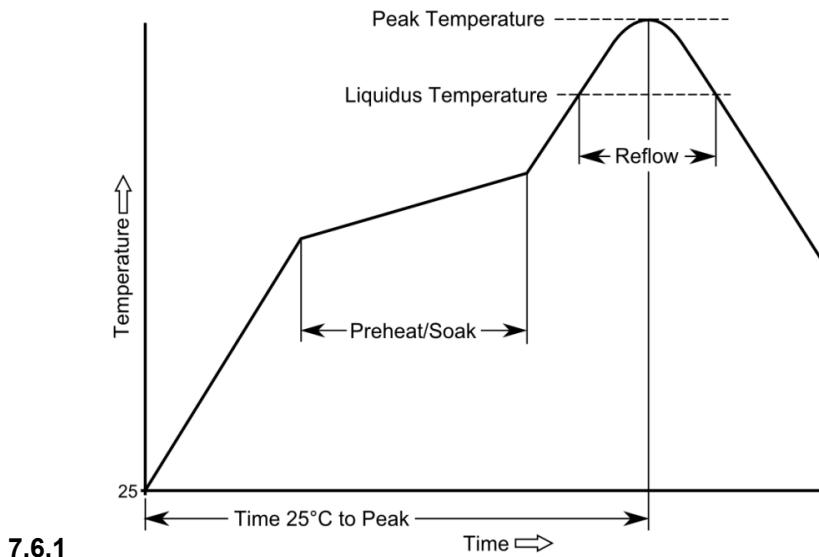
Sn-Pb Eutectic Assembly

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.

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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.

7.7 Maximum Reflow Passes: Parts can withstand three reflow passes at a peak component temperature of 260°C.

7.8 Stencil Thickness: The recommended stencil thickness is .005" (0.13 mm).

7.9 PCB Thickness: The PCB thickness must be 0.062" (1.57 mm) or thicker.

7.10 Placement: Machine placement of the parts is recommended.

7.11 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.

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.**