Reworking LSXX Razor Beam™ Vertical Connectors

This document describes the recommended procedure for reworking (connector removal, site cleaning, and connector replacement) Samtec's LSXX (LSEM, LSS and LSHM) Razor Beam™ vertical connectors using hot air rework equipment.

Equipment Used:
- Air-Vac DRS27 BGA/SMT rework machine
- Air-Vac NT217LB1208S hot air rework nozzle

Other Materials:
- LSHM-150-04.0-XX-DV-A connector
- Alpha OM-338 Pb-free, no-clean solder paste
- Kester TSF-6522 no-clean rework flux
- Mini-stencil
- PCB thickness .062

Thermal Profiling

Prior to each process, a complete thermal profile study shall be completed. Thermocouples shall be placed directly beneath the center of the component as well as on the insulator body. The ideal process will replicate the temperature gradient and ramp rate as recommended by the solder paste manufacturer.

Process 1 – Connector Removal

- Place board to be reworked on hot air rework machine.

- Align nozzle over component.

- Apply tacky flux to solder joints along each side of the connector.

---

Figure 1. Thermocouple Placement

Figure 2. Board Placed on Rework Machine

Figure 3. Flux Application
▪ Run connector removal heating program.

Process 2 – Site Cleaning

▪ Apply tacky flux to area to be site-cleaned.

▪ Run site cleaning thermal program.
(Once site-cleaning nozzle is lowered, manually adjust table location until all pads have been cleaned, resulting in a flat surface with a thin coating of solder.)

▪ If a site cleaning feature is not available, a manual site cleaning process is required.

Samtec Site Clean Program Settings*

Pre-heat board to 140°C
- Bottom heater – 300°C

Site Clean
- Z-axis hot gas heater – 425°C, 55% flow
- Bottom heater – 275°C

* Customer settings may be different

▪ After (removal) heating program is complete, quickly remove connector as nozzle rises.

* Customer settings may be different
Process 3 – Connector Replacement

- Apply solder paste to pads using the Samtec recommended stencil aperture design using either a stencil, mini-stencil, or solder jet printer.

![Solder Paste Application (Mini-Stencil)](image)

- Place printed PCB on rework machine and populate component.

![Populated PCB](image)

- Run connector replacement thermal program.

![Soldering Process - Nozzle in Down Position](image)

**Samtec Soldering Program Settings**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Hot Gas Heater</th>
<th>Bottom Heater</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-heat</td>
<td>140°C</td>
<td>325°C</td>
<td></td>
</tr>
<tr>
<td>Pre-soak</td>
<td>Z-axis: 210°C, 85% flow</td>
<td>Bottom: 275°C</td>
<td>30 seconds</td>
</tr>
<tr>
<td>Soak</td>
<td>Z-axis: 220°C, 85% flow</td>
<td>Bottom: 275°C</td>
<td>45 seconds</td>
</tr>
<tr>
<td>Ramp</td>
<td>Z-axis: 250°C, 85% flow</td>
<td>Bottom: 275°C</td>
<td>30 seconds</td>
</tr>
<tr>
<td>Reflow</td>
<td>Z-axis: 265°C, 85% flow</td>
<td>Bottom: 275°C</td>
<td>55 seconds</td>
</tr>
</tbody>
</table>

* Customer settings may be different

For more information regarding reworking Samtec connectors, please contact Samtec’s Interconnect Processing Group at ipg@samtec.com.

For more information on the hot air rework equipment/nozzles used, please contact:

Air-Vac Engineering  
30 Progress Ave., Seymour, CT 06483  
Telephone: 203-888-9900