Molex Mini50 0.50mm Unsealed Connector System

Application Specification
## REVISION HISTORY

<table>
<thead>
<tr>
<th>Rev</th>
<th>Description</th>
<th>Section</th>
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<tr>
<td>D</td>
<td>Added 12ckt information</td>
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<td>2013/07/24</td>
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<td>E</td>
<td>Added 12 circuit option information</td>
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<td>Added CPA option information</td>
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<td>Added note concerning hinge cracking / breaking</td>
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<td>F</td>
<td>Added service instructions for 4 &amp; 8 circuit connector and SMT header</td>
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<td>2013/07/24</td>
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<td>G</td>
<td>Adding 16, 20 and 24 ways</td>
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<td>H</td>
<td>Added Best Practices and Troubleshooting section</td>
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<td>I-J</td>
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<td>K</td>
<td>Added Electrical probes location</td>
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<td>Added disclaimer regarding pre-seated CPA</td>
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<td>L</td>
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<td>Adding terminal servicing tool</td>
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<td>Updated document formatting</td>
<td>All</td>
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<td>Added pictures of 2 Way connector / headers</td>
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<td>Added information regarding seated CPA</td>
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# Application Specification

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1. **SCOPE**

This procedure applies to all Mini50 Unsealed part numbers in the single row series (34791, 34792, and 34793) and dual row series (34824, 34825, and 34826)

2. **PRODUCT DESCRIPTION**

- 0.50mm terminal system with 1x2, 1x4, 1x8 and Dual Row 12, 16, 20 and 24 Way
- 4 polarization options for the 1x4 system and 3 polarization option for the 1x8, dual row 12, 16, 20 and 24 Way systems
- Wire range 0.08mm² -- 0.35mm² AS-34791-020
- Utilizes the Molex CTX terminal series 560023

**RECEPTACLES**

- 2 ckt
- 4 ckt
- 8 ckt
- 12 ckt
- 16 ckt
- 20 ckt
- 24 ckt
3. **REFERENCE DOCUMENTS**

Single Row Sales Drawing:
- Receptacle – SD-34791-001
- Header (Vertical) – SD-34792-001
- Header (Right Angle) – SD-34793-001
- Header (SMT) – SD-34912-001

Dual Row Sales Drawing:
- Receptacle – SD-34824-002
- Header (Vertical) – SD-34825-001
- Header (Right Angle) – SD-34826-001
- Header (SMT) – SD-34897-001

Single/Dual Row CPA Option Sales Drawing:
- Receptacle – SD-34824-003

Connector System Product Specification:
- PS-34791-020

Packaging Drawing:
- Receptacle – PK-31301-538
- Header – PK-31301-440

Terminal System:
- CTX50 Terminal Drawing – SD-560023-002
- CTX50 Product Specification – PS-560023-001
4. **PROCEDURE**

A. **Connector “As-Shipped”**

Connector ISL shown in “as shipped” condition (open). The ISL must remain in the open position until all circuits are loaded.

*THERE IS A SMALL CHANCE THAT THE CPA COULD SEAT DURING TRANSIT. IF THIS OCCURS, PLEASE SCRAP THAT SPECIFIC CONNECTOR.*

Pictures of a CPA seated in its final lock position in unmated connector are shown below:

**TOP VIEW:**

**ANGLED TOP/SIDE VIEW:**
B. ISL “lift to open”
ISL must be in pre-lock position to populate the connector. If during shipping the Connector ISL moves from its pre-lock position. Simply slide a small screwdriver (width 2-2.5mm) behind the latch on each side of the connector and pry to open the ISL

*IF THE ISL OR HOUSING IS DAMAGED IN ANY WAY, DO NOT USE THE CONNECTOR*

Pry gently here
C. Terminal Installation

With ISL still in the pre-lock position, orient the terminal to the rear of connector as shown below. Grip the wire behind the terminal insulation crimp and insert it through the appropriate circuit opening. If resistance is encountered, retract the terminal and adjust the angle of insertion. Continue inserting the terminal until it stops and locks up on the lock finger with an audible click or tactile feedback.

IsL MUST BE IN OPEN POSITION TO POPULATE THE CONNECTOR

12ckt receptacle shown above as reference. The 16, 20, and 24ckt receptacles have similar circuit IDs.
C. Terminal Installation (continued)

Installing a terminal correctly will have low effort. Improperly installing a terminal 180° will lead to a high effort and wire buckle.

NOTE WIRE BUCKLE
D. Closing the ISL
Once all terminals are installed:
1.) Perform a visual check to confirm terminals are fully seated and in the correct position
2.) Close the ISL by applying force to the hinged portion of the connector
3.) The ISL will “click” into its final position
4.) Gently pull down on the front of the ISL to confirm it is properly closed

NOTE REGARDING THE ISL:
WHILE CYCLING THE HINGE, THE USER MAY NOTICE STRESS LINES OR DELAMINATION IN THE AREA SHOWN BELOW. THIS WILL NOT AFFECT THE FUNCTION OF THE CONNECTOR IN ANY WAY. THE ISL WILL CONTINUE TO FUNCTION 100% EVEN IF THE HINGE IS COMPLETELY SEPERATED FROM THE CONNECTOR BODY.
E. **Detecting a partially installed terminal**
The ISL will not close with a partially installed terminal. If the ISL will not close, confirm all terminals are fully installed. The operator will not be able to mate the connector to the header if the ISL is not closed.

**DO NOT FORCE THE ISL CLOSED WHEN THERE ARE PARTIALLY INSTALLED TERMINALS OR DAMAGE TO THE TERMINAL AND CONNECTOR ISL MAY OCCUR**
F. Connector Mating
To properly mate the connector:
1.) First align the keying features from the receptacle connector to the mating header
2.) Slide the receptacle connector fully into the header assembly until you hear an audible “click”

IF RESISTANCE IS.EncOUNTERED DURING MATING, CONFIRM THE ISL IS FULLY LOCKED AND ALL TERMINALS ARE FULLY INSTALLED (SEE SECTION E. DETECTING A PARTIALLY INSTALLED TERMINAL).
F. Connector Mating (continued)
Never mate the system at an angle or with bias. This may cause damage to the header or connector.

Always push on the connector housing while mating.

DO NOT PUSH ON THE LATCH WHILE MATING

When mating the connector with a CPA:
1.) Align the connector and push evenly on the connector body to mate. 

DO NOT PUSH ON THE CPA DURING THE MATING PROCESS.
2.) After mating the connector, push on the CPA to engage.
3.) Check to ensure the CPA is fully seated.

1.  
2.  
3.  

[Images of connector mating process]
G. Connector Un-mating
To un-mate the connectors, push connectors together to unload the latch system, then:
1.) Depress the latch with your thumb.
2.) Continue to depress the latch, and gently pull apart connector assemblies.

When un-mating the connector with a CPA:
1.) Use a small flat tip screwdriver (width 2-2.5mm) to disengage the CPA
2.) Push connectors together to unload the latch system, then depress the latch with your thumb.
3.) Continue to depress the latch, and gently pull apart connector assemblies.
G. Connector Un-mating (continued)
If difficulty is encountered while attempting to un-mate the connector from an SMT header, the following procedure may be used:
1.) Use a small flat tip screwdriver (width 2-2.5mm) to disengage the CPA
2.) Push connectors together to unload the latch system, then insert a small flat tip screwdriver (width 2-2.5mm) between the latch and the latch cover.
3.) While pressing down on the latch with the screwdriver (width 2-2.5mm), gently pull on the wire bundle and the screwdriver (width 2-2.5mm) to remove the connector

1. 
2. 
3.
H. Opening the ISL
Use a small flat tip screwdriver (width 2-2.5mm) to gently pry on the ISL latch features one side at a time. Once each ISL latch is released, the ISL will open.
I. Terminal Servicing

With a small thumbtack gently pry up on the terminal lock finger. Once the lock finger is released, pull on the terminal to remove it from the housing.

**THE CONNECTOR HOUSING MAY BE DAMAGED WITH IMPROPER SERVICING. INSPECT THE TERMINAL, HOUSING, AND LOCK FINGER FOR DAMAGE AND REPLACE THE CONNECTOR IF DAMAGE IS EVIDENT. THE CONNECTOR HOUSING CAN BE SERVICE UP TO TWO TIMES, THEN IT MUST BE REPLACED.**
J. Electrical Probing / Continuity Checking
The preferred method of probing is to use the dedicated probe hole opening to check for electrical continuity. Use a 0.66mm (Lone Star part number LS040-MR-719), pin or smaller equivalent to prevent damaging the terminal.

**SINGLE ROW PROBE HOLE LOCATIONS**

<table>
<thead>
<tr>
<th>4 ckt</th>
<th>8 ckt</th>
</tr>
</thead>
<tbody>
<tr>
<td>CENTERLINE</td>
<td>CENTERLINE</td>
</tr>
<tr>
<td>3.085mm Max pogo pin insertion from front face</td>
<td></td>
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</tbody>
</table>

**DUAL ROW PROBE HOLE LOCATIONS**

<table>
<thead>
<tr>
<th>4 ckt</th>
<th>8 ckt</th>
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<td>3.085mm Max pogo pin insertion from front face</td>
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K. Post Solder Reflow Measurements
Header warpage during reflow soldering is expected. If the below dimension becomes less than 7.90mm, confirm processing temperatures are in accordance with SMES-152. The product is designed for a peak temp of 260°C is allowed.

7.90mm MIN
5. BEST PRACTICES / TROUBLESHOOTING

Steps can be taken during harness assembly that can ensure the successful product usage by the customer. Terminal crimping that is in accordance with the CTX50 terminal application specification, AS-560023-001, has been found to prevent assembly issues such as bent header pins, pushed-out header pins, ISL bowing, and terminal stubbing. Examples of good and bad terminals and issues attributed to bad terminals are shown in the following pages.

A. Observed issues attributed to improperly crimped and/or bent female terminals

i. Pushed-Out Header Pin

ii. ISL Opening / Bowing (due to improperly crimped and/or bent terminals)

- Improperly crimped and/or bent terminals – ISL appears open/bowed
- Terminals correctly crimped and positioned – ISL properly closed
- Terminal damage from header pin
- If the front edge of the terminal box can be seen through the connector cavity front window, terminal crimp dimensions should be confirmed to meet AS-560023-001.
iii. Excessive Wire Brush
Excessive Wire Brush can lead to ISL Bowing by interfering with ISL when ISL is closed. ISL bowing can cause bent or pushed-out header pins.

**Excessive Wire Brush**

**ISL appears open / bowed**

**ISL sits flat**

**Finished harness assembly should not exceed 8.2mm Max**
iv. Excessive Crimp Bulge
Excessive crimp bulge can lead to misaligned, improperly positioned terminals within the connector cavity and can contribute to ISL bowing and bent or pushed-out header pins.
v. Test Harness Cautions
Repetitive use of Mini50 connectors in test harnesses requires monitoring of the female connector for damage to the plastic lead-ins. The pictures below show examples of the type of damage that can occur, in which the lead-ins are bent or worn out due to repetitive mating. Damaged lead-ins can cause pin stubbing against the female terminal, bent header pins, pushed-out header pins, or connector stubbing. Test connectors should be inspected and replaced as needed.
B. Best Practice: CTX50 terminal dimensional verification

The below features must be in-spec as stated in AS-560023-001. The highlighted dimensions are critical to the performance of the CTX50 terminal and Mini50 connection system. To ensure high-quality crimps, the application tooling must be maintained in good condition. Reference the complete CTX50 Application Spec (AS-560023-001) for a list of all requirements.

i. Strip Length

ii. Conductor Crimp Height and Width

iii. Wire Position

iv. Bell Mouth

v. Insulation Crimp Height and Width

vi. Bend Up or Down; Twisting or Rolling

vii. Crimp Bulge