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| <b>W</b>                                                      | Addition of Reverse Footprint parts.<br><br>ECN IPG2013-0094 D.Byrnes<br><br>2012-Aug-29 | THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INC. AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION |                          |                                                            |                           |                  |  |
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| DESIGN CONTROL<br>MXI                                         | STATUS<br>RELEASED                                                                       | WRITTEN BY:<br>J.Dennehy                                                                                               | CHECKED BY:<br>D.Waszkiz | APPROVED BY:<br>J.Dennehy                                  | DATE:<br>2007-09-07       | YR/MO/DAY        |  |
| DOCUMENT NUMBER<br><b>PS-99020-0011</b>                       |                                                                                          |                                                                                                                        |                          |                                                            | FILENAME<br>PS-990200-011 | SHEET<br>1 of 14 |  |
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## 1.0 SCOPE

This specification defines the performance characteristics for the PICOFLEX connector system.

|                                  |             |                                                                                                                        |                                                    |                  |
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## PRODUCT SPECIFICATION



LANGUAGE

English

## 2.0 PRODUCT DESCRIPTION AND APPLICABLE DOCUMENTS

| Product Type   | Series No. | Product Description                                                          | Sales Drawing |
|----------------|------------|------------------------------------------------------------------------------|---------------|
| PCB Headers    | 90325      | Vertical Thru Hole Header                                                    | SDA-90325     |
|                | 90779      | Vertical Thru Hole Header, High Temperature Thermoplastic                    | SDA-90779     |
|                | 90814      | Vertical SMT Header                                                          | SDA-90814     |
|                | 93405      | Reverse Footprint Vertical SMT Header                                        | SD-93405-001  |
|                | 90816      | Vertical Latched SMT Header                                                  | SD-90816-001  |
|                | 93407      | Reverse Footprint Vertical Latched SMT Header                                | SD-93407-001  |
|                | 90800      | Right-Angle Thru Hole Header                                                 | SDA-90800E    |
|                | 91714      | Right-Angle Thru Hole Header, High Temperature Thermoplastic                 | SD-91714-001  |
|                | 91330      | Bottom Entry SMT Header                                                      | SD-91330-001  |
| IDT Connector  | 90327      | Insulation Displacement Connector                                            | SDA-90327     |
|                | 93338      | Insulation Displacement Connector (Glow Wire)                                | SD-93338-001  |
| PCB Connectors | 90584      | Insulation Displacement Board-In Connector                                   | SDA-90584     |
|                | 91577      | Insulation Displacement Board-In Connector with Alternative Terminal Stagger | SD-91577-001  |

|                                  |             |                                                                                                                        |                                                    |                           |                  |
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## PRODUCT SPECIFICATION



LANGUAGE

English

## 3.0 RATINGS

| Series No.     | Wire/Cable Size (AWG) | Maximum Current at 105°C | Voltage AC/DC | Operating Temperature | Storage Temperature |
|----------------|-----------------------|--------------------------|---------------|-----------------------|---------------------|
| 90325          | N/a                   | 1.2A                     | 250V Max.     | -40°C to +105°C       | -40°C to +85°C      |
| 90779          | N/a                   | 1.2A                     |               |                       |                     |
| 90814<br>93405 | N/a                   | 1.2A                     |               |                       |                     |
| 90816<br>93407 | N/a                   | 1.2A                     |               |                       |                     |
| 90800          | N/a                   | 1.2A                     |               |                       |                     |
| 91714          | N/a                   | 1.2A                     |               |                       |                     |
| 91330          | N/a                   | 1.2A                     |               |                       |                     |
| 90327          | 28 AWG                | 1.2A                     |               |                       |                     |
| 93338          | 28 AWG                | 1.2A                     |               |                       |                     |
| 90584          | 28 AWG                | 1.2A                     |               |                       |                     |
| 91577          | 28 AWG                | 1.2A                     |               |                       |                     |

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**4.0 ELECTRICAL PERFORMANCE**

|     | ITEM                            | TEST CONDITION                                                | REQUIREMENT              |
|-----|---------------------------------|---------------------------------------------------------------|--------------------------|
| 4.1 | Contact Resistance              | 20mV maximum open circuit voltage. 100mA maximum test current | 15mOhms<br>MAXIMUM       |
| 4.2 | Insulation Resistance           | 500V DC applied to adjacent circuits                          | 1000 megaOhms<br>MINIMUM |
| 4.3 | Dielectric Withstanding Voltage | 750 VAC applied to adjacent circuits for 1 minute             | No breakdown             |

|                                         |             |                                                                                                                        |                                                            |                  |
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## PRODUCT SPECIFICATION



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## 5.0 MECHANICAL PERFORMANCE

|              | ITEM                                                                    | TEST CONDITION                                                                                                                                                                                                                                                                                                                                                                                               | REQUIREMENT                                                                                                                                                                                                                   |              |          |         |      |     |     |        |     |      |       |     |      |
|--------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------|---------|------|-----|-----|--------|-----|------|-------|-----|------|
| 5.1          | Insertion Force<br>(Per individual contact, 90327 & 93338 series only)  | Insertion force tested by inserting standard gauge blade specified in Appendix A<br><br>Rate of insertion = 25 ±6 mm/minute                                                                                                                                                                                                                                                                                  | 1.7N maximum for initial insertion of Tin contact<br><br>1.5N maximum for initial insertion of PdNi/Gold contact                                                                                                              |              |          |         |      |     |     |        |     |      |       |     |      |
| 5.2          | Withdrawal Force<br>(Per individual contact, 90327 & 93338 series only) | Withdrawal force tested by withdrawing standard gauge blade specified in Appendix A<br><br>Rate of withdrawal =25 ±6 mm/minute                                                                                                                                                                                                                                                                               | Withdrawal force = 0.25N minimum                                                                                                                                                                                              |              |          |         |      |     |     |        |     |      |       |     |      |
| 5.3          | Durability                                                              | 1 durability cycle = 1 Mating & Un-mating of the connector using Picoflex extraction tool or pull-tab<br><br>For Tin on Tin system number of durability cycles = 30<br><br>For Gold on Gold system number of durability cycles = 100<br><br>For PdNi plated product number of durability cycles = 100<br><br>For 90816/93407 Latched maximum Cycles = 5(Tin or Gold) using Latched Picoflex extraction tool. | Change in insertion force from initial value = 0.5N maximum<br><br>Change in contact resistance from initial value = 10mOhms maximum                                                                                          |              |          |         |      |     |     |        |     |      |       |     |      |
| 5.4          | Shock                                                                   | Acceleration = 50g<br><br>Duration = 11 milliseconds<br><br>Per IEC 512-4, test condition 6c                                                                                                                                                                                                                                                                                                                 | Change in contact resistance from initial value = 10mOhms maximum<br><br>Discontinuity = 1micro second maximum                                                                                                                |              |          |         |      |     |     |        |     |      |       |     |      |
| 5.5          | Vibration                                                               | Sweep = 10-55-10Hz<br><br>Amplitude = 0.35mm or 5g<br><br>Pulse = 1/2 Sine<br><br>Duration = 2 hours in each X-Y-Z direction<br><br>Per IEC 512-4, test condition 6d                                                                                                                                                                                                                                         | Change in contact resistance from initial value = 10mOhms maximum<br><br>Discontinuity = 1micro second maximum                                                                                                                |              |          |         |      |     |     |        |     |      |       |     |      |
| 5.6          | Terminal Retention Force in Housing<br>(PCB Headers)                    | Terminal withdrawal force to be applied at the rate of 25 ± 6mm per minute                                                                                                                                                                                                                                                                                                                                   | Terminal retention force = 7N minimum.                                                                                                                                                                                        |              |          |         |      |     |     |        |     |      |       |     |      |
| 5.8          | Latched header retention force.<br>(Reference only)                     | Connector retention force to be applied at the rate of 25 ± 6mm per minute.<br><br>Straight and Right angle pull Minimum retention force.                                                                                                                                                                                                                                                                    | <table><tr><td>Circuit Size</td><td>Straight</td><td>R/angle</td></tr><tr><td>4ckt</td><td>30N</td><td>30N</td></tr><tr><td>14 ckt</td><td>55N</td><td>115N</td></tr><tr><td>26ckt</td><td>65N</td><td>175N</td></tr></table> | Circuit Size | Straight | R/angle | 4ckt | 30N | 30N | 14 ckt | 55N | 115N | 26ckt | 65N | 175N |
| Circuit Size | Straight                                                                | R/angle                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                               |              |          |         |      |     |     |        |     |      |       |     |      |
| 4ckt         | 30N                                                                     | 30N                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                               |              |          |         |      |     |     |        |     |      |       |     |      |
| 14 ckt       | 55N                                                                     | 115N                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                               |              |          |         |      |     |     |        |     |      |       |     |      |
| 26ckt        | 65N                                                                     | 175N                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                               |              |          |         |      |     |     |        |     |      |       |     |      |

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**6.0 ENVIRONMENTAL PERFORMANCE**

|                       | ITEM                                                            | TEST CONDITION                                                                                                                                                                                                                                                                                           | REQUIREMENT                                                                                                                                                                   |                      |            |            |         |               |            |            |                                                                                                 |
|-----------------------|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------|------------|---------|---------------|------------|------------|-------------------------------------------------------------------------------------------------|
| 6.1                   | Damp Heat                                                       | Mate connectors and expose to:<br>Temperature = +40°C +3/-0°C<br>Humidity = 90 - 95% R.H.<br>Duration = 1000 Hours                                                                                                                                                                                       | Change in contact resistance<br>from initial value = 10mOhms<br>maximum<br><br>For 93338 series maximum<br>contact resistance after test<br><50 mOhms<br><br>No visual damage |                      |            |            |         |               |            |            |                                                                                                 |
| 6.2                   | Dry Heat                                                        | Mate connectors and expose to:<br>Temperature = +105°C +3/-0°C<br>Duration = 240 Hours                                                                                                                                                                                                                   | Change in contact resistance<br>from initial value = 10mOhms<br>maximum<br><br>No visual damage                                                                               |                      |            |            |         |               |            |            |                                                                                                 |
| 6.3                   | Cold                                                            | Mate connectors and expose to:<br>Temperature = -40° C +0°C /-3°C<br>Duration = 96 Hours                                                                                                                                                                                                                 | Change in contact resistance<br>from initial value = 10mOhms<br>maximum<br><br>No visual damage                                                                               |                      |            |            |         |               |            |            |                                                                                                 |
| 6.4                   | Thermal Shock                                                   | Mate connectors and expose to 10 cycles of the<br>following profile:<br><table><tr><td><u>Temperature °C</u></td><td><u>Time Duration</u></td></tr><tr><td>-40 +0 /-3</td><td>30 minutes</td></tr><tr><td>+20 ± 5</td><td>5 minutes max</td></tr><tr><td>+105 +3/-0</td><td>30 minutes</td></tr></table> | <u>Temperature °C</u>                                                                                                                                                         | <u>Time Duration</u> | -40 +0 /-3 | 30 minutes | +20 ± 5 | 5 minutes max | +105 +3/-0 | 30 minutes | Change in contact resistance<br>from initial value = 10mOhms<br>maximum<br><br>No visual damage |
| <u>Temperature °C</u> | <u>Time Duration</u>                                            |                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                               |                      |            |            |         |               |            |            |                                                                                                 |
| -40 +0 /-3            | 30 minutes                                                      |                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                               |                      |            |            |         |               |            |            |                                                                                                 |
| +20 ± 5               | 5 minutes max                                                   |                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                               |                      |            |            |         |               |            |            |                                                                                                 |
| +105 +3/-0            | 30 minutes                                                      |                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                               |                      |            |            |         |               |            |            |                                                                                                 |
| 6.5                   | Corrosive Atmosphere<br>Sulphur Dioxide<br>(SO <sub>2</sub> )   | Mate Connectors and expose to:<br>Atmosphere: 10 parts per million (PPM) SO <sub>2</sub><br>Duration: 240 hours<br>Temperature: 25 °C<br>Humidity: 75% R.H.                                                                                                                                              | Change in contact resistance<br>from initial value = 10mOhms<br>maximum<br><br>No visual damage                                                                               |                      |            |            |         |               |            |            |                                                                                                 |
| 6.6                   | Corrosive Atmosphere<br>Hydrogen Sulphide<br>(H <sub>2</sub> S) | Mate Connectors and expose to:<br>Atmosphere: 1 part per million (PPM) H <sub>2</sub> S<br>Duration: 96 hours<br>Temperature: 25 °C<br>Humidity: 75% R.H.                                                                                                                                                | Change in contact resistance<br>from initial value = 10mOhms<br>maximum<br><br>No visual damage                                                                               |                      |            |            |         |               |            |            |                                                                                                 |

|                                         |             |                                                                                                                        |                                                            |                  |
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|     | ITEM                                                                                                                                                 | TEST CONDITION                                                                                           | REQUIREMENT                                                                                                                         |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| 6.7 | Solder Heat Resistance<br>90325, 90584, 90779<br>90800, 90814/93405*,<br>91577 and 91714 series<br>only<br>(*90814/93405<br>standard profile parts). | Insert Terminal Solder Tails in solder bath:<br>Solder Temperature: 230°C<br>Duration: 5 seconds maximum | No damage that would impair<br>normal operation                                                                                     |
| 6.8 | Resistance to Reflow<br>Temperature<br>90814/93405*,90816,<br>93407 and 91330 series<br>only<br>(* 90814/93405 Low<br>Profile parts only)            | Subject unmated connectors to applicable re-flow<br>profile shown in Appendix C                          | No damage that would impair<br>normal operation                                                                                     |
| 6.9 | Glow Wire<br>90779,<br>90814,93405,90816,93<br>407, 91330, 91714 and<br>93338 series only                                                            | Glow wire temperature: 750°C<br>Test positions shown in Appendix D<br>Per IEC 60695-2-11                 | Flame must extinguish within<br>2 seconds of removal of glow<br>wire<br>No ignition of wrapping tissue<br>200mm under test specimen |

|                                  |             |                                                                                                                        |                                                    |                           |                  |
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## 7.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage. No Styrofoam shall be used in any packing that comes in direct contact with the connectors.

|                                         |             |                                                                                                                        |                                                            |                  |
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## PRODUCT SPECIFICATION



LANGUAGE

English

## 8.0 TEST GROUPS

| TEST REF. | TEST                                                      | A          | B     | C          | D     | E     | F | G |
|-----------|-----------------------------------------------------------|------------|-------|------------|-------|-------|---|---|
| 4.1       | Contact Resistance                                        | 2 4 6<br>8 | 2 4 6 | 2 4 6<br>9 | 2 4 6 | 2 4 6 |   |   |
| 4.2       | Insulation Resistance                                     | 9          |       |            |       |       |   |   |
| 4.3       | Dielectric Withstanding Voltage                           | 10         |       |            |       |       |   |   |
| 5.1       | Insertion Force                                           |            |       |            |       |       | 1 |   |
| 5.2       | Withdrawal Force                                          |            |       |            |       |       | 2 |   |
| 5.3       | Durability                                                | 3          | 3     | 3          | 3     | 3     |   |   |
| 5.4       | Shock                                                     |            |       | 8          |       |       |   |   |
| 5.5       | Vibration                                                 |            |       | 7          |       |       |   |   |
| 5.6       | Terminal Retention Force in Housing (PCB Headers)         |            |       |            |       |       |   | 1 |
| 5.8       | Latched header retention force.                           |            |       |            |       |       |   | 1 |
| 6.1       | Damp Heat                                                 | 7          |       |            |       |       |   |   |
| 6.2       | Dry Heat                                                  | 5          |       |            |       |       |   |   |
| 6.3       | Cold                                                      |            |       | 5          |       |       |   |   |
| 6.4       | Thermal Shock                                             |            | 5     |            |       |       |   |   |
| 6.5       | Corrosive Atmosphere Sulphur Dioxide (SO <sub>2</sub> )   |            |       |            | 5     |       |   |   |
| 6.6       | Corrosive Atmosphere Hydrogen Sulphide (H <sub>2</sub> S) |            |       |            |       | 5     |   |   |
| 6.7       | Solder Heat Resistance                                    | 1          | 1     | 1          | 1     | 1     |   |   |
| 6.8       | Resistance to Reflow Temperature                          | 1          | 1     | 1          | 1     | 1     |   |   |
| 6.9       | Glow Wire                                                 |            |       |            |       |       |   | 1 |

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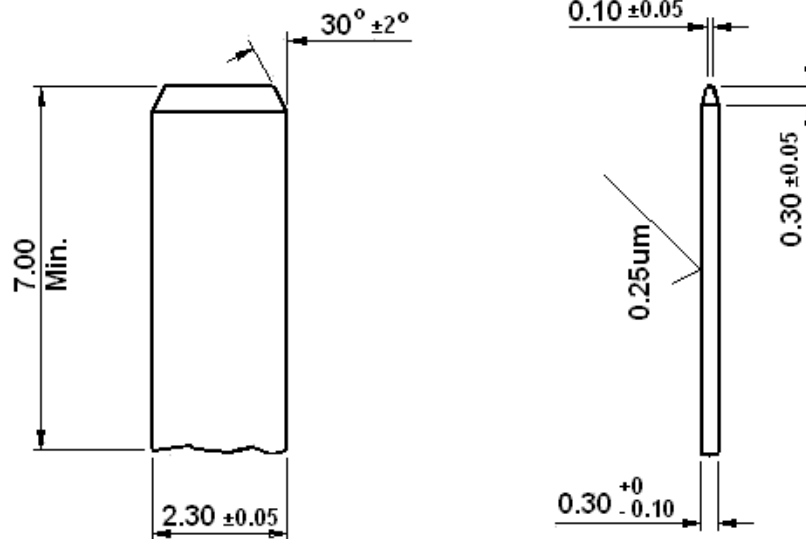
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## APPENDIX A - INSERTION/WITHDRAWAL GAUGE SPECIFICATION



Note: Gauge weight = 25 grams minimum

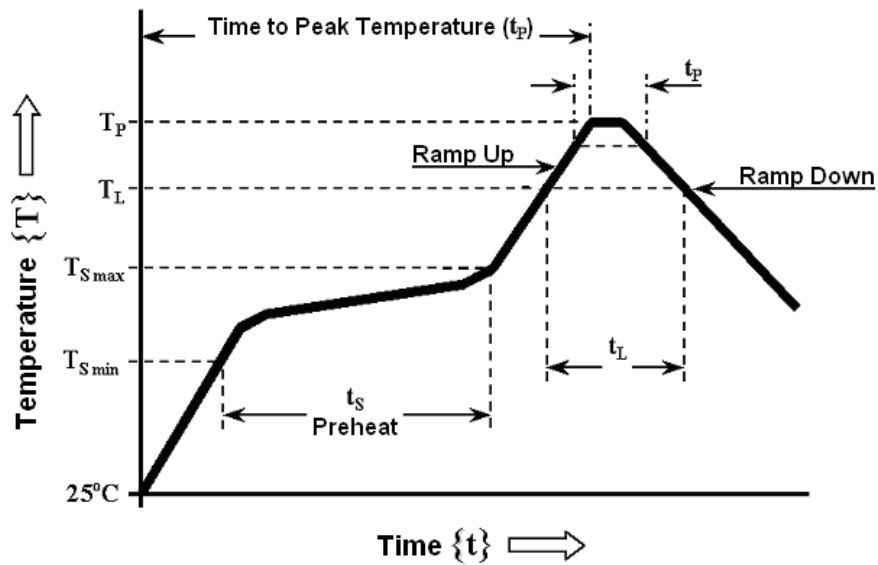
|                                  |             |                                                                                                                        |                                                    |                           |                   |  |
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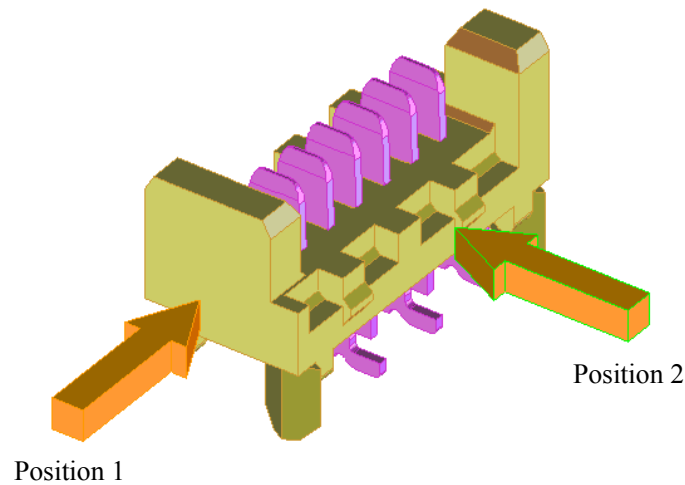
## APPENDIX B – RE-FLOW PROFILES

| PROFILE FEATURE                                                                                         | Pb-FREE PROCESS (RoHS)<br>COMPLIANT                             | Pb-FREE PROCESS (RoHS)<br>COMPATIBLE                     |
|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------|
| Product Series                                                                                          | 90779, 91714 and 90814/93405.<br>(90814/93405 standard profile) | 90814, 90816/93407 & 91330.<br>(90814/93405 low profile) |
| Average Ramp Up Rate                                                                                    | 3°C/second max.                                                 | 3°C/second max.                                          |
| Preheat<br>- Temperature Min ( $T_{S \min}$ )<br>- Temperature Max ( $T_{S \max}$ )<br>- Time ( $t_s$ ) | 100°C<br>150°C<br>60 – 120 seconds                              | 150°C<br>200°C<br>60 – 180 seconds                       |
| Time over Liquidus<br>- Temperature ( $T_L$ )<br>- Time ( $t_L$ )                                       | 183°C<br>60 – 150 seconds                                       | 217°C<br>60 – 150 seconds                                |
| Time from 25°C to Peak<br>Temperature ( $T_P$ )                                                         | 6 minutes max.                                                  | 8 minutes max.                                           |
| Peak Temperature ( $T_P$ )                                                                              | 230°C max.                                                      | 260°C max.                                               |
| Time within 5°C of Peak<br>Temperature ( $t_P$ )                                                        | 30 seconds max.                                                 | 40 seconds max.                                          |
| Ramp Down Rate                                                                                          | 6°C/second max.                                                 | 6°C/second max.                                          |

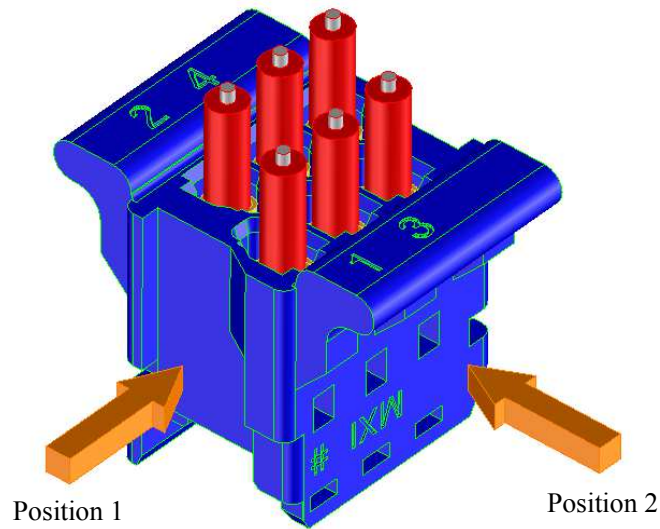
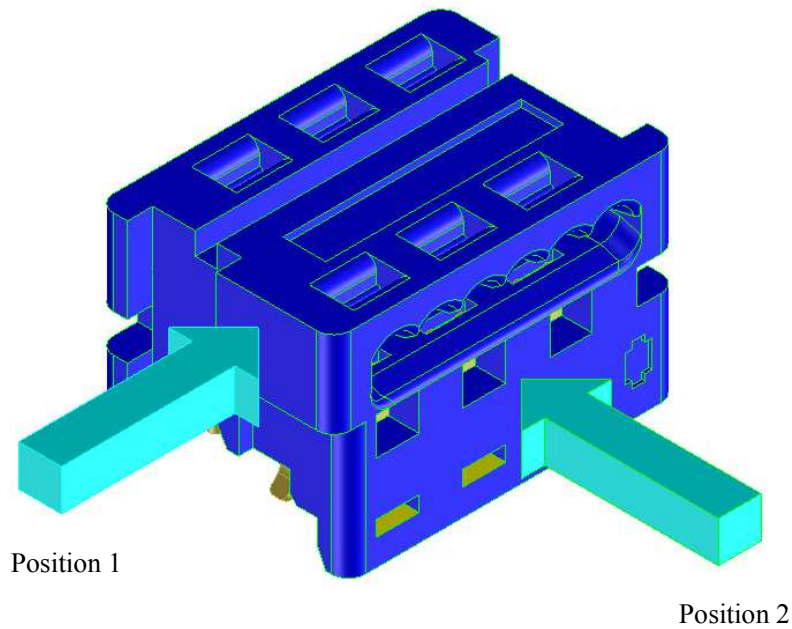
|                                         |             |                                                                                                                        |                                                            |                   |
|-----------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-------------------|
| REVISE ON PC ONLY:                      |             | TITLE:                                                                                                                 | <b>PICOFLEX CONNECTOR SYSTEM<br/>PRODUCT SPECIFICATION</b> |                   |
| W                                       | SEE SHEET 1 |                                                                                                                        |                                                            |                   |
|                                         |             | THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INC. AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION |                                                            |                   |
| REV.                                    | DESCRIPTION |                                                                                                                        |                                                            |                   |
| DOCUMENT NUMBER<br><b>PS-99020-0011</b> |             |                                                                                                                        | FILENAME<br>PS-99020-0011                                  | SHEET<br>12 of 14 |

**APPENDIX C - GLOW WIRE TEST POSITIONS**

Series 90779, 90814, 93405, 90816, 93407, 91330 and 91714



|                                  |             |                                                                                                                        |                                                    |  |                           |  |
|----------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--|---------------------------|--|
| REVISE ON PC ONLY:               |             | TITLE:                                                                                                                 | PICOFLEX CONNECTOR SYSTEM<br>PRODUCT SPECIFICATION |  |                           |  |
| W                                | SEE SHEET 1 |                                                                                                                        |                                                    |  |                           |  |
|                                  |             | THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INC. AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION |                                                    |  |                           |  |
| REV.                             | DESCRIPTION |                                                                                                                        |                                                    |  |                           |  |
| DOCUMENT NUMBER<br>PS-99020-0011 |             |                                                                                                                        |                                                    |  | FILENAME<br>PS-99020-0011 |  |
|                                  |             |                                                                                                                        |                                                    |  | SHEET<br>13 of 14         |  |

Series 91821 and 91935Series 93338

|                                  |             |                                                                                                                        |                                                    |  |               |          |
|----------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--|---------------|----------|
| REVISE ON PC ONLY:               |             | TITLE:                                                                                                                 | PICOFLEX CONNECTOR SYSTEM<br>PRODUCT SPECIFICATION |  |               |          |
| W                                | SEE SHEET 1 |                                                                                                                        |                                                    |  |               |          |
|                                  |             | THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INC. AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION |                                                    |  |               |          |
| REV.                             | DESCRIPTION |                                                                                                                        |                                                    |  | FILENAME      | SHEET    |
| DOCUMENT NUMBER<br>PS-99020-0011 |             |                                                                                                                        |                                                    |  | PS-99020-0011 | 14 of 14 |