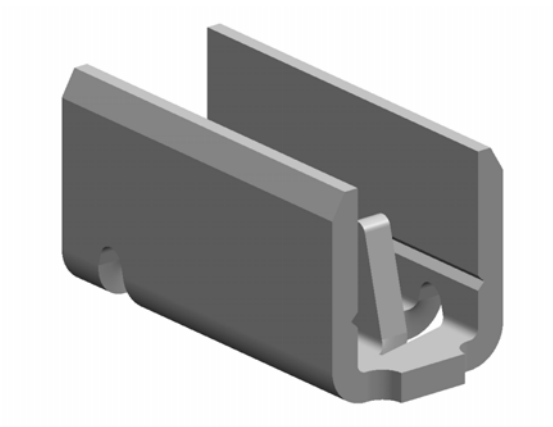




Test Report  
for

Part Number 1286  
Part Number 1293  
Part Number 1295

Revised 11/16/10



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SCOPE:

The intent of this test report is to document test results recorded for various applied conditions to a family of new connectors noted as Part Numbers 1295, 1286, and 1293. The test was designed to verify the reliability of these terminals.

PULL TESTS:

1. Pull tests were performed to illustrate the strength of the wire and connector interface after crimping, while the terminal was surface mounted onto a PCB.

The connector was mounted onto a copper clad .062 inch thick FR4 Printed Circuit Board. Solder paste a thickness of .006" was applied to the solder pad, the terminal was placed, and the board was reflowed through an oven.

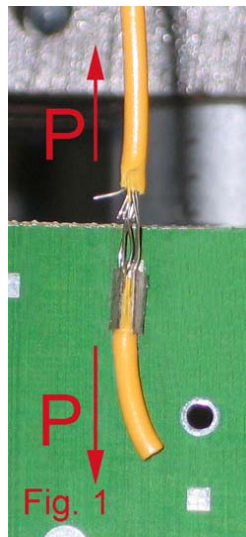
A 50 lb Chatillon force gauge and test stand was used to apply the load. Forces were applied in two directions.

- A. Straight axial tensile load was applied to stranded wire along the axis of the connector.

Load data recorded (in pounds):

| Part Number | Ref. Wire AWG | Pull Force Applied |       |       |       |
|-------------|---------------|--------------------|-------|-------|-------|
|             |               |                    |       |       |       |
| 1295        | 22 AWG        | 13.30              | 11.60 | 11.10 | 8.40  |
| 1286        | 18 AWG        | 16.90              | 19.02 | 20.70 | 21.90 |
| 1293        | 12 AWG        | 40.70              | 42.00 | 44.20 | 29.30 |

Mode of failure was that the wire pulled out of the terminal. The crimped terminal was not deformed. (Fig. 1)

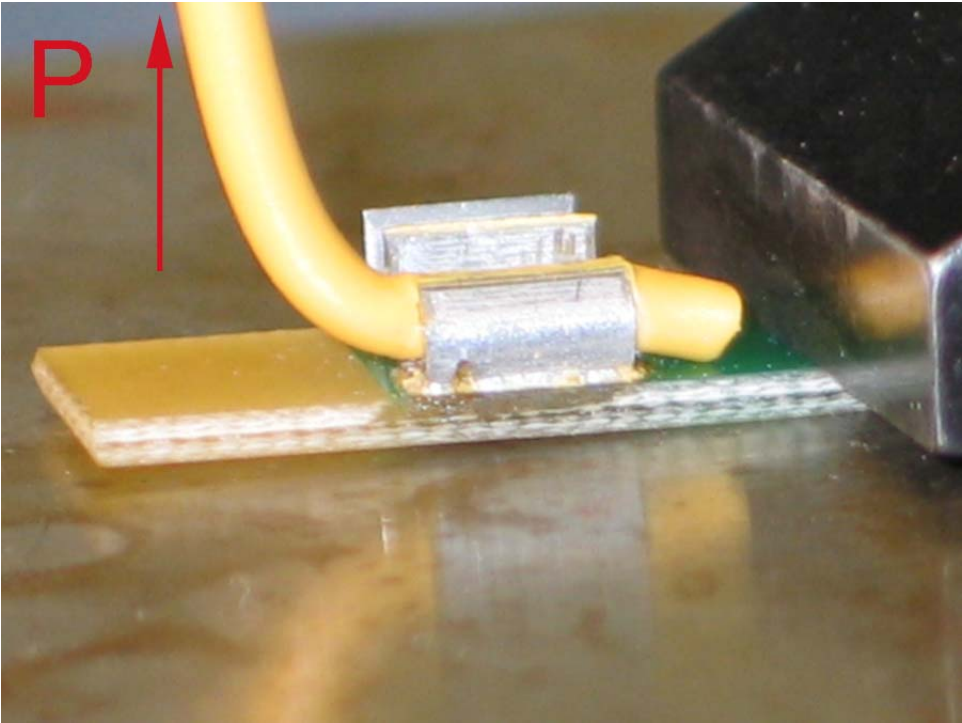


B. Straight axial tensile load was applied to the stranded wire perpendicular to the axis of the connector, pulling away from the surface of the printed circuit board. This was simply a test to determine how much force was required to pull the wire from the connector.

Load data recorded (in pounds):

| Part Number | Ref. Wire AWG | Pull Force Applied |       |       |       |
|-------------|---------------|--------------------|-------|-------|-------|
|             |               |                    |       |       |       |
| 1295        | 22 AWG        | 10.00              | 8.30  | 12.70 | 10.00 |
| 1286        | 18 AWG        | 15.92              | 14.56 | 15.48 | 16.36 |
| 1293        | 12 AWG        | 18.40              | 16.80 | 17.10 | 17.50 |

Mode of failure was that the wire PVC insulation stripped from the wire and/or the crimped terminal deformed slightly during wire pullout. (Fig. 2)



**Fig. 2**

PUSH TESTS:

1. Push force tests were performed to test the terminal's retention to the PC Board.

A 100 lb Chatillon force gauge and test stand was used to apply the load. Forces were applied in two directions.

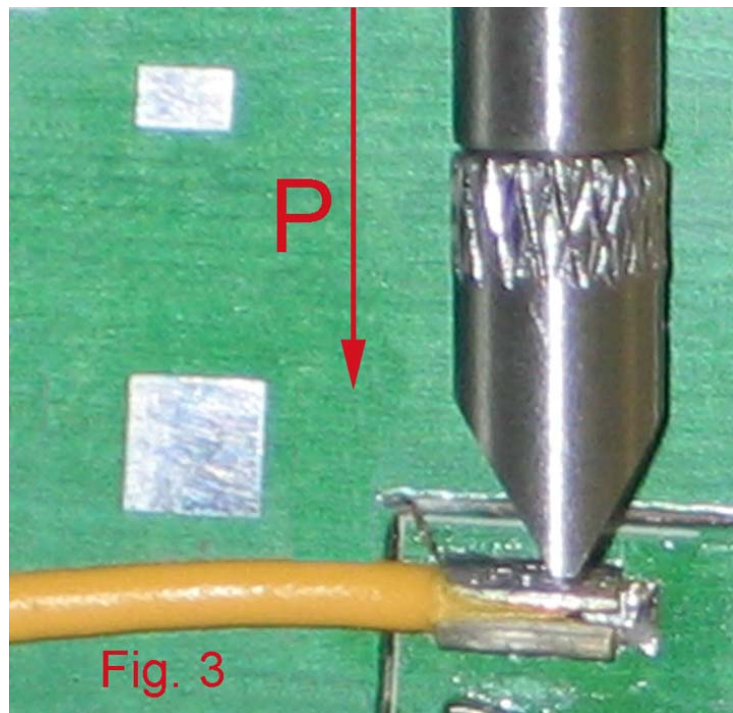
- A. The Push load was applied perpendicular to the axis of the connector along the plane of the Printed Circuit Board while surface mounted, as shown in Figure 3. The push force test was performed with the wire crimped in the connector.

Load data recorded (in pounds):

| Part Number | Ref. Wire AWG | Push Force Applied |       |       |       |
|-------------|---------------|--------------------|-------|-------|-------|
| 1295        | 22 AWG        | 42.16              | 47.62 | 47.84 | 46.35 |
| 1286        | 18 AWG        | 39.22              | 49.76 | 35.58 | 54.90 |
| 1293        | 12 AWG        | 100+               | 100+  | 100+  | 100+  |

(Maximum Load measure on Force Gauge)

Mode of failure was that the solder joint failed. The wire was still retained in the connector. The copper pad remained on the board. The Crimped terminal was not deformed. (Fig.3)

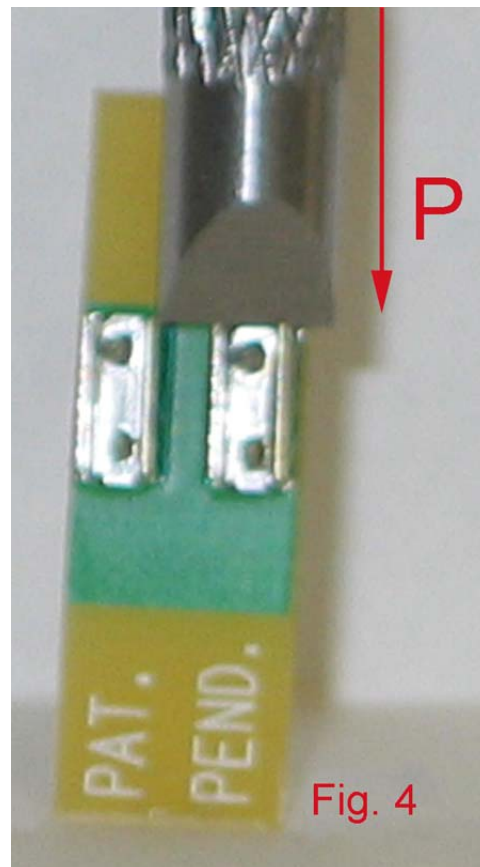


B. The Push load was applied along the axis of the surface mounted connector without a crimped wire, as shown in Figure 4.

Load data recorded (in pounds):

| Part Number | Ref. Wire AWG | Push Force Applied |       |       |       |
|-------------|---------------|--------------------|-------|-------|-------|
|             |               |                    |       |       |       |
| 1295        | 22 AWG        | 66.30              | 62.90 | 55.60 | 79.70 |
| 1286        | 18 AWG        | 79.00              | 45.20 | 69.30 | 51.60 |
| 1293        | 12 AWG        | 96.30              | 100+  | 100+  | 100+  |

Mode of failure was that the solder joint failed and/or the copper pad tore. The uncrimped terminal was not deformed. (Fig. 4)



## AMPACITY DETERMINATION

The heat rise test was performed to determine electrical current limitation per UL 310 standard in which the current limit is established at a 30 degree Celsius rise above ambient.

Six crimped connector specimens for each Part Number were connected in series with the appropriate gauge stranded wire for the given connector. The ambient temperature was recorded first.

The specimens were then connected to a power supply. Current was then applied in increments, and left until thermal equilibrium was achieved. Then the temperature of each connector was recorded with a thermocouple. Wire temperature was recorded as a reference.

**IMPORTANT:** THIS TEST WAS CONDUCTED IN AN OPEN AIR ROOM ENVIRONMENT. IT IS STRONGLY SUGGESTED THAT CUSTOMERS TEST THEIR OWN PARTICULAR CONNECTOR APPLICATIONS.

### Heat Rise Test Data for Part Number 1295

Temperature Rise of each Connector (in Celsius) - Ambient 21.9° C

| <b>Sample</b><br><b>Current</b> | <b>#1</b> | <b>#2</b> | <b>#3</b> | <b>#4</b> | <b>#5</b> | <b>#6</b> | <b>Wire</b><br><b>22</b><br><b>AWG</b> |
|---------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|--|
| 5 Amps                          | 8.0       | 8.0       | 9.0       | 8.9       | 12.3      | 13.4      | 13.3                                   |
| 7 Amps                          | 15.7      | 17.0      | 16.9      | 15.8      | 15.8      | 17.6      | 15.8                                   |
| 8 Amps                          | 21.0      | 20.9      | 26.6      | 22.2      | 22.3      | 26.9      | 24.6                                   |
| 9 Amps                          | 32.4      | 33.7      | 37.6      | 35.5      | 37.6      | 40.3      | 32.5                                   |

It is recommended that no more than 8 Amps is applied.

### **Heat Rise Test Data for Part Number 1286**

Temperature Rise of each Connector (in Celsius) - Ambient 23.8° C

| <b>Sample<br/>Current</b> | <b>#1</b> | <b>#2</b> | <b>#3</b> | <b>#4</b> | <b>#5</b> | <b>#6</b> | <b>Wire<br/>18<br/>AWG</b> |
|---------------------------|-----------|-----------|-----------|-----------|-----------|-----------|----------------------------|
| 15 Amps                   | 16.3      | 16.5      | 18.5      | 16.9      | 20.1      | 15.8      | 13.2                       |
| 16 Amps                   | 21.6      | 35.5      | 46.2      | 28.7      | 29.2      | 26.7      | 19.3                       |
| 18 Amps                   | 22.4      | 47.8      | 49.1      | 30.0      | 31.2      | 28.7      | 25.9                       |

It is recommended that no more than 15 Amps is applied.

### **Heat Rise Test Data for Part Number 1293**

Temperature Rise of each Connector (in Celsius) - Ambient 21.3° C

| <b>Sample<br/>Current</b> | <b>#1</b> | <b>#2</b> | <b>#3</b> | <b>#4</b> | <b>#5</b> | <b>#6</b> | <b>Wire<br/>12<br/>AWG</b> |
|---------------------------|-----------|-----------|-----------|-----------|-----------|-----------|----------------------------|
| 15 Amps                   | 4.1       | 4.0       | 4.7       | 5.5       | 6.2       | 6.3       | 5.3                        |
| 20 Amps                   | 8.4       | 9.0       | 9.1       | 10.9      | 11.2      | 11.9      | 9.8                        |
| 25 Amps                   | 14.5      | 12.8      | 13.3      | 16.4      | 21.1      | 20.7      | 17.5                       |
| 27 Amps                   | 16.1      | 17.6      | 18.2      | 20.5      | 25.7      | 21.8      | 21.1                       |
| 28 Amps                   | 25.3      | 25.3      | 25.8      | 27.7      | 30.7      | 31.5      | 26.3                       |

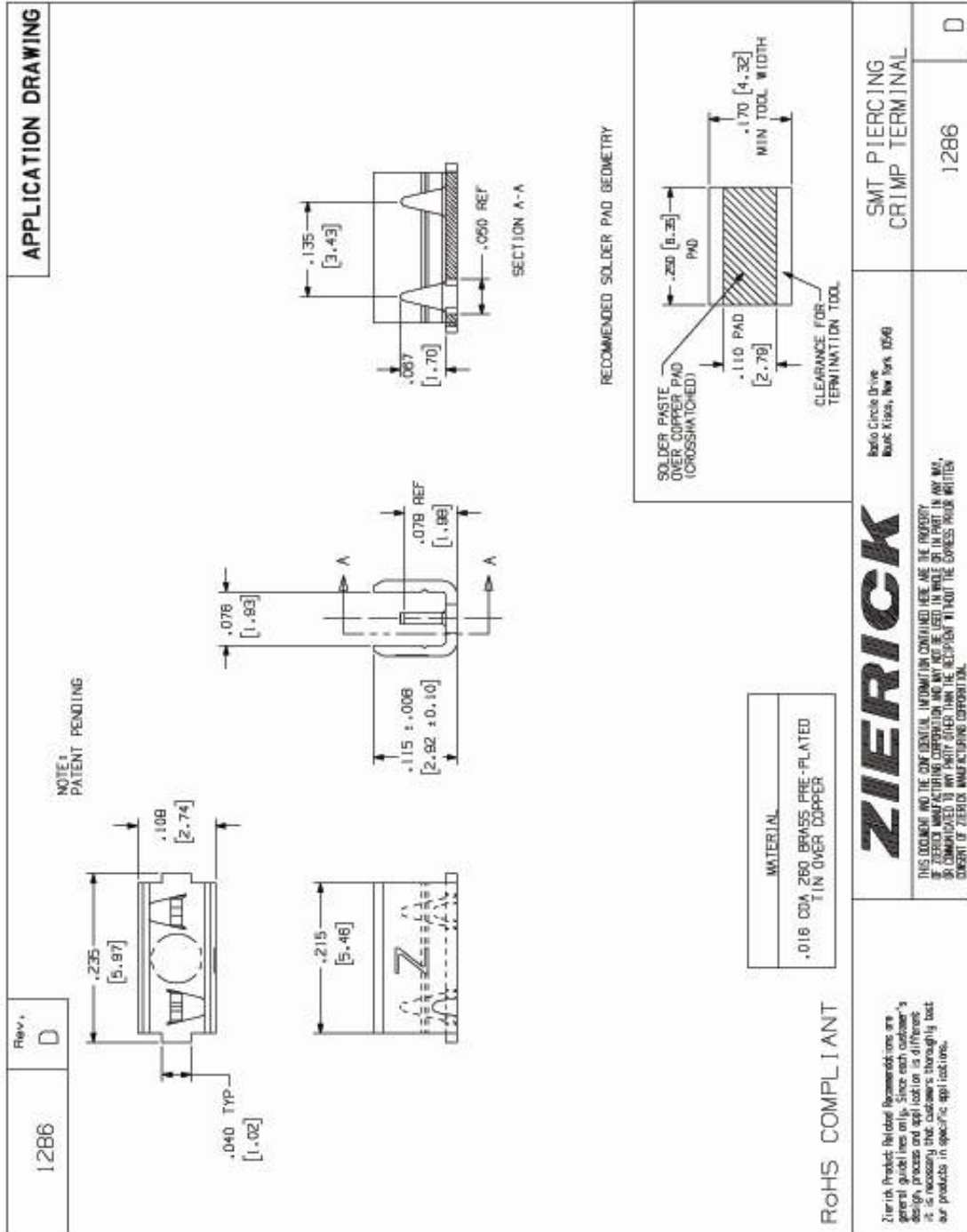
It is recommended that no more than 27 Amps is applied.

# Insulation Piercing Crimp Terminal

|   |  |  |        |                            |  |   |
|---|--|--|--------|----------------------------|--|---|
| 1295  | Rev.<br>A  | <b>APPLICATION DRAWING</b>   |        |                            |  |   |
|   |  |  |        |                            |  |   |
|   |  | <p style="text-align: center;">RECOMMENDED SOLDER PAD GEOMETRY</p>   |        |                            |  |   |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">MATERIAL</td> <td style="width: 50%; text-align: center;">FINISH</td> </tr> <tr> <td style="text-align: center;">.012 CDA 260 PREPLATED TIN</td> <td style="text-align: center;">150 MICRO-INCHES MATTIE TIN<br/>FINISH OVER 100 MICRO-INCH<br/>COPPER UNDERPLATE</td> </tr> </table> |  | MATERIAL   | FINISH | .012 CDA 260 PREPLATED TIN | 150 MICRO-INCHES MATTIE TIN<br>FINISH OVER 100 MICRO-INCH<br>COPPER UNDERPLATE | <p style="text-align: center;"><b>ZIERICK</b></p> <p style="text-align: center;">Radio Circle Drive<br/>Mount Kisco, New York 10548</p> <p style="text-align: center;">22 AWG SMT CRIMP RECEPTACLE<br/>LOOSE PIECE</p> <p style="text-align: center;">1295      A</p> |
| MATERIAL  | FINISH   |  |        |                            |  |   |
| .012 CDA 260 PREPLATED TIN  | 150 MICRO-INCHES MATTIE TIN<br>FINISH OVER 100 MICRO-INCH<br>COPPER UNDERPLATE |  |        |                            |  |   |
| <p style="text-align: center;"><b>RoHS COMPLIANT</b></p> <p style="font-size: small;">Zierick Product Related Specifications are general guidelines only. Since each customer's design process and application is different, it is necessary that customers thoroughly test our products in specific applications.</p>  |  | <p style="font-size: x-small;">THIS DOCUMENT AND THE CONFIDENTIAL INFORMATION CONTAINED HERE ARE THE PROPERTY OF ZIERICK MANUFACTURING CORPORATION AND MAY NOT BE USED IN WHOLE OR IN PART IN ANY WAY, OR COMMUNICATED TO ANY PARTY OTHER THAN THE RECIPIENT WITHOUT THE EXPRESS WRITTEN CONSENT OF ZIERICK MANUFACTURING CORPORATION.</p> |        |                            |  |   |

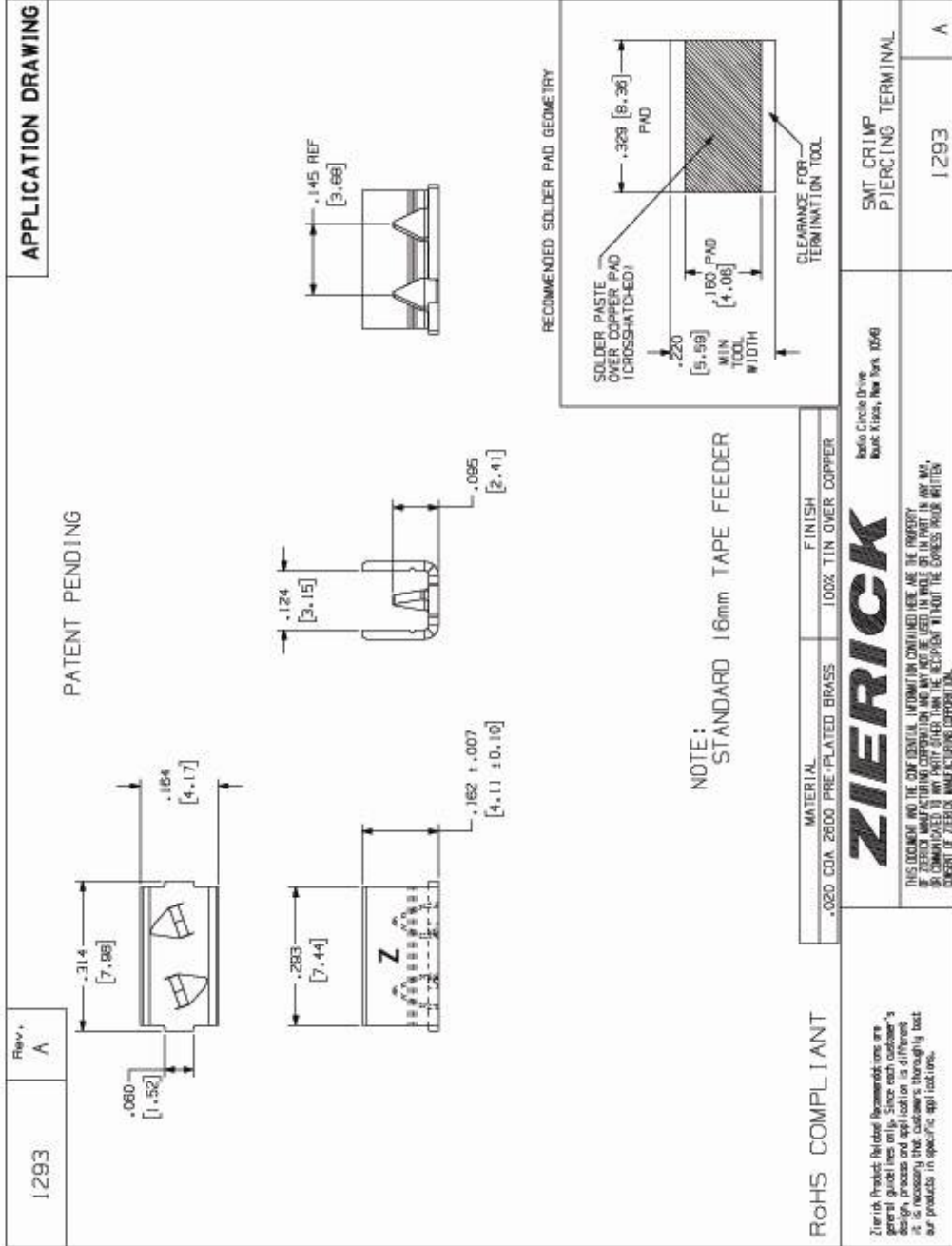
Application Drawing for PN 1295

# Insulation Piercing Crimp Terminal



Application Drawing for PN 1286

# Insulation Piercing Crimp Terminal



Application Drawing for PN 1293