Spring Loaded Contacts

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   One Part Probes
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Spring Loaded Contacts
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ATE Spring Probes Specification

Materials

Plunger
- P1113CA3, P1113CV3: Brass, Gold Finish
- P1113SS3: High Carbon Steel, Nickel finish
- P13-0121, P25-0126: Steel, Gold finish
- Other Two-Part Spring Probes: Beryllium Copper, Gold finish

Barrel
- P26-0126: Phosphor Bronze, Gold finish
  Other Probes: Brass, Gold finish

Spring
- P1113xx3, P25-0126: Phosphor Bronze, Gold finish
- Other Two-Part Spring Probes: Spring Steel, Gold finish

Sleeve
- S13-503: Phosphor Bronze, Gold finish
  Others: Brass, Gold finish

Packaging

Format: Loose

Electrical

Current
- P1113xx3: 2A max
- P13-xx23: 1.5A
- Other Two-Part Spring Probes: 3A

Contact resistance
- P1113xx3: 50mΩ max
- P13-xx23, P19-xx21: 100mΩ max at 2/3 travel
- P25-4021: 100mΩ max at 2/3 travel
- P25-0822, P25-xx23, P25-xx26: 50mΩ max at 2/3 travel
- P25-xx26: 30mΩ max

Mechanical

Durability: 100,000 operations min
Full travel: See individual pages
Spring force at full travel: See individual pages

Environmental

Operating temperature: -40°C to +180°C

Plunger Head Styles

<table>
<thead>
<tr>
<th>HEAD STYLE</th>
<th>TYPICAL USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPEAR, CONVEX</td>
<td>PCB lands and pads, clean plated through holes</td>
</tr>
<tr>
<td>CONVEX RADIUS, SPHERICAL RADIUS</td>
<td>Edge fingers, some connectors; positive contacts without marking or indentations</td>
</tr>
<tr>
<td>FLAT</td>
<td>Clean male pins, lands and pads</td>
</tr>
<tr>
<td>CONCAVE, CONCAVE RADIUS</td>
<td>Clean leads or clean terminal pins</td>
</tr>
<tr>
<td>SERRATED</td>
<td>Slightly contaminated leads, pin and blades; male connector pins</td>
</tr>
<tr>
<td>STAR</td>
<td>PCB plated through holes, connector testing; self-cleaning</td>
</tr>
<tr>
<td>TULIP</td>
<td>General purpose; 6 outer points, one central; self-cleaning</td>
</tr>
<tr>
<td>CROWN</td>
<td>Contaminated PCB leads and pads; self-cleaning</td>
</tr>
</tbody>
</table>

All dimensions in mm.
ATE Spring Probes

One-Part Test Probes

- Single piece spring test probe, with a selection of head styles for different probing surfaces.
- Can be assembled as either clearance fit and glued to a test jig, and wire attached to the rear groove, or clearance fit and soldered to a PCB for electrical connection.

**Mechanical**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Full travel</strong></td>
<td>3.18mm</td>
</tr>
<tr>
<td><strong>Spring force</strong></td>
<td></td>
</tr>
<tr>
<td>At full travel</td>
<td>0.75N</td>
</tr>
<tr>
<td>At working length (2.20mm travel):</td>
<td>0.54N</td>
</tr>
</tbody>
</table>

- Suitable for a minimum pitch spacing of 3mm.
- Recommended PC Board Hole: Ø2.20mm (clearance fit) or Ø2.00mm (interference fit).

**CONCAVE RADIUS HEAD**

<table>
<thead>
<tr>
<th></th>
<th>ORDER CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø2.39</td>
<td>P1113CA3</td>
</tr>
<tr>
<td>Ø1.02</td>
<td></td>
</tr>
<tr>
<td>SR3.05</td>
<td></td>
</tr>
</tbody>
</table>

**CONVEX RADIUS HEAD**

<table>
<thead>
<tr>
<th></th>
<th>ORDER CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø2.39</td>
<td>P1113CV3</td>
</tr>
<tr>
<td>Ø1.02</td>
<td></td>
</tr>
<tr>
<td>SR3.05</td>
<td></td>
</tr>
</tbody>
</table>

**CONVEX HEAD**

<table>
<thead>
<tr>
<th></th>
<th>ORDER CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø2.34</td>
<td>P1113SS3</td>
</tr>
<tr>
<td>Ø1.02</td>
<td></td>
</tr>
<tr>
<td>65°</td>
<td></td>
</tr>
</tbody>
</table>

All dimensions in mm.

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ATE Spring Probes

Two-Part Test Probes for 1.27mm Pitch

- Two piece test probe – probe can be replaced when damaged or worn out, without re-soldering to test jig.
- Sleeve can be assembled as either interference fit to a test jig, and wire attached to the rear bore, or clearance fit and soldered to a PCB for electrical connection.
- Slim miniature probes, suitable for mounting at 1.27mm pitch between centres.

### Mechanical

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full travel</td>
<td>2.65mm</td>
</tr>
<tr>
<td>Spring force</td>
<td>At full travel: 1.18N&lt;br&gt;At 2/3 travel: 0.88N</td>
</tr>
</tbody>
</table>

### Two-Part Test Probes

<table>
<thead>
<tr>
<th>Head Type</th>
<th>Dimensions</th>
<th>Probe Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONCAVE</td>
<td>Ø0.90 x 2.65 x 1.27</td>
<td>P13-1123</td>
</tr>
<tr>
<td>CONVEX</td>
<td>Ø0.90 x 2.65 x 1.27</td>
<td>P13-2123</td>
</tr>
<tr>
<td>SERRATED</td>
<td>Ø0.90 x 2.65 x 1.27</td>
<td>P13-4023</td>
</tr>
</tbody>
</table>

### Sleeve

- Suitable for use with 30AWG wire.

All dimensions in mm.
## ATE Spring Probes

### Two-Part Test Probes for 1.90mm Pitch

- Two piece test probe – probe can be replaced when damaged or worn out, without re-soldering to test jig.
- Sleeve can be assembled as either interference fit to a test jig, and wire attached to the rear bore, or clearance fit and soldered to a PCB for electrical connection.
- Slim miniature probes, suitable for mounting at 1.90mm pitch between centres.

### Mechanical

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full travel</td>
<td>2.54mm</td>
</tr>
<tr>
<td>Spring force</td>
<td></td>
</tr>
<tr>
<td>At full travel</td>
<td>1.26N</td>
</tr>
<tr>
<td>At 2/3 travel</td>
<td>0.88N</td>
</tr>
</tbody>
</table>

### SPEAR HEAD

ORDER CODE

P19-0121

### CONCAVE HEAD

ORDER CODE

P19-1121

### CONVEX HEAD

ORDER CODE

P19-2221

### SERRATED HEAD

ORDER CODE

P19-4021

### SLEEVE

- Suitable for use with 24 to 30AWG wire.

ORDER CODE

S19-501

---

All dimensions in mm.
ATE Spring Probes

Two-Part Test Probes for 2.54mm Pitch

- Two piece short probe, for low-profile test jigs.
- Can be mounted at 2.54mm pitch between centres.
- Serrated Head style – see Introduction page for applications.

**Mechanical**

**Full travel:** 1.50mm

**Spring force**
- At full travel: 1.08N
- At 2/3 travel: 0.78N

**7.5mm BODY**

![Diagram of 7.5mm BODY probe]

**SLEEVE**

- Suitable for use with 22 to 30AWG wire.

![Diagram of Sleeve]

All dimensions in mm.
ATE Spring Probes

Two-Part Test Probes for 2.54mm Pitch

- Two piece test probe – probe can be replaced when damaged or worn out, without re-soldering to test jig.
- Medium-length probes for 2.54mm minimum pitch, with 4.2mm travel.
- Applicable sleeves shown on following page.

### Mechanical

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full travel</td>
<td>4.20mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spring force</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>At full travel</td>
<td>1.47N</td>
</tr>
<tr>
<td>At 2/3 travel</td>
<td>1.13N</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order Code</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>P25-xx23</td>
<td></td>
</tr>
<tr>
<td>Ø0.75 (P25-0822)</td>
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</tr>
</tbody>
</table>

**Flat Head**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø1.80</td>
<td></td>
</tr>
</tbody>
</table>

**Spear Head**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>45°</td>
<td></td>
</tr>
</tbody>
</table>

**Spherical Radius Head**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>60°</td>
<td></td>
</tr>
</tbody>
</table>

**Concave Head**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>90°</td>
<td></td>
</tr>
</tbody>
</table>

**Convex Head**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>90°</td>
<td></td>
</tr>
</tbody>
</table>

**Serrated Head**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>60°</td>
<td></td>
</tr>
</tbody>
</table>

**Star Head**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>90°</td>
<td></td>
</tr>
</tbody>
</table>

All dimensions in mm.
ATE Spring Probes

Two-Part Test Probes for 2.54mm Pitch

- For use with probes with 18.5mm body length, as shown on previous page.
- Sleeve can be assembled as either interference fit to a test jig, and wire attached to the rear bore, or clearance fit and soldered to a PCB for electrical connection.

SOLDER CUP SLEEVE

- Suitable for use with 22 to 30AWG wire.

WIRE-WRAP TAIL SLEEVE

- Suitable for use with 22 to 30AWG wire.

SOLDER BARREL SLEEVE

- Suitable for use with 22 to 30AWG wire.

All dimensions in mm.
ATE Spring Probes

Two-Part Test Probes for 2.54mm Pitch

- Two piece test-probe – probe can be replaced when damaged or worn out, without re-soldering to test jig.
- Sleeve can be assembled as either interference fit to a test jig, and wire attached to the rear bore, or clearance fit and soldered to a PCB for electrical connection.
- Long length probe bodies with 6.3mm travel, for 2.54mm minimum pitch.

### Mechanical

- **Full travel:** 6.30mm
- **Spring force**
  - At full travel: 2.45N
  - At 2/3 travel: 1.67N

### Dimensions

- **SPEAR HEAD**
  - ORDER CODE: P25-0126
  - Ø1.75
  - 2.00
  - 8.30
  - 30°

- **TULIP HEAD**
  - ORDER CODE: P25-1726
  - Ø1.50
  - 2.00
  - 6.30
  - 35°

- **CROWN HEAD**
  - ORDER CODE: P25-3226
  - Ø1.50
  - 2.00
  - 6.30
  - 60°

- **SERRATED HEAD**
  - ORDER CODE: P25-4026
  - Ø1.50
  - 2.00
  - 6.30

### WIRE WRAP TAIL SLEEVE

- ORDER CODE: S25-346
- Ø1.75
- 0.64 square
- Recommended PC Board Pattern

### SOLDER BARREL SLEEVE

- ORDER CODE: S25-546
- Ø1.75
- 0.123 Internal Diameter
- Recommended PC Board Pattern

All dimensions in mm.

---

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# Spring Loaded Contact Specification

## Materials
- **Plunger:** Brass, Gold finish
- **Barrel:** Brass, Gold finish
- **Spring:** Stainless Steel

## Packaging
- **Format:** See individual pages
- **Connectors:** Tape and Reel
- **Single contacts:** See individual pages

## Electrical
- **Current:** 2A or 1A (see individual pages)
- **Contact resistance:** 50mΩ max

## Mechanical
- **Durability:** 10,000 operations
- **Spring force at working height:** See individual pages

## Environmental
- **Operating temperature:** -40°C to +85°C
- **Solderability:** 235°C for 5 seconds
- **Soldering heat resistance:** 260°C for 10 seconds
Spring Loaded Contacts

Single Spring Loaded Contacts – SMT with Peg

- These pogo pins are intended to be used as surface mount with a location peg, but they can also be used as a throughboard tail version.
- Available in Tape and Reeled packaging format for automated assembly methods.
- Gold finish for improved wear resistance.
- Additional height options shown on following page.

Packaging

Reel quantity
- P70-6000045R: 1,800 on a Ø330mm reel
- P70-2000045R: 800 on a Ø330mm reel
- P70-2010045R: 700 on a Ø330mm reel

Electrical

Current
- P70-6000045R: 1A
- P70-2000045R: 2A
- P70-2010045R: 2A

Mechanical

Spring force at working height
- P70-6000045R: 0.39N ±0.09N at 2.10mm working height
- P70-2000045R: 1.27N ±0.34N at 2.90mm working height
- P70-2010045R: 1.32N +0.39/-0.29N at 4.00mm working height

All dimensions in mm.

ORDER CODE

P70-6000045R

P70-2000045R

P70-2010045R

ORDER CODE

P70-2000045R

ORDER CODE

P70-2010045R

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Spring Loaded Contacts

Single Spring Loaded Contacts – SMT with Peg

- These pogo pins are intended to be used as surface mount with a location peg, but they can also be used as a throughboard tail version.
- Available in Tape and Reeled packaging format for automated assembly methods.
- Gold finish for improved wear resistance.
- Additional height options shown on previous page.

= Packaging

Reel quantity
- P70-2100045R: 600 on a Ø330mm reel
- P70-2300045R: 580 on a Ø330mm reel
- P70-2200045: Loose

= Electrical

Current: 2A

= Mechanical

Spring force at working height
- P70-2100045R: 0.68N ±0.24N at 4.50mm working height
- P70-2300045R: 0.83N ±0.25N at 4.90mm working height
- P70-2200045: 0.98 ±0.19N at 7.10mm working height

5.5mm FREE HEIGHT

6.2mm FREE HEIGHT

8.2mm FREE HEIGHT

All dimensions in mm.
Spring Loaded Contacts

Single Spring Loaded Contacts – Surface Mount

- Also referred to as Pogo pins, used for individual contacts or irregular layout requirements.
- Available in Tape and Reeled packaging format for automated assembly methods.
- Gold finish for improved wear resistance.
- Additional height options shown on following page.

Packaging

Reel quantity
- P70-5000045R: 2,000 on a Ø330mm reel
- P70-7000045: Loose
- P70-5100045: Loose

Electrical

Current
- P70-5000045R: 1A
- P70-7000045: 2A
- P70-5100045: 2A

Mechanical

Spring force at working height
- P70-5000045R: 0.68N ±0.19N at 1.90mm working height
- P70-7000045: 0.68N ±0.19N at 2.00mm working height
- P70-5100045: 0.98N ±0.29N at 4.00mm working height

All dimensions in mm.

2.4mm FREE HEIGHT

2.5mm FREE HEIGHT

4.8mm FREE HEIGHT
Spring Loaded Contacts

Single Spring Loaded Contacts – Surface Mount

- Also referred to as Pogo pins, used for individual contacts or irregular layout requirements.
- Available in Tape and Reeled packaging format for automated assembly methods.
- Gold finish for improved wear resistance.
- Additional height options shown on following page.

### Packaging

<table>
<thead>
<tr>
<th>Reel Quantity</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>P70-1100045R:</td>
<td>650 on a Ø330mm reel</td>
</tr>
<tr>
<td>P70-1030045R:</td>
<td>650 on a Ø330mm reel</td>
</tr>
<tr>
<td>P70-1000045R:</td>
<td>1,400 on a Ø330mm reel</td>
</tr>
<tr>
<td>P70-1010045R:</td>
<td>800 on a Ø330mm reel</td>
</tr>
<tr>
<td>P70-1020045R:</td>
<td>700 on a Ø330mm reel</td>
</tr>
</tbody>
</table>

### Electrical

- Current: 2A

### Mechanical

- Spring force at working height:
  - P70-1100045R: 1.23N ±0.34N at 5.00mm working height
  - P70-1030045R: 0.88N ±0.29N at 2.90mm working height
  - P70-1010045R: 1.17N ±0.29N at 4.00mm working height
  - P70-1020045R: 1.17N ±0.29N/-0.19N at 4.50mm working height
  - P70-1030045R: 1.29N ±0.29N at 6.20mm working height

### 6.3mm FREE HEIGHT

- Ø1.50
- Ø0.90
- Ø1.80
- Ø1.60
- Ø2.00

### 3.5mm TO 7.3mm FREE HEIGHT

- Ø0.90
- Ø1.50
- Ø1.60
- Ø2.20

#### Recommended PC Board Pattern

All dimensions in mm.
Contact Pads

Surface Mount Contacts

- Surface mountable contact pad, ideal as a mating area for Spring Contacts, Spring Loaded Contacts and Spring Loaded Contact Connectors.
- Available in Tape and Reeled packaging format for automated assembly methods.
- Gold finish for improved wear resistance.
- Available in 3 shapes, with a choice of pad dimensions.

Materials

Base material: Beryllium Copper
Finish: Gold

Electrical

Current: 6A
Contact resistance: 0.15mΩ max

Environmental

Operating temperature: -40°C to +180°C

CIRCULAR

ORDER CODE DIM L DIM W DIM T TAPE & REEL
S70-332002045R 2.00 1.60 0.15 4,000 on a Ø178 reel

RECTANGULAR

ORDER CODE DIM L DIM W DIM T TAPE & REEL
S70-125161545R 2.50 1.60 0.15 4,000 on a Ø178 reel
S70-138181045R 3.80 1.80 0.10 2,000 on a Ø178 reel
S70-138305045R 3.80 3.00 0.50 2,000 on a Ø178 reel

OVAL

ORDER CODE DIM T TAPE & REEL
S70-220101045R 0.10 9,000 on a Ø178 reel
S70-220102045R 0.20 9,000 on a Ø178 reel

All dimensions in mm.