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Introduction



Spring Contacts Contents

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260

274

Spring Contacts	
Specifications	262
Antenna: Positive Stop	263
Antenna: Extended C Style	264
C Style	265
Box Style	266
Multi-Directional	267
Development Kit	268
Pogo Pins	
Specifications	269
SMT with PC Tail	270
SMT, no PC Tail	272

SMT Contact Pads

Spring Contact Introduction

These designs provide single contact points with high durability (number of mating cycles) and require no special shape of mating surface or connector.

The Spring Contact family provides a choice of single contact options, that mate with flat metal surfaces. The spring force designed into the contact gives a positive connection, maintaining electrical connectivity between the assembled contact and another PCB, an antenna, a grounding plane, or the outer enclosure panels. Suitable for passing a full current, or for use as a grounding element with trickle current.

- ➤ Free heights from 1.23mm to 8.20mm, recommended working heights from 0.90mm to 7.10mm
- ▶ Total flexibility with multiple design styles and performance capabilities
- High mating durability, from 1,000 to 10,000 minimum operations
- Most designs supplied on Tape and Reel packaging, for fully automated assembly systems within high volume manufacturing applications
- Stocked in depth throughout Harwin's authorized distributor network

Spring Contacts

Manufactured from various grades and compositions of Copper Alloy, these products utilise the inherent spring properties of the metal to provide the spring force.

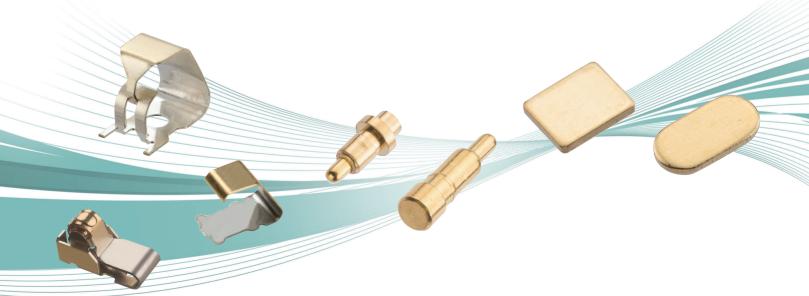
- ► Rated from 1A to 9A max current, depending on design.
- ♣ Alternative uses include grounding contacts, antenna contacts, single or parallel connections. Also called Spring Fingers.

Pogo Pins

- Precision construction consisting of plunger, barrel and inner miniature stainless steel spring.
- Provides robust connections with high mating cycle durability of 10,000 operations.
- Design options for heights and additional locating peg to assist with SMT mating and vertical stability.

SMT Contact Pads

- Provides a mating connection surface with a compatible gold finish for either the spring contact or pogo pin designs.
- Choice of three shapes and pad depths up to 0.5mm.
- Supplied in Tape and reel for easy automation during assembly.





Spring Contact Product Features

Spring Contacts - Simple flexible designs

Single piece contact designs with a variety of additional features. Small and compact, down to ultra-miniature for mobile antenna connection.



Spring Contacts - Positive Stop design

Rigid upstands on the lower contact surface prevent the mating surface from completely flattening the contact.



Spring Contacts – Anti-hooking design

Full 360 degree loop, to prevent the end of the upper contact surface from getting snagged during or after production and installation. Known as a Box style.



Spring Contacts & SMT Pads – Automated placement

Supplied as standard in tape and reel for fast and easy high volume automated assembly. Pick and place location built into the design.



Pogo Pins - SMT Locating Peg

Additional locating peg on base of contact, to assist with SMT location during assembly, and also maintain vertical stability during all assembly operations.



Pogo Pins - Automated placement

Most designs supplied as standard in tape and reel for high volume automated assembly. Pick and place caps pre-assembled to provide vacuum nozzle location.







Spring Contact Specifications

→ Materials

Base Metal

S1741, S7131 to S7191: S1941, S1951, S7061-46R: Others:

Finish:

Phosphor Bronze Beryllium Copper Titanium Copper

See individual product

: Environmental

Operating temperature

S1001: S7131 to S7191: S7221 to S7271: Others: -40°C to +150°C -20°C to +70°C -40°C to +85°C -55°C to +125°C

ORDER CODE	CURRENT (MAX)	DURABILITY (OPERATIONS)	WORKING HEIGHT	FORCE AT WORKING HEIGHT
S1741-46R	6A	5,000	1.75mm	1.50N
S1761-XXR	4A	1,500	2.50mm	1.50N
\$1791-42R	3A	1,500	3.00mm	1.00N
S1941-XXR	9A	5,000	6.95mm	1.20N
S1951-46R	7A	5,000	6.75mm	1.20N
S7041-42R	5A	1,500	3.40mm	1.20N
S7051-42R	4A	2,500	4.50mm	1.20N
\$7061-XXR	4A	2,500	4.60mm	1.20N
S7071-46R	5A	3,500	2.10mm	1.20N
\$7081-42R	4A	1,000	2.10mm	1.20N
S7091-42R	6A	2,000	2.30mm	1.20N
S7101-42R	3A	2,500	3.00mm	1.20N
S7111-42R	6A	2,000	3.80mm	1.20N
S7121-42R	4A	3,000	1.50mm	1.20N
S7131-45R	1A	10,000	1.20mm	0.49N
S7141-45R	1A	10,000	1.65mm	0.49N
S7151-45R	1A	10,000	2.15mm	0.49N
S7161-45R	1A	10,000	2.65mm	0.49N
S7171-45R	1A	10,000	3.15mm	0.49N
S7181-45R	1A	10,000	3.65mm	0.49N
S7191-45R	1A	10,000	4.15mm	0.49N
S7221-45R	1A	10,000	0.90mm	0.39N
S7231-45R	1A	10,000	0.98mm	0.39N
S7241-45R	1A	10,000	1.00mm	0.39N
S7251-45R	1A	10,000	1.20mm	0.58N
S7261-45R	1A	10,000	1.20mm	0.78N
S7271-45R	1A	10,000	1.70mm	0.39N

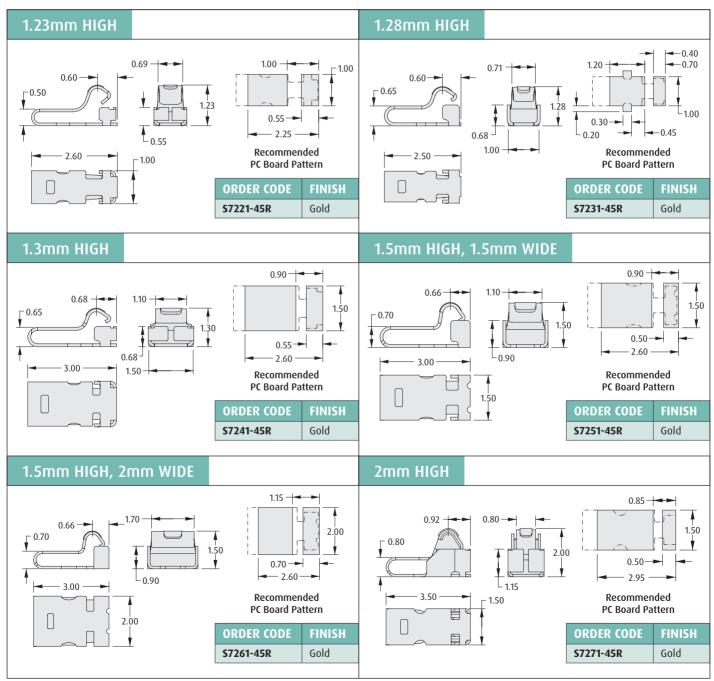




Antenna Contacts with Positive Stop

- **▶** Extended beam miniature spring contacts, ultra-low profile.
- Ideal for antenna feed in mobile devices, LED lamp connections or RFID tags.
- Ultra-low connection system free height from just 1.23mm to 2mm
- Positive Stop to prevent over-compression and permanent set.
- Surface Mount with Pick and Place area for automated placement.

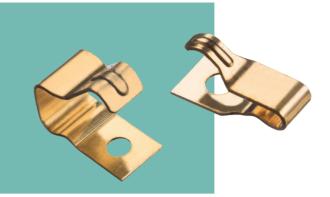




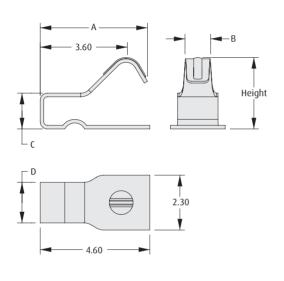


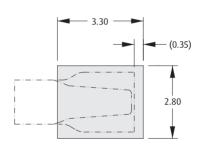
Extended Antenna Contacts

- **►** Extended beam miniature spring contacts, ideal for antenna feed in mobile devices.
- **▶** Identical footprint contacts, with incremental step heights from 2mm to 5mm.
- **▶** Suitable for both wiping and sliding actions.
- Surface Mount with Pick and Place area for automated placement.
- ▶ Packaged in standard (EIA 481) Tape & Reel format.



EXTENDED ANTENNA CONTACTS





Recommended PC Board Pattern

HOW TO ORDER

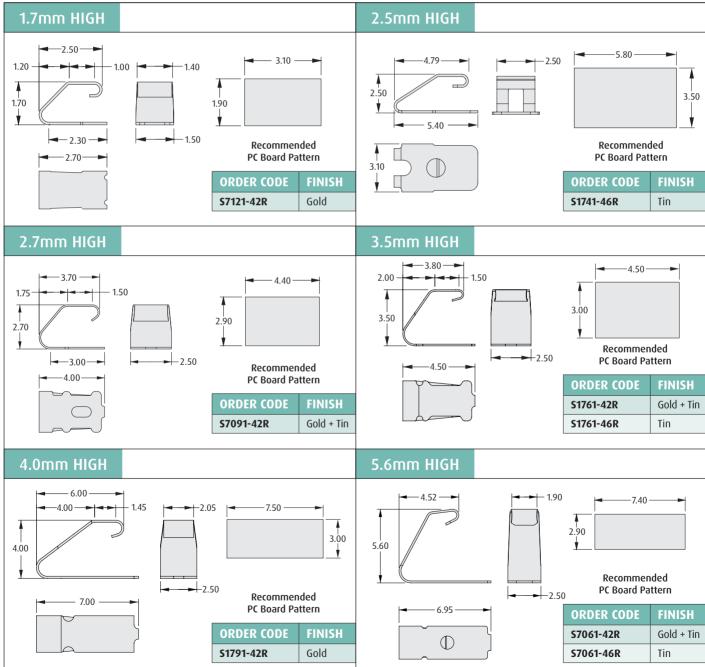
PART NO.	HEIGHT	DIM A	DIM B	DIM C	DIM D	FINISH
S7131-45R	2.00	4.30	0.80	1.00	1.55	Gold
S7141-45R	2.50	4.50	0.80	1.00	1.55	Gold
S7151-45R	3.00	4.50	0.90	1.50	1.70	Gold
S7161-45R	3.50	4.50	1.05	2.00	1.95	Gold
S7171-45R	4.00	4.50	1.36	2.50	2.30	Gold
S7181-45R	4.50	4.50	1.82	3.00	2.50	Gold
S7191-45R	5.00	4.50	2.08	3.50	3.00	Gold



Grounding/RFI Contacts

- **▶** SMT devices for use in shielding and grounding applications.
- ► For use on surface mount PCBs, in contact with metal shields or frames.
- **▶** Suitable for both wiping and sliding actions.
- ▶ Ideal for automated requirements, using standard placement equipment.



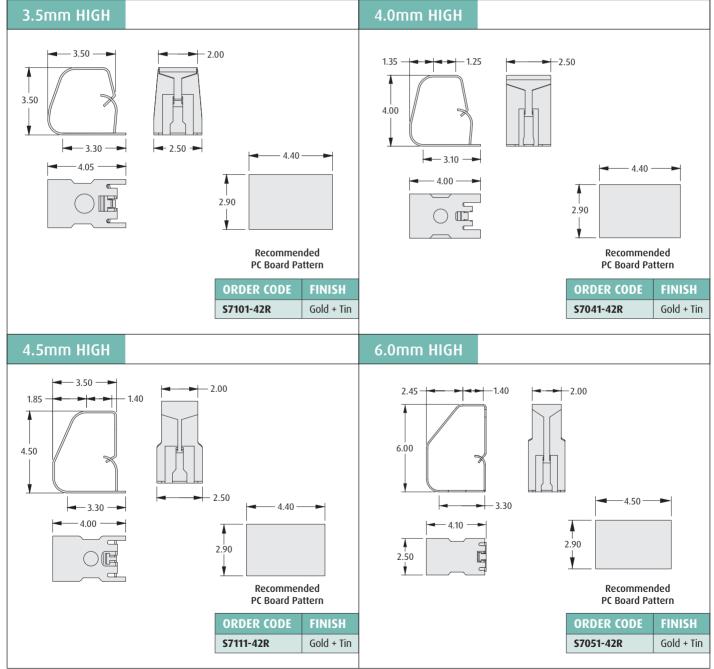




Grounding/RFI Contacts

- ▶ Prevents EMC noise and static.
- **♪** Simple and effective method for connecting multiple PCBs.
- ► No special tooling required, uses standard Pick and Place equipment.
- ▶ Protected tips prevent product from hooking.







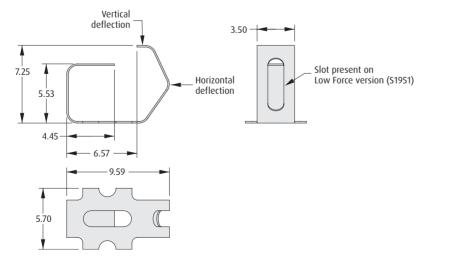
Grounding/RFI Contacts

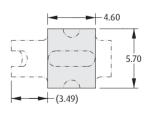
- ▶ Packaged in standard (EIA 481) Tape & Reel format.
- Spring contacts maintain a positive force and stable electrical contact.
- ▶ Small PCB footprint.
- ➤ Multi-Directional contacts can be used in either vertical or horizontal orientations.



2.5mm HIGH 2.75mm HIGH - 2.85 **-**▶ 1.50 -1.50 1.20 2.50 1.80 - 3.18 Ø3.18 **←** 2.70 **←** 3.15 -6.65 3.90 - 3.50 2.30 2.00 2.40 3.60 Recommended Recommended PC Board Pattern PC Board Pattern **ORDER CODE FINISH ORDER CODE** FINISH S7071-46R Tin S7081-42R Gold + Tin

MULTI-DIRECTION





Recommended PC Board Pattern

ORDER CODE	TYPE	FINISH
S1941-42R	Normal Force	Gold + Tin
S1941-46R	Normal Force	Tin
S1951-46R	Low Force	Tin



Development Kit

- ▶ Selection of 16 different Spring Contacts in one box.
- ▶ Ideal for prototyping on new projects.
- ▶ Free refills available on all Spring Contacts.
- ➤ For individual contact details, see previous catalog pages or search for the part number on www.harwin.com.





- ► External box dimensions are 338mm x 261mm, 57mm high
- ➤ Free refills available registration card included with each box with further details on claiming your spring contact replacements.



: Box Contents

ORDER CODE	CONTACT STYLE	QUANTITY
S7221-45R	Positive Stop	20
S7271-45R	Positive Stop	20
S7121-42R	C Style	20
S1741-46R	C Style	20
S1761-42R	C Style	20
S1761-46R	C Style	20
S1791-42R	C Style	20
S7061-42R	C Style	20
S7061-46R	C Style	20
S7131-45R	Extended Antenna	20
S7161-45R	Extended Antenna	20
S7101-42R	Box Style	20
S7051-42R	Box Style	20
S7071-46R	C/Box Style	20
S7081-42R	Point Contact 20	
S1941-46R	Multi-Direction 20	

ORDER CODE
DEV-001



Pogo Pin Specification

∴ Materials

Plunger:Brass, Gold finishBarrel:Brass, Gold finishSpring:Stainless Steel

→ 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



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

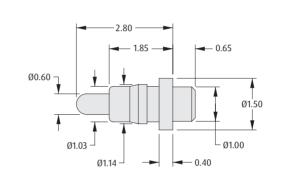
Spring force at working height

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

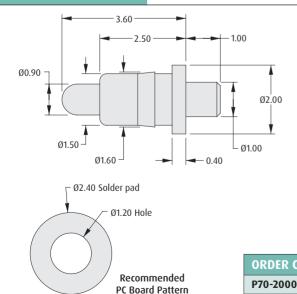
2.8mm FREE HEIGHT





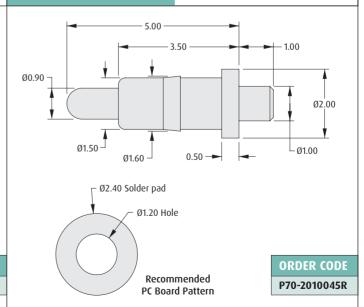
ORDER CODE P70-6000045R

3.6mm FREE HEIGH1



ORDER CODE P70-2000045R

5.0mm FREE HEIGHT





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

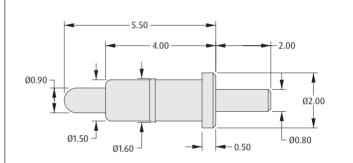
Current: 2A

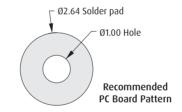
→ Mechanical

Spring force at working height

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

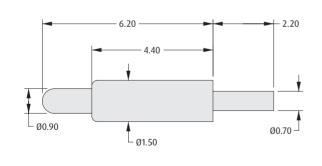
5.5mm FREE HEIGHT





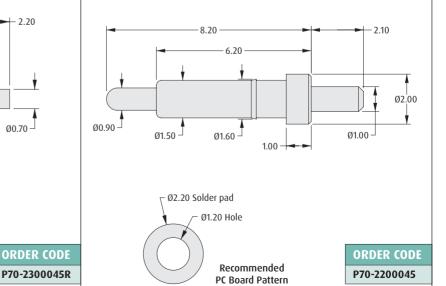
ORDER CODE P70-2100045R

6.2mm FREE HEIGHT





8.2mm FREE HEIGHT





Single Spring Loaded Contacts - Surface Mount

- **▶** 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

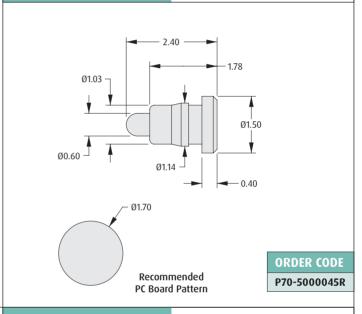
P70-5000045R: 1A P70-7000045: 2A P70-5100045: 2A

→ Mechanical

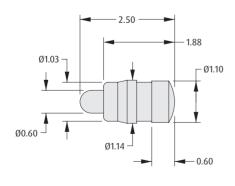
Spring force at working height

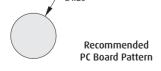
P70-5000045R: 0.68N \pm 0.19N at 1.90mm working height P70-7000045: 0.68N \pm 0.19N at 2.00mm working height 0.98N \pm 0.29N at 4.00mm working height

2.4mm FREE HEIGHT



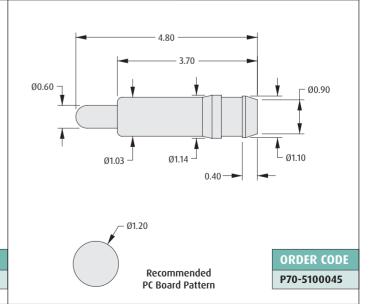
2.5mm FREE HEIGHT





ORDER CODE P70-7000045

4.8mm FREE HEIGHT





Single Spring Loaded Contacts - Surface Mount

- **▶** 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

P70-1100045R: 650 on a Ø330mm reel P70-1030045R: 650 on a Ø330mm reel P70-1000045R: 1,400 on a Ø330mm reel P70-1010045R: 800 on a Ø330mm reel P70-1020045R: 700 on a Ø330mm reel

: Electrical

Current: 2A

: Mechanical

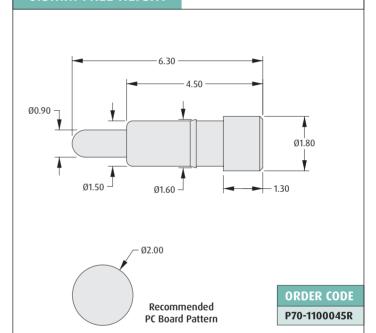
Spring force at working height

P70-1100045R: 1.23N ±0.34N at 5.00mm working height 0.88N ±0.29N at 2.90mm working height 1.17N ±0.29N at 4.00mm working height 1.17N ±0.29N/-0.19N at 4.50mm

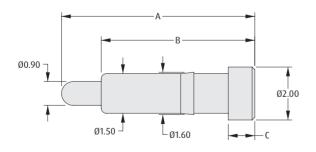
working height

P70-1030045R: 1.29N ±0.29N at 6.20mm working height

6.3mm FREE HEIGHT



3.5mm TO 7.3mm FREE HEIGHT





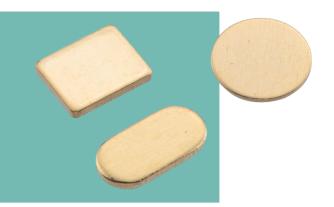
ORDER COD	E	DIM A	DIM B	DIM C
P70-1000045	R	3.50	2.50	0.40
P70-1010045	R	5.00	3.50	0.50
P70-1020045	R	5.50	4.00	0.50
P70-1030045	R	7.30	5.80	1.00



Contact Pads

Surface Mount Contacts

- Surface mountable contact pad, ideal as a mating area for spring contacts and pogo pins.
- **▶** Supplied 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

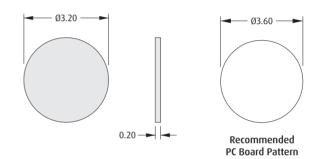
Current: 6A

Contact resistance: $0.15m\Omega$ max

: Environmental

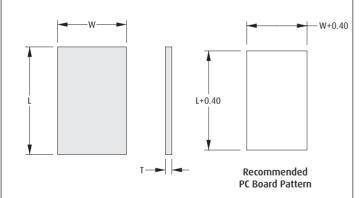
Operating temperature: -40°C to +180°C

CIRCULAR



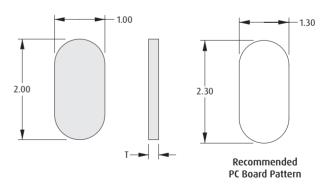
ORDER CODE	TAPE & REEL
S70-332002045R	2,000 on a Ø178 reel

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

