

EMC Shielding

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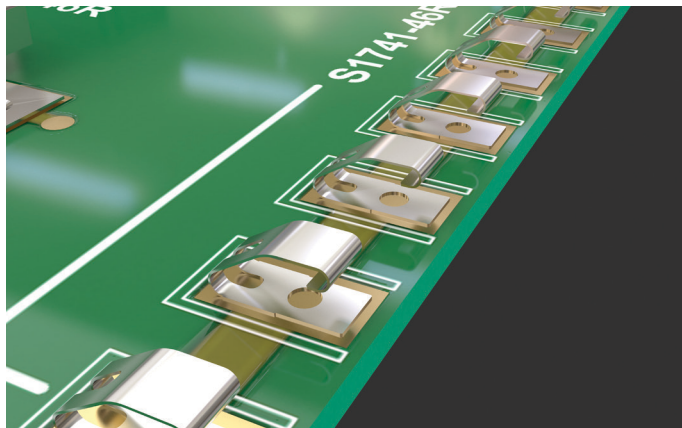
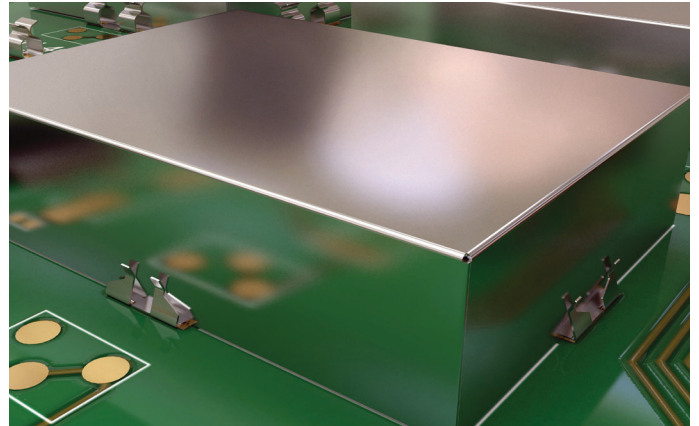


EMC Shielding Introduction

Harwin provides a range of Surface Mount Shield Clips, compatible Shield Cans, and a comprehensive selection of Spring Contacts, to solve a variety of EMC/RFI and grounding issues.

The Harwin combination of SMT Clips and Cans provide a simple and cost-effective method of shielding vulnerable or EMI radiating board components.

- ❖ No secondary manual soldering operations - Shield Cans quickly and easily slot into Clips.
- ❖ Potential hot-spots from manual soldering eliminated.
- ❖ Rework now easy without a de-soldering operation.



Spring Contacts (also known as Shield Fingers, Antenna or Grounding Contacts) are available in a choice of finish and wide array of styles.

- ❖ Heights from 1.23mm to 7.25mm in a variety of spring forces.
- ❖ Ideal for antenna feeds in mobile devices, LED lamp connections, grounding metal devices or single signal connections.
- ❖ All contacts are SMT, supplied in Tape and Reel packaging for simplified automated assembly and low production costs.

RFI Shield Clips Summary

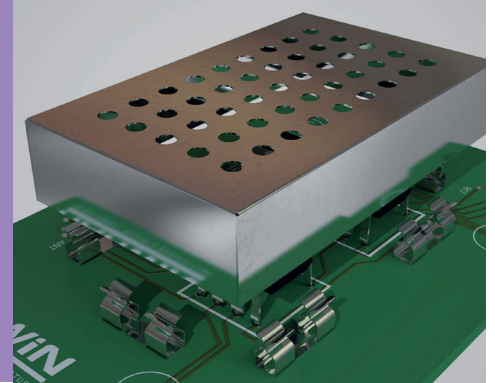
❖ Further dimensional information on the Shield Clips is available on the following pages.

Part No.	Type	Shield Thickness	Material	Finish	Pack Qty. on Ø330mm reel	Insertion Force (max)	Withdrawal Force (min)
S1411-46R	Maxi	0.70-1.00mm	Beryllium Copper	Tin	1,900	7N	0.8N
S1711-46R	Midi	0.17-0.30mm	Beryllium Copper	Tin	1,900	4N	0.5N
S2711-46R	Midi	0.17-0.30mm	Cupro-Nickel (Beryllium-free)	Tin	1,900	4N	0.5N
S0971-46R	Mini	0.20-0.30mm	Stainless Steel	Tin	5,000	19.6N	0.98N
S1721-46R	Mini	0.13-0.23mm	Beryllium Copper	Tin	5,000	5N	0.35N
S0941-46R	Micro	0.15-0.20mm	Stainless Steel	Tin	10,000	9.8N	0.69N
S0951-46R	Micro	0.20mm	Stainless Steel	Tin	10,000	9.8N	0.69N
S0961-46R	Micro	0.15-0.20mm	Stainless Steel	Tin	10,000	24.5N	0.98N
S0991-46R	Micro	0.20-0.25mm	Stainless Steel	Tin	15,000	19.6N	0.98N
S1001-46R	Micro	0.15-0.20mm	Stainless Steel	Tin	20,000	19.6N	0.98N
S0911-46R	Compact	0.15-0.20mm	Beryllium Copper	Tin	6,500	3N	0.1N
S0981-46R	Corner	0.20-0.25mm	Stainless Steel	Tin	6,000	19.6N	0.98N
S0921-46R	Corner	0.30-0.40mm	Cupro-Nickel	Tin	600	15N	0.3N

RFI Shield Clips

Shield Clips for EMI/RFI Shields

- ❏ SMT devices offering a fast solution for assembling RFI shields to PCBs.
- ❏ Eliminates the need for through holes and post reflow operations.
- ❏ Saves PCB real estate.
- ❏ Facilitates easy removal of the can for maintenance and repair.
- ❏ Substantial improvement in time and simplicity of assembly tuning and re-work.



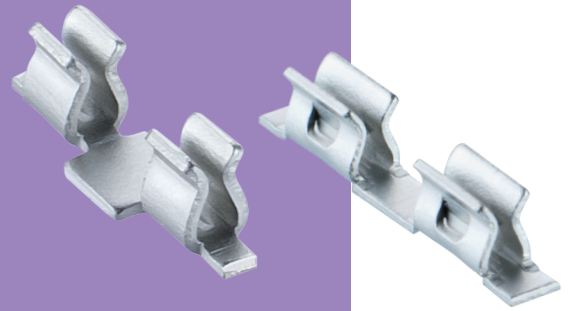
MAXI	MIDI						
<p style="text-align: right;">Shield Thickness 0.70-1.00mm</p> <p style="text-align: right;">ORDER CODE S1411-46R</p> <p>Recommended PCB Board Pattern</p>	<p style="text-align: right;">Shield Thickness 0.17-0.30mm</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #4a4a8a; color: white;">ORDER CODE</th> <th style="background-color: #4a4a8a; color: white;">MATERIAL</th> </tr> </thead> <tbody> <tr> <td style="background-color: #e0e0e0;">S1711-46R</td> <td style="background-color: #e0e0e0;">Beryllium Copper</td> </tr> <tr> <td style="background-color: #e0e0e0;">S2711-46R</td> <td style="background-color: #e0e0e0;">Cupro-Nickel</td> </tr> </tbody> </table> <p>Recommended PCB Board Pattern</p>	ORDER CODE	MATERIAL	S1711-46R	Beryllium Copper	S2711-46R	Cupro-Nickel
ORDER CODE	MATERIAL						
S1711-46R	Beryllium Copper						
S2711-46R	Cupro-Nickel						
MINI	MINI						
<p style="text-align: right;">Shield Thickness 0.20-0.30mm</p> <p style="text-align: right;">ORDER CODE S0971-46R</p> <p>Recommended PCB Board Pattern</p>	<p style="text-align: right;">Shield Thickness 0.13-0.23mm</p> <p style="text-align: right;">ORDER CODE S1721-46R</p> <p>Recommended PCB Board Pattern</p>						

All dimensions in mm.

RFI Shield Clips

Shield Clips for EMI/RFI Shields

- ❖ Compatible with industry standard placement machines.
- ❖ Packaged in standard (EIA 481) Tape & Reel format.
- ❖ Spring contact design provides secure retention.
- ❖ Higher force options for retention under vibration.
- ❖ Compatible with S02 shield cans (0.2mm thickness).



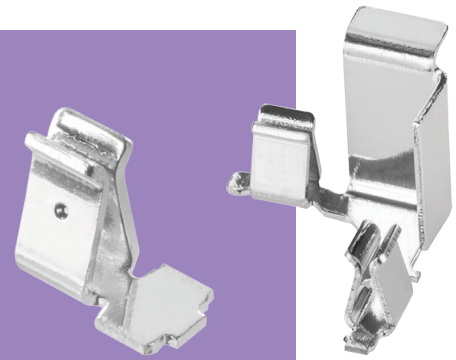
<p>MICRO</p> <p>Recommended PC Board Pattern</p> <p>Shield Thickness 0.15-0.20mm</p> <p>ORDER CODE S0941-46R</p>	<p>MICRO</p> <p>Recommended PC Board Pattern</p> <p>Shield Thickness 0.20mm</p> <p>ORDER CODE S0951-46R</p>
<p>MICRO</p> <p>Recommended PC Board Pattern</p> <p>Shield Thickness 0.15-0.20mm</p> <p>ORDER CODE S0961-46R</p>	<p>MICRO</p> <p>Recommended PC Board Pattern</p> <p>Shield Thickness 0.20-0.25mm</p> <p>ORDER CODE S0991-46R</p>

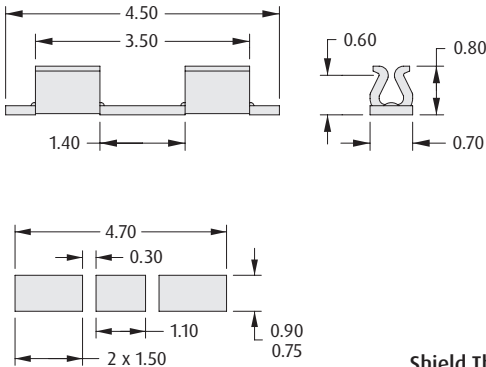
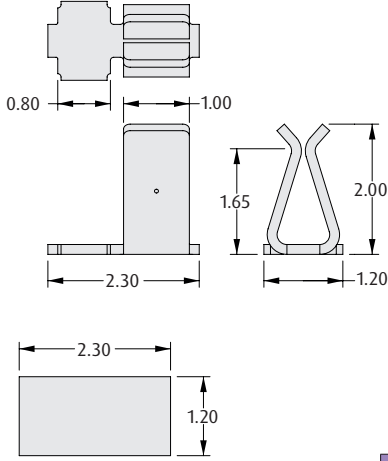
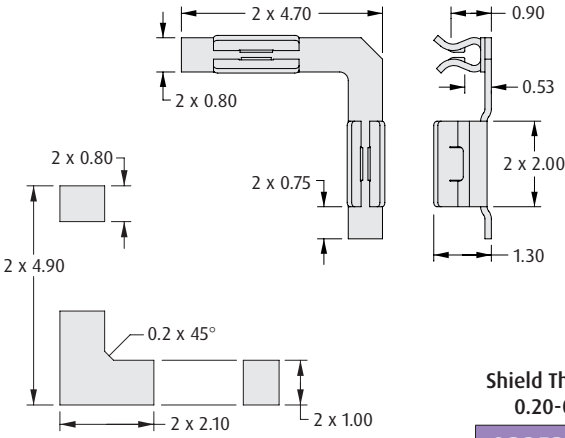
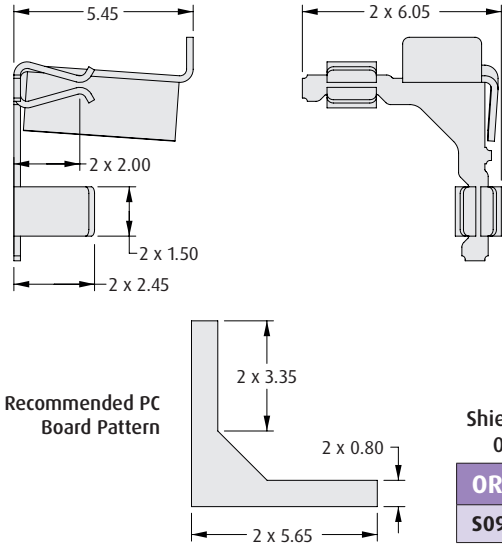
All dimensions in mm.

RFI Shield Clips

Shield Clips for EMI/RFI Shields

- ❖ Compatible with industry standard placement machines.
- ❖ Packaged in standard (EIA 481) Tape & Reel format.
- ❖ Spring contact design provides secure retention.
- ❖ Ideally suited to miniature electronics.
- ❖ Low profile and corner clips offer design flexibility.



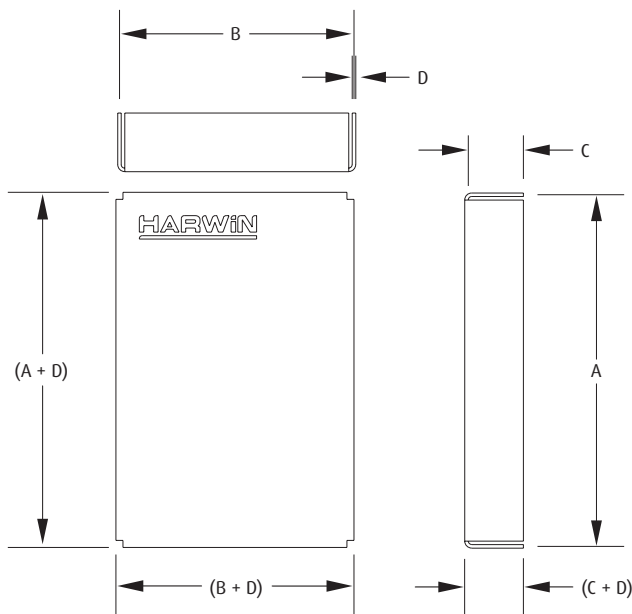
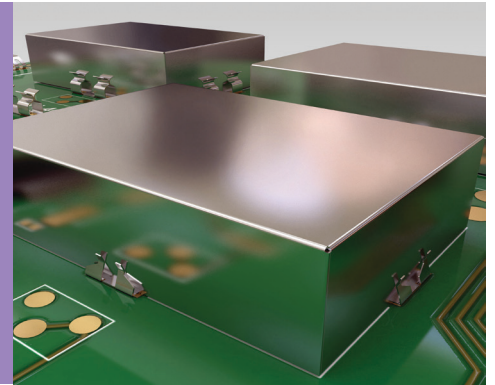
MICRO	COMPACT
 <p>Shield Thickness 0.15-0.20mm</p> <p>ORDER CODE S1001-46R</p>	 <p>Shield Thickness 0.15-0.20mm</p> <p>ORDER CODE S0911-46R</p>
CORNER	CORNER
 <p>Shield Thickness 0.20-0.25mm</p> <p>ORDER CODE S0981-46R</p>	 <p>Shield Thickness 0.30-0.40mm</p> <p>ORDER CODE S0921-46R</p>

All dimensions in mm.

RFI Shield Cans

EMI/RFI Shielding

- ❖ 0.3mm thickness Shield Cans suitable for use with S1711, S2711 and S0971 Shield Clips.
- ❖ 0.2mm thickness Shield Cans suitable for use with most of the Harwin Shield Clips - check the chart on the introduction page.
- ❖ Provides excellent RFI and EMI protection to sensitive circuitry at the PCB level.
- ❖ Standard can sizes available from stock.



Materials

Material: Nickel Silver
Finish: Unplated

Standard Sizes

ORDER CODE	DIM A	DIM B	DIM C	DIM D
S01-30200500	30mm	20mm	5mm	0.3mm
S01-30300500	30mm	30mm	5mm	0.3mm
S01-50250500	50mm	25mm	5mm	0.3mm
S02-20150300	20mm	15mm	3mm	0.2mm
S02-25200300	25mm	20mm	3mm	0.2mm
S02-30200250	30mm	20mm	2.5mm	0.2mm

- ❖ Dimensions A and B are measured from the **CENTRE** of the material thickness.
- ❖ Dimension C is measured from the bottom edge to the **INSIDE** of the top face.

HOW TO ORDER

S0X - XX XX XXX 0

SERIES CODE	
S01	Thickness (Dim D) = 0.3mm
S02	Thickness (Dim D) = 0.2mm

DIMENSION A
Example: 30mm = 30

FINISH	
0	Unplated

DIMENSION C
Example: 5mm = 050

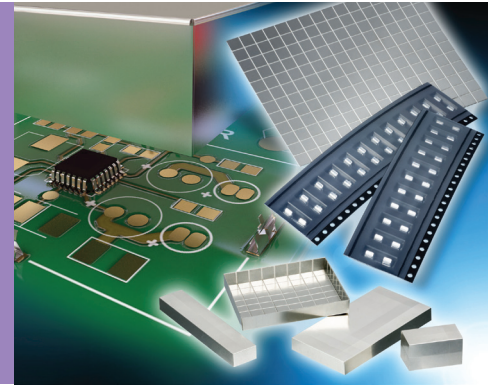
DIMENSION B
Example: 30mm = 30

All dimensions in mm.

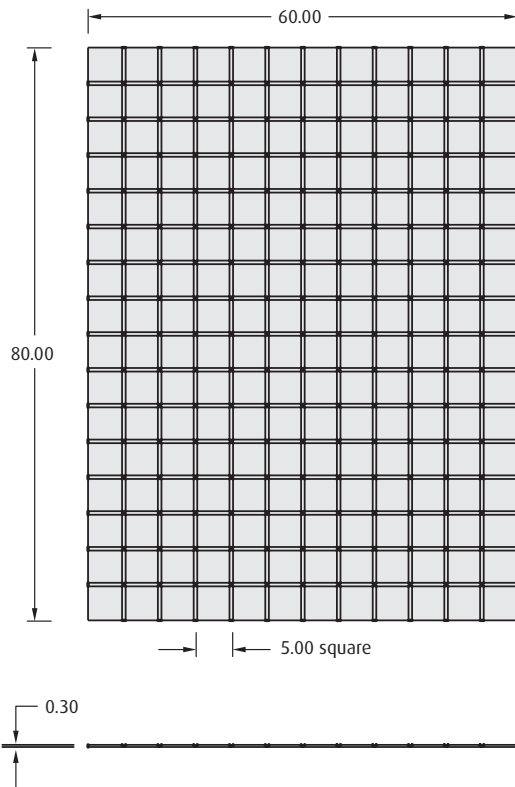
RFI Shield Can Kit

SMT Clips and Make-Your-Own Cans

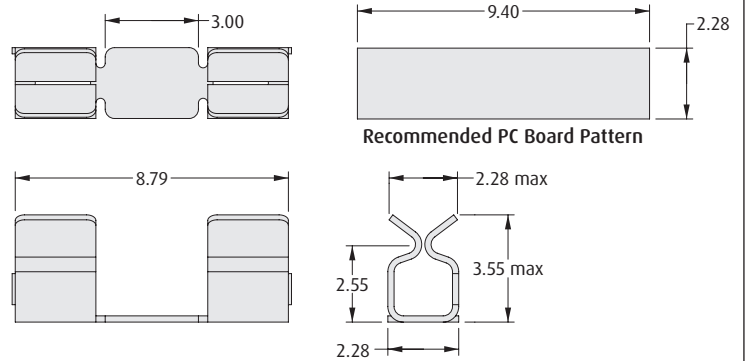
- ❖ Make your own Shield Cans in minutes, ideal for fast prototyping.
- ❖ Kit contains DIY Shield Can blanks, Shield retention clips and full instructions.
- ❖ Nickel Silver material for effective & useable shielding: up to 24dB attenuation achieved (frequency/configuration dependent).
- ❖ Shield Can is removable for adjustment.



SHIELD CAN KIT



2 x Shield Can Sheets
5mm pitch score lines, for folding



24 x Shield Clip S1711-46R



Instruction Sheet
(available from www.harwin.com/instructions)

ORDER CODE
S01-806005KIT

All dimensions in mm.

Spring Contacts

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.



EMC SHIELDING

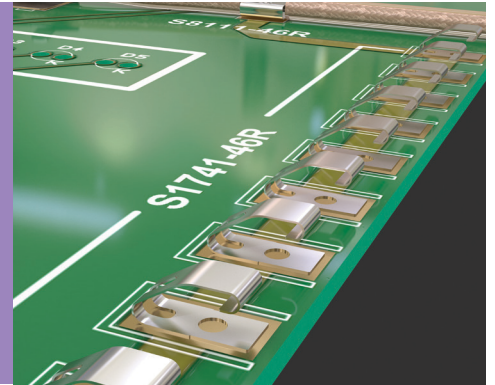
1.23mm HIGH	1.28mm HIGH								
<p>Recommended PC Board Pattern</p> <table border="1"> <thead> <tr> <th>ORDER CODE</th> <th>FINISH</th> </tr> </thead> <tbody> <tr> <td>S7221-45R</td> <td>Gold</td> </tr> </tbody> </table>	ORDER CODE	FINISH	S7221-45R	Gold	<p>Recommended PC Board Pattern</p> <table border="1"> <thead> <tr> <th>ORDER CODE</th> <th>FINISH</th> </tr> </thead> <tbody> <tr> <td>S7231-45R</td> <td>Gold</td> </tr> </tbody> </table>	ORDER CODE	FINISH	S7231-45R	Gold
ORDER CODE	FINISH								
S7221-45R	Gold								
ORDER CODE	FINISH								
S7231-45R	Gold								
1.3mm HIGH	1.5mm HIGH, 1.5mm WIDE								
<p>Recommended PC Board Pattern</p> <table border="1"> <thead> <tr> <th>ORDER CODE</th> <th>FINISH</th> </tr> </thead> <tbody> <tr> <td>S7241-45R</td> <td>Gold</td> </tr> </tbody> </table>	ORDER CODE	FINISH	S7241-45R	Gold	<p>Recommended PC Board Pattern</p> <table border="1"> <thead> <tr> <th>ORDER CODE</th> <th>FINISH</th> </tr> </thead> <tbody> <tr> <td>S7251-45R</td> <td>Gold</td> </tr> </tbody> </table>	ORDER CODE	FINISH	S7251-45R	Gold
ORDER CODE	FINISH								
S7241-45R	Gold								
ORDER CODE	FINISH								
S7251-45R	Gold								
1.5mm HIGH, 2mm WIDE	2mm HIGH								
<p>Recommended PC Board Pattern</p> <table border="1"> <thead> <tr> <th>ORDER CODE</th> <th>FINISH</th> </tr> </thead> <tbody> <tr> <td>S7261-45R</td> <td>Gold</td> </tr> </tbody> </table>	ORDER CODE	FINISH	S7261-45R	Gold	<p>Recommended PC Board Pattern</p> <table border="1"> <thead> <tr> <th>ORDER CODE</th> <th>FINISH</th> </tr> </thead> <tbody> <tr> <td>S7271-45R</td> <td>Gold</td> </tr> </tbody> </table>	ORDER CODE	FINISH	S7271-45R	Gold
ORDER CODE	FINISH								
S7261-45R	Gold								
ORDER CODE	FINISH								
S7271-45R	Gold								

All dimensions in mm.

Spring Contacts

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.



1.7mm HIGH	2.5mm HIGH										
<p style="text-align: center;">Recommended PC Board Pattern</p> <table border="1"> <thead> <tr> <th>ORDER CODE</th> <th>FINISH</th> </tr> </thead> <tbody> <tr> <td>S7121-42R</td> <td>Gold</td> </tr> </tbody> </table>	ORDER CODE	FINISH	S7121-42R	Gold	<p style="text-align: center;">Recommended PC Board Pattern</p> <table border="1"> <thead> <tr> <th>ORDER CODE</th> <th>FINISH</th> </tr> </thead> <tbody> <tr> <td>S1741-46R</td> <td>Tin</td> </tr> </tbody> </table>	ORDER CODE	FINISH	S1741-46R	Tin		
ORDER CODE	FINISH										
S7121-42R	Gold										
ORDER CODE	FINISH										
S1741-46R	Tin										
2.7mm HIGH	3.5mm HIGH										
<p style="text-align: center;">Recommended PC Board Pattern</p> <table border="1"> <thead> <tr> <th>ORDER CODE</th> <th>FINISH</th> </tr> </thead> <tbody> <tr> <td>S7091-42R</td> <td>Gold + Tin</td> </tr> </tbody> </table>	ORDER CODE	FINISH	S7091-42R	Gold + Tin	<p style="text-align: center;">Recommended PC Board Pattern</p> <table border="1"> <thead> <tr> <th>ORDER CODE</th> <th>FINISH</th> </tr> </thead> <tbody> <tr> <td>S1761-42R</td> <td>Gold + Tin</td> </tr> <tr> <td>S1761-46R</td> <td>Tin</td> </tr> </tbody> </table>	ORDER CODE	FINISH	S1761-42R	Gold + Tin	S1761-46R	Tin
ORDER CODE	FINISH										
S7091-42R	Gold + Tin										
ORDER CODE	FINISH										
S1761-42R	Gold + Tin										
S1761-46R	Tin										
4.0mm HIGH	5.6mm HIGH										
<p style="text-align: center;">Recommended PC Board Pattern</p> <table border="1"> <thead> <tr> <th>ORDER CODE</th> <th>FINISH</th> </tr> </thead> <tbody> <tr> <td>S1791-42R</td> <td>Gold</td> </tr> </tbody> </table>	ORDER CODE	FINISH	S1791-42R	Gold	<p style="text-align: center;">Recommended PC Board Pattern</p> <table border="1"> <thead> <tr> <th>ORDER CODE</th> <th>FINISH</th> </tr> </thead> <tbody> <tr> <td>S7061-42R</td> <td>Gold + Tin</td> </tr> <tr> <td>S7061-46R</td> <td>Tin</td> </tr> </tbody> </table>	ORDER CODE	FINISH	S7061-42R	Gold + Tin	S7061-46R	Tin
ORDER CODE	FINISH										
S1791-42R	Gold										
ORDER CODE	FINISH										
S7061-42R	Gold + Tin										
S7061-46R	Tin										

All dimensions in mm.

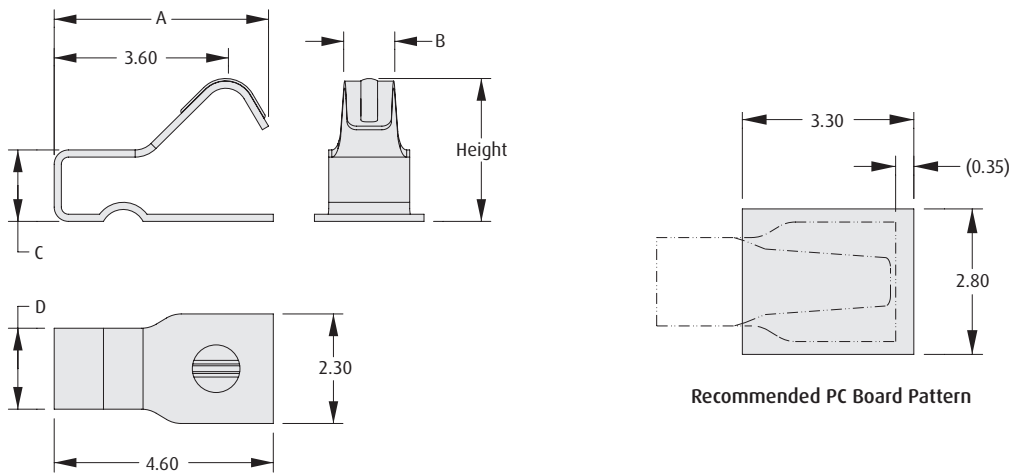
Spring Contacts

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



HOW TO ORDER

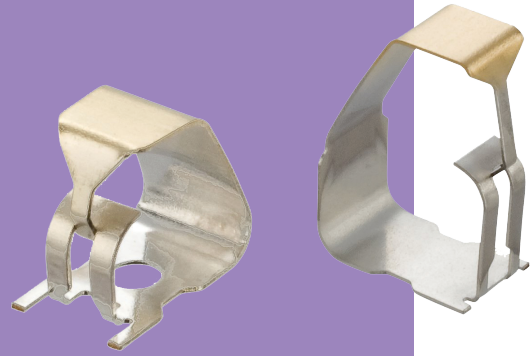
PART NO.	HEIGHT	DIM A	DIM B	DIM C	DIM D	FINISH
S7131-45R	2.00	4.30	0.80	1.00	1.55	Gold
S7141-45R	2.50	4.50	0.80	1.00	1.55	Gold
S7151-45R	3.00	4.50	0.90	1.50	1.70	Gold
S7161-45R	3.50	4.50	1.05	2.00	1.95	Gold
S7171-45R	4.00	4.50	1.36	2.50	2.30	Gold
S7181-45R	4.50	4.50	1.82	3.00	2.50	Gold
S7191-45R	5.00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

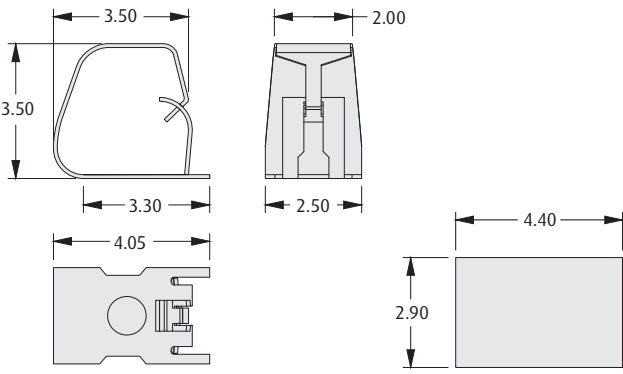
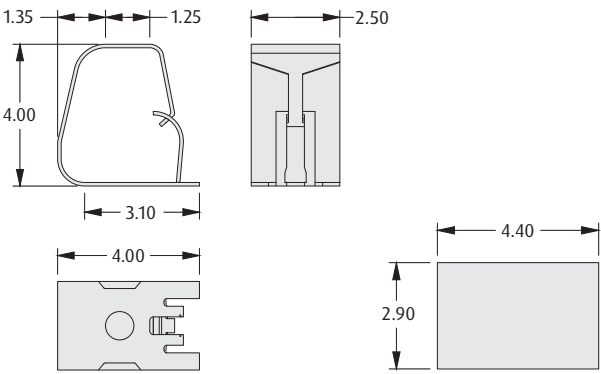
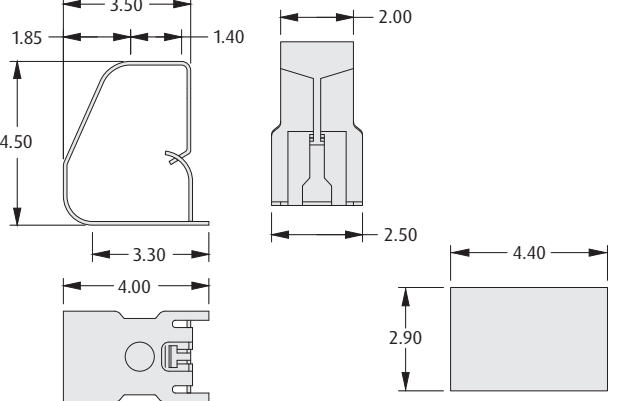
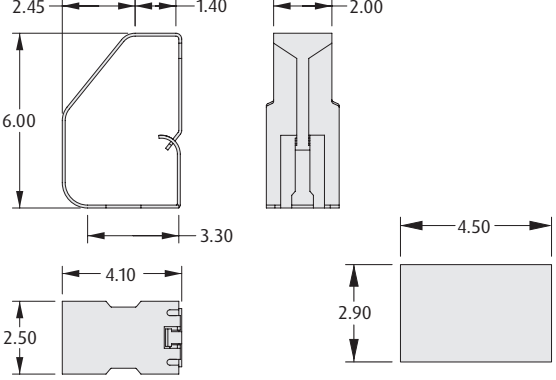
All dimensions in mm.

Spring Contacts

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.



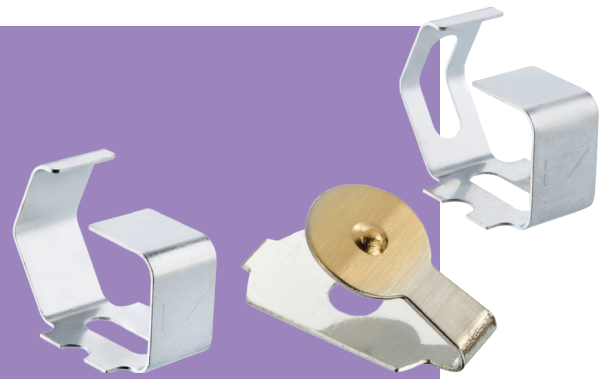
3.5mm HIGH	4.0mm HIGH								
 <p style="text-align: center;">Recommended PC Board Pattern</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #4a4a8a; color: white;">ORDER CODE</th> <th style="background-color: #4a4a8a; color: white;">FINISH</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">S7101-42R</td> <td style="text-align: center;">Gold + Tin</td> </tr> </tbody> </table>	ORDER CODE	FINISH	S7101-42R	Gold + Tin	 <p style="text-align: center;">Recommended PC Board Pattern</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #4a4a8a; color: white;">ORDER CODE</th> <th style="background-color: #4a4a8a; color: white;">FINISH</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">S7041-42R</td> <td style="text-align: center;">Gold + Tin</td> </tr> </tbody> </table>	ORDER CODE	FINISH	S7041-42R	Gold + Tin
ORDER CODE	FINISH								
S7101-42R	Gold + Tin								
ORDER CODE	FINISH								
S7041-42R	Gold + Tin								
4.5mm HIGH	6.0mm HIGH								
 <p style="text-align: center;">Recommended PC Board Pattern</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #4a4a8a; color: white;">ORDER CODE</th> <th style="background-color: #4a4a8a; color: white;">FINISH</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">S7111-42R</td> <td style="text-align: center;">Gold + Tin</td> </tr> </tbody> </table>	ORDER CODE	FINISH	S7111-42R	Gold + Tin	 <p style="text-align: center;">Recommended PC Board Pattern</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #4a4a8a; color: white;">ORDER CODE</th> <th style="background-color: #4a4a8a; color: white;">FINISH</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">S7051-42R</td> <td style="text-align: center;">Gold + Tin</td> </tr> </tbody> </table>	ORDER CODE	FINISH	S7051-42R	Gold + Tin
ORDER CODE	FINISH								
S7111-42R	Gold + Tin								
ORDER CODE	FINISH								
S7051-42R	Gold + Tin								

All dimensions in mm.

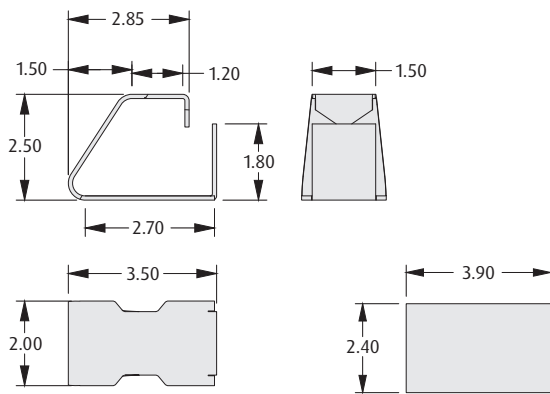
Spring Contacts

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.



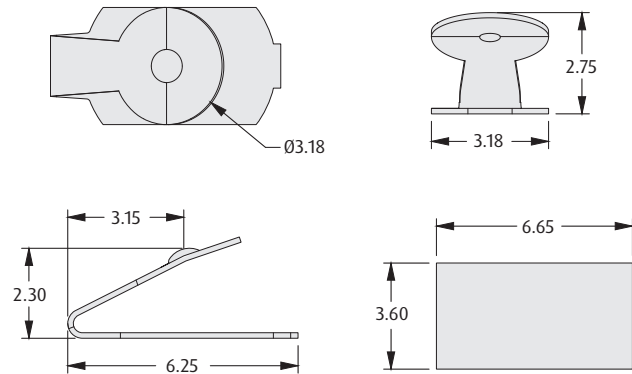
2.5mm HIGH



Recommended PC Board Pattern

ORDER CODE	FINISH
S7071-46R	Tin

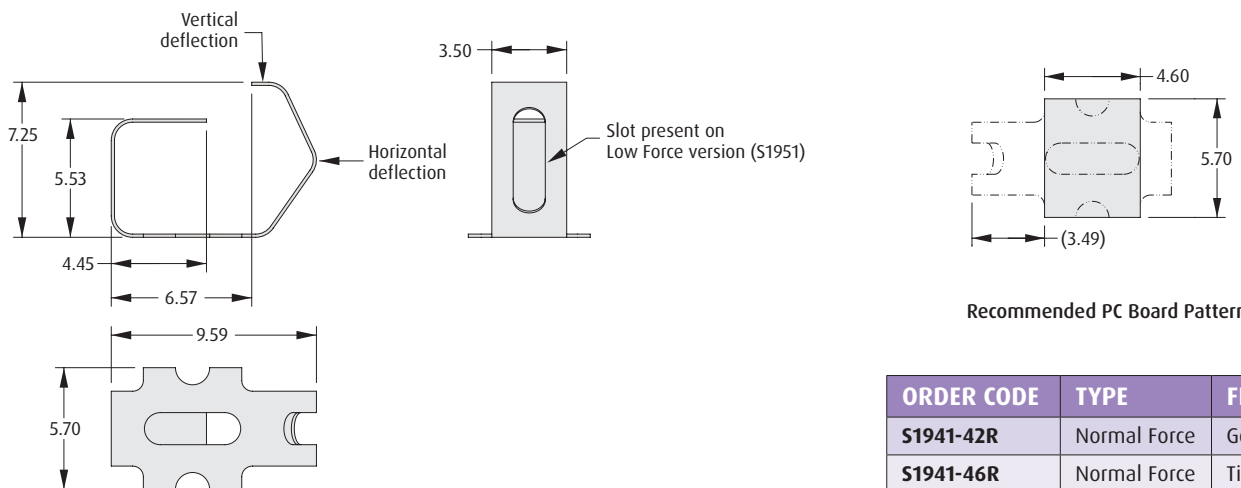
2.75mm HIGH



Recommended PC Board Pattern

ORDER CODE	FINISH
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

All dimensions in mm.

Spring Contacts

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

All dimensions in mm.