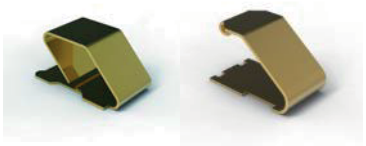
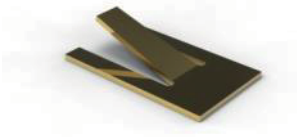
BROAD SPRING FINGER PORTFOLIO AND SCALABILITY

Spring fingers are small metal-formed parts that can conduct signal or power from one component to another and provide grounding to reduce EMI noise. Even though small in size, spring fingers need to be mechanically and electrically designed to handle robust applications. These applications range from mobile devices, personal computing and industrial devices, to home electronics and wearables. Spring fingers come in various sizes and working ranges that can be selected based on specific application requirements.

Box and C are standard flat contact types which provide simple cantilever spring shapes that can be used in grounding and shielding applications. The ultra low profile type has a Y-shaped spring profile designed to fit into low mated height applications, specifically antenna feeds, and the pre-loaded and pre-loaded scalable types have highly engineered geometry to handle high-speed manufacturing and more complex applications.



BOX TYPE C TYPE



Y TYPE

PRE-LOADED SCALABLE TYPE

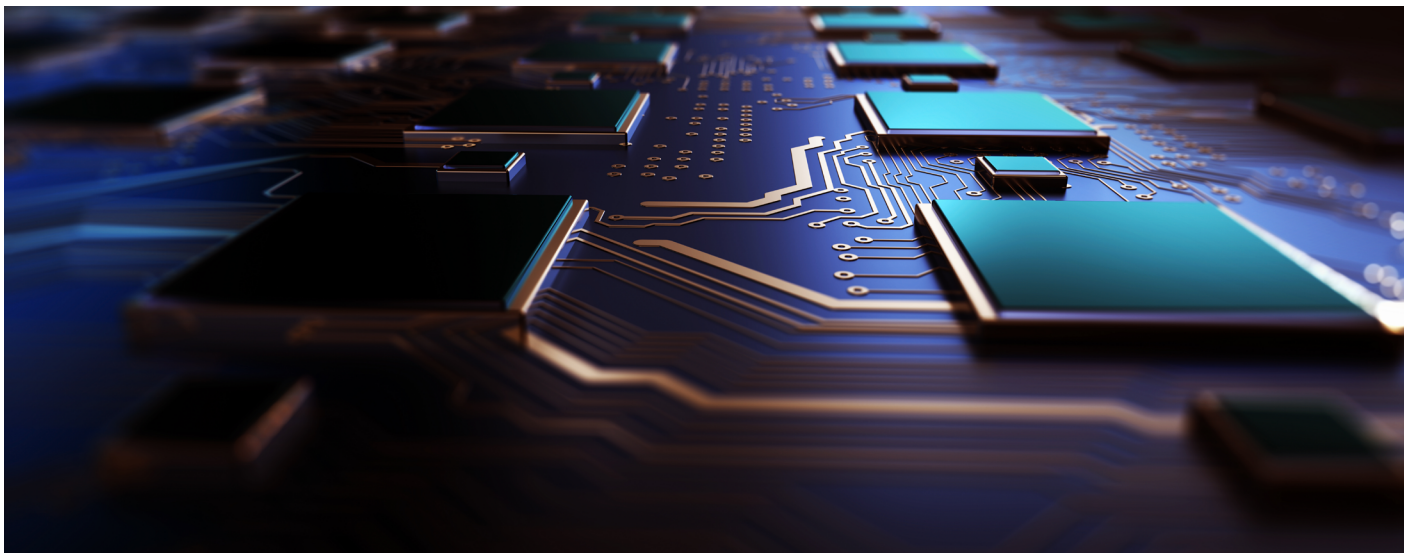
PRE-LOADED TYPE

Construction and Manufacturing

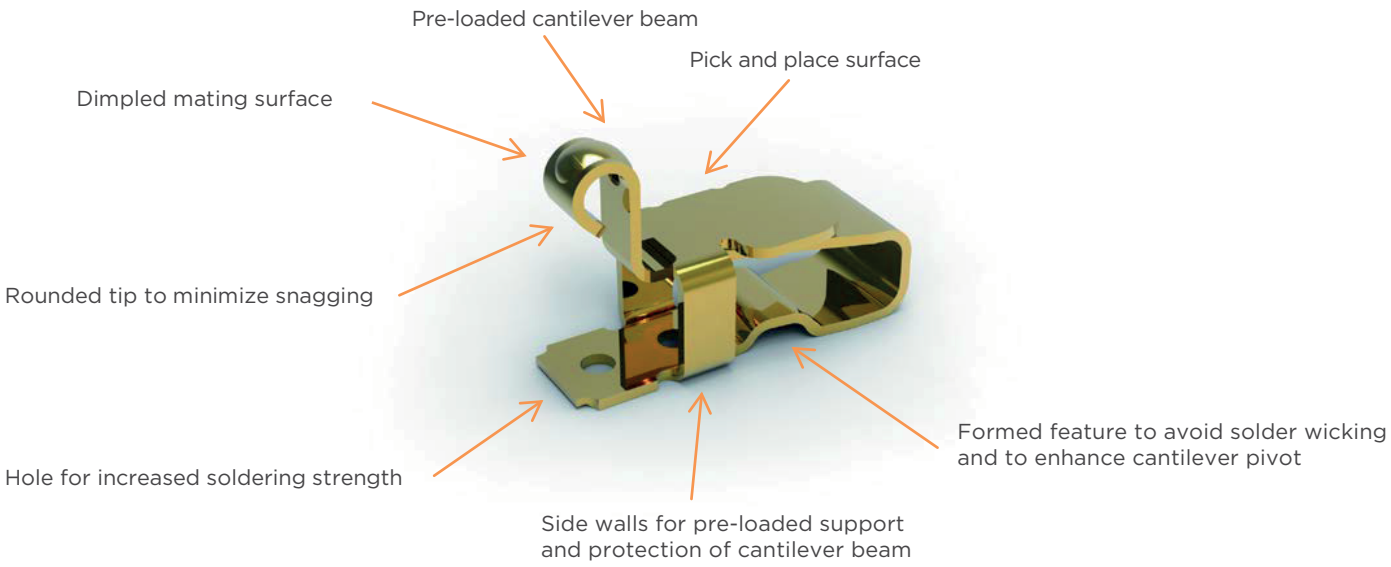
Spring fingers are manufactured from spring steel or copper alloy base materials. Spring steel and copper alloy both provide unique mechanical and electrical properties. For applications where value is more important than performance, spring fingers made from spring steel can help meet this objective. For applications where performance is more important, spring fingers made from copper alloy offer increased conductivity and mechanical performance compared to spring steel. Spring fingers are typically manufactured in advanced, automated manufacturing lines that produce dimensionally stable and highly reliable spring fingers.

Key Features and Benefits

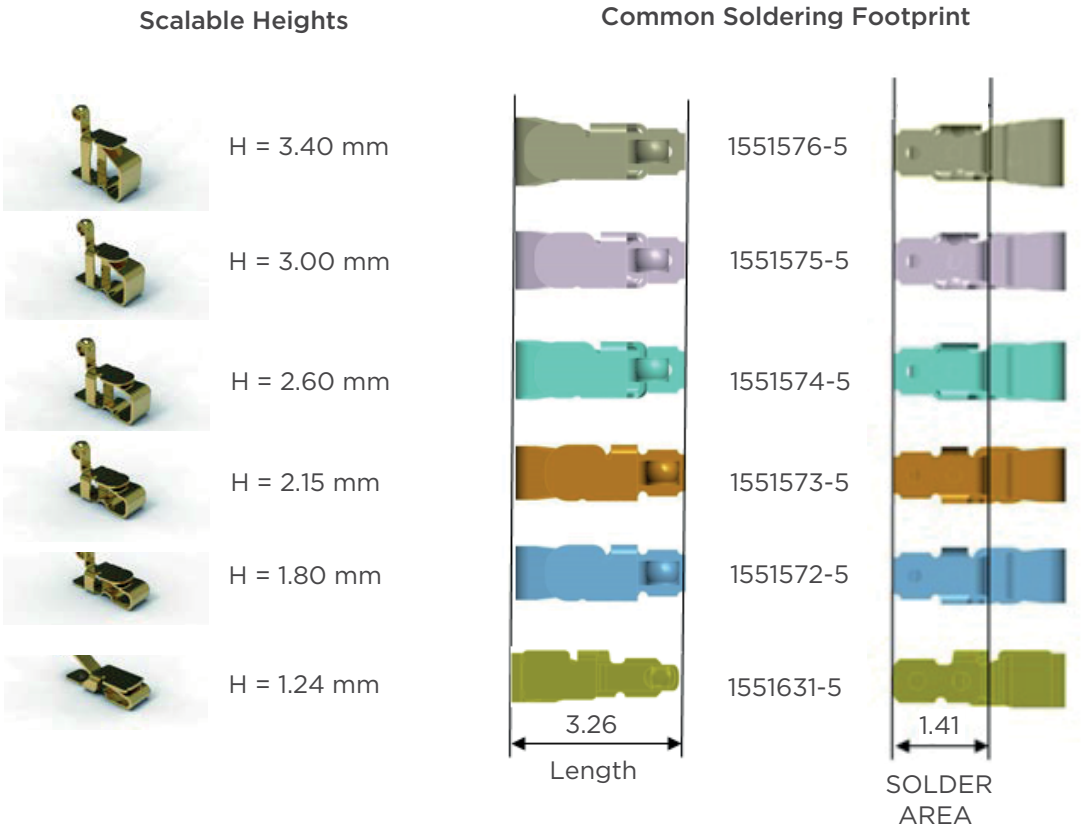
Scalable spring fingers share a common soldering footprint. This common footprint across a spring finger product family allows for easy change-out from one working height to another without the need to resize the soldering footprint or move surrounding components on the printed circuit board (PCB) to make space. This commonality minimizes the need to modify PCB design and layout when an application requires a change in working height, saving time and money. The pre-loaded cantilever beam feature increases normal force by 0.2N over a similar cantilever beam that is not pre-loaded.



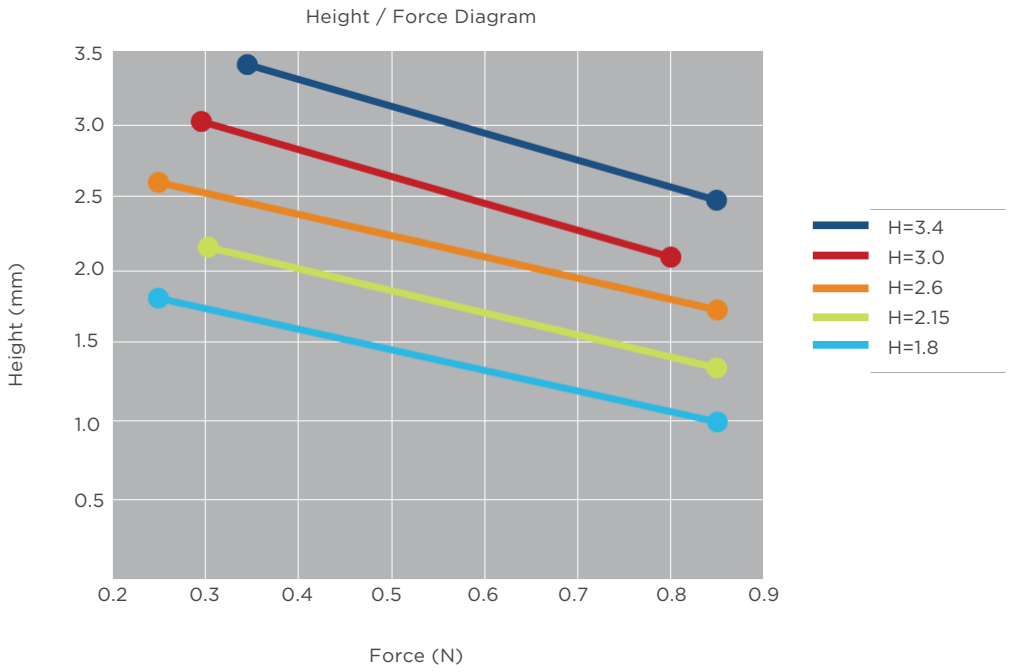
Spring Finger Design Features



Scalability in Height with Common Footprint



BROAD SPRING FINGER PORTFOLIO AND SCALABILITY



Enhanced side walls, as shown in the spring finger product family illustration below, provide protection against operator handling and help prevent over-deflection of the spring in the application. This key design feature helps maintain the spring geometry through manufacturing and application environments.

#1 #2 #3 #4 #5 #6 #7

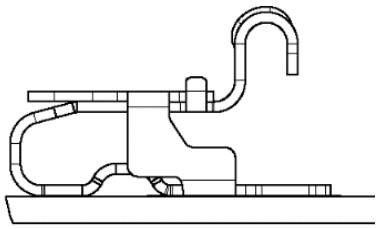
	TE Part Number	Effective Height (mm)	Height (mm)
#1	2108693-4	0.65-0.875	1.1
#2	2108610-5	0.8-1.0	1.4
#3	2108611-5	1.1-1.4	1.7
#4	2108612-5	1.4-1.75	2.05
#5	2108613-5	1.6-2.0	2.4
#6	2108614-5	1.9-2.3	2.7
#7	2108609-5	2.2-2.6	3.0

BROAD SPRING FINGER PORTFOLIO AND SCALABILITY

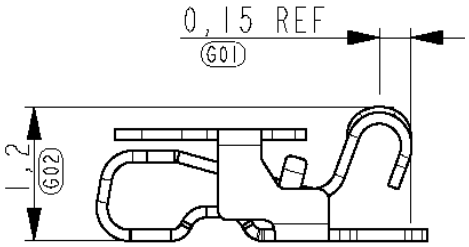
In applications that require transmitting radio frequency (RF) signals from an antenna carrier to the PCB, it is critical that the conductive path remains consistent throughout the entire working range of the spring. Depending on the spring finger design, the cantilever spring may touch supporting side walls or the pre-loaded geometry throughout the working range of the spring. In this case, the electrical path may short to the side walls or the pre-loaded geometry, which changes the RF signal path and could change the RF signals.

To minimize shorting issues, select spring fingers for RF signal application carefully. Spring finger design features, such as the clearance between the cantilever spring and side walls, must be adequate to help ensure that the cantilever spring does not short to side walls during deflection, electrically disconnect from the pre-loaded geometry, or bottom out at the application working range. (See illustration below.)

Uncompressed Spring



Compressed Spring



At working height, the cantilever spring avoids shorting to the pre-loaded geometry or side walls and bottoming out.

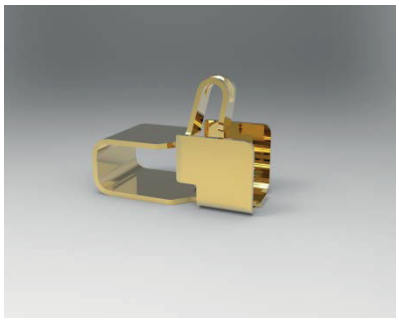
The non-pre-loaded spring designs shown below offer a large clearance between the cantilever spring and side walls that avoids potential shorting paths. These designs helps ensure a consistent conductive path over the working range of the spring, such as typically needed for RF antenna applications.

Y Type

For working height between 0.4mm and 1.4mm

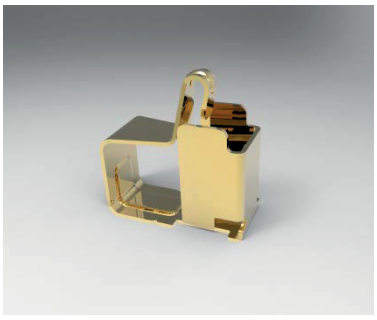
C Type

For working height between 1.1mm and 2.1mm



C Type

For working height between 2.0mm and 3.6mm



Part Number	Type	Height (mm)	Effective Height (mm)
2199248-4	Y	1.0	0.4 to .08
2199248-5	Y	1.3	0.5 to 1.1
2199248-6	Y	1.6	0.8 to 1.4
2199249-3	C	2.0	1.1 to 1.8
2199249-4	C	2.3	1.4 to 2.1
3-2199250-2	C	2.9	2.0 to 2.7
3-2199250-3	C	3.2	2.3 to 3.0
3-2199250-4	C	3.6	2.6 to 3.3
3-2199250-5	C	3.8	2.9 to 3.6

Today's customers demand portable consumer products that are smaller, thinner, and lighter but which offer increased functionality and performance. PCB space is becoming much more limited due to the higher component density required to deliver increased end use product functionality. As a result, component footprint, versatility, and performance will be key selection criteria for these applications. TE Connectivity offers a broad spring finger portfolio with a wide range of types and sizes to meet a diverse range of application requirements.

Visit www.te.com/products/spring-fingers for more information, products, and availability.

03/22

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