H-PIN

THERE'S AN H-PIN
FOR EVERYTHING.

Q3 2020

HOW HAS SOMETHING SO

SMALL

MADE SUCH A BIG IMPACT?

EVERY DAY,

IN EVERY CORNER OF THE WORLD,

millions of electronic devices are performing as they're supposed to because of an innovative component so small, it's hardly visible with the naked eye.

Manufacturers know this component as the H-Pin – a family of stamped spring probe pins used in a limitless array of semiconductor burn-in and functional test, programming and system-level product connector applications.

H-Pins are used to test, perfect and enable the proper functionality of such a wide array of devices because they provide a clear solution to a long-standing conundrum faced by every electronics manufacturer: pay up for costly spring probe pins (which are prone to quality control issues due to their difficult manufacturing process) or save money on inflexible, unreliable components that require you to work around their constraints?

With the H-Pin, you no longer have to choose between cost and performance. Now there's a high performance, compliant contact made to serve high volume applications requiring reliable electrical, mechanical and thermal performance – all for a project-enabling cost.

There's an H-Pin for everything.

The H-Pin family consists of seven unique series, each offering a range of features designed to meet the varying needs of small electronics manufacturers. You can find the specifications of each series on the page numbers indicated below. If you need help selecting the pin that works best within your size, power or dimensional constraints, please contact a member of our team and let us assist you.

MAXIMUM DENSITY

H027 SERIES PG 06

H033 SERIES PG 12

MAXIMUM SPEED

T033 SERIES PG 09

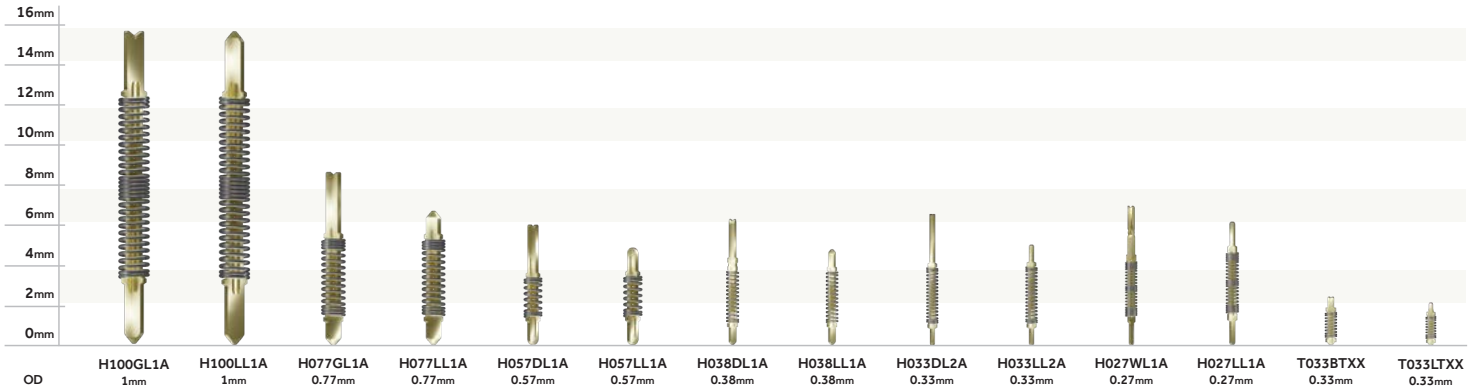
H038 SERIES PG 15

H057 SERIES PG 18

MAXIMUM POWER

H077 SERIES PG 21

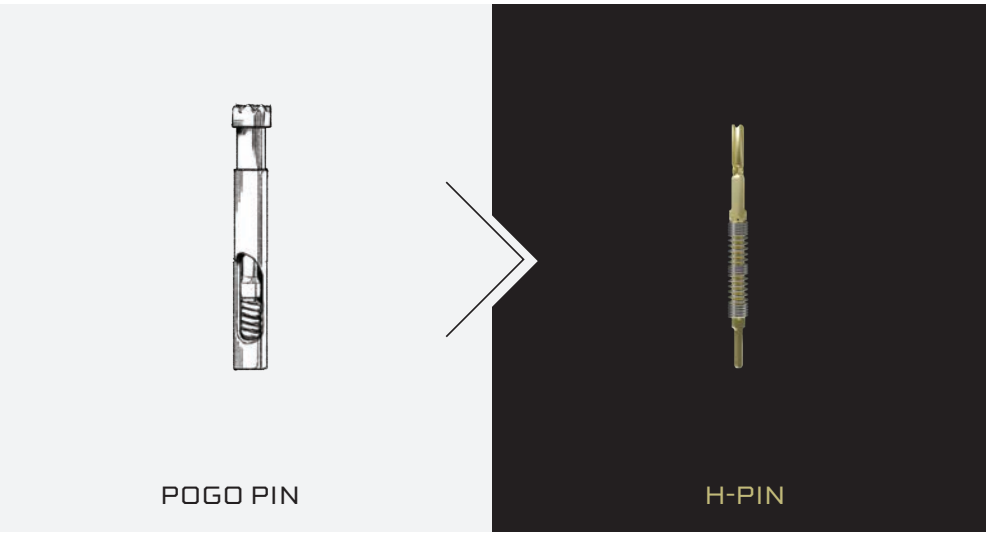
H100 SERIES PG 24



WHY WE

REINVENTED

THE SPRING PROBE PIN



The H-Pin came into existence because the market simply needed a better electrical interconnection solution.

Whether it was a matter of size, signal integrity or the exponential performance demands of a growing array of electronic devices, there was simply not a solution that delivered the all-around performance, reliability, versatility and availability that engineers, manufacturers and testers needed – at a cost that didn't push product development into the red. There had to be a better way.

2005 – THE H-PIN IS BORN

The idea for the H-Pin "sprang" from a fairly widely adopted technology called the Pogo Pin – an innovative electrical contact that controlled the amount of pin movement via a spring buried within a barrel (like a pogo stick). But while pogo pins solved many issues, their complex assembly process at the time made high-volume production difficult to fulfill, and the hidden components made it hard to identify issues and diagnose performance problems. So we decided to turn the pogo pin inside out.

We re-thought the entire process of making spring probe pins. We created patented designs that would be easy to produce cost-effectively. We developed a fully-automated production system with reel-to-reel, high-volume manufacturing rather than batched processing. We replaced screw-machined parts with stampings, and post-production validation tests with in-line, real-time QC inspections. Obtaining full visibility of all the parts allowed us to eliminate any failures before the pins went out the door and ensure exact consistency between each and every pin we produced.

These innovations explain why, today, the H-Pin provides users with unparalleled reliability and performance through a process that's less expensive and takes less time. And that is making more technological innovations possible for an expanding number of creators around the world.

THE PROCESS MAKES THE DIFFERENCE

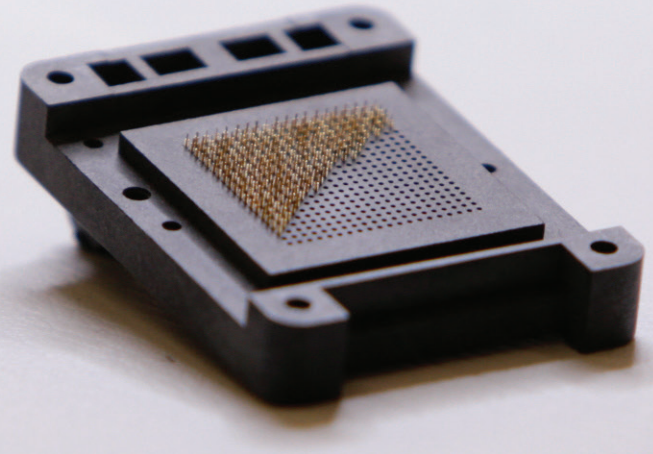
FULLY-AUTOMATED PRODUCTION SYSTEM

HIGH-VOLUME MANUFACTURING

COST EFFECTIVE

WHY THE WORLD'S MANUFACTURERS

TURN TO H-PIN



With over thirty years of providing test fixtures for semiconductor accelerated stress tests, Plastronics knows a thing or two about providing cutting edge interconnection technology that's built to last. Here's how that expertise has manifested in the H-Pin:

SIGNAL PERFORMANCE

- Right out of the box, before optimization the H-pin screams with, on average,15GHz signal speeds
- The H-Pin's contact beams maintain intimate contact with one another throughout an entire deflection creating a single conductor

CONSISTENCY

- Our fully-automated process ensures that H-Pin number one and one million are perfect matches
- The H-pin's pre-compressed pin design provides a flat and stable resistance curve

DENSITY

- We serve the global semiconductor market's packaging roadmaps down to 200 microns
- Many connector customers find that reducing pin pitch to 1.0mm can free up more than 1/3rd of the board space in some applications.

DURABILITY

- Accelerated stress testing is our business. We put the H-Pin to the extremes before you do.
- All H-Pins are built to endure extreme cold (-55C) and extreme heat (+220C) and can withstand one million mechanical cycles

RELIABILITY

- The H-Pin's open architecture only has three components: two stampings and a spring. Fewer parts mean fewer things that can go wrong.
- All H-Pin critical dimensions are measured in-line throughout the entire process

SWAP-C OPTIMIZATION

- H-Pins provide the electrical and mechanical performance of spring probe pins, but are produced quickly and in high volumes, making them very cost efficient.
- The high performance and low cost per-pin helps our military and aerospace customers optimize the size, weight and power of their applications, without increasing the cost.

H-PIN H027

The H-Pin H027 Series has an outside dimension of 0.27mm and is ideally suited for applications with 0.35 mm pitch, but can also be used for larger pitch applications with shorter signal paths.

H027WL1A	H027LL1A

MECHANICAL PROPERTIES

PITCH:	0.35mm (min)
WORKING TRAVEL:	0.40mm
CONTACT FORCE:	5.88gf
FULL LENGTH:	2.89mm
COMPRESSED LENGTH:	2.49mm
OPERATING TEMPERATURE:	+150°C
MECHANICAL LIFE:	>75,000 cycles

ELECTRICAL PROPERTIES

CONTACT RESISTANCE:	<65mΩ
CURRENT RATING (FREE AIR):	1 amp
SELF INDUCTANCE:	0.92nH
BANDWIDTH @ -1DB:	24.7GHz

MATERIALS

STAMPED CONTACT:	BeCu, Au Plate
SPRING:	SS, Au Plate

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- PDF DATA SHEET
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- PDF DC PERFORMANCE

H-PIN

H-PIN

H027 X L 1 A

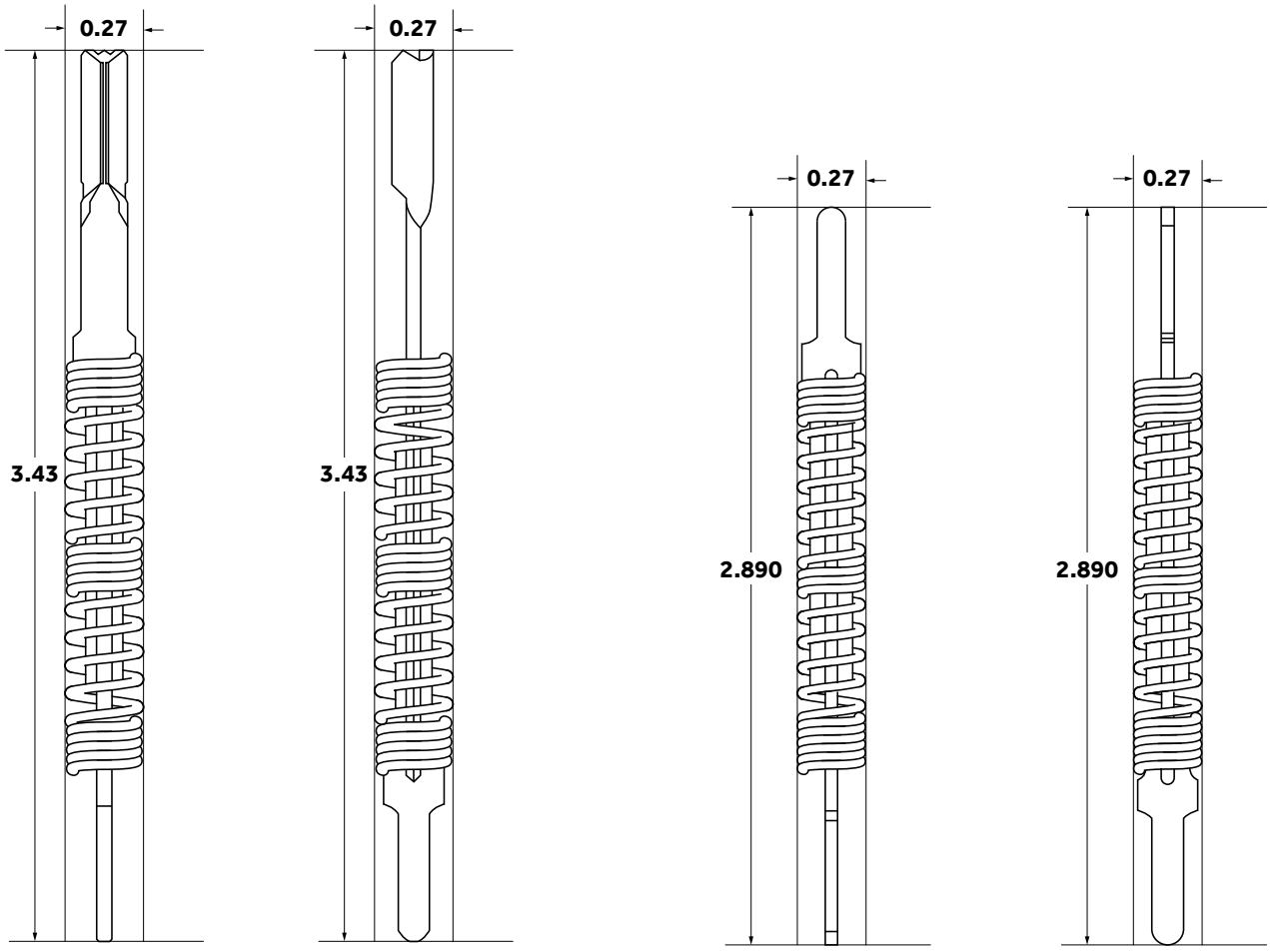
H-PIN SERIES
H027 – 0.35mm

TOP CONTACTOR
L – Standard LGA
W – BGA Tip

SPRING TYPE
(full Deflection)
1 –8.2gf

OPTIONS
A – Au Plating

BOTTOM CONTACTOR
L –Standard LGA



H027WL1A	H027LL1A

SIGNAL PERFORMANCE

EMPOWERING THE NEW WORLD OF COMMUNICATIONS AND DATA EXCHANGE

NEVER BEFORE HAVE COMMUNICATION DEVICES BEEN BOTH SO ABUNDANT AND SO CRITICAL TO OUR WAY OF LIFE.

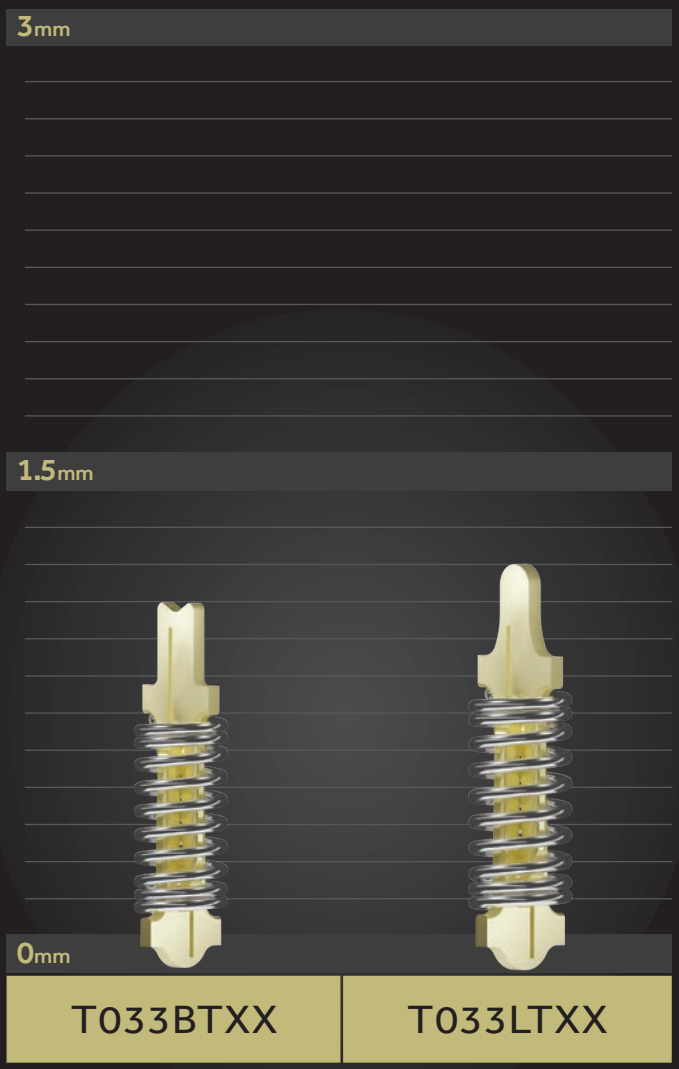
Technologies that provide fast, reliable communications are revolutionizing everything from our ability to explore the cosmos to the way we call our grandmas. But these technologies can only work when the signal integrity within their smallest components can be counted upon.

The H-Pin provides superior signal performance thanks to the simplicity of its design and the quality of its manufacturing. Secured by a stainless steel wound spring, the H-Pin's two beryllium copper stampings provide a reliable single beam conductor for superior signal integrity, yielding flat resistance curves, and a gas-tight conductivity.

As our world's desire to connect things only grows stronger, so too will our collective understanding of the importance of the components that enable these vital technologies to do their job. And no matter how extreme the application may be, the H-Pin is ready to answer the call.

H-PIN T033

The H-Pin T033 Series has an outside dimension of 0.33mm and is ideally suited for applications with 0.40mm pitch, but can also be used for larger pitch applications with shorter signal paths.



MECHANICAL PROPERTIES

PITCH:	0.40mm (min)
WORKING TRAVEL:	0.25mm
CONTACT FORCE:	9.2gf
FULL LENGTH:	1.26mm
COMPRESSED LENGTH:	1.00mm
OPERATING TEMPERATURE:	+150°C
MECHANICAL LIFE:	75,000 cycles

ELECTRICAL PROPERTIES

CONTACT RESISTANCE:	<60mΩ
CURRENT RATING (FREE AIR):	1.8 amp
SELF INDUCTANCE:	0.31nH
BANDWIDTH @ -1DB:	47.4GHz

MATERIALS

STAMPED CONTACT:	BeCu , Au Plate
SPRING:	SS, Au Plate

DOWNLOADS

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- SALES DRAWING/DESIGN GUIDE
- SIGNAL PERFORMANCE
- DC PERFORMANCE

H-PIN

H-PIN

T033 X X X X

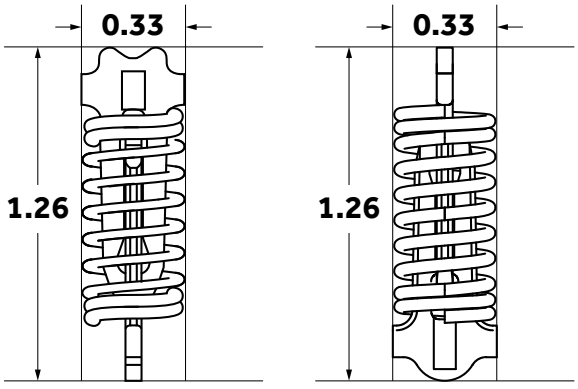
H-PIN SERIES
T033 – 0.40mm

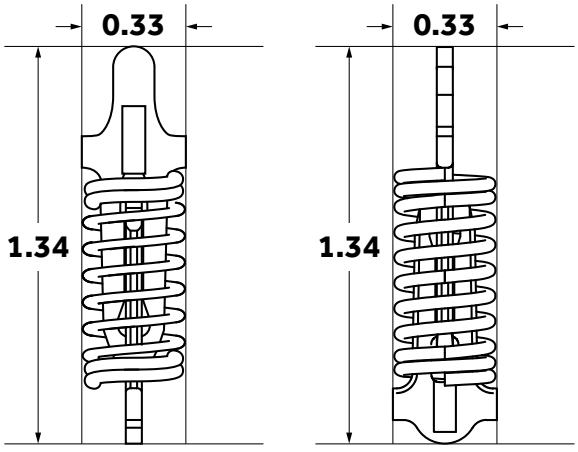
TOP CONTACTOR
B - BGA TIP
L - LGA TIP, Single Plate
M - LGA TIP, Double Plate

OPTIONS
A – Au Plating

SPRING TYPE
(full Deflection)
1 – 11.0gf

BOTTOM CONTACTOR
T - Short Contact TIP





T033BTXX	T033LTXX

RELIABILITY

TO ENSURE THAT TODAY'S COMPLEX AND VITAL PRODUCTS MEET THE MOST RIGOROUS TEST DEMANDS.

IT CAN'T BE SORT OF RIGHT. IT'S GOT TO BE EXACTLY RIGHT.

In the field of test and measurement, the accuracy of the data collected from the DUT (device under test) is only as good as the reliability of the test system itself.

What's more, pins or connectors that don't stand up to the challenges of a test sequence may falsely suggest a manufacturing process failure or a product design flaw within the product itself. These are chances that test and measurement companies cannot take.

With over 30 years of semiconductor reliability test experience, Plastronics understands the critical nature of device and system-level testing. This background is primarily why we know H-Pins are simply the best testing components there are, period.

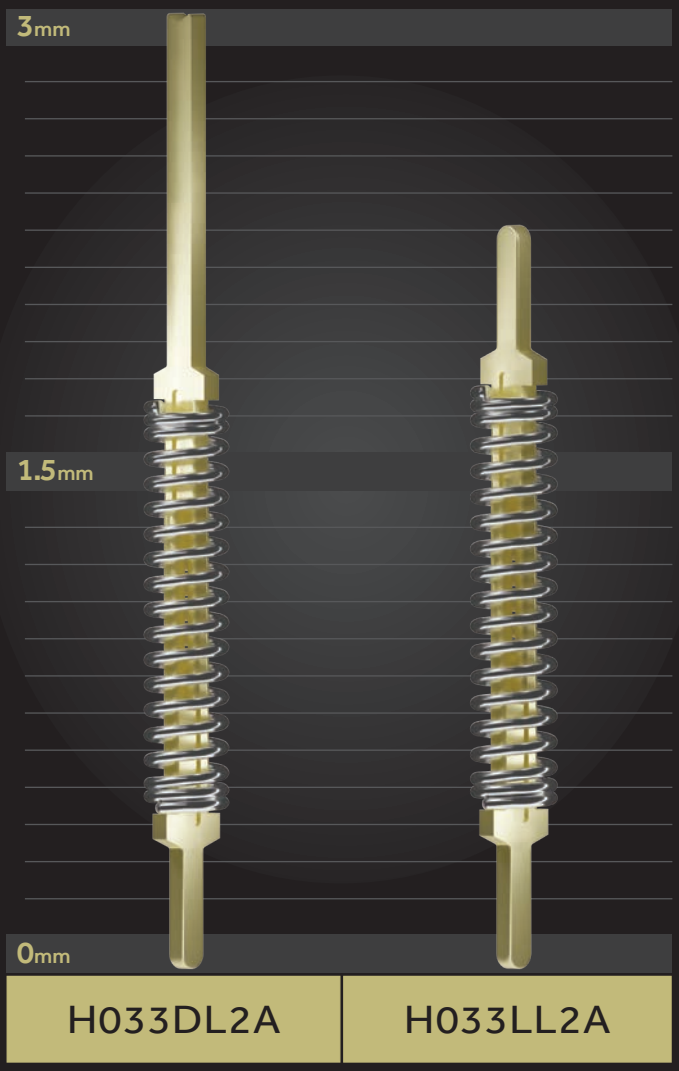
That's why H-Pins are the pin of choice for:

- Semiconductor burn-in sockets and functional test contactors
- System-level testing for devices such as mobile phones, medical devices, and more
- Printed circuit board "bed-of-nails" test fixtures
- Board-to-board connectors for manufacturing test equipment controllers and electronics

Our fully automated H-Pin manufacturing and assembly process removes human error and ensures the process control required by all reliability test components. When you have to have absolute consistency in current, pressure, signal performance, speed and results, you can trust the H-Pin.

H-PIN H033

The H-Pin H033 Series has an outside dimension of 0.33mm and is ideally suited for applications with 0.40mm pitch, but can also be used for larger pitch applications with shorter signal paths.



MECHANICAL PROPERTIES

PITCH:	0.40mm (min)
WORKING TRAVEL:	0.40mm
CONTACT FORCE:	14.5gf
FULL LENGTH:	3.81mm
COMPRESSED LENGTH:	3.41mm
OPERATING TEMPERATURE:	+150C
MECHANICAL LIFE:	>75,000 cycles

ELECTRICAL PROPERTIES

CONTACT RESISTANCE:	<60mΩ
CURRENT RATING (FREE AIR):	1.8 amp
SELF INDUCTANCE:	0.75nH
BANDWIDTH @ -1DB:	10GHz

MATERIALS

STAMPED CONTACT:	BeCu, Au Plate
SPRING:	SS, Au Plate

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H-PIN

H-PIN

H033 X X 2 X

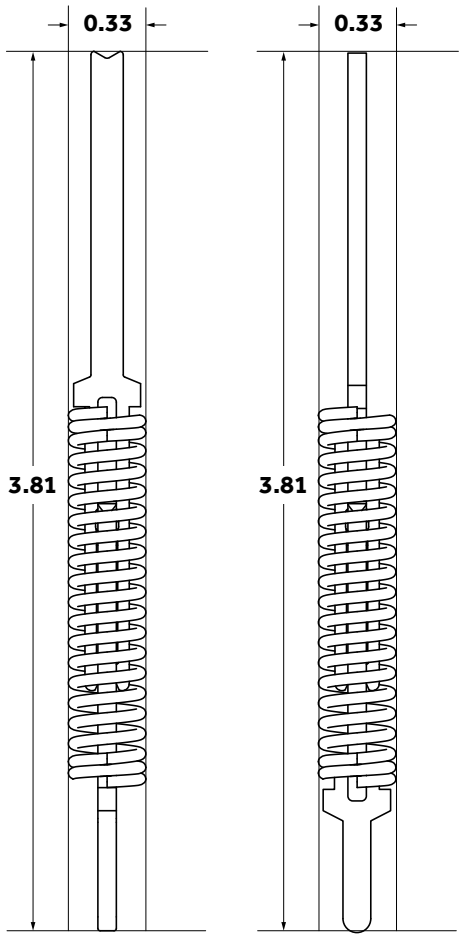
H-PIN SERIES
H033 – 0.40mm

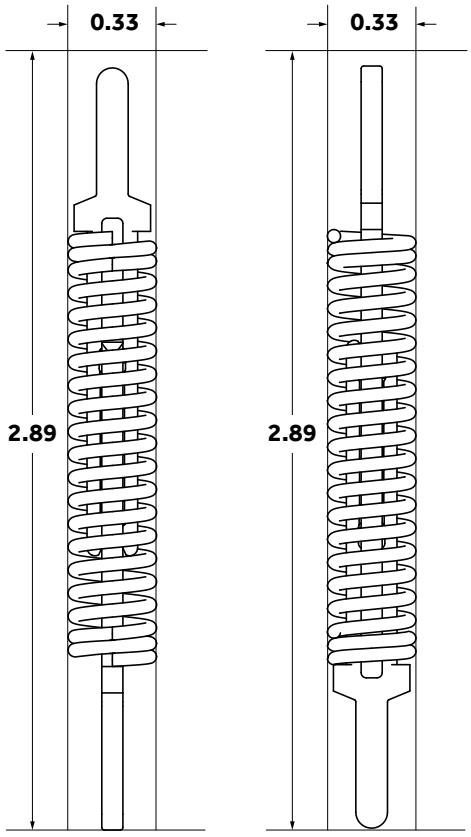
TOP CONTACTOR
L – Standard LGA
W – BGA Tip

OPTIONS
A – Au Plating (30uin)
B – Au Plating (50uin)
E – Anti-Diffusion Coating

SPRING TYPE
(full Deflection)
2 = 14.5gf

BOTTOM CONTACTOR
L - LGA TIP
H - LGA TIP W/ New Mods

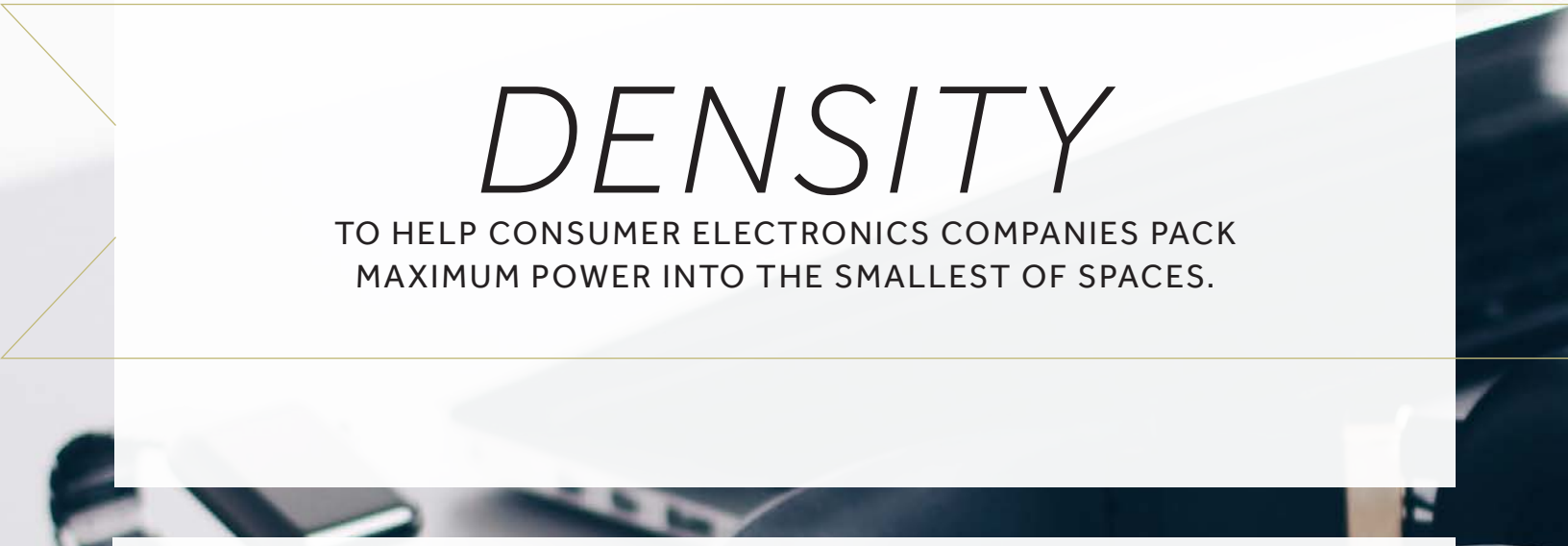




H033DL2A	H033LL2A

DENSITY

TO HELP CONSUMER ELECTRONICS COMPANIES PACK MAXIMUM POWER INTO THE SMALLEST OF SPACES.



BIGGER NO LONGER MEANS BETTER.

Today's consumer electronics pack more technology and features into already tight spaces. The continued emergence of IoT applications and the coming wave of 5G innovations will only push the demand for circuit board space as consumers ask for better, faster, and smaller devices. The H-pin is a vital part of making next-generation electronics better. The H-Pin is used in testing the semiconductor devices and circuit boards used in these electronics as well as used as connectors in the finished products.

What if your devices could do more in a smaller footprint? What if you could offer more functionality, create a better user experience, or enable your device to work faster? You can, the H-Pin is already doing it with:

- Active wearables
- Smartphones
- Smartwatches; personal fitness tracking devices
- Computers/laptops
- Cameras
- Mini mobile projectors
- GPS units
- Home surveillance electronics
- Game Consoles

With finer pin-to-pin pitches, equivalent or better power-per-pin than competing solutions and superior overall performance, you'll soon discover the joy of designing the product you intended rather than compromising your design around catalog connector dimensions that don't quite fit.

H-PIN H038

The H-Pin H038 Series has an outside dimension of 0.38 mm and is ideally suited for applications with 0.50 mm pitch, but can also be used for larger pitch applications with shorter signal paths.

MECHANICAL PROPERTIES

PITCH:	0.50mm (min)
WORKING TRAVEL:	0.43mm
CONTACT FORCE:	30.9gf
FULL LENGTH:	2.95mm
COMPRESSED LENGTH:	2.52mm
OPERATING TEMPERATURE:	+180°C
MECHANICAL LIFE:	+125,000 cycles

ELECTRICAL PROPERTIES

CONTACT RESISTANCE:	<35mΩ
CURRENT RATING (FREE AIR):	2.9 amp
SELF INDUCTANCE:	0.88nH
BANDWIDTH @ -1DB:	15.7GHz

MATERIALS

STAMPED CONTACT:	BeCu , Au Plate
SPRING:	SS, Au Plate

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- SIGNAL PERFORMANCE
- DC PERFORMANCE

H-PIN

H-PIN

H038 X X X X

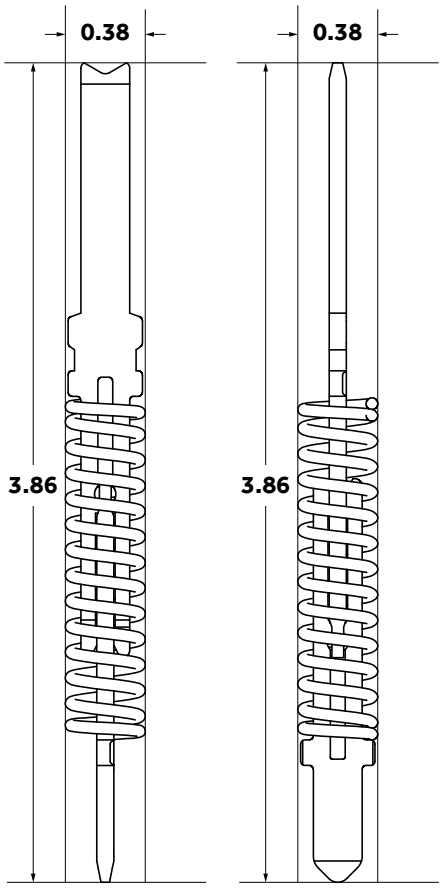
H-PIN SERIES
H038 – 0.50mm

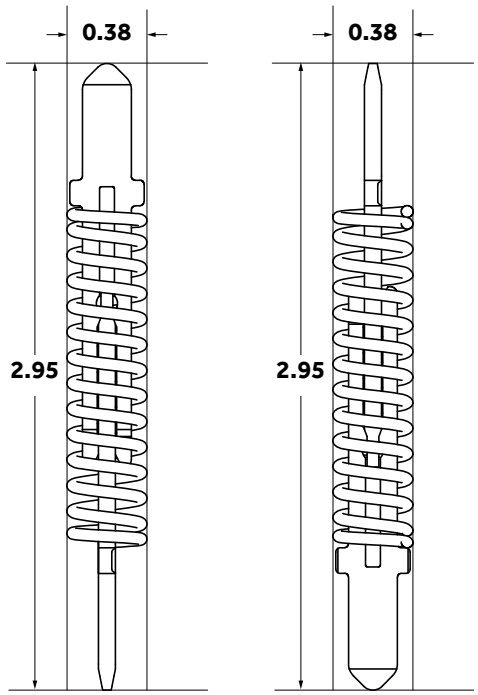
TOP CONTACTOR
U – Standard BGA
L – Standard LGA
D – Extended Tip BGA

OPTIONS
A – Au Plating

SPRING TYPE
(full Deflection)
1 – 30.9gf

BOTTOM CONTACTOR
L –Standard LGA





H038DL1A	H038LL1A

CONSISTENCY

TO MAKE SURE CRITICAL MEDICAL EQUIPMENT WORKS WHEN AND HOW IT IS SUPPOSED TO.

WHEN A PERSON'S HEALTH IS ON THE LINE, FAILURE IS NOT AN OPTION.

Nowhere is the consistent functionality of electronics more important than in the field of medical equipment. So when medical device companies manufacture their products they must rely on the supply chain to perform within the same standards they do.

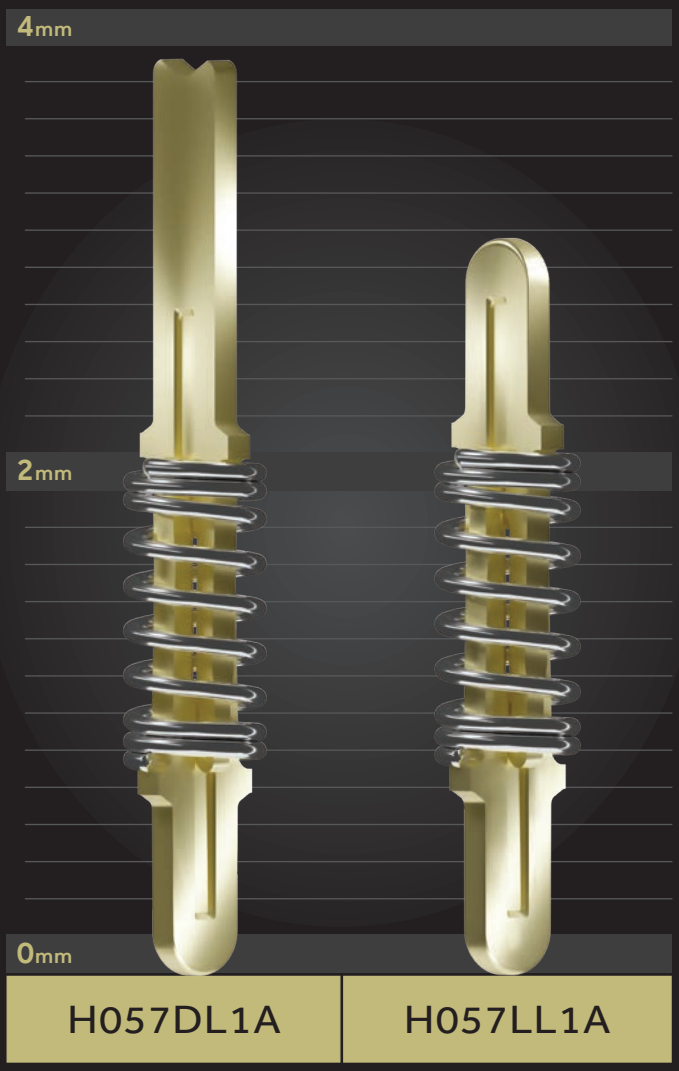
At Plastronics, we understand the value of consistency of performance. That's why our design, production process and process control measures ensure predictable performance results, even under extreme conditions.

Our core business is the design and manufacturing of semiconductor test fixtures. We use our reliability test experience as well as the fully automated H-Pin process to provide reliable and predictable test fixtures and connectors for medical devices such as pacemakers, ventilators, and wide array of diagnostic equipment.

Interconnections enabled by H-Pins have already passed rigorous semiconductor accelerated stress testing to ensure they're going to work in your application exactly right, every time, ensuring consistent performance no matter the environmental conditions.

H-PIN H057

The H-Pin H057 Series has an outside diameter of 0.57 mm and supports applications 0.7 mm pitch and above.



MECHANICAL PROPERTIES

PITCH:	0.70mm (min)
WORKING TRAVEL:	0.50mm
CONTACT FORCE:	30.0gf
FULL LENGTH:	3.00mm
COMPRESSED LENGTH:	2.49mm
OPERATING TEMPERATURE:	+180°C
MECHANICAL LIFE:	>125,000 cycles

ELECTRICAL PROPERTIES

CONTACT RESISTANCE:	<30mΩ
CURRENT RATING (FREE AIR):	3.0 amp
SELF INDUCTANCE:	0.95nH
BANDWIDTH @ -1DB:	18.1GHz

MATERIALS

STAMPED CONTACT:	BeCu , Au Plate
SPRING:	SS, Au Plate

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- SIGNAL PERFORMANCE
- DC PERFORMANCE

H-PIN

H-PIN

H057 X X X X

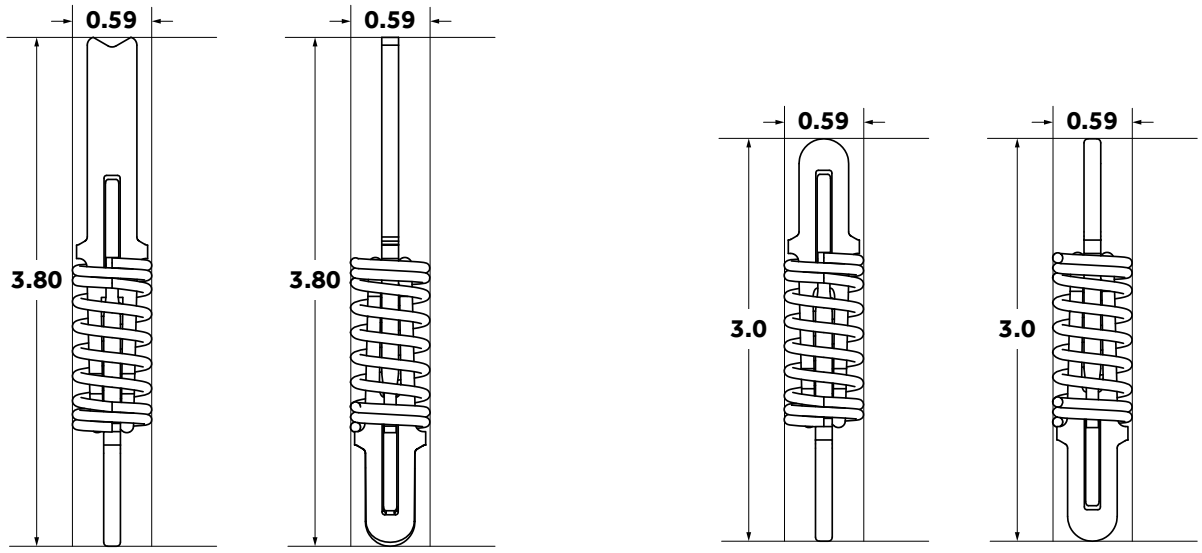
H-PIN SERIES
H057 – 0.80mm

TOP CONTACTOR
U – Standard BGA
L – Standard LGA
D – Extended Tip BGA

OPTIONS
A – Au Plating

SPRING TYPE
(full Deflection)
1 – 30.9gf
2 – 26.7gf

BOTTOM CONTACTOR
L –Standard LGA



H057DL1A H057DL2A	H057LL1A H057LL2A

DURABILITY

TO HELP AUTOMOBILE MANUFACTURERS CREATE VEHICLES THAT CAN GO THE DISTANCE.

TODAY'S VEHICLES HAVE TO DO MUCH MORE THAN JUST DRIVE.

In decades past, the factors that defined the success of automobile sales were largely based on mechanical features or design aesthetics. Today, vehicle technology is what consumers crave.

Modern automobiles already have astonishing computational power, ranging from convenience features like GPS and touch-screen interfaces to advanced safety features like forward collision warning and automatic emergency braking. The next era of automobiles — which won't even require human operation — will be even more dependent upon technology that can go the distance.

The H-Pin's compact design enables vehicle and component manufacturers to design, create and implement much smaller electronic designs that can stand up to the extreme temperatures, vibrations and wear-and-tear that vehicle technology must endure.

The low mass and steady contact force generated by the spring pin, combined with the architecture of the pin itself, ensures superior contact pin performance even under intense vibration. And with the ability to endure temperatures ranging from -55C to 220C, the H-Pin stays true in virtually any imaginable conditions.

H-PIN H077

The H-Pin H077 Series has an outside diameter of 0.77 mm and supports applications 1.00 mm pitch and above.

MECHANICAL PROPERTIES

PITCH:	1.0mm (min)
WORKING TRAVEL:	0.70mm
CONTACT FORCE:	34.9gf
FULL LENGTH:	4.45mm
COMPRESSED LENGTH:	3.75mm
OPERATING TEMPERATURE:	+180°C
MECHANICAL LIFE:	>125,000 cycles

ELECTRICAL PROPERTIES

CONTACT RESISTANCE:	<30mΩ
CURRENT RATING (FREE AIR):	4.0 amp
SELF INDUCTANCE:	1.04nH
BANDWIDTH @ -1DB:	21.9GHz

MATERIALS

STAMPED CONTACT:	BeCu , Au Plate
SPRING:	SS, Au Plate

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- PDF DC PERFORMANCE

H-PIN

H-PIN

H077 X X X X

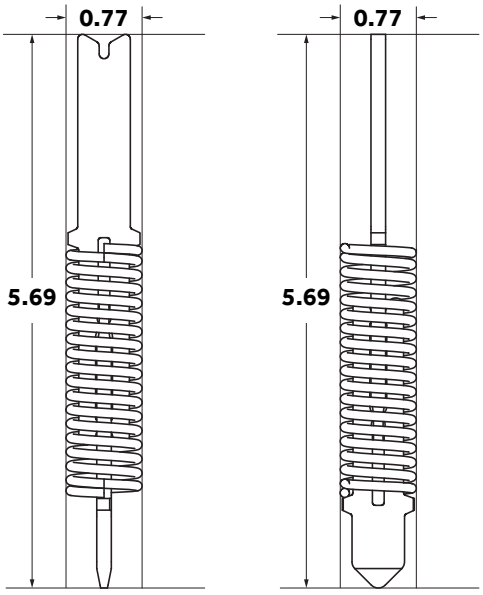
H-PIN SERIES
H077 – 1.0mm

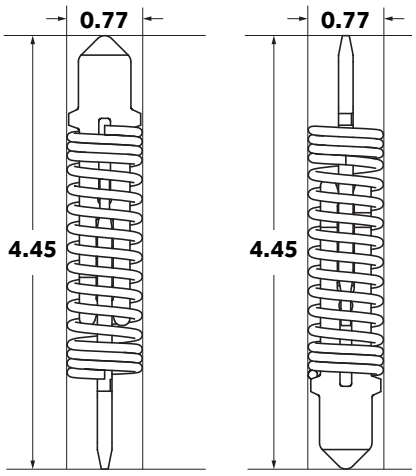
TOP CONTACTOR
L – Standard LGA TIP
G – Large Array BGA
A – Large Array LGAA

OPTIONS
A – Au Plating

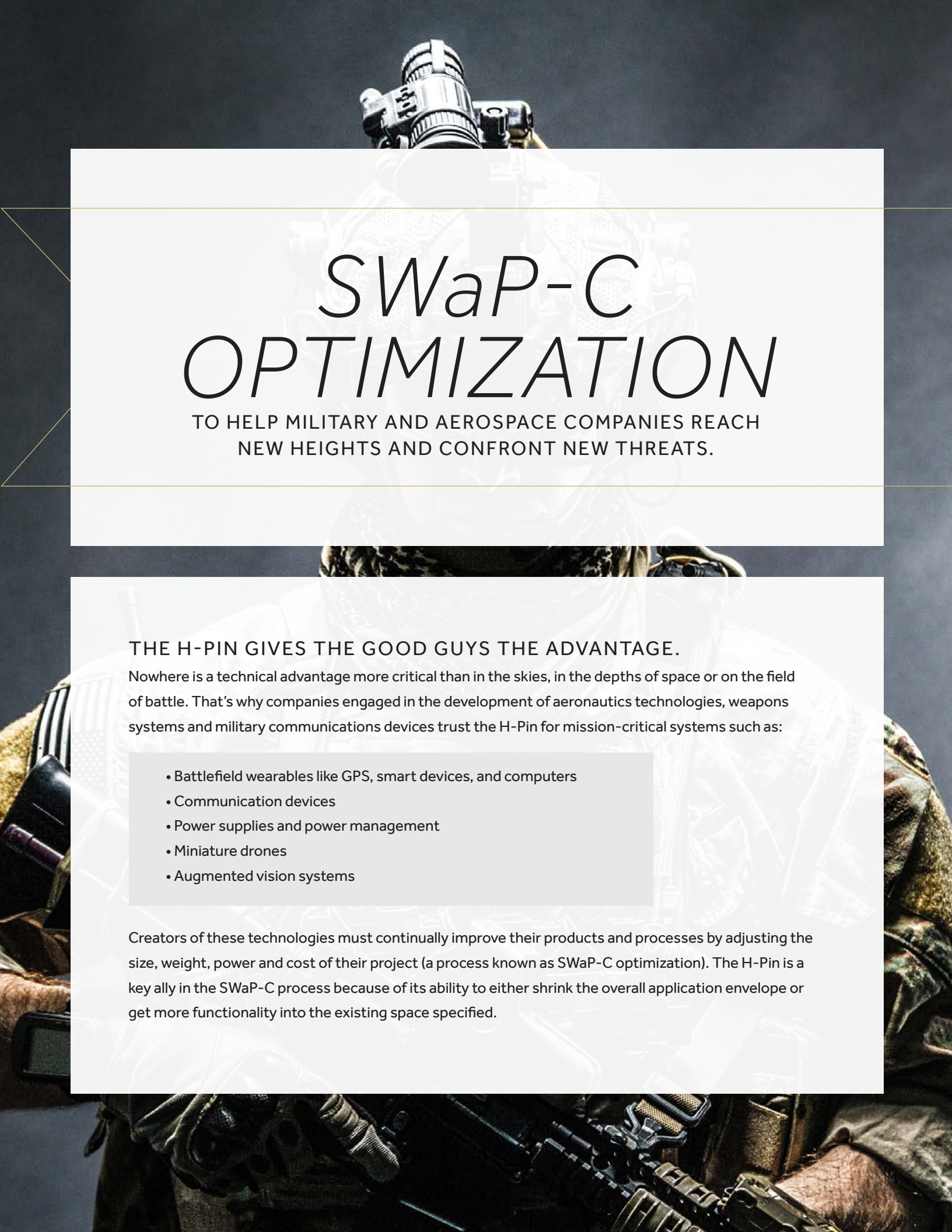
SPRING TYPE
(full Deflection)
1 – 34.9gf
1 – 19.7gf

BOTTOM CONTACTOR
L –Standard LGA
A –Long LGA Tip





H077GL1A	H077LL1A



SWaP-C OPTIMIZATION

TO HELP MILITARY AND AEROSPACE COMPANIES REACH NEW HEIGHTS AND CONFRONT NEW THREATS.

THE H-PIN GIVES THE GOOD GUYS THE ADVANTAGE.

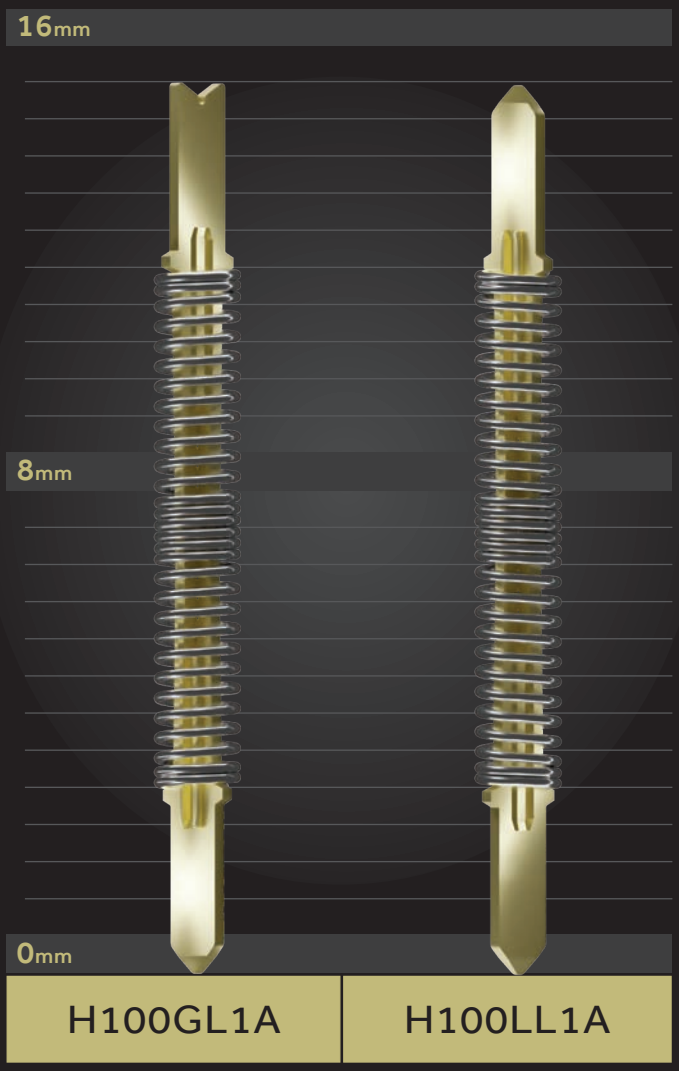
Nowhere is a technical advantage more critical than in the skies, in the depths of space or on the field of battle. That's why companies engaged in the development of aeronautics technologies, weapons systems and military communications devices trust the H-Pin for mission-critical systems such as:

- Battlefield wearables like GPS, smart devices, and computers
- Communication devices
- Power supplies and power management
- Miniature drones
- Augmented vision systems

Creators of these technologies must continually improve their products and processes by adjusting the size, weight, power and cost of their project (a process known as SWaP-C optimization). The H-Pin is a key ally in the SWaP-C process because of its ability to either shrink the overall application envelope or get more functionality into the existing space specified.

H-PIN H100

The H-Pin H100 Series has an outside diameter of 1.00mm and supports applications 1.5mm pitch and above.



MECHANICAL PROPERTIES

PITCH:	1.5mm
WORKING TRAVEL:	2mm
CONTACT FORCE:	49.7gf
FULL LENGTH:	10.30mm
COMPRESSED LENGTH:	8.30mm
OPERATING TEMPERATURE:	+180°C
MECHANICAL LIFE:	>125,000 cycles

ELECTRICAL PROPERTIES

CONTACT RESISTANCE:	<30mΩ
CURRENT RATING (FREE AIR):	4.5 amp
SELF INDUCTANCE:	2.88nH
BANDWIDTH @ -1DB:	5.8GHz

MATERIALS

STAMPED CONTACT:	BeCu, Au Plate
SPRING:	SS, Au Plate

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H-PIN

H-PIN

H100 X X X X

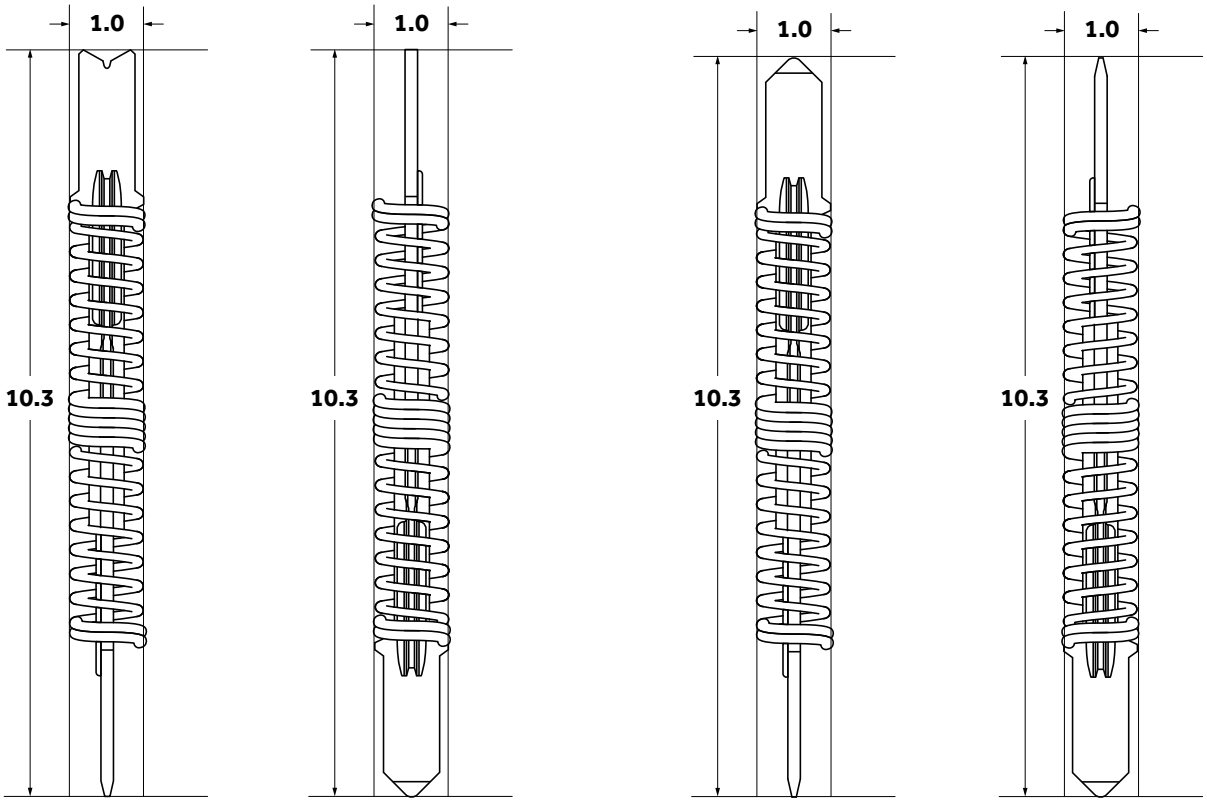
H-PIN SERIES
H100 – 1.0mm

TOP CONTACTOR
L – STD LGA
G – STD BGA
F – LONG LGA
H – LONG BGA

OPTIONS
A – Au Plating
D – Au on Spring
G – No Plating
J – No P lating

SPRING TYPE
(full Deflection)
1 – 33gf
3 – 50gf

BOTTOM CONTACTOR
L - STD LGA
G - STD BGA
F - LONG LGA
H - LONG BGA
B - SHORT LGA



H100GL1A	H100LL1A

OUR PROCESS MAKES THE

DIFFERENCE

When we reinvented the spring probe pin and conceived the H-Pin, we also created an innovative manufacturing process that would ensure that each pin – whether it was number one or one million – was identical. Here's why you can trust our process as much as you can trust the pins that come out of it:

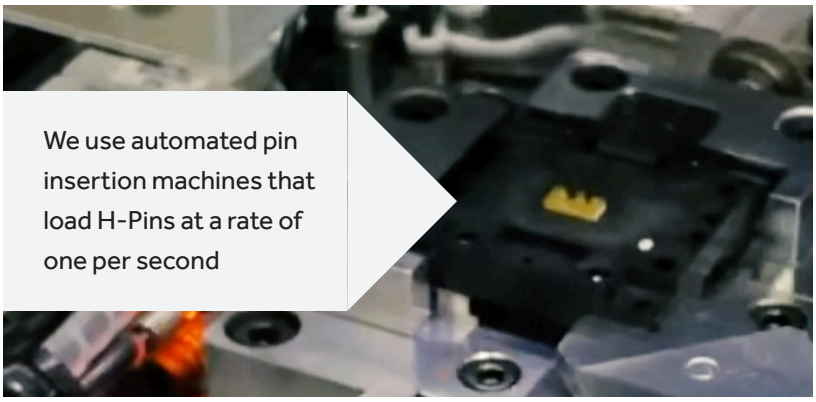
Each H-Pin component is produced using traditional high-volume manufacturing processes, such as stamping and spring winding

Component-level critical dimensions are measured in-line and in situ data is used to determine line-up or line-down production line quality

The H-Pin's open architecture allows us to use automated vision systems in-line at multiple inspection points throughout the process. Every H-Pin goes through both automated mechanical testing inspections and automated final visual inspection

Each component is re-inspected as it feeds into our fully-automated pin assembly process, where finished H-pins are assembled at a rate of more than 400 pins per minute

Most H-Pins get re-reeled at final packaging, allowing for automated reel-to-reel pin insertion into awaiting insulators (Plastronics or other fixture and connector suppliers)



We use automated pin insertion machines that load H-Pins at a rate of one per second

Automated, high-volume manufacturing enables economies of scale throughout all aspects of our manufacturing process, ensuring that we can have pins ready to ship at a moment's notice

THE H-PIN vs COMPETITORS

Many competing technologies rely on time-consuming, costly testing and binning processes to identify pins that as "good," "not so good," or "bad." By contrast, we are validating quality via actual measurements and performance all throughout our production process. Our investments in sophisticated, automated technologies reduce the likelihood of errors, reduce production time and enable us to quickly scale up to meet any order demand.

It all boils down to this – from the minute they go into production to the moment you retire them, you can count on H-Pin quality.

ABOUT

PLASTRONICS

WE KNOW A THING OR TWO ABOUT PRODUCT QUALITY.

In fact, we've been in the semiconductor testing business for more than 30 years, creating sockets, inserts and connectors that help manufacturers test the extreme limits of their applications. This is why we're 100% confident that the H-Pin can handle anything you throw at it — because we built it to be the best testing component on earth.

Our patented technologies are based on solving the difficult industry problems associated with high frequency, high current, low resistance and adequate contact travel. We produce off-the-shelf test sockets ready for immediate delivery, semi-custom test sockets that utilize custom components, and totally custom, one-of-a-kind test sockets.

Whether your challenge is cost, capability, lead time or quality, Plastronics has the in- house technologies and manufacturing capabilities to solve your burn-in and test challenges as well as your application performance objectives.

HIGH-DENSITY

MICRO CONNECTORS

Our high-density, board-to-board connectors are pushing the boundaries of size, signal speeds, temperature and reliability to ensure superior mechanical and electrical performance at a value-enabling cost.

- The H-Pin combines semiconductor test dimensions with connector manufacturing costs, which results in getting significantly more for much less
- Micro connectors that keep their cool in heated conditions—even at temperatures up to 220 C°
- Stack heights down to 1.0mm with signal speeds up to 40GHz at -1dB
- Pin densities as tight as 0.30mm pitch
- 100 percent fully-automated and controlled manufacturing and assembly process, which results in industry-best reliability

PLASTRONICS
SOCKETS & CONNECTORS

Dallas + Tokyo + Singapore

Learn more at www.Plastronics.com or give us a call at 972-258-2580.