

AS AN RFID USER, WE UNDERSTAND THAT YOU DON'T WANT TO THINK ABOUT YOUR TAGS, YOU JUST WANT THEM TO WORK.

To that end, demanding tags that are “Powered by Impinj” is the most important step you can take. Why? Because Impinj is the company that made UHF Gen 2 real. Not only were our products the first to earn EPCglobal’s certifications for Conformance and Interoperability, Impinj is the force behind every major advance the industry has seen, from authoring the UHF Gen 2 standard to the extension of Gen 2 to item-level tagging—including the tagging of materials high in liquid and metallic content. And just as our Monza™ and Monaco™ tag chip and Speedway® reader products culminate in system solutions that lead the industry, our tag antenna designs benefit from our innovative approach to RFID, as well.

It’s easy to overlook the importance of the tag antenna to overall RFID system performance; for most, it seems, it’s an afterthought. But at Impinj, the combination of tag chip and antenna design works together to leverage better, more robust, and innovative RFID solutions—solutions that not only enable whole new categories of applications, they yield the performance and reliability you demand.

UHF GEN 2 RFID

Tag Antenna Designs

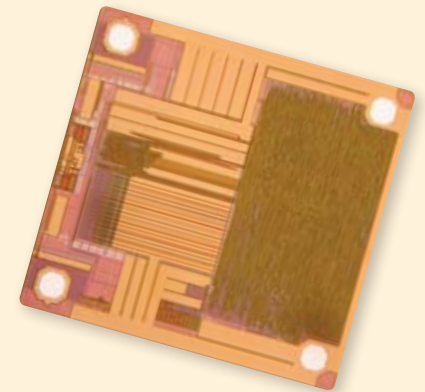


Maximizing Tag Performance: It Begins with the Chip

One of the tag antenna's essential functions is to harvest energy from a reader to power the tag chip—and do so in all regulatory environments. Sounds simple enough. Of course, there are a myriad of other factors that contribute to a successful RFID experience, but nothing happens until you get power to the tag! And that begins with the right tag chip.

Key to Impinj's tag chip antenna performance and diversity is the flexibility of our Monza and Monaco tag chips. As a result, tags powered by Impinj may be found in tagging applications from the item level to the pallet level, anywhere in the world. They may be used with a whole host of antenna form factors, large or small. They may be used with antennas designed for long range (far field) or very close range (near field) operations. Their ability to work with any antenna type combined with such attributes as high receptivity, broadband sensitivity, and exceptional performance means Monza and Monaco tag chips provide unparalleled flexibility to cover all applications from items to pallets, worldwide.

Featured here are some of the tag antenna configurations enabled by high-performance Monza and Monaco tag chips.



Worldwide operation, high receptivity, dual antenna ports, and exceptional quality make Monza and Monaco the most flexible and best performing tag chips available, enabling tag antenna designs not possible with any other tag chip.



Impinj's ThinPropeller tag design improves inventory accuracy and efficiency in the most demanding environments, from the warehouse to the retail floor.

Designs for Longer Range Applications

(Pallet and Case Level)

Impinj's ThinPropeller antenna design is an ideal choice for far-field case, carton, and pallet applications. Its small size, low cost, and convenient aspect ratio have made it an RFID industry workhorse. Sample uses include garment, airline baggage, and supply chain tagging.



ThinPropeller
92 mm x 8 mm

Designs for Range-bridging Applications

(Case and Item Level)

Impinj's Satellite, Paperclip, and Trellis antenna designs are configurations optimized for short to medium range, item-level applications. Sample uses include pharmaceutical, garment, and asset tracking tags.



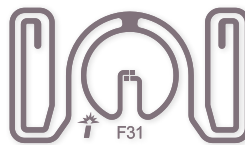
Originally designed for retail garment applications, the Satellite antenna is so flexible it can be used in any application that benefits from the ability to read tagged items in the near field, far field, or both.



Trellis
22 mm x 8 mm



Paperclip
20 mm X 8 mm



Satellite
32 mm x 18 mm



A custom variant of the Button tag design embedded directly into this plastic pill bottle means the drug manufacturer has inventory visibility from the moment of receipt—even before it is filled on the line.

Designs for Short Range Applications

(Item Level)

Impinj's Blade, Button, and Square Button antenna designs are configurations specifically optimized for item-level tagging. These designs provide outstanding performance with Monza and Monaco tag chips and a UHF Gen 2 reader equipped with a near-field antenna. Sample uses include e-pass, medical, pharmaceutical, and asset tracking tags.



Button
12 mm round



Blade
15 mm x 8 mm



Square Button
11 mm square

UHF Gen 2 tag antennas can be tailored to be sensitive to only the near field, the far field, or both. No other RFID solution can offer this level of flexibility. Only Impinj's brand of UHF Gen 2 allows a user to dial-in the optimal performance characteristics for the application at hand.

Antenna	Dimensions	Pallet	Case	Item	Long Range	Range-bridging	Short Range	Worldwide Operation
ThinPropeller	92 mm x 8 mm	✓	✓		✓			✓
Satellite	32 mm x 18 mm		✓	✓		✓		✓
PaperClip	20 mm x 8 mm			✓		✓		✓
Trellis	22 mm x 8 mm			✓		✓		✓
Blade	15 mm x 8 mm			✓			✓	✓
Button	12 mm round			✓			✓	✓
Square Button	11 mm square			✓			✓	✓

Inside Impinj's state-of-the-art antenna design lab, our engineers conduct in-depth antenna characterization and benchmarking studies, including the evaluation of range, near- and far-field characteristics, interference effects, and loading conditions across the UHF spectrum and under a variety of use conditions to verify consistent tag performance. Prior to releasing an antenna to production, the design is qualified for its targeted performance characteristics to work with all appropriate combinations of components that comprise the tag.



Impinj's state-of-the-art antenna lab includes a custom anechoic chamber, a shielded enclosure lined with radio-absorbing material that provides a controlled environment for tag antenna testing and evaluation.

Summary

While these antenna designs cover a wide spectrum of uses, countless other form factors are possible, and a great many more will emerge in the coming months with the ever-expanding scope of applications and specialized needs. Contact Impinj for specific recommendations for tag antenna selection, or any of our outstanding inlay and label conversion partners for more information.

