# Monza® RFID Tag Chips

UHF GEN 2 SERIALIZATION, MEMORY AND EXTENDED FEATURE SOLUTIONS

Monza X – Extended Feature Chips

Impinj's Monza® X-2K Dura and Monza® X-8K Dura chips enable users to communicate wirelessly with the processor inside electronic devices using standard UHF Gen 2 RFID readers, unlocking many new benefits for consumer electronics manufacturers, retailers and end users. Embedded directly into the circuit board of an electronic device, Monza X chips link to the device's processor through a standard I2C bus, enabling the processor or a UHF reader to read and write the Monza X chip memory even when the electronic device is powered off. By enabling electronic devices to communicate with RFID readers, Monza X chips deliver a wide range of extended capabilities such as theft deterrence in the supply chain and wireless device configuration at point of sale and beyond.

MONZA® X OVERVIEW
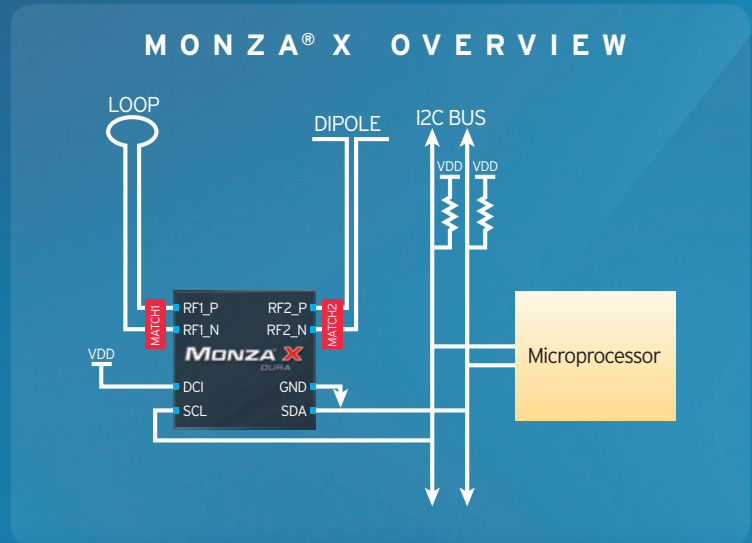
Monza X chip features include:

> 2 kbits or 8 kbits user memory accessible through both RF to reader devices and I2C interface to microprocessors

> Impinj's QT® technology and one time programmable memory blocks for privacy and security of sensitive information stored in the chip

> Superior passive read/write sensitivity and the ability to boost sensitivity by supplying DC power

> Two fully independent antenna ports, enabling multiple configurations for far field and near field RFID applications

> Ability to wake up the microprocessor from low power states in response to RF write event, enabling power efficient electronic devices

KEY APPLICATIONS

$4.99
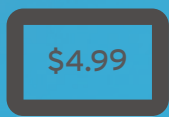
Wireless Displays
and Sensors

Product Activation/
Theft Deterrent

Late Stage Upgrades
and Configurations

Monza® RFID Tag Chips
The High-Performance, Item-Level Tagging Leader

The Monza family of tag chips delivers unique performance, memory and extended features that address even the most challenging RFID applications. Providing superior sensitivity combined with excellent interference rejection, support for chip-based serialization, omni-directional antennas, expanded memory and packaging options, Monza tag chips have number one market share in UHF RFID.

Monza chips are available on wafers or in a Dura package.

## Impinj's Monza tag chips feature:

> Industry's best read and write sensitivity combined with excellent interference rejection to yield outstanding read and write reliability, smaller tag designs, and longer read ranges

> Gen 2 compliant custom features that facilitate inventory of hard-to-read tags and rapid access of serial numbers

> Easy to deploy, reliable and scalable chip-based serialization method providing support for bulk and inline encoding

> Two fully-independent antenna ports which enable creation of tags that are insensitive to orientation

> Memory options to support large user memory and data profiles for privacy and security of sensitive information

> 48 bit serialized Tag Identifier (TID) memory

> Authentication and anti-cloning application support

Monza Self-Serialization

SIMPLY CREATE UNIQUE SERIAL NUMBERS

Monza Self-Serialization provides an easy to deploy and scalable Electronic Product Code (EPC) serialization method based on Impinj's breakthrough tag chip serial number management and an ecosystem of high-performance encoding solutions. Monza Self-Serialization enables users to generate a serial number directly from their tag's Monza chip, eliminating the need for IT systems to coordinate, distribute and synchronize serial numbers. In addition, users gain control and flexibility to choose when, where and how they manage their RFID tagging processes and deliver properly tagged products.

With Monza Self-Serialization, RFID printer encoders and inline or bulk encoding solutions based on the Impinj STP® source tagging platform construct a unique Serialized Global Trade Item Number (SGTIN), using the Monza chip's Tag Identifier (TID) and existing IT-based barcode and variable data management business processes.
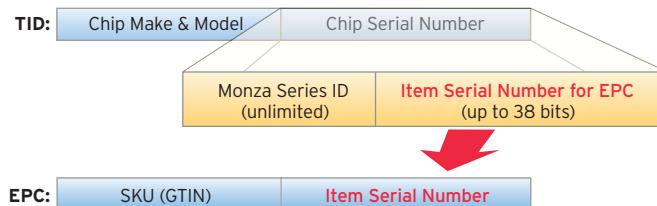
Monza Self-Serialization features:

> Scalable serialization built in, with no additional cost

> SGTIN serial numbers generated directly from Monza's unalterable TID

> EPC data quality and integrity with verifiable SGTIN at any point in supply chain

> 24-year serial number cycle time when using all 38-bits of the generated serial number

> Co-exists with other EPC serialization methods, including IT-based serialization solutions

> Compatible with existing variable data management processes

> Forward compatible with future generations of Monza tag chips

FastID™ & TagFocus™ Features

IMPROVE READ RATES AND RELIABILITY

Impinj's patent-pending FastID feature improves the read rates of Monza tags being inventoried by either their TID or EPC and TID numbers. FastID can deliver a 2X-3X faster read rate than a traditional Gen 2 inventory scenario and is ideal for applications including authentication, anti-counterfeiting, and TID-based serialization.

TagFocus improves read reliability for large tag populations. This UHF Gen 2 compliant feature enables a reader to instruct a tag to remain in a non-responsive state. By instructing tags that have already been inventoried to remain unresponsive while searching for tags not yet inventoried, the reader has a far greater chance of finding difficult-to-read tags. TagFocus offers great value to applications, including asset tracking, retail inventory monitoring and supply chain, that have a mix of easy and hard to read tags.
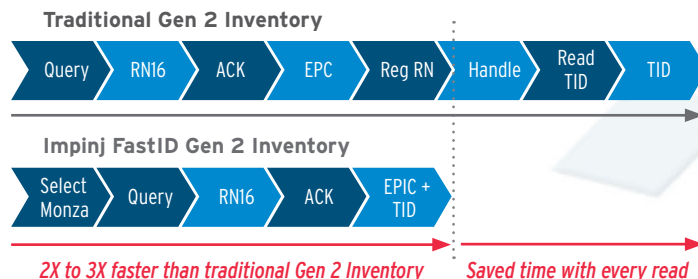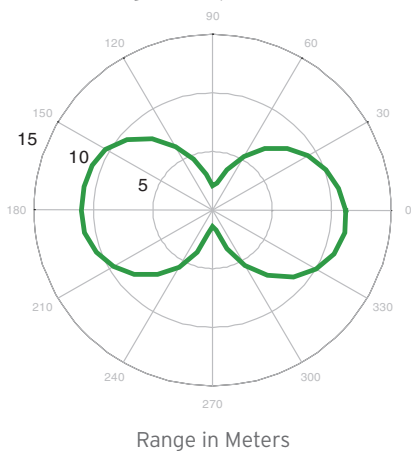
True3D™ Antenna Technology

SEE WHAT YOU'VE BEEN MISSING

Monza chips possess a unique, patent-pending architecture that provides two fully-independent antenna ports—enabling high performance, true omnidirectional tags for the first time.
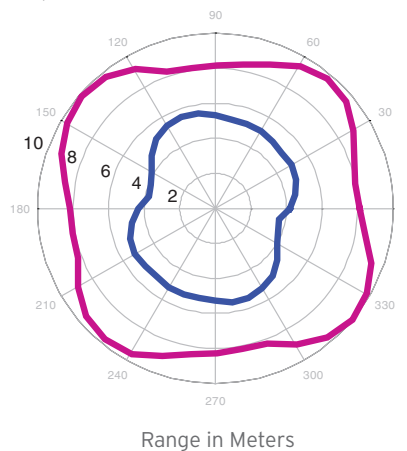
For many applications, consistent orientation of a tag with respect to a reader presents a challenge. Compare the read range response of the Monza 4 tag with True3D to the Monza 3 tag's conventional tag chip response. The response pattern is circular, no angle has significantly lower sensitivity than any other. At every angle, the read range has increased significantly. And this doubling of read range performance comes in a very compact form factor tag.

With True3D antenna technology, readers see tags from any angle, resulting in higher read rates and smaller, less expensive tags—extending RFID benefits to more applications.

Tag Read Range Response Performance Comparison

Range in Meters

Range in Meters

— H32 tag antenna with older Monza tag chip

— H42 tag antenna with current Monza, True3D-enabled tag chip

Tags based on conventional tag chips exhibit blind spots where read range drops significantly
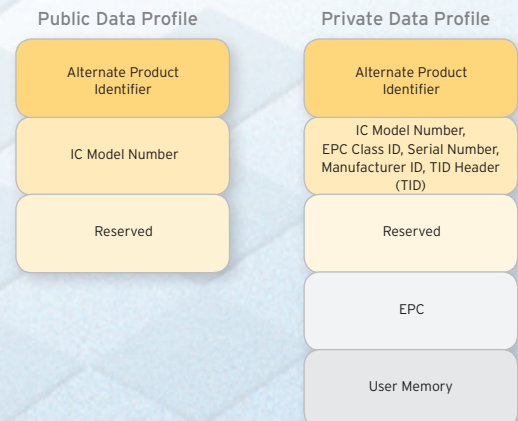
Monza tag chip's True3D Antenna Technology removes blind spots and provides excellent read range
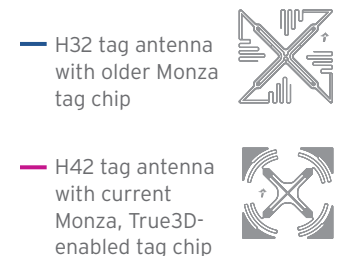
QT® Memory Technology

CONTROL WHAT THE WORLD SEES

Monza chips feature Impinj's patent-pending QT technology—a unique ability to maintain two data profiles to support protection of business-sensitive data and consumer privacy. In the Private Data Profile, users have access to all data/memory blocks while the Public Data Profile only contains the chip model information and the alternate product identifier. The ability to switch between these two profiles is protected by the tag's access password, physical distance from a reader antenna via a short range mode, or both. When a tag is switched to the Public Data Profile, all other data appears to be non-existent.

Public Data Profile

- Alternate Product Identifier
- IC Model Number
- Reserved

Private Data Profile

- Alternate Product Identifier
- IC Model Number, EPC Class ID, Serial Number, Manufacturer ID, TID Header (TID)
- Reserved
- EPC
- User Memory

Monza Tag Chips at a Glance

Product Details	Serial Chips			Memory Chip	Extended Feature Chips	
	Monza 5	**Monza 4D**	**Monza 4E**	**Monza 4QT**	**Monza X-2K Dura**	**Monza X-8K Dura**
EPC Memory (bits)	128	128	496	128	128	128
User Memory (bits)	32	32	128	512	2,176	8,192
QT® Memory Security Provides two data profiles to support protection of business-sensitive data	-	-	-	✔	✔	✔
True3D™ Dual Antenna Technology Enables high performance, omnidirectional tags	-	✔	✔	✔	✔	✔
TagFocus™ Mode Improves read reliability for large tag populations	✔	✔	✔	✔	✔	✔
FastID™ Mode Delivers 2X-3X faster read rates	✔	✔	-	✔	✔	✔
Monza Self-Serialization Easy, scalable, tag chip serial number management	✔	-	-	-	-	-
I2C Interface	-	-	-	-	✔	✔
Form	Wafer		Wafer or Dura		Dura	
Dura Package Size	-	-	2.0 x 2.0 x 0.5 mm		1.6 x 1.6 x 0.35 mm	2.0 x 2.0 x 0.35 mm
Air Interface Protocol	EPCglobal UHF Class 1 Gen 2 / ISO 18000-6C					

Dura - Packaged Monza Tag Chips

Extend the advantages of Monza-powered tags to printed circuit board (PCB) applications and ruggedized tag designs through the use of our packaged parts. Packaged tag chips are supported by standard surface mount assembly techniques, meaning easy integration into products designed with PCBs, as well as other applications where soldered connections are preferred. Impinj utilizes a µDFN package, making it the industry's smallest and lowest profile tag chip part.

For additional information about Monza products and features, please visit: www.impinj.com/Monza