

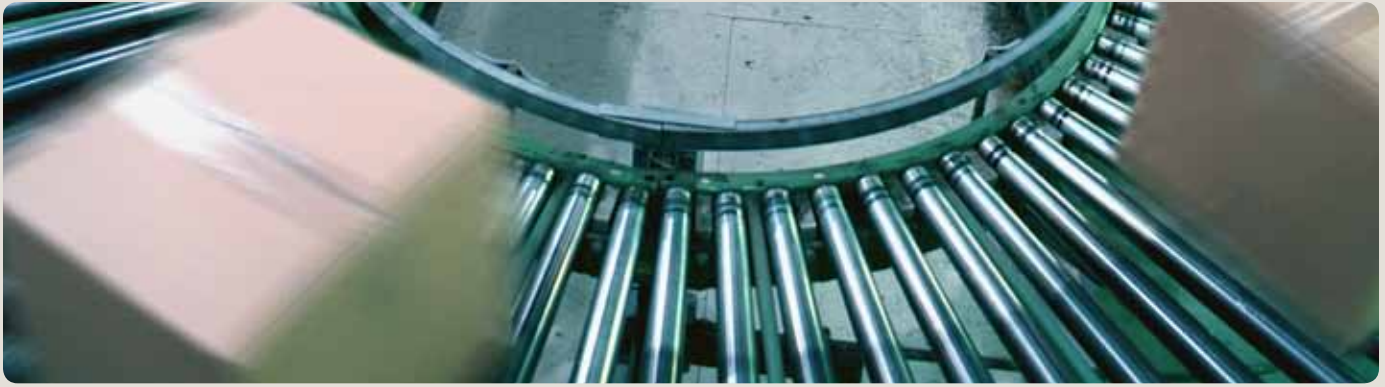
- Manufacturing Operations
- Warehouse Operations
- Supply Chain Operations
- In-Transit Visibility
- Store Operations
- Field Service

## Intermec RFID Tags & Media

Meeting the scalable RFID challenge







## How To Determine Which Tags Are Right For You

### Getting Started

One of the key factors to successfully implementing RFID technology in your operation is your selection of RFID tags. This guide serves as a way to quickly learn about tags, navigate through the different tag options and help you select the tag that's right for your application. As a leader in RFID as well as barcode technologies, Intermec is uniquely positioned to help as you transition your operations to take full advantage of new capabilities in automated data collection.

### The RFID Tag/Media Selection Check List

In choosing the right RFID tag for your application, there are a number of considerations, including:

#### 1. Frequency Range

RFID products currently on the market operate at a variety of frequencies, with each frequency targeted for specific geographical regions, applications and performance requirements. When selecting a tag or insert, first consider the general performance characteristics and the regulatory requirements associated for your region of operation. Intermec's RFID tag and media products allow for operation throughout all worldwide UHF regulatory regions.

#### 2. Memory Size

Flexibility is key, especially as business operations, industry standards, customer requirements and other variables change over time. Intermec offers tags for applications requiring both license plate and extended memory configurations. License plate tags allow the programming of a single number that can be referenced to an external database for additional information about the object being tagged, most often used for compliance applications. Extended memory tags enable information about the tagged object to be stored directly on the tag, allowing access in situations when an external database may not be available.

#### 3. Range Performance

A tag's read range performance is usually considered the primary gauge of its suitability for a particular application. However, not all applications require maximum range. Many of Intermec's tag and insert designs, though optimized for maximum performance on specific materials, are often used with other materials for applications requiring less than optimal read range, or where greater range may actually be detrimental.

#### 4. Form Factor

While range performance is often viewed as the best gauge for a tag design, the tag form factor cannot be overlooked. Intermec has developed a portfolio of tag and media designs that utilize state of the art materials to provide a wide range of options for combining size and performance.

#### 5. Environmental Conditions

How and where the tag or insert will be used plays a significant role in determining the right tag for your application. Performance will differ depending on what materials are adjacent to the tag along with environmental conditions such as temperature and humidity. Intermec's RFID tag and media products are available in a variety of designs and use materials capable of surviving even the harshest environments.

#### 6. Standards Compliance

Intermec maintains an active presence within the worldwide RFID standards community and will continue to develop products that meet existing and emerging standards, including EPC Global Class 1 Generation 2 and ISO 18000-6C. This ensures compatibility and interoperability with other products meeting these standards and protects your investment against premature obsolescence. Intermec's tag and media products comply with all relevant adopted and emerging global standards, a list of which we've included on the back page of this guide.

# Intermec RFID Gen 2 Tag & Media Products

## IT36 Low Profile Durable Asset Tag

The IT36 is tuned for a wide frequency band to include both FCC and ETSI regulatory environments and is optimized primarily for non-metal surfaces. The small, low profile IT36 is designed to provide superior performance and high durability on a variety of surfaces at a low cost.

**Typical applications:** Returnable and reusable plastic containers (RPCs) including totes, bins, trays, and boxes; wood and plastic pallets



## IT75 and IT76 Metal-Mount Low Profile Durable Asset Tag

The IT75 (tuned for FCC regions) and the IT76 (tuned for ETSI regions) are optimized specifically for metal surfaces. The small, low profile design of the IT75 and IT76 offers excellent mid-range performance and high durability at a low cost.

**Typical applications:** Metal assets; metal containers, cages, and pallets; conveyance assets (containers and trailers)



## IT65 Large Rigid Tag

The Intermec IT65 Large Rigid Tag offers the best combination of superior long-range performance, ruggedness, and worldwide compatibility. The tag is capable of withstanding extreme temperatures and hazardous exposures, and the broadband antenna design provides long-range performance on a wide range of materials including metal, plastic and wood.

**Typical Applications:** Shipping containers; trailers; heavy machinery; metal cages; unit loading devices (ULDs)



## IT65 Small Rigid Tag

The Intermec IT65 Small Rigid Tag is a compact-sized tag capable of withstanding extreme temperatures and hazardous exposures. The broadband antenna design provides superior mid-range performance on a wide range of materials including metal, plastic and wood.

**Typical Applications:** Metal and plastic pallets; metal cylinders; beverage, hazardous material, and chemical containers



## IT67 Lateral Transmitting Tag

Intermec's rugged IT67 Enterprise Lateral Transmitting (LT) Tag is the first in the industry designed to provide both edge and frontal performance for enhanced portal and forklift RFID applications. The IT67 is suitable for harsh environments and global operation.

**Typical Applications:** Metal shelves and racks; metal and plastic pallets; automotive and other manufacturing totes and containers



## IT32 UHF Identification Card

The IT32 Identification Card offers a longer read range than most passive UHF RFID card form factors. Available with optional magnetic stripe, the cards can be punched to allow mounting or accommodate a hanging strap and can also be printed with human and machine readable code.

**Typical Applications:** Primarily intended for use as an identification badge for long range ingress/egress monitoring.



## RFID Smart Labels

A variety of smart label products are available for Intermec's line of RFID-enabled printers. Inlays are available for most sizes of media stock suitable for compliance and other applications. Thermal transfer or direct thermal printing and chip encoding enable on-demand generation of durable RFID labels and tags that can be deployed with confidence to meet a broad range of customer requirements. Performance and size specifications vary according to the inlay and media.

**Typical Applications:** Supply chain pallet and carton tracking, warehouse operations

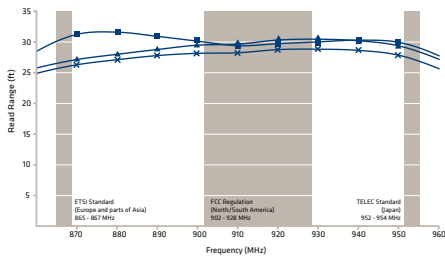


# Tag Performance Charts

The following charts reflect Intermec's durable tag typical performance on the noted materials.

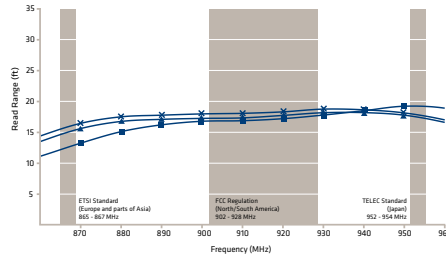
## IT65 Gen 2 Large Rigid Tag

Read Range Performance of Large Gen2 Rigid Tags



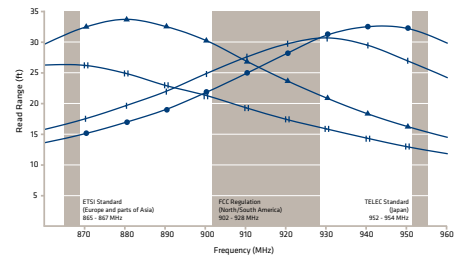
## IT65 Gen 2 Small Rigid Tag

Read Range Performance of Small Gen2 Rigid Tags



## IT32 Gen 2 Identification Card

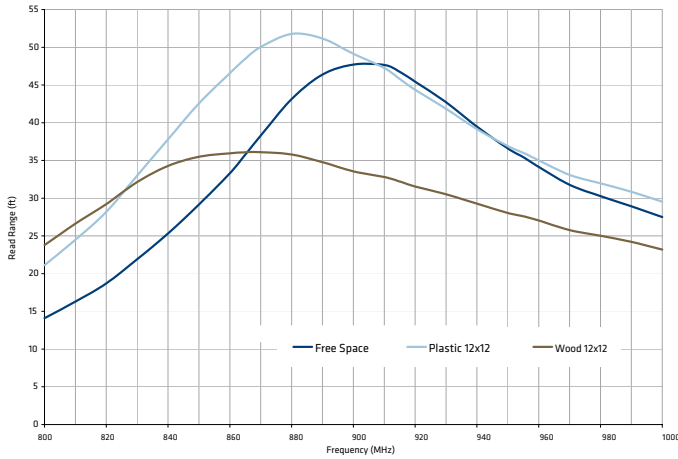
Read Range Performance of Gen2 ID Card



Legend: Metal (squares), Plastic (triangles), Free Space (circles), Wood (crosses), Plywood (plus signs), Cardboard (asterisks)

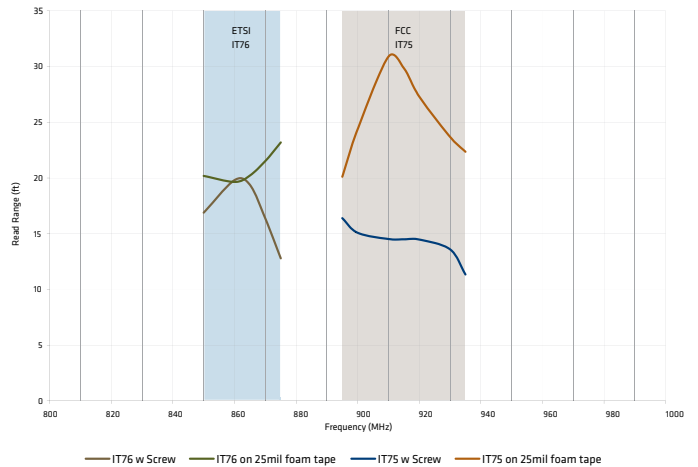
## IT36 Low Profile Durable Asset Tag

Read Range Performance of IT36 Durable Asset Tag



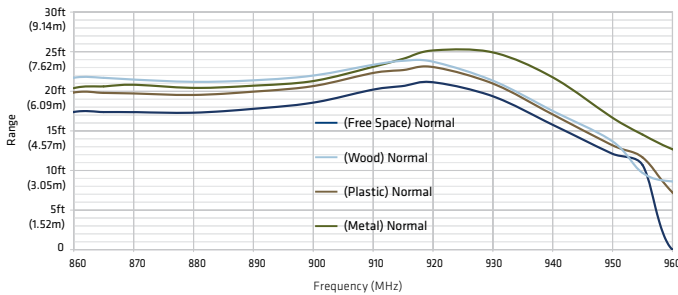
## IT75 and IT76 Metal-Mount Low Profile Durable Asset Tags

Read Range Performance of IT75 and IT76 Durable Asset Tags

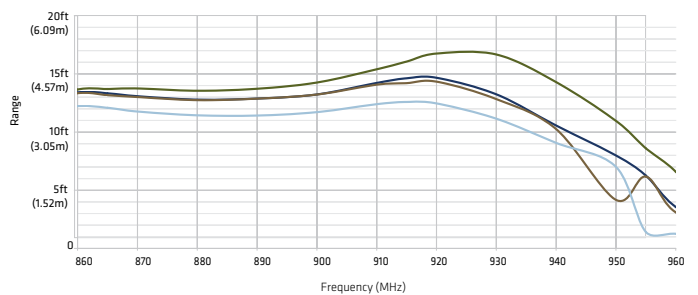


## IT67 Lateral Transmitting Tag

Read Range Performance of IT67 - (Normal Orientation)



Read Range Performance of IT67 - (Lateral Orientation)



Note: Performance data was measured in laboratory conditions at maximum legal powers. Actual performance will vary depending upon environmental factors, the material to which the tag is affixed, and the reader output power.

| Durable Tag Comparison Matrix                 |   |                        |                     |                    |                    |                                 |                                      |              |  |                  |                   |                           |                  |             |                    |                    |                  |                  |   |
|---|---|------------------------|---------------------|--------------------|--------------------|---------------------------------|--------------------------------------|--------------|--|------------------|-------------------|---------------------------|------------------|-------------|--------------------|--------------------|------------------|------------------|---|
| Product Name                                  | Part Number   | Operating Frequency    | Length              | Width              | Thickness          | Direct Application Materials    | Attachment Methods                   | On-metal tag | Typical Read Range                           | IC               | EPC Code Max Size | Unique Serial Number Size | TID / UID Memory | User Memory | Min Operating Temp | Max Operating Temp | Min Storage Temp | Max Storage Temp | Descriptive Notes   |
| IT36 Low Profile Durable Asset Tag, Non-metal | Pack qty 10: IT36A0010<br>Pack qty 250: IT36A0250     | UHF Global 860-960 MHz | 111.5 mm<br>4.39 in | 21.8 mm<br>0.86 in | 5.1 mm<br>0.20 in  | cardboard, plastic, wood        | screws/rivets<br>25 mil<br>foam tape | No           | 11 m<br>36 ft                                | Impinj Monza 4QT | 128 bit           | 48 bit                    | 64 bit           | 512 bit     | -40°C<br>-40°F     | +82.2°C<br>180°F   | -40°C<br>-40°F   | +93.3°C<br>200°F | The IT36 is tuned for a wide frequency band to include both FCC and ETSI regions and is optimized primarily for non-metal surfaces, such as reusable plastic containers and wooden and plastic pallets. |
|   | Pack qty 10: IT75A0010<br>Pack qty 250: IT75A0250     | UHF FCC 902-928 MHz    | 111.5 mm<br>4.39 in | 21.8 mm<br>0.86 in | 5.1 mm<br>0.20 in  | metal                           | screws/rivets<br>25 mil<br>foam tape | Yes          | 4 m<br>13 ft                                 | Impinj Monza 4QT | 128 bit           | 48 bit                    | 64 bit           | 512 bit     | -40°C<br>-40°F     | +82.2°C<br>180°F   | -40°C<br>-40°F   | +93.3°C<br>200°F | The IT75 is tuned for the FCC region and is optimized metal surfaces, such as metal pallets, ULDs, and other metal assets.  |
|   | Pack qty 10: IT76A0010<br>Pack qty 250: IT76A0250     | UHF ETSI 865-868 MHz   | 111.5 mm<br>4.39 in | 21.8 mm<br>0.86 in | 5.1 mm<br>0.20 in  | metal                           | screws/rivets<br>25 mil<br>foam tape | Yes          | 5 m<br>16 ft                                 | Impinj Monza 4QT | 128 bit           | 48 bit                    | 64 bit           | 512 bit     | -40°C<br>-40°F     | +82.2°C<br>180°F   | -40°C<br>-40°F   | +93.3°C<br>200°F | The IT76 is tuned for the ETSI region and is optimized metal surfaces, such as metal pallets, ULDs, and other metal assets.   |
| IT67 Enterprise Lateral Transmitting (LT) Tag | Pack qty 10: 225-756-001<br>Pack qty 250: 225-757-001 | UHF Global 860-960 MHz | 94.5 mm<br>3.72 in  | 72.3 mm<br>2.85 in | 9.9 mm<br>0.39 in  | metal, cardboard, plastic, wood | screws/rivets                        | Yes          | Front: 6 m<br>20 ft<br>Lateral: 4 m<br>13 ft | NXP UCODE G2XM   | 240 bit           | 32 bit                    | 64 bit           | 512 bit     | -40°C<br>-40°F     | +66°C<br>150°F     | -40°C<br>-40°F   | +85°C<br>185°F   | Rugged and reusable tag designed to provide both edge and normal performance for enhanced portal and forklift RFID applications   |
| IT65 Large Rigid Tag, Gen 2                   | IT04U000-YTT001B                                      | UHF Global 860-960 MHz | 155 mm<br>6.10 in   | 32 mm<br>1.26 in   | 10.2 mm<br>0.40 in | metal, cardboard, plastic, wood | screws/rivets                        | Yes          | 8 m<br>26 ft                                 | Impinj Monza 1a  | 96 bit            | 0 bit                     | 32 bit           | 0 bit       | -40°C<br>-40°F     | +121°C<br>250°F    | -40°C<br>-40°F   | +121°C<br>250°F  | Reusable consistent worldwide performance tag for harsh environments applications   |
| IT65 Small Rigid Tag, Gen 2                   | IT04U000-YTT002B                                      | UHF Global 860-960 MHz | 79 mm<br>3.11 in    | 31 mm<br>1.22 in   | 10.2 mm<br>0.40 in | metal, cardboard, plastic, wood | screws/rivets                        | Yes          | 4 m<br>13 ft                                 | Impinj Monza 1a  | 96 bit            | 0 bit                     | 32 bit           | 0 bit       | -40°C<br>-40°F     | +121°C<br>250°F    | -40°C<br>-40°F   | +121°C<br>250°F  | Ideal for industrial applications where ruggedness, chemical resistance or higher temperature ratings are required and where tag size in an important consideration.                                    |
| IT32A Gen 2 ID Card, FCC                      | Blank: IT32A04FST001<br>Mag Stripe: IT32A04FST002     | UHF FCC 902-928 MHz    | 85.7 mm<br>3.37 in  | 54 mm<br>2.12 in   | 0.8 mm<br>0.03 in  | free air, hand held             | tie/cord, hand held                  | No           | 8 m<br>26 ft                                 | Impinj Monza 1a  | 96 bit            | 0 bit                     | 32 bit           | 0 bit       | -10°C<br>14°F      | +50°C<br>122°F     | -10°C<br>14°F    | +35°C<br>95°F    | Reusable, superior performance badge for a variety of applications requiring encapsulated inlays. Magnetic stripe option.   |
| IT32A Gen 2 ID Card, ETSI                     | Blank: IT32A03FST001<br>Mag Stripe: IT32A03FST002     | UHF ETSI 865-868 MHz   | 85.7 mm<br>3.37 in  | 54 mm<br>2.12 in   | 0.8 mm<br>0.03 in  | free air, hand held             | tie/cord, hand held                  | No           | 5 m<br>16 ft                                 | Impinj Monza 1a  | 96 bit            | 0 bit                     | 32 bit           | 0 bit       | -10°C<br>14°F      | +50°C<br>122°F     | -10°C<br>14°F    | +35°C<br>95°F    | Reusable, superior performance badge for a variety of applications requiring encapsulated inlays. Magnetic stripe option.   |



## Next Steps

RFID tag or insert selection is just one part of building your RFID system. Other questions to consider are how the tags/ inserts will be interrogated, what infrastructure is needed, how will this system coexist with data collection systems already in place, and where will the data reside. RFID-certified Intermec

partners and Intermec Professional Services provide additional education, site survey, process re-engineering consultation, and project management services to enable companies to be piloting Intermec RFID in a matter of hours as opposed to weeks.

## RFIDeDeploy Services for Assured RFID Success

Even with standards, RFID is nothing close to being a plug-and-play technology. Many enterprises lack the expertise in-house to handle system design and implementation or to anticipate the complexities and consequences of the decisions to be made. With a decade of experience installing complete RFID systems around the world, Intermec is committed to working with companies to make sure each implementation of RFID technology is successful, today and tomorrow.

The long-term value, return on investment and total cost of ownership of an RFID system are all heavily dependent on the initial process design and implementation decisions. A solid business case, appropriate system architecture, and equipment that is optimized to satisfy both will provide the foundation of a successful project. Engaging Intermec RFIDeDeploy<sup>SM</sup> Services early in the process increases the chances for success. The use of professionals also helps avoid roadblocks that can prolong implementation and undermine ROI.

Intermec's RFIDeDeploy Services help customers by evaluating RFID technology and integrating it seamlessly into their business processes. RFIDeDeploy is a suite of consultative and site engineering services that combine together to accomplish a fully integrated RFID system implementation.

These services— Feasibility Analysis, Process Analysis, Site Analysis, and Site Installation— support the end user with a level of confidence in his RFID-related business decisions derived through proof of concept. The process is completed when the Site Installation tests out the performance level of the system against success criteria specified in the Process Analysis and confirmed during the Site Analysis. When RFIDeDeploy services are engaged, performance of the RFID system is guaranteed to meet the criteria for success established in the Process Analysis for 18 months after hand off to the end user.

## A Note on Standards

The Intermec technology behind Intermec RFID tag and media products supports all relevant adopted global standards including:

- EPC Gen 2
- EPC UHF Generation 2 – Air interface protocol for item management
- ISO/IEC 18000 Part 6 – Air interface for item management at UHF
- ISO/IEC 15961 & 15962 – Information interface for object oriented use of RFID in item management
- ANSI INCITS 256:2001 – American RFID standard for item management

- EAN.UCC GTAG™ – Application standard for use of RFID in the macro supply chain
- ANSI MH10.8.4 – Application standard for RFID on reusable containers
- ISO 18185 Electronic Seal Tags
- ISO 22389 RFID Read/Write for Containers
- Automotive Industry Action Group (AIAG) B-11 Tire and Wheel Identification

Intermec's RFID tag and media products can support EPC, GTIN, UPC content, and Advanced Shipping Notice reference codes, as well as original manufacturer and distributor-unique codes, delivering the user the ultimate flexibility to adapt as current and future standards evolve.

## Complete line of supply chain products and services

Mobile computing solutions  
Mobile and fixed RFID systems  
Scanning technology  
Printers and media  
Professional services  
Wireless networks  
Support services  
Software tools and utilities

## Applications

Manufacturing Operations  
Warehouse Operations  
Supply Chain Operations  
In-Transit Visibility  
Direct Store Delivery  
Store Operations  
Store Management  
Field Service

For more information on how your business can use supply chain technology to enhance operational productivity and deliver world-class customer service, visit [www.intermec.com](http://www.intermec.com).



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