

COMPANY PROFILE

Based in Finland with inlay manufacturing plants located in China and the United States, UPM RFID supports high-volume production of standards-based HF, NFC, and UHF RFID tags and inlays. The company's ranking and scores in this vendor matrix relate to its UHF inlay business only.

Innovation

UPM RFID has access to many in-house competencies, wide-ranging R&D expertise, and strong support in product research and development. UPM RFID manufactures passive UHF inlays in the following delivery formats: dry inlay (continuous web, no adhesive); wet inlay (die-cut web with adhesive, filmic face); and tag (die-cut web with adhesive, paper face). The company has a broad portfolio of UHF inlays operating at frequencies between 860 MHz and 960 MHz.

- Represented in its score for Breadth of Product Offerings is UPM RFID's diverse product designs for ISO 18000-6C/EPC Class 1 Gen2-compliant passive UHF inlays, including form factors such as:
 - UPM Mini™ (operates at 868 MHz, 915 MHz, and 950 MHz) and UPM Web™ (Global operation 860 MHz to 960 MHz)
 - UPM ShortDipole™ (Global operation 860 MHz to 960 MHz)
 - UPM DogBone™ (Global operation 860 MHz to 960 MHz)
 - UPM Frog™

Four UHF inlay products that were launched a couple of years ago incorporating the NXP G2X IC have proven highly successful for the company: 1) UPM Web™ with improved orientation insensitivity and EAS alarm functionality targeted at item-level apparel and footwear tagging; 2) UPM Belt™ with EAS alarm functionality and 512-bit extra memory for item-level tagging of consumer electronics; 3) UPM DogBone™; and 4) UPM ShortDipole™ for retail SCM pallet and case tagging.

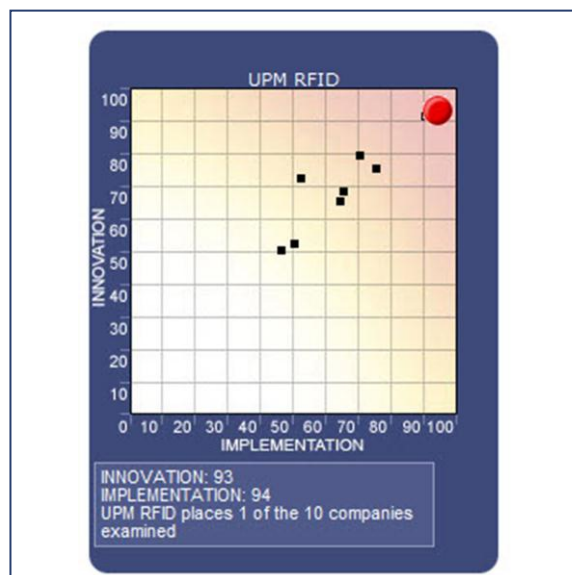
Innovation: 93

Implementation: 94

UPM RFID places **first** among the 10 companies examined.

This company is **highest rated** company along the Innovation scale.

This company is **highest rated** company along the Implementation scale.



COMPANY PROFILE (CONTINUED FROM PAGE 1)

The score given to UPM RFID for Experience/Leadership & Knowledge Transfer reflects the substantial recent activity UPM RFID has been pursuing in numerous industry sponsored trials and research projects. Its published activity spans retail apparel item tagging on three continents, automotive manufacturing operations in Europe, and IT asset management projects in North America, to name just a few. UPM RFID has been mentioned often as a participant with industry-specific sponsored trials and test programs, which have begun to pay off in the form of a broader base that uses RFID tags based on UPM RFID designs.

Environmental compliance is a matter of rising importance throughout the entire labeling value chain. UPM RFID has recognized the importance of environmental management and has become an increasingly vocal advocate for sustainability issues. The company is constantly looking for new eco-friendly solutions both in its operations and in its product offering.

UPM RFID's overall innovation score is further bolstered by its standards- and application-based approach to product development and constant investment in research for innovations in chip to antenna attachment. Unlike many of its major competitors, UPM RFID dedicates 100% of its product research, design, development, and manufacturing resources to RFID tags and inlays.

Implementation

Known for many years for its strength in the HF inlay market, UPM RFID has been aggressively pursuing the passive UHF inlay opportunity for several years. UPM RFID can be seen as quickly gaining ground, particularly in rapidly growing applications such as retail apparel and document tracking. Other leading applications include product authentication, item-level tracking in high-growth segments such as pharmaceuticals, asset management such as returnable transit items, containers, and corporate IT assets, as well as pallet/case tagging for supply chain management.

UPM RFID is known best for its strong presence in Europe; however, its recent international expansion efforts around passive UHF have been impressive. The company has local offices in all regional markets and has leveraged its ability to scale UHF production in 2010 when substantial inlay volumes were required to support multiple apparel item-tagging projects. Earlier investments made for two new manufacturing facilities, one in the United States and one in China, proved to be great timing for the company and enabled it to elevate its implementation score in this vendor matrix analysis.

UPM RFID's operations and sales have continued to ramp quickly in both North America and Asia, which also helped raise the company's scores in regional market presence and penetration, along with high scores for its overall market leadership and strength. The company targets item-level tracking in pharmaceuticals for e-pedigree-compliance, anti-counterfeiting and authentication, consumer electronics tagging, postal applications, retail apparel, and more. Baggage handling is another key developing market for UPM RFID.

Recent end-user customer announcements that highlight the breadth of applications served by the company's inlays/tags include:

- Item-level tagging of Nokia mobile phones and accessories by FCC (Future Communications Company) using UHF with EAS functionality inlays/tags. Based in the State of Kuwait, FCC supports 30 retail stores that will leverage a combination of UPM RFID's UPM DogBone™, UPM ShortDipole™, and UPM Belt™ offerings.
- UPM RFID tags were used in a Food Safety Project conducted by the Hawaii State Department of Agriculture incorporating sensors for cool chain temperature monitoring.

- UPM RFID tags have been identified as used for projects by retail companies in Europe, China, and North America within the past twelve months.
- MBA Grupo, a European healthcare distributor based in Spain, has piloted RFID for supply chain management–related applications.
- Hyundai/Kia Motors Group, a leading South Korean vehicle manufacturer, is using UPM RFID's UPM DogBone™ UHF inlays/tags to improve the visibility of its automotive parts supply chain. In the first phase of the project launch in March 2007, approximately 130,000 tags were applied to parts boxes and packaging cases from five major suppliers for export to Hyundai/Kia Motors's overseas factory in Alabama. In the second phase, 20 million tags per year will be used to track all boxes and containers of automotive parts through the supply chain.

UPM RFID's inlay products are sold to converters for integration into various forms for labels, environmentally hardened tags, and a variety of specialty application-specific form factors. The authorized converters act as a primary sales channel, along with numerous systems integrators. Overall UPM RFID has found a way to build a position of strength across nearly all identified evaluation areas, justifying its placement as #1 in our rankings for both Implementation and Innovation.

RANKINGS

Table 1: Rankings

(Source: ABI Research)

Rank	Company	Innovation	Implementation
1	UPM RFID	93	94
2	Avery Dennison	92	92
3	Alien Technology	91	90
4	Smartrac Technology Ltd	79	70
5	LS Industrial Systems	75	75
6	Checkpoint Systems	68	65
7	Invengo Technology	65	64
8	KSW Microtec AG	72	52
9	RSI ID Technologies	52	50
10	IER	50	46

METHODOLOGY

INTRODUCTION AND SCOPE

ABI Research has prepared this Vendor Matrix to give an unbiased rating of leading passive UHF (ISO 18000-6C/Gen2) RFID inlay vendors on the basis of each company's perceived "Innovation" and "Implementation." ABI Research evaluates passive UHF inlay manufacturers by selecting multiple criteria related to product and company characteristics as metrics for the vendors' performance in these two areas. The Vendor Matrix only assesses vendors' passive UHF inlay offerings and businesses and not any other products or solutions a company may offer. Although taken into consideration under certain criteria, product performance testing and benchmarking is not a focus of this Vendor Matrix.

ABI Research selected the profiled vendors based on our research as well as interviews with and feedback received from industry participants, including tag vendors, label converters, and end users. Based on this industry feedback as well as our own global RFID market analysis and impressions, the following vendors were selected for inclusion in this Vendor Matrix (in alphabetical order):

- Alien Technology
- Avery Dennison
- Checkpoint Systems
- IER
- Invengo Technology
- KSW Microtec AG
- LS Industrial Systems
- RSI ID Technologies
- Smartrac Technology Ltd
- UPM RFID

Listed vendors were profiled and scored across Innovation and Implementation criteria. Please note: these are not the only passive UHF inlay vendors competing in the global market.

Description of Criteria

Criteria used to develop this Vendor Matrix are related to product/company characteristics that serve as proxies for vendor performance in the two areas of Innovation and Implementation.

Numerical scores are aggregated, weighted, and analyzed to provide overall rankings, which are then assigned to each vendor on the Innovation and Implementation axes.

Innovation

The six (6) Innovation scoring criteria and their associated weighting are as follows:

1. Product Innovation and Development (25% weight)
 - Evaluates/main considerations:
 - Strength of engineering team and engineering leadership
 - Features sets and capabilities
 - Unique, differentiated offerings

- Performance optimization, including read speeds and read rate reliability
 - Additional consideration/recognition for:
 - Strong technology and product intellectual property (IP) portfolio
2. Antenna to Chip Connection Innovation, Materials and Methods (10% weight)
- Evaluates/main considerations:
 - Use of multiple, unique, and/or innovative materials and methods in the development of antennas to be used in the manufacture of inlays to meet customer needs and requirements
 - Different materials and methods include: etched aluminum, etched copper, printed silvers, or copper additive. There is no single method or material that can address each market; rather being able to offer multiple products is the best way to satisfy the broadest range of customers.
 - Use of "green" materials will become more important over time
3. Inlay Manufacturing Innovation (10% weight)
- Evaluates/main considerations:
 - Unique production techniques, materials, and processes that deliver perceived level of manufacturing innovation activity and strength
 - Capacity flexibility possible due to manufacturing practices
 - Cost reduction and efficiency improvement methods in place
 - Manufacturing capacity
 - Manufacturing capabilities
 - Manufacturing strategy (in-house, outsourced, combination)
4. Experience, Leadership & Knowledge Transfer (Technology Innovation) (25% weight)
- Evaluates/main considerations:
 - Involvement in leading trials and deployments
 - Length of time in passive UHF RFID inlay space
 - Perceived level of influence in the space
 - Participation in RFID education and awareness campaigns
 - Involvement in industry groups/associations (both RFID and end-user/vertical related)
5. Application Strategy & Standards-Based Product Innovation (10% weight)
- Evaluates/main considerations:
 - Industry-driven inlay development and product innovation targeted at certain applications
 - Perceived product innovation rating for inlay vendors considered "industry-trials based specialists" and category leaders in specific applications
 - Perception of an inlay vendor's "application flexibility" products supporting multiple applications and requirements
 - Number of applications in which the inlay vendor is considered to be a "specialist", early trial or major deployment participant or thought leader
6. Passive UHF RFID Inlay Product Offering Mix/Breadth of Product Offerings (20% weight)
- Evaluates/main considerations:
 - Vendor's passive UHF inlay portfolio, including the number of designs/offerings
 - Passive UHF RFID ICs supported (mix of types, sources)
 - Design innovation capabilities, including final packaging design

- Form factor sizes and size variety
- Antenna(e) configuration and impact on design
- Slow product launches or upgrades have a negative impact on scoring for this criterion
- Additional consideration/recognition for:
 - Awards/recognition for specific offerings

Implementation

The five (5) Implementation scoring criteria and their associated weighting are as follows:

1. Annual Volume UHF Inlays in Addressed/Targeted Markets (30% weight)

- Evaluates/main considerations:
 - Estimated or reported annual market shipments in terms of volume shipped into targeted markets for this frequency range
 - Vendor historical shipments and market penetration within key application segments - such as asset management; library management; rental items; transportation ticketing; baggage handling; supply chain - item; etc.

2. Regional Presence and Penetration (20% weight)

- Evaluates/main considerations:
 - Inlay manufacturer's presence and penetration in key regional markets
 - Vendors that exhibit both presence and penetration across multiple regions are better at implementing their strategic plans and/or have been doing so for a longer period than their competitors who may be only strong in one region or two.

3. Overall Market Leadership & Strength (25% weight)

- Evaluates competitive market position, level of market penetration and industry leadership through subjective and objective considerations such as:
 - Perceived level of penetration/share
 - Command of passive UHF RFID inlay segments
 - Perceived position in market relative to competition
 - Company size
 - Positive word-of-mouth/momentum in industry
 - Strength of customer base and customer mix
 - Types and sizes of deployments (pilots, full deployments, etc.)

4. Global Sales and Support Capabilities & Distribution Channels (15% weight)

- Evaluates/main considerations:
 - Overall sales and marketing strategy for passive UHF inlays
 - Geographical distribution of sales and support locations
 - Scope of partner network
 - Overall partnering strategy and approach, including partner “friendliness” (approachability and receptivity)
 - Depth and strength of those relationships – considerations include vertical and application specialization and synergy among partners
 - Geographic coverage via partner/customer network – local, national, and regional mix
 - Sales team size

- Additional consideration/recognition for:
 - Cross-marketing and messaging efforts with channel partners
- 5. Breadth of Vertical and Application Markets Targeted/Served (10% weight)
 - Evaluates/main considerations:
 - Strength/market position within targeted/served verticals and applications
 - Thought leadership within vertical and applications
 - Targeting a specific or broad range of verticals and applications through RFID inlay product portfolio
 - Involvement in multiple markets and applications as well as ability to seamlessly shift vertically or horizontally
 - Number of addressable markets and applications; potential growth of markets & applications
 - Additional consideration/recognition for:
 - Alliances with key vertically-aligned industry associations, regulatory bodies, etc.

SCORING

Vendors receive a rating score for each ABI Research-defined criterion under Implementation and Innovation. These scores range from 0 to 9 and are based on available information as well as ABI Research assumptions. Points are awarded in 0.5 point increments. For example, a score of 8.5 is possible within a given criterion.

Each criterion (and its score) is weighted based on ABI Research's opinion of each criterion's level of influence on and importance to the overall assessment of Innovation and Implementation. The number of criteria for Implementation and Innovation may vary; however, this does not impact vendor ranking.

Vendors receiving higher scores in higher weighted criteria will benefit in terms of better overall position via higher Innovation and Implementation scores. Lower scores in higher weighted categories will result in weaker overall placement due to the impact of the weighting.

The rating scores assigned to each criterion are added to determine a "raw total score" for Implementation and Innovation. A mathematical formula is then applied to adjust for the 0-9 rating system and the number of criteria so that vendors can be positioned along the x- and y-axes (with a maximum score of 100 for Implementation and Innovation). The mathematical formula does not impact vendor ranking.

It is ABI Research's policy not to publicly disclose individual scores for each criterion for each vendor. However, ABI will accept requests to discuss a vendor's individual scores with that same vendor.

Rankings

After individual scores are established for Innovation and Implementation using the above criteria, an overall company score is established using the Root Mean Square (RMS) method:

$$\text{Score} = \sqrt{\frac{\text{innovation}^2 + \text{implementation}^2}{2}}$$

The resulting overall scores are then ranked and used for percentile comparisons.

The RMS method, in comparison with a straight summation or average of individual innovation and implementation values, rewards companies for standout performance.

For example, using this method a company with an innovation score of 9 and an implementation score of 1 would score considerably higher than a company with a score of 5 in both areas, despite the mean score being the same. ABI Research believes this is appropriate as the goal of these matrices is to highlight those companies that stand out from the others.

TABLE OF CONTENTS

COMPANY PROFILE	1
Innovation.....	1
COMPANY PROFILE (CONTINUED FROM PAGE 1)	2
Implementation.....	2
RANKINGS	4
METHODOLOGY	5
INTRODUCTION AND SCOPE	5
Description of Criteria.....	5
Innovation.....	5
Implementation.....	7
SCORING.....	8
Rankings	8
TABLE OF CONTENTS	10

Published August 4, 2011
Updated September 6, 2011

©2011 ABI Research
PO Box 452
249 South Street
Oyster Bay, NY 11771 USA
Tel: +1 516-624-2500
Fax: +1 516-624-2501
<http://www.abiresearch.com/analystinquiry.jsp>

ALL RIGHTS RESERVED. No part of this document may be reproduced, recorded, photocopied, entered into a spreadsheet or information storage and/or retrieval system of any kind by any means, electronic, mechanical, or otherwise without the expressed written permission of the publisher.

Exceptions: Government data and other data obtained from public sources found in this report are not protected by copyright or intellectual property claims. The owners of this data may or may not be so noted where this data appears.

Electronic intellectual property licenses are available for site use. Please call ABI Research to find out about a site license.