

The Passive UHF RFID Label Inlay Vendor Matrix

(Excerpt of Vendor Matrix)

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Alien Technology Company Profile from the Vendor Matrix Application

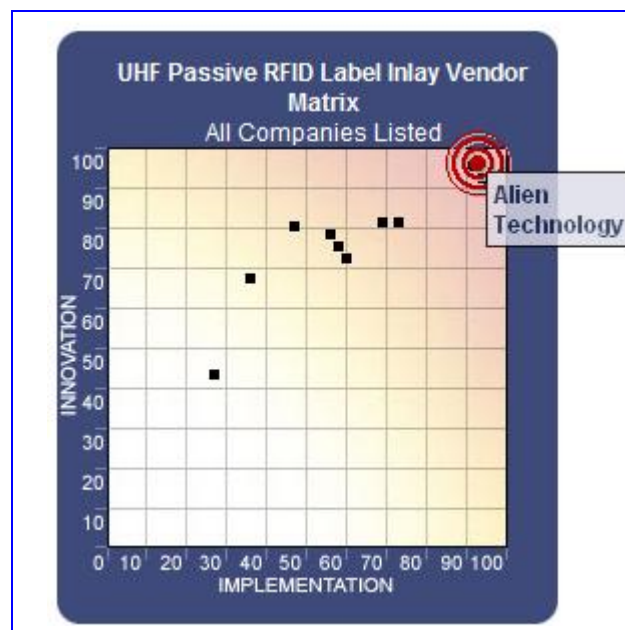
Founded in 1994, Alien Technology is a total solutions provider in the passive UHF market. Alien's products include RFID ICs, inlays, tags, readers, and related training and professional services. The company's ranking and scores in this vendor matrix relate to its passive UHF inlay business only.

This company secured the top overall score, placing first in this matrix. Alien is the highest rated company along the Innovation scale.

Innovation: 96 (rounded)

Implementation: 93 (rounded)

Alien Technology places 1st of those 11 companies examined.



Section 1. COMPANY PROFILE

1.1 Innovation

Alien's passive UHF inlay portfolio is broad and showcases the company's innovation strength. Alien offers several passive UHF inlays (operating at 860 MHz to 960 MHz) available in several form factors and designs to meet the needs of various applications. Alien inlays are designed as World Tags, ensuring uniform operation on a global scale.

The Squiggle® Inlay (ALN-9540) is Alien's general-use EPC Class 1 Gen 2 price/performance benchmark offering and is considered to be the company's most versatile UHF inlay offering. Targeted applications for this product are broad and include pallet tracking, case tracking, asset management, and others. The Squiggle-SH inlay addresses the 3-inch market, including supply chain management pallet and case-tracking applications, as well as item-level tracking (i.e. apparel hang tags). The Squiggle-SQ inlay offering (ALN-9529) supports near- and far-field communications modes and is well-suited for item-level tagging, especially for tagging plastic objects such as pharmaceuticals bottles and fashion apparel hang tags. The M Inlay (ALN-9554) is positioned as a high-performance inlay for tagging plastics such as tote, bins, pallets, and other reusable and returnable assets. The 2x2 Inlay (ALN-9534) has a compact design that can be leveraged for baggage handling, item-level tracking, and other small form-factor tagging applications.

Alien focuses on the production of high-volume, low-cost RFID inlays and tags leveraging the company's patented FSA (Fluidic Self-Assembly) technology and related proprietary manufacturing processes, including HiSAM (High-Speed Strap Attach Machine) assembly technology. Alien operates a tag assembly and test facility in Fargo, North Dakota (United States) – permitting large, scalable manufacturing capacity. The RFID Solutions Center in Dayton, Ohio (United States) offers EPCglobal-certified Applied Tag Performance Testing to help companies ensure the readability of their EPC/RFID-tagged goods. The facility is one of eight EPCglobal Accredited Performance Test Centers in the world. All Alien inlays are based on Alien's Higgs UHF RFID ICs and boast strong dB sensitivity at different UHF operating frequencies. By leveraging innovative processes such as FSA and HiSAM, coupled with the use of internally developed ICs, Alien ensures quality, performance, and cost competitiveness (particularly against flip chip inlay assembly techniques) to its inlay and tag customers.

Alien also holds numerous patents and patent applications essential to RFID protocols, inlay and tag design, inlay and tag manufacturing, and other RFID-related IP. In addition, the company offers a wide variety of standard products aimed at closed- and open-loop applications in verticals such as transportation, aerospace and defense, retail CPG, manufacturing, and others. Alien's continued strength in inlay design, development, and low-cost manufacturing – complemented by a solid RFID IP portfolio, the Higgs IC product line, and strap-based technology – afford the company significant competitive advantage in the crowded passive UHF inlay field. .

1.2 Implementation

Alien is a leading global supplier of passive UHF RFID inlays, helping to bolster the inlay volume criterion score. High-volume applications for Alien include supply chain management (pallet, case, and item) as well as baggage handling. Closed-loop asset management is also a high-growth segment for Alien. The overall implementation score is being impacted as well by the perceived strength of the company's distribution channels, partner network, and regional market presence and penetration. The company has a very strong presence in the United States, in terms of physical locations as well as customers and partners. However, the company's global footprint has been steadily increasing, with an emphasis on building upon traction gained in Europe and advancing its position in Asia. US operations are supported by the headquarters and manufacturing facility in Morgan Hills, California; a tag assembly and test facility in Fargo, North Dakota; and an RFID Solutions Center in Dayton, Ohio. Sales offices are located in all major regional markets. Recent distribution efforts have been focused on partner ecosystem development and strengthening its partner program.

In contrast to some other passive UHF inlay providers such as competitor UPM Raflatac, Alien does not focus solely on RFID inlay design and manufacture. Alien's strategy is to offer RFID system components from ICs to straps, inlays, tags, readers, antennas, and services. Alien presently does not concentrate on external inlay sales. However, once focused on internal consumption of 100% of inlays manufactured, Alien included external inlay sales as part of its RFID strategy. The revised approach to inlay sales is expected to attract new customers, particularly label converters and tag specialists looking to leverage Alien's high-performance, low-cost inlays.

Alien's existing tag/inlay customer base is far reaching and consists of enterprise end users, converters, and resellers/SI partners. The overall implementation score is bolstered by Alien's vertical and application strategy, which crosses multiple verticals and supports a wide range of applications such as supply chain management, asset management, and baggage handling.

The company is very strong in retail CPG compliance, particularly in the United States, supporting large customers such as Daisy Brands. However, the company's inlay/tag business serves numerous applications from textile tracking to sports timing and spare parts management. Inlay/tag orders can range from a few thousand to tens of millions depending on the customer and the application.

Alien, Avery, and UPM Raflatac share the majority of passive UHF Gen2 inlay shipments in the current market, far outpacing the competition. However volume alone does not dictate the overall implementation score and does not necessarily translate to #1 market share. For example, one vendor's annual passive UHF inlay shipments may be the highest in the market, but that vendor's overall implementation score may be lower than a competitor due to factors such as weak cross-regional presence, immature channels, narrow application, and vertical market focus.

Section 2. RANKINGS

Rank	Company	Innovation	Implementation
1	Alien Technology	95.5	93.3
2	UPM Raflatac	94.8	91.1
3	Avery Dennison	91.5	94.4
4	IER	81.3	73.3
5	Omron Corp	81.3	68.9
6	KSW Microtec AG	78.0	55.6
7	Tagsys	74.7	57.8
8	Checkpoint Systems	72.0	60.0
9	RSI ID Technologies	79.7	46.7
10	RCD Technology Corporation	67.0	36.0
11	FCI Smartag	43.3	26.7

(Source: ABI Research)

Section 3. METHODOLOGY

3.1 Criteria and Scoring

ABI Research evaluates RFID UHF (Ultra-High-Frequency) passive label inlay manufacturers on the basis of “Innovation” and “Implementation” by selecting multiple criteria. Criteria are related to product/company characteristics that serve as proxies for vendor performance in these two areas. Numerical scores are aggregated and analyzed to provide overall rankings, which are assigned to each vendor on the Innovation and Implementation axes.

Relevant Innovation scoring criteria include product innovation/development and feature sets; manufacturing innovation; key roles in developing and expanding the market through industry leadership and knowledge transfer; application strategy and standards-based product innovation; and breadth of product offerings. ABI Research uses specific assumptions under each criterion to assign scores.

Implementation scoring criteria include estimated annual UHF inlay volume in addressed/targeted markets; regional market presence and penetration; overall market leadership and strength; global sales/support capabilities and distribution channels; and breadth of vertical and application markets served/addressable markets. ABI Research uses specific assumptions under each criterion to assign scores.

Vendors receive a ‘rating score’ for each ABI Research–defined criterion under Implementation and Innovation. These scores range from 0-9 and are based on available information as well as ABI Research assumptions. The number of criteria for Implementation and Innovation may vary; however, this does not impact vendor ranking.

The rating scores assigned for 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 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. Please be aware that no weighting system is used, as each criterion carries equal weight.

3.2 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.

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