

F R O S T & S U L L I V A N

BEST PRACTICES

AWARDS

F R O S T & S U L L I V A N

BEST
2020 PRACTICES
AWARD



em microelectronic

2020 EUROPEAN RFID ICS
NEW PRODUCT INNOVATION AWARD

Contents

<i>Background and Company Performance</i>	<i>3</i>
<i>Industry Challenges.....</i>	<i>3</i>
<i>New Product Attributes and Customer Impact.....</i>	<i>3</i>
<i>Conclusion</i>	<i>5</i>
<i>Significance of New Product Innovation</i>	<i>6</i>
<i>Understanding New Product Innovation</i>	<i>6</i>
<i>Key Benchmarking Criteria</i>	<i>7</i>
<i>New Product Attributes</i>	<i>7</i>
<i>Customer Impact</i>	<i>7</i>
<i>Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices.....</i>	<i>8</i>
<i>The Intersection between 360-Degree Research and Best Practices Awards.....</i>	<i>9</i>
<i>Research Methodology</i>	<i>9</i>
<i>About Frost & Sullivan</i>	<i>9</i>

Background and Company Performance

Industry Challenges

RFID adoption has increased across different applications in the past five years, with retail as the largest market. As industries strive to achieve digitization, retailers struggle to hold onto their customers while coming to terms with customers' changing buying patterns. Emphasis on conscious buying is growing worldwide amid an environment where brands have to deal with counterfeit products.

Many Internet of Things (IoT) devices are expected to be deployed with digitizing trends growing across industries. Battery life is a crucial challenge considering IoT devices' ubiquitousness in sectors such as retail, industrial, and healthcare. Since batteries can only store limited energy, applications requiring battery through the product's lifetime are likely to result in large form factors or expenses. Batteries need to be replaced with time, requiring workforce and additional costs as well.

Significant IoT devices volume also means more usage of batteries, resulting in a considerable environmental footprint. Organizations are trying different ways to address this issue, such as downsizing, energy harvesting, and using low-power integrated circuits (ICs). Low-power ICs hold tremendous potential to mitigate the problems of battery usage. However, several products in the market with varying functionality, capabilities, and costs lead to market fragmentation and difficulty selecting the right solution. Successful market participants must build a comprehensive product that offers scalability and cost-effectiveness.

New Product Attributes and Customer Impact

Founded in 1975, EM Microelectronic is headquartered in Marin, Switzerland, and is part of the Swatch Group. The company has over four decades of experience in semiconductor manufacturing and is known in the industry for its specialization in ultra-low power ICs. It also pioneered RFID adoption in retail and other verticals. Backed by robust semiconductor design and manufacturing and a strategy to focus on differentiated solutions, EM Microelectronic is a provider of ultra-low power RFID ICs to applications in industrial, logistics, and retail.

Broad RFID Portfolio Delivering High Performance at Optimum Cost

Frost & Sullivan forecasts the IoT devices business to surpass US\$66.5 billion by the end of 2026, recording 15.5% CAGR between 2020 and 2026. Due to the ongoing COVID-19 pandemic, the market is expected to decline in 2020. However, the market is poised to return to over 15% growth rates in 2021.

In order to enable scalable, cost-effective, green IoT deployments, EM Microelectronic introduced em|aura-sense, an Augmented RFID product that combines capacitive sensing with passive radio-frequency identification (RAIN RFID) technology, in 2020. The capacitive sensor in the em|aura-sense is external to the chip. It can be assembled as a standalone surface mount device (SMD) component onto a printed circuit board (PCB), or integrated into a traditional RFID inlay. The product leverages existing RAIN RFID infrastructure, making it is easy to deploy and operate. The em|aura-sense does not need

batteries or wiring for power, it operates autonomously using energy harvested from the electromagnetic field provided by the RAIN RFID reader – an essential element for green IoT. Designed for place-it-and-leave-it operation, it requires no maintenance. Another unique feature of the em|aura-sense is the decoupling of the antenna and the sensor. This enables the product's communication aspect to be independent of the sensing, removing environmental influence on product performance. The decoupling feature also allows EM Microelectronic's customers to manufacture em|aura-sense sensor tags using currently installed assembly methods, making them compatible with 1-step manufacturing.

The company introduced em|echo-V earlier in 2020, which finds applications in retail, consumer engagement, and product authentication. It combines standard ultra-high frequency (UHF), high frequency (HF), and near-field communication (NFC) technologies on a single die through its em|echo-V, enabling the chip to be used for short-, medium-, and long-range applications. EM Microelectronic recognized that the industry does not offer similar dual-frequency ICs; fully based on standards, the combination, called RAINFC, is so far unique in the market. The dual-frequency IC allows customers to track products along the supply chain and fight counterfeit products by verifying product authenticity. The em|echo-V uses shared memory, enabling a wide array of readers, from industry-grade UHF RFID readers to NFC-enabled smartphones, to access the same data. With RFID technology gaining prominence over the past decade in different industries, the dual-frequency IC allows brands to engage frequently with their customers throughout the product lifecycle. Moreover, it enables more sophisticated lifecycle models, with resale, rental, buy-back, ownership and recycling, addressing the circular economy and conscious consumerism challenges. The consumer experience remains consistent across all the different sales channels, while guaranteeing the product authenticity, for a truly holistic omnichannel approach. EM Microelectronic delivers value to its customers without compromising on data privacy through its em|echo-V product. The dual-frequency tag pricing is below US\$0.10 in high volume, less than buying a UHF and NFC tag separately in comparable volumes. EM Microelectronic targets added-value applications, unlike its competitors, who focus on commodity mainstream applications.

Frost & Sullivan recognizes that delivering cost-effective, scalable, future-proof, and battery-free products targeting growing IoT applications positions EM Microelectronic to offer customers a competitive edge as they pursue digitization.

Providing Unmatched Customer Value to Spur Market Adoption

EM Microelectronic maintains an interactive relationship with customers, allowing the company to enhance its portfolio continuously. It has a robust customer feedback mechanism to collect end-user responses, including having meetings with customers and partners to understand their pain points. As part of the Swatch Group, which, as a leader in watchmaking, with brands established as early as the 18th century, has been one of the forefathers of the wearable device industry, EM Microelectronic gathers the necessary feedback on retailer pain points from its parent company. An example of customer feedback translating to product development is its RAINFC product line, launched in 2015. Retailers faced challenges such as low brand loyalty, declining sales, and the shift toward

e-commerce since customer engagement throughout the product lifecycle has been non-existent. RAINFC addressed this challenge by combining UHF and NFC technologies. Using NFC, consumers could use their smartphones to learn about the product and its authenticity. The echo-V product introduced this year is part of the RAINFC product line.

As a pure IC participant, EM Microelectronic focuses on building superior ICs rather than expanding its presence into other RFID product markets down the value chain. An emphasis on customer satisfaction and the consistent drive to improve existing product lines have helped EM Microelectronic develop a broad base of elite customers. Its partners and customers include RFID inlay, tag, and reader companies such as Avery Dennison, HID Global, Kathrein Solutions, Smartrac, Zebra, Lab-ID, R-Pac and Paragon ID.

Conclusion

The energy consumption of devices is becoming a critical challenge worldwide in the growing IoT market. Customers are looking for energy-efficient products/solutions to reduce their capital and operational expenditure. EM Microelectronic emphasizes on identifying customer requirements and addressing them through its products. Known for its ultra-low power ICs, the company addressed this customer requirement through its aura-sense product, a smart sensing battery-less device that has a capacitive sensor. With comprehensive capabilities and value-added benefits, EM Microelectronic's technology has attracted top-notch brands.

For its strong overall performance, EM Microelectronic is recognized with Frost & Sullivan's 2020 New Product Innovation Award.

Significance of New Product Innovation

Ultimately, growth in any organization depends on continually introducing new products to the market and successfully commercializing those products. For these dual goals to occur, a company must be best in class in three key areas: understanding demand, nurturing the brand, and differentiating from the competition.



Understanding New Product Innovation

Innovation is about finding a productive outlet for creativity, for consistently translating ideas into high-quality products that have a profound impact on the customer.

Key Benchmarking Criteria

For the New Product Innovation Award, Frost & Sullivan analysts independently evaluated 2 key factors, New Product Attributes and Customer Impact, according to the criteria identified below.

New Product Attributes

Criterion 1: Match to Needs

Requirement: Customer needs directly influence and inspire the product's design and positioning.

Criterion 2: Reliability

Requirement: The product consistently meets or exceeds customer expectations for consistent performance during its entire life cycle.

Criterion 3: Quality

Requirement: Product offers best-in-class quality, with a full complement of features and functionalities.

Criterion 4: Positioning

Requirement: The product serves a unique, unmet need that competitors cannot easily replicate.

Criterion 5: Design

Requirement: The product features an innovative design, enhancing both visual appeal and ease of use.

Customer Impact

Criterion 1: Price/Performance Value

Requirement: Products or services offer the best value for the price, compared to similar offerings in the market.

Criterion 2: Customer Purchase Experience

Requirement: Customers feel they are buying the optimal solution that addresses both their unique needs and their unique constraints.

Criterion 3: Customer Ownership Experience

Requirement: Customers are proud to own the company's product or service and have a positive experience throughout the life of the product or service.

Criterion 4: Customer Service Experience

Requirement: Customer service is accessible, fast, stress-free, and of high quality.

Criterion 5: Brand Equity

Requirement: Customers have a positive view of the brand and exhibit high brand loyalty.

Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan analysts follow a 10-step process to evaluate award candidates and assess their fit with select best practices criteria. The reputation and integrity of the awards are based on close adherence to this process.

STEP	OBJECTIVE	KEY ACTIVITIES	OUTPUT
1 Monitor, target, and screen	Identify award recipient candidates from around the world	<ul style="list-style-type: none"> Conduct in-depth industry research Identify emerging industries Scan multiple regions 	Pipeline of candidates that potentially meet all best practices criteria
2 Perform 360-degree research	Perform comprehensive, 360-degree research on all candidates in the pipeline	<ul style="list-style-type: none"> Interview thought leaders and industry practitioners Assess candidates' fit with best practices criteria Rank all candidates 	Matrix positioning of all candidates' performance relative to one another
3 Invite thought leadership in best practices	Perform in-depth examination of all candidates	<ul style="list-style-type: none"> Confirm best practices criteria Examine eligibility of all candidates Identify any information gaps 	Detailed profiles of all ranked candidates
4 Initiate research director review	Conduct an unbiased evaluation of all candidate profiles	<ul style="list-style-type: none"> Brainstorm ranking options Invite multiple perspectives on candidates' performance Update candidate profiles 	Final prioritization of all eligible candidates and companion best practices positioning paper
5 Assemble panel of industry experts	Present findings to an expert panel of industry thought leaders	<ul style="list-style-type: none"> Share findings Strengthen cases for candidate eligibility Prioritize candidates 	Refined list of prioritized award candidates
6 Conduct global industry review	Build consensus on award candidates' eligibility	<ul style="list-style-type: none"> Hold global team meeting to review all candidates Pressure-test fit with criteria Confirm inclusion of all eligible candidates 	Final list of eligible award candidates, representing success stories worldwide
7 Perform quality check	Develop official award consideration materials	<ul style="list-style-type: none"> Perform final performance benchmarking activities Write nominations Perform quality review 	High-quality, accurate, and creative presentation of nominees' successes
8 Reconnect with panel of industry experts	Finalize the selection of the best practices award recipient	<ul style="list-style-type: none"> Review analysis with panel Build consensus Select recipient 	Decision on which company performs best against all best practices criteria
9 Communicate recognition	Inform award recipient of recognition	<ul style="list-style-type: none"> Announce award to the CEO Inspire the organization for continued success Celebrate the recipient's performance 	Announcement of award and plan for how recipient can use the award to enhance the brand
10 Take strategic action	Upon licensing, company is able to share award news with stakeholders and customers	<ul style="list-style-type: none"> Coordinate media outreach Design a marketing plan Assess award's role in strategic planning 	Widespread awareness of recipient's award status among investors, media personnel, and employees

The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of the research process. It offers a 360-degree view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often companies make important growth decisions based on a narrow understanding of their environment, resulting in errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry participants and for identifying those performing at best-in-class levels.

360-DEGREE RESEARCH: SEEING ORDER IN THE CHAOS



About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, helps clients accelerate growth and achieve best-in-class positions in growth, innovation, and leadership. The company's Growth Partnership Service provides the CEO and the CEO's growth team with disciplined research and best practices models to drive the generation, evaluation, and implementation of powerful growth strategies. Frost & Sullivan leverages nearly 60 years of experience in partnering with Global 1000 companies, emerging businesses, and the investment community from 45 offices on 6 continents. To join Frost & Sullivan's Growth Partnership, visit <http://www.frost.com>.