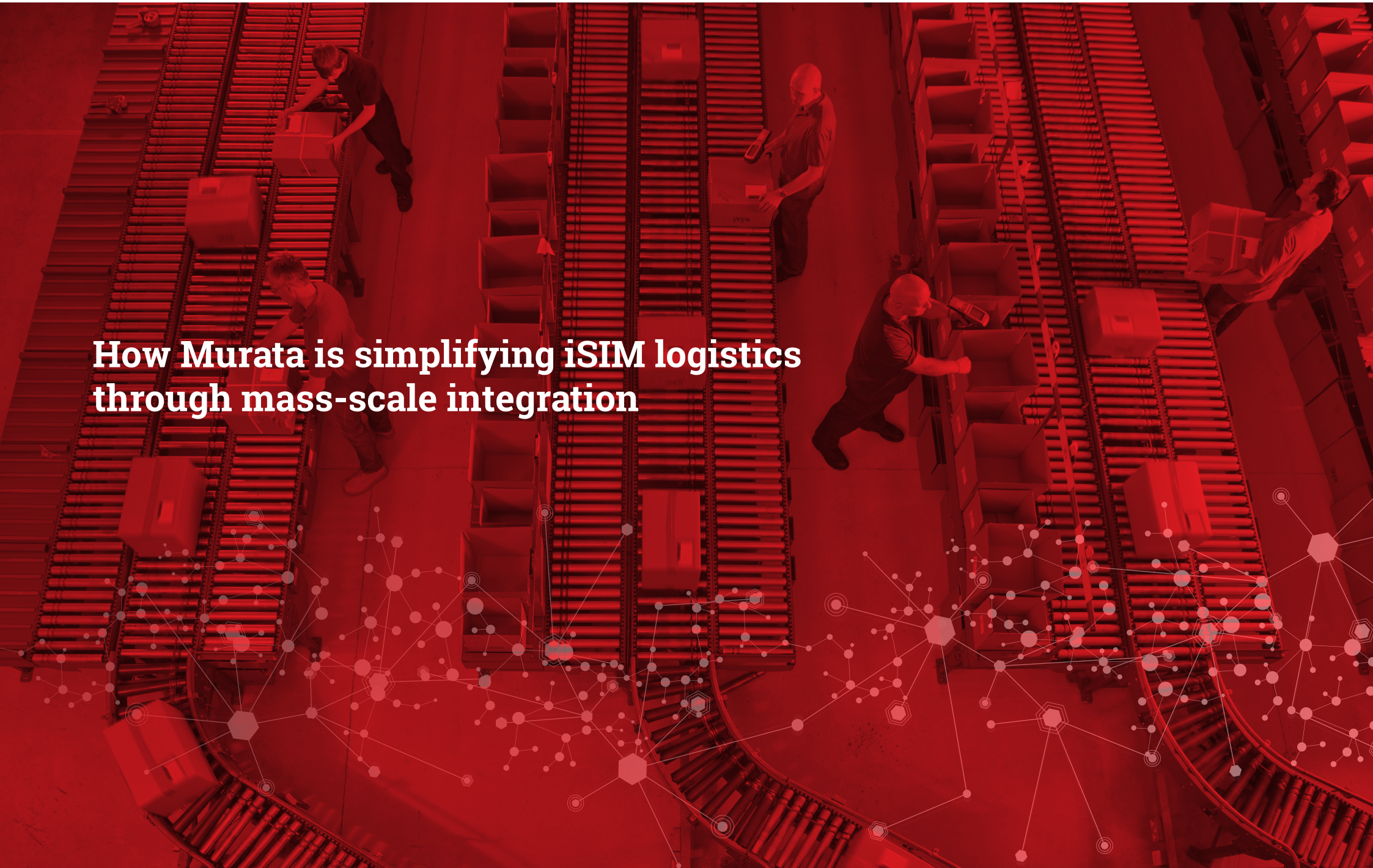
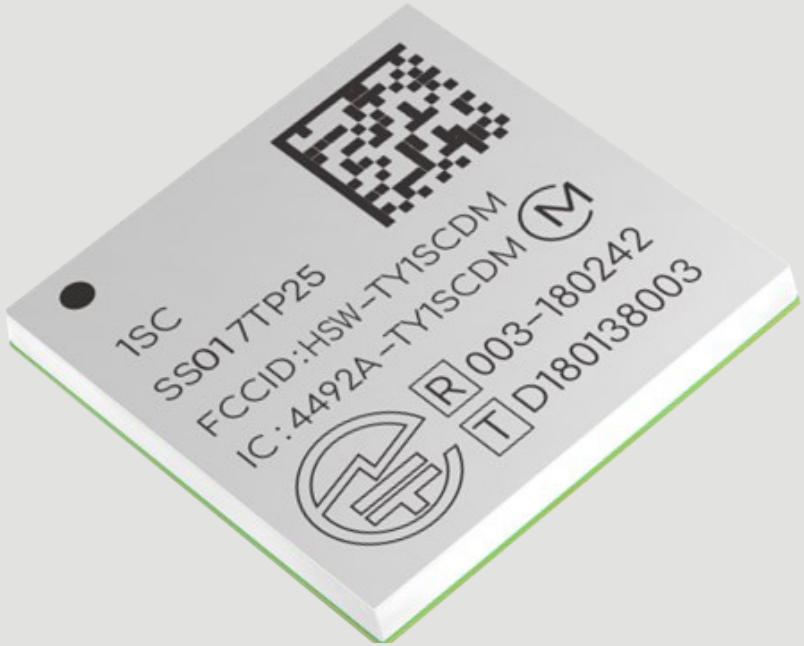


How Murata is simplifying iSIM logistics through mass-scale integration



Introduction

As the connectivity landscape evolves, integrated SIM (iSIM) technology is emerging as a transformative advancement, reshaping how devices communicate and operate in increasingly compact, efficient and secure ways. Murata's iSIM module stands at the forefront of this evolution, offering an integrated solution that consolidates SIM functionality directly into the main chipset of a device, eliminating the need for separate physical SIM cards or even embedded SIM (eSIM) hardware.

In this report, we explore the journey of iSIM technology, from its development and advantages to its promising future. With iSIM, connectivity solutions are moving toward unprecedented levels of integration and flexibility. As IoT, smart devices and machine-to-machine communications expand, iSIM will enable more seamless, secure and adaptable connectivity for a vast range of applications. This progression not only advances technical capabilities but also brings substantial benefits to industries by streamlining device manufacturing, reducing power consumption, and enabling enhanced security protocols.

Looking ahead, iSIM technology is set to support a world of highly connected devices, fostering new possibilities in fields such as smart healthcare, automotive, agriculture and wearables. Murata's iSIM module is prepared to lead this shift, setting new standards for reliability, efficiency and connectivity as we advance into the future of integrated communication.

The iSIM advantage: Simplified manufacturing and design

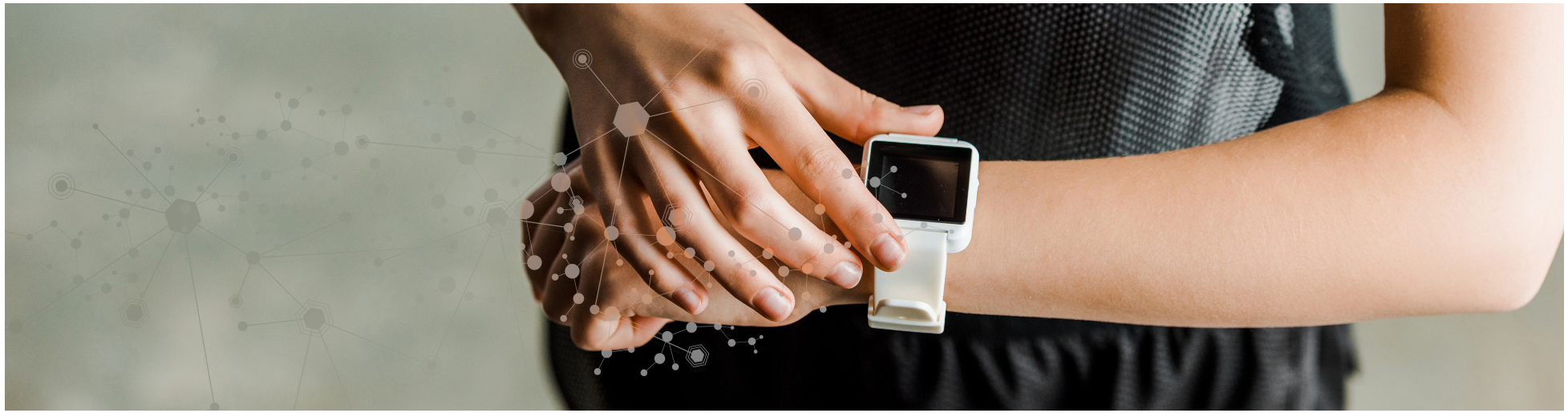
OEMs are increasingly recognising that beyond connectivity benefits, iSIM integration brings significant manufacturing and design efficiencies. By eliminating the need for traditional plastic SIM trays and cards, iSIM technology is installed directly into the module during manufacturing, making it a cost-effective alternative.

Additionally, Murata's iSIM modules simplify design by removing the need for SIM slots or trays, which often pose challenges such as increased vulnerability to dust and moisture ingress, added component costs, and the complexity of incorporating additional design elements. By avoiding these complications, the Murata iSIM module enables OEMs to optimise both the manufacturing process and the overall design of their devices, enhancing product durability and reducing assembly costs.

Enhancing device design with Murata's iSIM module

Murata's iSIM module provides substantial design benefits by saving space that would otherwise be occupied by traditional SIM cards and slots. This space efficiency is particularly valuable for compact devices, such as wearables or tracking tags, where every millimetre matters. By integrating Murata's iSIM module early in the development process, engineers can significantly reduce device costs, simplify manufacturing and maximise available space - often allowing room for additional features.

Murata's solution delivers full SIM functionality without the need for bulky and inconvenient SIM slots or trays, and it eliminates the necessity for multiple stock-keeping unit numbers (SKUs) to accommodate regional variations. This approach not only accelerates development but also reduces the bill of materials (BOM) cost and streamlines manufacturing and logistics, making it a highly efficient choice for OEMs looking to optimise both design and production processes.



BOM-proof efficiency with Murata's integrated iSIM modules

Murata has taken iSIM efficiency a step further, optimising manufacturing processes and reducing BOM costs. Drawing upon its expertise in module manufacturing, Murata has embedded iSIM technology directly into its modules, achieving the same compact size as standard modules. This integration frees up space for applications with tight design constraints and fosters greater flexibility for innovation, as the module itself now incorporates iSIM technology.

By combining the module and iSIM technology into a single component, Murata significantly streamlines BOM costs, simplifying sourcing, inventory management and manufacturing processes. This single-product approach reduces the number of parts and assembly steps required, which is impactful in high-volume IoT applications where even small BOM savings can yield substantial cost benefits. As a result, Murata's iSIM module enables OEMs to narrow the profitability gap across large-scale deployments, delivering both economic and operational efficiencies.

Scaling iSIM technology: Overcoming growing pains

Until now, many of the advantages of iSIM technology have remained mostly theoretical. While it's easy to anticipate how deployments will benefit from Murata's iSIM module, these benefits only fully materialise when iSIM-equipped devices reach the market at scale. At that point, traditional SIM infrastructure and resources can be redeployed, amplifying iSIM's impact. Trials have demonstrated the potential of Murata's iSIM module, building confidence in its effectiveness.

This confidence is further reinforced by GSMA standardisation efforts in the iSIM technology arena. However, to unlock the complete value of Murata's iSIM, deployment must occur on a massive scale.

Drawing on its extensive module expertise, Murata has been preparing for this mass-scale deployment for several years. The company quickly recognised the work required to support large-scale iSIM integration and has developed modules designed for mass adoption. These solutions are available to customers in partnership with chipset, secure OS and network collaborators.

Turnkey connectivity with Murata's iSIM module

Murata's vision is to make large-scale connectivity seamless, enabling companies to purchase 10,000 or more iSIM modules pre-configured, for example, with a Vodafone Business SIM, ready to connect directly to the OEM's or vendor's network account. This turnkey approach simplifies device connectivity across vast deployments, offering ready-to-use functionality right out of the box.

However, achieving this scale requires extensive logistical planning and a robust, reliable supply chain. Unlike evaluation kits that serve for testing, Murata's iSIM solution is engineered specifically for large-scale, real-world deployments in just-in-time manufacturing environments. Following over a year of process refinement, Murata's production system now aligns the iSIM module, factory workflows, and additional device components to ensure each iSIM-equipped device is certified and compliant, ready to deliver frictionless, scalable connectivity across thousands of devices.

Murata's vision is to make large-scale connectivity seamless, enabling companies to purchase 10,000 or more iSIM modules pre-configured

Scaling iSIM for mass production: Murata's streamlined solution

Murata's process transforms iSIM module adoption from isolated trials to a robust, mass-scale manufacturing approach. Centred around Murata's compact, resin-sealed module, this fully automated system ensures production efficiency. Unlike separate iSIMs requiring additional metal housings, Murata's iSIM module integrates everything within a single, reliable resin package, streamlining handling and enhancing durability in production.

By adopting a combined iSIM technology and module approach, Murata's solution is optimised for low power consumption, so OEMs no longer need to worry about SIM card versions or compatibility - every module delivers the most efficient connectivity solution available.

This streamlined design also enhances production by providing a single, compact component for easy installation, reducing complexity and accelerating the assembly process for OEMs. The combined iSIM module, chipset, secure OS and connectivity elements work together seamlessly, simplifying deployment and benefiting all stakeholders within the connected device value chain.

Murata's process transforms iSIM module adoption from isolated trials to a robust, mass-scale manufacturing approach

Conclusion

In summary, Murata's iSIM-enabled modules provide a transformative solution for OEMs seeking scalable, secure and efficient connectivity. By embedding iSIM technology within a compact, sealed module, Murata not only reduces the cost and complexity of traditional SIM infrastructure but also enables seamless integration into high-volume production environments. Through a meticulously developed, automated process, Murata has positioned itself as a leader in the iSIM space, offering a turnkey solution that supports OEMs in achieving streamlined logistics, simplified design and reliable connectivity at scale. This comprehensive approach to iSIM integration empowers OEMs and their customers to unlock the full potential of connected devices across global deployments.