beacon
EmbeddedWorks

Efficiently Updating Compact Medical Devices

Summary

This Beacon EmbeddedWorks customer returned to our team to support development of their next generation wearable device capable of monitoring cardiac activity. Their first-generation product utilized our Beacon EmbeddedWorks Torpedo™ + Wireless System on Module (SOM) for its versatility and compact form factor. When the customer heard about our newest i.MX 8M Mini SOM, they came to our team to help streamline their product update and proactively prepare for their next generation device.

Challenge

The customer's next generation product would serve as a small, wearable device responsible for recording patients' heart beats to monitor for potentially dangerous arrhythmias. Not only would the device have to reliably monitor patients, it would need to offer the connectivity capabilities to transmit data to patient monitoring services. Further, the device needed to be highly compact and portable to be comfortable and discrete when worn by the patient. Beyond size, connectivity, and processing requirements, the medical device would be required to comply with strict quality and reliability regulations, including ISO 13485.

To fulfill these stringent requirements the device would rely on its embedded electronics systems. Our Beacon EmbeddedWorks Torpedo™ + Wireless SOM was already used in the customer's existing product, and they had sufficient SOMs to continue using the Torpedo™ for 3-4 years. The Torpedo™ fulfilled the device's connectivity and regulatory requirements while delivering

Customer Profile

This customer is a leading expert in cardiac medical devices, focusing on compact and wearable solutions. Their technologies combine reliable patient monitoring with communications capabilities to offer patient-centric diagnostic and therapeutic solutions. With a patient-centric approach to medical device development, the customer supports patients and providers in gaining visibility and control over their cardiac outcomes.

About Beacon EmbeddedWorks

Beacon EmbeddedWorks is a full-service provider of innovative System on Modules (SOMs). Backed by a suite of customization, security, and support services, our dependable, pre-certified, and feature-dense embedded solutions serve the most strenuous applications.

powerful processing in a compact space, but the customer wanted to implement product updates to keep their device on the cutting-edge. This proactive approach would improve the device's effectiveness and extend its product lifecycle to remain an industry leading wearable medical device for years to come.

The customer decided to execute the product update without a complete system redesign, accelerating time-to-market and minimizing design risk. By selecting a new SOM that could utilize the same baseboard layout, the update would achieve improved functionality without incurring unnecessary redesign costs. While the result would be a highly streamlined process, the no-rework approach would require careful planning to ensure successful execution.

Solution

Having established ourselves as a trusted supplier of reliable SOMs, the customer came back to our team when it came time to consider device updates that would extend their product's life. Our i.MX 8M Mini SOM offered an ideal solution for their product, delivering increased processing power and expanded connectivity capabilities while maintaining a compact form factor. The i.MX 8M SOM met the product requirements for the update, but implementation without a board redesign wouldn't be as simple as removing the old SOM and inserting the new.

While both SOMs deliver powerful processing and connectivity capabilities, they are not based on the same form factor or processor series. The Torpedo™, based on TI's DM3730 processor, offered a highly compact 15 x 33mm size. The new SOM, based on NXP's i.MX 8M Mini, offered a substantial performance boost in a slightly larger, though still compact, form factor of 28 x 38mm. This added a layer of complexity to the desired product update since neither the SOM size nor processor type would remain consistent.

To overcome this challenge, our team suggested an interposer design that would allow our i.MX 8M Mini SOM to plug directly into the baseboard that the customer used for their active generation product. The interposer would act as an adapter connecting the board that had been designed for the Torpedo™ form factor to the new SOM with different dimensions. By avoiding a complete product redesign, the update would achieve improved performance with an efficient development cycle that minimized time investment and cost. After considering all possible options, the customer approved our plan to use an interposer for the i.MX 8M SOM. With a clear objective in mind, our team of in-house engineering experts set to work designing a custom interposer for the customer's application.

Result

The customer decided to move forward with our i.MX 8M Mini SOM and the custom interposer design. Their proactive approach to the update positioned the customer to implement the new SOM as soon as it became available, and the updated device passed regulatory standards. The SOM constituted a valuable upgrade for the device, packing Wi-Fi 5 and Bluetooth 4.2 connectivity, with processing power clocking up to 1.8 GHz. Our highly responsive customer service team helped to keep the project on track with an accelerated timeline and ensure the customer's complete visibility to our process. The success of the project has fostered our ongoing business relationship with the customer, and we'll continue to support their embedded systems through their extended product lifecycle.

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