Filtronic: Pioneering Smarter Semiconductor Packaging for UK Defence

12.3.2026 - | Her Majesty's Revenue and Customs

With DTEP funding, Filtronic has developed cutting-edge plastic packaging technology for high-power semiconductors, strengthening the UK's independence in critical defence technology.

- Filtronic used DTEP funding to solve a longstanding engineering challenge — packaging high-power semiconductors in plastic rather than bulky ceramic, making defence electronics smaller, lighter and more powerful.
- After testing more than 150 units under extreme conditions, every single device passed 100% of electrical performance tests — proving the technology is ready for real-world defence use.
- The results speak for themselves: Filtronic doubled its workforce, tripled its revenue and opened a new manufacturing facility in the North East of England.
- This is what targeted innovation funding can achieve — a UK company with cutting-edge capability, a growing domestic supply chain, and technology that’s ready for the frontline.

The challenge: making defence electronics smaller, lighter and more powerful

Modern defence systems, from radar to electronic warfare, rely heavily on radio frequency (RF) technology. RF technology enables secure communications, real-time data sharing and situational awareness across land, sea, air and space.

At the heart of these systems are semiconductors made from Gallium Nitride (GaN), a material that offers superior power and efficiency compared to traditional silicon. GaN semiconductors are already widely used in everyday electronics, from compact phone chargers and efficient power supplies to LEDs, electric vehicle components and data centres. In defence, they’re prized for their performance in high-power RF systems.

But there’s been a longstanding problem: GaN semiconductors are typically housed in bulky ceramic packaging that doesn’t suit modern defence needs, where every gram and millimetre counts.

Filtronic set out to solve this.

About Filtronic

Filtronic is a UK-based specialist in RF and mmWave technology, with over 45 years of experience. Originally a spin-out from Leeds University, the company has evolved from a telecoms giant into a focused innovator serving defence, space and 5G markets.

“Defence and space are high-growth sectors with strong demand for sovereign, UK-based supply chains. With most of our design and manufacturing conducted domestically, we’re well-positioned to support national security objectives whilst continuing to innovate.”

Tudor Williams, Chief Technology Officer, Filtronic

The solution: compact plastic packaging that performs

In 2022, Filtronic began working with UK Defence Innovation (UKDI) through the Defence Technology Exploitation Programme (DTEP). By August 2025, Filtronic had solved a tricky engineering challenge: how to package high-power GaN semiconductors in plastic rather than ceramic, without compromising on performance.

The result is a new type of Quad Flat No-lead (QFN) packaging that's smaller, lighter and better at managing heat.

Why is this important? Imagine a radar system containing hundreds of tiny semiconductors, each about the size of a small fingernail. Traditionally, each one sits in bulky ceramic housing. Filtronic's compact plastic design means more semiconductors can fit in the same space, delivering greater power, better thermal efficiency and lighter payloads. That's a game-changer for advanced radar systems used across air, sea and space platforms.

Moulding machine used in Filtronic's plastic packaging programme

Rigorous testing, outstanding results

Over more than two years, Filtronic designed, built and tested over 150 units under extreme conditions, including high moisture exposure, thermal testing and intensive electrical stress testing.

The outcome: every single device passed 100% of electrical performance tests.

"By pushing devices to their limits and validating their performance, we've taken a significant step forward in sovereign capability," Williams remarks.

This validation proved that plastic packaging can match, or even exceed, the performance of traditional ceramic solutions, while offering significant size and weight advantages.

Real-world results: growth, jobs and future investment

The DTEP project has delivered far more than a technical breakthrough. It's sparked significant commercial momentum for the company and local economy.

Since the project began, Filtronic has:

- doubled its workforce
- tripled its revenue
- opened a new manufacturing facility in the North East of England
- secured follow-on funding through UKRI to explore enhanced thermal management techniques

- attracted strong interest from defence and space sectors

As part of DTEP, the company’s partnership with a major UK defence prime contractor was instrumental, not only in shaping the project, but in helping secure board approval for investment in the new packaging line.

Williams notes: “This project has helped us grow not just in capability, but in confidence. We’ve expanded our workforce, invested in new facilities, and built a service offering that meets real defence needs.”

Filtronic's new manufacturing facility in the North East which opened in 2025.

A model for UK innovation

Filtronic’s success illustrates what’s possible when established companies receive targeted support to overcome technical and commercial barriers.

Today, the company works with major defence primes on bespoke design and manufacturing services, including custom filters for airborne and naval platforms. Their recent partnership with SpaceX, supplying components for their Starlink solution, underscores their growing influence in the commercial space sector.

Throughout the project, UKDI’s Innovation Partners provided hands-on support, guiding the application process and helping navigate requirements at every stage. As Williams explains: “The DTEP process was smooth and collaborative. It wasn’t just about submitting a proposal; it was about working together to find the right fit. That made a real difference.”

Filtronic’s journey demonstrates how UKDI funding can unlock meaningful innovation, advancing critical technologies while building sustainable UK businesses that support national security.

https://www.gov.uk/government/case-studies/filtronic-pioneering-smarter-semiconductor-packaging-for-uk-defence