GlobalData.

Microwave Backhaul: Competitive Landscape Assessment

May 29, 2025

Ed Gubbins

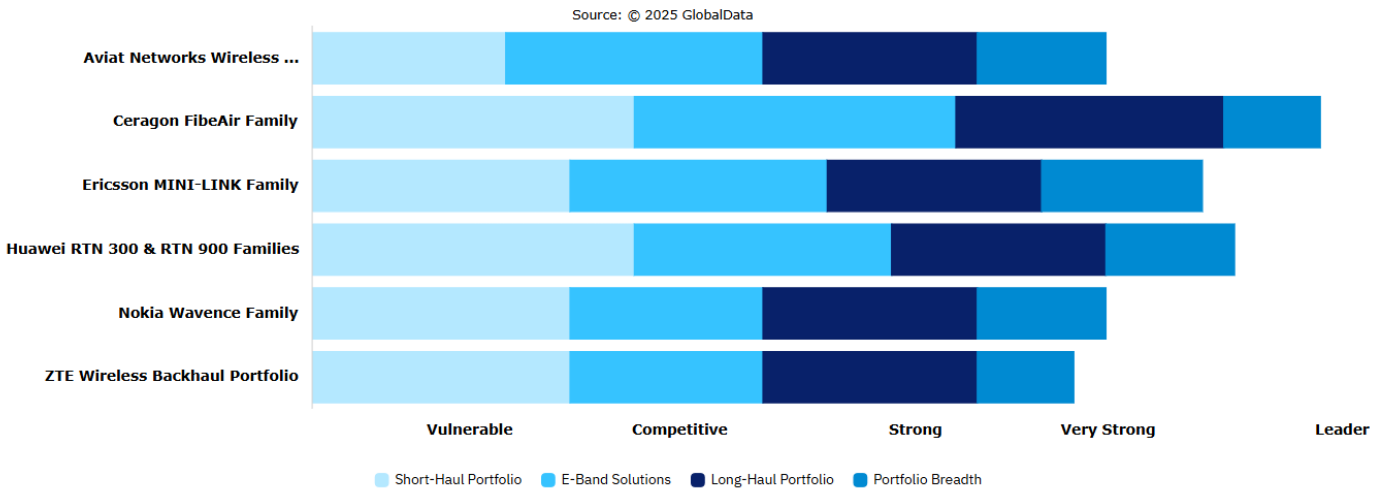
COMPETITIVE LANDSCAPE ASSESSMENT – Microwave Backhaul

REPORT SUMMARY:

Wireless backhaul vendors continue to enhance their portfolios' use of E-band millimeter-wave spectrum. And as 5G traffic increases, vendors are increasingly looking at interfaces above 10 Gbps.

PRODUCT CLASS SCORECARD

GlobalData.



MARKET OVERVIEW

Product Class	Microwave Backhaul
Market Definition	To connect mobile base stations to the rest of the network, operators generally prefer fiber as a high-capacity, reliable medium. However, for a variety of reasons, deploying fiber to the cell site is not always cost-effective or practical. In these cases, a common alternative has been the use of wireless connections, most often using microwave spectrum (i.e., radio signals in the traditional microwave spectrum between 6 and 42 GHz). Operators also use millimeter-wave spectrum (70 and 80 GHz spectrum, known as E-band, or – less commonly – 60 GHz spectrum, also known as V-band). Wireless backhaul solutions often include indoor units (IDUs) that process signals and outdoor units (ODUs, also known as radio units) that transmit and receive signals, though some backhaul solutions reside entirely indoors and some entirely outdoors. This assessment evaluates the portfolios of such products as well as their accompanying software.
Rated Competitors	• Aviat Networks Wireless Backhaul Portfolio • Ceragon FibeAir Family • Ericsson MINI-LINK Family • Huawei RTN 300 & RTN 900 Families • Nokia Wavence Family • ZTE Wireless Backhaul Portfolio
Additional Competitors	• Intracom Telecom • SIAE
Changes Since Last Update	• *May 2025:* US-based Aviat Networks is been included in this analysis for the first time. • *March 2025:* Ceragon unveiled new backhaul products including the IP-50GP (a "cost-efficient" indoor unit), the IP-50EX-A (a multi-band product) and the IP-100E (a dual-band E-band solution that is the first to use Ceragon's own in-house chip design). • *March 2025:* Huawei introduced a "full-duplex" E-band solution and a spherical antenna to give operators more flexibility to make changes as well as direct beams at tight angles without interference. • *May 2025:* Ericsson added two new E-band radios to its portfolio: the MINI-LINK 6355, available starting Q2 2025, and the higher-power MINI-LINK 6356, due to be available in Q4. • *May 2025:* Nokia added new enhancements to its long-haul portfolio and, in its short-haul radio portfolio, introduced the Wavence UBT-S2, which supports 224-MHz channels but in a more compact, lightweight unit than similar existing Nokia products. The vendor also introduced a new Multiservice Switch (the MSS-400) and a new E-band radio (the Wavence UBT-mT), neither of which are included in this analysis because they are not generally commercially available until 2026. • *May 2025:* ZTE introduced the UR2010, an operation and maintenance platform spanning ZTE's wireless backhaul and radio access networks and more.

MARKET ASSESSMENT

The landscape of wireless backhaul equipment vendors can broadly be segmented into two groups. One is made up of vendors that offer solutions for multiple parts of the network, including backhaul, radio access network (RAN), mobile core, optical transport, routing (or some combination thereof), etc. The other group is made up of specialists that focus more narrowly on wireless backhaul and areas directly tangential to it.

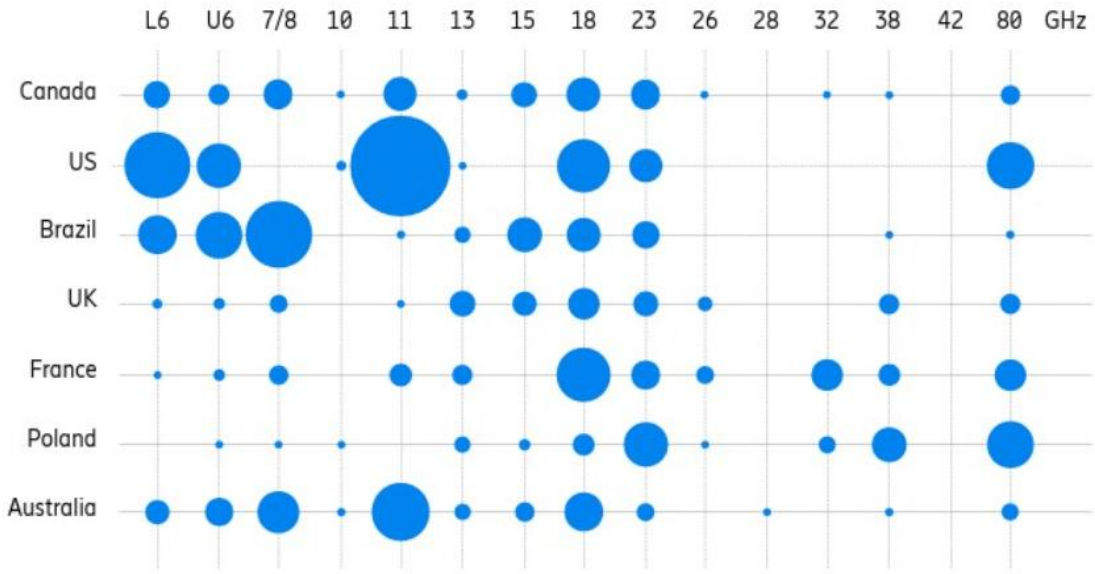
The first group – which includes vendors such as Ericsson, Huawei, Nokia, and ZTE – often promote themselves as providers of "end-to-end" network solutions, which allow for cohesion and smooth, efficient interoperability between multiple parts of the network and a cost structure that benefits from this breadth of sourcing.

The other group – including vendors such as Aviat Networks, Ceragon, Intracom Telecom, and SIAE Microelettronica (not all of which are merely pure microwave specialists, but none of which offer comprehensive end-to-end solutions) – often promote themselves as providers of "best-of-breed" products whose performance is superior to that of the end-to-end suppliers.

In 2023, each of the sector's two leading specialists grew via significant acquisitions: US-based Aviat Networks acquired the wireless backhaul business of Japan-based NEC. And Israel-based Ceragon acquired another Israeli company: Siklu. The Aviat/NEC combination created the sector's largest specialist by revenue and market share. And buying Siklu helped further diversify Ceragon's business in terms of both customer bases and product markets, as Siklu introduced Ceragon to the fixed-wireless access space, a different mix of geographies and a base of smaller customers. Both specialists add stability to their business by supplementing wireless backhaul use cases with others, including enterprise connectivity.

MARKET DRIVERS

Wireless Backhaul Spectrum Use in Seven Countries



Source: Ericsson (2024)

- **5G Capacity Demands:** 5G networks, especially using mid-band spectrum for a combination of boosted coverage and capacity, have increased capacity requirements for wireless backhaul networks. One consequence of that is demand among operators for wireless backhaul gear optimized for the next level of capacity – with interfaces above 10 Gbps, for example.
- **E-band Backhaul Growth:** The use of E-band millimeter-wave spectrum (70-80 GHz) - both on its own and bonded with traditional microwave links – is common. The fact that E-band spectrum is unlicensed or lightly licensed (depending on each country's regulations) has made it an appealing choice for operators looking for cost-effective connectivity. Bonding E-band with traditional microwave signals adds greater reliability as well as capacity.
- **Regional Variance:** Geographies with the highest proportions of wireless backhaul relative to fiber or other media are India, the Middle East, sub-Saharan Africa, and Latin America. North America and China have some of the lowest percentages of microwave backhaul. India became a particular hotbed for wireless backhaul activity as it rolled out nationwide 5G networks at a rapid pace in 2022

and 2023. Geography also impacts the competitive landscape, as China-based vendors Huawei and ZTE face geopolitical barriers to some markets (e.g., the US) that its rivals exploit – in some cases replacing Huawei and ZTE where regulators have required it (e.g., in parts of Europe).

- **Fixed Wireless Access (FWA):** Wireless backhaul is used in some FWA networks that deliver residential broadband services. This opportunity is aligned with the use of millimeter-wave for residential broadband.
- **Non-Terrestrial Networks:** The increasing prevalence and technological evolution of non-terrestrial networks to provide wireless connectivity in rural and remote areas could affect the wireless backhaul sector, which serves similar needs. Each approach has relative advantages and disadvantages (connection speed, cost, etc.) that will be weighed by individual market requirements.
- **Energy Efficiency Features:** The expense of 5G rollouts has prompted a wave of energy efficiency technologies focused on lowering energy costs in the RAN. These efforts have spilled over into the wireless backhaul segment as well, with multiple vendors offering ways to decrease power consumption dynamically to avoid waste, for example. These functions may be influenced by broader networking technology trends, including artificial intelligence (and with it, automation and optimization) and service management orchestration platforms.
- **Routing Functionality Convergence:** This sector has seen increased integration of routing functionality with the indoor units (IDUs) of wireless backhaul systems. In some cases, this has taken the form of virtualized cell-site routing capabilities or IDUs taking on routing functions in cards and slots, either from the wireless backhaul vendor or a partner. The result can be an economy of space and complexity and, in some cases, more cohesion in network management operations.
- **Integrated Access & Backhaul:** Industry 5G standards include the capability to allow access and backhaul connections to use the same spectrum simultaneously. Where applied, this prompts fundamental changes in network architecture and equipment product design. It could also give an advantage to vendors that offer both RAN and backhaul gear over specialists who only offer one or the other.

BUYING CRITERIA

Operators investing in wireless backhaul will evaluate a long list of criteria, including the cost of the equipment (the cost to purchase it as well as the cost to power, manage, and maintain it) and how well that cost matches the needs of each particular site, since site needs vary widely from high-traffic to low-traffic areas. Our analysis looks at a small subset of the criteria operators examine, as we have no visibility into costs, for example. Some analysis of the data available to us – radio maximum power output levels, for example – offers useful comparisons but doesn't address the kind of "right-sizing" of appropriate power outputs with costs and other considerations that operators commonly make. That said, here are some of the buying criteria this report examines:

- **Short-Haul Portfolio:** Short-haul microwave radio products are the most important part of any vendor's microwave backhaul portfolio. Vendors that promise high capacity in small form factors have the best competitive position. That capacity can take the form of channel counts and bandwidths as well as aggregate interface capacity. Innovative software features can also distinguish a vendor.
- **E-Band Solutions:** Solutions that make use of 70 and 80 GHz millimeter wave have become increasingly popular in mobile backhaul in recent years, especially solutions that bond E-band links with traditional microwave. Solutions that promise higher capacity in smaller form factors have a competitive edge, as do those with high power outputs, channel capacities and multiband bonding capabilities.

- **Long-Haul Portfolio:** Though not as prevalent as short-haul products, long-haul gear remains an essential aspect of microwave backhaul portfolios and deployments. As with short-haul gear, vendors that promise high capacity in small form factors have the best competitive position. That capacity can take the form of channel counts and bandwidths as well as aggregate interface capacity.
- **Portfolio Breadth:** Vendors with broader portfolios of macrocell and small-cell backhaul products can make operators comfortable with flexible options and are better suited to meet the diverse needs of a global market. In addition, vendors that supplement their backhaul radio portfolios with other elements – such as cell-site routers, wireline access, or optical products – to offer more comprehensive end-to-end solutions can appeal to some segments of the market.

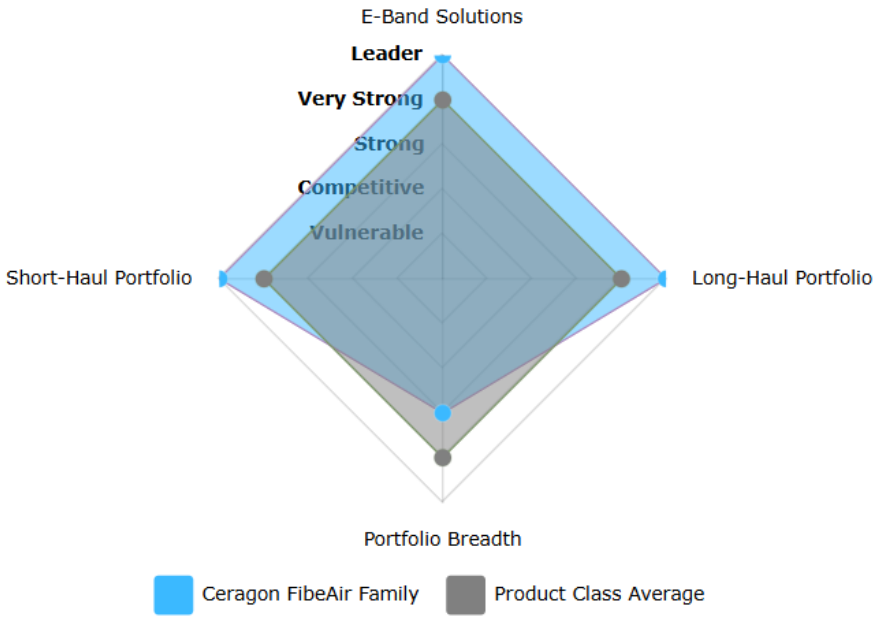
VENDOR RECOMMENDATIONS

- **Ceragon:** Contrast recent new introductions to Ceragon's portfolio with the portfolio of fellow specialist Aviat, which has not announced a new product recently; suggest that they may be more focused on eliminating redundancies in the existing portfolio.
- **Ericsson:** Explore the advantages of relying more on in-house silicon designs for wireless backhaul. In recent years, Ericsson has promoted in-house silicon as a key strength of its RAN business. Similar actions in wireless backhaul may make sense given Ceragon's moves in that direction and Huawei's general struggles with silicon supply in recent years.
- **Huawei & ZTE:** Though both vendors' portfolios offer high capacity and scalability, the geographic markets they need to target in response to geopolitical barriers in Europe and elsewhere may have more low-scale, cost-optimized preferences. Emphasizing value stories aligned with those needs could help.
- **Nokia:** Cultivate stronger messaging around multiband bonding and unique software features to counter, and differentiate from, competitors. Where possible, leverage innovations from Nokia's RAN business that wireless backhaul specialists would be less likely to match.

BUYER RECOMMENDATIONS

- **Understand Non-Terrestrial Network Impact:** Mobile operators considering using wireless backhaul to serve rural and remote areas should stay informed of the latest developments and future trajectory of non-terrestrial networks in order to understand how the growth of NTNs might influence their rural coverage strategies.
- **Keep Up with E-Band Reach Evolution:** Engage with vendors to better understand recent advances in the reach of E-band links (and bonded E-band/microwave links). Competition and R&D are pushing the limits of these technologies, and the math that was used to plan network hops only a few years ago may now be meaningfully different.
- **Push for RAN-Style Energy Efficiency Innovations:** Press vendors to adapt, for microwave backhaul solutions, the energy-efficiency software features that are increasingly being applied to the radio access network. The need for RAN savings is driving innovation there that could benefit microwave gear, whose relatively lower power consumption typically gets less attention than the RAN's.

Rated Competitors

Product Name	Ceragon FibeAir Family
Current Perspective	Ceragon's short-haul microwave backhaul portfolio is not as broad as some others, and its radios sit on the bulky side. But it offers a higher radio power output than any other vendor, the highest IDU interface capacity density, nearly the highest IDU interface capacity and the most compact IDU on the market (in addition to a "virtual IDU" in its FibeAir IP-50FX cell-site "gateway"). Its IDUs also include 25 Gbps interfaces, unlike some competitors. The portfolio also offers differentiating features such as advanced frequency reuse, advanced space diversity, and "Ceragon Insight," a software suite that uses network analytics and AI to help operators plan, manage, optimize, and automate networks – including multi-vendor networks. Another distinguishing feature is the 'disaggregated' architecture of its IP-50 platform, which supports third-party radios. The portfolio has an especially broad set of options for E-band products, including the new IP-100E, unveiled in early 2025. The first product to use Ceragon's own in-house chip design, the IP-100E is a dual-band product that Ceragon says can deliver 25 Gbps throughput from a single unit and up to 40 Gbps using multiple units in four-channel configurations without redundancy. (However, full details about the product – including its volume and weight, for example – are not yet disclosed.) The portfolio also offers the ability to bond an E-band link with two microwave links. Ceragon's long-haul portfolio offers a higher interface capacity and channel/bandwidth capacity than nearly any other vendor. And in the context of hardware volume, both figures sit at the top end of market claims. It is also one of only two vendors in this analysis to offer an all-outdoor long-haul solution. The vendor offers multiple options for E-band small-cell backhaul, and supplements its backhaul portfolio with the FibeAir IP-50FX, a cell-site "gateway" that combines the functions of a cell-site router, a networking switch and a microwave indoor unit (IDU).
Buying Criteria Rating	**E-Band Solutions:** Leader **Long-Haul Portfolio:** Leader **Portfolio Breadth:** Strong **Short-Haul Portfolio:** Leader
Product Scores	**Leader** 

Strengths	• **IDU Interface Capacity:** Ceragon's short-haul IDUs offer 25 Gbps interfaces, unlike some of its competitors. In addition, the total interface capacity of Ceragon's short-haul IDUs are higher than those of nearly all competitors. Ceragon's short-haul IDUs also have a higher interface capacity density (interface capacity per liter of hardware) than any other vendor. Its long-haul IDUs offer highly competitive interface capacities, nearly unsurpassed channel bandwidth per liter and capacities of both types per liter of hardware sit at the top of market claims. A combination of high-capacity interfaces and a large number of interfaces can help operators keep up with capacity demands in a flexible manner. • **High Short-Haul Microwave Radio Power Output:** Ceragon's highest power short-haul radios offer market-leading power output. High output power helps strengthen signals for greater capacity, reach, and reliability. • **E-Band Options:** Ceragon offers a broader selection of E-band radios than its competitors. The radios are relatively small and lightweight and include a high-capacity dual-band product that promises to deliver up to 40 Gbps using multiple units in four-channel configurations. This combination of high capacity and compact, lightweight designs can assure operators their networks will be easy to install and capable of keeping up with traffic volume increases over time and/or attain enough reach to reduce the number of sites needed.
Limitations	• **Short-Haul Options:** Ceragon offers fewer short-haul IDU options than most competitors. In addition, its smallest, lightest short-haul radios fall on the bulky, heavy side compared to rivals. A wide range of IDUs optimized for different needs allows operators to closely match products to individual sites. And compact, lightweight radio options can ease deployment. • **Short-Haul IDU Channel Count:** Ceragon's short-haul IDUs, although compact, don't support as many channels as its competitors do, forcing customers to use more units to achieve similar channel counts. Vendors with units supporting higher channel counts can claim greater value per unit. • **Multi-Purpose Gear Versus Best of Breed:** Ceragon's combination indoor unit/cell-site router/networking switch, with its divided functionality, may be seen by some customers as clashing with Ceragon's basic proposition that a specialist offering best-of-breed products is superior to multi-faceted solutions from a single vendor. Ceragon's typical customer base may be particularly skeptical of the value of this multi-purpose gear, as their preference for Ceragon often indicates a preference for the best-of-breed specialist approach.