



Enabling
Performance

5N+ Patents Uniquely Positioned to Expedite First-to-Market Commercialization of Vertical GaN-on-Si Power Devices

Recently validated 5N+ patent portfolio key to development of novel vertical GaN-on-Si power devices for 600V-1200V High-Power Electronics, EV and AI server applications

Montréal, Québec, March 21, 2024 – 5N Plus Inc. (TSX:VNP) (“5N+” or “the Company”), a leading global producer of specialty semiconductors and performance materials, today announced that it is officially launching the commercialization rights for its portfolio of gallium nitride on silicon (GaN-on-Si) patents that will take semiconductors and power switching technology to the next level. These key patents can enable the rapid prototype development and first-to-market commercialization of novel vertical GaN-on-Si power devices by companies operating in the High-Power Electronics (HPE), Electric Vehicles (EV) and Artificial Intelligence (AI) server sectors.

Key Patents Enabling First-to-Market Vertical GaN-on-Si Devices

A mechanically stable, wide-bandgap semiconductor material with high heat capacity and thermal conductivity, GaN has outstanding properties. Today, lateral GaN is primarily used in low voltage (<400V) applications, such as chargers, but novel vertical GaN-on-Si has the potential to replace silicon carbide (SiC), which is the current preferred material for medium and high voltage applications (i.e. EV inverters operating 650V). SiC is expensive and not easily available, whereas GaN-on-Si is more efficient and cost-effective. Recent [academic demonstrations](#) utilizing key 5N+ patents have shown that vertical GaN-on-Si, as opposed to lateral GaN transistors showing destructive breakdown, offers soft breakdown with avalanche capability for safe, compact and more efficient devices.

“Our 54 patents have now been shown to be more high-performing and efficient than the current alternative through recent academic demonstrations. As such, our portfolio of patents is uniquely positioned to enable industry-leading HPE and EV companies to rapidly develop and commercialize first-to-market vertical GaN-on-Si power devices that will revolutionize high-voltage semiconductor applications,” said Gervais Jacques, President and CEO of 5N+.

5N+ Gan-on-Si Patent Portfolio

The commercial rights of the 54 granted patents owned by 5N+ include mandatory use of large diameter thick silicon substrates (over 1mm), combined with masking layers to filter the dislocations. Increasing the thickness of large diameter silicon substrates in vertical GaN-on-Si devices enables increased voltage capacity without increasing the chip size. Also included in this patent is the ability to remove the substrate to form the backside contacts once the GaN growth is complete. In addition, the Company holds lateral GaN-on-Si patents for radiofrequency (RF) applications that will enable next generation 5G and 6G wireless communication components. 5N+ holds these patents through its wholly owned subsidiary AZUR SPACE Solar Power GmbH, a leader in multi-junction solar cell technology.

About 5N+

5N+ is a leading global producer of specialty semiconductors and performance materials. The Company's ultra-pure materials often form the core element of its customers' products. These customers rely on 5N+'s products to enable performance and sustainability in their own products. 5N+ deploys a range of proprietary and proven technologies to develop and manufacture its products. The Company's products enable various applications in several key industries, including renewable energy, security, space, pharmaceutical, medical imaging and industrial. Headquartered in Montréal, Quebec, 5N+ operates R&D, manufacturing and commercial centers in strategically located facilities around the world including Europe, North America and Asia.

Forward-Looking Statements

Certain statements in this press release may be forward-looking within the meaning of applicable securities laws. Such forward-looking statements are based on a number of estimates and assumptions that the Company believes are reasonable when made, including that 5N+ will be able to retain and hire key personnel and maintain relationships with customers, suppliers and other business partners, that 5N+ will continue to operate its business in the normal course, that 5N+ will be able to implement its growth strategy, that 5N+ will be able to successfully and timely complete the realization of its backlog, that 5N+ will not suffer any supply chain challenges or any material disruption in the supply of raw materials on competitive terms, that 5N+ will be able to generate new sales, produce, deliver, and sell its expected product volumes at the expected prices and control its costs, as well as other factors believed to be appropriate and reasonable in the circumstances. However, there can be no assurance that such estimates and assumptions will prove to be correct. These statements are not guarantees of future performance and involve assumptions, risks and uncertainties that are difficult to predict and may cause the Company's actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements. A description of the risks affecting the Company's business and activities appears under the heading "Risk and Uncertainties" of the Company's 2023 MD&A dated February 27, 2024, available on www.sedarplus.ca.

Forward-looking statements can generally be identified by the use of terms such as "may", "should", "would", "believe", "expect", the negative of these terms, variations of them or any similar terms. No assurance can be given that any events anticipated by the forward-looking statements in this press release will transpire or occur, or if any of them do so, what benefits that 5N+ will derive therefrom. In particular, no assurance can be given as to the future financial performance of 5N+. The forward-looking statements contained in this press release is made as of the date hereof and the Company has no obligation to publicly update such forward-looking information to reflect new information, subsequent or otherwise, unless required by applicable securities laws. The reader is warned against placing undue reliance on these forward-looking statements.

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