

**GaN Transistors Expand 100-V And 200-V Rad Hard Options**

[EPC](#) has expanded its portfolio of radiation-hardened GaN FETs with the introduction of the EPC7020, a 200-V, 11-mΩ, 170-A pulsed, rad-hard GaN FET in a 12-mm<sup>2</sup> footprint and the EPC7003, a 100-V, 30-mΩ, 42-A pulsed, rad-hard GaN FET in a 1.87-mm<sup>2</sup> footprint. Both devices have a total dose radiation rating greater than 1,000 Krad(Si) and SEE immunity for LET of 83.7 MeV/mg/cm<sup>2</sup> with V<sub>DS</sub> up to 100% of rated breakdown.

These devices, along with the rest of the Rad Hard family—the EPC7019 (40 V, 1.5 mΩ), EPC7014 (60 V 340 mΩ), EPC7004 (100 V, 7 mΩ), EPC7018 (100 V, 3.9 mΩ), and EPC7007 (200 V, 25 mΩ)—are offered in a chip-scale package, the same as the commercial eGaN FET and IC family. Packaged versions will be available from EPC Space.

Note that when compared with the previously introduced 25-mΩ 200-V EPC7007, the EPC7020 has a lower R<sub>DS(ON)</sub> of 11 mΩ, but a larger die size. Meanwhile, the 100-V EPC7003, at 30 mΩ, has a higher on-resistance than the previously introduced EPC7004 (7 mΩ) and EPC7018 (3.9 mΩ), but offers a smaller die size. So the new devices expand the rad hard FET portfolio to allow more tradeoffs in R<sub>DS(ON)</sub> versus device size (see the table).

According to the vendor, eGaN FETs and ICs are smaller, operate 40 times better electrically, and are lower cost than the Rad Hard silicon devices typically used in high reliability and space applications. GaN devices also support higher total radiation levels and SEE LET levels than silicon solutions.

Applications benefiting from the performance and fast deployment of these devices include dc-dc power converters, motor drives, lidar, deep probes, and ion thrusters for space applications, satellites including those for LEO and GEO orbits, and avionics.

The EPC7020 and EPC7003 are available for engineering sampling now. For more information, see [EPC7020](#) and the [EPC7003](#) pages.

Table. Comparing the EPC7020 and EPC7003 versus previously introduced GaN FETs from EPC.

Voltage rating	Device	R <sub>DS(ON)</sub>	ID	Pulsed ID	Die Size
100 V	EPC7003 (New)	30 mΩ	10 A	42 A	1.7 mm x 1.1 mm
	EPC7004	7 mΩ	60 A	160 A	4.1 mm x 1.6 mm
	EPC7018	3.9 mΩ	90 A	345 A	6.05 mm x 2.3 mm
200 V	EPC7020 (New)	11 mΩ	39 A	170 A	4.6 mm x 2.6 mm
	EPC7007	25 mΩ	20 A	80 A	3.6 mm x 1.6 mm