

# eGaN® FETs and ICs for Hi-Rel Power Solutions



Power converters used in harsh environments, such as space, high altitude flight, or high reliability military applications must be resistant to damage or malfunctions caused by radiation.

Commercial-off-the-shelf (COTS) eGaN FETs and ICs are smaller, more efficient, and lower cost than aging silicon devices. eGaN FETs and ICs perform 40 times better electrically than the Rad Hard devices typically used in these systems. This enables entirely new architectures for satellite power and data transmission, robotics, drones, and aeronautical power systems.

Lidar (Light Distancing and Ranging) systems use pulsed lasers to rapidly provide a high-resolution, 360-degree, three-dimensional images. This technology is increasingly used for autonomous rendezvous and docking in spaceflight as well as for autonomous vehicles and robots. In lidar, the speed of the laser is critical to getting extremely high-resolution images. GaN technology enables the laser signal to be fired at far higher speeds than comparable silicon MOSFET components. GaN-based lidar allows systems to see farther, faster, and better.



## GaN-based Hi-Rel Power Solutions

### Features

- Proven **Reliability**
- No parasitic p-n junction diode
- High frequency switching
- Higher power system efficiency
- Small footprint

### Benefits

- Reduce system size and weight
- Higher frequency communications
- Eliminate shielding
- Eliminate solar panels
- Extend the life of the satellite

### Applications

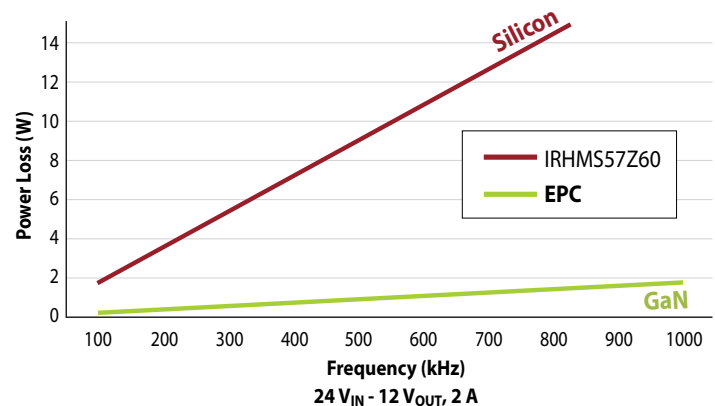
- Low-Earth-orbit (LEO) missions
- Lidar
- Unmanned aerial vehicles (UAVs)
- Robotics
- Aeronautics

### Services and Resources

- **Data packs:** Lot and device specific test information
- **Wafer sales**
- 95/5 Pb/Sn solder termination available
- Backmetal options available
- EPC has worked with industry leaders to test high-reliability GaN products for military and space applications. These partners offer high-performance packaging and Rad tested and certified products.
  - **EPC Space**
  - **Renesas**

### GaN vs. Silicon

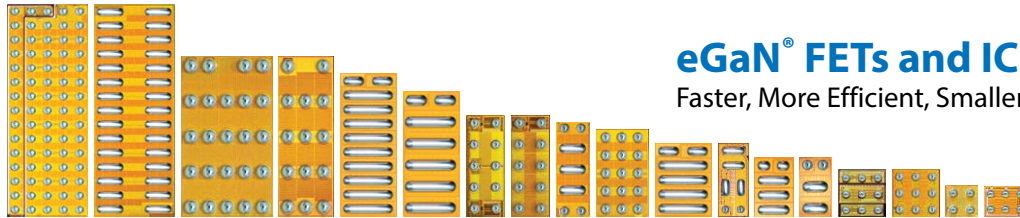
Nearly a 10:1 improvement in power dissipated





## EPC has over 60 discrete transistors and ICs ranging from 15 V–350 V:

Available for off-the-shelf delivery



### eGaN® FETs and ICs...

Faster, More Efficient, Smaller

### Rad Hard GaN FETs

Part Number	Configuration	V <sub>DS</sub>	Max R <sub>DS(on)</sub> (mΩ) (V <sub>GS</sub> = 5 V <sub>GS</sub> )	Q <sub>G</sub> typ (nC)	Q <sub>GS</sub> typ (nC)	Q <sub>GD</sub> typ (nC)	Q <sub>OSS</sub> typ (nC)	Max. Peak Pulsed I <sub>D</sub> (A) (25°C, T <sub>pulse</sub> = 300 μs)	Package (mm)
EPC7019	Single – Rad Hard	40	1.5	22	7.6	3.4	51	530	LGA 6.05 x 2.3
EPC7001	Single – Rad Hard	40	4	11	3.6	1.7	26	250	LGA 4.1 x 1.6
EPC7002	Single – Rad Hard	40	14.5	2.9	1	0.4	6.6	62	LGA 1.7 x 1.1
EPC7014	Single – Rad Hard	60	340	142	43	25	764	2	BGA 0.9 x 0.9
EPC7003	Single – Rad Hard	100	30	1.8	0.6	0.3	9.4	10	LGA 1.7 x 1.1
EPC7004	Single – Rad Hard	100	7	6.4	2.2	1.1	37	60	LGA 4.1 x 1.6
EPC7018	Single – Rad Hard	100	3.9	15.2	4	2.6	77	90	LGA 6.05 x 2.3
EPC7007	Single – Rad Hard	200	25	5.4	1.5	1	37	20	LGA 3.6 x 1.6
EPC7020	Single – Rad Hard	200	11	11.7	3.5	2.2	76.0	39	BGA 4.6 x 2.6

### eGaN® FET vs. Rad Hard MOSFET

Parameters	Part Number		Units	Performance Ratio	Electrical Performance
	EPC2034C	IRHN57250SE			
BV <sub>DSS</sub>	200	200	V		
R <sub>DS(on)</sub>	0.008	0.060	Ω	8:1	
Q <sub>G</sub>	11.1	132	nC	12:1	
Q <sub>GS</sub>	3.8	45	nC	12:1	
Q <sub>GD</sub>	2	60	nC	30:1	
Q <sub>OSS</sub>	96	78	nC		GaN at 1/8 <sup>th</sup> the on-resistance
Q <sub>RR</sub>	0	6	μC	∞	yes, that's infinity!
General FOM	0.09	7.9	Ω • nC	87:1	R <sub>DS(on)</sub> • Q <sub>G</sub>
Rectifier FOM	0.77	12.6	Ω • nC	474:1	R <sub>DS(on)</sub> • (Q <sub>OSS</sub> + Q <sub>RR</sub> )
Hard-switched FOM	0.065	3.6	Ω • nC	225:1	R <sub>DS(on)</sub> • Q <sub>GD</sub>

#### For More Information

Please contact [info@epc-co.com](mailto:info@epc-co.com)  
or your local sales representative

Visit our website: [epc-co.com](http://epc-co.com)

Sign-up to receive EPC updates at  
[bit.ly/EPCupdates](http://bit.ly/EPCupdates)



eGaN is a registered trademark of Efficient Power Conversion Corporation

