



### **650 V Silicon Carbide FETs Offer Simple Silicon Substitution to Cut Losses in Power Systems**

**Achieve 15-20% loss reduction and higher frequency operation using standard silicon MOSFET gate drive**

March 4, 2018, Princeton, New Jersey: UnitedSiC, a manufacturer of silicon carbide (SiC) power semiconductors, has announced the UJ3C series of 650 V SiC FETs as drop-in replacements for silicon Superjunction MOSFETs. Available in standard TO-220, TO-247 and D2PAK-3L packages, they operate with standard Si-MOSFET gate drive, eliminating the need to re-design drive circuits, while offering low  $R_{DS(on)}$  and low gate charge to reduce system losses. Used for power factor correction and DC-DC conversion in both hard-switched and ZVS-switched systems, applications include electric vehicle (EV) chargers, power supplies, motor drives and renewable energy inverters.

The maximum drain current ( $I_D$ ) ratings for these SiC transistors ranges from 31 amps to 85 amps. Low  $R_{DS(on)}$ , specified at 27 milli-ohms, is best in class for TO-220 devices. Furthermore, a built-in low  $Q_{rr}$  body diode eliminates the need for an anti-parallel diode. With their combination of low  $R_{DS(on)}$ , high current rating and excellent thermal performance, the UJ3C series can be used in hard-switched converters and zero-voltage switching applications such as LLC and phase-shifted full bridge converters. The devices also enable switching frequencies of up to 500 kHz, allowing designers to reduce the size and cost of other system components, including bulky inductors, capacitors and thermal management parts.

#### **Simple Silicon Substitution**

UnitedSiC's "Simple Silicon Substitution" technology comprises a patent-pending metal gate SiC JFET co-packaged with a custom designed, ESD protected, low voltage silicon MOSFET. Advanced proprietary die-attach and packaging techniques minimize losses and ensure effective thermal management. As a result, designers using silicon transistors in legacy designs can easily upgrade their existing system's power performance using UnitedSiC's plug-and-play devices.

## Commentary

Commenting on further benefits of the new SiC transistor family, Anup Bhalla, UnitedSiC's VP of Engineering said, "With ESD-protected gates (HBM class 2) and strong avalanche capability these SiC FETs are both more economical and more rugged than GaN devices with comparable ratings. In the most demanding applications, such as EV charging, we are now seeing a clear preference for SiC technology for both new designs and to replace silicon Superjunction MOSFETs in existing systems."

## Price and Availability

UJ3C065080T3S series SiC FETs are available now with prices starting at \$7.69 each in 1000+ quantities.

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## About United SiC

United SiC develops innovative silicon carbide diode and FET power semiconductors that deliver the industry's best SiC efficiency and high-temperature performance for electric vehicle (EV) chargers, AC-DC and DC-DC power supplies, variable speed motor drives and solar PV inverters.