# Dossier: UNITED SEMICONDUCTORS, LLC

## SBIR Award Details

**Award Title:** N/A

**Amount:** $1,249,949.00

**Award Date:** 2024-01-30

**Branch:** USAF

## AI-Generated Intelligence Summary

**Company Overview:**

United Semiconductors, LLC (UnitedSiC), headquartered in Princeton, NJ, is a fabless semiconductor company focused on developing and manufacturing high-performance silicon carbide (SiC) power semiconductors. Their core mission is to deliver superior power efficiency and reliability compared to traditional silicon-based solutions, enabling smaller, lighter, and more efficient power systems. They address critical challenges in applications such as electric vehicles (EVs), solar inverters, industrial power supplies, and motor drives. Their unique value proposition lies in their advanced SiC technology, including trench MOSFETs and Schottky diodes, designed for higher switching frequencies, lower conduction losses, and robust performance in harsh environments, leading to significant improvements in system-level performance.

**Technology Focus:**

* Development and production of Silicon Carbide (SiC) FETs based on a unique cascode configuration which allows for enhanced gate oxide reliability and robust performance at high temperatures and voltages. Their SiC FETs offer RDS(on) values ranging from milliohms to ohms and voltage ratings up to 1200V.
* Production of SiC Schottky Diodes designed for high-frequency rectification and power factor correction applications, exhibiting zero reverse recovery charge (Qrr) and high surge current capability.

**Recent Developments & Traction:**

* October 2021:\*\* Acquisition by Qorvo (QRVO), a leading provider of core technologies and RF solutions for mobile, defense and infrastructure markets. This acquisition provides UnitedSiC access to significant resources and a wider customer base.
* December 2020:\*\* Introduced a new series of 750V SiC FETs optimized for electric vehicle (EV) on-board chargers (OBCs), power factor correction (PFC), and DC-DC converters.
* November 2019:\*\* Launched a new line of 650V SiC FETs in a TO-247-4L package with Kelvin source connection, aiming to further improve switching performance and reduce EMI.

**Leadership & Team:**

* Christopher Dries (General Manager of Qorvo SiC):\*\* Prior to Qorvo's acquisition, served as President and CEO of UnitedSiC. Previously held executive roles at companies like International Rectifier (now Infineon Technologies).

**Competitive Landscape:**

* Wolfspeed (CREE):\*\* A major competitor in the SiC power semiconductor market, offering a broad range of SiC devices. UnitedSiC's differentiator is its cascode SiC FET technology, providing ease of use and robust performance, particularly in applications where gate drive complexity is a concern.
* ROHM Semiconductor:\*\* A global semiconductor manufacturer with a growing portfolio of SiC power devices. UnitedSiC focuses on specific niches in the market, targeting efficiency-critical applications with specialized SiC FET designs, whereas Rohm targets a broader SiC device market.

**Sources:**

1. [https://www.qorvo.com/newsroom/news/2021/qorvo-completes-acquisition-of-unitedsic](https://www.qorvo.com/newsroom/news/2021/qorvo-completes-acquisition-of-unitedsic)

2. [https://www.unitedsic.com/](https://www.unitedsic.com/)

3. [https://www.prnewswire.com/news-releases/unitedsic-announces-new-750v-sic-fets-for-on-board-ev-chargers-301185871.html](https://www.prnewswire.com/news-releases/unitedsic-announces-new-750v-sic-fets-for-on-board-ev-chargers-301185871.html)