

ODYSSEY SEMI



Investor Presentation

February 10, 2022

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Odyssey Semiconductor (OTCQB: ODII) at a Glance

Company Overview

- Odyssey Semiconductor is a development stage company focused on fabricating vertical GaN power devices based on its proprietary technology
- Our power devices target the following markets:
 - High voltage industrial motors
 - Solar Power Inverters
 - Electric vehicles
 - Other
- Vertical GaN based power devices set to disrupt the SiC power device market based on its ability to:
 - Operate at higher switching speed
 - Provide lower losses
 - Reduce size and weight of power conversion modules

Odyssey Fabrication Facility in Ithaca, NY



- Founded in 2019
- Seasoned team
- Only US based GAN foundry – Ithaca
- CY2021 revenue of ~\$750,000
- 1 AARPA Grant \$1.5M - 2017
- Reverse IPO 2 Rounds of Financing
 - August 2019 - \$2.9M @ \$1.50
 - March 2021 - \$5M @ \$4.00
- Shares outstanding at 2/4/22 - 12.7Msh

Key Messages

- **New Disruptive High-Voltage Power Switching Devices with Strong Intellectual Property**
 - Vertical GaN will provide significant benefits over silicon carbide and lateral GaN
 - Odyssey's proprietary vertical GaN-based device technology enables dramatic efficiency increases over competition for applications up to 10 kV
 - Odyssey is focused on proprietary medium and high voltage GaN power switching devices
- **Rapid Growth in High Voltage – Strong Market Demand**
 - TAM: \$2.5B by 2025, 30% CAGR)
- **Seasoned GaN Team & III-V Semiconductor Fab**
 - CEO search expected completion in 1H 2022. Then plan to quickly add a few additional resources to add depth in marketing, manufacturing, and finance to scale Odyssey from R&D focused to capabilities as an operating company
- **Near to Medium Term Growth Strategies**
 - Sample product to customers in Q1 2022
 - Build a business in high voltage electric motors
 - More efficient solar power inverters
 - Get established in electric vehicle supply chains
- **Longer Term Growth Strategies**
 - Enable on-the-go charging for electric transportation
- **Emerging from Development Stage**
 - Announced on February 10, 2022 the company will be applying to have its common stock uplisted to Nasdaq Capital Market and will be filing in a few days a Form S-1 related to public offering of its securities to raise the capital needed to meet the Nasdaq Listing requirements and other capital needs

Odyssey is pioneering vertical GaN development.
GaN will drive replacement of silicon and silicon carbide in high voltage, high performance power applications.

Power Conversion Applications



LOW VOLTAGE

Power Supplies



MEDIUM & HIGH VOLTAGE

Solar PV Inverters



Industrial Motor Drives

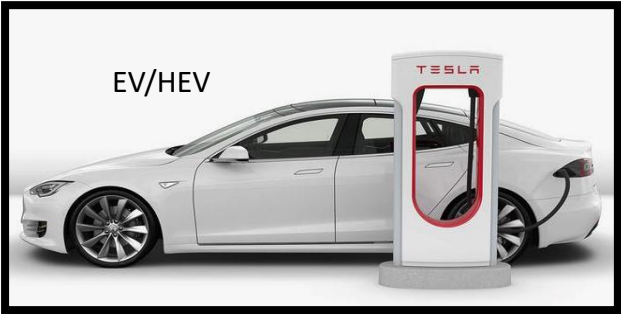


HIGH VOLTAGE

Smart Grid



Electric Train Propulsion



Odyssey's vertical GaN-based device technology enables dramatic efficiency increases over competition for applications up to 10 kV for industrial motors, electric vehicles, solar power, etc.

Near to Medium Term Opportunities

Odyssey is focused on three markets: industrial motors, solar power, and electric vehicle recharging

High Voltage Industrial Motors

~45% of world's energy is consumed turning a motor which is a \$100M market today growing at 6% CAGR



Solar Power Inverters

Decrease losses from tying in solar power generation to the electric grid – a \$170M+ market today growing at 17% CA



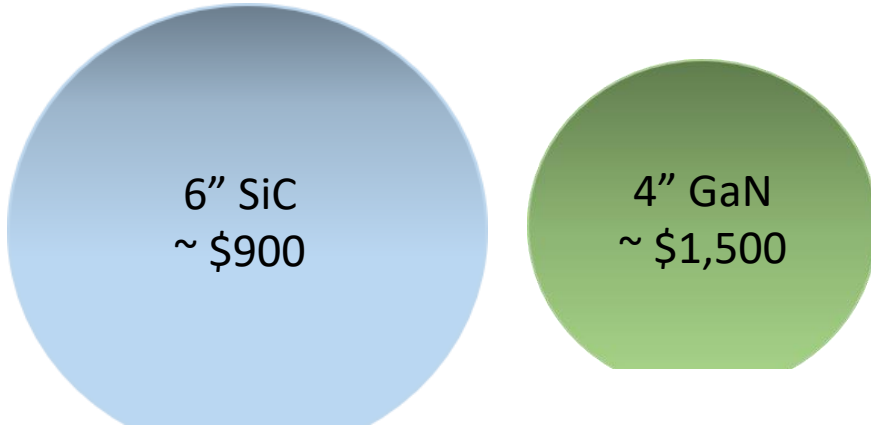
Electric Vehicles

Decrease losses in power converters and power inverters while reducing the size and weight of these modules which is a \$450M mkt today w/CAGR of 38%



Device Cost: SiC vs GaN

Current state-of-the-art wafer Sizes: GaN vs. SiC



- GaN wafers are ~ 4x the cost of SiC wafers per mm²
- However, GaN transistors require 10x less area to achieve equivalent on resistance as SiC wafers
- One 4" GaN wafer has 4x the number of equivalent devices as One 6" SiC wafer

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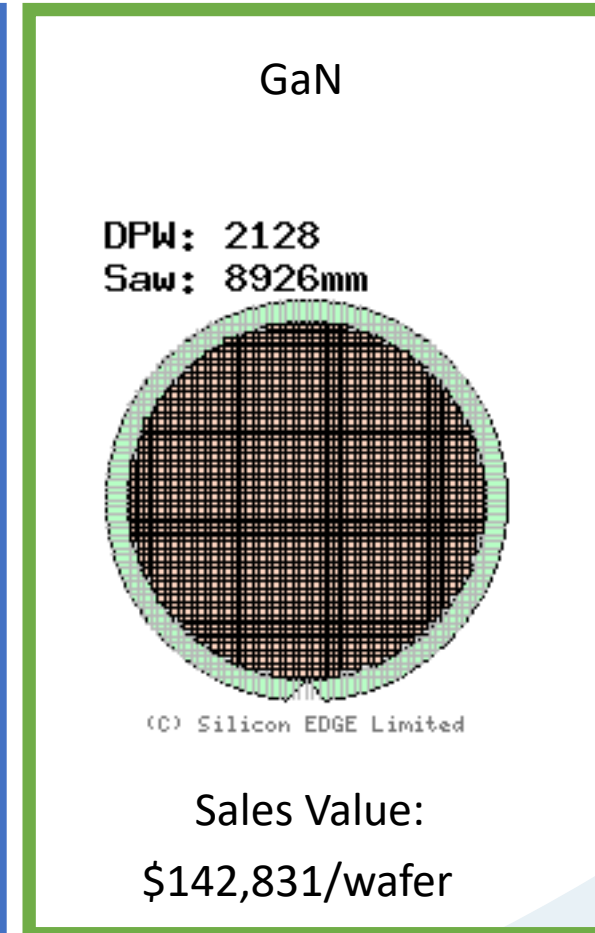
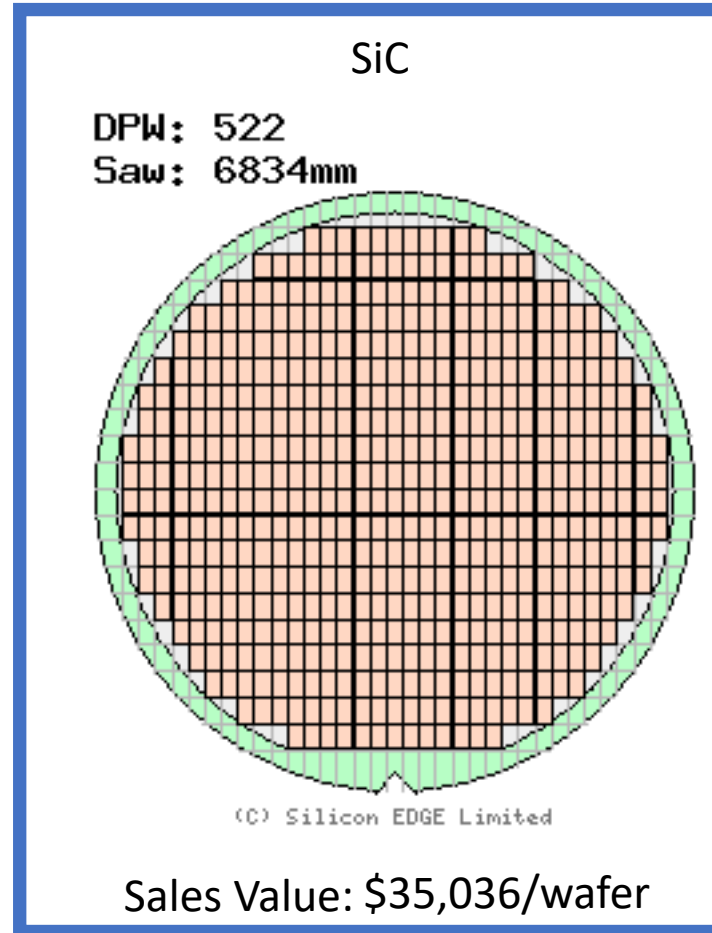
Silicon Carbide Power MOSFET
C2M™ MOSFET Technology
N-Channel Enhancement Mode

V_{DS} 1200 V

$I_D @ 25^\circ C$ 81 A

$R_{DS(on)}$ 25 mΩ

ASP
\$67.12/
device



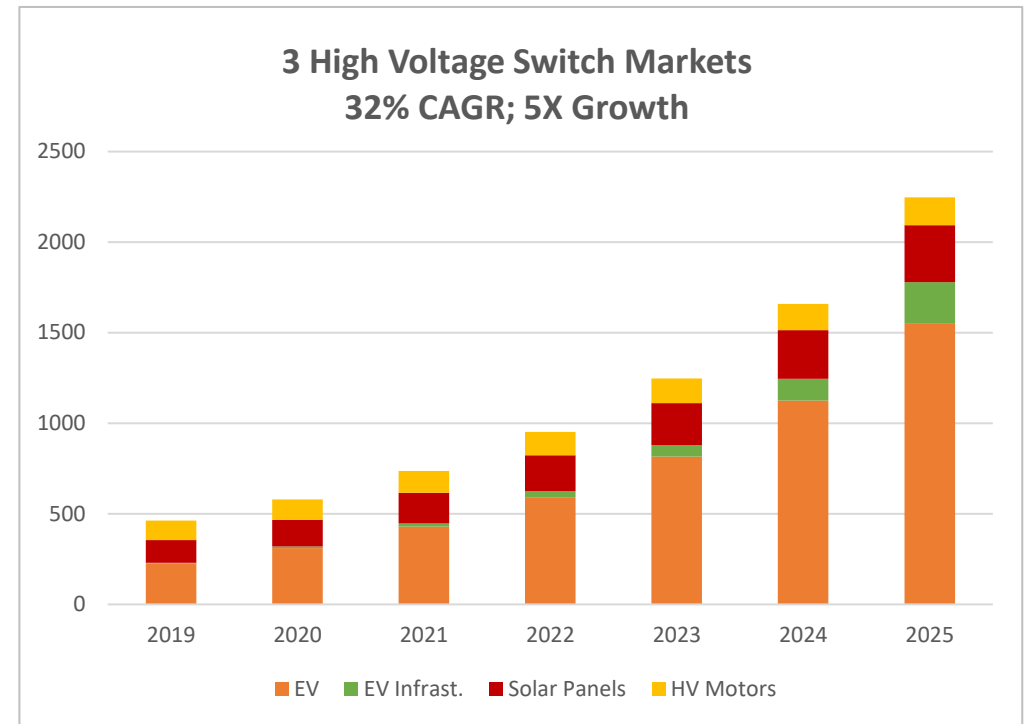
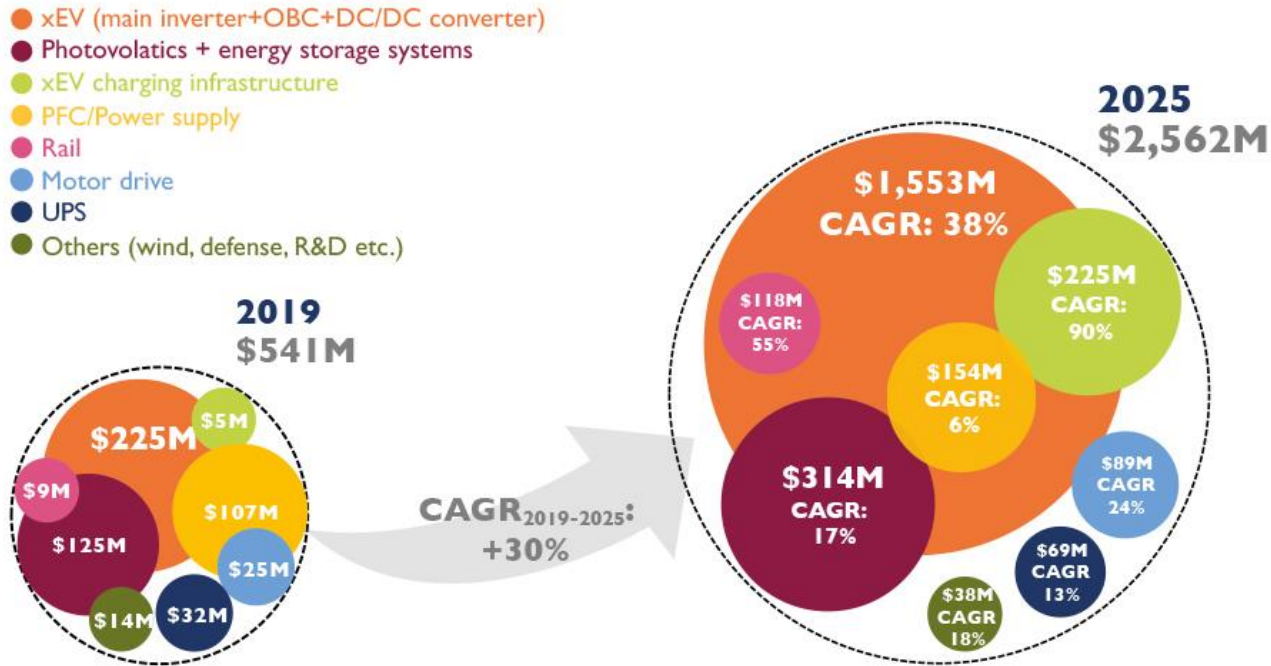
4" GaN wafer foundry can outproduce 6" SiC foundry by 4x/wafer

TAM for Odyssey Semiconductor's GaN-Based Vertical Conduction Devices

All SiC-based applications addressed by Odyssey' vertical GaN-based conduction devices

2019-2025 power SiC market forecast split by application

(Source: Power SiC: Materials, Devices and Applications 2020, November 2020)



Large growing markets for the technologies that Odyssey will deliver

Source: Yole Development

Key Takeaways from Yole: Development 2020 Power SiC report

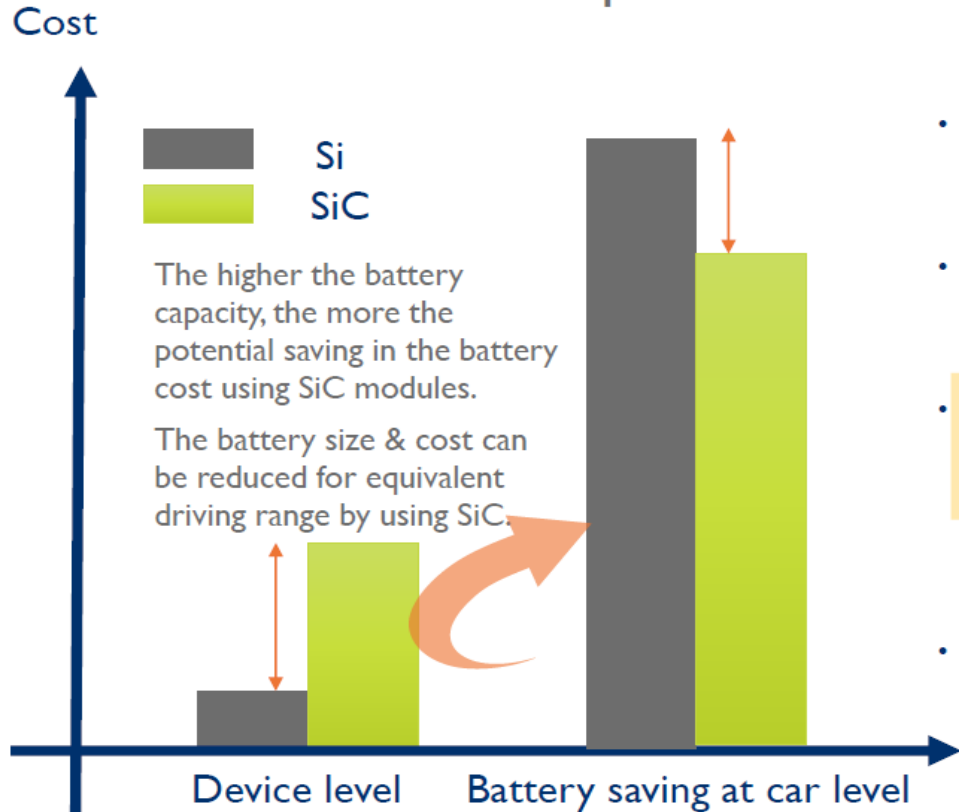
- **Upgrade to 800V battery vehicles represent a significant market opportunity for SiC** owing to its interesting performance/cost ratio compared to Si IGBT.
 - The volume use of a higher cost SiC component is **dependent both on a significant reduction of cost** coupled with a lower battery size & cost savings enabled by using SiC. For the main inverter, this is where **vertical GAN has an opening to more effectively seize this opportunity**. The main inverter market is the driving volume in the overall SiC-based EV/HEV market (see next slide)
- To increase EV driving range (>400km) – need more efficient and higher power density main inverter. This may also drive people to think about multiple Inverters (1 per axel) or in wheel motors.
- SiC is already used in On Board Chargers – OBCs, and is expected to be widely used in the coming years.
- **GaN could reduce cost significantly**. GAN could enter in at least one premium car’s OBC starting in 2021. As Battery packs move up from 400 to 800V – the need for a vertical GaN device for OBC rather than a Horizontal GAN comes into play.
- **“All most all OEM and Tier I EV Mfg keep an eye on/develop GaN for next generation EV systems... Thus the competition between SiC and GaN is extremely important to watch”**

Odyssey is pioneering vertical GaN development.

GaN will drive replacement of silicon and silicon carbide in high voltage, high performance power applications.

Yole's analysis of Cost Challenge in Sic Market from 2020 Power SiC Mkt Report

Focus on cost aspects



The higher the battery capacity, the more the potential saving in the battery cost using SiC modules.

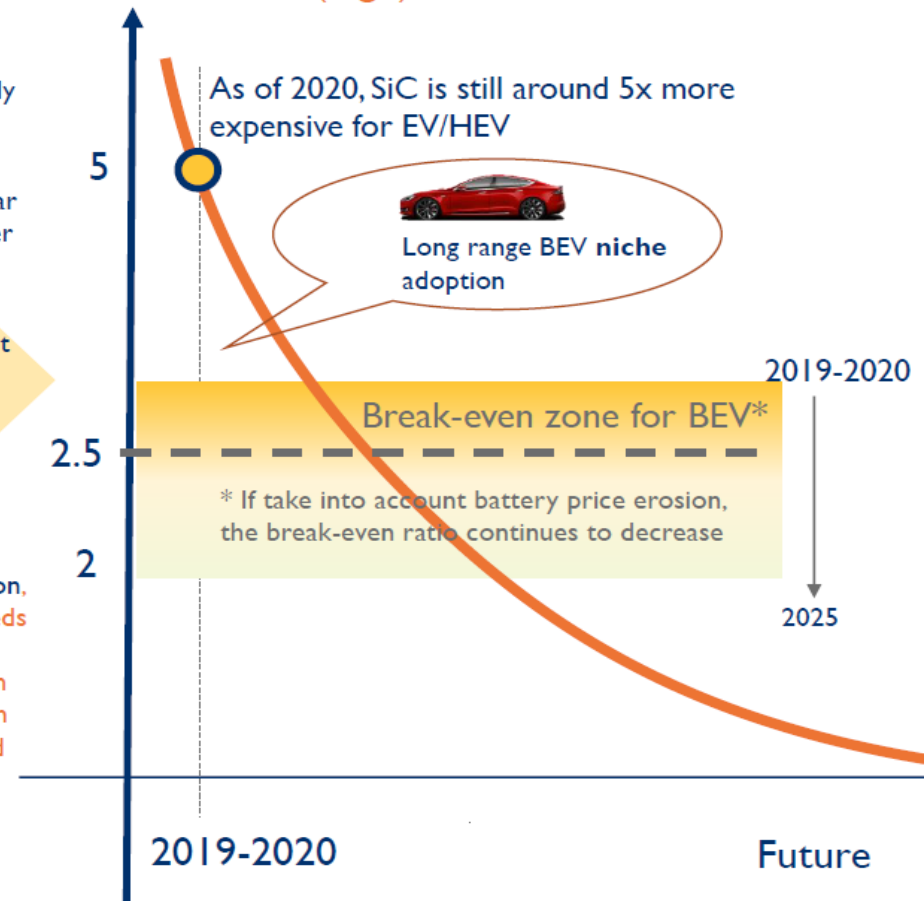
The battery size & cost can be reduced for equivalent driving range by using SiC.

*Not to scale – for illustration only

Battery Saving
(Hypothesis: 5% energy improvement)
Yole estimates \$5 to about \$750 of battery cost saving from mild EV to long range BEV.

- The break-even point for SiC/IGBT ASP ratio is highly dependent on the type of electrification.
- The break-even is at the car level but not at the inverter level based on current SiC device pricing.
- From the car owner's point of view, it does not matter whether it is SiC or Si, as long as it gives best cost/performance ratio. So Tier 1s/OEMs need to evaluate the cost aspects.
- According to our estimation, the ASP of SiC devices needs to fall by 2.5x to meet the break-even for BEVs, which means strong price erosion pressure on the device and wafer suppliers.

SiC/IGBT ASP ratio (high)



Customer Update—Vertical GaN

1. European Tier 1 Auto and EV Company

- Mutual NDA signed
- Have had 2 discussions with them so far
- They have shared their requirements for devices
- Very encouraged by our results so far

2. Tier I US EV Company

- Mutual NDA send to us (we've signed; they have not)
- Will see us when we are ready with >1 kV devices

3. Tier 1 European Module Subassembly Maker Also has large Industrial Division

- Very Interested will take unpackaged parts to test
- Has GAN manufacturing capability for devices and modules

4. Tier 1 in their Mkt - US High Large Voltage Motor Mfg Co.

- Will re-engage with technical team when we can sample
- Have continued to give updates to CEO, both technical and business

Expected Timelines for Power Products

2021 - Accomplishments

- Vertically conducting GaN transistor and p-n diode without regrowth demonstrated
- Processing refinements to freeze transistor process

2022

- Provide customers with engineering samples of first vertical GaN product in Q1 – additional time has enabled a better design and an existing product with greater potential range
- Initiate Odyssey qualifications for Joint Electron Device Engineering Council (“JEDEC”) standards
- Ship first vertical GaN-based conduction product to customers for qualification and production
- Provide customers with engineering samples of second generation product

2023

- Expand the production of the first product
- Qualify and begin shipping second product

Under Capitalized or More Leverageable Opportunity?

	<u>Other Pub</u> <u>GAN Co.</u>	<u>Odyssey</u>
<u>Objective</u>	Displace Silicon Power Switches <600V	Displace Silicon Carbide Power Switches >600V-4,000V
Invested Capital prior to SPAC	\$ 102M	\$ 9M
Years Invested	7	5
People on Board	150	13
Operating Loss in Q3	\$ 6.5M	\$0.5M
Size of Available Mkt	\$ 2.5B	\$ 2.6B
Mkt CAP	\$ 1.5B	??

Financials

- Revenues of \$748,948 in 2021
 - Odyssey's revenue was generated from foundry service business being done for other companies: design, develop, manufacture, and test complex equipment, and provide engineering and technical services. It is not GaN product revenue.
- Diligently managing its cash, the cash balance is \$2.6 million on December 31, 2021
- Cash used in operation was ~\$208,000 per month in 2021
 - We plan to build the foundry service business
 - Plan to hire our permanent CEO and then quickly add a few additional resources to add depth to marketing, manufacturing, and finance to scale Odyssey from R&D focused to capabilities of a fully listed operating company

Odyssey Investment Highlights

- **New Disruptive High-Voltage Power Switching Devices with Strong Intellectual Property**
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- **Rapid Growth in High Voltage Market – Strong Demand**
 - TAM: \$2.5B by 2025, 30% CAGR
- **Seasoned GaN Team & III-V Semiconductor Fab**
- **Near to Medium Term Growth Strategies; Long Growth Runway**

Appendix

Prototype Development Progress

- Odyssey conceived its current device design in the summer of 2021
 - Current design has many improvements over original implementation of the vertical GaN transistor
 - Lower gate leakage
 - Lower on-resistance
 - Much wider processing window
- Batches of new raw materials can take up to three months to obtain
- Rapid prototyping process runs have been completed, on average, every 2 weeks since mid-2021
 - Batches of new raw materials can take up to three months to obtain
- The only important device parameter left to achieve is breakdown voltage >1000 V
 - Several experiments are in progress and being completed every 2 weeks
 - Odyssey expects the confluence of all the important device parameters to occur sometime in this quarter

Odyssey GaN Processing Technologies Featured in Recent Articles

- *Gearing Up For Next-Gen Power Semis* in Semiconductor Engineering.
- *Going Vertical With GaN Devices* in Semiconductor Engineering.
- *Gallium Nitride Isn't New, But Its Latest Use is of Great Interest in Electric-Car Land* in Motortrend.

Those articles can be accessed on the Odyssey website at <https://www.odysseysemi.com/investors/news-events>