



**Ideal Power**

---

**Investor Presentation**

February 8, 2023

# Safe Harbor

All statements in this presentation that are not based on historical fact are "forward looking statements." While management has based any forward-looking statements included in this presentation on its current expectations, the information on which such expectations were based may change.

These forward-looking statements rely on a number of assumptions concerning future events and are subject to a number of risks, uncertainties and other factors, many of which are outside of our control, that could cause actual results to materially differ from such statements.

Such risks, uncertainties, and other factors include, but are not limited to, whether the patents for our technology provide adequate protection and whether we can be successful in maintaining, enforcing and defending our patents, whether demand for our products, which we believe are disruptive, will develop and whether we can compete successfully with other manufacturers and suppliers of power semiconductor products, both now and in the future, as new products are developed and marketed.

Furthermore, we operate in a highly competitive and rapidly changing environment where new and unanticipated risks may arise. Accordingly, investors should not place any reliance on forward looking statements as a prediction of actual results. We disclaim any intention to, and undertake no obligation to, update or revise forward looking statements.



# Investment Highlights

- ✓ B-TRAN™ disruptive semiconductor power switch has 3 compelling advantages:
  - Bidirectional switching
  - Lower losses = lower user costs
  - Smaller, lower cost product designs
- ✓ Scalable solution across several power levels and large, growth markets – EV, renewables, energy storage and solid-state circuit breakers (SSCBs)
- ✓ Introduced first commercial product in January 2023. Our near-term commercialization milestones include first commercial sales later in 2023
- ✓ Asset light, fabless business model leveraging existing silicon processing infrastructure
- ✓ Engagement with multiple target customers in key market segments
- ✓ Broad patent estate – 72 issued & 24 pending



# Commercial Agreements and Collaborations

- Entered into development agreement for custom B-TRAN™ module with top 10 global automaker
- Announced collaborations for the testing and evaluation of B-TRAN™ including:
  - Second top 10 global automaker
  - Top 10 global solar power conversion provider
  - Forbes Global 500 diverse power management market leader
  - Leading commercial EV manufacturer
- Completed several major milestones under the NAVSEA project including two deliveries of tested B-TRAN™ devices



# Significant Advancements and Milestones

- Introduced first commercial product in January 2023, the SymCool™ Power Module, a B-TRAN™ multi-die module. First commercial sales later in 2023
- Complete Phase I of multi-year development program with top 10 global automaker in Q2 2023
- Complete first engineering run with production fab in Q2 2023
- Deliver packaged B-TRAN™s to DTI under the NAVSEA program in 1H 2023
- Introduce second commercial product, an intelligent power module, in Q3 2023
- Cash runway potential through at least Q4 2024 with no debt



**Ideal Power**

# What is B-TRAN™?

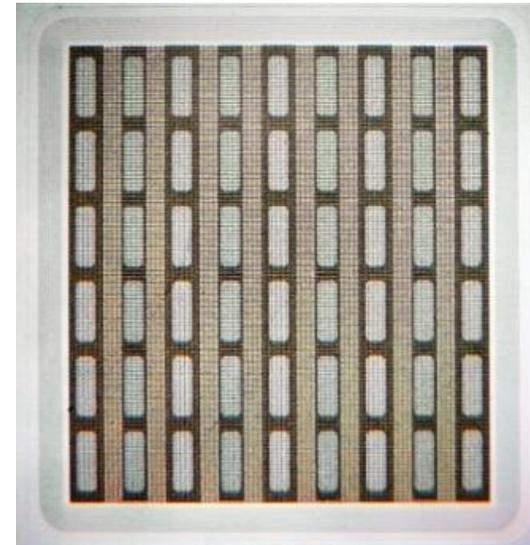
B-TRAN™ is a proprietary semiconductor power switch

- New, disruptive design (architecture)
- Fabrication on both sides of wafers

B-TRAN™ Architecture has 3 compelling advantages

- Bidirectional switching
- Lower losses = lower user costs
- Smaller, lower cost product designs

Critical performance characteristics demonstrated and first devices shipped



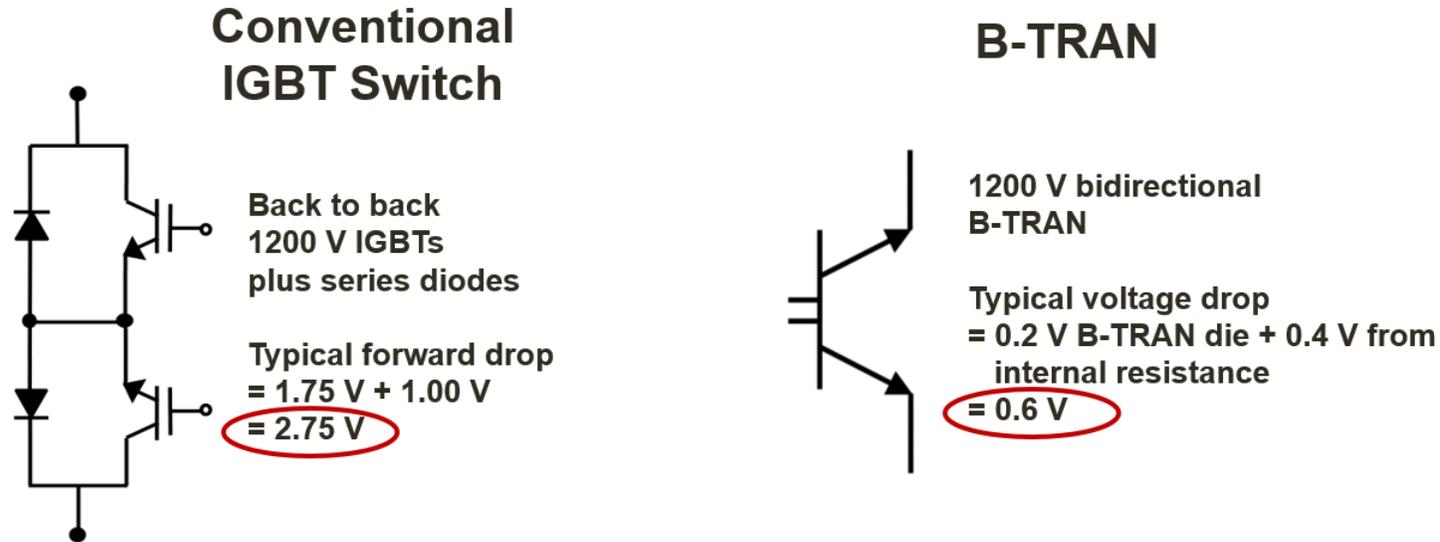
**B-TRAN™ will address many power switching needs**



**Ideal Power**

# B-TRAN™ Bidirectional Switching

B-TRAN™ replaces 4 conventional devices to provide a bidirectional switch



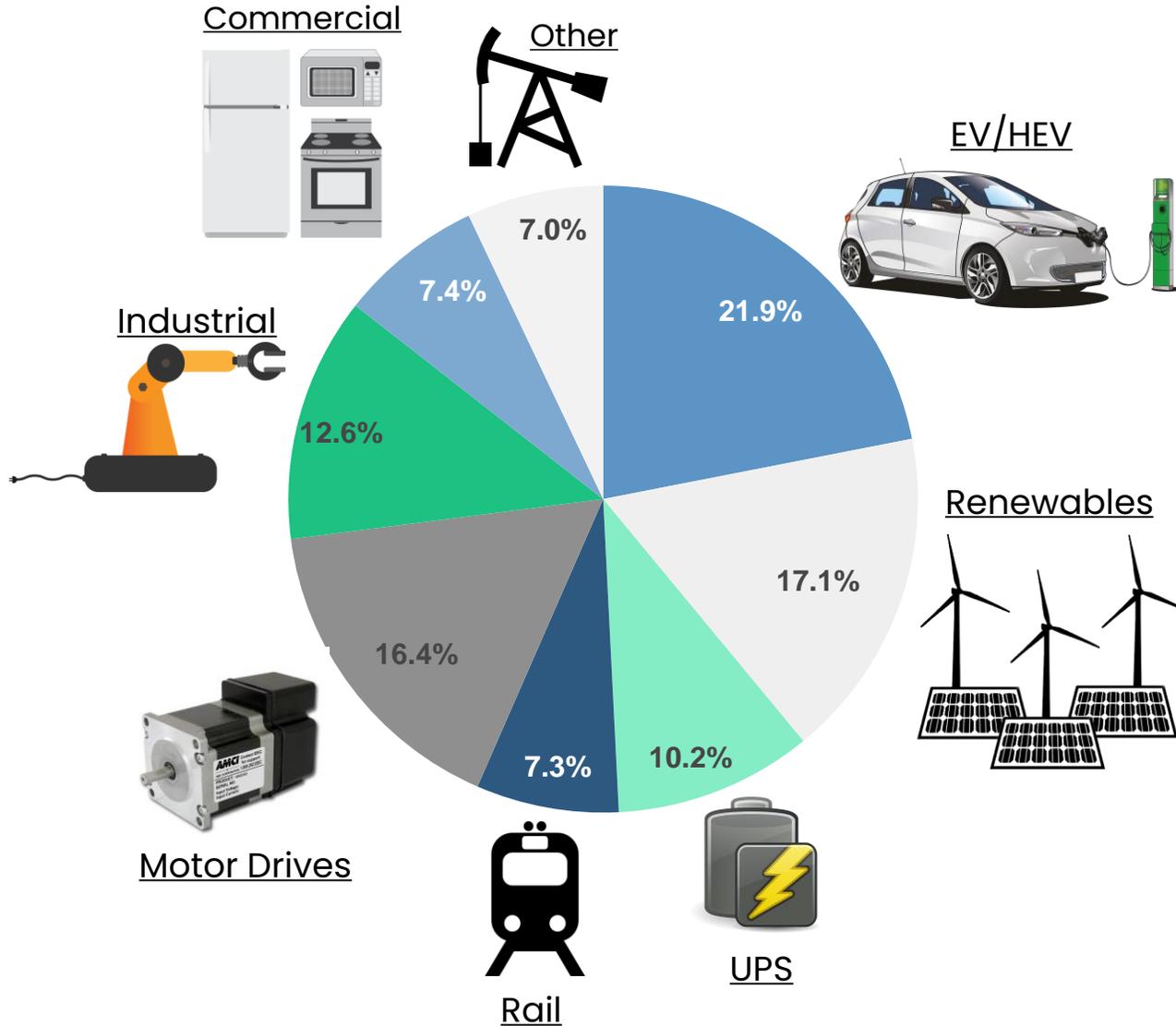
Effective forward drop <0.6 V

Conduction Losses in Bidirectional Applications  
>4x better than IGBT + Blocking Diode



Ideal Power

# IGBT Market



- IGBT market expected to reach \$11B by 2026<sup>1</sup>
- 10.6% projected CAGR<sup>1</sup>
- EV/HEV segment to drive the growth of the IGBT market<sup>1</sup>

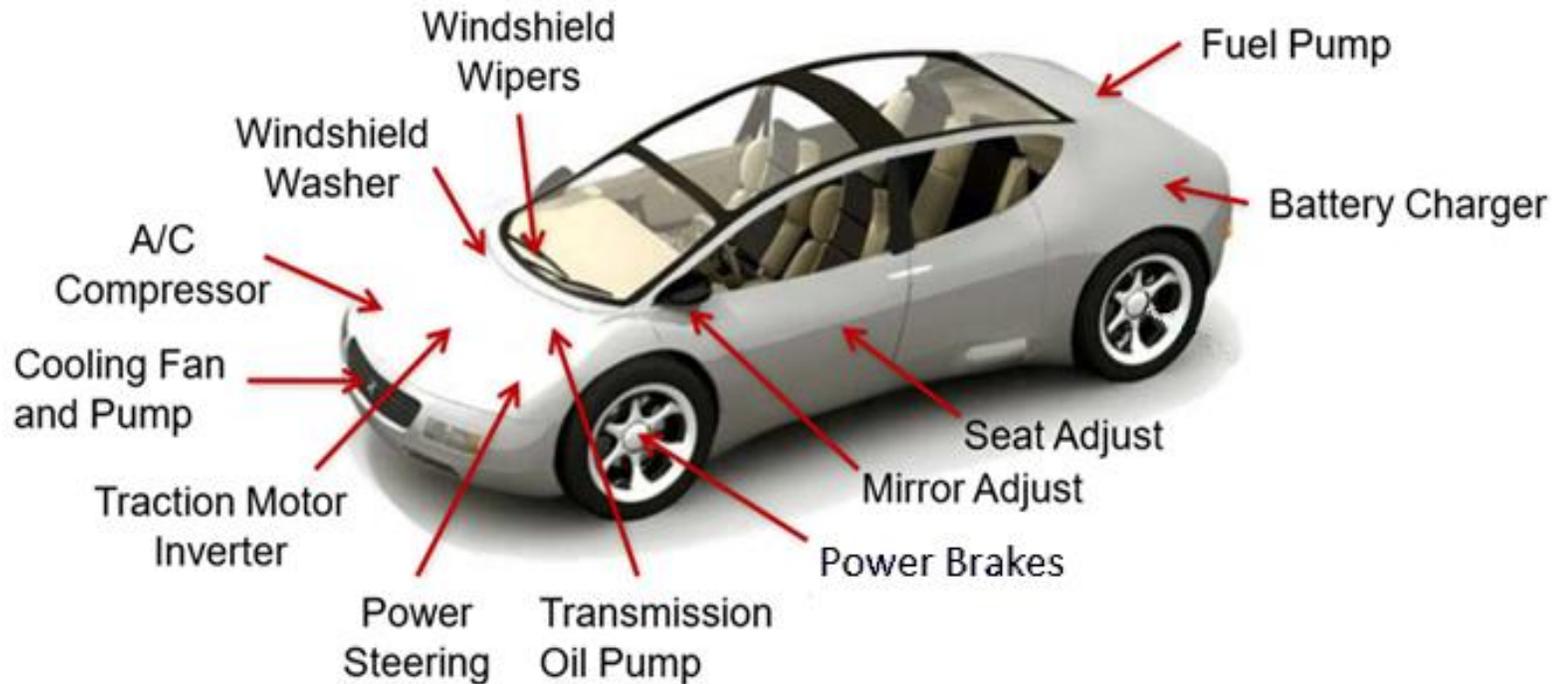
<sup>1</sup> *Global Insulated-Gate Bipolar Transistor (IGBT) Market (2021-2026) by Mordor Intelligence*



# Key Addressable Market Segments

**EV/HEV: \$1.5B IGBT Market Segment**

CAGR: 15%

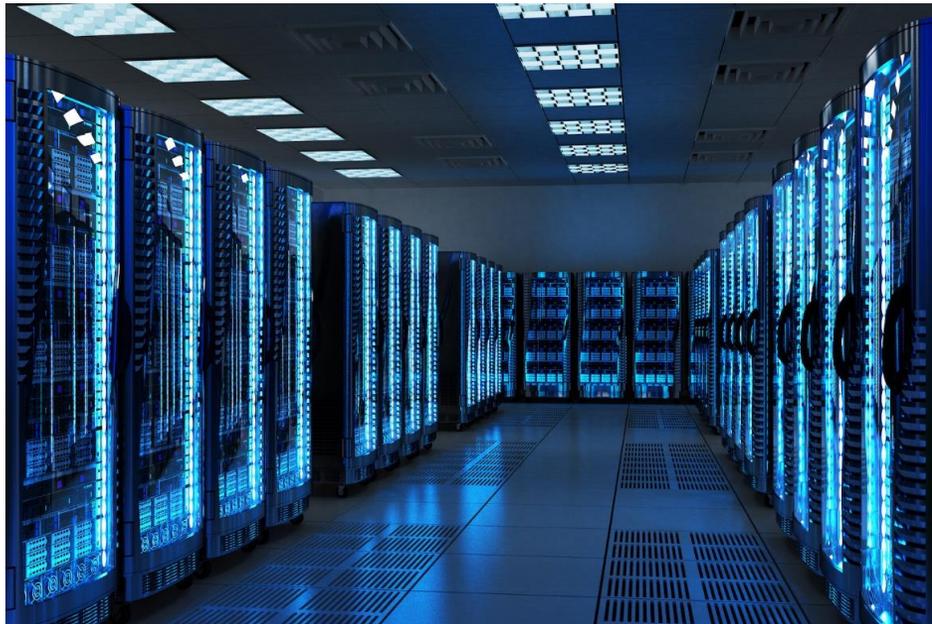


**Ideal Power**

# Key Addressable Market Segments Continued

**Renewable Energy:  
\$1.1B IGBT Market Segment**

CAGR 12%



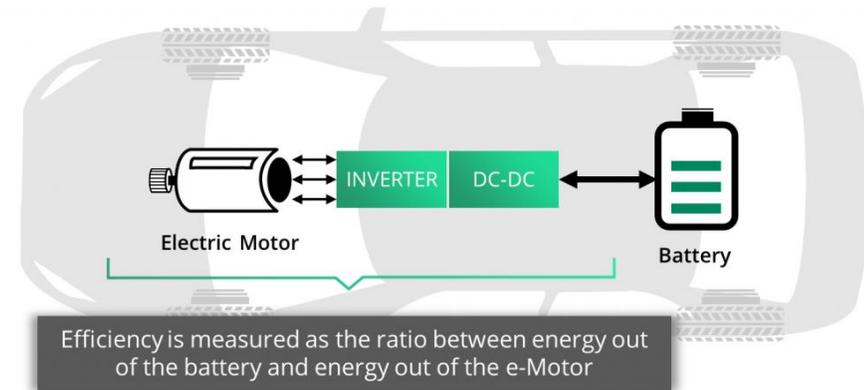
**Data Center/Cloud Storage:  
\$0.5B IGBT Market Segment**

CAGR 6%



**Ideal Power**

# B-TRAN™ Impact in Electric Vehicles



- EVs need to convert DC-AC, AC-DC, and DC-DC efficiently to improve range and performance
- Power switches are needed in the Traction Inverter, DC-DC Converter, On-Board Charger (OBC) and Circuit Protection
- The largest cost component of the drivetrain is the power semiconductor switches which make up 8-10% of the total electric vehicle production cost<sup>1</sup>
- B-TRAN™ reduces the number of power devices needed in bidirectional circuits from 4 to 1 while increasing EV efficiency and range by an estimated 7 to 10%<sup>2</sup>

**B-TRAN enables new architectures and solutions to improve EV efficiency, range and performance, while lowering total system size, cost and component count**

<sup>1</sup> IGBTs Critical to EV Cost by David Manners

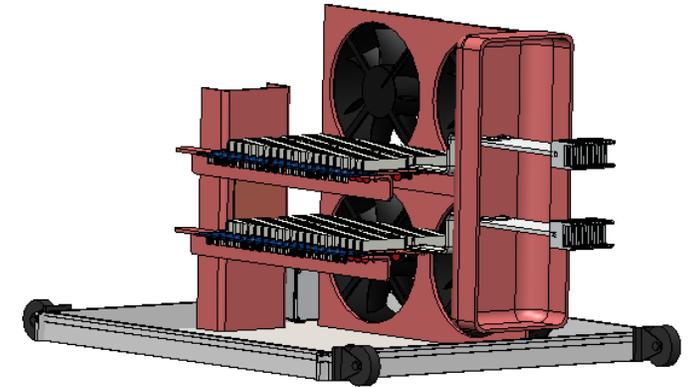
<sup>2</sup> Company estimate extrapolated from A Novel Carrier Accumulating Structure for 1220V IGBTs without Negative Capacitance and Decreasing Breakdown-Voltage by Toyota Motor Corporation



**Ideal Power**

# B-TRAN™ Enabled Circuit Breakers

- Solid-state circuit breakers (SSCBs) enabled by B-TRAN™s low conduction losses
- U.S. Navy/NAVSEA funded project (\$1.2M to Ideal Power) for direct current SSCB
- Funded under DOD's Rapid Innovation Fund
- Mission critical technology for ship electrification program
- Partnered with Diversified Technologies (DTI)
- Fabricated, packaged and tested B-TRAN™ devices
- Packaged device performance matched computer simulations
  - Very low loss, high breakdown voltage, fast switching speed
- Initial device deliveries to DTI with additional devices in production



B-TRAN™ based MVDC solid-state circuit breaker rated at 12 kV, 500 A (6 MW)



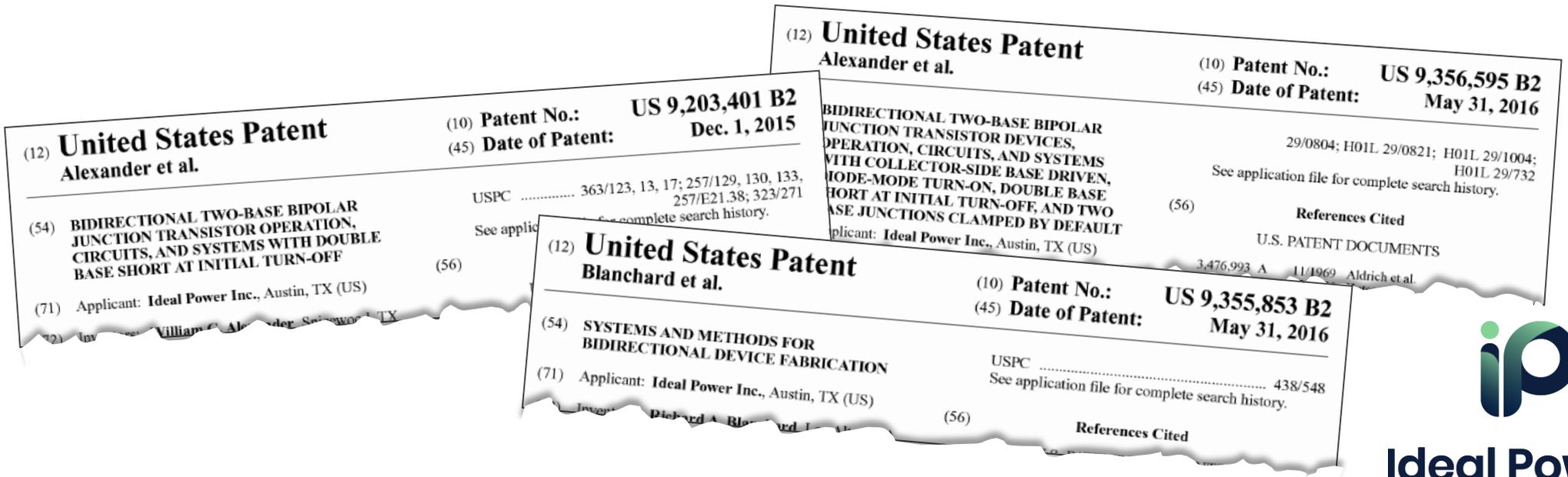
**Ideal Power**

# Ideal Power's Broad Patent Estate

Region	Issued Patents	Pending Patents
United States	41	8
Foreign	31	16
<b>TOTAL</b>	<b>72</b>	<b>24</b>

## The Patents Cover

- B-TRAN™ device architecture
- Control methodologies and techniques
- Double-sided device manufacturing techniques
- Applications specific uses of B-TRAN™



**Ideal Power**

# Recent News and Capital Structure

## ***News Releases***

***January 25, 2023***

Ideal Power Launches Its First Commercial Product, the SymCool™ Power Module

***November 14, 2022***

Ideal Power Enters into Development Agreement with Top 10 Global Automaker for B-TRAN™-based Electric Vehicle Power Module

***August 10, 2022***

Ideal Power Delivers Initial B-TRAN™ Devices to Diversified Technologies under NAVSEA Program

***March 1, 2022***

Ideal Power Adds Leading Commercial Electric Vehicle Manufacturer to its B-TRAN™ Test and Evaluation Program

***October 27, 2021***

Ideal Power Adds Global Diverse Power Management Market Leader to its B-TRAN™ Test and Evaluation Program

***August 3, 2021***

Ideal Power Signs B-TRAN™ Test and Evaluation Agreement with Top 10 Global Provider of Power Conversion Solutions to the Solar Industry

***July 20, 2021***

Ideal Power to Sample B-TRAN™ Bidirectional Power Switches with Top 10 Global Automaker

---

# IPWR

**Nasdaq Listed**

Shares Outstanding<sup>1</sup>: **5,903,797**

Options/Warrants<sup>1</sup>: **1,666,196**

Cash Balance<sup>1</sup>: **\$18.5 Million**

Debt Balance<sup>1</sup>: **\$0.0 Million**

Sector: **Industrials**

Year-End: **December 31**

1) As of September 30, 2022



**Ideal Power**



**Ideal Power**

---

**Thank you.**

[idealpower.com](http://idealpower.com)