



**Ideal Power**

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**Investor Presentation**

May 2022

# 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.

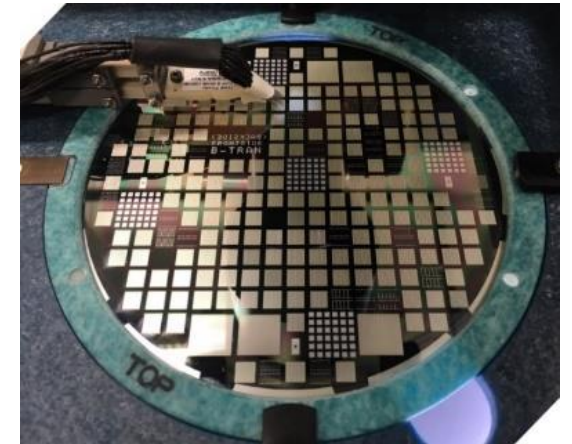
Furthermore, we operate in a highly competitive and rapidly changing environment where new and unanticipated risks may arise. Accordingly, investors should not place any reliance on forward looking statements as a prediction of actual results. We disclaim any intention to, and undertake no obligation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



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# Investment Highlights

- Disruptive Semiconductor Architecture Technology
- Bidirectional, Low Loss Semiconductor Switch
- Broad Patent Estate – 67 Issued & 25 Pending
- Attractive Growth Markets – EV, Renewables
- Fabless Model, Strong Balance Sheet
- Building Strategic Relationships for Commercialization



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# What is B-TRAN™?

B-TRAN™ is a proprietary semiconductor power switch

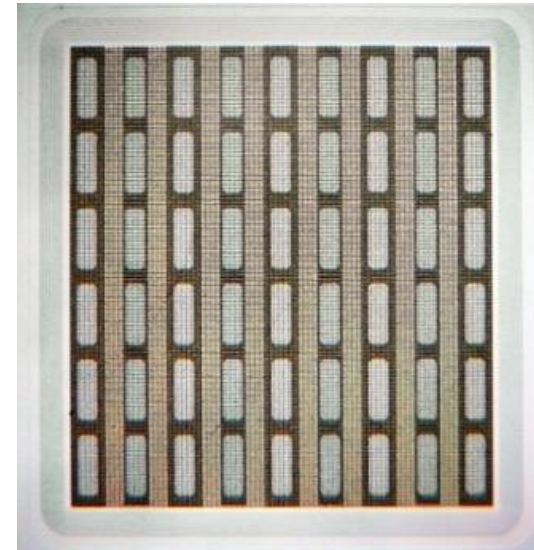
- New, disruptive design (architecture)
- Fabrication of both sides of wafers

B-TRAN™ Architecture has 3 compelling advantages

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

Critical performance characteristics validated

**B-TRAN™ Will Address Many  
Power Switching Needs**

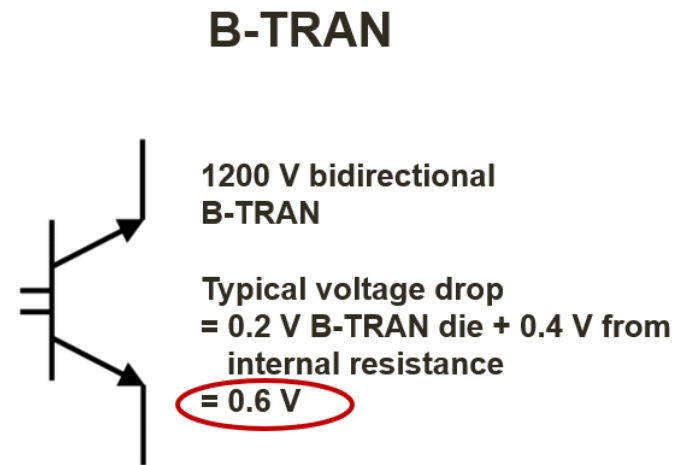
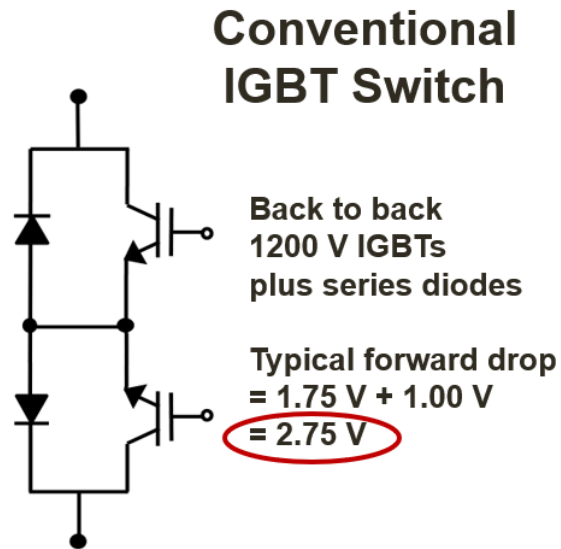


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# B-TRAN™ Bidirectional Switching

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



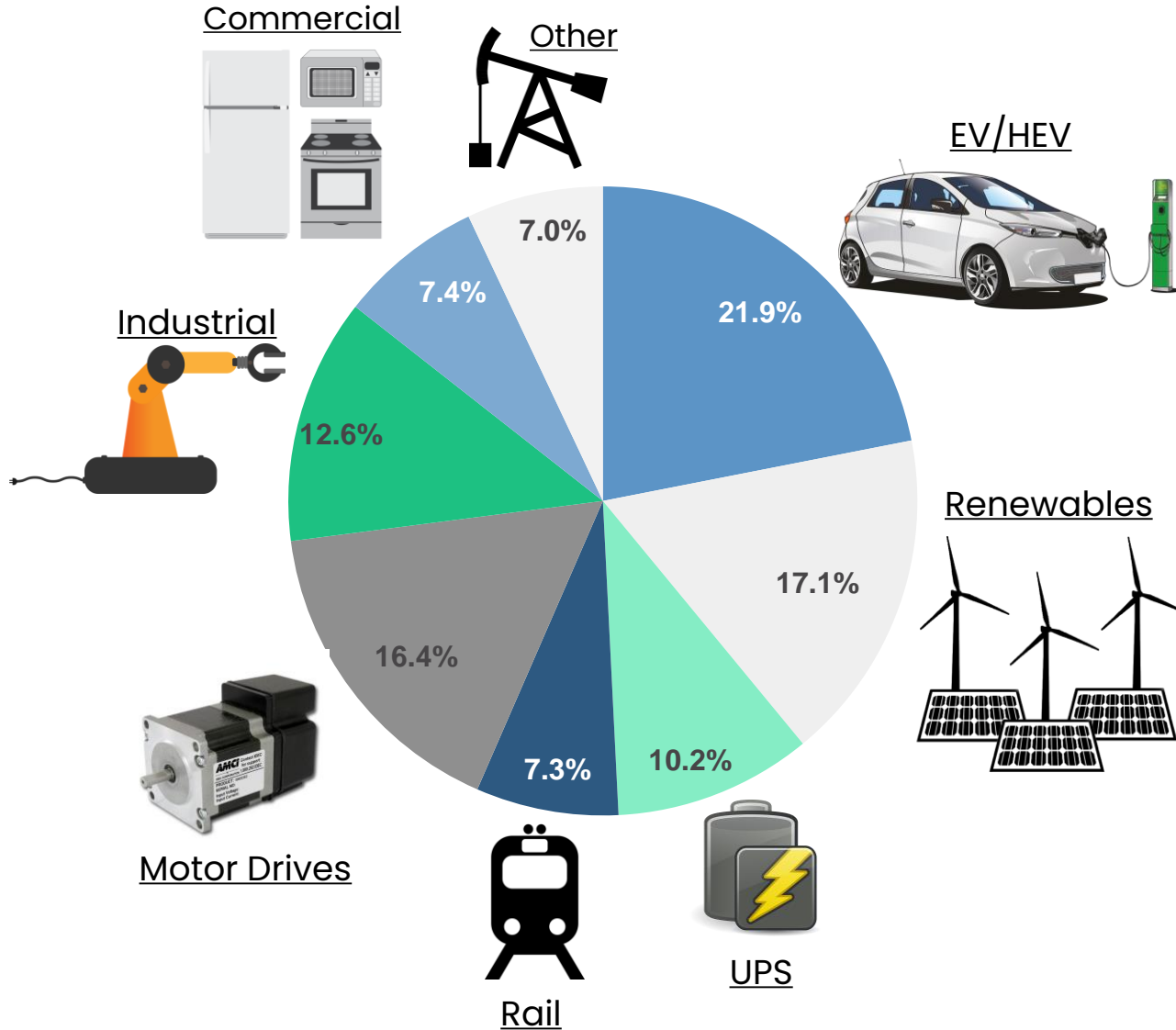
**Effective forward drop <math><0.6 \text{ V}</math>**

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



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# 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*

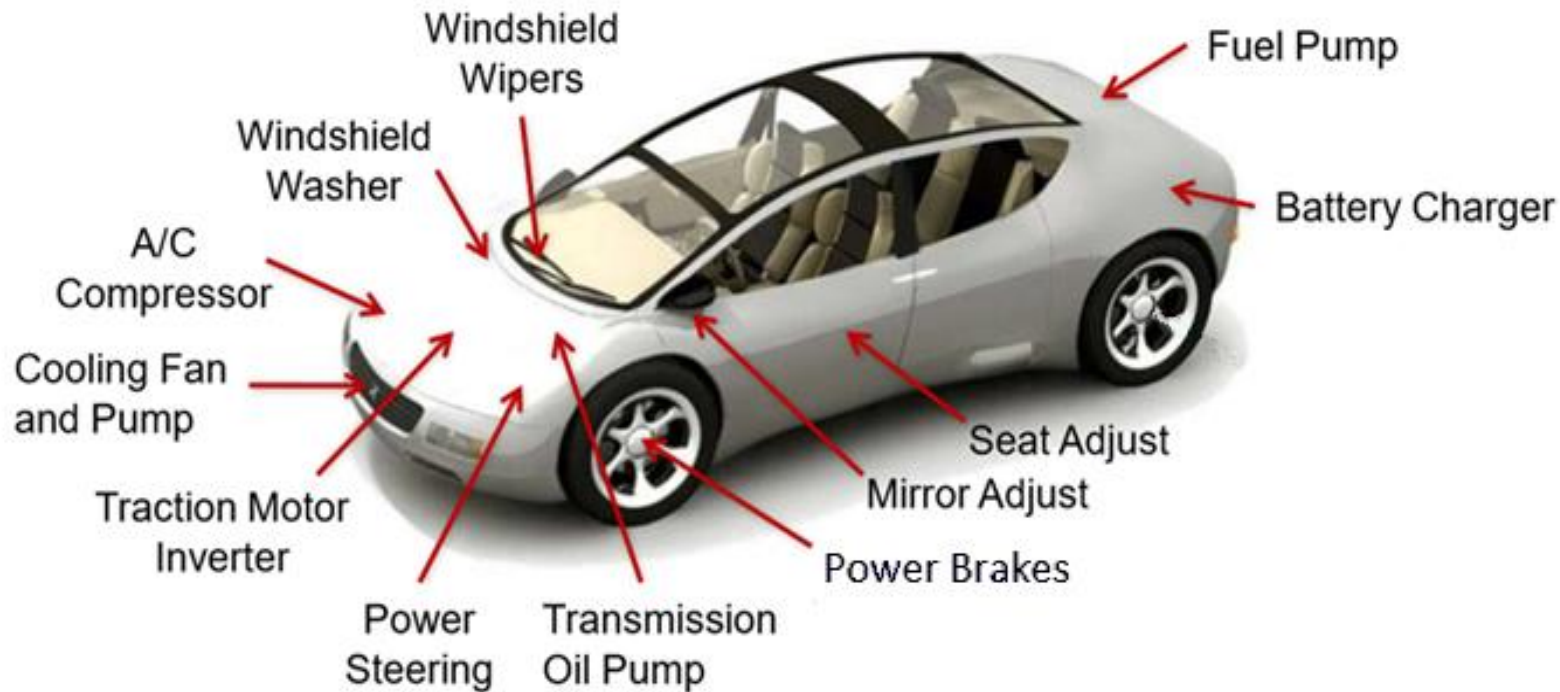


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# Key Addressable Market Segments

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

CAGR: 15%



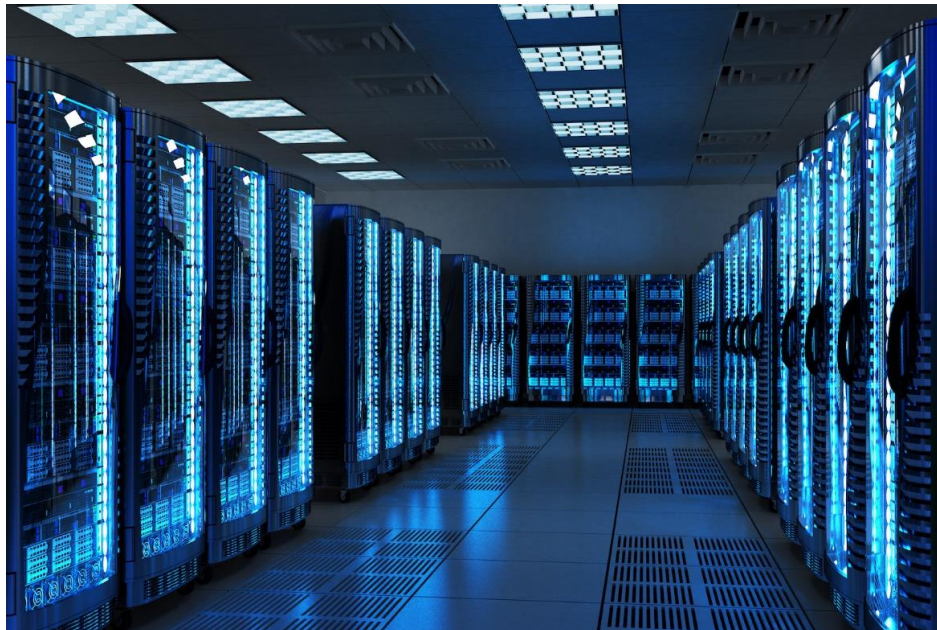
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# Key Addressable Market Segments Continued

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

CAGR 12%



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

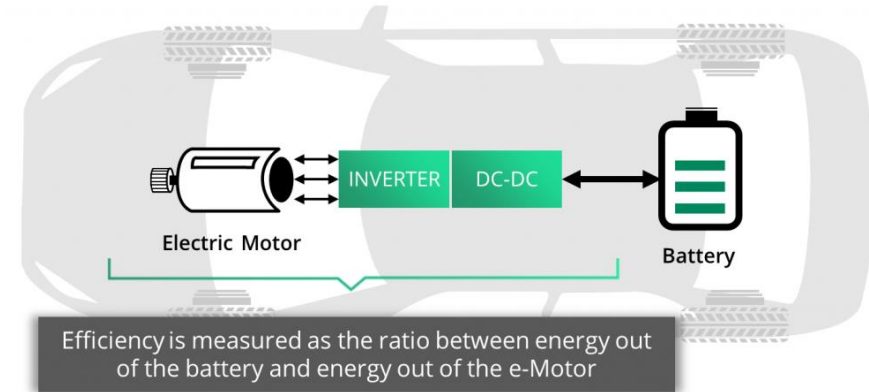
CAGR 6%



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# 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

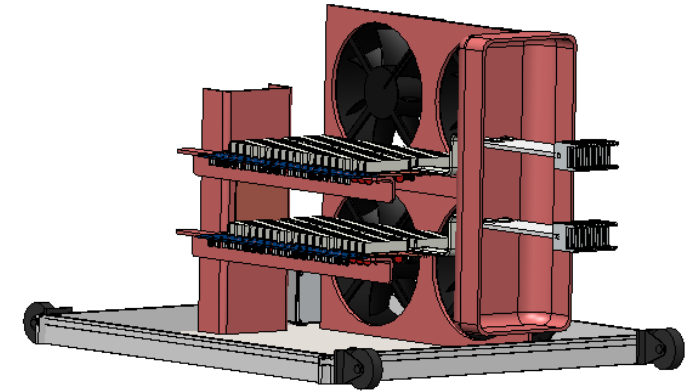
<sup>2</sup> Company estimate extrapolated from A Novel Carrier Accumulating Structure for 1220V IGBTs without Negative Capacitance and Decreasing Breakdown-Voltage by Toyota Motor Corporation



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# 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 DC SSCB
- Funded under DOD's Rapid Innovation Fund
- Mission critical technology for ship electrification program
- Partnered with Diversified Technologies (DTI)
- Completed DOE SBIR Phase I award and submitted Phase II proposal with DTI for AC SSCB
- AC SSCB intended to be used in power distribution and renewable energy / microgrid connection to utility power grids



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



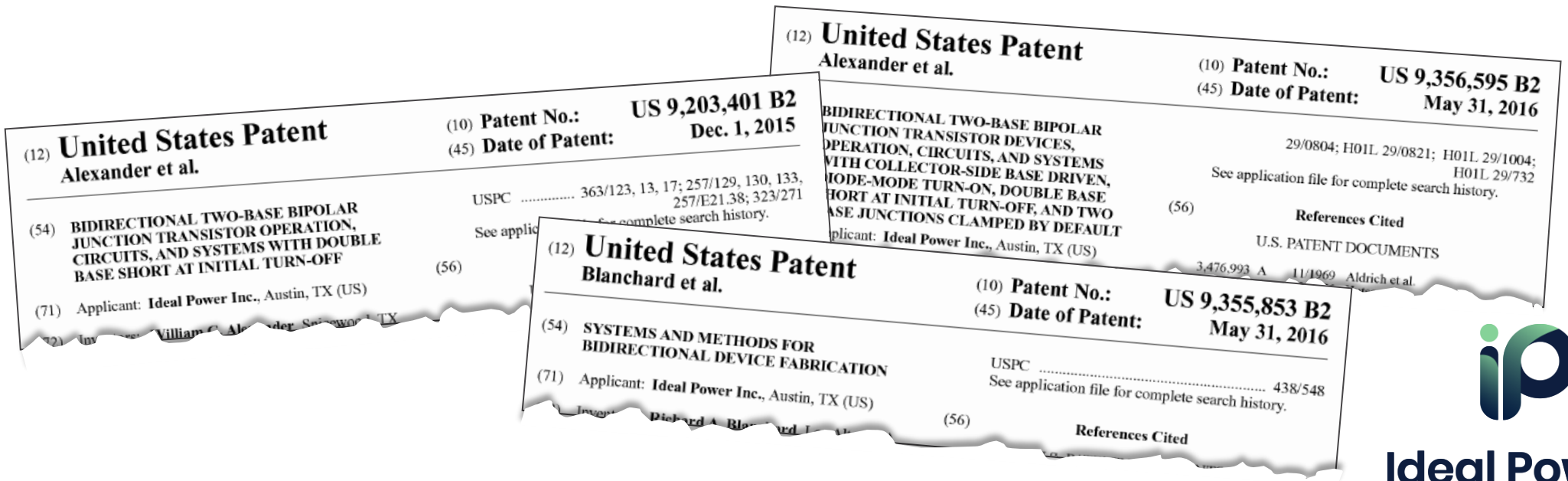
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# Ideal Power's IP

Region	Issued Patents	Pending Patents
United States	38	7
Foreign	29	18
<b>TOTAL</b>	<b>67</b>	<b>25</b>

## The Patents Cover

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

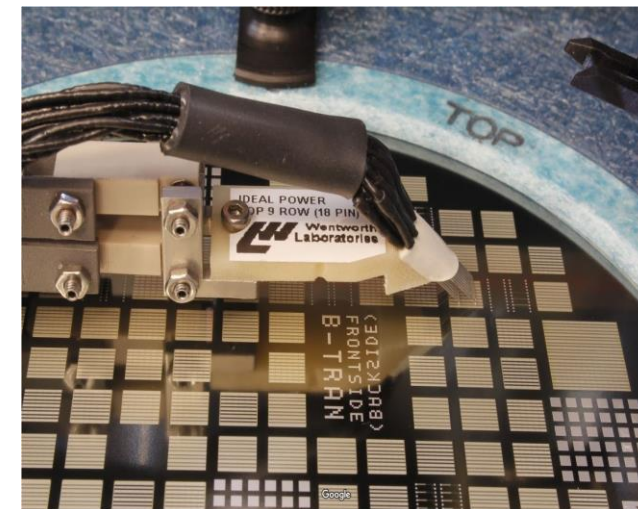


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# Where We Are Now

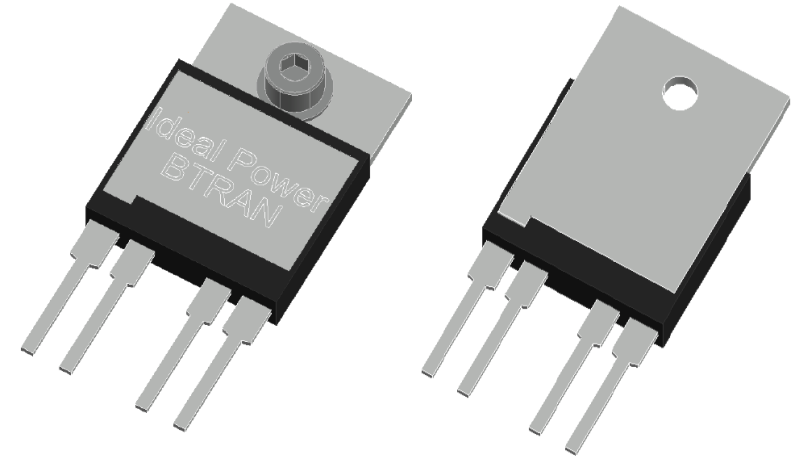
- B-TRAN™ manufactured using standard silicon processing equipment
- Driver and packaging designs completed
- Completed SBIR Phase I project and submitted proposal for SBIR Phase II project for AC SSCB
- Completed multiple major milestones under the NAVSEA project
- Completed qualification run at second domestic fabrication partner
- Announced collaborations for the testing and evaluation of B-TRAN™ including:
  - Top 10 global automaker
  - Top 10 global solar power conversion provider
  - Forbes Global 500 diverse power management market leader
  - Leading commercial EV manufacturer
  - EV charging company



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# What's Ahead

- Sign additional evaluation agreements for target markets
- Deliver packaged B-TRAN™s with a driver for test and evaluation program
- Receive customer feedback and design and introduce first commercial product
- Complete third-party B-TRAN™ testing
- Qualify a world-class non-domestic fabrication partner for higher volume production
- NAVSEA program – Deliver packaged B-TRAN™s to DTI followed by demonstration of a B-TRAN™ enabled 12kV DC SSCB
- Submit additional proposals for government funding



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# Recent News and Capital Structure

## ***News Releases***

***March 14, 2022***

Ideal Power Appoints Two Independent Members to its Board of Directors

***March 7, 2022***

Ideal Power Completes Department of Energy SBIR Phase I Project Deliverables for a B-TRAN™ Enabled AC Solid-State Circuit Breaker

***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 27, 2021***

Ideal Power Signs B-TRAN™ Sampling Agreement for Electric Vehicle Charging Application

***July 20, 2021***

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

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# IPWR

**Nasdaq Listed**

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

Options/Warrants<sup>1</sup>: **1,636,230**

Cash Balance<sup>1</sup>: **\$21.7 Million**

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

Sector: **Industrials**

Year-End: **December 31**

<sup>1</sup>) As of March 31, 2022



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**Thank you.**

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