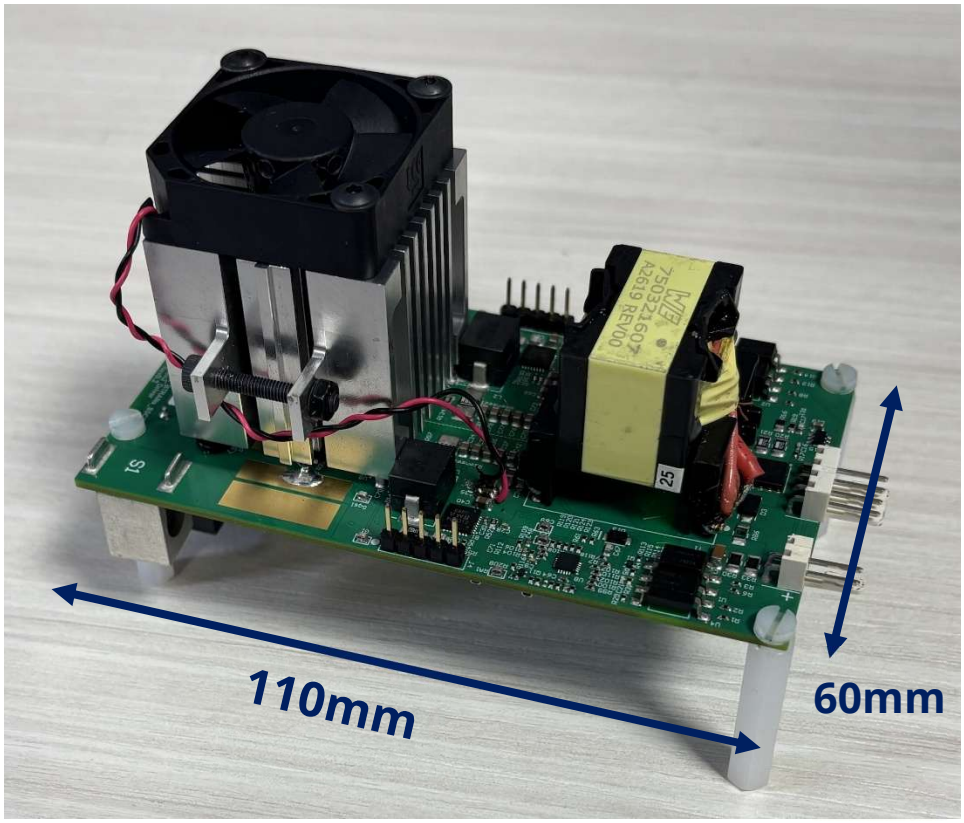
Ideal Power

B-TRAN® Solid-State Circuit Breaker (SSCB) Reference Design Kit (RDK)
800 V / 63 A Evaluation Platform for Fast, Bidirectional DC Protection

The **B-TRAN® Solid-State Circuit Breaker Reference Design Kit** is an engineering evaluation platform intended to help customers assess B-TRAN® based DC solid-state protection under controlled laboratory conditions.

The SSCB RDK is designed to support customer proof-of-concept testing, application learning, and early architecture assessment for high-voltage DC protection use cases such as energy storage, EV battery systems, DC distribution, industrial power systems, and emerging data-center power architectures.

The platform allows customers to evaluate B-TRAN® based SSCB behavior at the system level, including conduction performance, interruption behavior, transient voltage response, thermal behavior, and integration constraints.



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Key Evaluation Capabilities

Capability	Customer Value
800 V class DC operation	Supports high-voltage DC protection evaluation.
63 A continuous current class	Enables evaluation of practical low-current SSCB use cases.
Bidirectional conduction and blocking	Supports DC systems where current direction may vary.
Fast overcurrent / short-circuit interruption	Enables evaluation of microsecond-scale protection behavior.
Transient / overshoot characterization	Helps customers understand voltage stress during interruption.
Thermal performance evaluation	Supports heatsink, airflow and current-rating studies.
Measurement access	Provides access for voltage, current, control signal, and temperature observation.

Recommended Customer Evaluation Questions

B-TRAN® based SSCB RDK is intended to help answer practical SSCB application questions:

- Can B-TRAN® support the required 800 V DC protection architecture?
- What is the conduction loss at my operating current?
- How does the platform respond to overcurrent or short-circuit events?
- What voltage overshoot occurs during interruption?
- What thermal design is required for continuous operation?
- How does this architecture scale toward my final SSCB product?

B-TRAN® SSCB RDK Specifications

Category	Preliminary Baseline	Notes
Nominal DC bus voltage	800 VDC	840 VDC max target operating envelope
Continuous current	63 A	Under defined cooling and ambient conditions
Short-circuit evaluation range	120–150 A	Dependent on bus voltage, source impedance, and loop inductance
Fault detection to trip command	~130 ns	Short-circuit detection to cascode turn-off command
Semiconductor interruption interval	~1.4 µs	Cascode turn-off until B-TRAN current reaches 10% of peak
Total clearing time	~15 µs	Under defined test condition, including 20 µH system inductance
Peak transient overshoot	Up to 1100 Vpk target	Dependent on clamp/snubbers, bus energy, and test setup
Maximum di/dt	Up to 50 A/µs	Dependent on system inductance and fault conditions
Auxiliary supply	External 24 V	Evaluation platform architecture
Cooling	Forced air / heatsink / fan	Supports controlled laboratory evaluation
Efficiency	≥99.9%	Under defined operating and measurement conditions
Assembly envelope	~60 × 110 × 72.5 mm	Preliminary mechanical reference

Use-Case Boundary

B-TRAN® based SSCB RDK is an **engineering evaluation platform**. It is not intended for direct field deployment, safety-certified installation, unattended operation, or use as a production-equivalent breaker.

For additional information, please contact Ideal Power Sales sales@idealpower.com