

Quick Start Guide

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TDHBG2500P100_0v6
For evaluation purposes only

Design files and more at
transphormusa.com/hb25kit

TDHBG2500P100-KIT

Evaluation Platform

2.5kW half-bridge synchronous buck or boost

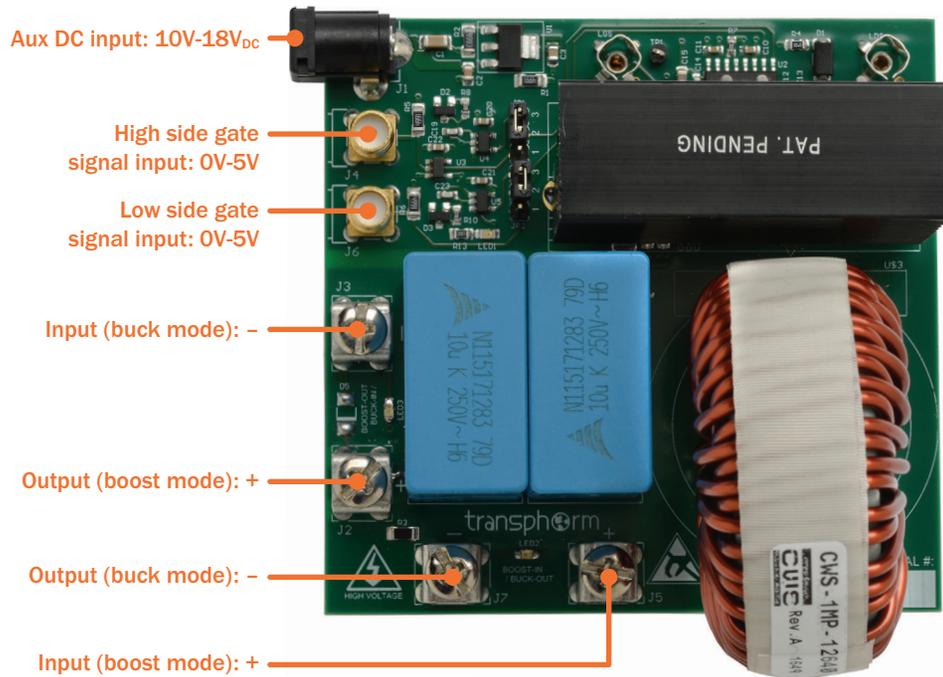
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Highest Performance, Highest Reliability GaN

Equipment Needed

- ➔ The TDHBG2500P100_Ov6 board
- ➔ High-voltage DC power supply for input/output
 - 400V_{DC} maximum
 - 2.5kW maximum
- ➔ Low-voltage DC power supply for auxiliary voltage
 - 10V min, 18V max
- ➔ Pulse generator or direct gate driver for logic inputs
 - Nominal 0V to 5V
 - Typical frequency is 100kHz; other frequencies may require a different inductor
 - SMA coaxial connectors
- ➔ 450V low ESR electrolytic capacitors capable of 2Arms and 7Arms ripple current

Step 1: Connect the Board



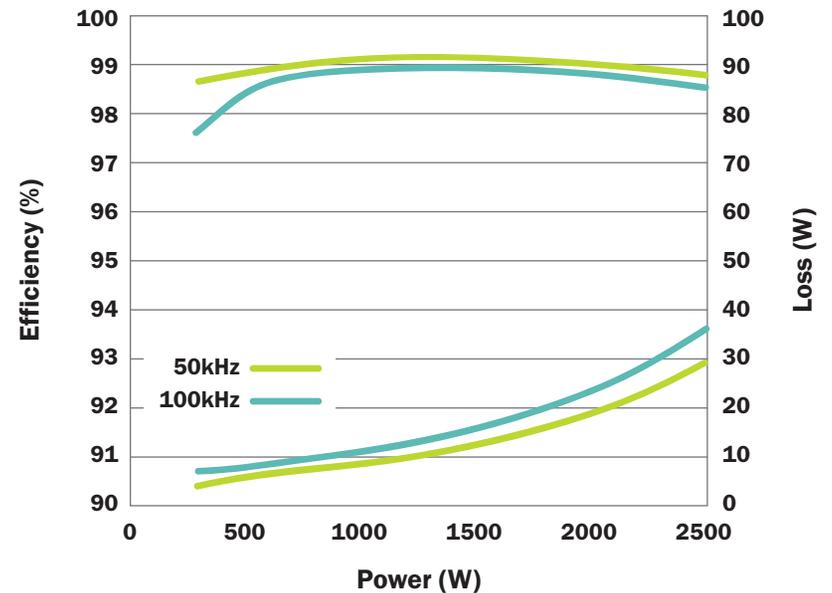
Warning:

Inductor is designed for 100kHz operation; a different inductor may be needed for a different frequency. Please refer to the TDHBG2500P100 User Guide.

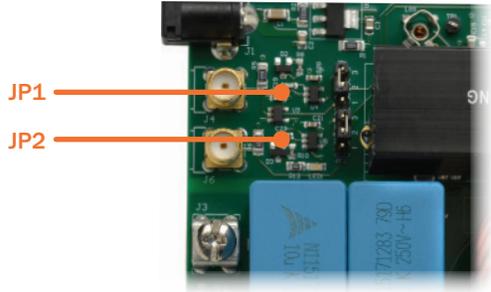
Step 4: Power-up the Board

- ➔ The TDHBG2500P100 board can deliver 2500W with forced air cooling when configured as
 - 200V to 400V boost, 100kHz, or
 - 400V to 200V buck, 100kHz
- ➔ Different input/output voltage and power can be chosen, however
 - Input/output voltage should not exceed 400V
 - In each GaN FET, the rms current should not exceed 9A
 - Users should monitor the device temperature to make sure they are not being overheated by excessive power during the test
- ➔ Driver deadtime is preset to 120ns for typical operation and can be adjusted for different operating conditions; please refer to the TDHBG2500P100 User Guide for a detailed description

Typical Efficiency for a Boost 200V:400V Converter

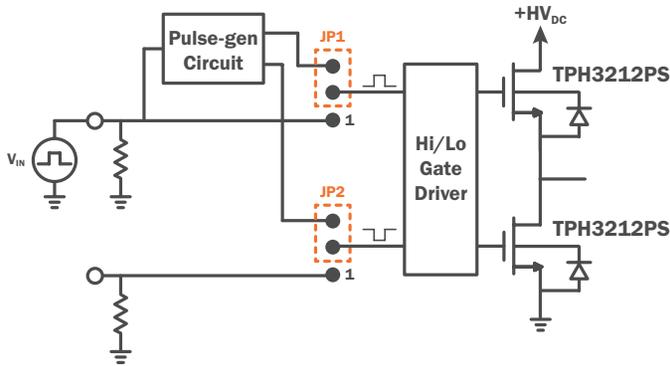


Step 2: Set the Jumpers

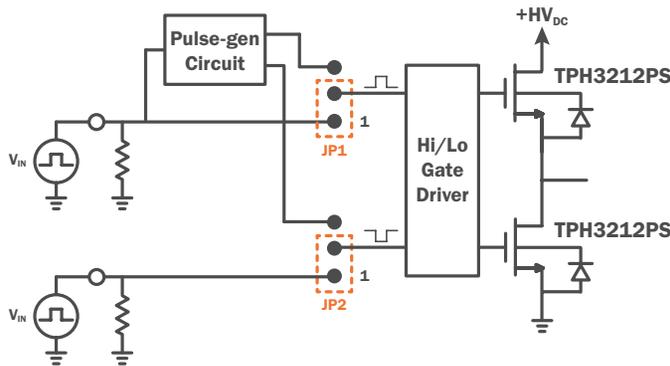


Jumper Positions

- Using single source for either buck or boost mode using synchronous rectification



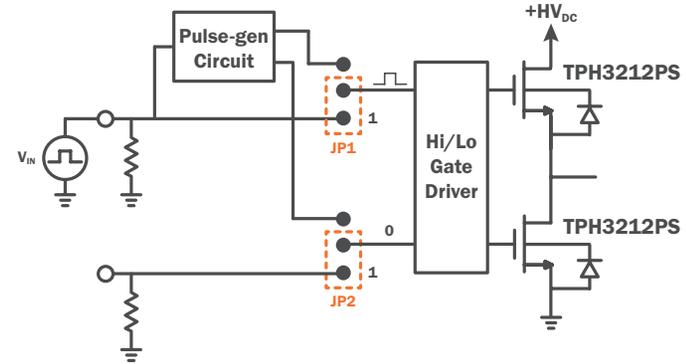
- Using two single sources with synchronous rectification



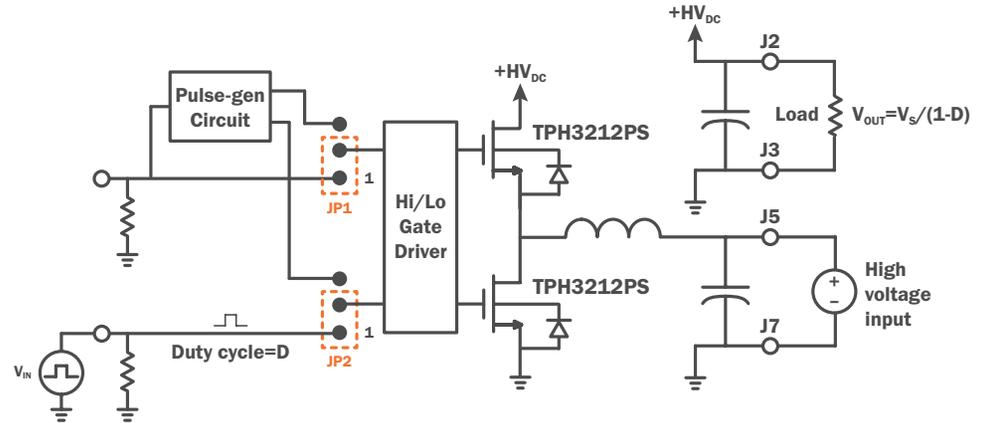
Warning:

During non-synchronous operation, the freewheeling diode will get hot resulting in decreased efficiency.

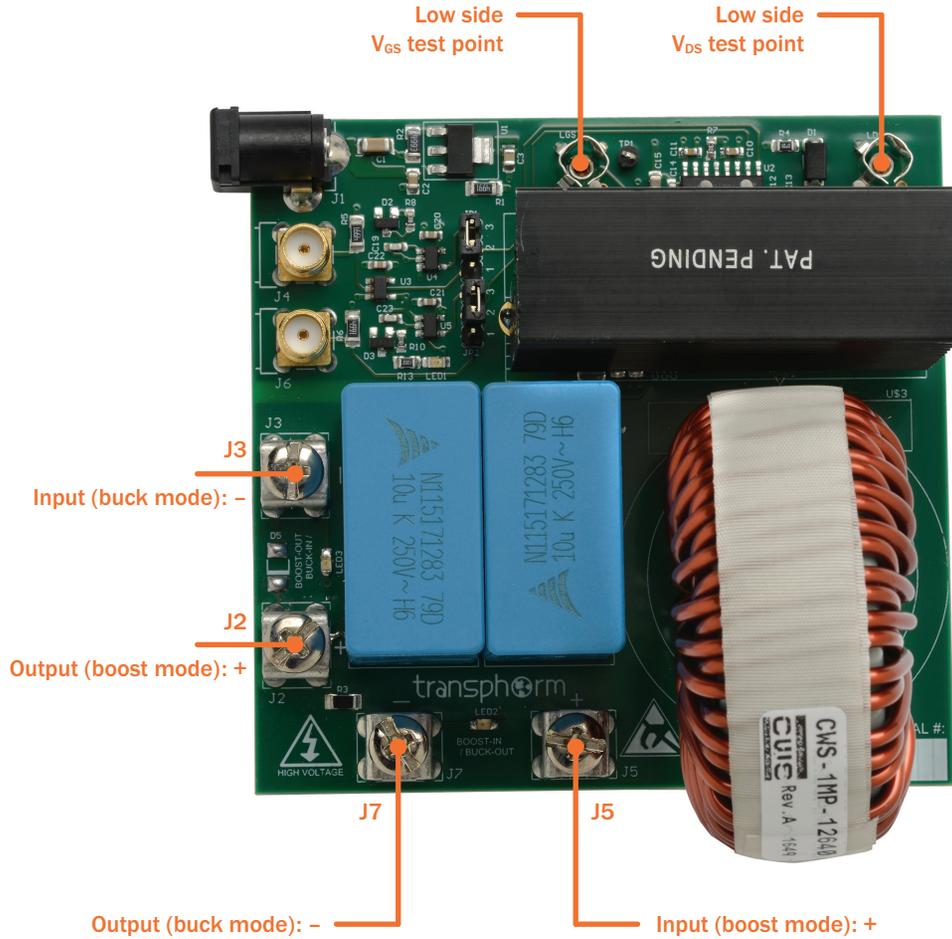
- Buck mode without synchronous rectification (not recommended)



- Boost mode without synchronous rectification (not recommended)



Step 3: Attach Probes

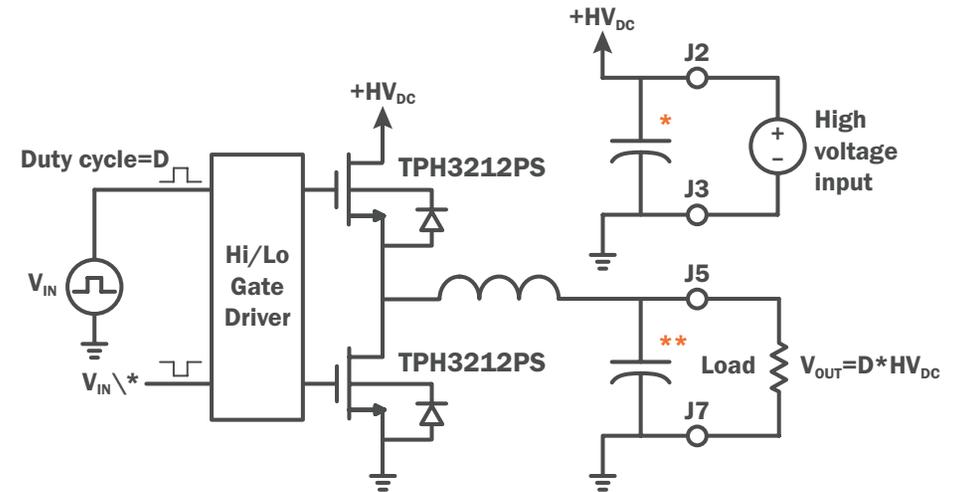


Connect in Buck and Boost Modes

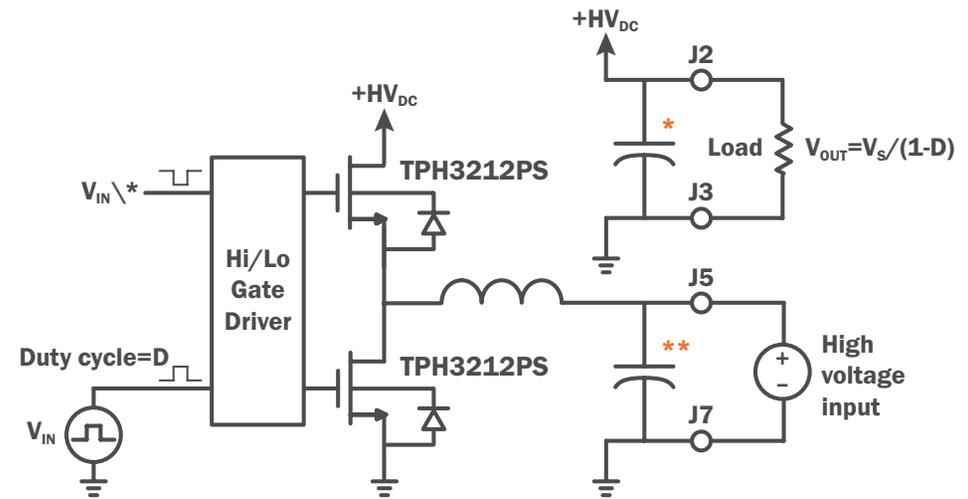
Warning:

Driver deadtime is preset to 120ns for typical operation and can be adjusted for different operating conditions. Please refer to the TDHBG2500P100 User Guide.

Buck Mode



Boost Mode



* 450V low ESR electrolytic capacitor capable of 7Arms ripple current

** 450V low ESR electrolytic capacitor capable of 2Arms ripple current