

# Quick Start Guide

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TDHBG1200DC100\_0v1  
For evaluation purposes only

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**TDHBG1200DC100-KIT**

**Evaluation Platform**

1.2 kW half-bridge synchronous buck or boost

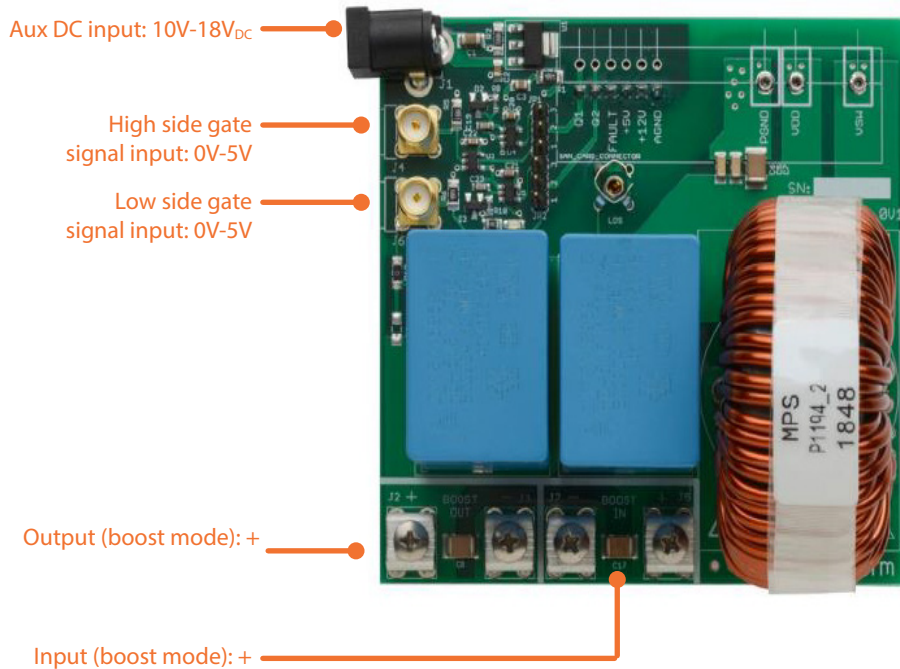
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Highest Performance, Highest Reliability GaN

## Equipment Needed

- ➔ TDHBG1200DC100\_0v1 board
- ➔ TDHB-65H070L-DC daughter card
- ➔ High-voltage DC power supply for input/output
  - 400V<sub>DC</sub> maximum
  - 1.2kW 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

## 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 TDHBG1200DC100 User Guide.

## Step 4: Power-up the Board

- ➔ The TDHBG1200DC100 board can deliver 1200W 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 7A
  - 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 TDHBG1200DC100 User Guide for a detailed description

## Typical Efficiency for a Boost 200V:400V Converter

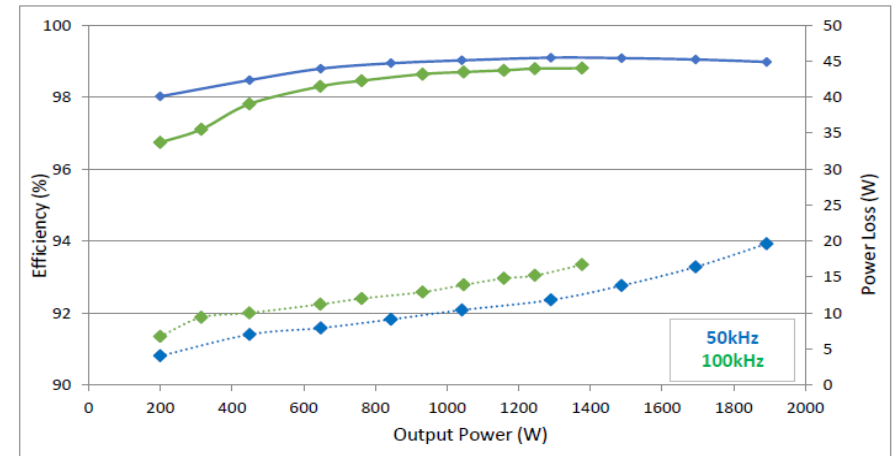
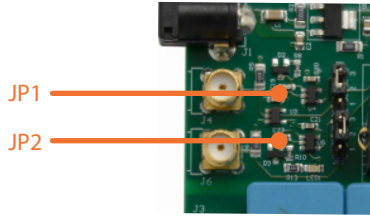


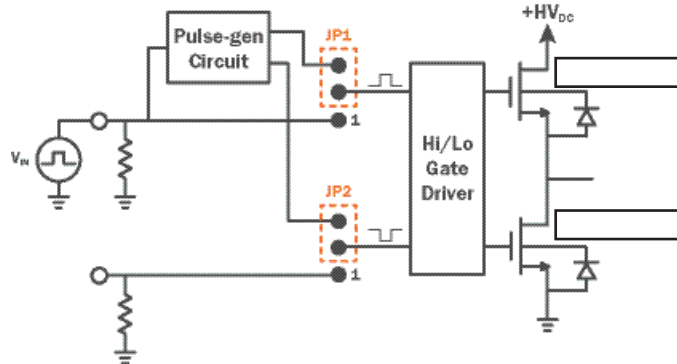
Figure 11. Efficiency for a boost 200V:400V converter

# Step 2: Set the Jumpers

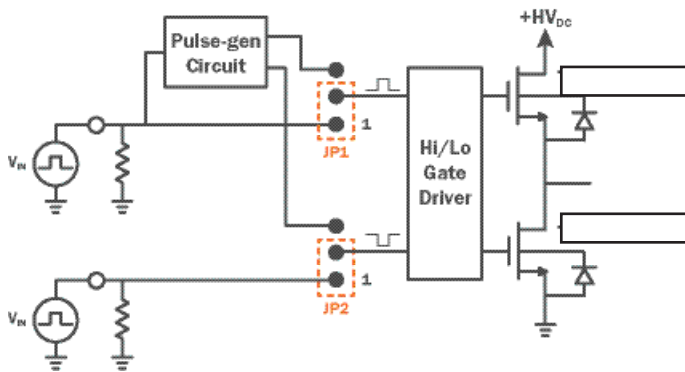


## Jumper Positions

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

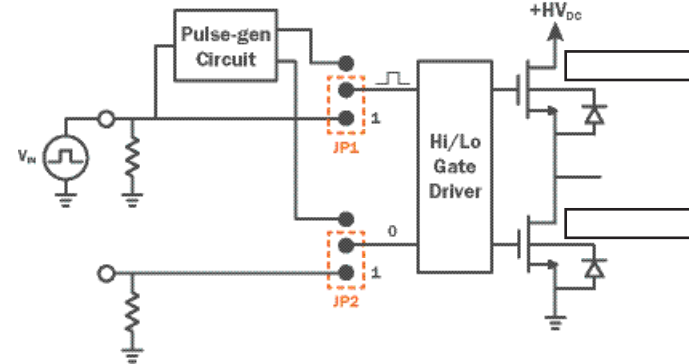


- Using two single sources with synchronous rectification

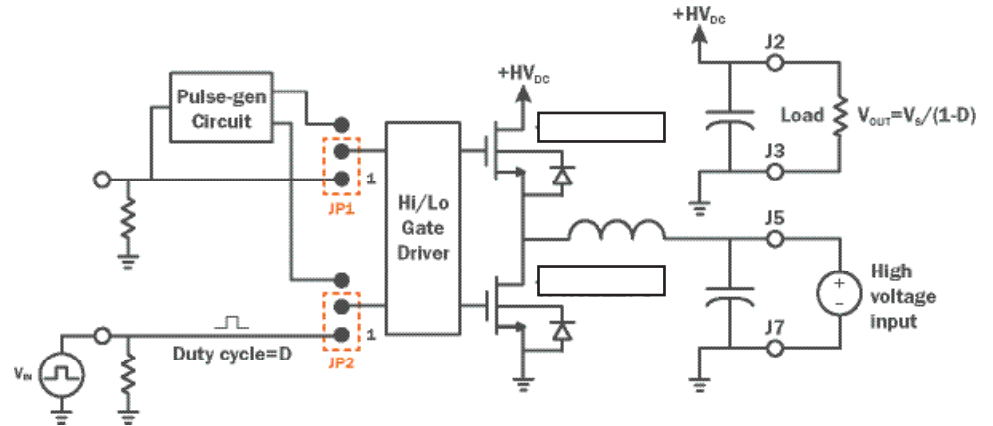


**Warning:**  
During non-synchronous operation, the freewheeling diode will get hot resulting in decreased efficiency.

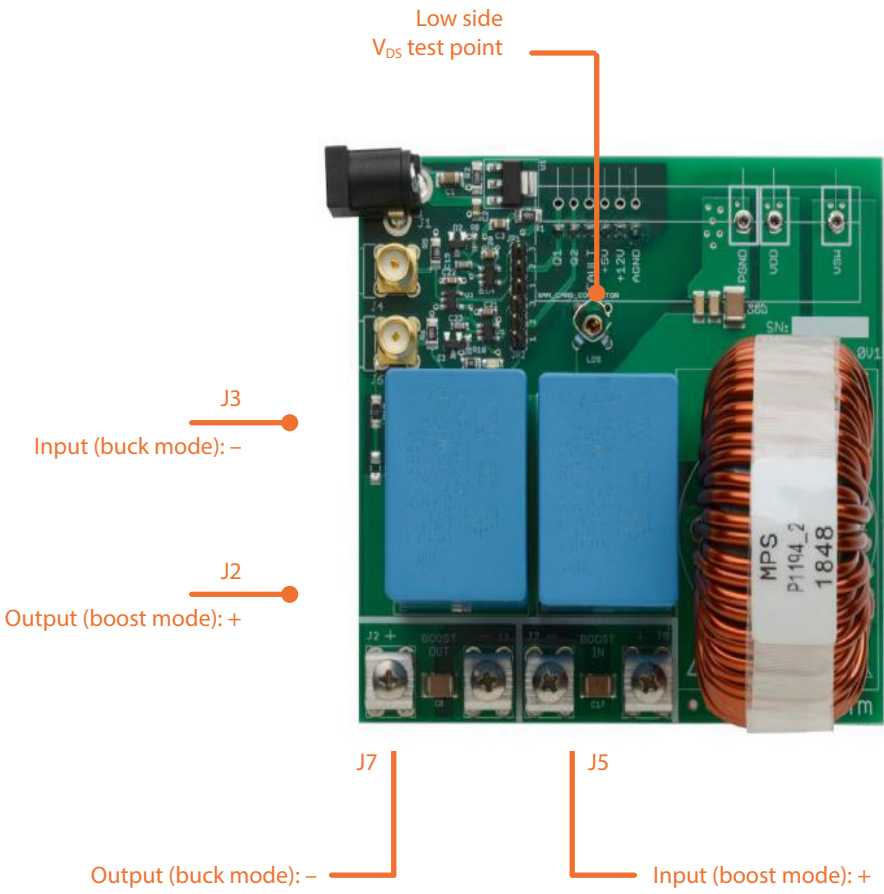
- Buck mode without synchronous rectification (not recommended)



- Boost mode without synchronous rectification (not recommended)



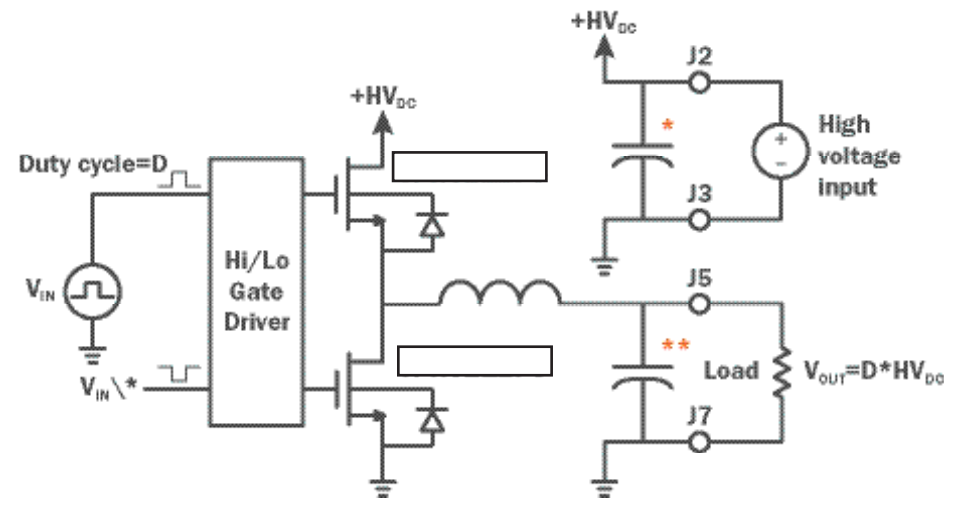
# Step 3: Attach Probes



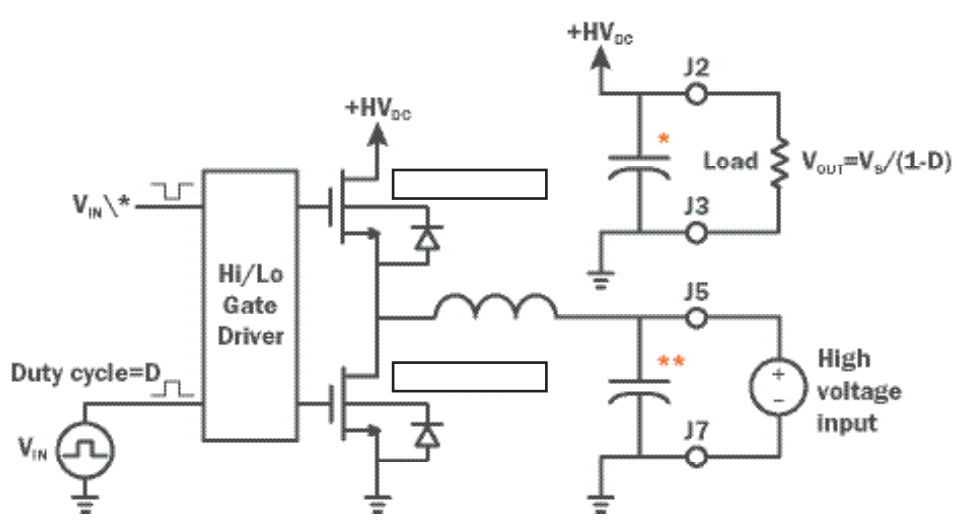
# Connect in Buck and Boost Modes

**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