

100V GaN Based High-Speed, Half-Bridge Evaluation Board

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Introduction

Central Semiconductor introduces the 100V High-Speed, Half-Bridge Evaluation Board using our 100V, 3.2mΩ gallium nitride (GaN) FETs.

Designed for existing and new PCB designs, this high-performance solution enables power electronics designers to leverage GaN for the growing market applications, including non-isolated buck converters, non-isolated boost converters, half-bridge, and full-bridge converters. The evaluation board includes a GaN driver and GaN Emode GaN power transistor connected in a high-side/low-side configuration, as well as all the necessary driver circuitry. It offers maximum flexibility in GaN transistor and driver combinations and can be used in any topology that requires the use of a combination of high-side/low-side FETs. This board can be configured as a Buck or Boost converter. When connected to your existing power supply, you can replace your HS/LS drive. The evaluation board also features configurable dead time control load interchangeability, user inductor selection, and driver enable/disable functionality.

Schematic: Half-bridge solution (100V max)

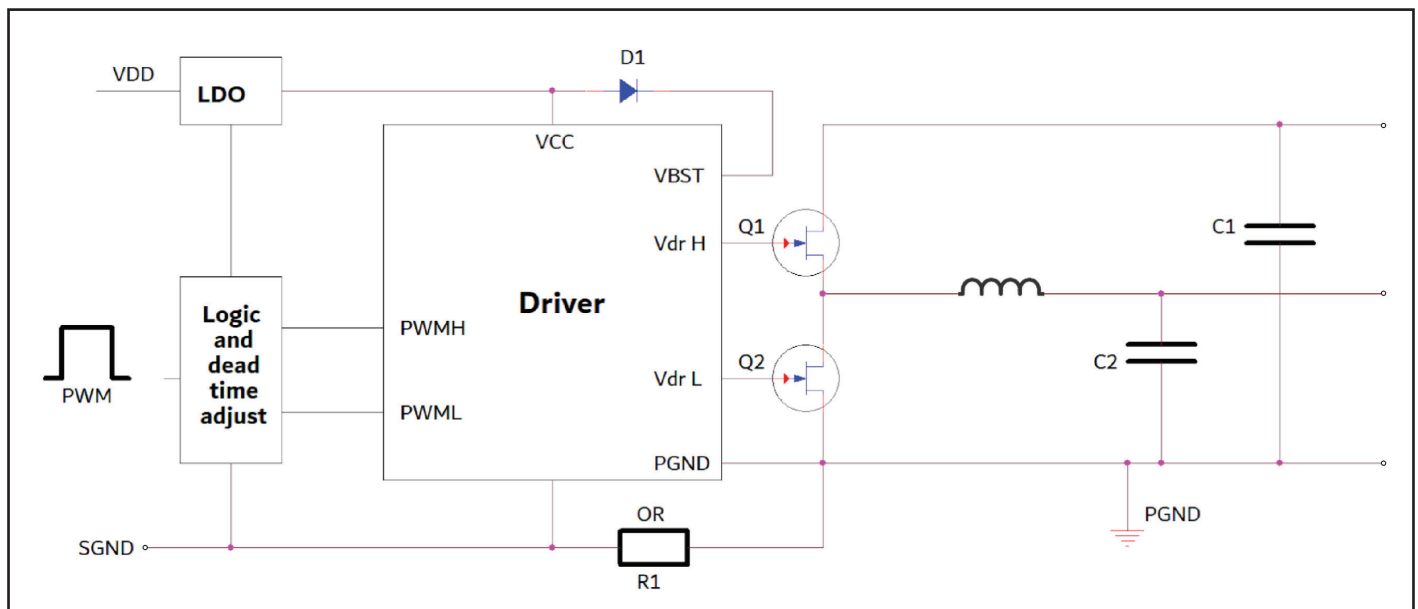


Figure 1: CCSPG1060N EVB Block Diagram

Featured Central Semiconductor's GaN

Q1, Q2: CCSPG1060N; 100V, 60A, 3.2mΩ, CSP 3.5mm x 2mm

Summary of Features

- Supports 48V input design with sufficient safety margin and high performance
- Robust design for high frequency operation
- Simplified design, optimized for driving GaN transistors
- Fast propagation delay
- High efficiency and allow paralleling
- Allows control of rise and fall time
- Offers configurable dead-time control and driver enable / disable functions

High Efficiency

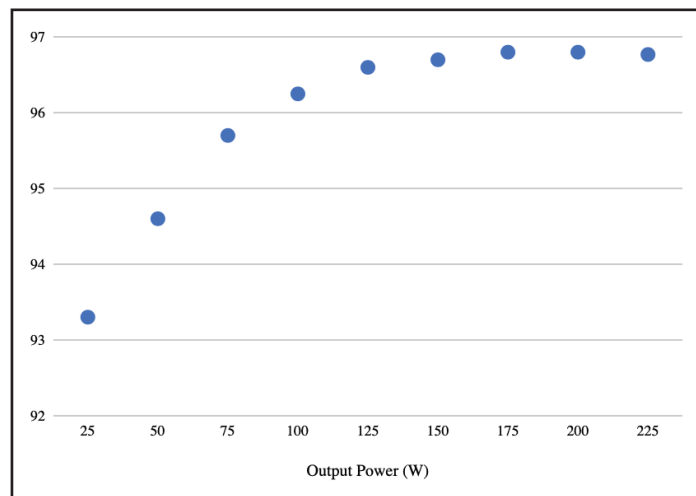


Figure 2: Test conditions

~ 48V to 12V Buck, 600kHz, 1400LFM air cooling

Target Applications

- [1] Buck/Boost
- [2] Motor drive
- [3] Resonant converters
- [4] Half-bridge and full-bridge converters
- [5] Non-isolated step down/up converters
- [6] Active clam flyback converter
- [7] 48V to Pol converter
- [8] Industrial power module

Parameters

Symbol	Parameters	Min	Nom	Max	Units
V _{DD}	Gate Drive Regulator Supply Range	7		12	V
V _{in}	Input Voltage			80	V
P _{out}	Output Power			250	W
V _{pwm}	Input Logic 'High'	3.5		5	V
	Input Logic 'Low'	0		1.5	V

Testing Guide: Test Point Location

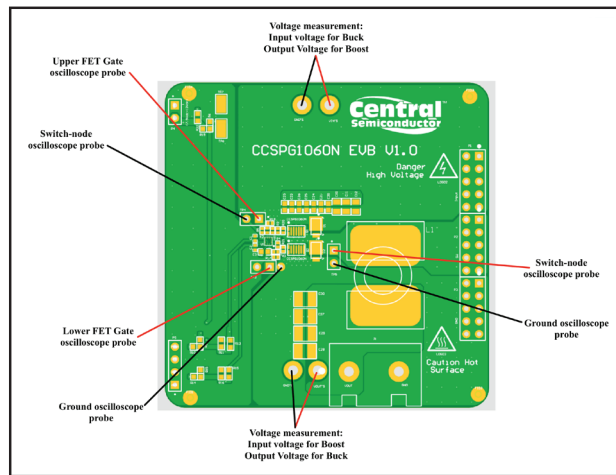


Figure 3: Measurement Points

Test Setups

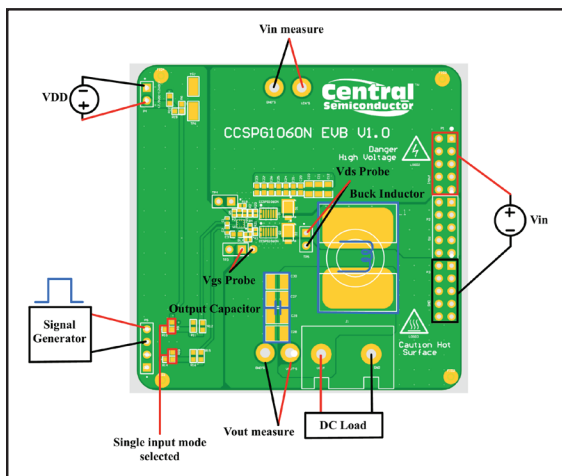


Figure 4: Single-PWM Input Buck Mode

Buck Mode

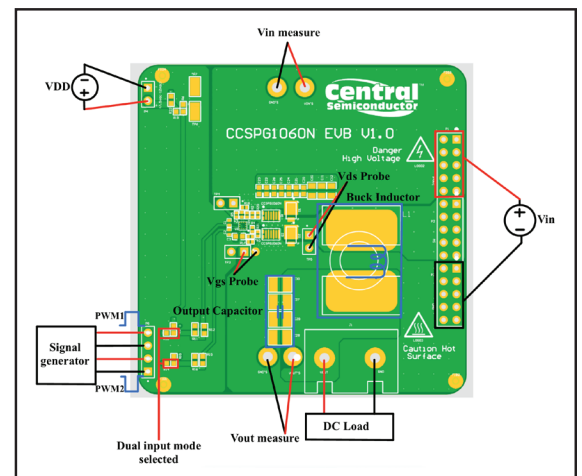


Figure 5: Dual-PWM Input Buck Mode

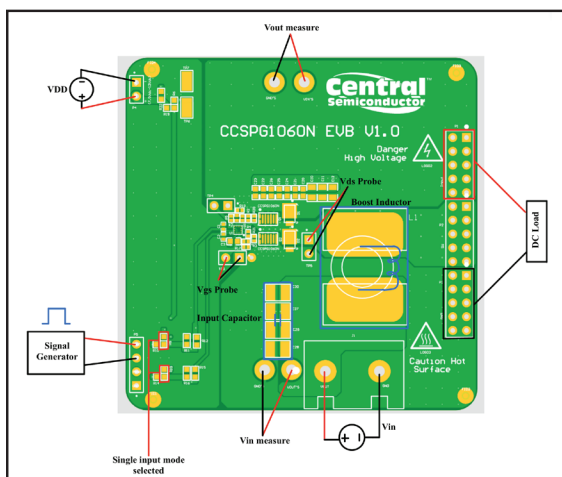


Figure 6: Single-PWM Input Boost Mode

Boost Mode

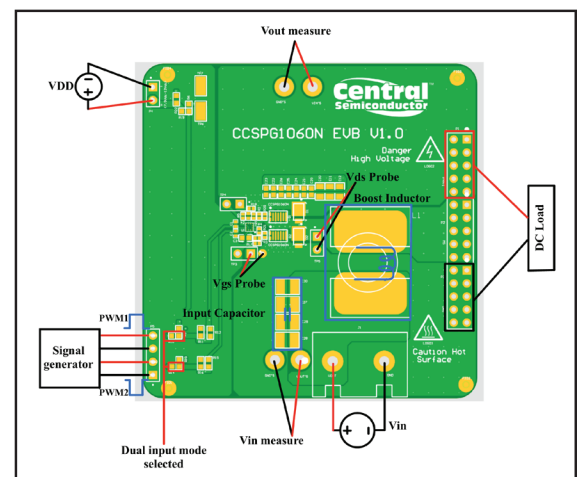


Figure 7: Dual-PWM Input Boost Mode

To obtain evaluation board, please contact your Central sales representative.