Speed your time to market with GaN and SiC evaluation kits, reference designs and simulation tools

As power conversion applications rapidly transition to gallium nitride (GaN) and silicon carbide (SiC) technologies, Richardson RFPD can help you in your integration plans with our broad selection of GaN and SiC resources to help speed your time to market.

Reference the links for each item listed in the brochure for more details on our offering of GaN and SiC technology evaluation kits and reference designs. Also access our gate driver resources that help you address the uniqueness of the voltage requirements, faster switching speeds and high frequency presented by these technologies.

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**GaN-on-Si E-HEMT Evaluation Platforms and Reference Designs**

**Part Number: GS61008P-EVBHF**  
Half bridge using GS61008P 100V, 7mΩ and pSemi PE29101 high speed gate driver.

**Part Number: GS61004B-EVBCD**  
Full bridge using GS61004B 100V, 15mΩ and pSemi PE29102 high speed gate driver.

**Part Number: GS665MB-EVB**  
650V universal motherboard for GS665XXX-EVBDB.

**Part Number: GS66508B-EVBDB1**  
1.5kW Half bridge daughter board.

**Part Number: GS66516T-EVBDB2**  
2kW Half bridge daughter board.

**Part Number: GS665MB-EVB**  
650V universal motherboard for GS665XXX-EVBDB.

**Part Number: GS66508B-EVBDB1**  
1.5kW Half bridge daughter board.

**Part Number: GS66516T-EVBDB2**  
2kW Half bridge daughter board.

**Part Number: GS665BTP-REF**  
3kW High 99% efficiency bridgeless totem pole PFC using GS66516T 650V, 25mΩ.

*No hardware. Documentation only.

**Part Number: GS1200BTP-EVB**  
1.2kW High 99% efficiency Bridgeless Totem Pole PFC Eval Board using GS66508B 650V, 50mΩ.  
Vin: 85 – 264Vrms • Vout: 240VDC • Fmax: 100kHz

**Part Number: GS-EVB-HB-66508B-ON1**  
650V high-side and low-side GaN gate driver evaluation board including two GS66508B GaN E-HEMTs in a fully functional half-bridge.

**Wireless Power Transfer Products**

**Wireless Power Transfer Demo Kit**

**Part Number: GSWPT-EVBSKY**  
SkyCurrent III™ Charging Pad dual-mode charging pad supports both AirFuel’s Magnetic Resonant (MR) and WPC’s Qi charging standard. The SkyCurrent III™ charging pad can support a mix and match of devices and power requirements to deliver the ultimate in "drop and go" charging.

**Wireless Power Transfer Amplifiers**

50W, 100W and 300W amps for wireless power transfer/charging applications. Push-pull class EF2 topology, operating at 6.78MHz, 90% peak efficiency.

**Part Number: GSWP050W-EVBPA**  
50W Wireless Power Transfer (WPT) amp using GS61004B 100V, 15mΩ device and PE29102 gate driver from pSemi.

**Part Number: GSWP100W-EVBPA**  
100W WPT amp using GS61008P 100V, 7mΩ device and PE29102 gate driver from pSemi.

**Part Number: GSWP300W-EVBPA**  
300W WPT amp using GS66508B 650V, 50mΩ device and PE29102 gate driver from pSemi.

**GSWPT-EVBSKY**  
SkyCurrent III™ Charging Pad dual-mode charging pad supports both AirFuel’s Magnetic Resonant (MR) and WPC’s Qi charging standard. The SkyCurrent III™ charging pad can support a mix and match of devices and power requirements to deliver the ultimate in "drop and go" charging.

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SiC Evaluation Platforms and Reference Designs

Part Number: CRD-060DD17P-2
48W Aux power supply using C2M1000170J. 
Vin: 300 – 1000VDC • Vout: 12VDC/4A, 12VDC/0.1A

Part Number: CRD-5FF0912P
High-frequency, flexible half bridge configuration using C3M0120090J.

Part Number: CRD-60DD12N*
60kW 4-phase interleaved boost using C3M0075120K. 
Vin: 470 – 800VDC • Vout: 850VDC

Part Number: KIT8020-CRD-5FF0917P-2
Half bridge eval board using C3M0075120K.

Part Number: CRD-20DD09P-2*
20kW full bridge resonant LLC using C3M0065100K. 
Vin: 650 – 750VDC • Vout: 300 – 550VDC • Iout: 35A

Part Number: CRD-06600FF065N*
Demonstration of Cree’s 650 V, 60 mΩ (C3M™) SiC MOSFETs (C3M0060065D) in a 6.6 kW High Frequency DC-DC converter targeting high power density applications. 
Vin: 380 – 420 VDC • Vout: 400 VDC • Fmax: 1 MHz

Part Number: CRD200DA12E-XM3
200kW three-phase inverter using CAB400M12XM3 module, CGD12HBXMP gate driver and CP3012-XP high performance cold plate. Vin: 800 – 900VDC • Vout: 480Vrms • Fmax: 80kHz

Part Number: KIT8020-CRD-8FF1217P-1
Half bridge eval kit using C2M0080120D.

Reference designs using Wolfspeed’s 650V SiC MOSFETs

Part Number: CRD-06600DD065N*
Demonstration of Cree’s 650 V, 60 mΩ (C3M™) SiC MOSFETs (C3M0060065D) in a 6.6 kW High Frequency DC-DC converter targeting high power density applications. 
Vin: 380 – 420 VDC • Vout: 400 VDC • Fmax: 1 MHz

Part Number: CRD-06600FF065N*
Demonstration of Cree’s 650 V, 60 mΩ (C3M™) SiC MOSFETs (C3M0060065D) in a 6.6 kW Bi-Directional converter targeting high efficiency and high power density On-Board Charging applications. 
Vin: 90 - 265 VAC • Vout: 250 – 450 VDC

*No hardware. Documentation only.

SiC Evaluation Platforms and Reference Designs

Part Number: MSCSICPFC/REF5*
For qualified opportunities, Reference design files only, no hardware. 30kW Vienna PFC Reference Design using Microsemi Next Generation SiC diodes and MOSFETs. 
Vin: 380/400Vrms, 3-Phase • Vout: 780VDC

*No hardware. Documentation only.
GaN & SiC Gate Driver Resources

**ANALOG DEVICES**

**Part Number: EVAL-ADuM4121EBZ**
Evaluation board facilitates testing of the propagation delay, drive strength, miller clamp functionality and input logic of the ADuM4121 single-channel gate driver.

**Part Number: EVAL-ADuM4135EBZ**
The EVAL-ADuM4135EBZ supports the ADuM4135 which is a single channel gate driver optimized for driving IGBTs. Integrated onto the ADuM4135 is a desaturation detection circuit that provides protection against high voltage short circuit IGBT operation.

**Part Number: EVAL-ADuM4138EBZ**
Demonstrates the advanced features of the ADuM4138 while maintaining flexibility in a testing environment. Works with the USB-SDP-CABLEZ programming cable to access the secondary side EEPROM and includes the option to drive the serial peripheral interface (SPI) bus with any other SPI compatible system.

**Part Number: EVAL-ADuM4136EBZ**
Evaluation board supports the ADuM4136 single-channel gate driver and facilitates testing of the desaturation circuitry. The evaluation board has layout locations for three different types of discrete switches, allowing for a wide range of device testing.

**Part Number: EVAL-ADuM4120EBZ**
Supports ADuM4120 single-channel gate driver with an integrated miller clamp. Provides operation with voltages up to 35V and features a high common-mode transient immunity (CMTI) suitable for GaN & SiC devices.

**Part Number: GS65011-EVBEZ**
EZDrive™ Open Loop Boost Evaluation Board. A low-cost, easy way to implement a GaN driving circuit using a standard MOSFET controller with integrated driver. Adaptable to any power level, any frequency, and any LLC and PFC controller.

**Part Number: EVAL-ADuM4122EBZ**
Evaluation board supports the ADuM4122 isolated gate driver with slew rate control. The evaluation board supplies jumpers and screw terminals to configure different drive conditions.

**Part Number: EVAL-ADUM4137EBZ**
Demonstrates the advanced features of the ADuM4137 while maintaining flexibility in a testing environment. Works with the USB-SDP-CABLEZ programming cable to access the secondary side EEPROM and includes the option to drive the serial peripheral interface (SPI) bus with any other SPI compatible system.

**Part Number: EVAL-ADUM4138EBZ**
Demonstrates the advanced features of the ADuM4138 while maintaining flexibility in a testing environment. Works with the USB-SDP-CABLEZ programming cable to access the secondary side EEPROM and includes the option to drive the serial peripheral interface (SPI) bus with any other SPI compatible system.

**Part Number: MSCSICMDD/REF1**
Reference design providing users with a highly isolated SiC MOSFET dual-gate driver switch as a means of evaluating SiC MOSFETs in a number of topologies.

**Part Number: MSCSICSP6/REF3**
Reference design featuring Microsemi's low inductance SP6Li SiC modules.

**Part Number: M5CSICSP3/REF2**
Dual gate driver reference design for Microsemi's SP3 package SiC modules.

**Part Number: ASDAK-2ASC-12A1HP-62**
Accelerated silicon carbide development kit includes the hardware and software elements required to rapidly optimize the performance of SiC modules and systems up to 1200V.

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**GaN & SiC Gate Driver Resources (cont’d)**

**Part Number: EK29102-03**
pSemi evaluation board in full-bridge configuration showcases the GaN-enabling capabilities of the PE29102 high-speed GaN FET driver and incorporates GaN Systems’ 100V, 45A E-HEMTs.

**Part Number: RDHP-1526**
General purpose base board for SCALE-iDriver™ SID1182K gate driver IC with booster stage. Suitable for IGBT power modules in various housings, up to 800V DC-link voltage.

**Part Number: RDHP-1608**
General purpose base board for SCALE-iDriver™ SID1182K gate driver IC without boost stage. Suitable for IGBT power modules in various housing, up to 800V DC-link voltage.

**Part Number: R-REF01-HB**
Half-Bridge Gate-Drive Power Supply Reference Design (RD) suitable for voltages up to 1kV and optimized for very high switching speeds. For single gate drive supply voltages as low as +4V and dual gate drive supply voltages as high as +20V / -5V (30V max) with no maximum duty cycle limitations.

**Part Number: CRD-001**

**Part Number: CGD15SB00D2**

**Part Number: CGD15FB45P1**
Six-channel gate driver for Wolfspeed’s 1200V SiC MOSFET power modules (CSCXXXM12CM2).

**Part Number: CGD15HB62LP**
Form-factor fitting, two-channel gate driver for Wolfspeed’s high-performance module platform (CAS325M12HM2).

**Part Number: CGD15HB62P1**
Two-channel gate driver for Wolfspeed’s 1200V SiC MOSFET power modules (CSCXXXM12BM2).

**Part Number: CGD12HBXMP**
Form-factor-fitting, two-channel gate driver for the 1,200V XM3 power module platform.

**Part Number: RDHP-1901**
General purpose base board for SCALE-iDriver™ SID1182K. Suitable for half-bridge SiC MOSFET power modules in 62mm housing.

**Part Number: RDHP-1608**
General purpose base board for SCALE-iDriver™ SID1182K gate driver IC without boost stage. Suitable for IGBT power modules in various housing, up to 800V DC-link voltage.

**Part Number: R-REF01-HB**
Half-Bridge Gate-Drive Power Supply Reference Design (RD) suitable for voltages up to 1kV and optimized for very high switching speeds. For single gate drive supply voltages as low as +4V and dual gate drive supply voltages as high as +20V / -5V (30V max) with no maximum duty cycle limitations.

**Part Number: CGD15FB45P1**
Six-channel gate driver for Wolfspeed’s 1200V SiC MOSFET power modules (CSCXXXM12CM2).

**Part Number: CGD15HB62LP**
Form-factor fitting, two-channel gate driver for Wolfspeed’s high-performance module platform (CAS325M12HM2).

**Part Number: CGD15HB62P1**
Two-channel gate driver for Wolfspeed’s 1200V SiC MOSFET power modules (CSCXXXM12BM2).

**Part Number: CGD12HBXMP**
Form-factor-fitting, two-channel gate driver for the 1,200V XM3 power module platform.