

# SiC COMPANION SOLUTIONS

**Analog Devices** is the market leader in digital isolation with the #1 Market Share and over 3 Billion Channels of digital isolation shipped. ADI were the first company to develop digital isolation and offer the broadest portfolio of isolation products, offering solutions including std isolators, isolated Power, isolated communications and isolated gate drivers. ADI's gate drivers offer market leading CMTI and prop delay, coupled with the most robust switching and protection to enable the highest performance systems on the market.



**Cree | Wolfspeed** is a global leader in wide bandgap semiconductor technology. Wolfspeed's silicon carbide MOSFET portfolio (C3M™ technology) offers the industry's lowest on-state resistances in a discrete package as well as low switching losses, enabling high efficiency and power density. Wolfspeed SiC devices far outperform conventional silicon components and set new standards for efficiency and reliability in industrial, energy, automotive, and consumer markets.



**ADI and Wolfspeed** combine market-leading MOSFETs and gate drivers to deliver high-efficiency and high-reliability system solutions across industrial, energy and automotive applications. These solutions are backed by industry-relevant reference designs, evaluation platforms and hardware design packages.

- Automotive Qualified
- Automotive Capable

	Basic				Protecting		Programmable					
	ADuM4120	ADuM4121	ADuM4122	ADuM4221	ADuM4135	ADuM4136	ADuM4137	ADuM4138				
<b>1200V XM3 Module</b>					C, E, T*	C	C	C				
<b>1200V HM2 Module</b>					C	C	C	C				
<b>1200V BM2 Module</b>					C, E	C	C	C				
<b>1700V BM2 Module</b>												
<b>1200V CM2 Module</b>					C	C	C	H				
<b>650V C3M MOSFET</b>					C	C, E*	C	H, R	P	P	P	P
<b>900V C3M MOSFET</b>					C	C	C	H	P	P	P	P
<b>900V E3M MOSFET</b>					C	C	C	H	P	P	P	P
<b>1000V C3M MOSFET</b>					C	C	C	H	P	P	P	P
<b>1200V C3M MOSFET</b>					C	C	C	H	P	P	P	P
<b>1700V C2M MOSFET</b>												

- \* - In development
- E - Evaluation Board Exists
- T - Test Report Exists
- R - Reference Design Exists

- C - General companion recommendation
- H - Preferred for Half Bridge Configurations
- F - Preferred for High Frequency Applications
- V - Preferred for High Voltage Applications
- P - Preferred when paralleling switches

- Basic**
- Low Pin Count
  - Small Footprint
  - Low Delay
  - High CMTI
  - Typical applications:
    - OBC, DC / DC

- Protecting**
- Low Delay
  - High CMTI
  - Bipolar Supplies
  - Integrated Protection
  - Error Reporting (flag)
  - Typical applications:
    - Traction Inverter
    - Industrial / Energy Systems

- Programmable**
- Low Delay
  - High CMTI
  - Bipolar Supplies
  - Integrated Protection/Monitoring
  - Status Reporting (Flag + SPI)
  - Fly-back Controller
  - SPI Configurable
  - Typical applications:
    - Traction Inverter
    - High Performance Industrial / Energy Systems

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## ADI Isolated Gate Drivers Product Selection Guide

	ADuM4120	ADuM4121	ADuM4122	ADuM4221	ADuM4135	ADuM4136	ADuM4137	ADuM4138
Package Style	SOIC-6W	SOIC-8W	SOIC-8W	SOIC-16W	SOIC-16W	SOIC-16W	SOIC-28W	SOIC-28W
# of Channels	1	1	1	2	1	1	1	1
Peak Current (A)	2	2	2	4	4	4	6	6
Output Volt Max (V)	35	35	35	35	30	35	25	25
CMTI (kV/usec)	150	150	150	150	100	100	150	150
UVLO	x	x	x	x	x	x	x	x
TSD	x	x	x	x	x	x	x	x
Miller Clamp		x			x		x	x
Slew Rate Adj			x					
Dead Time Adj				x				
ASC							x	
Fault Detect					x	x	x	x
SPI Prog Temp Sense							x	x
SPI Prog Over Current Detect							x	x
SPI Prog Iso Flyback Cont								x
Desat Detect					x	x		x
ADI Eval Board	EVAL-ADuM4120	EVAL-ADuM4121	EVAL-ADuM4122	EVAL-ADuM4221	EVAL-ADuM4135	EVAL-ADuM4136	EVAL-ADuM4137	EVAL-ADuM4138

## RECOM High-isolation 2W DC/DC Converters for SiC Gate Drivers

Switching SiC MOSFETs requires turn-on and turn-off voltages that are uncommon for other IGBT or MOSFET applications. RECOM provides high-isolation DC-DC converters with both single and dual asymmetric outputs to match the recommended gate drive levels of various SiC MOSFETs for optimized switching.



Series	Power (W)	Vin (V)	Nr. of Outputs	Vout 1 (V)	Vout 2 (V)	Mounting Type
 RKZ-xx2005	2.0	5.0, 12.0, 15.0, 24.0	2	20.0	-5.0	THT
 RxxP21503	2.0	12.0, 15.0, 24.0	2	15.0	-3.0	THT
 RxxP22005	2.0	5.0, 12.0, 15.0, 24.0	2	20.0	-5.0	THT
 RxxP215S	2.0	5.0, 12.0, 15.0, 24.0	1	15.0	-	THT
 RxxP215S/R	2.0	5.0, 12.0, 15.0, 24.0	1	15.0	-	THT

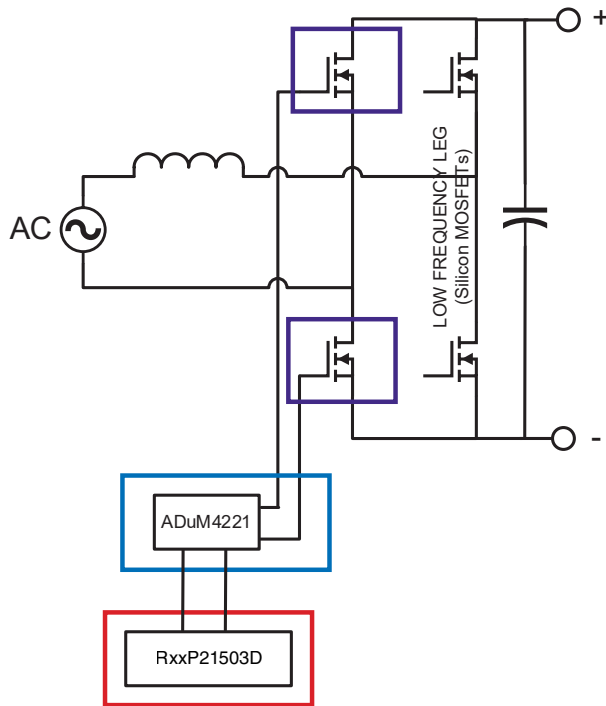
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## Bridgeless PFC Design

The elimination of bridge rectifiers ensures low conduction losses, high power density, low THD, and low common-mode noise. Further, this topology uses the fewest components, saving space and providing designers with added flexibility.



### Applications

- > Server power supplies
- > Industrial motor control
- > Industrial power conversion
- > Energy storage systems



Wolfspeed SiC  
MOSFETs



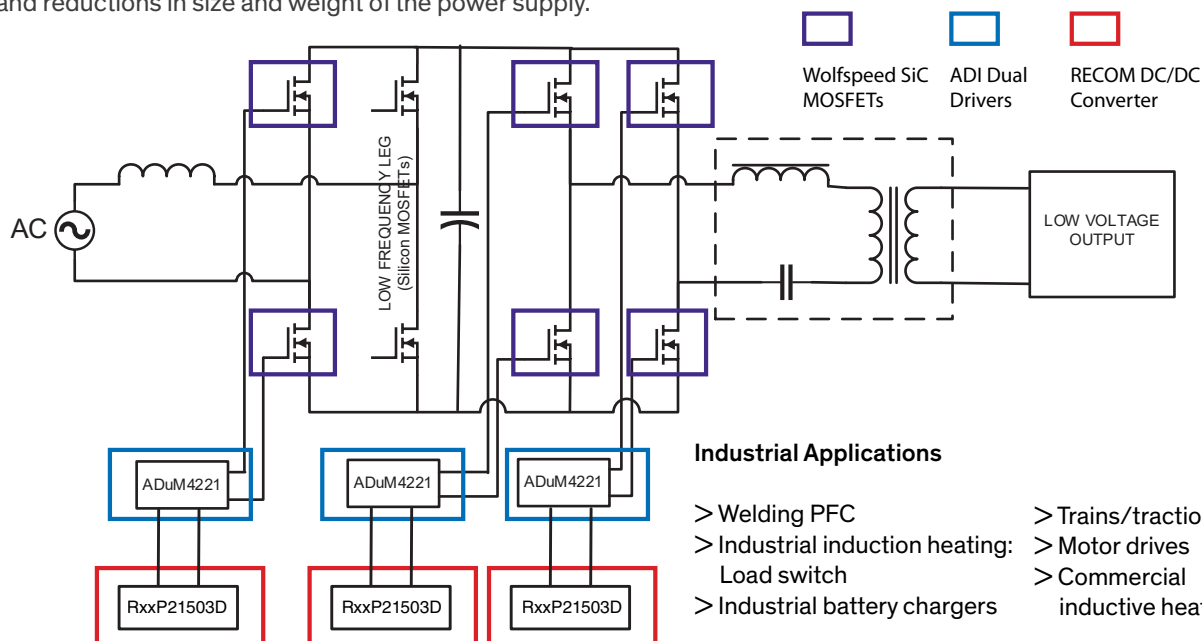
ADI Dual  
Drivers



RECOM DC/DC  
Converter

## Industrial AC/DC PFC + DC/DC

Benefits of this topology include: Reduction in overall energy consumption, higher efficiency, improved thermal performance and reductions in size and weight of the power supply.



### Industrial Applications

- > Welding PFC
- > Industrial induction heating: Load switch
- > Industrial battery chargers
- > Trains/traction
- > Motor drives
- > Commercial inductive heating

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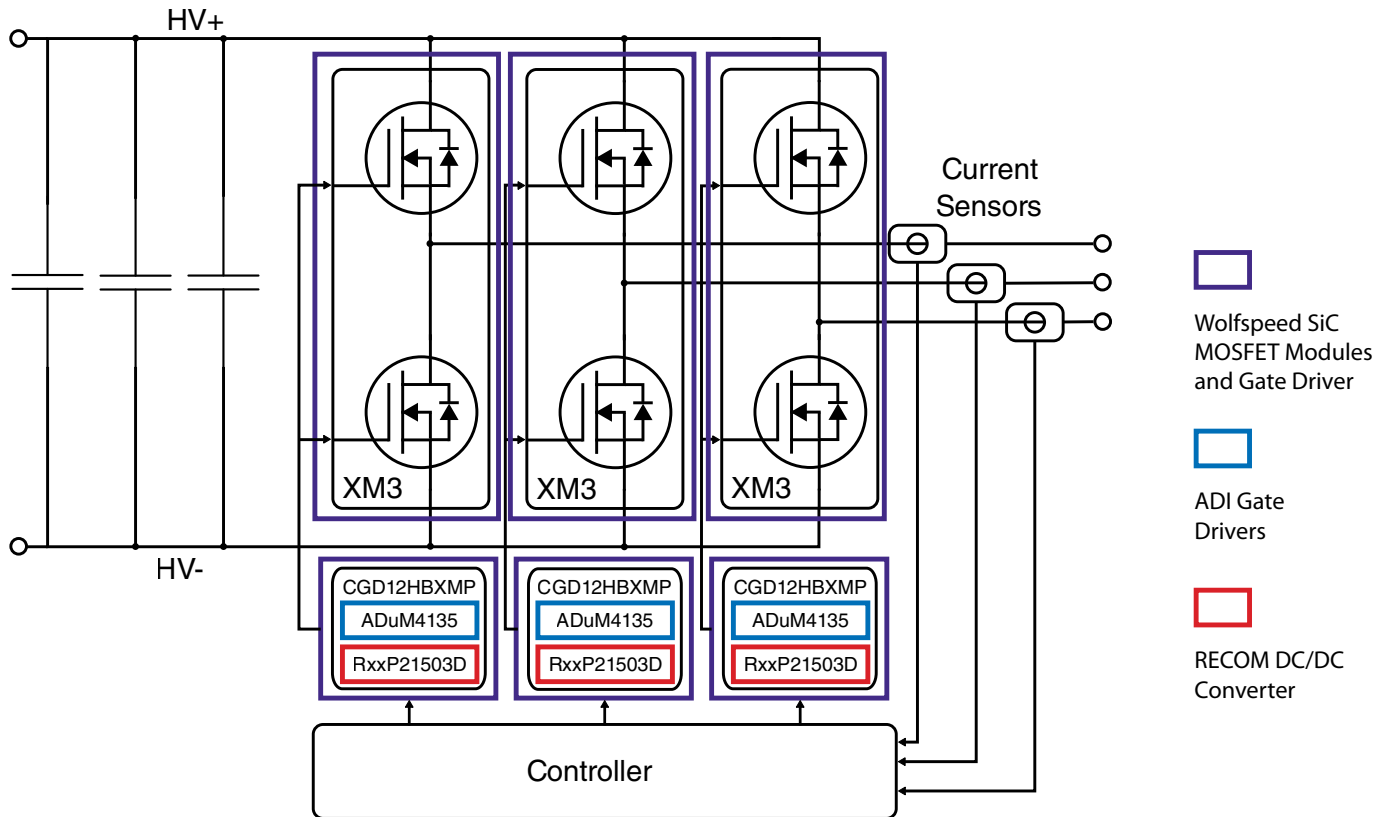
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# SiC COMPANION SOLUTIONS

## High Power Three-Phase Inverter

Integrating Wolfspeed's XM3 high-density, low-inductance modules in a high-power three-phase inverter design enables a reduction of system losses and simplification of the design for low-loss, high-frequency operation. Expect power densities 2X that comparable silicon solutions and greater than 98% efficiency.



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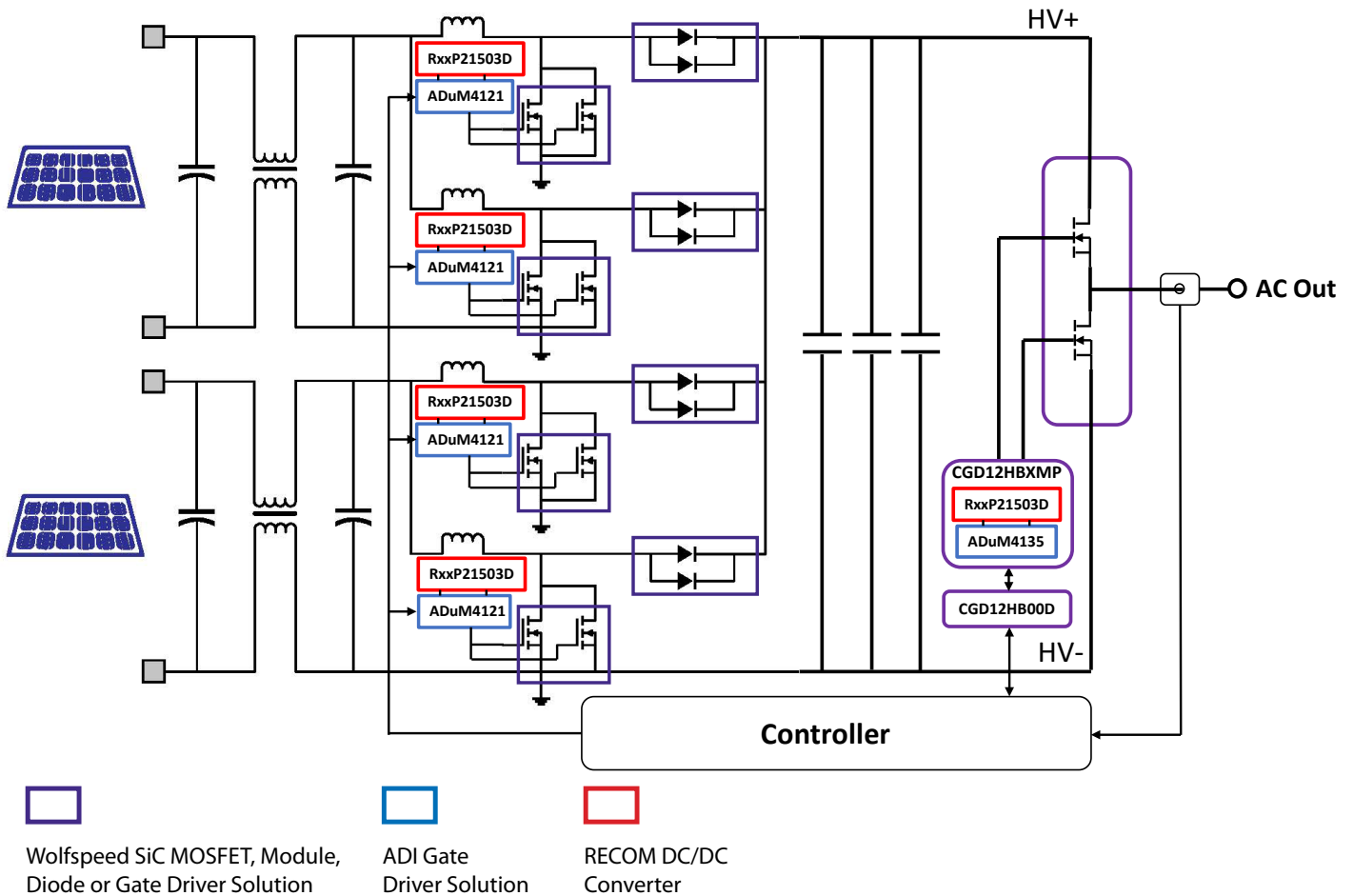
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## Solar Inverter

A solar panel's semiconductors must absorb sunlight and convert it to electricity efficiently despite the challenges presented by fluctuating ambient temperatures, high humidity and other harsh conditions. Wolfspeed's devices offer field-proven reliability with 98% efficiency even in these corrosive, often remote environments.



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