



The Power To
MAKE IT REAL

POWER PRODUCTS CATALOG

Industry-Leading Silicon Carbide Power Products

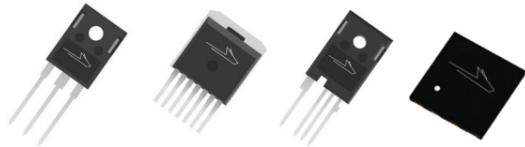
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Reference designs, design and evaluation tool to ease your design process and get you to market faster.

THE POWER TO MAKE IT REAL

Silicon carbide provides unprecedented advantages of power density and efficiency, enabling a new set of high-power applications to create a more sustainable, electrified future.

At Wolfspeed, we pioneered the first commercial silicon carbide wafers in 1991. In 2011, we got one step closer to an electrified future, when we introduced the industry's first silicon carbide MOSFETs. Today, our quest for better is rooted in our rich legacy of SiC invention and driven forward by our scientists' passion to harness half the power of the sun, to create one of the toughest materials on Earth.

Whether you are a world-leading automotive original manufacturer (OEM), driving the adoption of electric

cars, or a small utility company, providing accessible energy to local municipalities, we are here to provide you silicon carbide to power the world's most disruptive innovations.

We recognize that adopting new technology comes with challenges. That's why we're dedicated to making this transition easier for you. From inception to production, we design our products with the most critical design challenges in mind. Our reference designs, SpeedFit™ design simulator, and evaluation tools are created to facilitate your design process and get you to production faster.

So bring us your what ifs. Those never-been-done-before. We will bring you the power to make it real.



GEN 4 TECHNOLOGY PLATFORM: PERFORMANCE THAT SCALES WITH YOUR SHIFTING DESIGN REQUIREMENTS

Designers of high power automotive, industrial and renewable energy systems can achieve the ultimate in performance via a highly flexible technology platform supporting a long-term roadmap of application-optimized bare die, module, and discrete products.

Gen 4 represents a paradigm shift in silicon carbide technology that puts three performance vectors at the center of every Gen 4-based design: Durability, holistic system efficiency, and lower system cost.

- Designed to last, even in the harshest environments
- Designed to comprehensively improve system efficiency
- Designed to enable reduced system cost and development time



WOLFSPEED POWER MODULES: DEVELOPED FOR RUGGED, HIGH-VOLTAGE ENVIRONMENTS

As the need for more power continues to increase, so does the need to design smaller, more durable systems. Wolfspeed's Aluminum Nitride (AlN) substrate reduces thermal resistance by up to 50%, maximizing thermal conductivity for greater ampacity and extended lifetime.

Wolfspeed power modules in FM and GM platforms come with a pre-applied thermal-interface material

(TIM) option that allows you to increase current capability by 60% or reduce junction temperature by 40C for system durability.

Lastly, our industry-standard and SiC-optimized footprints provide flexibility so you can simplify design layout and reduce assembly costs.

Industry-Standard Footprints

Wolfspeed WolfPACK™

F platform (33.8 mm)

G platform (56.7 mm)

B platform (62 mm)

L platform (100 mm)

Optimized Footprint

D platform (40.8 mm)

X platform (53 mm)

H platform (High performance 62 mm)

INDUSTRY-STANDARD FOOTPRINTS

Well-established footprints / packages that have been internally optimized for Silicon Carbide and provide a straight-forward drop-in replacement at the package level for customers using these platforms with either Si or Silicon Carbide devices.

OPTIMIZED FOOTPRINTS

Uniquely developed by Wolfspeed to offer new capability designed specifically for Silicon Carbide.

MODULE GATE DRIVER BOARDS

CGD1200HBP-BM2
CGD1200HBP-BM3



CGD1700HB2P-XM3

COMPANION GATE DRIVERS

SKU	Package	Designed By	Working Voltage	Gate Driver	Output Channels
CGD12HBXMP	X Platform	Wolfspeed	1000 V	Analog Devices® ADuM4135	2
CGD1200HB2P-BM2	B Platform	Wolfspeed	1000 V	Analog Devices ADuM4135	2
CGD1200HB2P-BM3	B Platform	Wolfspeed	1000 V	Analog Devices ADuM4135	2
UCC5880QEVN-057	X Platform	Partner	1200 V	Texas Instruments® UCC5880Q1	2
UCC5880INVERTEREVM	X Platform	Partner	1200 V	Texas Instruments® UCC5880-Q1	2
CGD1700HB2M-UNA	F Platform, G Platform	Wolfspeed	1500 V	Texas Instruments® UCC21710	2
FRDMGD3160XM3EVM	X Platform	Partner	1500 V	NXP® GD3160	2
EVAL-ADUM4146WHB1Z	F Platform, G Platform	Partner	1500 V	Analog Devices ADuM4146	2
Si823H-AxWA-KIT	F Platform, G Platform	Partner	1500 V	Skyworks® Si823Hx	2
CGD1700HB3P-HM3	H Platform	Wolfspeed	1500 V	IXDD614YY	2
ACPL-355JC	F Platform, G Platform	Partner	1500 V	Broadcom®, ACPL-355JC	2
CGD1700HB2P-BM3	B Platform	Wolfspeed	1500 V	Analog Devices ADuM4146	2
CGD1700HB2P-XM3	X Platform	Wolfspeed	1500 V	Analog Devices ADuM4146	2

WOLFSPEED® MODULES

	Part Number	Blocking Voltage (V)	Nominal Current (A)	R _{DS(ON)} (mΩ) at 25°C	Description
G PLATFORM std. 56.7 mm	CCB016M12GM3T	1200	50	16	Six-Pack, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CCB016M12GM3	1200	50	16	Six-Pack, Al ₂ O ₃ Substrate
	CBB011M12GM4T	1200	107	11	Full-Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CBB011M12GM4	1200	107	11	Full-Bridge, Al ₂ O ₃ Substrate
	CHB011M12GM4T	1200	102	11	T-Type, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CHB011M12GM4	1200	102	11	T-Type, Al ₂ O ₃ Substrate
	CAB011A12GM3T	1200	141	11	Half-Bridge, AlN Substrate, Pre-Applied TIM
	CAB011A12GM3	1200	141	11	Half-Bridge, AlN Substrate
	CAB008M12GM3T	1200	146	8	Half-Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CAB008M12GM3	1200	146	8	Half-Bridge, Al ₂ O ₃ Substrate
	CAB008A12GM3T	1200	194	8	Half-Bridge, AlN Substrate, Pre-Applied TIM
	CAB008A12GM3	1200	194	8	Half-Bridge, AlN Substrate
	CAB006A12GM3T	1200	200	6	Half-Bridge, AlN Substrate, Pre-Applied TIM
	CAB006A12GM3	1200	200	6	Half-Bridge, AlN Substrate
	CAB006M12GM3T	1200	200	6	Half-Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CAB006M12GM3	1200	200	6	Half-Bridge, Al ₂ O ₃ Substrate
	CAB004M12GM4T	1200	200	4	Half-Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CAB004M12GM4	1200	200	4	Half-Bridge, Al ₂ O ₃ Substrate
	CAB7R5A23GM4T	2300	180	7.5	Half-Bridge, AlN Substrate, Pre-Applied TIM
	CAB7R5A23GM4	2300	180	7.5	Half-Bridge, AlN Substrate
	CAB6R0A23GM4T	2300	200	6	Half-Bridge, AlN Substrate, Pre-Applied TIM
	CAB6R0A23GM4	2300	200	6	Half-Bridge, AlN Substrate
	CAB5R0A23GM4T	2300	200	5	Half-Bridge, AlN Substrate, Pre-Applied TIM
	CAB5R0A23GM4	2300	200	5	Half-Bridge, AlN Substrate

	Part Number	Blocking Voltage (V)	Nominal Current (A)	R _{DS(ON)} (mΩ) at 25°C	Description
F PLATFORM std. 33.8 mm	CBB032M12FM3T	1200	39	32	Full Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CBB032M12FM3	1200	39	32	Full Bridge, Al ₂ O ₃ Substrate
	CCB032M12FM3T	1200	30	32	Six-Pack, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CCB032M12FM3	1200	30	32	Six-Pack, Al ₂ O ₃ Substrate
	CBB021M12FM3T	1200	50	21	Full Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CBB021M12FM3	1200	50	21	Full Bridge, Al ₂ O ₃ Substrate
	CCB021M12FM3T	1200	30	21	Six-Pack, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CCB021M12FM3	1200	30	21	Six-Pack, Al ₂ O ₃ Substrate
	CBB017M12FM4T*	1200	60	17	Full Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CBB017M12FM4*	1200	60	17	Full Bridge, Al ₂ O ₃ Substrate
	CAB016M12FM3T	1200	78	16	Half-Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CAB016M12FM3	1200	78	16	Half-Bridge, Al ₂ O ₃ Substrate
	CAB011M12FM3T	1200	105	11	Half-Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CAB011M12FM3	1200	105	11	Half-Bridge, Al ₂ O ₃ Substrate
	CAB008M12FM4T*	1200	105	8	Half-Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CAB008M12FM4*	1200	105	8	Half-Bridge, Al ₂ O ₃ Substrate

*Coming Soon

	Part Number	Blocking Voltage (V)	Nominal Current (A)	R _{DS(ON)} (mΩ) at 25°C	Description
B PLATFORM standard 62 mm	CAS110M12BM2	1200	110	12.5	Half-Bridge, C3M™ MOSFETs + Schottky Diodes
	WAS110M12BM2	1200	110	12.5	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes
	CAS300M12BM2	1200	300	4.2	Half-Bridge, C3M™ MOSFETs + Schottky Diodes
	WAS300M12BM2	1200	300	4.2	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes
	CAS175M12BM3	1200	175	8	Half-Bridge, C3M™ MOSFETs + Schottky Diodes
	CAS175M12BM3T*	1200	175	8	Half-Bridge, C3M™ MOSFETs + Schottky Diodes, Pre-Applied TIM
	WAS175M12BM3	1200	175	8	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes
	WAS175M12BM3T*	1200	175	8	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
	HAS175M12BM3	1200	175	8	Half-Bridge, Harsh Environment (CTI 600 Plastic), THB-80 Qualified, C3M MOSFETs + Schottky Diodes
	HAS175M12BM3T*	1200	175	8	Half-Bridge, Harsh Environment (CTI 600 Plastic), THB-80 Qualified, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
	CAS350M12BM3	1200	350	4	Half-Bridge, C3M MOSFETs + Schottky Diodes
	CAS350M12BM3T*	1200	350	4	Half-Bridge, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
	WAS350M12BM3	1200	350	4	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes
	WAS350M12BM3T*	1200	350	4	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
	HAS350M12BM3	1200	350	4	Half-Bridge, Harsh Environment (CTI 600 Plastic), THB-80 Qualified, C3M MOSFETs + Schottky Diodes
	HAS350M12BM3T*	1200	350	4	Half-Bridge, Harsh Environment (CTI 600 Plastic), THB-80 Qualified, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
	CAB530M12BM3	1200	530	2.7	Half-Bridge, C3M MOSFETs
	CAB530M12BM3T*	1200	530	2.7	Half-Bridge, C3M MOSFETs, Pre-Applied TIM
	CAS530M12BM3	1200	530	2.7	Half-Bridge, C3M MOSFETs + Schottky Diodes
	CAS530M12BM3T*	1200	530	2.7	Half-Bridge, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
WAS530M12BM3	1200	530	2.7	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes	
WAS530M12BM3T*	1200	530	2.7	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM	
HAS530M12BM3	1200	530	2.7	Half-Bridge, Harsh Environment (CTI 600 Plastic), THB-80 Qualified, C3M MOSFETs + Schottky Diodes	
HAS530M12BM3T*	1200	530	2.7	Half-Bridge, Harsh Environment (CTI 600 Plastic), THB-80 Qualified, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM	

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Part Number	Blocking Voltage (V)	Nominal Current (A)	R _{DS(ON)} (mΩ) at 25°C	Description
CAS310M17BM3	1700	310	5	Half-Bridge, C3M MOSFETs + Schottky Diodes
CAS310M17BM3T*	1700	310	5	Half-Bridge, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
WAS310M17BM3	1700	310	5	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes
WAS310M17BM3T*	1700	310	5	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
HAS310M17BM3	1700	310	5	Half-Bridge, Harsh Environment (CTI 600 Plastic), THB-80 Qualified, C3M MOSFETs + Schottky Diodes
HAS310M17BM3T*	1700	310	5	Half-Bridge, Harsh Environment (CTI 600 Plastic), THB-80 Qualified, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM

L PLATFORM
standard 144 mm

CAB600M33LM3	3300	770	2.7	Half-Bridge, Industrial Qualified, C3M MOSFETs
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X PLATFORM
optimized 53 mm

CAB400M12XM3	1200	400	4	Half-Bridge, C3M MOSFETs
CAB425M12XM3	1200	425	3.2	Half-Bridge, C3M MOSFETs
CAB450M12XM3	1200	450	2.6	Half-Bridge, C3M Conduction-Optimized MOSFETs
EAB450M12XM3	1200	450	2.6	Automotive grade, Half-Bridge, C3M Conduction-Optimized MOSFETs
CAB525F12XM3	1200	525	3.2	Half-Bridge, C3M MOSFETs, Pin Fin Baseplate
CAB320M17XM3	1700	320	4	Half-Bridge, C3M MOSFETs

H PLATFORM
optimized 62 mm

CAS480M12HM3	1200	480	2.29	Half-Bridge, C3M MOSFETs + Schottky Diodes
CAR600M12HN6	1200	600	N/A	Half-Bridge Rectifier, Gen 6 Schottky Diodes
CAB760M12HM3	1200	765	1.33	Half-Bridge, C3M MOSFETs
CAB760M12HM3R	1200	760	1.33	Half-Bridge Right GK for Paralleling, C3M MOSFETs
CAS380M17HM3	1700	380	3.3	Half-Bridge, C3M MOSFETs + Schottky Diodes
CAB500M17HM3	1700	500	2.5	Half-Bridge, C3M MOSFETs
CAR600M17HN6	1700	600	N/A	Half-Bridge Rectifier, Gen 6 Schottky Diodes
CAB650M17HM3	1700	650	1.67	Half-Bridge, C3M MOSFETs
CLB650M17HM3*	1700	650	1.67	Common-Source, C3M MOSFETs

D PLATFORM
Optimized 40.8 mm

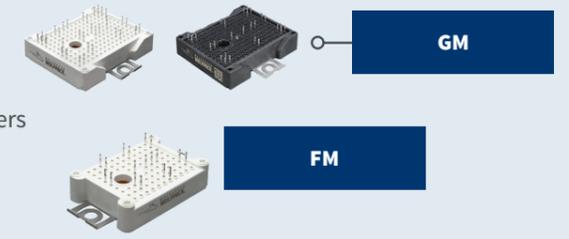
CAB003M09DM3	900	350	2.5	Half-Bridge, C3M MOSFETs
CAB3R5M12DM4	1200	350	3.5	Half-Bridge, C4M MOSFETs

*Coming Soon

Wolfspeed WolfPACK™ F & G MODULE PLATFORMS

DELIVERING THE INDUSTRY'S HIGHEST POWER DENSITY IN ITS CLASS FOR UNSURPASSED EFFICIENCY

Wolfspeed WolfPACK™ Silicon Carbide Power Modules enable multiple configurations across power levels in multiple applications. The new GM3 Aluminum Nitride Substrate dramatically reduces thermal resistance, lowers junction temperature for given loss, enhances power cycling lifetime for given losses, and enables higher utilization of Silicon Carbide performance.



Module Size:

F platform | 62.8 mm x 33.8 mm
G platform | 62.8 mm x 56.7 mm

Topology:

F platform | six-pack / half-bridge / full-bridge
G platform | Six-pack/ half-bridge / full-bridge / t-type



FEATURES

- Leading Silicon Carbide MOSFET Technology in an Industry Standard Form Factor
- Highest Current Rated Topologies Commercially Available In Class
- Built in NTC
- Press Fit Connections
- High performance Aluminum Nitride (AlN) Substrate
- Available with Pre-Applied TIM



BENEFITS

- Maximum Power Density In Class
- Ease Of Layout and Assembly
- System Scalability and Reliability
- End To End Support - Simulation Through Reference Hardware
- Simpler Cooling Systems and Smaller Systems



APPLICATIONS

- EV Fast Charging
- UPS
- Induction Heating and Welding Industrial
- Motor Drives
- Industrial Power Supply
- Solar
- Renewable Energy Storage

	Part Number	Blocking Voltage (V)	Nominal Current (A)	R _{DS(ON)} (mΩ) at 25°C	Description
G PLATFORM std. 56.7 mm	CCB016M12GM3T	1200	50	16	Six-Pack, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CCB016M12GM3	1200	50	16	Six-Pack, Al ₂ O ₃ Substrate
	CBB011M12GM4T	1200	107	11	Full-Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CBB011M12GM4	1200	107	11	Full-Bridge, Al ₂ O ₃ Substrate
	CHB011M12GM4T	1200	102	11	T-Type, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CHB011M12GM4	1200	102	11	T-Type, Al ₂ O ₃ Substrate
	CAB011A12GM3T	1200	141	11	Half-Bridge, AlN Substrate, Pre-Applied TIM
	CAB011A12GM3	1200	141	11	Half-Bridge, AlN Substrate
	CAB008M12GM3T	1200	146	8	Half-Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CAB008M12GM3	1200	146	8	Half-Bridge, Al ₂ O ₃ Substrate
	CAB008A12GM3T	1200	194	8	Half-Bridge, AlN Substrate, Pre-Applied TIM
	CAB008A12GM3	1200	194	8	Half-Bridge, AlN Substrate
	CAB006A12GM3T	1200	200	6	Half-Bridge, AlN Substrate, Pre-Applied TIM
	CAB006A12GM3	1200	200	6	Half-Bridge, AlN Substrate

	Part Number	Blocking Voltage (V)	Nominal Current (A)	R _{DS(ON)} (mΩ) at 25°C	Description
G PLATFORM std. 56.7 mm	CAB006M12GM3T	1200	200	6	Half-Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CAB006M12GM3	1200	200	6	Half-Bridge, Al ₂ O ₃ Substrate
	CAB004M12GM4T	1200	200	4	Half-Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CAB004M12GM4	1200	200	4	Half-Bridge, Al ₂ O ₃ Substrate
	CAB7R5A23GM4T	2300	180	7.5	Half-Bridge, AlN Substrate, Pre-Applied TIM
	CAB7R5A23GM4	2300	180	7.5	Half-Bridge, AlN Substrate
	CAB6R0A23GM4T	2300	200	6	Half-Bridge, AlN Substrate, Pre-Applied TIM
	CAB6R0A23GM4	2300	200	6	Half-Bridge, AlN Substrate
	CAB5R0A23GM4T	2300	200	5	Half-Bridge, AlN Substrate, Pre-Applied TIM
	CAB5R0A23GM4	2300	200	5	Half-Bridge, AlN Substrate

F PLATFORM std. 33.8 mm	CBB032M12FM3T	1200	39	32	Full Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CBB032M12FM3	1200	39	32	Full Bridge, Al ₂ O ₃ Substrate
	CCB032M12FM3T	1200	30	32	Six-Pack, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CCB032M12FM3	1200	30	32	Six-Pack, Al ₂ O ₃ Substrate
	CBB021M12FM3T	1200	50	21	Full Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CBB021M12FM3	1200	50	21	Full Bridge, Al ₂ O ₃ Substrate
	CBB017M12FM4T*	1200	60	17	Full Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CBB017M12FM4*	1200	60	17	Full Bridge, Al ₂ O ₃ Substrate
	CCB021M12FM3T	1200	30	21	Six-Pack, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CCB021M12FM3	1200	30	21	Six-Pack, Al ₂ O ₃ Substrate
	CAB016M12FM3T	1200	78	16	Half-Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CAB016M12FM3	1200	78	16	Half-Bridge, Al ₂ O ₃ Substrate
	CAB011M12FM3T	1200	105	11	Half-Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM
	CAB011M12FM3	1200	105	11	Half-Bridge, Al ₂ O ₃ Substrate
CAB008M12FM4T*	1200	105	8	Half-Bridge, Al ₂ O ₃ Substrate, Pre-Applied TIM	
CAB008M12FM4*	1200	105	8	Half-Bridge, Al ₂ O ₃ Substrate	

*Coming Soon

B MODULE PLATFORM

WOLFSPEED'S 62 MM HALF-BRIDGE SILICON CARBIDE POWER MODULES SUPPORT RAPID SYSTEM DEVELOPMENT

Wolfspeed's 62mm power module platform provides the system benefits of Silicon Carbide while maintaining the robust, industry-standard 62 mm module package. The internal design of Wolfspeed's 62 mm BM package enables high speed Silicon Carbide switching benefits, due to the low-inductance layout. Choose from silicon nitride ceramic for sustained maximum junction temperature operation, or aluminum nitride ceramic for reduced thermal resistance with robust CTE matching. Wolfspeed power modules are backed by industry leading Silicon Carbide technology and a broad portfolio of current and voltage ratings available to fit diverse industrial application requirements.

MODULE SIZE:
106 x 62 x 30 (mm)

TOPOLOGY:
Half-Bridge

SUPPORTING GATE DRIVER:
CGD1200HB2P-BM2 for 1200 V BM2 modules
CGD1200HB2P-BM3 for 1200 V BM3 modules
CGD1700HB2P-BM3 for 1700 V BM3 modules

SUPPORTING EVALUATION KIT:
KIT-CRD-CIL12N-BM
KIT-CRD-CIL17N-BM



FEATURES

Copper Baseplate, Silicon Nitride and Aluminum Nitride Ceramics
Low Inductance Design (10 – 11nH)



BENEFITS

Improved Thermal Conductivity
Faster Time to Market
Reduced Cooling & System Costs
Low Power Losses & Maximum Voltage Utilization



APPLICATIONS

Railway Technology
EV Fast Charging
On-Board Charging
Industrial Automation & Testing
Renewable Energy

	Part Number	Blocking Voltage (V)	Nominal Current (A)	R _{DS(ON)} (mΩ) at 25°C	Description
B PLATFORM standard 62 mm	CAS110M12BM2	1200	110	12.5	Half-Bridge, C3M™ MOSFETs + Schottky Diodes
	WAS110M12BM2	1200	110	12.5	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes
	CAS300M12BM2	1200	300	4.2	Half-Bridge, C3M™ MOSFETs + Schottky Diodes
	WAS300M12BM2	1200	300	4.2	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes
	CAS175M12BM3	1200	175	8	Half-Bridge, C3M™ MOSFETs + Schottky Diodes
	CAS175M12BM3T*	1200	175	8	Half-Bridge, C3M™ MOSFETs + Schottky Diodes, Pre-Applied TIM
	WAS175M12BM3	1200	175	8	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes
	WAS175M12BM3T*	1200	175	8	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
	HAS175M12BM3	1200	175	8	Half-Bridge, Harsh Environment (CTI 600 Plastic), THB-80 Qualified, C3M MOSFETs + Schottky Diodes

Part Number	Blocking Voltage (V)	Nominal Current (A)	R _{DS(ON)} (mΩ) at 25°C	Description
HAS175M12BM3T*	1200	175	8	Half-Bridge, Harsh Environment (CTI 600 Plastic), THB-80 Qualified, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
CAS350M12BM3	1200	350	4	Half-Bridge, C3M MOSFETs + Schottky Diodes
CAS350M12BM3T*	1200	350	4	Half-Bridge, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
WAS350M12BM3	1200	350	4	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes
WAS350M12BM3T*	1200	350	4	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
HAS350M12BM3	1200	350	4	Half-Bridge, Harsh Environment (CTI 600 Plastic), THB-80 Qualified, C3M MOSFETs + Schottky Diodes
HAS350M12BM3T*	1200	350	4	Half-Bridge, Harsh Environment (CTI 600 Plastic), THB-80 Qualified, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
CAB530M12BM3	1200	530	2.7	Half-Bridge, C3M MOSFETs
CAB530M12BM3T*	1200	530	2.7	Half-Bridge, C3M MOSFETs, Pre-Applied TIM
CAS530M12BM3	1200	530	2.7	Half-Bridge, C3M MOSFETs + Schottky Diodes
CAS530M12BM3T*	1200	530	2.7	Half-Bridge, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
WAS530M12BM3	1200	530	2.7	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes
WAS530M12BM3T*	1200	530	2.7	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
HAS530M12BM3	1200	530	2.7	Half-Bridge, Harsh Environment (CTI 600 Plastic), THB-80 Qualified, C3M MOSFETs + Schottky Diodes
HAS530M12BM3T*	1200	530	2.7	Half-Bridge, Harsh Environment (CTI 600 Plastic), THB-80 Qualified, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
CAS310M17BM3	1700	310	5	Half-Bridge, C3M MOSFETs + Schottky Diodes
CAS310M17BM3T*	1700	310	5	Half-Bridge, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
WAS310M17BM3	1700	310	5	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes
WAS310M17BM3T*	1700	310	5	Half-Bridge, THB-80 Qualified, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM
HAS310M17BM3	1700	310	5	Half-Bridge, Harsh Environment (CTI 600 Plastic), THB-80 Qualified, C3M MOSFETs + Schottky Diodes
HAS310M17BM3T*	1700	310	5	Half-Bridge, Harsh Environment (CTI 600 Plastic), THB-80 Qualified, C3M MOSFETs + Schottky Diodes, Pre-Applied TIM

*Coming Soon

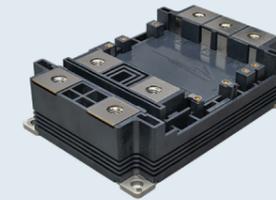
L MODULE PLATFORM

ENABLING HIGH EFFICIENCY AND RELIABILITY IN HIGH-POWER APPLICATIONS

Wolfspeed has developed the LM power module platform to provide the benefits of silicon carbide in applications that require increased power density, high reliability, faster switching and long lifetime. The LM module enables 175°C continuous junction temperature operation with high thermal conductivity Silicon Nitride (Si3N4) substrate to ensure mechanical robustness under extreme conditions and a lightweight AlSiC baseplate. The 3300 V power modules are a perfect fit for demanding applications such as heavy equipment, solid state circuit breakers, industrial UPSs and motor drives, and more.

MODULE SIZE:
144 x 100 x 40 (mm)

TOPOLOGY:
Half-Bridge



FEATURES

- Low RDS(ON)
- AlSiC baseplate
- High thermal conductivity AMB SiN substrates (90 W/m·K at 25°C)
- Exemplary thermal-mechanical cycling performance
- Low stray Inductance (10 nH)



BENEFITS

- Faster switching speeds and higher efficiencies than Si IGBTs
- Lower system-level volume, weight, and cost
- Candidate for reduced or no cooling requirements
- Wide operating temperature range, -55°C to 175°C



APPLICATIONS

- Heavy Duty Industrial E-Mobility
- Ultra-Fast DC Chargers
- Industrial Motor Drives
- Industrial Uninterruptible Power Supply (UPS) Systems
- Marine and Aerospace Propulsion
- Terrestrial Power Distribution Systems
- High Voltage Direct Current (HVDC) and Flexible AC Transmission System (FACTS) Controllers

	Part Number	Blocking Voltage (V)	Nominal Current (A)	R _{DS(ON)} (mΩ) at 25°C	Description
L PLATFORM standard 144 mm	CAB600M33LM3	3300	770	2.7	Half-Bridge, Industrial Qualified, C3M MOSFETs

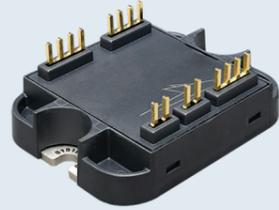
D MODULE PLATFORM

DESIGNED TO OFFER HIGH CURRENT CAPABILITY IN A SMALL AND LIGHT FORM FACTOR

Wolfspeed's DM module family is designed to offer high current capability in a very low mass and low volume form factor. DM allows designers to develop high power density Silicon Carbide converters for weight and space constrained applications. The optimized packaging enables 175°C continuous junction operation, with a high reliability Silicon Nitride (Si₃N₄) power substrate to ensure mechanical robustness and a lightweight AlSiC baseplate.

MODULE SIZE:
51.6 x 40.8 (mm)

TOPOLOGY:
Half-Bridge



FEATURES

- High power density footprint
- Ultra low mass (41 g)
- High junction temperature (175°C) operation
- Implements Wolfspeed's Third Generation SiC MOSFET Technology



BENEFITS

- Enables compact, lightweight power conversion systems
- Increased system efficiency
- Reduced thermal requirements and system cost



APPLICATIONS

- E-Mobility Inverters
- EV Chargers
- High-Efficiency Converters / Inverters
- Renewable Energy

D PLATFORM standard 51.6 mm	Part Number	Blocking Voltage (V)	Nominal Current (A)	R _{DS(ON)} (mΩ) at 25°C	Description
	CAB003M09DM3	900	350	2.5	Half-Bridge, C3M MOSFETs
CAB3R5M12DM4	1200	350	3.5	Half-Bridge, C4M MOSFETs	

X MODULE PLATFORM

ENABLER TO MAXIMIZE POWER DENSITY WHILE MINIMIZING LOOP INDUCTANCE AND SIMPLIFY POWER BUSSING

Wolfspeed has developed the XM3 power module platform to maximize the benefits of Silicon Carbide while keeping the module and system design robust, simple, and cost effective. With half the weight and volume of a standard 62 mm module, the XM3 power module maximizes power density while minimizing loop inductance and enabling simple power bussing. The XM3's Silicon Carbide optimized packaging enables 175°C continuous junction operation with a high reliability silicon nitride (Si₃N₄) power substrate to ensure mechanical robustness under extreme conditions.

SUPPORTING GATE DRIVER:

- CGD12HBXMP
- FRDMGD3160XM3EVM
- CGD1700HB2P-XM3
- UCC5880QEVMM-057
- UCC5880INVERTEREVM

MODULE SIZE:
80 x 53 x 19 (mm)

TOPOLOGY:
Half-Bridge

SUPPORTING EVALUATION KIT:

- KIT-CRD-CIL12N-XM3
- KIT-CRD-CIL17N-XM3

SUPPORTING REFERENCE DESIGNS:

- CRD***DA12E-XM3
- ***=200, 250, 300, 600



FEATURES

- 50% Smaller/Lighter than Standard 62 mm Footprint
- Conduction Loss / Switching Loss Optimized Versions
- Allow For Simple and Low-Inductance Busbar Interconnection
- High Reliability Power Substrate to Address Demanding Markets



BENEFITS

- Lightweight, Compact Form Factor with 62 mm Compatible Baseplate Enables System Retrofit
- Increased System Efficiency, Due to Low Switching & Conduction Losses of Silicon Carbide
- High Reliability, Robust Material Selection



APPLICATIONS

- Traction Inverter / Motor Drive
- Power Supplies / UPS
- Test and Production Equipment
- Aerospace / eVTOL
- EV Fast Charging
- Medical

X PLATFORM standard 52 mm	Part Number	Blocking Voltage (V)	Nominal Current (A)	R _{DS(ON)} (mΩ) at 25°C	Description
	CAB400M12XM3	1200	400	4	Half-Bridge, C3M™ Switching-Optimized MOSFETs
CAB425M12XM3	1200	425	3.2	Half-Bridge, C3M Switching-Optimized MOSFETs	
CAB450M12XM3	1200	450	2.6	Half-Bridge, C3M Conduction-Optimized MOSFETs	
EAB450M12XM3	1200	450	2.6	Automotive grade, Half-Bridge, C3M Conduction-Optimized MOSFETs	
CAB525F12XM3	1200	525	3.2	Half-Bridge, C3M MOSFETs, Pin Fin Baseplate	
CAB320M17XM3	1700	320	4	Half-Bridge, C3M MOSFETs	

H MODULE PLATFORM

THE BEST-IN-CLASS 62 MM SILICON CARBIDE MODULES AT WOLFSPEED'S **HIGHEST POWER DENSITY, LOWEST INDUCTANCE IN A LIGHTWEIGHT & COMPACT PACKAGE DESIGN**

Wolfspeed has developed the HM power module platform to provide the benefits of Silicon Carbide in power density sensitive applications while maintaining the baseplate compatibility of a 62 mm module. The HM platform's Silicon Carbide optimized packaging enables

175°C continuous junction operation with a high-reliability Silicon Nitride (Si₃N₄) power substrate to ensure mechanical robustness under extreme conditions and a lightweight ALSiC baseplate.

SUPPORTING GATE DRIVER:

CGD1700HB3P-HM3

SUPPORTING EVALUATION KIT:

KIT-CRD-CIL12N-HM3

KIT-CRD-CIL17N-HM3

MODULE SIZE:

110 mm x 65 mm x 12.2 mm

TOPOLOGY:

Half-Bridge



FEATURES

Low Inductance, Low Profile 62 mm Footprint

High Junction Temperature (175 °C) Operation

Light Weight ALSiC Baseplate

High Reliability Silicon Nitride Insulator



BENEFITS

Lightweight, Compact Form Factor with 62 mm Compatible Baseplate Enables System Retrofit

Increased System Efficiency, Due to Low Switching & Conduction Losses of Silicon Carbide

High Reliability Material Selection



APPLICATIONS

Railway Technology

High Performance Motor Sports

EV Fast Charging

On-Board Charging

Industrial Automation & Testing

Medical power

	Part Number	Blocking Voltage (V)	Nominal Current (A)	R _{DS(ON)} (mΩ) at 25°C	Description
H PLATFORM optimized 62 mm	CAS480M12HM3	1200	480	2.29	Half-Bridge, C3M™ MOSFETs + Schottky Diodes
	CAR600M12HN6	1200	600	N/A	Half-Bridge Rectifier, Gen 6 Schottky Diodes
	CAB760M12HM3	1200	760	1.33	Half-Bridge, C3M MOSFETs
	CAB760M12HM3R	1200	760	1.33	Half-Bridge Right Signal Pins for Paralleling, C3M MOSFETs
	CAS380M17HM3	1700	380	3.3	Half-Bridge, C3M MOSFETs + Schottky Diodes
	CAB500M17HM3	1700	500	2.5	Half-Bridge, C3M MOSFETs
	CAR600M17HN6	1700	600	N/A	Half-Bridge Rectifier, Gen 6 Schottky Diodes
	CAB650M17HM3	1700	650	1.67	Half-Bridge, C3M MOSFETs

DISCRETES

WOLFSPEED DISCRETE MOSFETS AND DIODES: MAXIMIZE SYSTEM EFFICIENCY WHILE KEEPING YOUR SYSTEM COST IN CHECK

As pioneers of the first commercially released AEC-Q101 SiC Schottky diode and MOSFET, we know that designing systems for tough operating conditions while meeting strict industry standards sometimes requires the utmost flexibility to optimize your layout.

With Wolfspeed MOSFETs, you can reduce conduction losses and maximize system efficiency – our portfolio

achieves a 20% lower RDS_(on) over temperature at 125C over comparable devices in the market.

You can also drive design-to-cost optimization with flexibility to upgrade your system design with our 17 industry-standard package footprints for power ranging from 1 kW to 60 kW.

WOLFSPEED® DISCRETE POWER | PACKAGE GUIDE

MOSFETS	D	M	K	K1	J	J1	J2	L	P
	TO-247-3	TO-247-3PF	TO-247-4	TO-247-4 LP	TO-263-7	TO-263-7 XL	TO-263-7 XL	TOLL	TO-247-4 PLUS
	Std. Package	No Back Metal	Kelvin Lead	Kelvin Lead Low Profile	Small Drain Footprint	Larger Drain Footprint	Automotive Qualified	TO-Lead Less	Kelvin Lead

Schottky Diodes	A	D	D1	E	F	G	H	I	Q
	TO-220-2	TO-247-3	TO-247-3	TO-252-2	TO-220-2-F2	TO-263-2	TO-247-2	TO-220-2-ISO	QFN 8x8
	Std. Package	Dual Die	Single Die	Smaller Footprint	No Back Metal	Better Thermals	More Creepage	Isolated Metal Tab	Smallest Footprint

WOLFSPEED® DISCRETE POWER | DEVICE NOMENCLATURE GUIDE

Example: C3M0060065D

	C	3	M	0060	065	D
	-	-	-	----	---	--
MOSFETS	Qualification Grade	Product Series	Device Type	Typ R _{ds(on)} @ 25C	Voltage Rating	Package
	C = Industrial E = Automotive	2 3 ...	M = MOSFET	Ex = 0060 = 60 mΩ	Ex = 065 = 650 V	D = TO-247-3 K1 = TO-247-4-LP K = TO-247-4 J = TO-263-7 J1, J2 = TO-263-7-XL L = TOLL P = TO-247-4-PLUS

	E	4	D	20	120	D
	-	-	-	----	---	--
Schottky Diodes	Qualification Grade	Product Series	Device Type	Current Rating	Voltage Rating	Package
	C = Industrial	2 3 4 ...	D = Diode	Ex = 20 = 20 A	Ex = 120 = 1200 V	A = TO-220-2 D = TO-247-3 D1 = TO-247-3 E = TO-252-2 F = TO-220-2-F2 G = TO-263-2 H = TO-247-2 I = TO-220-2-ISO Q = QFN 8X8

650 V SILICON CARBIDE MOSFETS

BROADEST PORTFOLIO OF 650 V SILICON CARBIDE MOSFETS FOR EFFICIENCY

Wolfspeed is proud to offer our 3rd-Generation 650 V MOSFETs, enabling smaller, lighter, and highly efficient power conversion in an even wider range of power systems.

The 650 V MOSFET product family is ideal for applications including high performance industrial power supplies, server/telecom power, electric vehicle charging systems, energy storage systems, uninterruptible power supplies, and battery management systems.

FEATURED DESIGN TOOLS



3.6 kW Bridgeless Totem-Pole PFC
CRD-03600AD065E-L



6.6 kW High Frequency DC-DC Converter
CRD-06600DD065N



6.6 kW High Power Density Bi-Directional EV On-Board Charger
CRD-06600FF065N-K



SpeedVal™ Kit Modular Evaluation Platform
SpeedVal™ Kit



FEATURES

- Low $R_{DS(ON)}$ over Temperature
- Low Device Capacitances
- Kelvin Source Pin
- High Temperature Operation ($T_J = 175^\circ\text{C}$)
- Fast Diode with Ultra Low Reverse Recovery



BENEFITS

- Improves System Efficiency with Lower Conduction Losses
- Enables High Switching Frequency Operation
- Improves System Level Power Density
- Reduces System Size, Weight, and Cooling Requirements
- Enables New Hard Switching Topologies (Totem-Pole PFC)



APPLICATIONS

- On-Board Charger
- Industrial Power Supplies
- Server/Telecom
- EV Fast Charging
- Energy Storage Systems (ESS)
- Uninterruptible Power Supplies (UPS)
- Battery Management Systems (BMS)

Part Number	Qualification	Blocking Voltage (V)	$R_{DS(ON)}$ at 25°C	Current Rating at 25°C (A)	Package
C3M0015065D	Industrial	650	15 mΩ	120	TO-247-3
C3M0015065K	Industrial	650	15 mΩ	120	TO-247-4
C3M0025065D	Industrial	650	25 mΩ	97	TO-247-3
C3M0025065J1	Industrial	650	25 mΩ	80	TO-263-7
C3M0025065K	Industrial	650	25 mΩ	97	TO-247-4
C3M0025065L	Industrial	650	25 mΩ	77	TOLL
C3M0045065D	Industrial	650	45 mΩ	49	TO-247-3
C3M0045065J1	Industrial	650	45 mΩ	47	TO-263-7
C3M0045065K	Industrial	650	45 mΩ	49	TO-247-4
C3M0045065L	Industrial	650	45 mΩ	49	TOLL
C3M0060065D	Industrial	650	60 mΩ	29	TO-247-3
C3M0060065J	Industrial	650	60 mΩ	36	TO-263-7
C3M0060065L	Industrial	650	60 mΩ	39	TOLL
C3M0060065K	Industrial	650	60 mΩ	37	TO-247-4

750 V SILICON CARBIDE MOSFETS

WOLFSPEED® SILICON CARBIDE SOLUTIONS ENABLING HIGHER SYSTEM DENSITY

Wolfspeed's 750 V silicon carbide MOSFETs enable smaller, lighter, and highly-efficient power conversion in a wider range of power systems. The new featured low-profile package provides improved assembly performance through increased solderability, thinner Gate and Kelvin pins reducing risk of solder bridging, and lower package inductance.

The 750 V MOSFET product family is ideal for applications including high performance industrial power supplies, server/telecom power, electric vehicle charging systems, energy storage systems, uninterruptible power supplies, and battery management systems.

FEATURED DESIGN TOOLS



SpeedVal™ Kit Modular Evaluation Platform
SpeedVal™ Kit



FEATURES

- Optimized package with separate driver source pin
- Through hole, surface mount and top side cooled packages available
- High blocking voltage with low on-resistance
- High-speed switching with low capacitances
- Fast intrinsic diode with low reverse recovery (Q_{rr})



BENEFITS

- Reduce switching losses and minimize gate ringing
- Higher system efficiency
- Reduce cooling requirements
- Increase power density
- Increase system switching frequency



APPLICATIONS

- Motor Control
- EV On and Off Board Chargers
- High Voltage DC/DC Converters
- Power Supply
- Solar/ESS
- UPS
- EV HVAC Motor Drives
- Fuel Cell Vehicle Converters

Part Number	Qualification	Blocking Voltage (V)	$R_{DS(ON)}$ at 25°C	Current Rating (A)	Package
E4M0015075J2	Automotive	750	15	156	TO-263-7 XL
C3M0015075K1	Industrial	750	15	128	TO-247-4 LP
E4M0015075K1	Automotive	750	15	128	TO-247-4 LP
E4M0025075J2	Automotive	750	25	84	TO-263-7 XL
C3M0025075K1	Industrial	750	25	80	TO-247-4 LP
E4M0025075K1	Automotive	750	25	80	TO-247-4 LP
E4M0045075J2	Automotive	750	45	46	TO-263-7 XL
C3M0045075K1	Industrial	750	45	42	TO-247-4 LP
E4M0045075K1	Automotive	750	45	42	TO-247-4 LP
E4M0060075J2	Automotive	750	60	36	TO-263-7 XL
C3M0060075K1	Industrial	750	60	35	TO-247-4 LP
E4M0060075K1	Automotive	750	60	35	TO-247-4 LP

1200 V SILICON CARBIDE MOSFETS

BROADEST PORTFLIO OF 1200 V SILICON CARBIDE MOSFETS FOR EFFICIENCY

Wolfspeed's latest generation of Silicon Carbide MOSFETs set the standard for performance, ruggedness and ease of design-in. Extremely fast switching, ultra-low switching losses, stable

conduction losses over temperature assure significant improvement of system efficiency, power density and overall BOM cost versus silicon MOSFET and IGBT incumbants.

FEATURED DESIGN TOOLS



30 kW DISCRETE INTERLEAVED LLC DC-DC CONVERTER
CRD30DD12N-K



60 kW INTERLEAVED BOOST CONVERTER
CRD-60DD12N



FEATURES

- Low $R_{DS(ON)}$ Over Temperature
- Fast, rugged intrinsic Silicon Carbide body diode
- High Temperature Operation ($T_j=175^\circ\text{C}$)



BENEFITS

- Lowest Possible Switching and Conduction Losses
- Minimizes System Heat-Sink Requirement
- Enables High Power Density Designs



APPLICATIONS

- Energy Storage
- Solar Inverters
- EV On and Off Board Chargers
- UPS and Motor Drive
- EV HVAC Motor Drives
- Auxiliary Power Supply

Part Number	Qualification	Blocking Voltage (V)	$R_{DS(ON)}$ at 25°C	Current Rating at 25°C (A)	Package
E4M0013120K	Automotive	1200	13	153	TO-247-4
C3M0016120K1	Industrial	1200	16	125	TO-247-4 LP
E3M0016120K	Automotive	1200	16	125	TO-247-4
C3M0016120D	Industrial	1200	16	115	TO-247-3
C3M0016120K	Industrial	1200	16	115	TO-247-4
E3M0021120J2	Automotive	1200	21	114	TO-263-7 XL
C3M0021120J2	Industrial	1200	21	114	TO-263-7 XL
E3M0021120K	Automotive	1200	21	104	TO-247-4
C3M0021120K1	Industrial	1200	21	104	TO-247-4 LP
C3M0021120K	Industrial	1200	21	100	TO-247-4
C3M0021120D	Industrial	1200	21	81	TO-247-3
E3M0032120J2	Automotive	1200	32	74	TO-263-7 XL
C3M0032120J2	Industrial	1200	32	74	TO-263-7 XL
C3M0032120J1	Industrial	1200	32	68	TO-263-7 XL
E3M0032120K	Automotive	1200	32	67	TO-247-4
C3M0032120K1	Industrial	1200	32	67	TO-247-4 LP
C3M0032120K	Industrial	1200	32	63	TO-247-4
C3M0032120D	Industrial	1200	32	63	TO-247-3
C3M0040120K	Industrial	1200	40	66	TO-247-4
C3M0040120D	Industrial	1200	40	66	TO-247-3
C3M0040120J1	Industrial	1200	40	64	TO-263-7 XL
E3M0040120J2	Automotive	1200	40	63	TO-263-7 XL

*Coming Soon

Part Number	Qualification	Blocking Voltage (V)	$R_{DS(ON)}$ at 25°C	Current Rating at 25°C (A)	Package
C3M0040120J2	Industrial	1200	40	63	TO-263-7 XL
E3M0040120K	Automotive	1200	40	57	TO-247-4
C3M0040120K1	Industrial	1200	40	57	TO-247-4 LP
C3M0060120J2*	Industrial	1200	60	48	TO-263-7 XL
C3M0060120K*	Industrial	1200	60	45	TO-247-4
C3M0060120K1*	Industrial	1200	60	43	TO-247-4 LP
E3M0075120J2	Automotive	1200	75	34	TO-263-7 XL
C3M0075120J2	Industrial	1200	75	34	TO-263-7 XL
C3M0075120K	Industrial	1200	75	32	TO-247-4
E3M0075120D	Automotive	1200	75	32	TO-247-3
E3M0075120K	Automotive	1200	75	32	TO-247-4
C3M0075120K-A	Industrial	1200	75	32	TO-247-4
C3M0075120D-A	Industrial	1200	75	32	TO-247-3
C3M0075120K1	Industrial	1200	75	32	TO-247-4 LP
C3M0075120J	Industrial	1200	75	30	TO-263-7
C3M0075120D	Industrial	1200	75	30	TO-247-3
E3M0160120J2	Automotive	1200	160	18	TO-263-7 XL
C3M0160120K1	Industrial	1200	160	18	TO-247-4 LP
C3M0160120D	Industrial	1200	160	17	TO-247-3
C3M0160120J	Industrial	1200	160	17	TO-263-7
E3M0160120K	Automotive	1200	160	17	TO-247-4
C3M0350120D	Industrial	1200	350	7.6	TO-247-3
C3M0350120J	Industrial	1200	350	7.2	TO-263-7

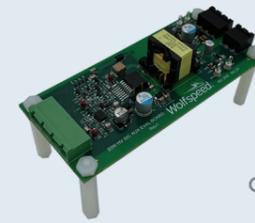
1700 V SILICON CARBIDE MOSFETS

FASTER SWITCHING, ENHANCED RELIABILITY FOR SUPERIOR POWER CONVERSION

Wolfspeed's 1700 V Silicon Carbide MOSFETs are optimized for superior versatility in auxiliary power supplies. The ultra-wide 12 V to 18 V turn-on gate

voltage range coupled with 0 V turn-off voltage enables simplified auxiliary power supply designs without the need for additional voltage regulators or negative bias.

FEATURED DESIGN TOOLS



60 VDC - 1000 VDC INPUT 25 W AUXILIARY POWER SUPPLY EVALUATION PLATFORM
KIT-CRD-025DD17P-J* (Coming Soon)



60 VDC - 1000 VDC INPUT 20 W HIGH-DENSITY AUXILIARY POWER SUPPLY
CRD-020DD17P-J* (Coming Soon)



FEATURES

- Wide $V_{gs(on)}$ Range: 12-18 V for Industrial and 12-15 V for Automotive
- Simple Turn Off with 0 V $V_{gs(off)}$
- High Speed Switching with Low Capacitances



BENEFITS

- Simplified Circuit Design
- Higher System Efficiency
- Increased System Switching Frequency



APPLICATIONS

- Auxiliary Power Supplies
- Switch Mode Power Supplies

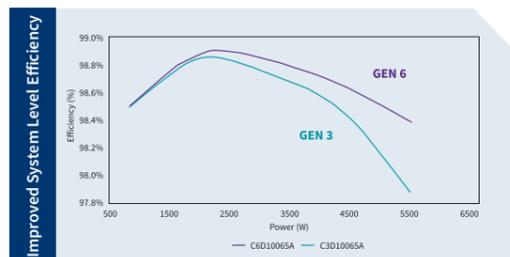
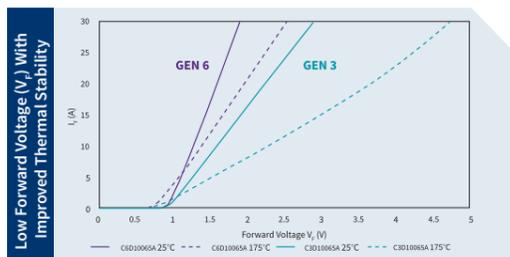
Part Number	Qualification	Blocking Voltage (V)	$R_{DS(ON)}$ at 25°C	Current Rating at 25°C (A)	Package
C3M0900170D	Industrial	1700	900 mΩ	4.4 A	TO-247-3
C3M0900170J	Industrial	1700	900 mΩ	4.4 A	TO-263-7
C3M0900170M	Industrial	1700	900 mΩ	4.0 A	TO-247-3 (FullPAK)
E3M0900170D	Automotive	1700	900 mΩ	4.4 A	TO-247-3
E3M0900170J	Automotive	1700	900 mΩ	4.4 A	TO-263-7

SILICON CARBIDE SCHOTTKY DIODES

Wolfspeed's Latest Generation (C6D) Schottky Diodes

Wolfspeed's Silicon Carbide diode portfolio offers multiple generations to meet diverse application requirements. Wolfspeed's continually expanding 6th generation Silicon Carbide Schottky diode family

offers best-in-class forward voltage drop (V_f (25 °C) = 1.27 V & V_f (175 °C) = 1.5 V). This improvement further reduces conduction losses and boosts overall system efficiency – even in the most demanding power conversion applications.



FEATURES

- Low V_f (25 °C) = 1.27 V & (175 °C) = 1.5 V
- Positive Temperature Co-efficient
- Zero Reverse Recovery
- Robust MPS Technology
- Low Figure of Merit ($Q_c \times V_f$)
- Wide Range of T_j (-55°C to 175°C)



BENEFITS

- Improved System Level Efficiency
- High Surge Current Capability
- High Frequency Operation
- Cost Effective High Power Density
- Easy Parallel Operation
- Reduced Heat Sink Requirements



APPLICATIONS

- Enterprise Power, Server, & Telecom
- Uninterruptible Power Supplies (UPS)
- Consumer Electronics
- Industrial Power Supplies
- Solar Energy Systems
- Medical Power Supplies

Part Number	Qualification	Blocking Voltage (V)	Current Rating at 25°C (A)	Package
C6D04065A	Industrial	650	4	TO-220-2
C6D04065E	Industrial	650	4	TO-252-2
C6D06065A	Industrial	650	6	TO-220-2
C6D06065E	Industrial	650	6	TO-252-2
C6D06065G	Industrial	650	6	TO-263-2
C6D06065Q	Industrial	650	6	QFN 8x8
C6D08065A	Industrial	650	8	TO-220-2
C6D08065E	Industrial	650	8	TO-252-2
C6D08065G	Industrial	650	8	TO-263-2
C6D08065Q	Industrial	650	8	QFN 8x8
C6D10065A	Industrial	650	10	TO-220-2
C6D10065E	Industrial	650	10	TO-252-2
C6D10065G	Industrial	650	10	TO-263-2
C6D10065Q	Industrial	650	10	QFN 8x8
C6D16065D	Industrial	650	16	TO-247-3
C6D16065H	Industrial	650	16	TO-247-2
C6D20065A	Industrial	650	20	TO-220-2
C6D20065D	Industrial	650	20	TO-247-3
C6D20065G	Industrial	650	20	TO-263-2
C6D20065H	Industrial	650	20	TO-247-2
C6D20065D1	Industrial	650	20	TO-247-3
C6D30065H	Industrial	650	30	TO-247-2
C6D50065D1	Industrial	650	50	TO-247-3
C6D50065H	Industrial	650	50	TO-247-2
C6D05170H	Industrial	1700	5	TO-247-2
C6D10170H	Industrial	1700	10	TO-247-2
C6D25170H	Industrial	1700	25	TO-247-2

SILICON CARBIDE SCHOTTKY DIODES

Wolfspeed Silicon Carbide diodes make efficient systems cost effective through a diverse portfolio of different power ranges and package footprints to fit all applications.

Part Number	Qualification	Blocking Voltage (V)	Current Rating (A)	Package
CSD01060A	Industrial	600	1	TO-220-2
CSD01060E	Industrial	600	1	TO-252-2
C3D02060A	Industrial	600	2	TO-220-2
C3D02060E	Industrial	600	2	TO-252-2
C3D02060F	Industrial	600	2	TO-220-F2
C3D03060A	Industrial	600	3	TO-220-2
C3D03060E	Industrial	600	3	TO-252-2
C3D03060F	Industrial	600	3	TO-220-F2
C3D04060A	Industrial	600	4	TO-220-2
C3D04060E	Industrial	600	4	TO-252-2
C3D04060F	Industrial	600	4	TO-220-F2
C3D06060A	Industrial	600	6	TO-220-2
C3D06060F	Industrial	600	6	TO-220-F2
C3D06060G	Industrial	600	6	TO-263-2
C3D08060A	Industrial	600	8	TO-220-2
C3D08060G	Industrial	600	8	TO-263-2
C3D10060A	Industrial	600	10	TO-220-2
C3D10060G	Industrial	600	10	TO-263-2
C3D16060D	Industrial	600	16	TO-247-3
C3D20060D	Industrial	600	20	TO-247-3

Part Number	Qualification	Blocking Voltage (V)	Current Rating (A)	Package
C3D02065E	Industrial	650	2	TO-252-2
C3D03065E	Industrial	650	3	TO-252-2
C3D04065A	Industrial	650	4	TO-220-2
C3D04065E	Industrial	650	4	TO-252-2
C6D04065A	Industrial	650	4	TO-220-2
C6D04065E	Industrial	650	4	TO-252-2
C3D06065A	Industrial	650	6	TO-220-2
C3D06065E	Industrial	650	6	TO-252-2
C3D06065I	Industrial	650	6	TO-220 Iso
C6D06065A	Industrial	650	6	TO-220-2
C6D06065E	Industrial	650	6	TO-252-2
C6D06065G	Industrial	650	6	TO-263-2

Part Number	Qualification	Blocking Voltage (V)	Current Rating (A)	Package
C6D06065Q	Industrial	650	6	QFN 8x8
C3D08065A	Industrial	650	8	TO-220-2
C3D08065E	Industrial	650	8	TO-252-2
C3D08065I	Industrial	650	8	TO-220 Iso
C6D08065A	Industrial	650	8	TO-220-2
C6D08065E	Industrial	650	8	TO-252-2
C6D08065G	Industrial	650	8	TO-263-2
C6D08065Q	Industrial	650	8	QFN 8x8
C3D10065A	Industrial	650	10	TO-220-2
C3D10065E	Industrial	650	10	TO-252-2
C3D10065I	Industrial	650	10	TO-220 Iso
C6D10065A	Industrial	650	10	TO-220-2
C6D10065E	Industrial	650	10	TO-252-2
C6D10065G	Industrial	650	10	TO-263-2
C6D10065Q	Industrial	650	10	QFN 8x8
C3D12065A	Industrial	650	12	TO-220-2
C3D16065D1	Industrial	650	16	TO-247-3
C3D16065A	Industrial	650	16	TO-220-2
C3D16065D	Industrial	650	16	TO-247-3
C6D16065D	Industrial	650	16	TO-247-3
C6D16065H	Industrial	650	16	TO-247-2
C3D20065D	Industrial	650	20	TO-247-3
C6D20065A	Industrial	650	20	TO-220-2
C6D20065G	Industrial	650	20	TO-263-2
C6D20065H	Industrial	650	20	TO-247-2
C6D20065D	Industrial	650	20	TO-247-3
C6D20065D1	Industrial	650	20	TO-247-3
C6D30065H	Industrial	650	30	TO-247-2
C3D30065D	Industrial	650	30	TO-247-3

E-SERIES™ AUTOMOTIVE SILICON CARBIDE PRODUCTS

AUTOMOTIVE-QUALIFIED SILICON CARBIDE PRODUCTS

Wolfspeed continues to lead the end of the ICE vehicle age with our diverse E-Series portfolio of Silicon Carbide MOSFETs. E-Series products are automotive qualified and PPAP capable, specifically designed to

be robust and reliable in the harshest environments. These devices are optimized for use in multiple on-board automotive applications across battery electric, plug-in electric, and fuel cell vehicles.

FEATURED DESIGN TOOLS



22 kW High Efficient Bi-directional AFE

CRD-22AD12N



22 kW Bi-Directional CLLC Utilizing IMS Board

CRD-22DD12N-J2



6.6 kW High Power Density Bi-directional EV ON-Board Charger

CRD-06600FF065N-K



FEATURES

Automotive Qualified (AEC-Q101) and PPAP Capable

Low MOSFET $R_{DS(ON)}$ Over Temperature

Fast Intrinsic Diode with Low Reverse Recovery (Q_{rr}) MOSFETs



BENEFITS

High-Voltage, High-Temperature, and High-Humidity Resistance

Higher Power Density Enabling Smaller System Form Factor

Improves System Efficiency with Lower Switching & Conduction Losses

Enables High-Reliability Operation



APPLICATIONS

Electric Vehicle On-Board Charging

High Voltage DC-DC Converters

Auxiliary Power Supplies

Fuel Cell Vehicle Converters

Traction Inverters

EV HVAC Motor Drives

1200 V DISCRETE

Part Number	Qualification	Blocking Voltage (V)	Current Rating (A)	Package
C4D02120A	Industrial	1200	2	TO-220-2
C4D02120E	Industrial	1200	2	TO-252-2
C4D05120A	Industrial	1200	5	TO-220-2
C4D05120E	Industrial	1200	5	TO-252-2
C4D08120A	Industrial	1200	8	TO-220-2
C4D08120E	Industrial	1200	8	TO-252-2
C4D10120A	Industrial	1200	10	TO-220-2
C4D10120D	Industrial	1200	10	TO-247-3
C4D10120E	Industrial	1200	10	TO-252-2
C4D10120H	Industrial	1200	10	TO-247-2
C4D15120A	Industrial	1200	15	TO-220-2
C4D15120D	Industrial	1200	15	TO-247-3
C4D15120H	Industrial	1200	15	TO-247-2
C4D20120A	Industrial	1200	20	TO-220-2
C4D20120D	Industrial	1200	20	TO-247-3
C4D20120H	Industrial	1200	20	TO-247-2
C4D30120D	Industrial	1200	30	TO-247-3
C4D30120H	Industrial	1200	30	TO-247-2
C4D40120D	Industrial	1200	40	TO-247-3
C4D40120H	Industrial	1200	40	TO-247-2

1700 V DISCRETE

C6D05170H	Industrial	1700	5	TO-247-2
C6D10170H	Industrial	1700	10	TO-247-2
C6D25170H	Industrial	1700	25	TO-247-2

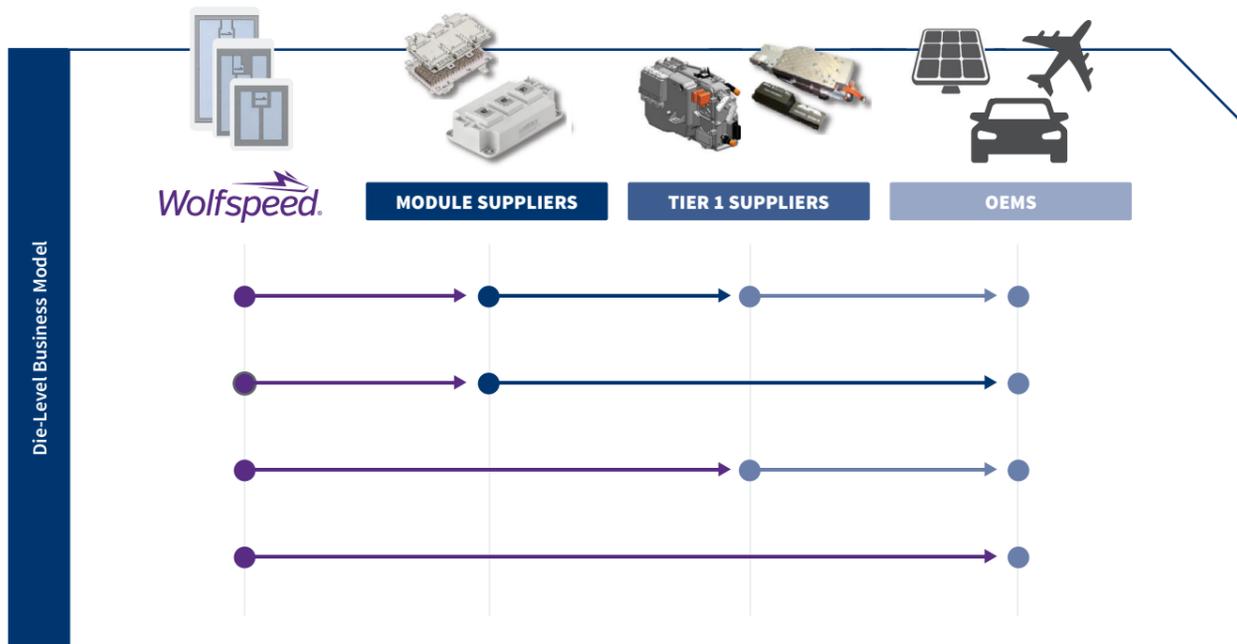
MOSFETS

Part Number	Blocking Voltage (V)	$R_{DS(ON)}$ at 25°C	Current Rating at 25°C (A)	Package
E4M0015075J2	750	15 mΩ	156	TO-263-7 XL
E4M0025075J2	750	25 mΩ	84	TO-263-7 XL
E4M0045075J2	750	45 mΩ	46	TO-263-7 XL
E4M0060075J2	750	60 mΩ	36	TO-263-7 XL
E4M0015075K1	750	15 mΩ	128	TO-247-4 LP
E4M0025075K1	750	25 mΩ	80	TO-247-4 LP
E4M0045075K1	750	45 mΩ	42	TO-247-4 LP
E4M0060075K1	750	60 mΩ	35	TO-247-4 LP
E3M0021120J2	1200	21 mΩ	114	TO-263-7 XL
E3M0032120J2	1200	32 mΩ	74	TO-263-7 XL
E3M0040120J2	1200	40 mΩ	63	TO-263-7 XL
E3M0075120J2	1200	75 mΩ	34	TO-263-7 XL
E3M0160120J2	1200	160 mΩ	18	TO-263-7 XL
E4M0013120K	1200	13 mΩ	153	TO-247-4
E3M0016120K	1200	16 mΩ	125	TO-247-4
E3M0021120K	1200	21 mΩ	104	TO-247-4
E3M0032120K	1200	32 mΩ	67	TO-247-4
E3M0040120K	1200	40 mΩ	57	TO-247-4
E3M0075120K	1200	75 mΩ	32	TO-247-4
E3M0160120K	1200	160 mΩ	17	TO-247-4
E3M0900170D	1700	900 mΩ	7	TO-247-3
E3M0900170J	1700	900 mΩ	7	TO-263-7

OPTIMIZE DESIGN TO COST RATIO TO SCALE YOUR PLATFORMS QUICKLY

For advanced power circuit designs we offer SiC Bare Die MOSFETS and Schottky Diodes. For those who have a complex supply chain, or who prefer greater control over package development, our bare die devices offer the ultimate in system-level customization.

Our technical support team is eager to partner—no matter where you reside within the supply chain—to help you achieve greater system performance and enhance reliability.



Need help getting started with Wolfspeed Bare Die? Check out these helpful resources:

[Sintering considerations and the die top system](#)

[SiC MOSFET short circuit testing](#)



SCAN ME



SCAN ME

BARE DIE SILICON CARBIDE MOSFETS

MAXIMUM DESIGN FLEXIBILITY WITH QUALITY BACKED BY 20+ YEARS OF DIE FIELD HOURS

Wolfspeed's latest generation die, Gen 4, enables those who desire a custom scalable and tailored solution in their own packaging technology to confidently address some of the most significant design challenges facing high-power applications.

Our complete die portfolio includes a range top side and backside metallization options and layouts to provide flexibility to module designers through their assembly and module layout processes.

Designers can achieve up to a 30% higher power output within the same footprint via Wolfspeed's excellent $R_{DS(on)}$. Development time is reduced, as Gen 4 die include a 3.5X improvement in body diode softness factor to help minimize EMI during reverse recovery scenarios. Wolfspeed Gen 4 die also can better survive overload or overstress events, as they are qualified at 185°C continuous operation / 200°C limited life operation.



FEATURES

- High Blocking Voltage with Industry Leading Low $R_{DS(on)}$ Over Temperature Stability
- Fast Intrinsic Diode with Low Reverse Recovery Charge (Q_{rr})
- High-Speed Switching with Low Output Capacitance
- Low Conduction Losses Over Temperature
- Avalanche Ruggedness



BENEFITS

- Supply Chain Flexibility
- Improves System Efficiency with Lower Conduction Losses
- Enables High Switching Frequency Operation
- Improves System Level Power Density
- Reduces System Size, Weight, and Cooling Requirements



APPLICATIONS

- Drivetrain
- Fast Charging
- Energy Storage
- Solar
- Motor Drive
- UPS
- Aerospace

Part Number	Blocking Voltage (V)	$R_{DS(on)}$ at 25 c	Q_{rr}
CPM3-0650-0015A	650	15	510
CPM3-0650-0045A	650	45	247
CPM3-0650-0060A	650	60	151
CPM3-0900-0010A	900	10	1300
CPM3-0900-0065A	900	65	220
CPM3-1200-0013A	1200	13	1800
CPM3-1200-0016A	1200	16	1238
CPM3-1200-0021A	1200	21	928
CPM4-0120-0149JS0A	1200	26	590
CPM3-1200-0032A	1200	32	478
CPM4-0120-0104JS0A	1200	42	496
CPM3-1200-0075A	1200	75	109
CPM3-1700-R020E	1700	20	2557
CPM4-0230-0255JS0A*	2300	30	256
CPM3-3300-R050A	3300	52	2.5

Part Number	Blocking Voltage (V)	$R_{DS(on)}$ at 25 c	Q_{rr}
EPM4-E075-0276D00A*	750	6.8	TBD
EPM3-0750-0010D	750	10	737
EPM4-E120-0320D10A*	1200	9.8	1566
EPM4-E120-0276D00A*	1200	12	1584
EPM3-1200-R013D	1200	13	1259
EPM4-0120-0260JS0A	1200	14	1379
EPM3-1200-0014D1	1200	14	1068
EPM3-1200-R014D2	1200	14	1500
EPM3-1200-R015D	1200	15	1388
EPM3-1200-0017D	1200	17	1100
EPM3-1200-0017D1	1200	17	1242

*Coming Soon

BARE DIE SILICON CARBIDE SCHOTTKY DIODES

WOLFSPEED® SILICON CARBIDE BARE DIE SCHOTTKY DIODES OFFER PROVEN RELIABILITY

Wolfspeed has the broadest portfolio of Silicon Carbide Schottky diodes, with more than twelve trillion field hours, lowest FIT rate, and 35 years of experience in Silicon Carbide offering customers proven reliability. Wolfspeed provides advanced design, extensive qualification, screening and parametric characterization resulting in the most reliable and robust devices on the market.

Our diodes feature the MPS (Merged PiN Schottky) design which is more robust and reliable than standard

Schottky barrier diodes. Pairing Wolfspeed Silicon Carbide diodes with Silicon Carbide MOSFETs creates a powerful combination of higher efficiency and reduced component pricing when purchased together.

For 650V diodes, please reach out to a Wolfspeed Power Die representative.



FEATURES

- Zero Reverse Recovery
- Zero Forward Recovery
- High-Frequency Operation
- Fast Switching



BENEFITS

- Higher Efficiency
- Low Switching Loss
- High Thermal Conductivity



APPLICATIONS

- EV Chargers
- Industrial Power Supplies
- Motor & Traction Drives
- Solar & Energy Storage Systems
- UPS
- DC-DC Converters

	Part Number	Blocking Voltage (V)	Current Rating (A)	Total Capacitive Charge (Q_c (typ))
Power Die Industrial Products	CPW6-1200-Z005A	1200	5	38 nC
	CPW6-1200-Z010A	1200	10	42 nC
	CPW6-1200-Z015A	1200	15	90 nC
	CPW6-1200-Z020A	1200	20	118 nC
	CPW6-1200-Z050A	1200	50	279 nC
	CPW6-1700-Z005A	1700	5	79 nC
	CPW6-1700-Z010A	1700	10	126 nC
	CPW6-1700-Z025A	1700	25	325 nC
	CPW6-1700-Z050A	1700	50	479 nC

DESIGN TOOLS

DESIGN TOOLS

START MODELING FOR YOUR DESIGN WITH SPEEDFIT™ DESIGN SIMULATOR

WELCOME TO SPEEDFIT™ DESIGN SIMULATOR

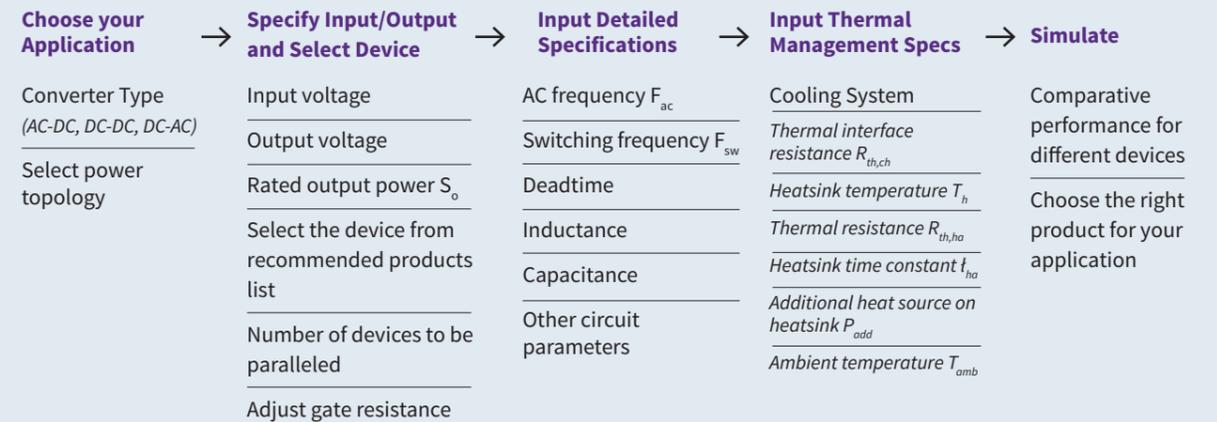
Welcome to SpeedFit™ Design Simulator, the industry's most comprehensive system-level circuit simulator for Silicon Carbide power applications.

Accelerate the design process with simulation results you can trust. SpeedFit™ Design Simulator quickly calculates losses and estimates junction temperature for power devices based on lab data for common topologies ranging from simple buck and boost converters to a fully bi-directional totem pole PFC or resonant DC/DC converter.

USING SPEEDFIT™ DESIGN SIMULATOR, YOU CAN QUICKLY DETERMINE:

- The right product for an application
- Comparative performance for different devices
- How the performance with varies Rg
- How many devices need to be paralleled

KICKSTART YOUR DESIGN



EXPLORE SPEEDFIT™ DESIGN SIMULATOR AT [WOLFSPEED.COM/SPEEDFIT](https://www.wolfspeed.com/speedfit)

EVALUATION KITS

Wolfspeed understands that system designers want to perform characterization in their own labs when working with a new product. To help reduce design resource investment and enable fast characterization of our products, Wolfspeed offers a wide array of Evaluation Kits to help you better understand the capability of our Silicon Carbide discrete and module packages.

Wolfspeed partners with component manufacturers to provide our customers with access to the widest selection of and the latest system components. Our Partner Evaluation Kits are developed and supported by our partners in collaboration with Wolfspeed.

	Name*	Topology	Package	SKU
DISCRETE PACKAGES	SpeedVal™ Kit Modular Evaluation Platform	Dynamic Characterization	TO-247-4, TO-263-7, TOLL	SpeedVal™ Kit
	SpeedVal™ Kit Modular Evaluation Platform Three-Phase Motherboard	3-Phase Inverter	TO-247-4, TO-247-3, TO-263-7, TOLL	MOD-MB-3P-0900V-40A
	25W Auxiliary Power Supply Evaluation Platform	Flyback	TO-263-7	KIT-CRD-025DD17P-J
MODULE PLATFORMS	Dynamic Characterization Evaluation Tool Optimized for the 62 mm (BM) Module Platform	Dynamic Characterization	B platform	KIT-CRD-CIL12N-BM3 KIT-CRD-CIL17N-BM3
	Dynamic Characterization Evaluation Tool Optimized for the Wolfspeed WolfPACK™ Half Bridge Module Platform	Dynamic Characterization	F platform	KIT-CRD-CIL12N-FMA
	Dynamic Characterization Evaluation Tool Optimized for the Wolfspeed WolfPACK™, Six-Pack Platform	Dynamic Characterization	F platform	KIT-CRD-CIL12N-FMC
	Dynamic Characterization Evaluation Tool Optimized for the Wolfspeed WolfPACK™ GM3 Half Bridge Module Platform	Dynamic Characterization	G platform	KIT-CRD-CIL12N-GMA
	Dynamic Characterization Evaluation Tool Optimized for the HM High Performance 62 mm (HM) Module Platform	Dynamic Characterization	H platform	KIT-CRD-CIL12N-HM3 KIT-CRD-CIL17N-HM3
	Dynamic Performance Evaluation Board for the Wolfspeed WolfPACK™ Full-Bridge Module Platform	Dynamic Characterization	F platform	KIT-CRD-CIL12N-FMB
	Evaluation Tool for the XM3 Module Platform	AC to DC, Dynamic Characterization	X platform	KIT-CRD-CIL12N-XM3 KIT-CRD-CIL17N-XM3
	Dynamic Characterization Evaluation Tool Optimized for the Wolfspeed DM Half Bridge Module Platform	Dynamic Characterization	D platform	KIT-CRD-CIL12N-DM

*All of these Evaluation kits are designed by Wolfspeed

SPEEDVAL™ KIT MODULAR EVALUATION PLATFORM

THE INDUSTRY'S MOST VERSATILE SiC MODULAR EVALUATION PLATFORM

Wolfspeed's SpeedVal™ Kit Modular Evaluation Platform enables rapid testing of silicon carbide devices at real operating conditions with a flexible set of building blocks for in-circuit evaluation of system performance. Quickly evaluate and optimize the high-speed dynamic switching performance of Wolfspeed SiC MOSFETs paired with your choice of optional control cards, accessories and gate drivers from industry-leading partners.



FEATURES

- Multiple Configurations
- Quickly Swap Devices for Testing
- Verified Compatible Components
- Buck/Boost up to 15 kW
- 3-Phase Inverter up to 30 kW
- Test 650 V – 1200 V Devices



BENEFITS

- Starting Point for Firmware Development
- Comprehensive Design Kit
- Functional Blocks as Design Starting Points
- Flexible Platform for Quick Evaluation of Multiple Device Choices



USES

- Single and 3-Phase Inverter
- Switching Loss Measurement
- Gate Driver Evaluation
- Thermal Testing
- Buck/Boost Operation

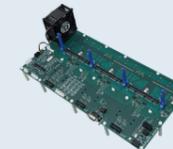
Explore the Options

The platform consists of a motherboard, power daughter cards, partner gate driver cards and optional control cards, and accessories.

Components may be purchased separately or use the SpeedVal™ Kit Configurator to build your complete evaluation system.



Half-Bridge Motherboard



3-Phase Motherboard



Power Daughter Cards



Gate Driver Cards



Control Cards (optional)



Accessories (optional)

TO LEARN MORE, VISIT US AT [WOLFSPEED.COM/POWER](https://www.wolfspeed.com/power)

TO LEARN MORE, VISIT US AT [WOLFSPEED.COM/SPEEDVALKIT](https://www.wolfspeed.com/speedvalkit)

GATE DRIVER BOARDS

Wolfspeed provides companion gate driver evaluation tools for its Silicon Carbide products to help you get up and running quickly. These evaluation tools help you learn best practices and give you a starting point for working with

Wolfspeed's Silicon Carbide. All design files available are complimentary, so that you can quickly understand and implement our designs into your end-system and modify as-needed to fit your specific design requirements.



AduM4146



CGD1200HBP-BM2
CGD1200HBP-BM3



UCC21750 & UCC21710



CGD12HBXMP

SYSTEM SOLUTIONS

Reference Designs

Wolfspeed offers time-saving Reference Designs for some of the most in-demand Silicon Carbide devices in power systems – Inverters, power converters, chargers and many more. These Reference Designs come complete with application notes, user guides and design files to allow designers to create rugged and reliable systems with best-in-class power density, performance and efficiency.

Wolfspeed partners with experts in system integration to offer a wider selection of applications and power topologies built with the latest components. Our Partner Reference Designs are developed and supported by our partners in collaboration with Wolfspeed. Hardware Design Files, System and Mechanical Design Files, and Firmware are available with these reference designs.

Wide Input Voltage Range (60 VDC – 1000 VDC) 20 W Flyback Auxiliary Power Supply Board



Topology:

DC to DC

Package:

TO-263-7

CRD-020DD17P-J

Specifications:

- Demonstration of the efficient operation of Wolfspeed's 1700 V 900 mohm Silicon Carbide MOSFET
- Wide VGS operating range of 12-18 V and 0 V turn-off enables drop-in compatibility and a simplified design
- Increased efficiency, reduced temperature, and improved FIT rates compared to earlier generations enables rugged designs with long lifetime

3.6 kW Bridgeless Totem-Pole PFC



Topology:

AC to DC

Package:

TOLL, TO-247-3

CRD-03600AD065E-L

Specifications:

- Applications: 80 Plus® Platinum/Titanium, Energy Star®, Lot 9, and OCP3.0 power supplies
- Power density: 92 W/in³
- Switching frequency: 60 kHz
- Input voltage: 180 - 305 VAC
- Output voltage: 440 VDC MAX
- Output power: 3.6 kW (Derated at low line)
- Peak efficiency: 99%
- Cooling: Forced air

This reference design demonstrates the application of Wolfspeed's C3M™ 650 V Silicon Carbide MOSFET Technology in TOLL (TO – Leadless) Package to create a 3.6 kW bridgeless totem-pole PFC for server power supply, data center power supply, mining power supply, and telecom systems.

COMPANION
GATE DRIVERS

SKU	Package	Designed By	Gate Driver	Output Channels
CGD1200HB2P-BM2	B Platform	Wolfspeed	Analog Devices® ADuM4135	2
CGD1200HB2P-BM3	B Platform	Wolfspeed	Analog Devices® ADuM4135	2
CGD1700HB2P-BM2	B Platform	Wolfspeed	Analog Devices® ADuM4146	2
CG1700HB2P-BM3	B Platform	Wolfspeed	Analog Devices® ADuM4146	2
CGD1700HB3P-HM3	H Platform	Wolfspeed	IXDD614YY	2
UCC21750QDWEVM-054	SpeedVal™ Kit, F Platform, G Platform	Texas Instruments	Texas Instruments® UCC21750	2
CGD1700HB2M-UNA / UCC21710QDWEVM-054	SpeedVal™ Kit, F Platform, G Platform	Texas Instruments	Texas Instruments® UCC21710	2
EVAL-ADUM4146WHB1Z	SpeedVal™ Kit, F Platform, G Platform	Analog Devices	Analog Devices® ADuM4146	2
EVAL-ADUM4122WHB1Z	SpeedVal™ Kit, F Platform, G Platform	Analog Devices	Analog Devices® ADuM4122	2
EVAL-ADUM4121WHB1Z	SpeedVal™ Kit, F Platform, G Platform	Analog Devices	Analog Devices® ADuM4121	2
Si823H-ACWA-KIT Si823H-AAWA-KIT Si823H-ABWA-KIT	SpeedVal™ Kit, F Platform, G Platform	Skyworks	Skyworks® Si823Hx	2
CGD12HBXMP	X Platform	Wolfspeed	Analog Devices® ADuM4135	2
UCC5880QEVM-057	X Platform	TI	Texas Instruments® UCC5880Q1	2
UCC5880INVERTEREVM	X Platform	TI	Texas Instruments® UCC5880-Q1	2
CGD1700HB2P-XM3	X Platform	Wolfspeed	Analog Devices® ADuM4146	2
FRDMGD3160XM3EVM	X Platform	NXP	NXP® GD3160	2

6.6 kW High Power Density Bi-Directional EV On-Board Charger



Topology:
AC to DC, DC to AC

Package:
TO-247-4

CRD-06600FF065N-K

This reference design is offered as a comprehensive design package which can be used as a starting point for new Silicon Carbide designs.

The design accomplishes a peak efficiency of 96.5% and a power density of 53 W/in³ or 3 kW/L.

- Specifications:**
- Universal single phase input voltage: 90 V - 265 V AC
 - Output voltage: 250 V - 450 V DC
 - Output current in charging mode: 18 A
 - AC/DC topology: CCM Totem-Pole PFC operating at 67 kHz
 - DC/DC topology: Bi-directional CLLC resonant converter operating at 148 - 300 kHz
 - Control modes: A combination of constant current, constant voltage and constant power mode
 - Unique integrated heatsink design removes heat from MOSFETs, transformer and inductors
 - CAN interface

6.6 kW High Frequency DC-DC Converter



Topology:
DC to DC

Package:
TO-247-3

CRD-06600DD065N

- Specifications:**
- Input voltage: 380 - 420 VDC
 - Output voltage: 400 VDC
 - Max current: 16.5 A
 - Output power: 6.6 kW
 - Switching frequency: 500 kHz - 1 MHz
 - Closed loop control for regulated output
 - Optional external PWM inputs for open loop testing

7.5 kW FM3 Three-Phase Motor Drive



Topology:
AC to DC, DC to AC

Package:
FM3

CRD07500AA12N-FMC

- Specifications:**
- Output power of 7.5 kW
 - Switching frequency of 100 kHz
 - Input/output voltage of 480 VAC

11 kW High Efficiency Three-Phase Motor Drive Inverter



Topology:
DC to AC

Package:
TO-247-4, TO-263-7

CRD-11DA12N-K

- Specifications:**
- Input voltage: 550 - 850 VDC
 - Switching frequency: 16 - 32 kHz
 - Nominal RMS output voltage: 380 VL-L
 - Output power: 11 kW
 - Short circuit protection
 - Bus derived auxiliary power supply
 - Open loop mode for static testing
 - Sensorless FOC for permanent magnet synchronous machine (PMSM)
 - CAN interface to PC based user interface

13 kW High Efficiency Three-Phase Motor Drive Inverter



Topology:
3-Phase DC/AC

Package:
TO-263-7

CRD-13DA12N-J2

- Specifications:**
- Input voltage: 550 - 850 VDC
 - Switching frequency: 10 - 32 kHz
 - Nominal RMS output voltage: 380 VL-L
 - Output power: 13 kW Max.
 - Output current: 25 A_{rms} Max.
 - Short circuit protection
 - Sensorless FOC for permanent magnet synchronous motor
 - CAN interface to PC based user interface

20 kW High Efficiency Three-Phase Motor Drive Inverter



Topology:
DC to AC

Package:
TO-247-4, TO-263-7

CRD-20DA12N-K

- Specifications:**
- Input voltage: 550 - 850 VDC
 - Switching frequency: 16 - 32 kHz
 - Nominal RMS output voltage: 380 VL-L
 - Output power: 20 kW
 - Short circuit protection
 - Bus derived auxiliary power supply
 - Open loop mode for static testing
 - Sensorless FOC for permanent magnet synchronous machine (PMSM)
 - CAN interface to PC based user interface

22 kW Bi-directional High Efficiency Active Front End (AFE) Converter



Topology:
AC to DC

Package:
TO-247-4

CRD-22AD12N

This reference design demonstrates the application of Wolfspeed's 1200 V C3M™ and E3M SiC MOSFETs to create a 22 kW three phase bidirectional active front end (AFE) converter for electric vehicle (EV) on-board charger (OBC); off-board fast charging; and other industrial applications such as energy storage systems and three phase PFC power supplies.

- Specifications:**
- Switching frequency: 45 kHz
 - Tooled heatsink to simulate cooling plate
 - CAN interface

PFC Mode

- Maximum input current: 32 A

Three Phase Input

- Input voltage: 305 Vrms - 450 Vrms line-line, 50/60 Hz
- Output DC voltage: 650 V - 900 V
- Maximum power: 22 kW

Single phase input

- Input voltage: 180 Vrms - 264 Vrms, 50/60 Hz
- Output DC voltage: 380 V - 900 V
- Maximum power: 6.6 kW

Inverter Mode

- DC input voltage: 350 V - 760 V DC
- Maximum current: 20 A
- AC output voltage: 230 Vrms, 50 Hz single phase
- Maximum power: 6.6 kW

22 kW Bi-directional High Efficiency DC/DC Converter



Topology:

DC to DC

Package:

TO-247-4, TO-263-7

CRD-22DD12N

CRD-22DD12N-J2

The reference design accomplishes a peak efficiency of 98.5% in both charging and discharging mode and a power density of 8 kW/L. The CRD-22DD12N design is suited for off-board fast charging, and the CRD-22DD12N-J2 design utilized an automotive SKU and demonstrates performance in an on-board charger setting. This design is offered as a comprehensive design package which can be used as a starting point for new Silicon Carbide designs.

Specifications:

- Full bridge CLLC resonant converter operating at 135-250 kHz
- Tooled heatsink to simulate cooling plate
- CAN interface

Charging Mode

- Input voltage: 380 V - 900 V DC
- Output voltage: 480 V - 800 V DC Nominal, System capable of 200 V - 800 V DC
- At $V_{in} = 650$ V - 900 V DC, output power: 22 kW, output current: 36 A
- At $V_{in} = 380$ V - 900 V DC, output power: 6.6 kW, output current: 26.4 A

Discharging Mode

- Input voltage: 300 V - 800 V DC
- Output voltage: 360 V - 750 V DC Nominal
- Output power: 6.6 kW
- Output current : 19 A

25 kW FM3 Three-Phase Inverter



Topology:

DC to AC

Package:

FM3

CRD25DA12N-FMC

Specifications:

- Output power of 25 kW
- Switching frequency of 100 kHz
- Input voltage of 1000 VDC

25 kW High Efficiency High Power Density Bi-directional T-type Inverter



Topology:

DC to AC, AC to DC, Three-Phase

Package:

TO-247-4

CRD-25BDA6512N-K

The 25 kW bi-directional T-type inverter demonstrates the performance of Wolfspeed's 650 V and 1200 V Silicon Carbide (SiC) MOSFETs within high power systems such as solar inverters, uninterruptible power supplies (UPS), EV fast chargers, HVDC applications, high power PSU for AI/datacenters and energy storage systems. This reference design is offered as a comprehensive evaluation tool that can be used as a starting point for new SiC designs. It has two operating modes: inverter mode and power factor correction (PFC) mode.

Specifications:

- Inverter mode specifications
 - IDC input voltage: 800 V DC
 - Max current: 36 A
 - AC output voltage: 380-480 V_{line-line} 50/60 Hz
 - Max power: 25 kW
 - Switching frequency: 60 kHz
- PFC mode specifications
 - Three phase input voltage 380-480 V_{line-line} 50/60 Hz
 - Max current: 36 A
 - Output DC voltage: 650 V → 900 V; Max power 25 kW
 - Max current: 36 A
 - Switching frequency: 60 kHz

30 kW Discrete Interleaved LLC DC-DC Converter



Topology:

DC to DC

Package:

TO-247-4, TO-220-2, TO 247-3

CRD30DD12N-K

This reference design targets high-power-density, high-efficiency fast charger applications and features Wolfspeed's discrete 1200 V C3M Silicon Carbide MOSFETs and 650 V C6D Silicon Carbide Schottky Diodes. A 3-phase interleaved LLC topology is implemented to provide low input current ripple and high efficiency for EV high power fast charger.

Specifications:

- Output voltage 200 V - 1000 V
- Power density of 6.5 kW/L
- Peak efficiencies over 98.3%
- Adaptive control 130 kHz - 250 kHz switching frequency
- Series output configuration
 - Input voltage: 650 V - 850 V DC
 - Output voltage: 500 V - 1000 V DC, 50 A max, 30 kW max
- Parallel output configuration
 - Input voltage: 650 V - 850 V DC
 - Output voltage: 200 V - 250 V DC, 66 A max
 - 250 V - 500 V DC, 100 A max, 30 kW max

60 kW Interleaved LLC Converter



Topology:

DC to DC

Package:

TO-247-4

CRD-60DD12N-K

Specifications:

- The 60 kW 3-phase interleaved LLC DC-DC converter is targeted to provide high power density, low input current ripple and high efficiency for EV DC fast chargers.

- Features Wolfspeed's discrete 1200 V C3M™ Silicon Carbide MOSFETs (C3M0040120K or C3M0032120K) and 650 V C6D Silicon Carbide Schottky diodes (C6D20065D).
- A wide output voltage range of 200 V - 1000 V to accommodate all levels of EV charging.
- A high power density of 4.83 kW/L and higher than 98.5% peak efficiency.
- Adaptive control operates over a 120 kHz - 250 kHz switching frequency range to maintain optimal control over all operating conditions.

60 kW Interleaved Boost Converter



Topology:

DC to DC

Package:

TO-247-4

CRD-60DD12N

Specifications:

- This reference design demonstrates the application of Wolfspeed's C3M™ and E3M Silicon Carbide MOSFETs in a 4-phase interleaved boost converter. The design uses parallel Silicon Carbide

MOSFETs and parallel Silicon Carbide Schottky diodes to achieve a high-power density using discrete devices

- 60 kW Interleaved Boost Converter demo board is based on four 15 kW Interleaved Boost Stages and each stage is using Wolfspeed's C3M™ CGD15SG00D2 isolated Gate Driver Board
- Wolfspeed's 60 kW Interleaved Boost Converter demo board can accept 470 VDC - 800 VDC as an input and provide 850 VDC at the output with a peak efficiency of 99.5% and a power density of 127 W/in³

300 kW, 250 kW & 200 kW Three-Phase Inverter



Topology:

AC to DC, DC to AC

Package:

X Platform

CRD200DA12E-XM3
CRD250DA12E-XM3
CRD300DA12E-XM3

Specifications:

- 800 VDC bus nominal (900 V max)
- 360/300/240 A_{RMS} output
- 80 kHz maximum switching frequency
- 300 uF DC link capacitance
- Liquid cooled cold plate
- CAN interface

300 kW Three-Phase Traction Inverter



Topology:

DC to AC

Package:

XM3

ERD300DA12SA-XM3

Specifications:

- 800 VDC bus nominal (900 V max)
- 360 A_{RMS} output
- 80 kHz maximum control and switching frequency
- 300 uF DC link capacitance
- Liquid cooled cold plate
- CAN interface

600 kW High Performance Dual Three-Phase Inverter



Topology:

AC to DC, DC to AC

Package:

X Platform

CRD600DA12E-XM3

Specifications:

- DC bus voltage: 800 V nominal, 900 V maximum
- Switching frequency: 80 kHz maximum
- DC link capacitance: 600 µF
- Double-sided liquid cold plate
- CAN interface
- Single bridge operation - 360 A_{rms} output current
- Parallel bridge operation - 720 A_{rms} output current

Optimized for Wolfspeed's all Silicon Carbide, Low Inductance, Conduction Optimized XM3 Power Module. Complete Stackup, including: Modules, Cooling, Bussing, Gate Drivers, Voltage / Current Sensors, and Controller.



The Power To
MAKE IT REAL

A white icon of a diamond with four small crosses at its corners, positioned to the left of the main text.

THROUGH THE POWER OF SILICON CARBIDE, WE ARE POWERING A
CLEANER, SAFER, COOLER, GREENER WORLD **TODAY, NOT TOMORROW.**

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