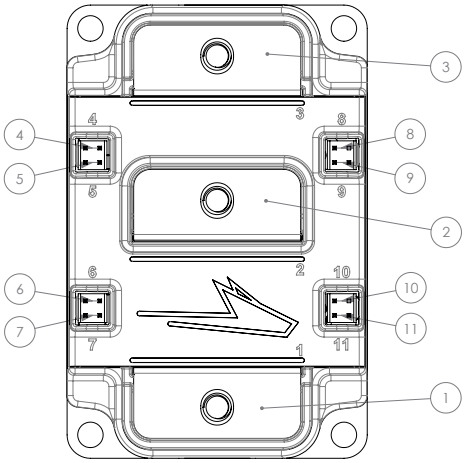
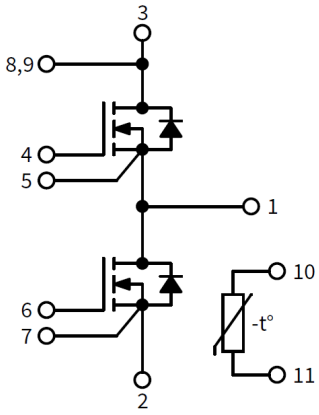
XM Module Signal Pinout Clarification Guide

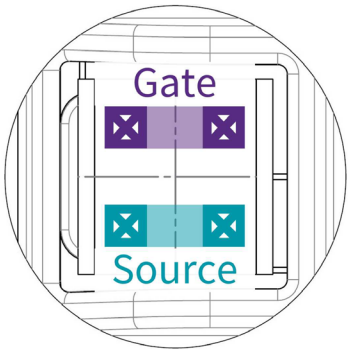
Inline Pinout vs. Cross Pinout

There are two signal pinout variants in the XM module family: the **inline pinout** and the **cross pinout**. The cross pinout improves the dynamic control of new and future generation SiC MOSFETs at peak switching speeds. This document lists the power modules and gate driver boards that utilize the inline pinout and which employ the cross pinout to provide guidance on module and driver compatibility. **Incorrectly pairing a power module and a gate driver can result in a short circuit condition on the gate driver board's output, which can damage the gate driver.**

Inline Pinout

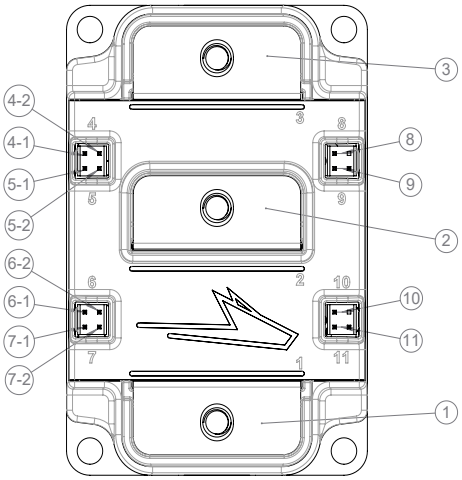


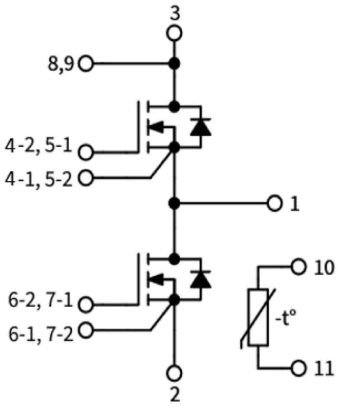


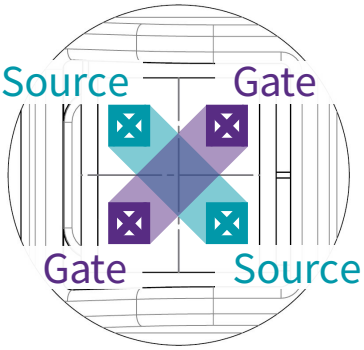


The inline pinout features both of the gate pins and both of the source pins directly next to each other in a row. The pinout applies to both the low-side and high-side signal pins in the half-bridge power module.

Cross Pinout







The cross pinout features the gate pins and the source pins in an X pattern or in opposite corners of the 2 by 2 connector. The pinout applies to both the low-side and high-side signal pins in the half-bridge power module.

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Inline Pinout

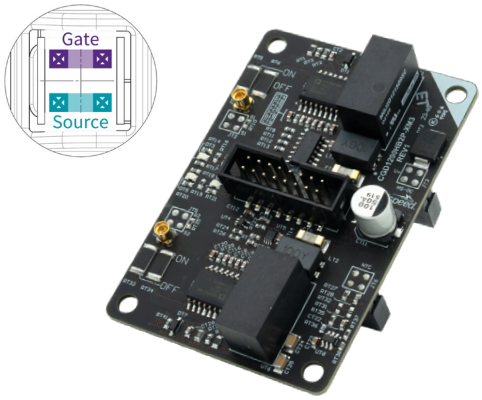

Figure 1. CGD1200HB2P-XM3 Gate Driver

Table 1. XM Power Modules featuring Inline Pinout

Module	Description
CAB400M12XM3	Half-Bridge, C3M Switching-Optimized MOSFETs
CAB425M12XM3	Half-Bridge, C3M Switching-Optimized MOSFETs
CAB450M12XM3	Half-Bridge, C3M Conduction-Optimized MOSFETs
CAB525F12XM3	Direct cooling, Half-Bridge, C3M Conduction-Optimized
EAB450M12XM3	Automotive grade, Half-Bridge, C3M Conduction-Optimized

Table 2. XM Gate Drivers featuring Inline Pinout

Gate Driver	Designed By	Gate Driver IC	Key Features
CGD1200HB2P-XM3	Wolfspeed	ADuM4146	Form-factor fit with multi-source driver IC footprint.
CGD12HBXMP	Wolfspeed	ADuM4135	Form-factor fit with multi-source driver IC footprint.
Si828x-AAWB-KIT	Skyworks	Si828x	Fast overcurrent protection and discrete output buffer.
FRDMGD3160XM3EVM	NXP	GD3160	Automotive-ready solution with SPI programmability.
EVAL-ADuM4177WHBBZ	Analog Devices	ADuM4177	High drive strength with SPI programmability.
CMT-TIT0697	Cissoid	HADES	High temperature operation up to 125°C ambient.
UCC5880QEVM-057	Texas Instruments	UCC5880	Automotive solution with on-the-fly adjustable drive strength.
UCC5880INVERTEREVM	Texas Instruments	UCC5880	Automotive solution with on-the-fly adjustable drive strength.

Cross Pinout

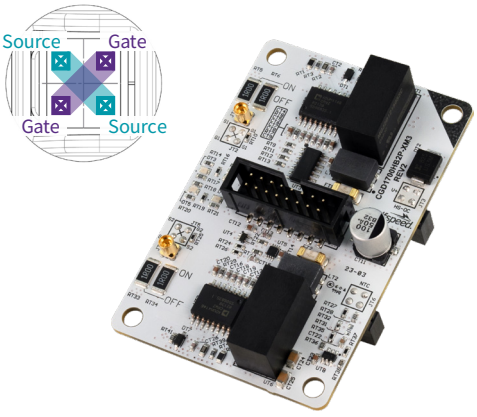

Figure 2. CGD1700HB2P-XM3 Gate Driver

Table 3. XM Power Modules featuring Cross Pinout

Modules	Description
CAB320M17XM3	Half-Bridge, C3M 1700 V MOSFETs

Table 4. XM Gate Drivers featuring Cross Pinout

Gate Driver	Designed By	Gate Driver IC	Key Features
CGD1700HB2P-XM3	Wolfspeed	ADuM4146	Form-factor fit with high voltage isolation rating.
Si828x-BAWB-KIT	Skyworks	Si828x	Fast overcurrent protection and discrete output buffer.

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