XM3 Module Platform

Platform Benefits:
- High Power Density Footprint
- High Temperature (175 °C) Operation
- Low Inductance (6.7 nH) Design
- Implements Third Generation MOSFET Technology
- Initial Product Releases: Optimized for Low Conduction-Loss & High-Frequency Operation
- Future Derivative Configurations: Up to 1.7 kV, Spanning Multiple Topologies

Targeted Applications:
- Motor & Traction Drives
- UPS
- EV Chargers

High-Level Data:
- Module Size: 80 x 53 x 19 mm
- Topology: Half-Bridge
- Maximum Junction Temperature: 175 °C

Technical Features:
- Terminal Layout Simplifies Bus Bar Design
- Integrated Temperature Sensing
- Dedicated Drain-Kelvin Pin
- Silicon Nitride Insulator and Copper Baseplate

Initial Part Numbers in the XM3 Module Family:

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Status</th>
<th>Blocking Voltage (V)</th>
<th>Current (A)</th>
<th>Rds (on) (MOhm)</th>
<th>Footprint</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAB450M12XM3</td>
<td>Available</td>
<td>1200</td>
<td>450</td>
<td>2.6</td>
<td>Optimized XM3</td>
<td>Conduction-Optimized, Third Generation MOSFETs</td>
</tr>
<tr>
<td>CAB400M12XM3</td>
<td>Fall 2019</td>
<td>1200</td>
<td>400</td>
<td>3.2</td>
<td>Optimized XM3</td>
<td>Frequency-Optimized, Third Generation MOSFETs</td>
</tr>
</tbody>
</table>
XM3 Evaluation Tools:

**Support Rapid SiC System Evaluation**

**Optimized for Wolfspeed’s XM3 Half Bridge SiC Modules**

### CGD12HBXMP XM3 Gate Driver:

- **Up to 80 kHz Switching Frequency**
- Replaceable, Easy-Access Turn-On and Turn-Off Gate Resistors for Switching Behavior Optimization
- Overcurrent, Shoot-Through and Reverse Polarity Protection
- 100 kV/μs Common-Mode Transient Immunity (CMTI)
- 1000 V<sub>rms</sub> Isolation (Working Voltage) and 5 kV Peak Isolation for 1 Minute
- Differential Inputs for Increased Noise Immunity
- Fault and Power LED Indicator

### XM3 Dynamic Evaluation Board:

- Evaluate and Optimize the Switching Performance of the XM3 Module
- Compatible with 350 MHz Current Shunt
- Includes Bulk and High-Frequency Film Capacitors with Low Stray Inductance
- Configurable Connections to Evaluate Both Low- and High-Side Switching
- Documentation Included: Schematic, Bill of Materials, Board Layout and Application Note

### CGD12HB00D Differential Transceiver:

- Converts Single-Ended I/O to High Noise Immunity Differential I/O
- Supports Single-Ended 3.3 V or 5.0 V Logic-Level Inputs
- Integrated Reverse Polarity and Overvoltage Protections
- Fault Indicator LEDs for Instant Visual Feedback
- Single-Ended and Differential Filter Networks for Additional EMC/EMI Immunity

### CRD---DA12E-XM3 Inverter Reference Design:

- 250-300 kW Output Power, depending on the XM3 Module Implemented
- Demonstrates best-in-class system-level power density and efficiency obtained by using Wolfspeed’s new XM3 power module platform
- Enables over 2x the power density of comparable Si based designs and >98% efficiency
- Includes XM3 Power Modules, CGD12HBXMP Gate Drivers, High Performance Cold Plate, Optimized Laminated Bussing for Reduced Power Loop Inductance, DC-Link Capacitors, Sensors and Control Hardware

*2019 Wolfspeed. All rights reserved. The information in this document is subject to change without notice.*
**XM3 Evaluation Gate Driver Tools:**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Output Channels</th>
<th>Isolation Voltage (V)</th>
<th>Output Peak Current (A)</th>
<th>Designed for</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGD12HBXMP</td>
<td>2</td>
<td>1200</td>
<td>10</td>
<td>XM3 Platform</td>
<td>Available</td>
</tr>
<tr>
<td>CGD12HB00D</td>
<td>2</td>
<td>N/A</td>
<td>N/A</td>
<td>Differential Transceiver for CGD15HB62LP and CGD12HBXMP</td>
<td>Available</td>
</tr>
</tbody>
</table>

**XM3 Reference & Evaluation Designs:**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Voltage Class</th>
<th>Optimized for</th>
<th>Avail for Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRD300DA12E-XM3</td>
<td>300 kW Inverter Kit for Conduction-Optimized XM3</td>
<td>1200</td>
<td>CAB450M12XM3</td>
<td>Upon Request</td>
</tr>
<tr>
<td>CRD250DA12E-XM3</td>
<td>250 kW Inverter Kit for Frequency-Optimized XM3</td>
<td>1200</td>
<td>CAB400M12XM3</td>
<td>Fall 2019</td>
</tr>
<tr>
<td>KIT-CRD-CIL12N-XM3</td>
<td>Dynamic Performance Evaluation Board for the XM3 Module</td>
<td>1200</td>
<td>XM3 Platform</td>
<td>Upon Request</td>
</tr>
</tbody>
</table>