[APPLICATION BRIEF]

CGD™
CAMBRIDGE GaN DEVICES

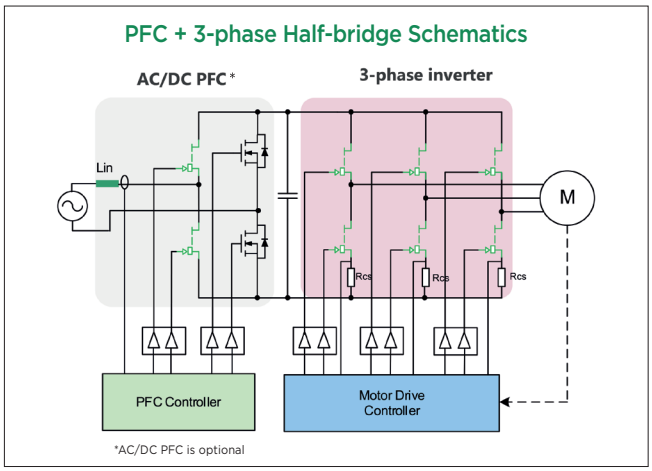
ICeGaN® H2 AND P2 SERIES FOR INVERTERS

BOOSTING SUPERIOR SYSTEM PERFORMANCE IN MOTOR DRIVE APPLICATIONS

Powering the Future: How GaN Provides a Novel Approach in Home Appliances and Industrial Applications

Two distinguishing characteristics of wide-bandgap devices, particularly when applied to motor control inverters, include their reduced heat generation compared to conventional silicon devices—potentially negating the necessity for heat sinks—and their ability to endure significantly higher operating temperatures.

Even at low switching speeds, GaN brings significant efficiency improvements, especially at light loads compared to traditional IGBTs, resulting in higher power capability and reducing BOM costs due to reduced cooling solutions. This technology supports increased switching frequencies, enabling smoother and quieter operation in motor controls. GaN facilitates reduction in physical size resulting in more compact designs and improved integration levels. For ICeGaN® specifically, these advantages are augmented by simple integration features, such as compatibility with existing drivers and controllable slew rates, which simplify the transition from IGBTs and reduce design complexities.



Home Appliances

- Ceiling fan / Range hood
- Food blender / mixer
- Refrigerator / HVAC compressor
- Washing machine
- Vacuum cleaner

Commercial

- HVAC
- Building automation
- Pumps
- Ventilation fans

Industrial

- Industrial automation
- High-power robotics
- Servo motor drive
- Pumps and fans

Highest system performance resulting from...

Key Features

1. **Highest efficiency**
2. **Improved motion control**
3. **Reduced part count**
4. **Lowest standby losses**

ICeGaN® Benefits vs SiC – in 3-phase Inverter

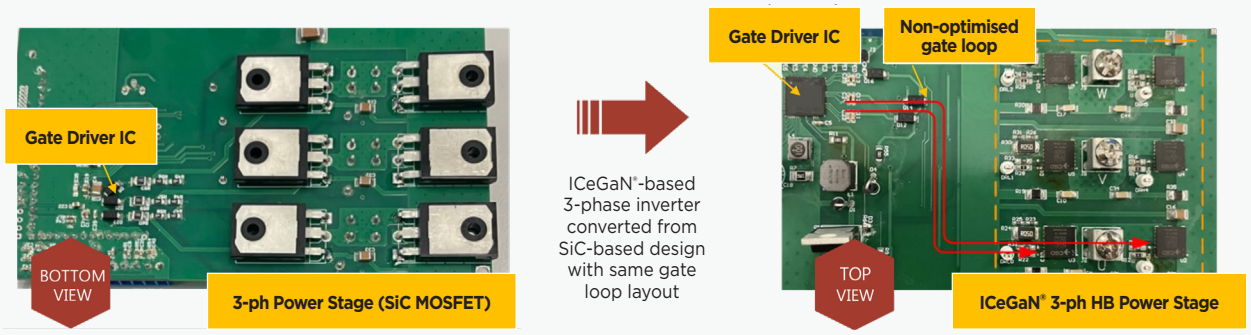
Driver and Layout

Enhanced Device Stability and Simplified Gate Drive Design

- ICeGaN® makes it possible to have clean and stable device switching even with non-optimised gate loop layout
- Experimental results show cleaner waveform than SiC MOSFET in TO-247 with same gate drive layout

Lower Cost Gate Driver

- Thanks to lower Q_G and Miller Clamp, ICeGaN® requires very small peak current from gate driver (100 mA range)
- SiC MOSFET needs >10x higher peak driving current due to higher Q_G – max switching frequency and power level limited by the driver capability
- Low source/sink current driver (<1 A) can be used for ICeGaN® – better driver compatibility and cost reduction



ICeGaN® Simplifies Gate Drive Design and Reduces Gate Driver Cost

ICeGaN® outperforms SiC in 3-phase inverters by simplifying gate drive design and reducing costs. Needing up to ten times less gate driving current allows compatibility with more drivers, enabling higher frequencies and power levels, and achieving BOM cost savings with low-cost, low-current legacy IGBT drivers. ICeGaN® also produces smoother waveforms with less ringing, enhancing device stability and efficiency.

Product Portfolio

PN	$R_{DS(on)}$ typ (mΩ)	Current Rating (A)	Package	Features	Preferred Gate Driver	Status
CGD65A055SH2	55	27	DFN 8x8	ICeGaN® Current Sense NL³* circuit	Any MOSFET and IGBT driver	In production
CGD65A130SH2	130	12	DFN 8x8			
CGD65C025SP2	25	60	BHDFN-9-1	ICeGaN®		Contact factory
CGD65D025SP2	25	60	DHDFN-9-1	ICeGaN® Dual gate		
CGD65C055SP2	55	27	BHDFN-9-1	ICeGaN® NL³* circuit		In production
CGD65D055SP2	55	27	DHDFN-9-1	ICeGaN® Dual gate NL³* circuit		Contact factory

DFN 8X8:

BHDFN:
BOTTOM-SIDE COOLED

DHDFN:
DUAL-SIDE COOLED

BH: Bottom heat-spreader **DH:** Dual heat-spreader ***NL³:** No load and light load

See product datasheet

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