



# Intelligent Power Modules (IPM)

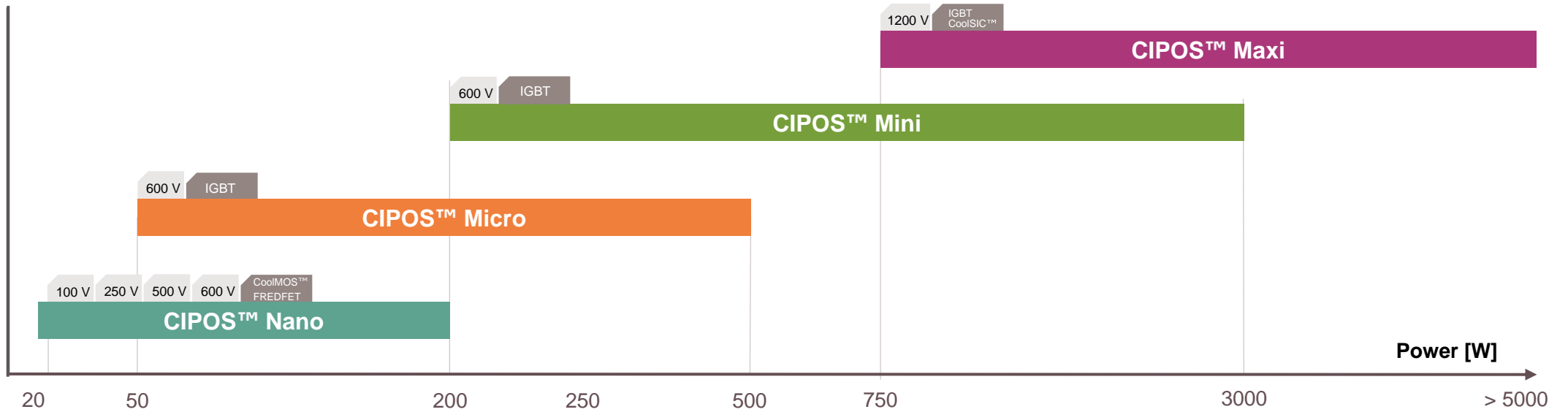
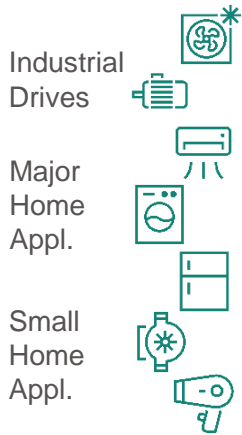
GIP GCO MIP Marketing  
June 2024



# Broad Intelligent Power Module portfolio serving power ranges from 20 W to 10 kW plus



## Main Applications



**CIPOS™ Nano**

- 7x8x0.9 mm
- 8x9x0.9 mm
- 12x10x0.9 mm
- 12x12x0.9 mm

**For space constrained applications**

Powering millions of personal cares and low power application

**CIPOS™ Micro**

29x12x2.9 mm

**Compact solution**

Optimized solution for low power fan & pump

**CIPOS™ Mini**

36x21x3.1 mm

**Broad range portfolio**

Proven solution for MHA/Industrial drives

**CIPOS™ Maxi**

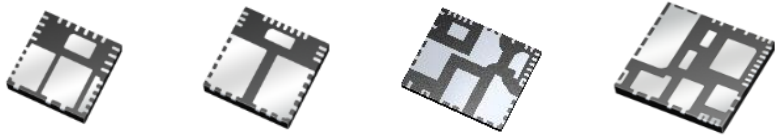
36x23x3.1 mm

**Highest power density**

Ruggedized Industrial drives and CAC solution

# CIPOS™ Nano product family

## Product overview



Dimension [mm]	7x8	8x9	12x10	12x12
Configuration	Half-bridge	Half-bridge	H-bridge	3-phase
Voltage rating	100 V	250 V, 500 V	250 V, 600 V	250 V, 500 V
RdsOn [max]	0.21 Ω	0.15 – 1.7 Ω	0.063 – 0.31 Ω	0.45 – 6.0 Ω

## Typical applications

- Hair dryer
- Fan motor
- Pump
- Air conditioner Indoor Unit
- Air purifiers
- Small kitchen appliances



## Key features

- Various topology solutions; Half-bridge, H-bridge, 3-phase
- Broad product coverage in same footprint; 100 V - 600 V
- Power capability up to 200 W
- Optimized dv/dt for loss and EMI trade-off
- Built-in NTC thermistor, Bootstrap function
- Multiple protection; Overcurrent, Shoot-through, Over temperature, UVLO, Fault reporting

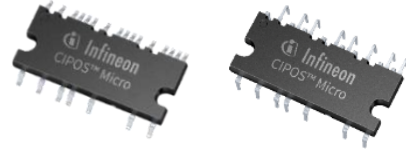
## Value proposition

- Smallest modules in the market
- Cost savings from smaller footprint and PCB size reduce
- Half-bridge enables more PCB design flexibility, better heat dissipation
- Same package/PCB design for multiple markets (Battery powered, AC plugged)

# CIPOS™ Micro product family

## Product overview

DIP 29x12 (F)  
SOP 29x12 (F)



Dimension [mm]	29x12x2.9
Configuration	3-phase
Voltage rating	600 V
IGBT current rating	2 A, 4 A, 6 A
Package type	SOP, DIP

## Typical applications

- Aircon Indoor & outdoor fan drive
- Fan motors
- Circulation pumps
- Dish washer
- Washing machine
- Cooling fan for commercial fridge
- Up to 500 W motor drives



## Key features

- Wide range of product coverage with various switch technologies
- Various application optimized options available
- Pin-comparable solution to one of the main solution in the market

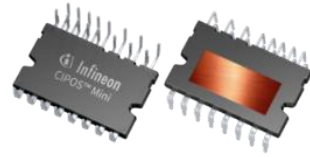
## Value proposition

- Reduce system costs and fast time to market
- Provide wide switching speed range
- High power density and high efficiency and high output power in one small package
- Cross conduction prevention and turn of all switches in case of overcurrent and under voltage

# CIPOS™ Mini product family

## Product overview

DIP 36x21(D)



Dimension [mm]

36x21x3.1

Lineup	Application	Specifications
Lineup	Inverter	600 V 4 A, 6 A, 10 A, 15 A, 20 A, 30 A
	SRM	600 V 15 A, 20 A
	PFC	650 V 20 A, 30 A
	PFC + Inverter	600 V 10 A, 15 A, 20 A

## Typical applications

- Refrigerator, washing machine, room air conditioner
- Door drives/GPI/sewing machine
- General motor drive applications including industrial drives in the power range of 300 W to 3 kW



## Key features

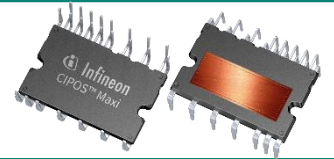
- Wide range of current rating: 4 A to 30 A
- High integration (bootstrap circuit, thermistor, single boost PFC)
- Optimized for target application requirements (separate version for washing machine and air conditioner)

## Value proposition


- Lower PCB size and system cost
- Easy power extension from 300 W to 3 kW
- Optimized performance for each application
- UL certified package and temp sensor

# CIPOS™ Maxi product family

## Product overview

<b>DIP 36x23D</b>	
	
<b>Dimension [mm]</b>	<b>36 x 22.7 x 3.1 mm<sup>3</sup> with 24 pins</b>
Configuration	3-phase inverter with open emitters
Voltage rating	1200 V
IGBT current rating	5 A, 10 A , 15 A (TC = 80°C, TJ < 150°C )
SIC MOSFET ID DC drain current	20 A (TC = 80°C, TJ < 150°C )

## Typical applications

- Commercial air conditioners
  - PFC (Active filter)
  - Compressor
  - Outdoor unit fan
  - Low power motor drives
  - Pumps
  - Fans
- 

## Key features

- Offers the smallest package in 1200 V IPM class
- Integrated 6 TRENCHSTOP™ IGBT 4 / CoolSiC™ MOSFET and a rugged 1200 V 6-channel SOI gate driver
- Integrated bootstrap functionality
- RFE pin with multi-functions
- Multiple protect functions (overcurrent shutdown, under-voltage lockout at all channels, temperature monitoring)
- An independent thermistor for temperature monitoring

## Value proposition

- The smallest package size in 1200 V IPM class with high power density and best performance
- Enhanced robustness of gate driver technology for excellent protection
- Adapted to high switching application with lower power loss
- Simplified design and manufacturing

