CIPOS™
Intelligent Power Modules (IPM)

Selection guide 2017

www.infineon.com/ipm

Infineon CIPOS™ IPMs are families of highly integrated, compact power modules designed to drive motors in applications ranging from home appliances, fans, pumps to general purpose drives.

Contents

CIPOS™ IPM family overview

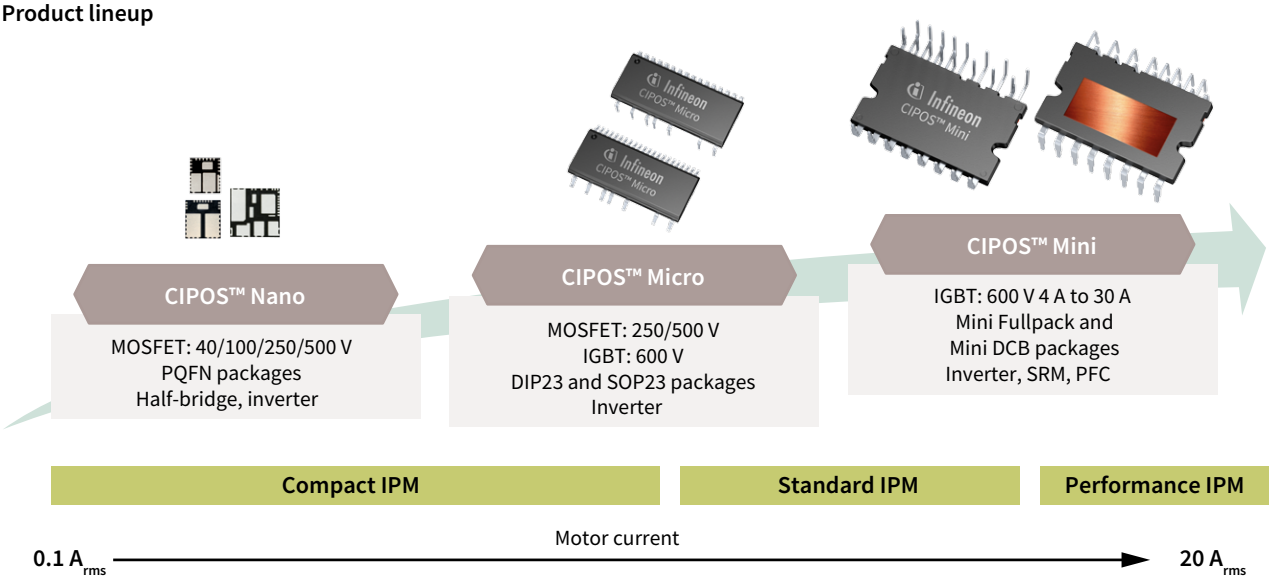
Control Integrated Power System (CIPOS™) Intelligent Power Modules (IPM)

Depending on the level of integration and power to be handled, Infineon offers a variety of IPMs, with different semiconductors in different packages and different voltage and current classes. These IPMs are separated into **Compact**, **Standard** and **Performance** families.

The CIPOS™ IPMs are families of highly integrated, compact power modules designed to drive motors in applications ranging from home appliances, to fans, pumps and general purpose drives.

Infineon's energy-efficient IPMs integrate the latest power semiconductor and control IC technology leveraging Infineon's advanced IGBTs, MOSFETs, next-generation gate driver ICs and state-of-the-art thermo-mechanical technology.

Product lineup



Key benefits

- Shorter time-to-market
- Increased reliability
- Reduced system cost
- Improved manufacturability
- Reduced space

Major applications

Product family	Applications							
	Fridge	Aircon	Washing Machine	Dishwasher	Laundry dryer	Vacuum cleaner	Fans	Drives
CIPOS™ Nano	●	●	●	●		●	●	●
CIPOS™ Micro	●	●	●	●	●	●	●	●
CIPOS™ Mini	●	●	●	●	●	●		●

CIPOS™ Nano overview

3-phase or half-bridge driver with MOSFETs

CIPOS™ Nano is a family of highly integrated, ultra-compact, power modules for high efficiency appliance and light industrial applications, including compressor drives for refrigeration, pumps for heating and water circulation, air-conditioning fans, dishwashers, and automation systems. By utilizing an innovative packaging solution, the CIPOS™ Nano family delivers a new benchmark in device size, offering up to a 60 percent smaller footprint than existing 3-phase motor control power IPMs.

CIPOS™ Nano products comprise of a series of fully integrated 3-phase or half-bridge surface-mount motor control circuit solutions. The new alternative approach utilizes PCB copper traces to dissipate heat from the module, providing cost savings through a smaller package design and even eliminating the need for an external heat sink.

Key features

- Smallest IPMs on the market
- Integrated gate driver IC and bootstrap functionality
- Suitable for sinusoidal or trapezoidal modulation
- Low $R_{DS(on)}$ Trench FREDFET
- Under-voltage lockout for all channels
- Matched propagation delay for all channels
- Optimized dV/dt for loss and EMI trade offs
- 3.3 V input logic compatible
- Active high HIN and LIN
- Isolation 1500 V_{RMS}, 1 minute

PQFN 12x12
12x12x0.9 mm

PQFN 8x9
8x9x0.9 mm

PQFN 7x8
7x8x0.9 mm

Key benefits

- Cost savings from smaller footprint and reduced PCB space
- Easy implementation of 2 or 3-phase motor drives with half-bridge IPMs
- Half-bridge IPMs distribute heat dissipation and enable elimination of heat sink
- Same PCB footprint to address multiple application markets (100 V_{AC} - 230 V_{AC})

Major applications

CIPOS™ Micro overview

Solution for low power motor drive applications

CIPOS™ Micro is a family of compact IPMs for low power motor drive applications including fans, pumps, air purifiers and refrigerator compressor drives.

It offers a cost effective power solution by leveraging industry standard footprints and processes compatible with various PCB substrates. The family features rugged and efficient high voltage FREDFET MOSFETs specifically optimized for variable frequency drives with voltage ratings of 250 V, 500 V and 600 V IGBTs. These devices are paired with the most advanced high voltage driver ICs tuned to achieve optimal balance between EMI and switching losses. CIPOS™ Micro family offers DC current ratings ranging up to 6 A to drive motors up to 100 W without heatsink and up to 300 W with heatsink, and are available in both through-hole and surface mount package options.

Key features

- Integrated bootstrap functionality
- Under-voltage lockout for all channels
- Matched propagation delay for all channels
- Optimized dV/dt for loss and EMI trade off
- Advanced input filter with shoot-through protection
- Separate low-side emitter pins for single or leg-shunt current sensing
- 3.3 V logic compatible
- Up to 1900 V_{RMS}, 1 min isolation (UL certified: file number E252584)
- UL certified NTC thermistor for temperature feedback available
- Various lead forms available including through-hole and surface mounted

SOP23
29x12x2.9 mm

DIP23
29x12x2.9 mm

Key benefits

- Ease of design and short time-to-market
- Compact package with three lead form options available
- Wide range of current and voltage ratings in the same package
- Wide range of modules for 110 V_{AC} or 230 V_{AC} applications in the same footprint
- Simplified design and manufacturing
- Lower losses than similar modules in the market
- Heat sink-less operation possible

Major applications

CIPOS™ Mini overview

Broad range of applications from PFC to inverter

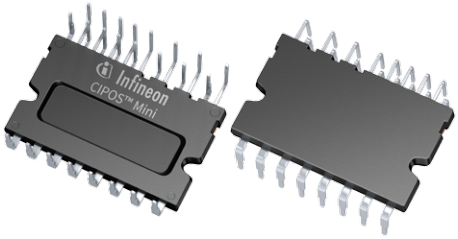
CIPOS™ Mini modules integrate various power and control components to increase reliability, and to optimize PCB size and system costs. This simplifies the power design and reduces significantly time-to-market.

CIPOS™ Mini modules are designed to control AC motors in variable speed drives for applications from 4 A up to 30 A such as air conditioning, washing machines, refrigerators, vacuum cleaners, compressors and industrial drives up to 3 kW.

The package concept is specially adapted to power applications that need good thermal conduction and electrical isolation, but also EMI-safe control, innovative FAULT indication and overload protection. The feature of Infineon's reverse conducting IGBTs or TRENCHSTOP™ IGBT is used with a new optimized Infineon SOI gate driver IC for excellent electrical performance.

Key features

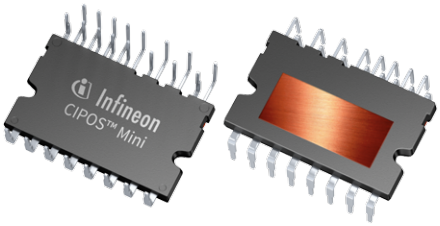
- Dual-in-line transfer molded package with DCB or Fullpack substrate
- Current rating from 4 A to 30 A, power rating up to 3 kW
- Optimized for home appliances and motor drives
- Rugged SOI gate driver IC technology
- Advanced protection features
- UL1577 certified



MDIP-24 Fullpack
36x21x3.1 mm

Key benefits

- High integration (bootstrap circuit, thermistor) for easy design and system space saving
- Single platform possible from 4 A to 30 A
- Enhanced robustness of the advanced IGBT and gate driver IC technology
- High power density
- Two kinds of substrates provide cost efficient solution for home appliances
- UL certified thermistor



MDIP-24/21 DCB
36x21x3.1 mm

Major applications

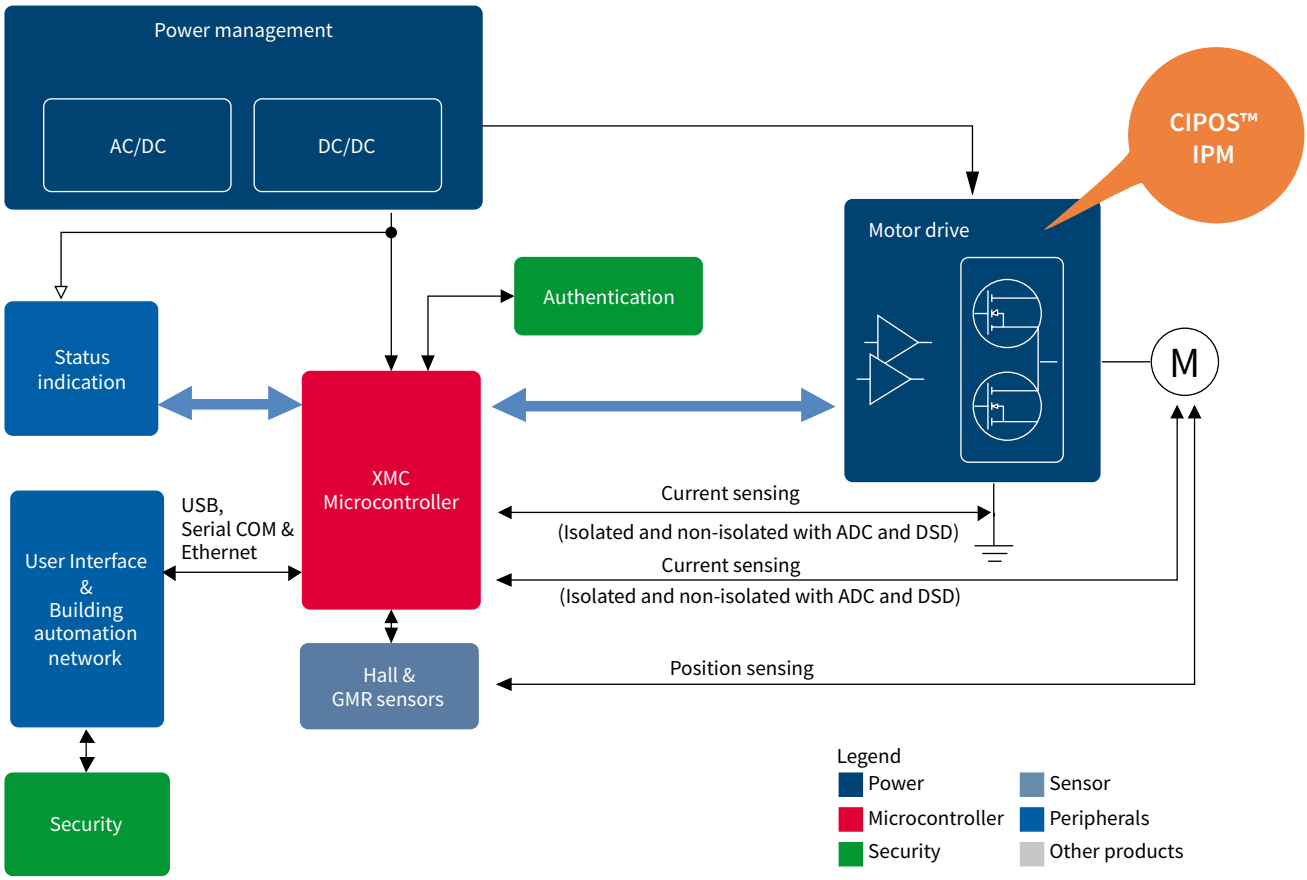
Major applications of CIPOS™ IPM

High performance products with seamless functionality

Home appliances perform tasks essential to busy everyday life – being a washing machine or an air conditioning system. Historically home appliances have been big energy consumers. But at an age of heightened awareness for the environment and financial costs, the demand for energy-efficient systems is rapidly growing. At the same time, consumers expect the sleekest, quietest, most compact and visually appealing home appliances. Also, connectivity between an increasing number of devices requires a fallback for user privacy.

Product designers are challenged in terms of form and function. They must deliver smaller, smarter and more secure solutions that are the most powerful and the most energy-efficient possible.

Industry-leading technology and manufacturing expertise from Infineon helps customers overcome the challenges unique to designing a major home appliance. Our line of innovative components meets and exceeds even the most rigorous requirements for reliability, quality, security and energy efficiency. Explore applications of interest to learn more about innovative design options and to find dedicated IPM solutions.



Buzzword: inverterization

More and more home appliances, including refrigerators, freezers, washers, dryers and air condition units, are getting a boost in the form of a digital inverter to control the motor. It can turn the motor on and off as required, as well as intelligently regulate its performance. Consumers clearly benefit from the inverterization trend: appliances with digital inverters have longer lifetimes, make less noise, consume less energy, and ultimately save consumers' money.

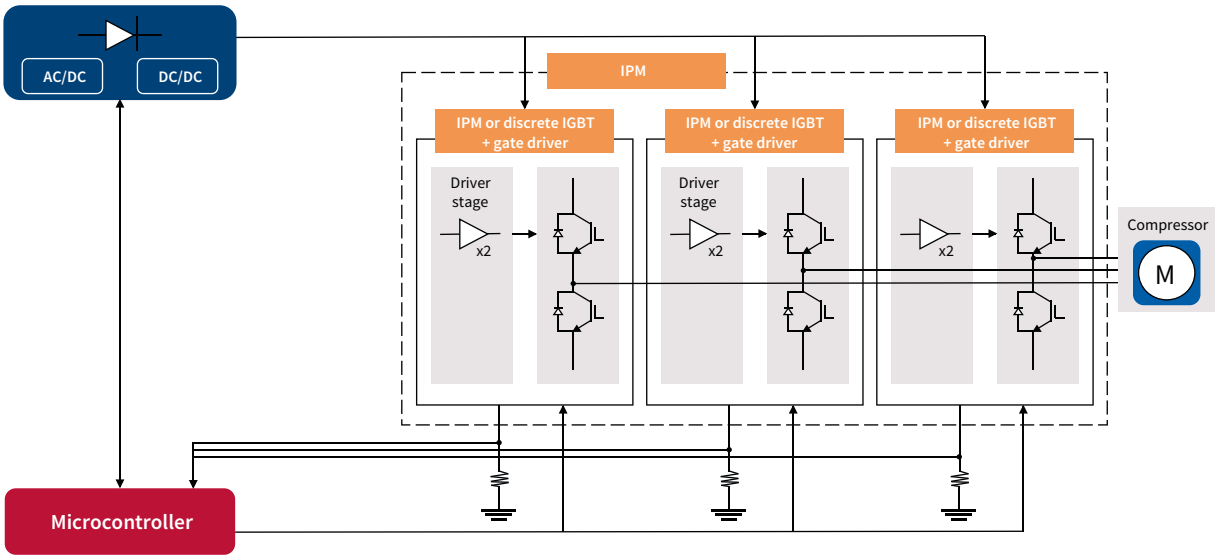
Variable speed refrigerators

Less noise, better efficiency – just what consumers want

When the time comes to select a new refrigerator, today's consumers typically focus on two aspects: more energy efficiency, and reduction or even suppression of audible noise. Compact design is a third factor that frequently comes into play. Meanwhile, refrigerator manufacturers currently face more stringent regulations of the appliance's form factor and are under constant pressure to reduce costs.

Infineon's products and expertise will allow engineers to embed all these expectations into the design of a variable speed refrigerator. The result is an advanced technical solution for the consumer that meets target cost constraints.

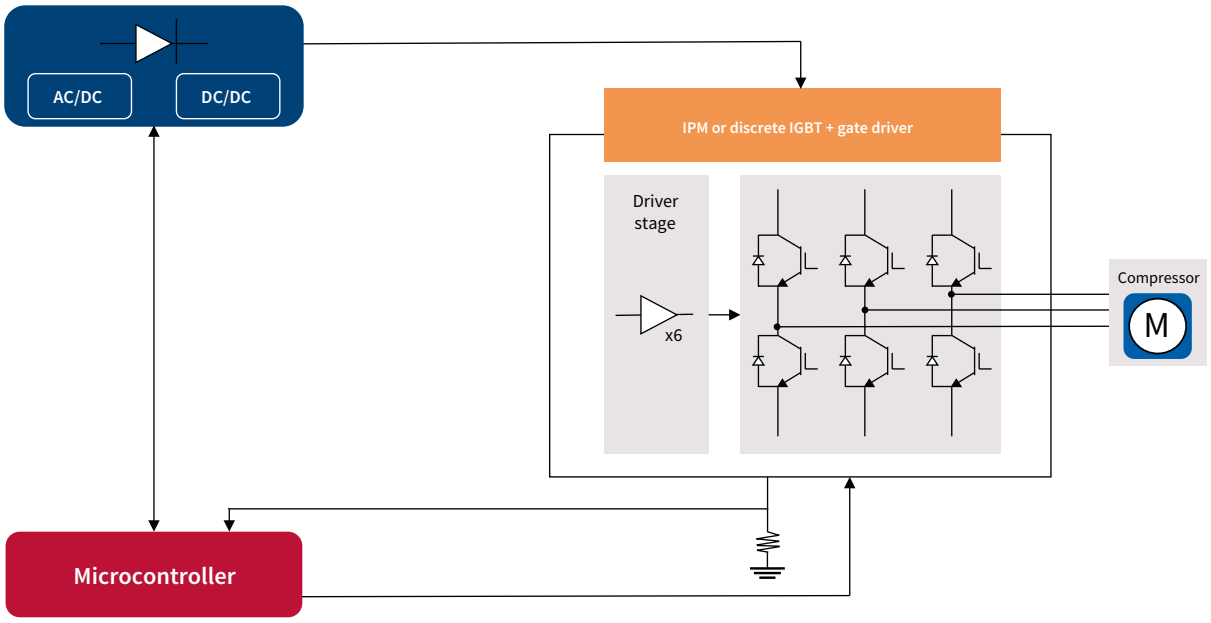
Variable speed refrigerators – half-bridge IPM solution



Half-bridge IPM solution for variable speed refrigerators

Product family	Motor I_{rms} range [A_{rms}]	Topology	Lineup	Product number	Package
CIPOS™ Nano	0.4 – 1.5	Half-bridge	500 V MOSFET 0.8 Ω, 1.7 Ω	IRSM807-045MH IRSM807-105MH	PQFN 8x9

Variable speed refrigerators – full inverter IPM solution



Full inverter IPM solution for variable speed refrigerators

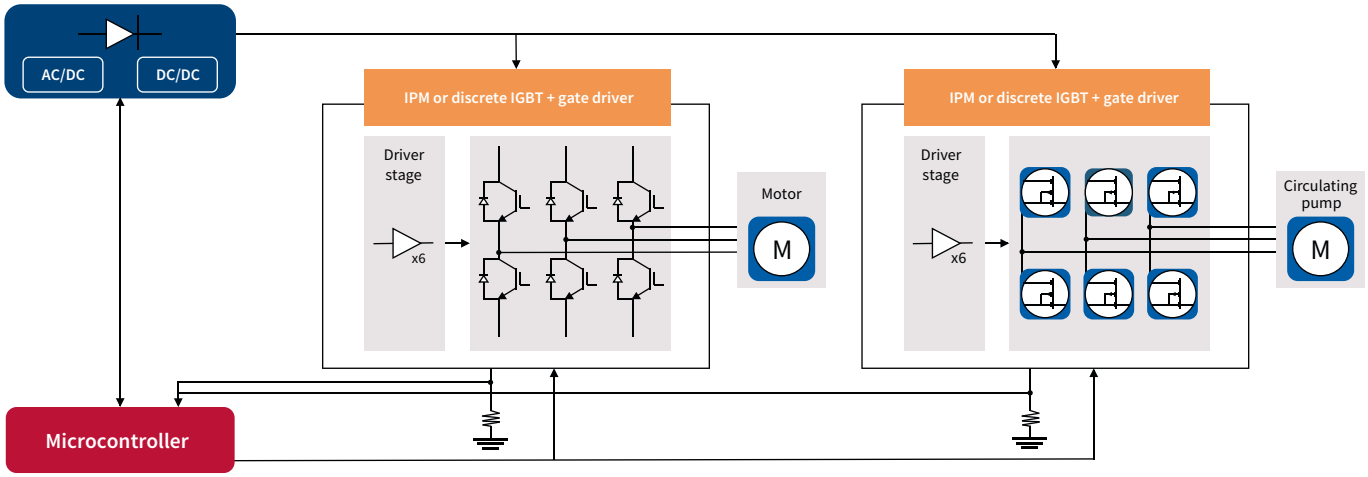
Product family	Motor I_{rms} range [A_{rms}]	Topology	Lineup	Product number	Package
CIPOS™ Mini	up to 6	3-phase inverter	600 V IGBT 4 A, 6 A	IGCM04F60GA IGCM06F60GA	MDIP-24 Fullpack

Washing machines

From inverterization to smart appliances

Washing machines have become an essential appliance that people can no longer imagine life without. Today, consumers seek quiet, highly efficient systems with the right feature set. As commodities, washing machines require components with an attractive price-performance ratio for their designs that improve reliability and energy efficiency. Furthermore, new features and innovations are designed to reduce vibration and noise when handling heavy or light loads.

Variable speed washing machine system diagram



IPM solution for variable speed washing machines

IPMs for motor

Product family	Motor I_{rms} range [A_{rms}]	Topology	Lineup	Product number	Package
CIPOS™ Mini	up to 11	3-phase inverter	600 V IGBT 10 A, 15 A	IGCM10F60GA/IKCM10H60yA IKCM10L60yA IGCM15F60yA/IKCM15H60GA IKCM15L60yA	MDIP-24 Fullpack

y = G (with thermistor); y = H (without thermistor)

IPMs for drain pump

Product family	Motor I_{rms} range [A_{rms}]	Topology	Lineup	Product number	Package
CIPOS™ Nano	0.1 – 0.4	3-phase inverter	500 V MOSFET 1.7 Ω, 2.2 Ω, 4.0 Ω, 6.0 Ω	IRSM836-0x5MA	PQFN 12x12
	0.2 – 1.0		250 V MOSFET 0.45 Ω, 1.05 Ω, 2.2 Ω	IRSM836-0x4MA	PQFN 12x12
CIPOS™ Micro	0.2 – 0.5	3-phase inverter	500 V MOSFET 1.3 Ω, 1.7 Ω, 2.2 Ω, 4.0 Ω, 6.0 Ω	IRSM5y5-0x5DA	DIP23
				IRSM5y5-0x5PA	SOP23
	0.2 – 1.0		250 V MOSFET 0.45 Ω, 1.05 Ω, 2.2 Ω	IRSM5y5-0x4DA	DIP23
				IRSM5y5-0x4PA	SOP23
	0.7	3-phase inverter	600 V IGBT 6 A	IRSM5y6-076DA	DIP23
				IRSM5y6-076PA	SOP23

x = current rating; y = 0 (with thermistor); y = 1(without thermistor)

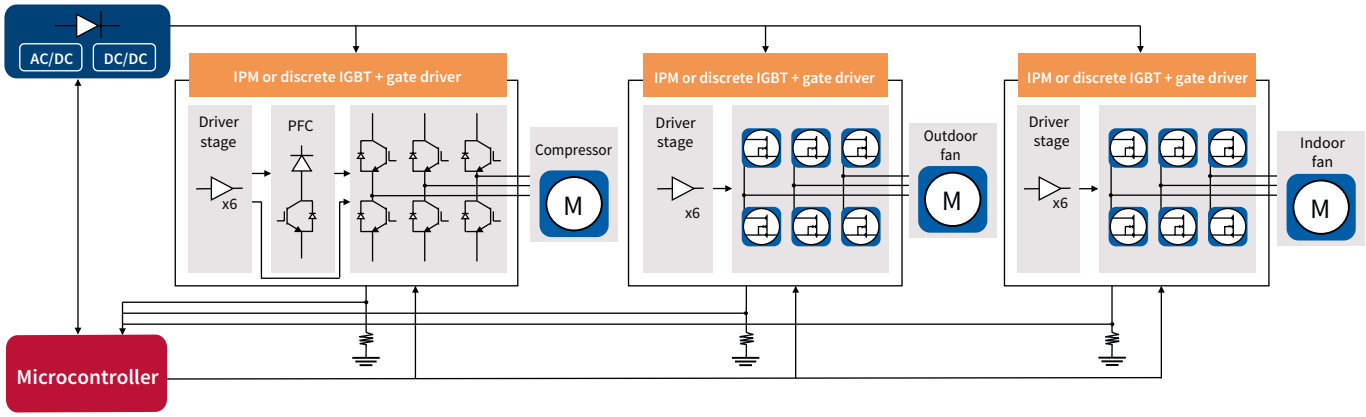
Room air conditioners

Quiet, stable, and smooth

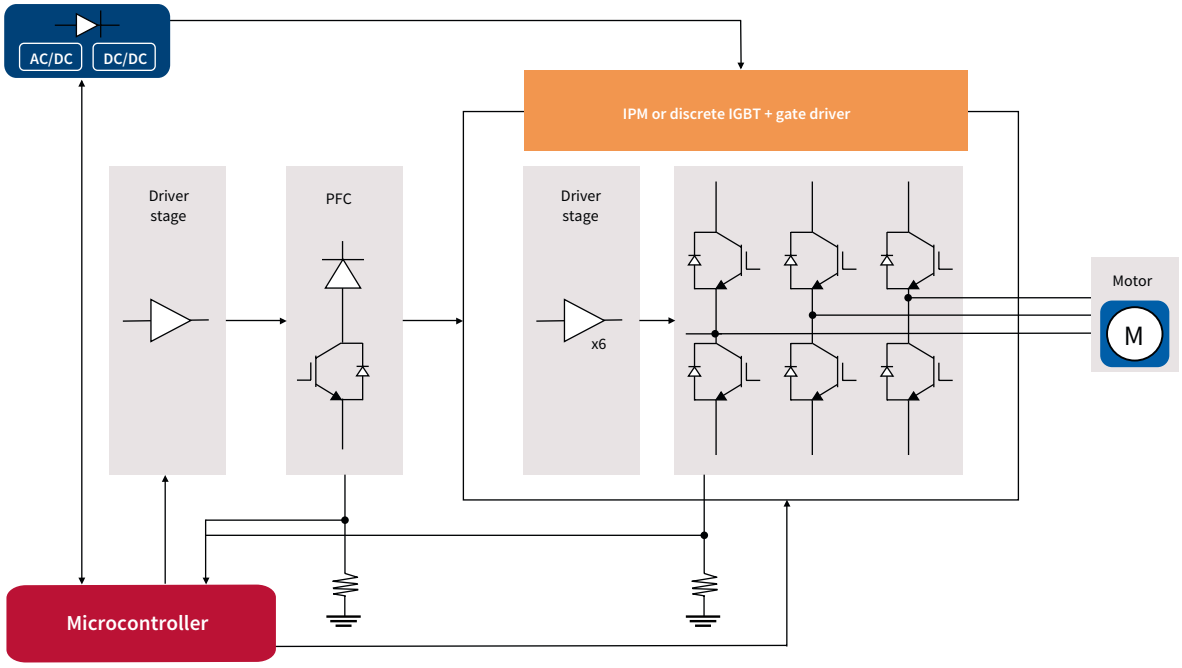
Smart and smaller, more powerful and energy-efficient: today's room air conditioning units must fulfill a growing list of demands. Because they are used in private homes, quiet air conditioning systems are highly sought after. Functions such as a smooth starting and variable operating speed round out the list of must-haves.

Designing room air conditioning units that boast such capabilities requires everything from low vibration components, to a low acoustic noise compressor, a reliable fan control and a sensor less field oriented control. Semiconductor solutions must also be energy-efficient and reflect new form factors.

High efficiency air conditioning systems



Standard efficiency air conditioning systems



IPM solution for room air conditioners

IPMs for compressors

Product family	Motor I_{rms} range [A_{rms}]	Topology	Lineup	Product number	Package
CIPOS™ Mini	up to 10	3-phase inverter + PFC	600 V IGBT 15 A	IFCM15S60GD IFCM15P60GD	MDIP-24 DCB
	up to 13	3-phase inverter	600 V IGBT 10 A, 15 A, 20 A, 30 A	IGCM10F60yA/IKCM10L60yA IGCM15F60yA/IKCM15F60yA IKCM15L60yA IGCM20F60yA/IKCM20L60yA IKCM30F60yA	MDIP-24 Fullpack
	up to 20		600 V IGBT 15 A, 20 A, 30 A	IKCM15L60yD IKCM20L60yD IKCM30F60yD	MDIP-24 DCB
	up to 16	2-phase interleaved PFC	650 V IGBT 20 A, 30 A	IFCM20T65GD IFCM30T65GD	MDIP-21 DCB
	up to 24	3-phase interleaved + PFC	650 V IGBT 20 A, 30 A	IFCM20U65GD IFCM30U65GD	

S = 20 kHz; P = 40 kHz; y = G (with thermistor); y = H (without thermistor)

IPMs for outdoor fans

Product family	Motor I_{rms} range [A_{rms}]	Topology	Lineup	Product number	Package
CIPOS™ Nano	0.1 – 0.4	3-phase inverter	500 V MOSFET 1.7 Ω, 2.2 Ω, 4.0 Ω, 6.0 Ω	IRSM836-0x5MA	PQFN 12x12
CIPOS™ Micro	0.2 – 0.5	3-phase inverter	500 V MOSFET 1.3 Ω, 1.7 Ω, 2.2 Ω, 4.0 Ω, 6.0 Ω	IRSM5y5-0x5DA	DIP23
	1.5*			IRSM5y5-0x5PA	SOP23
	0.6	3-phase inverter	600 V IGBT 6 A	IRSM5y6-076DA	DIP23
	2.0*			IRSM5y6-076PA	SOP23

x = current rating; y = 0 (with thermistor); y = 1(without thermistor); * With heatsink

IPMs for indoor fans

Product family	Motor I_{rms} range [A_{rms}]	Topology	Lineup	Product number	Package
CIPOS™ Nano	0.1 – 0.4	3-phase inverter	500 V MOSFET 1.7 Ω, 2.2 Ω, 4 Ω, 6 Ω	IRSM836-0x5MA	PQFN 12x12
	0.2 – 1.0		250 V MOSFET 0.45 Ω, 1.05 Ω, 2.2 Ω	IRSM836-0x4MA	PQFN 12x12
	0.6	Half-bridge	500 V MOSFET 1.7 Ω	IRSM807-045MH	PQFN 8x9
CIPOS™ Micro	0.2 – 0.5	3-phase inverter	500 V MOSFET 1.3 Ω, 1.7 Ω, 2.2 Ω, 4 Ω , 6 Ω	IRSM5y5-0x5DA	DIP23
				IRSM5y5-0x5PA	SOP23
	0.2 – 1.0		250 V MOSFET 0.45 Ω, 1.05 Ω, 2.2 Ω	IRSM5y5-0x4DA	DIP23
				IRSM5y5-0x4PA	SOP23

x = current rating; y = 0 (with thermistor); y = 1(without thermistor)

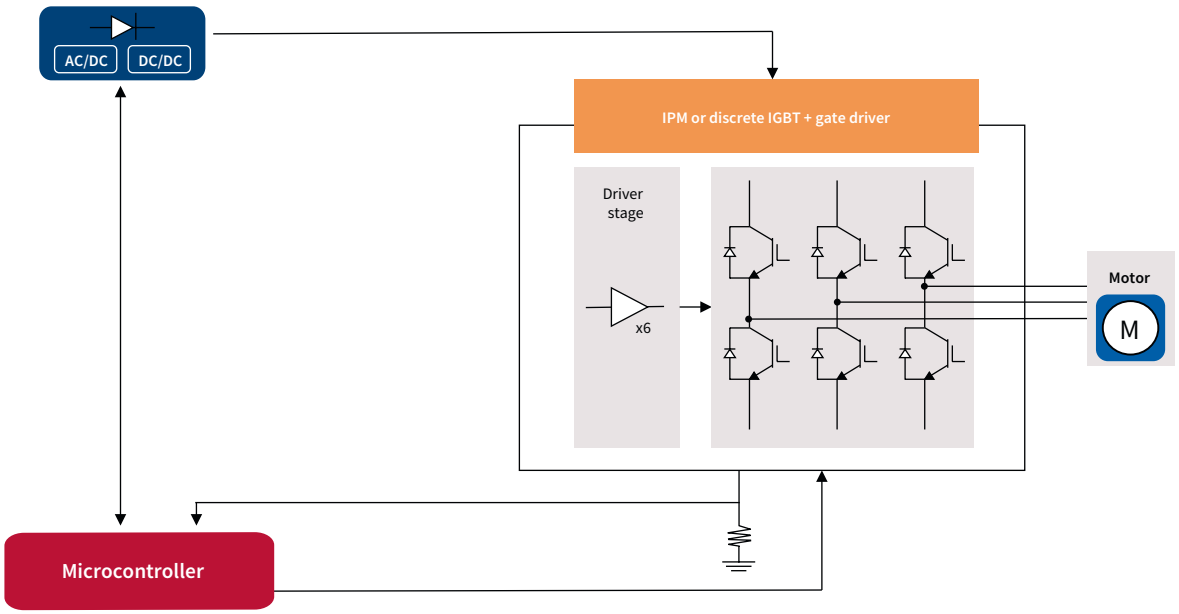
Variable speed fans

Efficiency, power density, and reliability

What are today's consumers looking for in a fan motor? For one, it is a smarter, more powerful and energy-efficient fan. Less acoustic noise is highly desirable in a fan motor, as are functions such as stable and smooth starting, a wide range of operating speeds, and vibration suppression.

Reliable and energy-efficient components are key to a fan motor that is in synchronization with consumer needs. New form factors to achieve smaller designs are also essential and the price-performance ratio needs to be just right. In a world where applications are becoming smarter, an ideal solution must enable feature novelties that render a fan an intelligent appliance. Select CIPOS™ IPMs to go beyond just connectivity and give consumers a reliable solution.

Fan motor system diagram



IPM solution for fan motors

Product family	Motor I_{rms} range [A_{rms}]	Topology	Lineup	Product number	Package
CIPOS™ Nano	0.1 – 0.4	3-phase inverter	500 V MOSFET 2.2 Ω, 4.0 Ω, 6.0 Ω	IRSM836-015MA IRSM836-025MA IRSM836-035MA	PQFN 12x12
	0.2 – 1.0		250 V MOSFET 0.45 Ω, 1.05 Ω, 2.2 Ω	IRSM836-0x4MA	PQFN 12x12
CIPOS™ Micro	0.1 – 2.0	3-phase inverter	500 V MOSFET 1.3 Ω, 1.7 Ω, 2.2 Ω 600 V IGBT 6 A	IRSM505-035DA IRSM505-055DA IRSM505-065DA IRSM506-076DA	DIP23
				IRSM505-035PA IRSM505-055PA IRSM505-065PA IRSM506-076PA	SOP23
	0.2 – 1.0		250 V MOSFET 0.45 Ω, 1.05 Ω, 2.2 Ω	IRSM5y5-0x4DA	DIP23
				IRSM5y5-0x4PA	SOP23
CIPOS™ Mini	up to 6	3-phase inverter	600 V IGBT 4 A, 6 A	IGCM04F60GA/IGCM04G60GA IGCM06F60GA/IGCM06G60GA	MDIP-24 Fullpack

x = current rating; y = 0 (with thermistor); y = 1(without thermistor)

CIPOS™ IPMs are applicable to a variety of home appliances, fans, pumps, and general purpose drives. For more information, please see application mapping on p 16-17.

Application mapping

Applications			Current rating	Product		
				CIPOS™ Nano	CIPOS™ Micro	CIPOS™ Mini
Home appliances	Refrigerator	Fan	1-3 A (500 V) 2-4 A (250 V)	IRSM836-0x5MA IRSM836-0x4MA	IRSM5y5-0x5zA IRSM5y5-0x4zA	
		Compressor (small refrigerator)	1-3 A (500 V) 2-4 A (250 V) 4 A (600 V)	IRSM836-084MA IRSM807-105MH IRSM808-204MH	IRSM5y5-084zA IRSM5y6-076zA	
		Compressor	4-8 A			IGCM04F60yA IGCM06F60yA
	Washing machine	Drain pump	1-6 A (500 V)	IRSM836-0x5MA	IRSM5y5-0x5zA	
		Motor	8-15 A			IKCM10H60yA IKCM15H60yA
	Air conditioner	Indoor unit fan	1-3 A (500 V) 2-8 A (250 V)	IRSM836-0x5MA IRSM836-0x4MA IRSM807-045MH	IRSM5y5-0x5zA IRSM5y5-0x4zA	
		Outdoor unit fan	4-10 A (500 V) 4-8 A (250 V) 4 A (600 V)	IRSM807-04(10)5MH IRSM808-204MH	IRSM5y5-0x5zA IRSM5y6-076zA	
		Compressor	10-30 A			IKCM10L60yA IKCM15L60yA IKCM20L60yA IKCM30F60yA IKCM20L60yD IKCM30F60yD
		PFC[1]	20-30 A			IFCM20T65GD IFCM20U65GD IFCM30T65GD IFCM30U65GD
		PFC + Compressor	15 A			IFCM15S60GD IFCM15P60GD
	Dish washer	Circulation pump	5-7 A (500 V) 4 A (600 V)	IRSM807-045MH	IRSM5y5-0x5zA IRSM5y6-076zA	
		Drain pump	1-5 A (500 V)	IRSM836-0x5MA	IRSM5y5-0x5zA	
		Pump	3-6 A			IGCM04F60yA
	Vacuum cleaner	Brush motor	10 A (500 V) 20 A (250 V)	IRSM807-105MH IRSM808-204MH		
		SRM[2]	15-20 A			IKCM15R60GD IKCM20R60GD
	Air purifier	Fan	1-5 A (500 V) 2-8 A (250 V)	IRSM836-0x5MA IRSM836-0x4MA IRSM807-045MH	IRSM5y5-0x5zA IRSM5y5-0x4zA	
	Fan	Ceiling & upright fans	1-3 A (500 V) 2-8 A (250 V)	IRSM836-0x5MA IRSM836-0x4MA IRSM807-045MH	IRSM5y5-0x5zA IRSM5y5-0x4zA	

x = current rating; z = D (through hole) or P (SMD); y = 0/G (with thermistor); y = 1/H (without thermistor); [1] PFC = Power factor correction; [2] SRM = Switched reluctance motor

Applications			Current rating	Product		
				CIPOS™ Nano	CIPOS™ Micro	CIPOS™ Mini
Others	Circulation pump	Motor	3-7 A (500 V) 4-8 A (250 V)	IRSM836-0x5MA IRSM836-0x4MA IRSM807-045MH	IRSM5y5-0x5zA IRSM5y5-0x4zA	
	Ventilation	Bathroom fan	1-5 A (500 V) 2-8 A (250 V)	IRSM836-0x5MA IRSM836-0x4MA IRSM807-045MH	IRSM5y5-0x5zA IRSM5y5-0x4zA	
	Servo	Motor	30 A (100 V) 80 A (40 V)	IRSM005-301MH IRSM005-800MH		
	Elevator door		10 A			IKCM10L60yA
	Treadmill	Motor	20-30 A			IKCM20L60yD IKCM30F60yD
		PFC[1)]	20-30 A			IFCM20T65GD IFCM20U65GD IFCM30T65GD IFCM30U65GD
	Fan pump GPI		4-30 A			IGCM04F60yA IKCM20L60yA IGCM06F60yA IKCM30F60yA IKCM10L60yA IKCM15L60yA IKCM20L60yD IKCM30F60yD

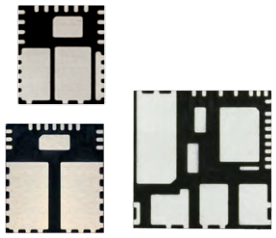
x = current rating; z = D (through hole) or P (SMD); y = 0/G (with thermistor); y = 1/H (without thermistor); [1)] PFC = Power factor correction

Contact the local Infineon sales team for detailed information about IPM products and applications.
Contact information are available on the back cover.
For complete Infineon solutions for major home appliances, refer to Selection guide for major home appliance systems and www.infineon.com/homeappliance.

Product portfolio

Infineon's CIPOS™ IPM solutions are the expert's choice. With more than 100 reliable and efficient IPM solutions, Infineon provides a comprehensive portfolio for virtually any application. To ease the selection process, this overview is structured along the CIPOS™ families.

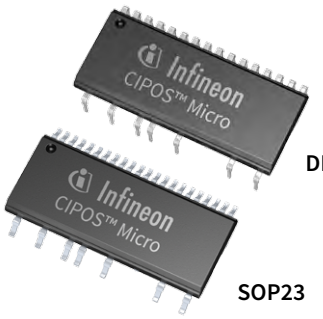
CIPOS™ Nano



PQFN 12x12: 12x12x0.9 mm
PQFN 8x9: 8x9x0.9 mm
PQFN 7x8: 7x8x0.9 mm

Voltage class [V]	P_{mot} (16 kHz) w/o heatsink [W]	$R_{DS(on)}$ (25°C) max. [Ω]	PN	Built in NTC	Configuration: Half-bridge	Configuration: 3-phase open source	Configuration: 3-phase common source	Package: PQFN 7x8	Package: PQFN 8x9	Package: PQFN 12x12
40	160	0.005	IRSM005-800MH		●			●		
100	210	0.02	IRSM005-301MH		●			●		
250	35	2.2	IRSM836-024MA			●				●
	50	1.05	IRSM836-044MA			●				●
	70	0.45	IRSM836-084MA			●				●
	240	0.15	IRSM808-204MH		●				●	
500	40	6.0	IRSM836-015MA			●				●
	45	4.0	IRSM836-025MA			●				●
	50	2.2	IRSM836-035MA			●				●
			IRSM836-035MB				●			●
	55	1.7	IRSM836-045MA			●				●
	80	1.7	IRSM807-045MH		●				●	
	135	0.8	IRSM807-105MH		●				●	
			IRSM808-105MH		●				●	

CIPOS™ Micro



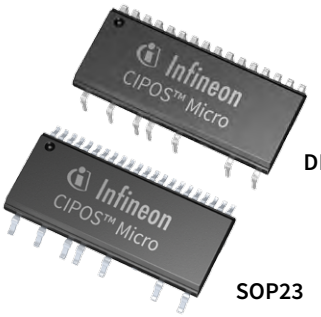
DIP23

SOP23

29x12x2.9 mm

Voltage class [V]	P_{mot} (16 kHz) w/o heatsink [W]	$R_{DS(on)}$ (25°C) max. [Ω]	Rated current [A]	PN	Built in NTC	Configuration 3-phase open source	Package: DIP23	Package: SOP23
250	35	2.2	-	IRSM505-024DA	●	●	●	
				IRSM505-024PA	●			●
				IRSM515-024DA			●	
				IRSM515-024PA				●
	50	1.05	-	IRSM505-044DA	●		●	
				IRSM505-044PA	●			●
				IRSM515-044DA			●	
				IRSM515-044PA				●
	70	0.45	-	IRSM505-084DA	●		●	
				IRSM505-084PA	●			●
				IRSM515-084DA			●	
				IRSM515-084PA				●
500	40	6.0	-	IRSM505-015DA	●		●	
				IRSM505-015PA	●			●
				IRSM515-015DA			●	
				IRSM515-015PA				●
	45	4.0	-	IRSM505-025DA	●		●	
				IRSM505-025PA	●			●
				IRSM515-025DA			●	
				IRSM515-025DA				●
	50	2.2	-	IRSM505-035DA	●		●	
				IRSM505-035PA	●			●
				IRSM515-035DA			●	
				IRSM515-035PA				●
	55	1.7	-	IRSM505-055DA	●		●	
				IRSM505-055PA	●			●
				IRSM515-055DA			●	
				IRSM515-055PA				●
		1.3	-	IRSM505-065DA	●		●	
				IRSM505-065PA	●			●
				IRSM515-065DA			●	
				IRSM515-065PA				●

CIPOS™ Micro



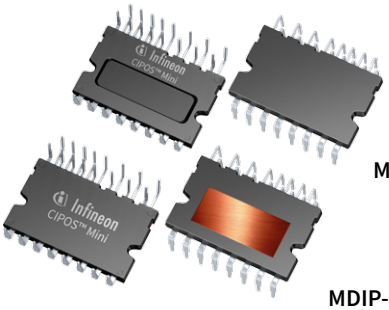
DIP23

SOP23

29x12x2.9 mm

Voltage class [V]	P_{mot} (16 kHz) w/o heatsink [W]	$R_{DS(on)}$ (25°C) max. [Ω]	Rated current [A]	PN	Built in NTC	Configuration 3-phase open source	Package: DIP23	Package: SOP23
600	70	-	6	IRSM506-076DA	●	●	●	
				IRSM506-076PA	●			●
				IRSM516-076DA			●	
				IRSM516-076PA				●

CIPOS™ Mini



MDIP-24 Fullpack

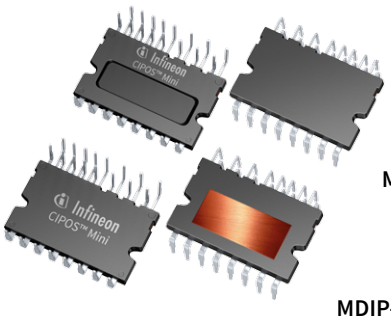
MDIP-24/21 DCB

36x21x3.1 mm

Voltage class [V]	P_{mot} (10 kHz) [W]	Rated current [A]	PN	Built in NTC	2-phase switched reluctance drives	2 or 3-phase interleaved PFC	3-phase common emitter	3-phase open emitter	3-phase open emitter with PFC integrated	MDIP-21 DCB	MDIP-24 DCB	MDIP-24 Fullpack
					Configuration					Package		
600	-	10	IFCM10P60GD*	●					●		●	
			IFCM10S60GD*	●					●		●	
		15	IFCM15P60GD*	●					●		●	
			IFCM15S60GD*	●					●		●	
	600	4	IGCM04F60GA	●				●				●
			IGCM04F60HA					●				●
			IGCM04G60GA	●			●					●
			IGCM04G60HA				●					●
	800	6	IGCM06F60GA	●				●				●
			IGCM06F60HA					●				●
			IGCM06G60GA	●			●					●
			IGCM06G60HA				●					●
	1000	10	IGCM10F60GA	●				●				●
			IGCM10F60HA					●				●
			IKCM10H60GA	●				●				●
			IKCM10H60HA					●				●
	1200	10	IKCM10L60GA	●				●				●
			IKCM10L60HA					●				●
		15	IGCM15F60GA	●				●				●
			IGCM15F60HA					●				●
			IKCM15H60GA	●				●				●
			IKCM15H60HA					●				●

* New product

CIPOS™ Mini



MDIP-24 Fullpack

MDIP-24/21 DCB

36x21x3.1 mm

Voltage class [V]	P_{mot} (10 kHz) [W]	Rated current [A]	PN	Built in NTC	2-phase switched reluctance drives	2 or 3-phase interleaved PFC	3-phase common emitter	3-phase open emitter	3-phase open emitter with PFC integrated	MDIP-21 DCB	MDIP-24 DCB	MDIP-24 Fullpack
					Configuration					Package		
600	1600	15	IKCM15L60GA	●				●				●
			IKCM15L60HA					●				●
			IKCM15F60GA	●				●				●
			IKCM15F60HA					●				●
		20	IGCM20F60GA	●				●				●
			IGCM20F60HA					●				●
	1800	20	IKCM20L60GA	●				●				●
			IKCM20L60HA					●				●
	2000	30	IKCM30F60GA	●				●				●
			IKCM30F60HA					●				●
	2200	15	IKCM15L60GD	●				●			●	
			IKCM15L60HD					●			●	
			IKCM15R60GD	●	●						●	
	2400	20	IKCM20L60GD	●				●			●	
			IKCM20L60HD					●			●	
			IKCM20R60GD	●	●						●	
	2600	30	IKCM30F60GD	●				●			●	
			IKCM30F60HD					●			●	
650	-	20	IFCM20T65GD	●		●				●		
			IFCM20U65GD	●		●				●		
		30	IFCM30T65GD	●		●				●		
			IFCM30U65GD	●		●				●		

New product highlights

The following section features Infineon's latest CIPOS™ IPM products at a glance. Visit the product pages for more information.

IFCM1XY60GD CIPOS™ Mini

IFCM10P60GD 10A/40 kHz; IFCM10S60GD 10 A/20 kHz
IFCM15P60GD 15A/40 kHz; IFCM15S60GD 15 A/20 kHz

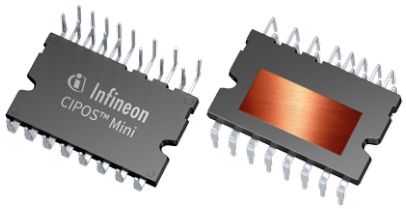
3-phase bridge 600 V, single phase PFC 650 V/30 A

These products are designed to control 3-phase AC motors and permanent magnet motors with single phase PFC in variable speed drives for applications like air conditioning and low power motor drives. The package concept is specially adapted to power applications, which need good thermal conduction and electrical isolation, but also EMI-save control and overload protection.

TRENCHSTOP™ IGBT3 and anti-parallel diodes are combined with an optimized SOI gate driver for excellent electrical performance.

Key features

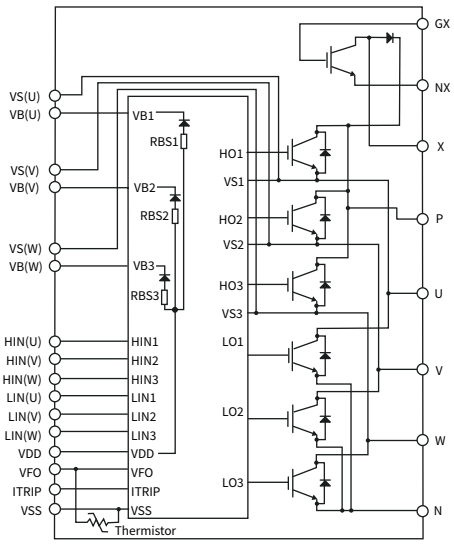
- Dual-in-line molded module with DCB substrate
- PFC + inverter in one package
- Power capability: 2 kW
- UL certified thermistor (85 kΩ)



MDIP-24 DCB
36x21x3.1 mm

Key benefits

- System size reduction with PFC integration into inverter module
- Cost down due to reduced BOM and assembly cost
- Smaller and cheaper heatsink
- Customer can design switching performance of PFC IGBT by using external driver circuit



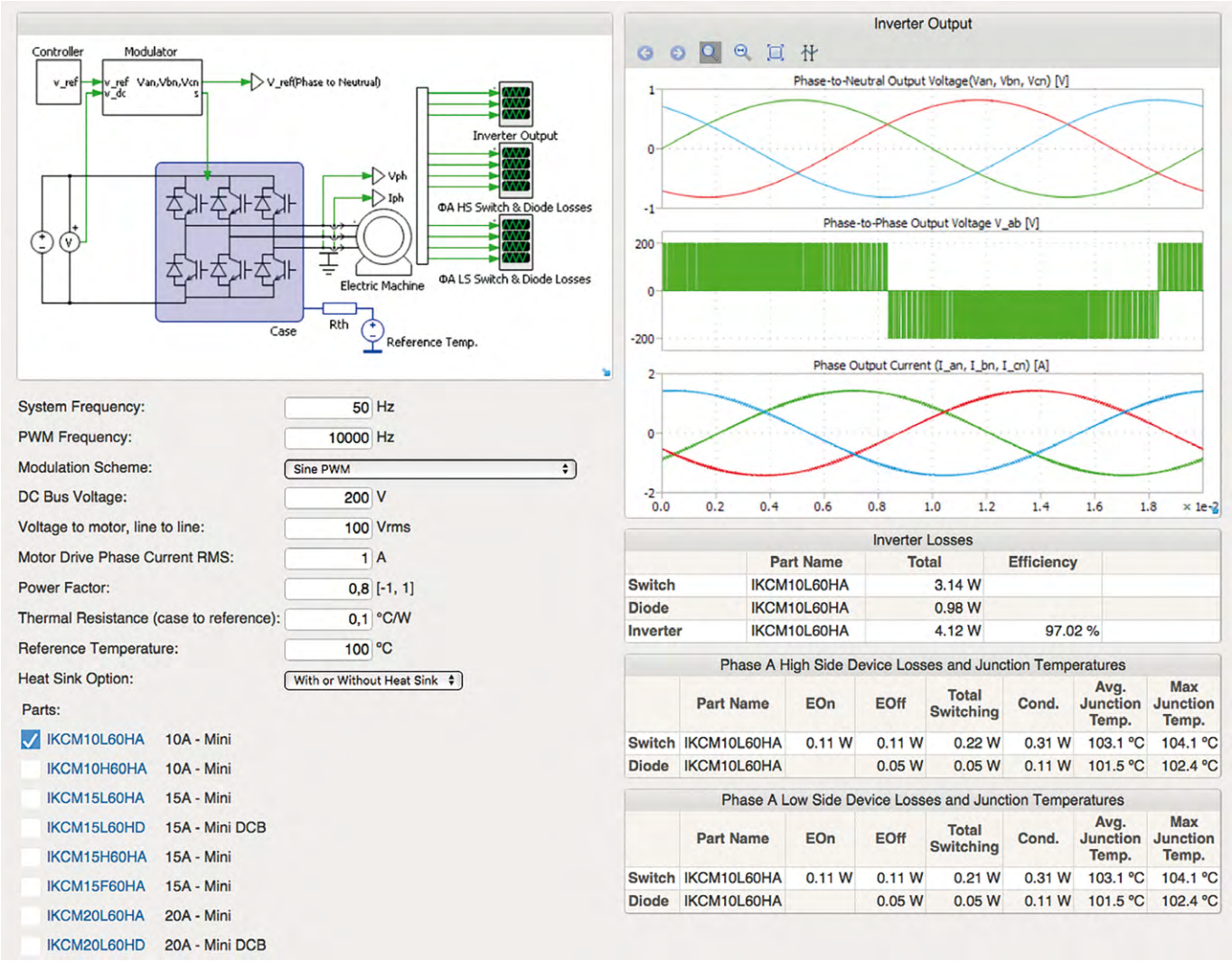
Major applications

IPM support tools

Useful links and helpful tools

IPM motor drive simulator

IPM simulation tool is available on **www.infineon.com/plex-ipm.** A 3-phase motor drive inverter system is implemented to simulate the power loss and junction temperature of each device inside IPM at the given static load conditions.



The simulation settings include DC bus voltage, motor phase current, PWM frequency, modulation strategy (typical motor drive PWM modulation options are available), heat-sink parameters and reference temperature.

Results are shown in summary tables as well as time dependent waveforms. Additionally, designers can compare the effect of parameter variations or the operation of different parts directly.

IPM evaluation boards

IPM evaluation boards are available on **www.infineon.com/ipm.** The boards enable fast evaluation, prototyping and system design by demonstrating key characteristics and benefits of Infineon CIPOS™ IPMs.

EVAL-M1-CM610N3
The board is powered by CIPOS™ Mini IKCM10H60GA and purposed to drive 3-phase motors up to 750 W.

EVAL-M1-36-84A
A complete power stage to drive 3-phase motor, powered by IRSM836-084MA CIPOS™ Nano.

EVAL-M1-36-45A
A complete power stage to drive 3-phase motor, powered by IRSM836-045MA CIPOS™ Nano.

EVAL-M1-05F804
A complete power stage powered by IRSM005-800MH CIPOS™ Nano to drive 3-phase motors in low voltage domain.

EVAL-M1-1302_36-84A
A compact and flexible 3-phase motor drive system solution platform with control card and power stage, powered by IRSM836-084MA CIPOS™ Nano.

EVAL-M1-1302_36-45A
A compact and flexible 3-phase motor drive system solution platform with control card and power stage, powered by IRSM836-045MA CIPOS™ Nano.

EVAL-M1-05-84D
A complete power stage to drive 3-phase motor, powered by IRSM505-084DA2 CIPOS™ Micro.

EVAL-M1-05-65D
A complete power stage to drive 3-phase motor, powered by IRSM505-065DA2 CIPOS™ Micro.

Notes

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Notes

Where to buy

Infineon distribution partners and sales offices:
www.infineon.com/WhereToBuy

Service hotline

Infineon offers its toll-free 0800/4001 service hotline as one central number, available 24/7 in English, Mandarin and German.

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- India ..... 000 800 4402 951 (English)
- USA ..... 1-866 951 9519 (English/German)
- Other countries ..... 00* 800 951 951 951 (English/German)
- Direct access ..... +49 89 234-0 (interconnection fee, German/English)

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