

Chipown Drives Motors & Power Topologies



Chipown & Driver Product Line

About Chipown

Stock code: 芯朋微 / 688508

The unique power semiconductor design company invested by National IC fund!



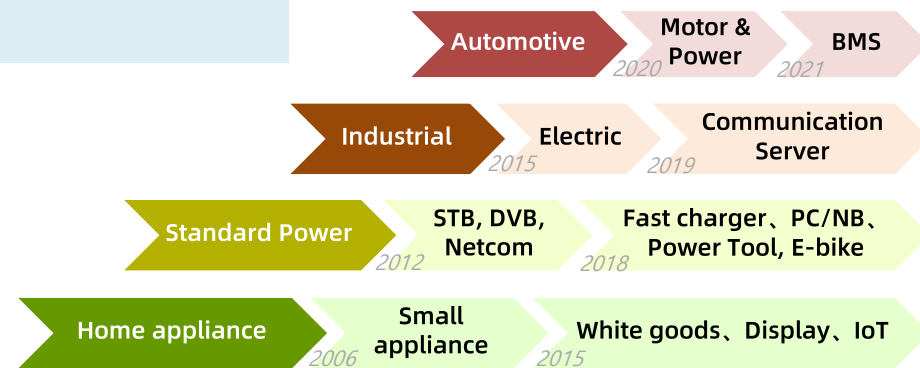
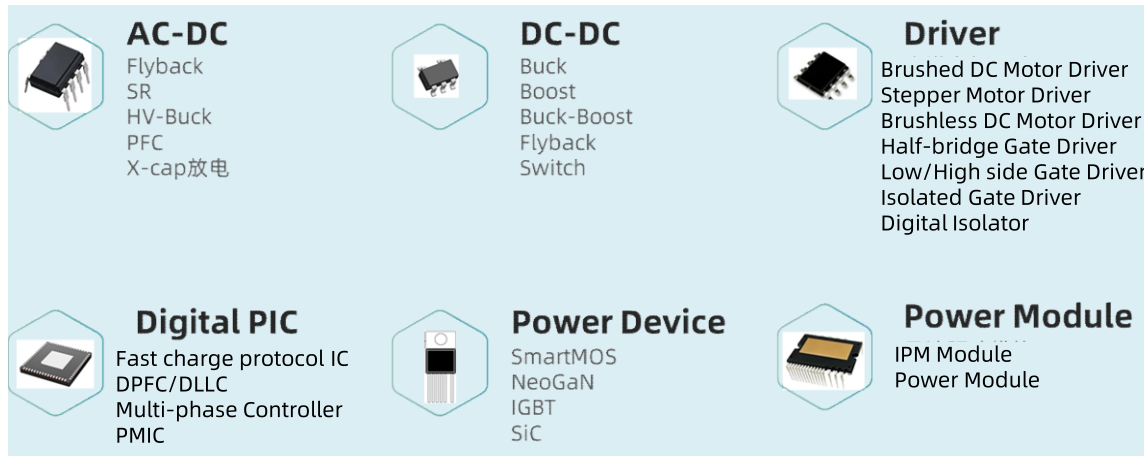
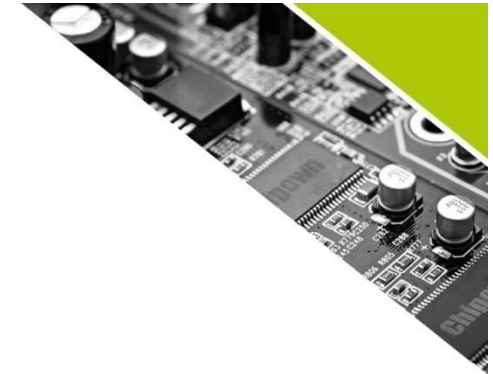
- National key-planning IC design company
- National Post-doctoral research station
- Jiangshu Province Power IC engineering research center
- National home appliance standards drafting group
- Standing member of China Power Supply Society
- Enacting Member Of CQC Technology Specification

Chipown Driver
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	Y2022	Y2021	Y2020	Y2019	Y2018
R&D expense%	26.28%	16.38%	13.65%	14.26%	15.02%

Chipown Product & Market



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Chipown Driver PL Profile

DC Brushed Motor Stepper Motor

Focus on:

- DC brushed & stepper motor:
[Integrated driver](#): integrates power MosFETs
[Pre-driver](#): Drive external MosFETs for H bridge or dual bridge
[Smart driver](#): Driver or Pre-driver built-in control algorithm

Applications:

- Home appliance/small appliance, Surveillance IPC, Massage chair, Printer, textile machine, valves/solenoids .etc.
- Automotive body motors of DC brushed and stepper motors



Develop direction:

- Smooth, quiet and low vibration spin of BDC and stepper motors
- Accurate motor current regulation, Auto Decay control, Torque control and Back-EMF detection.
- Integrates advanced protection and diagnostic features.

BLDC/PMSM Motor

Focus on:

- BLDC/PMSM motor
[Integrated driver](#): integrates power MosFETs
[Pre-driver](#): Drive external MosFETs /IGBTs for three half-bridge
[Smart driver](#): Driver or Pre-driver built-in control algorithm

Applications:

- Home appliance, industrial inverter/servo, power tool, e-bike, drone/robot, equipments .etc.
- Automotive body BLDC motors



Develop direction:

- Products cover from low voltage to high voltage.
- Integrates rich analog devices.
- Integrates control algorithm.
- Integrates advanced protection and diagnostic features.

Low-side/High-side Gate Driver Half-Bridge Gate Driver

Focus on :

- Low side/high side gate driver:
- Half-bridge gate driver:
[Channel](#): Single, Dual, Multiple
[Pre-driver](#): Drive external MOS/IGBT/SiC/GaN .etc.

Applications:

- Switching power topology, PFC driver、Solar/Energy storage
- Motor drive
- Automotive OBC/DCDC



Develop direction:

- Products cover from low voltage to high voltage.
- Ultra-low propagation delay time and channel match time.
- Adaptive Dead time.
- Input&output withstand negative voltage.
- Full advanced protection features.

Isolated Gate Driver Digital isolator

Focus on:

- Isolated gate driver:
[Channel](#): Single/Dual
[Drive](#): external MOS/IGBT/SiC/GaN
[Input type](#): Voltage/current input
[ISO voltage](#): 2.5kV/3kV/5.7kV
- Digital isolator:

[Channel](#): 2/3/4/6 channels

[Feature](#): General, Integrates power

Applications:

- High voltage motor drive, automotive motor drive
- Industrial power, solar inverter, isolated PFC/DCDC converter



Develop direction:

- Functional/Basic /Reinforced ISO
- Wide working voltage, high peak output current
- High CMTI, high noise immunity
- Input&output withstand negative voltage.
- Miller clamp, DESAT .etc. high level protection features.

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Applications - Low/Middle voltage Motor Drive

End Equipments



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Applications - High voltage motor, Power topology

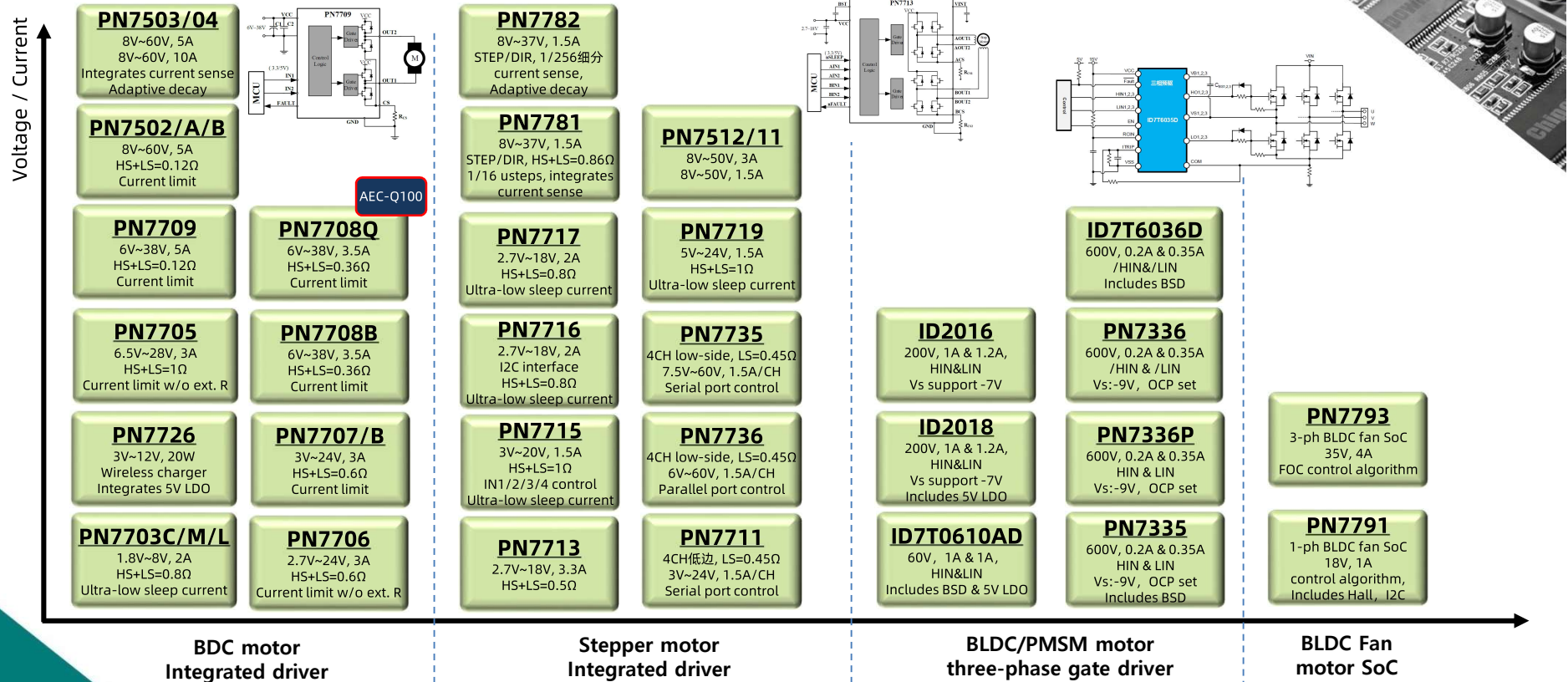
End Equipments



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Driver portfolio – Stepper & BDC & BLDC Motor Driver

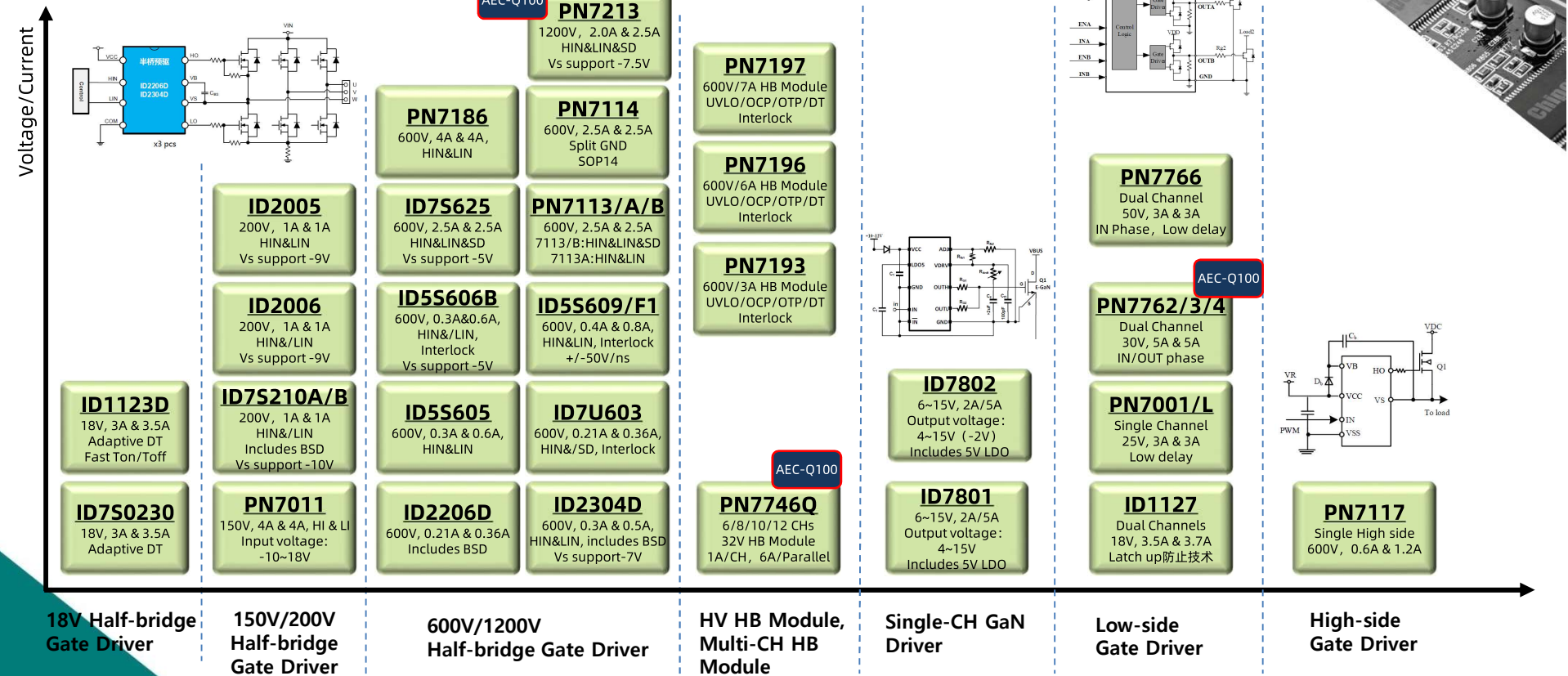


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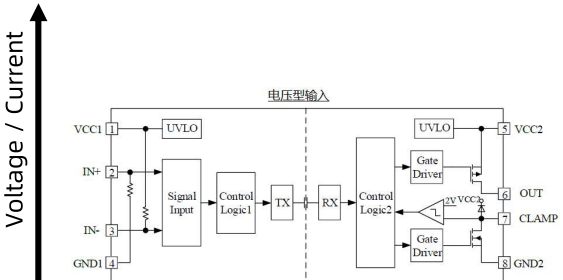
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Driver portfolio – Half-bridge, Low/High-side Gate Driver

Note: Current here is Gate driver Source & Sink current ability.



Driver portfolio – ISO Gate Driver, Digital Isolator



2CH Digital Isolator
Integrates ISO Power
VISO: 5KV

ISO Gate Driver – Voltage input

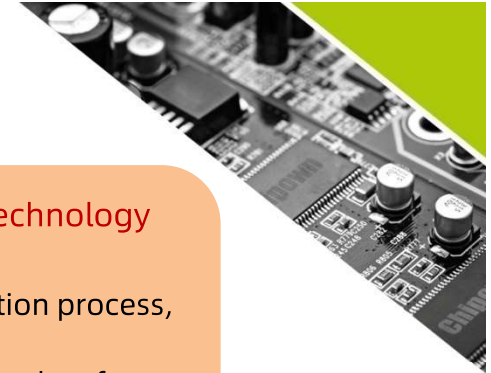
ISO Gate Driver – Current input

Digital Isolator

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Chipown Driver Edges



Differentiation - Self-develop ICs, Discrete components, Process, Packaging technology

- ACDC IC、Driver IC 、DCDC IC、 Power discrete .etc. all self-develop technology
- High voltage components, high density power packaging, high&low voltage integration process, Digital-analog hybrid design .etc. technology
- Portfolio contains not only series of catalog products, but also specific customized product for leading customers

High Reliability -- Advanced protections, component-level failure analysis technology

- Failure rate statistics of long time is far below industrial average
- UVLO, OCP/SCP, OTP and advanced protection like Miller clamp, DESAT, STO, ASC .etc. features
- Strong dv/dt noise immunity, Negative voltage withstand ability, Input interlock, Dead time .etc.

Full Coverage -- Full range series of driver portfolio for motor and power topology

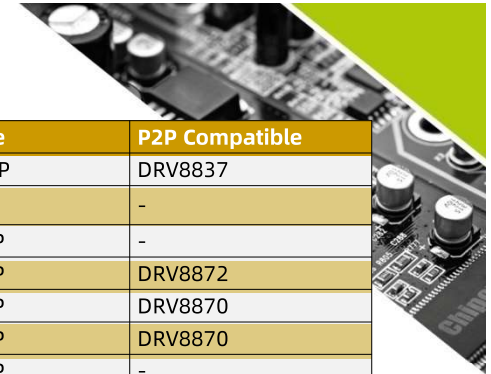
- Low voltage integration driver for types of motors (BDC/Stepper/BLDC/PMSM)
- Up to 1200V high voltage half-bridge gate driver, three-phase gate driver
- Isolated gate driver(basic & reinforced ISO), digital isolator

Driver portfolio – Competition cross reference

Product	Description	VCC (Max)	Io(Max)	Package	P2P Compatible
PN7703C	DC Brushed Motor Driver (H bridge), w/ ultra-low power mode	9V	2A	DFN/SOP	DRV8837
PN7705	DC Brushed Motor Driver (H bridge), integrates current sense	32V	3A	SOP-8	-
PN7706	DC Brushed Motor Driver (H bridge), integrates current sense	36V	3A	SOP-8PP	-
PN7707	DC Brushed Motor Driver (H bridge)	36V	3A	SOP-8PP	DRV8872
PN7707B	DC Brushed Motor Driver (H bridge)	40V	3.6A	SOP-8PP	DRV8870
PN7708B	DC Brushed Motor Driver (H bridge)	40V	3.5A	SOP-8PP	DRV8870
PN7709	DC Brushed Motor Driver (H bridge)	40V	5A	SOP-8PP	-
PN7502/A/B	DC Brushed Motor Driver (H bridge)	60V	5A	HTSSOP24/SOP-8PP	DRV8840
PN7503	DC Brushed Motor Driver (H bridge) , integrates current sense & adaptive decay	60V	5A	HTSSOP24/SOP-8PP	DRV8874
PN7504	DC Brushed Motor Driver (H bridge) , integrates current sense & adaptive decay	60V	10A	HTSSOP24	DRV8873/8243
PN7713	Stepper Motor Driver (Dual H bridge)	20V	3.3A	TSSOP16-PP	DRV8833
PN7715	Stepper Motor Driver (Dual H bridge), w/ ultra-low power mode	32V	1.5A	SSOP10L	LV8548
PN7716	Stepper Motor Driver (Dual H bridge), w/ I2C interface	20V	2A	TSSOP16	DRV8847S
PN7716S	Stepper Motor Driver (Dual H bridge)	20V	2A	TSSOP16	DRV8847
PN7717	Stepper Motor Driver (Dual H bridge)	20V	2A	TSSOP16-PP	DRV8848
PN7719	Stepper Motor Driver (Dual H bridge)	32V	1.5A	SSOP10	LB1909
PN7781	Stepper Motor Driver (Dual H bridge), 1/16 usteps & integrates current sense	40V	1.5A	HTSSOP24	DRV8885
PN7782	Stepper Motor Driver (Dual H bridge), 1/256 usteps , integrates current sense and adaptive decay mode	40V	1.5A	HTSSOP24	DRV8425
PN7511	Stepper Motor Driver (Dual H bridge)	60V	1.5A	HTSSOP24	DRV8436E
PN7512	Stepper Motor Driver (Dual H bridge)	60V	3A	HTSSOP24	DRV8841/8434E
PN7791	Single phase BLDC fan driver SoC	18V	1A	SOT23-6L	MLX90411B
PN7793	Three phase BLDC fan driver SoC	40V	4A	QFN40	DRV10983/MCF8315
PN7711	4 CH Low-side Driver, separated control	32V	0.8A/CH	SSOP24L	LB1205M
PN7735	4 CH Low-side Driver, separated control and SPI interface	65V	1.5A/CH	TSSOP16-PP	DRV8804
PN7736	4 CH Low-side Driver, separated control	65V	1.5A/CH	TSSOP16-PP	DRV8803

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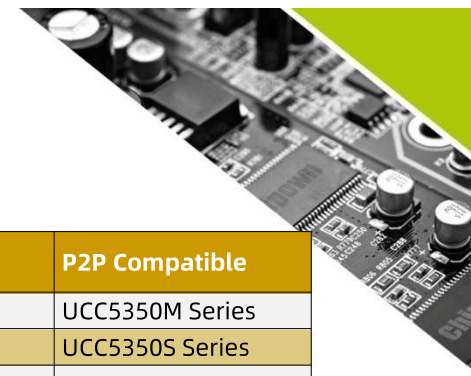


Driver portfolio

Product	Description	VOFFSET (Max)	Io+/Io- (typ.)	Package	P2P Compatible
PN7801/02	High-speed GaN Gate Driver	15V	2A/5A	DFN-10	
ID1123D	Half-bridge Gate Driver, integrates BSD	18V	3.5A/3A	SOP-8/DFN-8	NCP81155
ID750230	Half-bridge Gate Driver, integrates BSD	18V	3.5A/3A	DFN-8	-
ID1127	Dual CH Low-side Gate Driver	20V	3.5A/3.7A	SOP-8	UCC27324
PN7762/63/64	Dual CH Low-side Gate Driver	30V	5A/5A	SOP-8/DFN-8	UCC27524/523/525
PN7766	Dual CH Low-side Gate Driver	50V	3A/3A	SOP-8	IX4427
PN7746Q	Multi-CH Half-bridge Driver	32V	1A/CH	HTSSOP-24	TLE94106/DRV8906Q1
ID7T0610AD	Three-phase Gate Driver	60V	1A/1A	QSOP24	DRV8320
PN7011	Half-bridge Gate Driver, integrates BSD	150V	4A/4A	DFN/SOP/SOP-PP	UCC27211
ID7S210A	Half-bridge Gate Driver, integrates BSD	200V	1A/1A	SOP-8/DFN2x3-8	-
ID7S210B	Half-bridge Gate Driver, integrates BSD	200V	1A/1A	SOP-8	-
ID2005	Half-bridge Gate Driver	200V	1A/1A	SOP-8	IRS2007/2003
ID2006	Half-bridge Gate Driver	200V	1A/1A	SOP-8	IRS2005/2001
ID5S609/F1	Half-bridge Gate Driver	600V	0.4A/0.8A	SOP-8	IRS2304
ID5S605	Half-bridge Gate Driver	600V	0.3A/0.6A	SOP-8	IRS2106
ID5S606B	Half-bridge Gate Driver	600V	0.3A/0.6A	SOP-8	IRS2103
ID2304D	Half-bridge Gate Driver, integrates BSD	600V	0.3A/0.5A	SOP-8	L6388
ID7U603	Half-bridge Gate Driver	600V	0.21A/0.36A	SOP-8	IRS2104
ID2206D	Half-bridge Gate Driver, integrates BSD	600V	0.21A/0.36A	SOP-8	2EDL05N06PF
ID7S625	Half-bridge Gate Driver	600V	2.5A/2.5A	SOW-16	IRS2113/2110
PN7113	Half-bridge Gate Driver	600V	2.5A/2.5A	SOIC-16	-
PN7113A	Half-bridge Gate Driver	600V	2.5A/2.5A	SOP-8	IRS2181
PN7113B	Half-bridge Gate Driver	600V	2.5A/2.5A	SOP-16	-
PN7114	Half-bridge Gate Driver	600V	2.5A/2.5A	SOP-14	UCC27714/IR21814
PN7186	Half-bridge Gate Driver	600V	4A/4A	SOP-8	IRS2186
PN7117	High-side Gate Driver	600V	0.6A/1.2A	TSSOP-16	-
ID2016	Three-phase Gate Driver	200V	1A/1A	TSSOP20	FD6288/DRV8300N
ID2018	Three-phase Gate Driver	200V	1A/1.2A	QSOP24	-
PN7336P	Three-phase Gate Driver	600V	0.2A/0.35A	SOP28	AGD8256A
PN7335	Three-phase Gate Driver, integrates BSD	600V	0.2A/0.35A	SOP28	6EDL04I06PT
PN7336	Three-phase Gate Driver	600V	0.2A/0.35A	SOP28	IRS2136
PN7193	Half-bridge Drive Module	600V	3A	LasSOP-10	LAS1M0261
PN7195	Half-bridge Drive Module	650V	5A	LasSOP-10	LAS1N0561
PN7197	Half-bridge Drive Module	600V	7A	LasSOP-10	LAS1M0761
PN7213	Half-bridge Gate Driver	1200V	2A/2.5A	SOW-16	IRS2213/FAN73912

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Driver portfolio – Competition cross reference



Product	Description	ISO Voltage	Io+/Io- (typ.)	Package	P2P Compatible
PN7901M Series	Single-channel ISO Gate Driver, w/ Miller clamp	2.5kV	5A/5A	SOP-8	UCC5350M Series
PN7901 Series	Single-channel ISO Gate Driver, w/ split output	2.5kV	5A/5A	SOP-8	UCC5350S Series
PN7922 Series	Dual-channel ISO Gate Driver	1.5kV	5A/5A	LGA-13	-
PN7903 Series	Single-channel ISO Gate Driver, Opto-compatible	5.7kV	4.5A/5.3A	SOP6W	UCC21513/11 Series

Product	Description	ISO Voltage	工作速率 (Mbps)	封装	P2P Compatible
PN7932/A/B Series	General 2 CH Digital Isolator	3/3.75/5/5.7KV	>150	SOP8/SOW8/SOW16/SOWW16	ISO672x/772x NSi822x/C
PN7933/A Series	General 3 CH Digital Isolator	3/3.75/5/5.7KV	>150	SOP8/SOW8/SOW16/SOWW16	ISO673x/773x NSi823x/C
PN7934/A/B Series	General 4 CH Digital Isolator	3/3.75/5/5.7KV	>150	SOP8/SOW8/SOW16/SOWW16	ISO674x/774x NSi824x/C
PN7936/A/B/C Series	General 36CH Digital Isolator	3/3.75/5/5.7KV	>150	SOP8/SOW8/SOW16/SOWW16	ISO676x/776x NSi826x/C
PN7962/A/B Series	2 CH Digital Isolator, Integrates ISO PWR	5/5.7KV	>150	SOW16/SOWW16	NSi882x/892x
PN7964/A/B/C/D Series	4 CH Digital Isolator, Integrates ISO PWR	5/5.7KV	>150	SOW16/SOWW16	ISOW774x/784x NSi884x/894x

1, A/B/C/D: Backward CHs 1/2/3/4;
 2, ISO voltage related to Package:
 SOP: 3.75kV; SSOP: 3kV;
 SOW: 5kV; SOWW: 5.7kV;

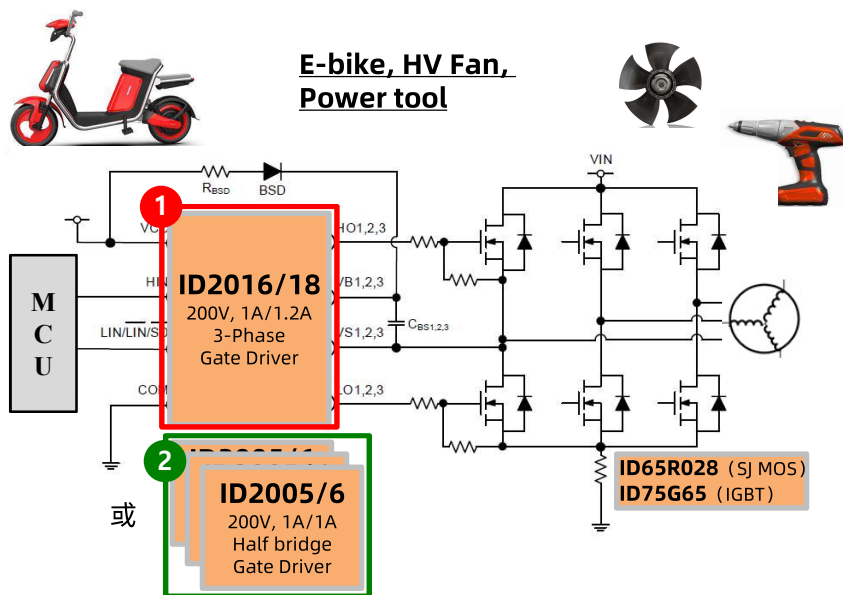
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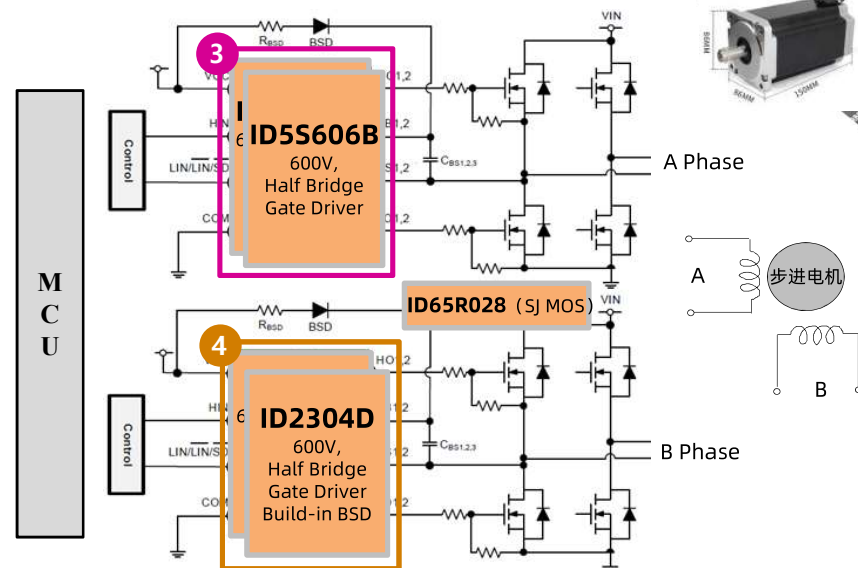
Appendix: Typical system block-diagram(part)

E-bike/Power tool/HV Fan/Stepper Servo



1	Part No.	Features
200V 三相驱动	ID2016/18	✓ 200V, 1A/1.2A ✓ Vs耐负压 ✓ 传播时延小, 通道延时匹配
200V 半桥驱动	ID2005/6	✓ 200V, 1A/1A ✓ Vs耐负压 ✓ 集成自举二极管 (ID7S210)
600V 半桥驱动	ID55605	✓ 600V, 0.21A/0.36A ✓ 集成自举二极管 (ID2206D) ✓ 抗干扰+/-50V/n
	ID2206D	

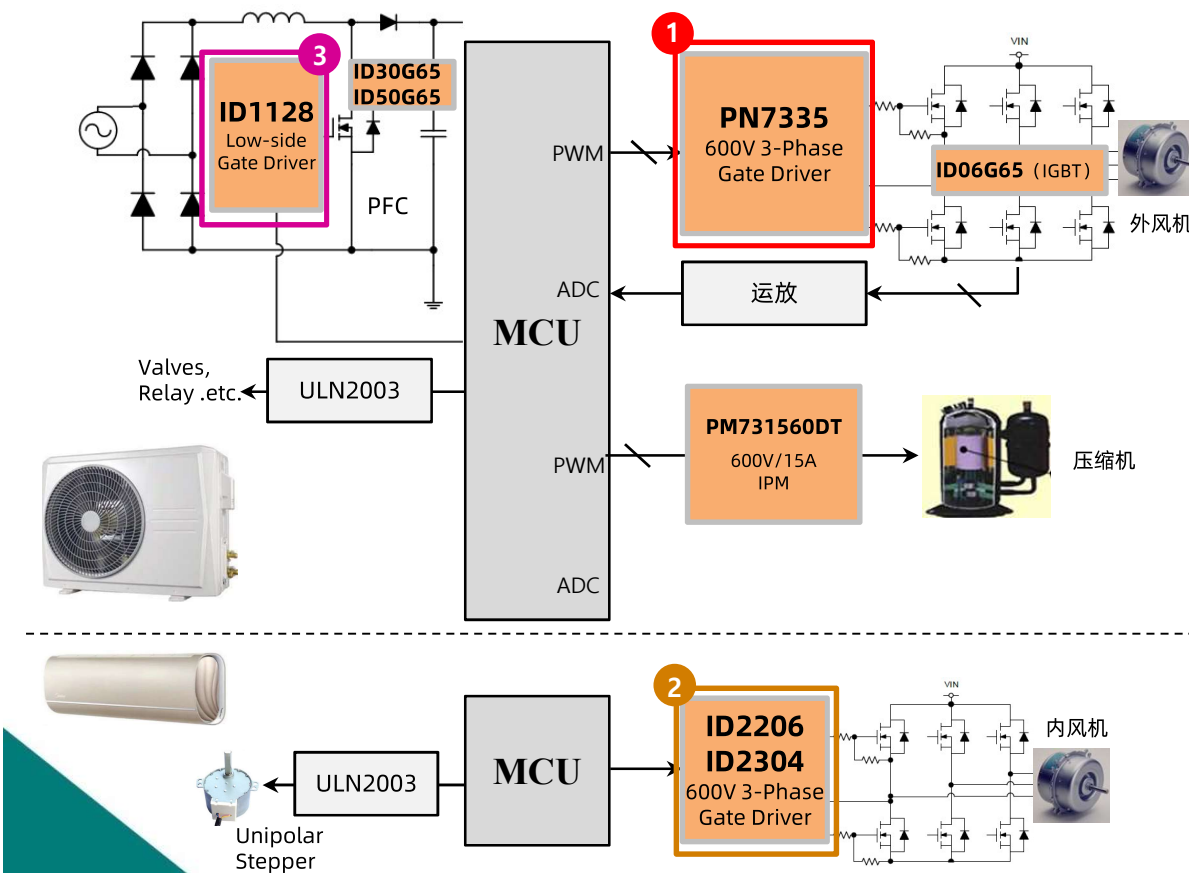
Stepper servo



3	Part No.	Features
600V 半桥驱动	ID55606B	✓ 600V, 0.3A / 0.6A ✓ Vs耐负压, 抗干扰能力 ✓ 输入互锁
4	ID2304D	✓ 600V, 0.3A / 0.5A ✓ Vs耐负压, 抗干扰能力 ✓ 集成自举二极管

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Inverter Air conditioner

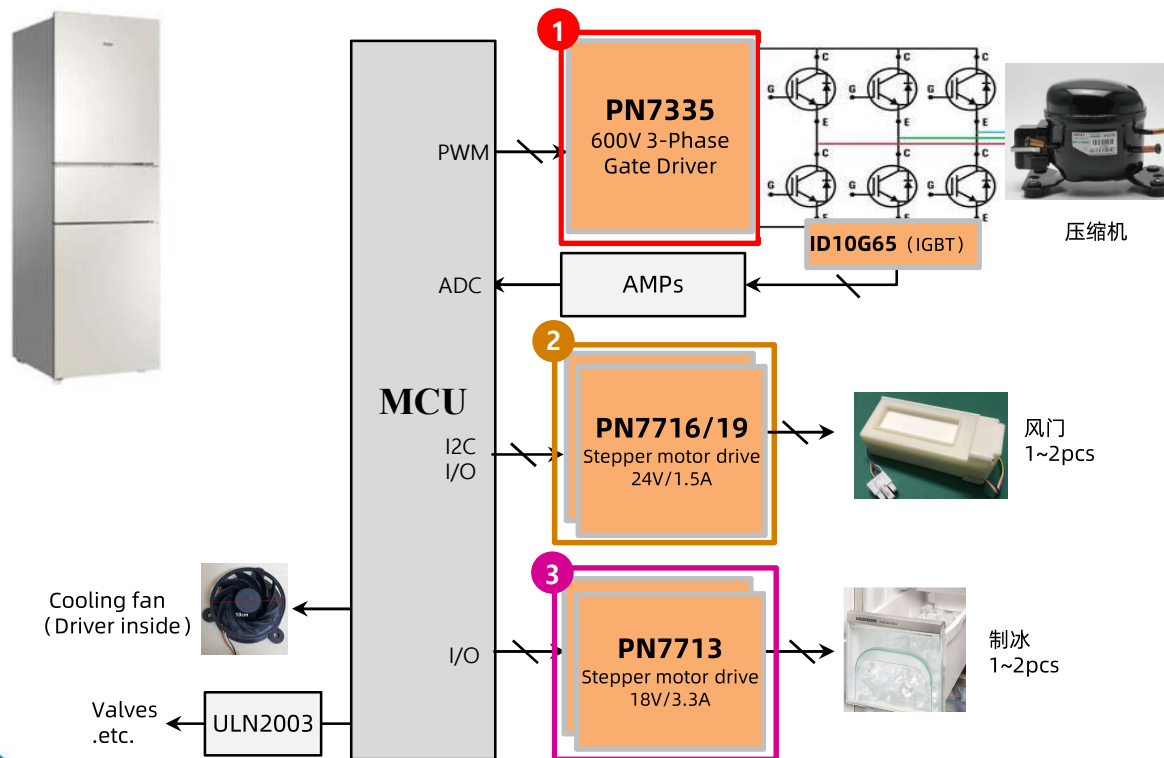


	Part No.	Features	
1	600V Three-phase Gate Driver	✓ Cost and supply flexible ✓ Save heat sink ✓ 600V, 0.2A & 0.35A ✓ Vs support -9V, OCP set ✓ Integrates BSD (PN7335)	P2P 6EDL04I06 IRS2136
	PN7335		
2	600V Half-bridge Gate Driver	✓ Cost and supply flexible ✓ 600V, 0.21A & 0.36A ✓ 600V, 0.3A & 0.5A ✓ Integrates BSD	P2P 2EDL05N06 L6388
	ID2206		
3	Low-side Gate Driver	✓ Dual CH, 30V, 5A & 5A ✓ Interlock, noise immunity	P2P UCC27524
	PN7001/L	✓ Single CH, 25V, 3A & 3A ✓ Low propagation delay	P2P IRS44273

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Inverter Refrigerator



	Part No.	Features
1 600V Three-phase Gate Driver	PN7335	✓ 600V, 0.2A & 0.35A ✓ Cost and supply flexible ✓ Save heat sink ✓ Vs support -9V, OCP set ✓ Integrates BSD (PN7335)
	PN7336	
2 Stepper motor driver	PN7716	✓ Integration driver, small size ✓ 2.7V~18V, 2A ✓ Ultra-low power mode ✓ I2C for multi motors, save I/O pins
	PN7719	
	PN7717	
	PN7715	✓ Integration driver, small size ✓ 24V, 1.5A (PN7719) ✓ 18V, 2A (PN7717) ✓ 20V, 1.5A (PN7715) ✓ Ultra-low power mode
3 Stepper motor driver	PN7713	✓ Integration driver, small size ✓ 18V, 3.3A

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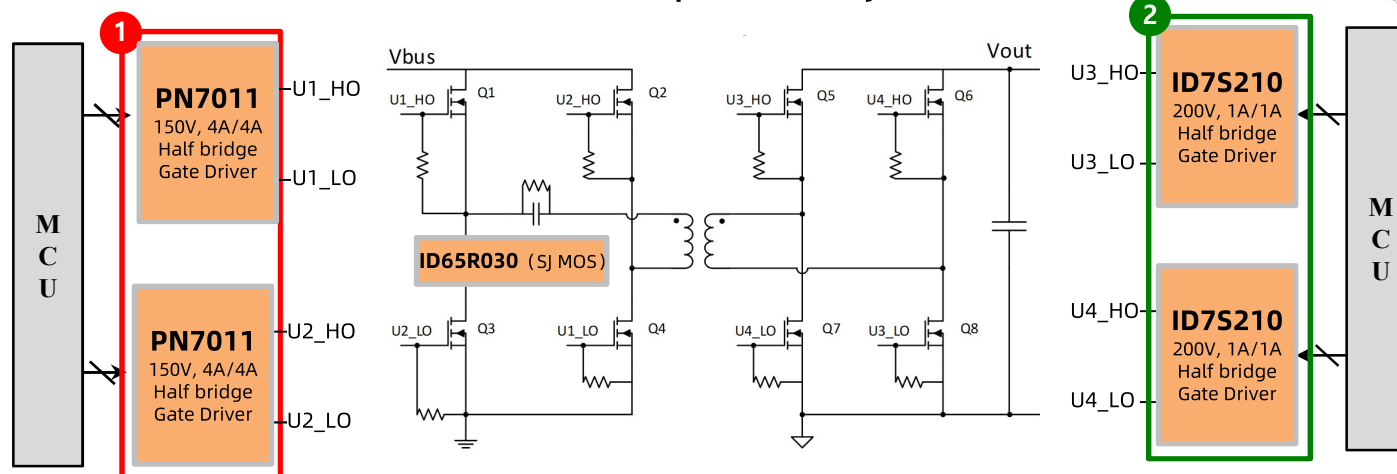
洗衣机、普通家电等用相似的电机驱动物料芯片；

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Communication Power Supply



Communication power (48V system)



	Part No.	Features
150V Half-bridge Gate Driver	PN7011	✓ 150V, 4A / 4A ✓ Vin: -10V~18V ✓ Integrates BSD ✓ Low prop. delay (30ns)

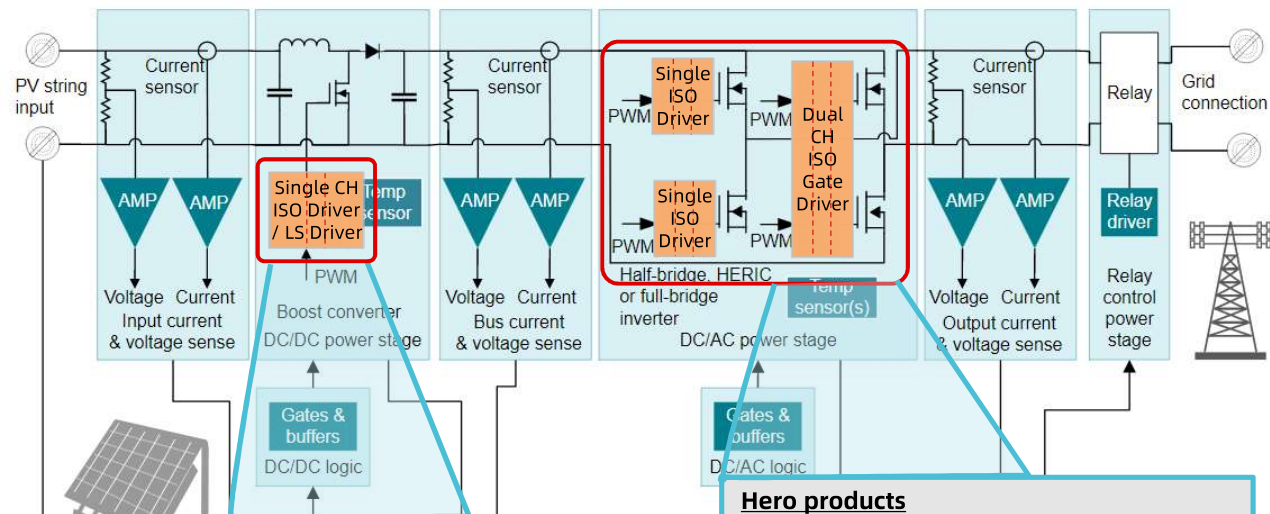
	Part No.	Features
200V Half-bridge Gate Driver	ID7S210A/B	✓ 200V, 1A / 1A ✓ Integrates BSD ✓ Vs withstands -10V ✓ High noise immunity +/-50V/ns

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电池化成、光伏PV板等拓扑结构用相似的驱动物料芯片；

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Solar Energy String Inverter



Hero products

- **PN7903** - Single CH, 5.7kV reinforced ISO gate driver, output 4.5A/5.3A, current input type, opto-compatible, SOP6W.
- **PN7901/M** - Single CH, 2.5kV basic ISO gate driver, output 5A/5A, split outputs or Miller clamp(M), SOP8.
- **PN7762** - Dual CH low-side gate driver, up to 30V, 5A/5A, low delay.

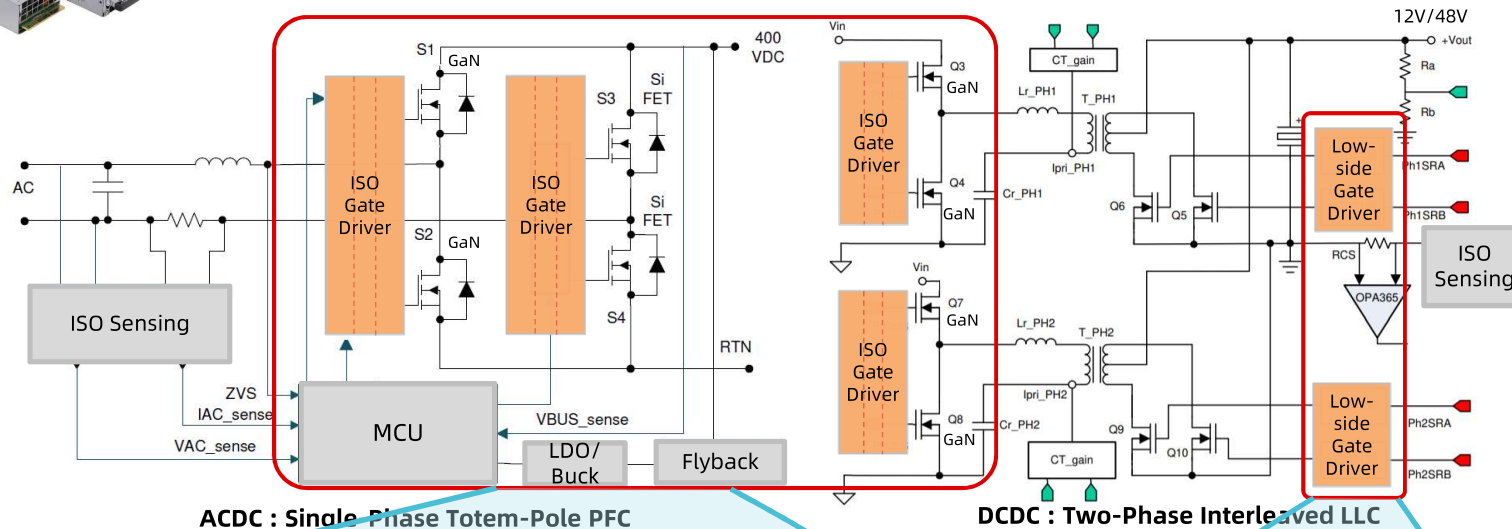
Hero products

- **PN7903** - Single CH, 5.7kV reinforced ISO gate driver, output 4.5A/5.3A, current input type, opto-compatible, SOP6W.
- **PN7901/M** - Single CH, 2.5kV basic ISO gate driver, output 5A/5A, split outputs or Miller clamp(M), SOP8.
- **PN7921** - Dual CH, 5.7kV Reinforced ISO gate driver, output current 4A/8A, fast delay and UVLO .etc. SOP16W.
- **PN7922** - Dual CH, 3kV Basic ISO gate driver, output 4A/8A, fast delay & UVLO .etc. LGA-13.

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Server PSU



Hero products

- **PN7921** - Dual CH, 5.7kV Reinforced ISO gate driver, output current 4A/8A, fast delay and UVLO .etc. SOP16W .
- **PN7922** - Dual CH, 3kV Basic ISO gate driver, output 4A/8A, fast delay & UVLO .etc. LGA-13.
- **PN7901M** - Single CH, 2.5kV basic ISO gate driver, output 5A/5A, Miller clamp(3A), SOP8.
- **PN7924** - Half-bridge ISO GaN Driver, 3kV basic ISO, output 2A/4A & support negative voltage, UVLO/OTP .etc.

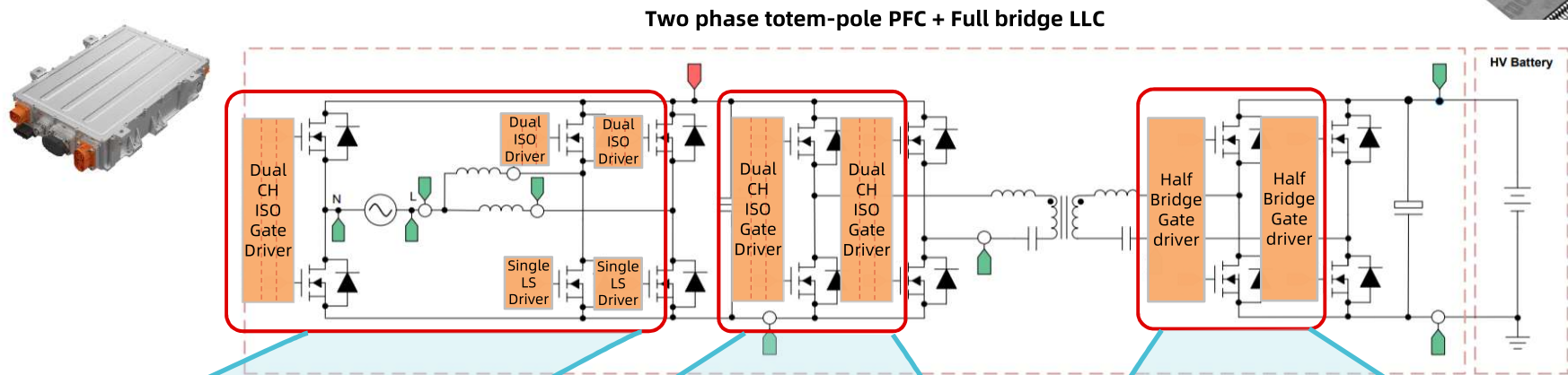
Hero products

- **PN7762/3/4** - Dual CH low-side gate driver, up to 30V, 5A/5A, low delay.

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EV OBC System / DC Charging Pile



Hero products

- **PN7921/Q** - Dual CH, 5.7kV Reinforced ISO gate driver, output current 4A/8A, fast delay and UVLO .etc. SOP16W.
- **PN7901/Q** - Single CH, 2.5kV Basic ISO gate driver, output current 5A/5A, Miller clamp(3A), SOP8.
- **PN7762/Q** - Dual CH low-side gate driver, up to 30V, 5A/5A, low delay.

Hero products

- **PN7921/Q** - Dual CH, 5.7kV Reinforced ISO gate driver, output current 4A/8A, fast delay and UVLO .etc. SOP16W.
- **PN7901/Q** - Single CH, 2.5kV Basic ISO gate driver, output current 5A/5A, Miller clamp(3A), SOP8.

Hero products

- **PN7213/Q** - 1200V Half-bridge gate driver, output 2A/2.5A, fast delay, UVLO .etc.
- **PN7113/Q** - 600V Half-bridge gate driver, output 2.5A/2.5A, fast delay, UVLO .etc.

谢谢！
THANKS!



无锡芯朋微电子股份有限公司

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