

### 描述/Description

- XNS50660AB/ABS基于Trench FS-IGBT技术，为小功率电机驱动应用（如风机和水泵）提供紧凑型逆变解决方案。  
XNS50660AB/ABS is an Advanced IPM Based on Trench FS-IGBT Technology as a Compact Inverter Solution for Small Power Motor Drive Applications Such as Fans and Pumps.
- XNS50660AB/ABS由6个IGBT和FRD，3个内置测温功能的HVIC和3个自举二极管组成，紧凑高绝缘并具有优化的热性能。  
XNS50660AB/ABS Contains Six IGBTs and FRDs, Three Half-Bridge Gate Drive HVICs with Temperature Sensing, and Three Bootstrap Diodes in a Compact Package Fully Isolated and Optimized for Thermal Performance.
- XNS50660AB/ABS通过优化开关速度和减小寄生电感实现低电磁干扰（EMI）特性。  
XNS50660AB/ABS Features Low Electromagnetic Interference (EMI) Characteristics Through Optimizing Switching Speed and Reducing Parasitic Inductance.
- XNS50660AB/ABS内置于电机的应用和要求紧凑安装场合。  
XNS50660AB/ABS is the Right Solution for Compact and Reliable Inverter Designs Where the Assembly Space is Constrained.

### 主要特点

- 内置6个600V/6A IGBT和3个半桥栅极驱动（HVIC）
- 3个独立的IGBT源极副直流端用于变频器电流检测的应用
- HVIC实现驱动和欠压保护功能
- 完全兼容3.3V和5V的MCU接口，高电平有效
- 优化并采用了低电磁干扰设计
- 绝缘级别1500V<sub>rms</sub>/1min
- 内置于HVIC的温度传感器
- 封装内置自举二极管
- 符合ROHS

### 应用

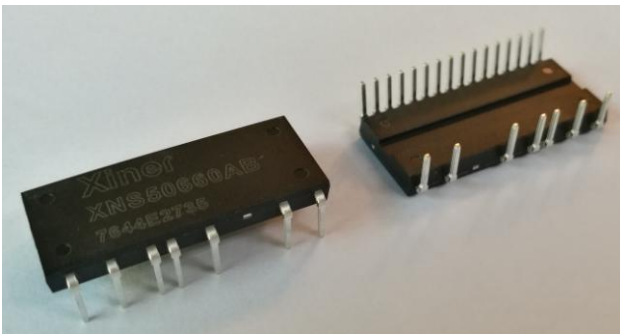
- 小功率电机

### Features

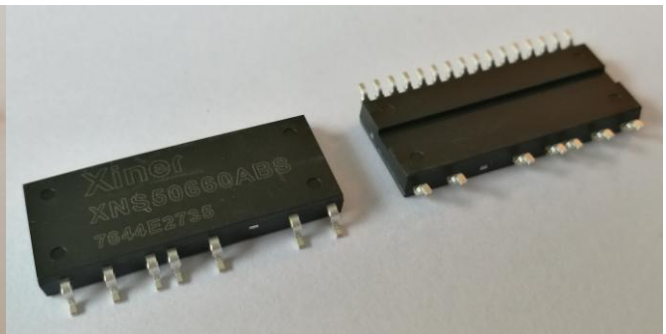
- 600 V 6A IGBT 3-Phase Inverter Including HVICs
- Three Separate Open-Source Pins from Low Side IGBTs for Three Leg Current Sensing
- HVIC for Gate Driving and Undervoltage Protection
- Active-High Interface, Can Work With 3.3 V / 5 V Logic
- Optimized for Low Electromagnetic Interference
- Isolation Voltage Rating of 1500 V<sub>rms</sub> for 1 min.
- Temperature Sense Unit in HVIC
- Embedded Bootstrap Diode in the Package
- ROHS Compliant

### Applications

- Small Power AC Motor



IPM-DIP23



IPM-SOP23

**引脚描述 / Pin descriptions**

引脚号/Pin Number	引脚名/Pin Name	引脚描述/ Pin Description
1	COM	IC公共电源接地 IC Common Supply Ground
2	$V_{B(U)}$	U相高端IGBT驱动的偏压 Bias Voltage for U Phase High Side IGBT Driving
3	$V_{CC(U)}$	U相IC和低端IGBT驱动的偏压 Bias Voltage for U Phase IC and Low Side IGBT Driving
4	$IN_{(UH)}$	U相高端的信号输入 Signal Input for U Phase High-Side
5	$IN_{(UL)}$	U相低端的信号输入 Signal Input for U Phase Low-Side
6	N.C	无连接 N.C
7	$V_{B(V)}$	V相高端IGBT驱动的偏压 Bias Voltage for V Phase High Side IGBT Driving
8	$V_{CC(V)}$	V相IC和低端IGBT驱动的偏压 Bias Voltage for V Phase IC and Low Side IGBT Driving
9	$IN_{(VH)}$	V相高端的信号输入 Signal Input for V Phase High-Side
10	$IN_{(VL)}$	V相低端的信号输入 Signal Input for V Phase Low-Side
11	$V_{TS}$	模拟电压输出与 IC 温度成比例关系 Output for HVIC Temperature Sensing
12	$V_{B(W)}$	W相高端IGBT驱动的偏压 Bias Voltage for W Phase High Side IGBT Driving
13	$V_{CC(W)}$	W相IC和低端IGBT驱动的偏压 Bias Voltage for W Phase IC and Low Side IGBT Driving
14	$IN_{(WH)}$	W相高端的信号输入 Signal Input for W Phase High-Side
15	$IN_{(WL)}$	W相低端的信号输入 Signal Input for W Phase Low-Side
16	N.C	无连接 N.C
17	P	直流输入正端 Positive DC-Link Input
18	U, $V_{S(U)}$	高端IGBT驱动的U相偏压接地输出 Output for U Phase & Bias Voltage Ground for High Side IGBT Driving
19	$N_U$	U相的直流输入负端 Negative DC-Link Input for U Phase
20	$N_V$	V相的直流输入负端 Negative DC-Link Input for V Phase
21	V, $V_{S(V)}$	高端IGBT驱动的V相偏压接地输出 Output for V Phase & Bias Voltage Ground for High Side IGBT Driving
22	$N_W$	W相的直流输入负端 Negative DC-Link Input for W Phase
23	W, $V_{S(W)}$	高端IGBT驱动的W相偏压接地输出 Output for W Phase & Bias Voltage Ground for High Side IGBT Driving

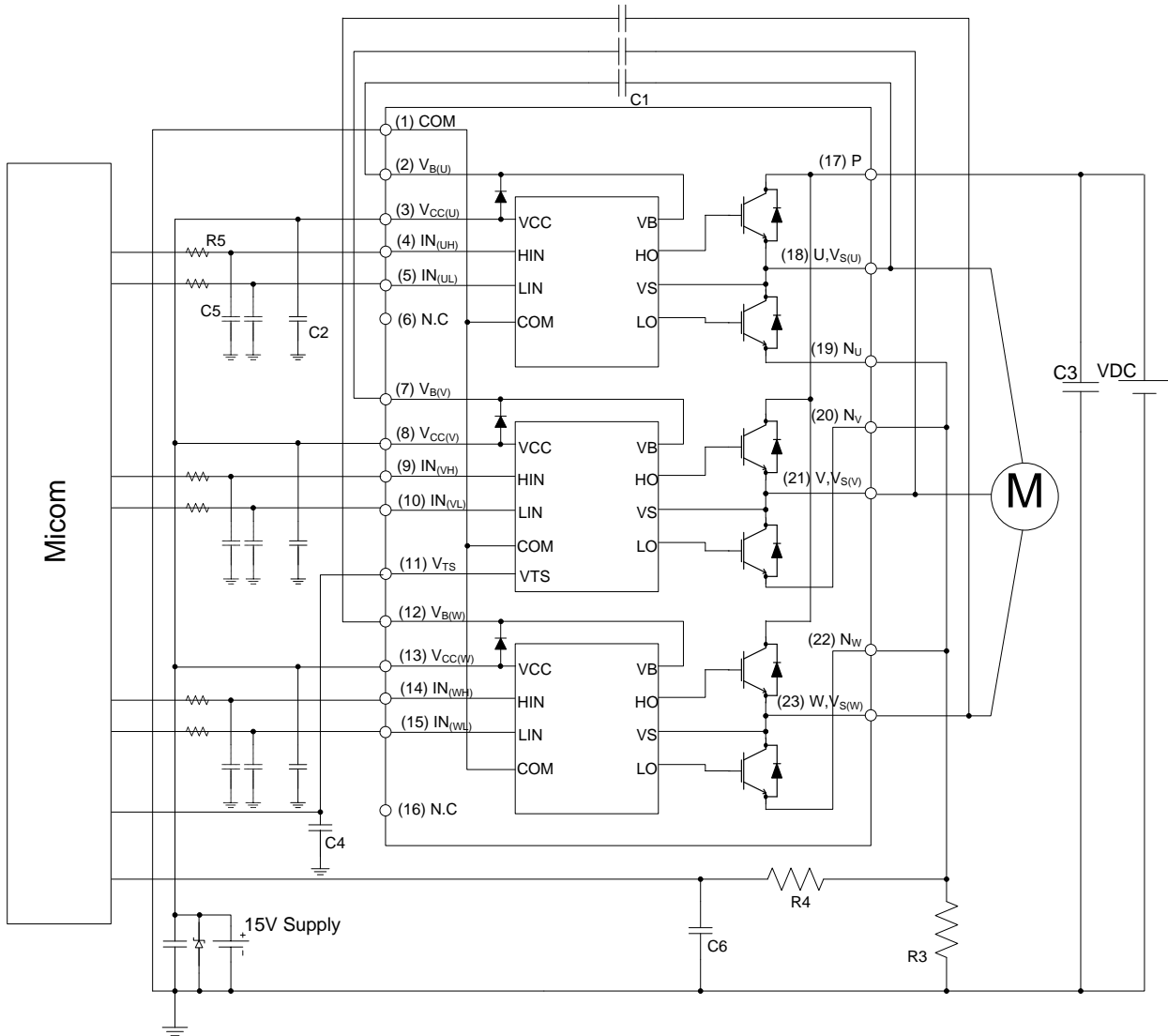


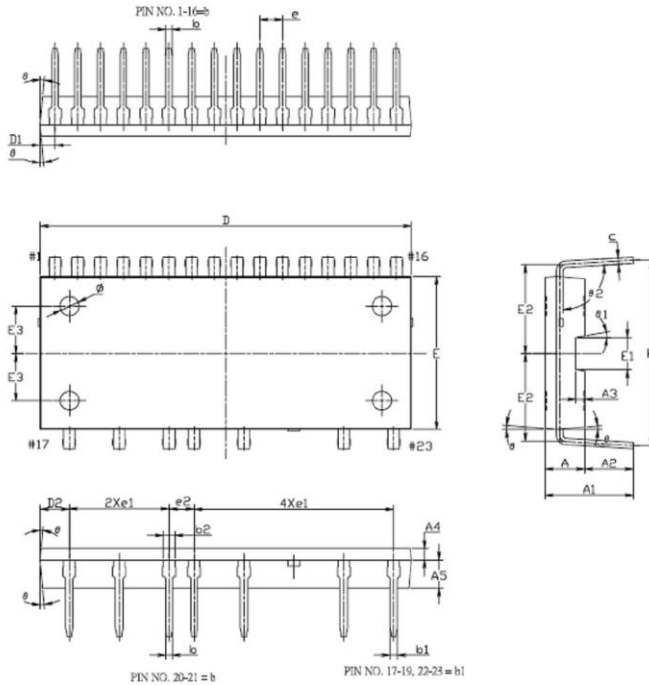
图10. 应用电路实例

Figure 10. Example of Application Circuit

注/Note:

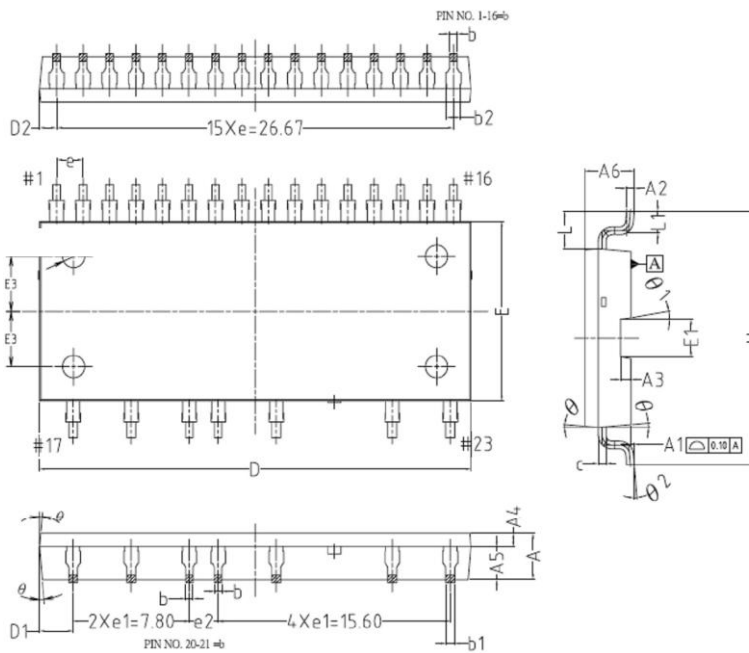
- 关于引脚的位置请参阅图1。  
About Pin Position, Refer to Figure 1.
- IPM产品和MCU的每个输入端的RC耦合 (R<sub>5</sub>和C<sub>5</sub>, R<sub>4</sub>和C<sub>6</sub>)和C<sub>4</sub>, 能有效地防止由浪涌噪声产生的错误的输入信号。  
RC Coupling (R<sub>5</sub> and C<sub>5</sub>, R<sub>4</sub> and C<sub>6</sub>) and C<sub>4</sub> at Each Input of IPM Mcu are Useful to Prevent Improper Input Signal Caused by Surge Noise.
- 由于位于COM和低端IGBT的源极端子之间, R<sub>3</sub>的压降会影响低端的开关性能和自举特性。为此稳态情况下的R<sub>3</sub>的压降应小于1V。  
The voltage Drop Across R<sub>3</sub> Affects the Low Side Switching Performance and the Bootstrap Characteristics Since it is Placed Between COM and the Source Terminal of the Low Side IGBT. For this Reason, the Voltage Drop Across R<sub>3</sub> Should Be Less Than 1 V in the Steady-State.
- 为避免浪涌电压和HVIC故障, 接地线和输出端子之间的接线应短且粗。  
Ground Wires and Output Terminals, Should Be Thick and Short in Order to Avoid Surge Voltage and Malfunction of HVIC.
- 所有的滤波电容器应紧密连接到IPM产品, 他们应当具有能够很好的阻挡高频纹波电流的特性。  
All the Filter Capacitors Should Be Connected Close to Motion SPM, and They Should Have Good Characteristics for Rejecting High-Frequency Ripple Current.

## 轮廓封装详图 / Detailed Package Outline Drawings



SYMBOL	COMMON			
	MM		INCH	
	MIN	MAX	MIN	MAX
A	2.90	3.30	0.1142	0.1299
A1	6.70	7.10	0.2638	0.2795
A2	3.60	4.00	0.1417	0.1575
A3	0.70 BSC 0.0276 BSC			
A4	0.90 BSC 0.0354 BSC			
A5	2.20 BSC 0.0866 BSC			
b	0.40	0.60	0.0157	0.0236
b1	0.50	0.70	0.0197	0.0276
b2	/	1.00	/	0.0394
c	0.45	0.55	0.0177	0.0217
D	28.80	29.80	1.1339	1.1732
D1	1.165 BSC 0.0459 BSC			
D2	2.275 BSC 0.0896 BSC			
E	11.80	12.20	0.4646	0.4803
E1	2.50 BSC 0.0984 BSC			
E2	6.90 BSC 0.2717 BSC			
E3	3.70 BSC 0.1457 BSC			
e	1.778 BSC 0.0700 BSC			
e1	3.90 BSC 0.1535 BSC			
e2	1.95 BSC 0.0768 BSC			
H	14.25	14.85	0.5610	0.5846
a	5' REF		5' REF	
a1	10' REF		10' REF	
a2	91'	96'	91'	96'
a	1.50 BSC 0.0591 BSC			

### IPM-DIP23



SYMBOL	COMMON			
	MM		INCH	
	MIN	MAX	MIN	MAX
A	2.90	3.30	0.1142	0.1299
A1	0.05	0.30	0.0020	0.0118
A2	0.50 BSC 0.0197 BSC			
A3	0.70 BSC 0.0276 BSC			
A4	0.90 BSC 0.0354 BSC			
A5	2.20 BSC 0.0866 BSC			
A6	/	3.50	/	0.1378
b	0.40	0.60	0.0157	0.0236
b1	0.50	0.70	0.0197	0.0276
b2	/	1.00	/	0.0394
c	0.45	0.55	0.0177	0.0217
D	28.80	29.80	1.1339	1.1732
D1	2.275 BSC 0.0896 BSC			
D2	1.165 BSC 0.0459 BSC			
E	11.80	12.20	0.4646	0.4803
E1	2.50 BSC 0.0984 BSC			
E3	3.70 BSC 0.1457 BSC			
e	1.778 BSC 0.0700 BSC			
e1	3.90 BSC 0.1535 BSC			
e2	1.65	2.25	0.0650	0.0886
L	2.50 BSC 0.0984 BSC			
L1	1.30	1.70	0.0512	0.0669
H	17.00 BSC 0.6693 BSC			
a	5' REF		5' REF	
a1	10' REF		10' REF	
a2	3'	6'	3'	6'
a	1.50 BSC 0.0591 BSC			

### IPM-SOP23