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FNB43060T2 is an advanced Motion SPM 45 module providing a fully-featured, high-performance inverter output stage for AC Induction, BLDC, and PMSM motors. These modules integrate optimized gate drive of the built-in IGBTs to minimize EMI and losses, while also providing multiple on-module protection features including under-voltage lockouts, over-current shutdown, thermal monitoring of drive IC, and fault reporting. The built-in, high-speed HVIC requires only a single supply voltage and translates the incoming logic-level gate inputs to the high-voltage, high-current drive signals required to properly drive the module's internal IGBTs. Separate negative IGBT terminals are available for each phase to support the widest variety of control algorithms.

Features

- UL Certified No. E209204 (UL1557)
- 600 V – 30 A 3-Phase IGBT Inverter with Integral Gate Drivers and Protection
- Low Thermal Resistance Using Ceramic Substrate
- Low-Loss, Short-Circuit Rated IGBTs
- Built-In Bootstrap Diodes and Dedicated Vs Pins Simplify PCB Layout
- Built-In NTC Thermistor for Temperature Monitoring
- Separate Open-Emitter Pins from Low-Side IGBTs for Three-Phase Current Sensing
- Single-Grounded Power Supply
- Isolation Rating: 2000 V_{rms}/min.

Applications

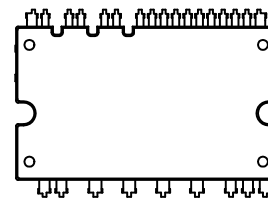
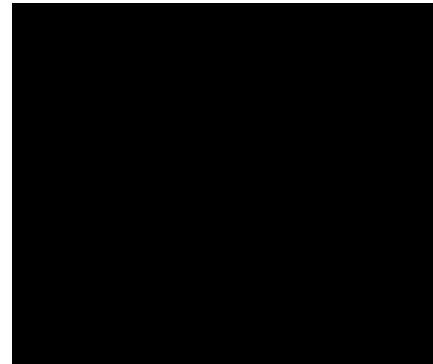
- Motion Control – Home Appliance / Industrial Motor

Integrated Power Functions

- 600 V – 30 A IGBT inverter for three-phase DC / AC power conversion (please refer to Figure 2)

Integrated Drive, Protection and System Control Functions

- For Inverter High-side IGBTs: gate drive circuit, high-voltage isolated high-speed level shifting control circuit Under-Voltage Lock-Out Protection (UVLO)(Note: Available bootstrap circuit example is given in Figure 14)
- For Inverter Low-side IGBTs: gate drive circuit, Short-Circuit Protection (SCP) control supply circuit Under-Voltage Lock-Out protection (UVLO)
- Fault Signaling: corresponding to UVLO (low-side supply) and SCBA



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PIN CONFIGURATION

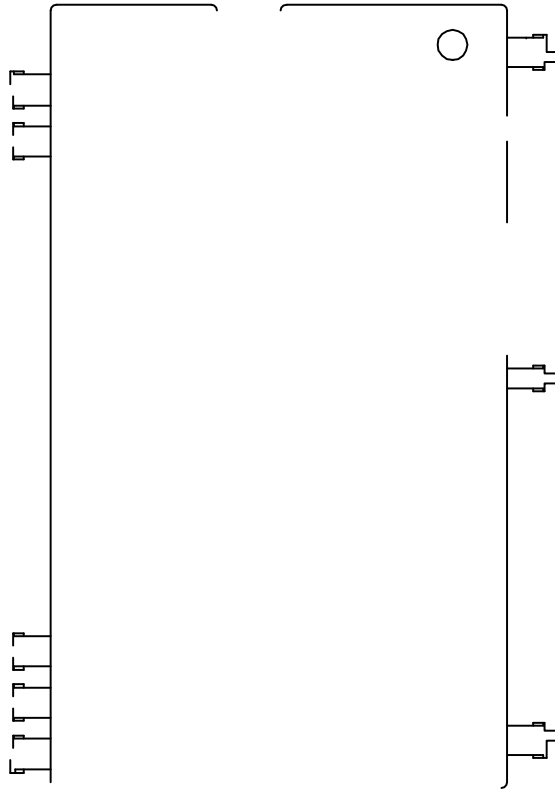


Figure 1. Pin Configuration – Top View

PIN DESCRIPTIONS

ABSOLUTE MAXIMUM RATINGS

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ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
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INVERTER PART

V _{CE(SAT)}	Collector - Emitter Saturation Voltage	V _{DD} = V _{BS} = 15 V, V _{IN} = 5 V	I _C = 30 A, T _J = 25°C	-	1.65	2.25	V
V _F	FWDi Forward Voltage	V _{IN} = 0 V	I _F = 30 A, T _J = 25°C	-	2.00	2.60	V
HS t _{ON}	Switching Times	V _{PN} = 300 V, V _{DD} = V _{BS} = 15 V, I _C = 30 A, T _J = 25°C V _{IN} = 0 V ↔ 5 V, Inductive load (Note 6)		0.45	0.85		

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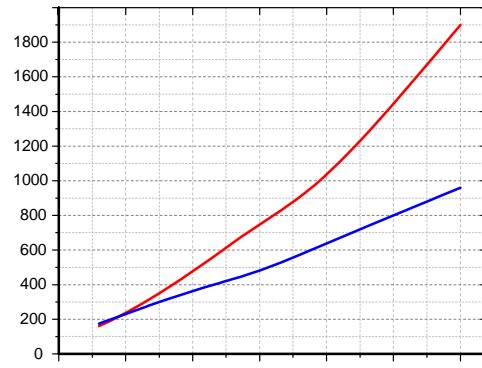


Figure 4. Switching Loss Characteristics (Typical)

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Table 3. RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{PN}	Supply Voltage	Applied between P – N_U , N_V , N_W	–	300	400	V
V_{DD}	Control Supply Voltage	Applied between $V_{DD(H)}$, $V_{DD(L)}$ – COM	13.5	15.0	16.5	V
V_{BS}	High – Side Bias Voltage	Applied between $V_{B(U)} - V_{S(U)}$, $V_{B(V)} - V_{S(V)}$, $V_{B(W)} - V_{S(W)}$	13.0	15.0	18.5	V
dV_{DD} / dt , dV_{BS} / dt	Control Supply Variation		–1	–	1	V/ μ s
t_{dead}	Blanking Time for Preventing Arm – Short	For each input signal	1.0	–	–	μ s

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Table 4. MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Conditions	Min	Typ	Max	Unit
Device Flatness	See Figure 8	0	-	+120	μm
Mounting Torque	Mounting Screw: M3 See Figure 9	Recommended 0.7 N • m	0.7	0.8	N • m
		Recommended 7.1 kg • cm			

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TIME CHARTS OF PROTECTIVE FUNCTION

Figure 10. Under-Voltage Protection (Low-Side)

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ORDERING INFORMATION

Device	Device Marking	Package	Shipping
FNB43060T2	FNB43060T2	SPMAA-C26 / 26LD, PDD STD CERAMIC TYPE, LONG LEAD DUAL FORM TYPE (Pb-Free)	72 Units / Tube

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