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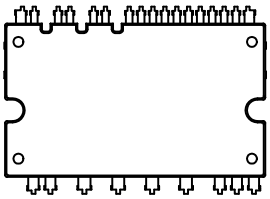
FNB43060T2 is an advanced Motion SPM 45 module providing a fully−featured, high−performance inverter output stage for AC Induction, BLDC, and PMSM motors. These modules integrate optimized gate drive of the built−in IGBTs to minimize EMI and losses, while also providing multiple on−module protection 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&

PIN CONFIGURATION

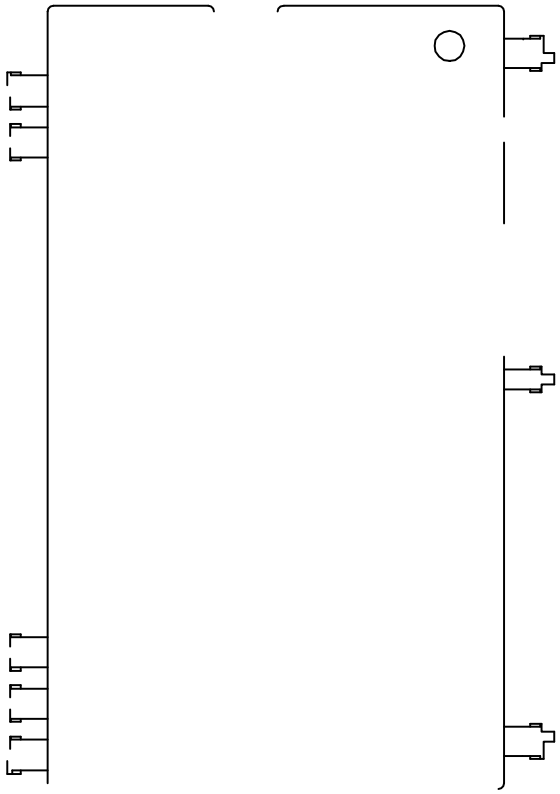


Figure 1. Pin Configuration − Top View

PIN DESCRIPTIONS

ABSOLUTE MAXIMUM RATINGS

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

Symbol		Parameter	Conditions		Min	Typ	Max	Unit
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		

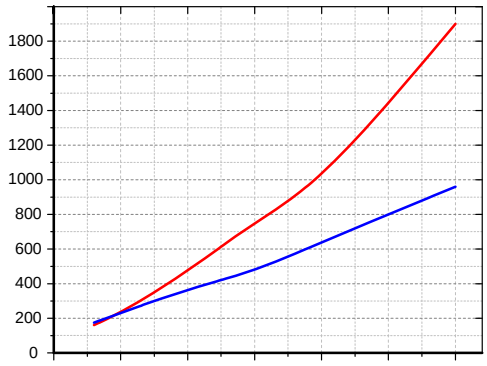


Figure 4. Switching Loss Characteristics (Typical)

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/μs
t_{dead}	Blanking Time for Preventing Arm – Short	For each input signal	1.0	–	–	μs

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	0.6	0.7	0.8	N • m
		Recommended 7.1 kg • cm	6.2			

TIME CHARTS OF PROTECTIVE FUNCTION

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

FNB43060T2

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