

# FPDB40PH60B

## PFC SPM® 3 Series for 2-Phase Bridgeless PFC



### Features

- UL Certified No. E209204 (UL1557)
- 600 V - 40 A 2-Phase Bridgeless PFC with Integral Gate Driver and Protection
- Very Low Thermal Resistance Using Al<sub>2</sub>O<sub>3</sub> DBC Substrate
- Built-in NTC Thermistor for Temperature Monitoring
- Built-in Shunt Resistor for Current Sensing
- Optimized for 20kHz Switching Frequency
- Isolation Rating: 2500 Vrms/min.

### Applications

- 2-Phase Bridgeless PFC Converter

### Related Source

- [AN-9041 - Bridgeless PFC SPM 3 Series Design Guide](#)

### General Description

The FPDB40PH60B is an advanced PFC SPM® 3 module providing a fully-featured, high-performance Bridgeless PFC (Power Factor Correction) input power stage for consumer, medical, and industrial applications. 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 lockout, over-current shutdown, thermal monitoring, and fault reporting. These modules also feature high-performance output diodes and shunt resistor for additional space savings and mounting convenience.

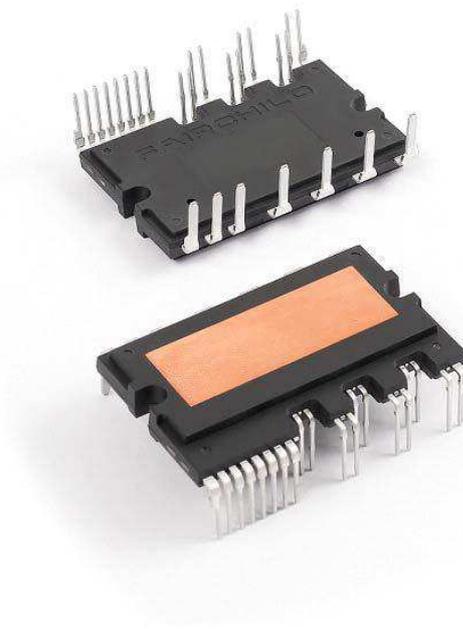


Figure 1. Package Overview

### Package Marking & Ordering Information

Device	Device Marking	Package	Packing Type	Quantity
FPDB40PH60B	FPDB40PH60B	SPMGC-027	Rail	10

## Integrated Drive, Protection and System Control Functions

- For IGBTs: gate drive circuit, Over-Current Protection (OCP), control supply circuit Under-Voltage Lock-Out (UVLO) Protection
- Fault signal: corresponding to OC and UV fault
- Built-in thermistor: temperature monitoring
- Input interface: active-HIGH interface, works with 3.3 / 5 V logic, Schmitt-trigger input

## Pin Configuration

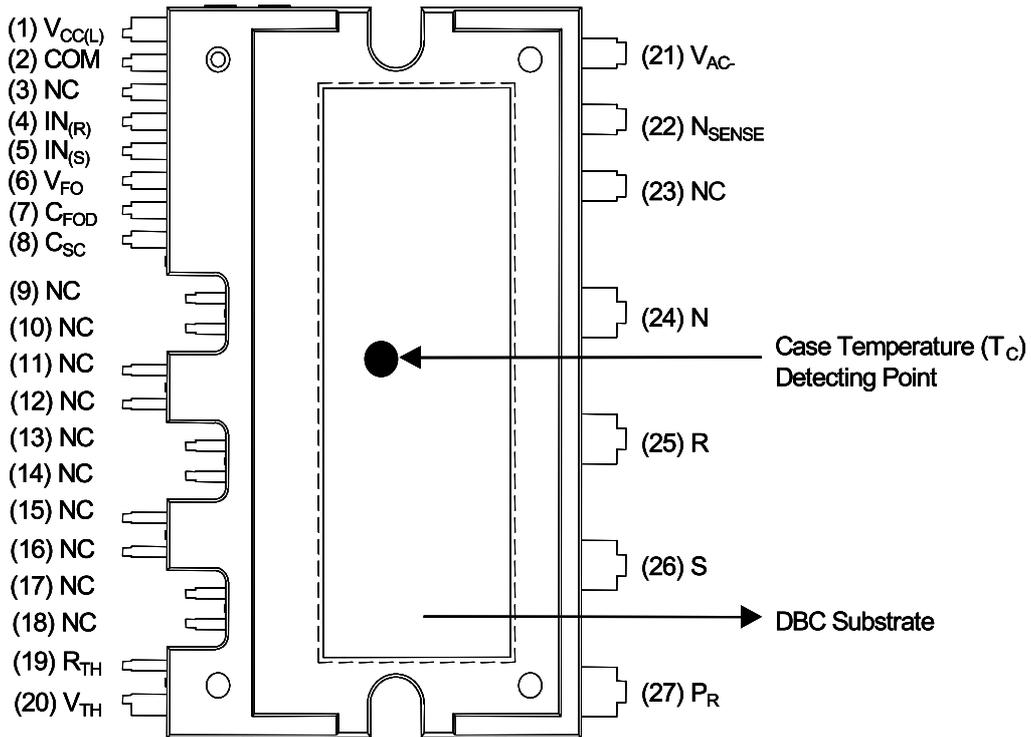
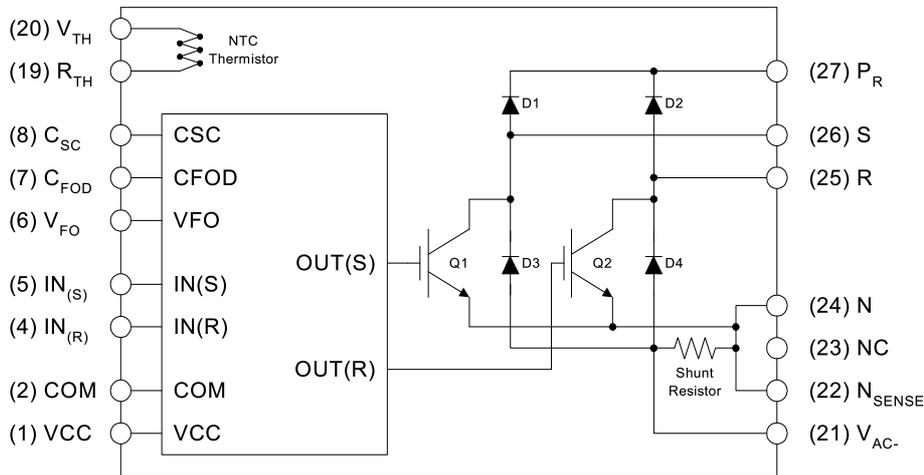


Figure 2. Top View

### Pin Descriptions

Pin Number	Pin Name	Pin Description
1	V <sub>CC</sub>	Common Bias Voltage for IC and IGBTs Driving
2	COM	Common Supply Ground
4	IN <sub>(R)</sub>	Signal Input for Low-Side R-Phase IGBT
5	IN <sub>(S)</sub>	Signal Input for Low-Side S-Phase IGBT
6	V <sub>FO</sub>	Fault Output
7	C <sub>FOD</sub>	Capacitor for Fault Output Duration Selection
8	C <sub>SC</sub>	Capacitor(Low-Pass Filter) for Over-Current Detection
19	R <sub>(TH)</sub>	Series Resistor for The Use of Thermistor
20	V <sub>(TH)</sub>	Thermistor Bias Voltage
21	V <sub>AC-</sub>	Current Sensing Terminal
22	N <sub>SENSE</sub>	Current Sensing Reference Terminal
24	N	Negative Rail of DC-Link
25	R	Output for R-Phase
26	S	Output for S-Phase
27	P <sub>R</sub>	Positive Rail of DC-Link
3, 9~18, 23	NC	No Connection

### Internal Equivalent Circuit



**Figure 3. Internal Block Diagram**

**Notes:**

1. Converter is composed of two IGBTs including four diodes and one IC which has gate driving and protection functions.