



New Product Announcement

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ZXBM1021 Package Extension

ZXBM1021 High performance 1-Phase BLDC Motor Pre-driver with Speed Control and Minimum Speed Setting

The ZXBM1021 is a high performance and integrated feature rich single phase Brushless Direct Current (BLDC) motor control pre-driver for fans, blowers, extractors and motors.

For system flexibility, the motor speed can be controlled by a voltage signal from either external control voltage or a PWM signal and has a minimum speed setting.

The ZXBM1021 minimizes electromagnetic interference (EMI) by allowing the user to adjust the switch-on speed of the external power switches via a single resistor.

In the motor industry, protection is critical. To help protect the motor coil, the ZXBM1021 provides rotor lock protection and a programmable over current limit. A user adjustable soft start helps prevent motor inrush currents.

The open-drain Frequency Generator (FG) pin allows an external interface to monitor motor rotation to monitor rotor status.

The ZXBM1021 is available in space saving low profile and thermally enhanced U-QFN4040-20 and industry standard QSOP-20 packages.



The Diodes Advantage

The ZXBM1021 provides high performance and integration yet a simple solution for a wide range of fan and motor drive applications.

▪ Speed control by DC voltage or PWM input signal

Flexible speed control by either an external PWM signal, DC voltage or by a resistor-theristor network.

▪ Built-in Hall bias, amplifier, PWM integrator and reference output

Highly integrated solution significantly reduces external components, PCB area and placement cost. External switches and resistors are not required to interface with PWM speed signal. This simplifies the application circuits.

▪ High current drive capability with V+OP pin

Low side source/sink of 100mA/100mA and high side sink of 50mA provides a direct drive to a larger range of external power switches.

- V+OP pin allows to adjust the external power switch turn-on time to help minimize EMI and shoot-through challenges.

▪ Soft-start and programmable over current limit

Soft-start helps to minimize in-rush current at start up. Over current limit to protect the motor coil. Programmability provides flexibility to suit wide range of motor power and application.

▪ Lock detect, shutdown and automatic restart

Helps protect coil from over-heating or burning during rotor lock.

▪ Wide operating temperature range -40°C to 110°C

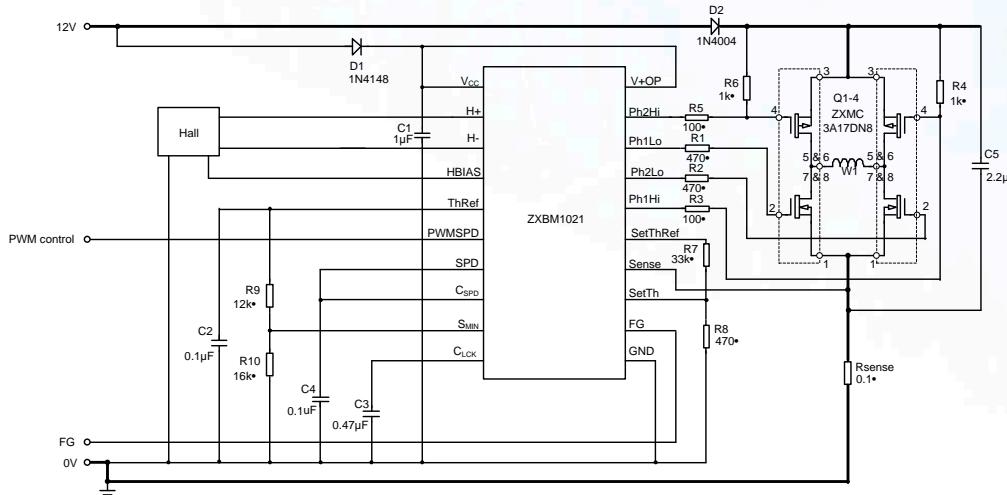
Suitable for thermally demanding applications.

Applications

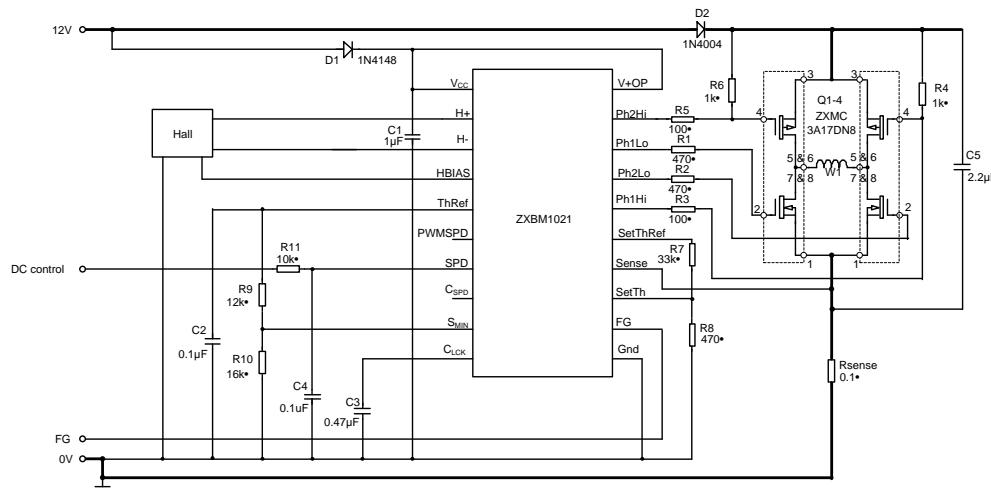
- 12V/24V/48V and above BLDC motors, cooling fans, extractors and pumps
- PC, server, equipment cooling fans and blowers
- Industrial and Home appliances – cooling, valve close and rotation
- Power tools

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Typical Application Circuit



Typical Applications Circuit for PWM Control using the ZXBM1021 and ZXMC MOSFET 1/2 Bridge Drivers



Typical Applications Circuit for DC Control using the ZXBM1021 and ZXMC MOSFET 1/2 Bridge Drivers



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Electrical Characteristics

Part Number	Operating Voltage	Typical IC supply current	Average Output Drive Source/Sink Current	Speed Control	Min. Speed Setting	Rotor Lock Protection	Current limit	Operating Temp.	Package
								(°C)	
ZXBM1021JB20TC	6.8 to 18.0	10	Low side: 100/100 High side: -/50	DC voltage or PWM signal	Yes	Yes	Yes Programmable	-40 to 110	U-QFN4040-20
ZXBM1021Q20TC									QSOP-20

Ordering Information

Device	Packaging (Note 1 and 2)	Part mark	Reel size	Tape width	Quantity
ZXBM1021JB20TC	U-QFN4040-20	ZXBM 1021 YY WW	13"	8mm	3000
ZXBM1021Q20TC	QSOP-20	ZXBM1021 YY WW	13"	8mm	2500

Notes: 1. "Green" and with Lead Free Finish/RoHS Compliant packages.

EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. No purposely added lead. Halogen and Antimony free. Please visit our website at http://www.diodes.com/products/lead_free.html

2. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>



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Product Portfolio – Single phase ^(1, 2, 3) BLDC fans and motor control pre-drivers ICs

Part Number	Operating Voltage	Typical IC supply current	Average Output Drive Source/Sink Current	Vref	Speed Control	Rotor Lock Protection	Min. Speed Setting	Current limit	Tail-End Current Control (TECC)	Operating Temp.	Package
	(V)	(mA)	(mA)	(V)						(°C)	
ZXBM1004	4.7 to 18.0	6	High side: -/100 Low side: 80/16	3	DC voltage or PWM signal	Yes	No	No	No	-40 to 110	QSOP16
ZXBM1015	4.7 to 18.0	11	High side: -/100 Low side: 80/32	3	DC voltage or PWM signal	Yes	Yes	Yes	No	-40 to 110	TSSOP20
ZXBM1016	6.7 to 18.0	15	High side: -/100 Low side: 80/80	5	DC voltage or PWM signal	Yes	Yes	Yes	Yes	-40 to 85	TSSOP20
ZXBM1017	6.7 to 18.0	11	High side: -/100 Low side: 80/32	5	DC voltage or PWM signal	Yes	Yes	No	No	-40 to 110	TSSOP20
ZXBM1018	7 to 18.0	6	80/100	5	DC voltage or PWM signal	Yes	Yes	Yes	No	-40 to 105	QSOP16
ZXBM1021	6.8 to 18.0	10	High side: -/50 Low side: 100/100	5	DC voltage or PWM signal	Yes	Yes	Yes	No	-40 to 110	U-QFN4040-20 QSOP-20
ZXBM1026 ⁽³⁾	6.8 to 18.0	10	High side: -/50 Low side: 100/100	5	DC voltage or PWM signal	Yes	Yes	Yes	Yes	-40 to 105	U-QFN4040-20 QSOP20

(1) For single or two phase BLDC fans and motor control pre-drivers please refer to the motor drive portfolio page on http://www.diodes.com/products/catalog/browse.php?parent_id=222

(2) For single, two and three phase All-In-One BLDC fans and motor drivers please refer to the motor drive portfolio http://www.diodes.com/products/catalog/browse.php?parent_id=220

(3) For single phase BLDC fans and motor drivers please refer to the motor drive portfolio http://www.diodes.com/products/catalog/browse.php?parent_id=221

To find out more information:

Motor Control Portfolio Page:

http://diodes.com/catalog/motor_control_199/

Motor Pre-Driver Portfolio page:

http://diodes.com/catalog/bldc_motor_pre_drivers_222

ZXBM1021 Product Page:

http://diodes.com/catalog/single_phase_229/zxbm1021.html

ZXBM1021 Datasheets:

<http://www.diodes.com/datasheets/ZXBM1021.pdf>