



New Product Announcement

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-thermistor 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 out 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 protects 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

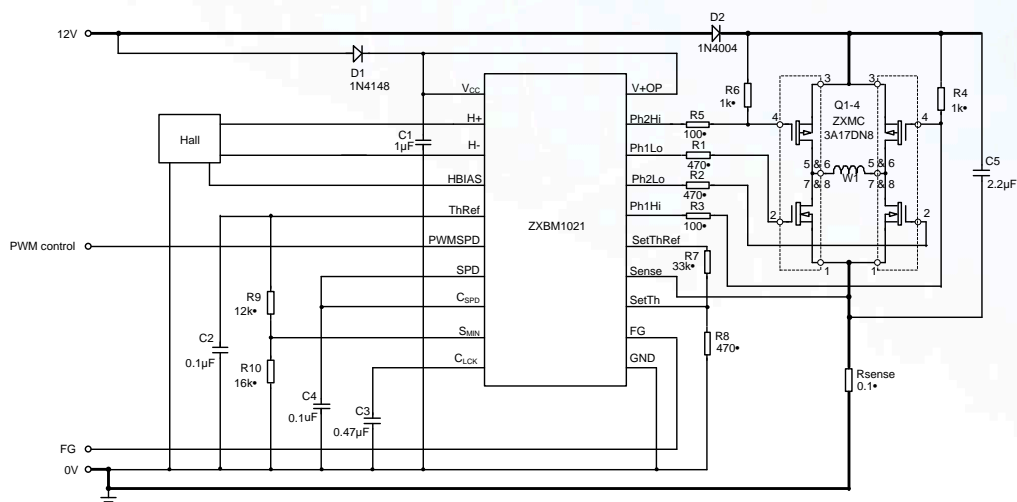


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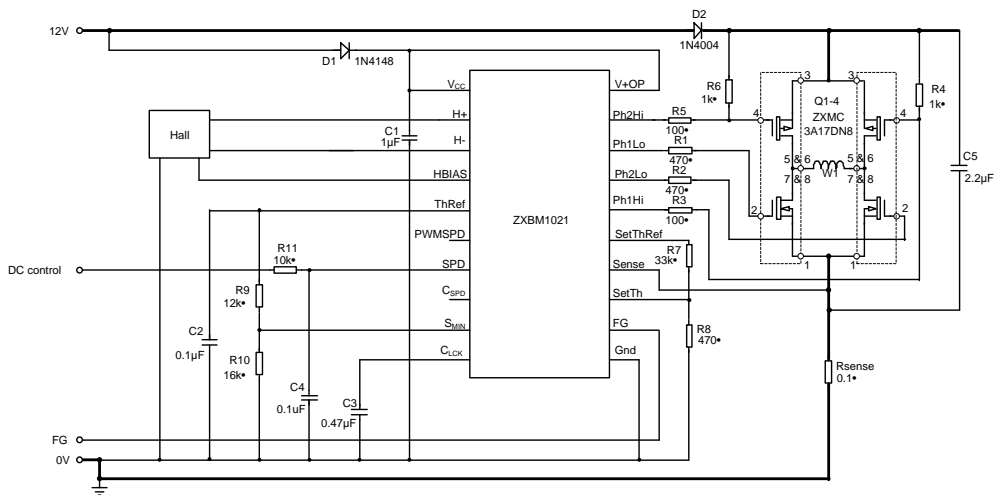
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Typical Application Circuit



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
	(V)	(mA)	(mA)					(°C)	
ZXBM1021JB20TC	6.8 to 18.0	10	Low side: 100/100	DC voltage or PWM signal	Yes	Yes	Yes Programmable	-40 to 110	U-QFN4040-20
ZXBM1021Q20TC			High side: -/50						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:
Motor Pre-Driver Portfolio page:
ZXBM1021 Product Page:
ZXBM1021 Datasheets:

http://diodes.com/catalog/motor_control_199/
http://diodes.com/catalog/bldc_motor_pre_drivers_222
http://diodes.com/catalog/single_phase_229/zxbm1021.html
<http://www.diodes.com/datasheets/ZXBM1021.pdf>