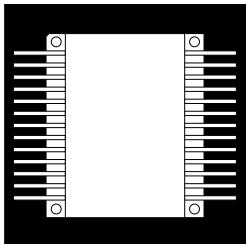
THREE PHASE BRUSHLESS MOTOR DRIVER MODULES IN HERMETIC ISOLATED PACKAGES



60 And 100 Volt, 50 To 100 Amp MOSFET Modules, Including Gate Drive For Complete 3-Phase Brushless Motor Control

FEATURES

- Hermetic Isolated Metal And Ceramic Packages
- Includes MOSFET Gate Drivers
- Operates To Zero Speed Without Separate External Power Supplies For High Side Drive
- High Current Output Stages
- Antiparallel Diodes For Independent Braking Current Sense (-50 And -100 Models Only)
- Available Hi-Rel Screened
- Ideally Suited For 28 Volt Applications

DESCRIPTION

These modules are ideally suited for high density, high reliability switching applications such as frequency converters for 3-phase motors, UPS and high power SMPS. These multi-chip modules incorporate in one package both the power MOSFETs, soft recovery rectifiers (-50 and -100 models), and gate drive circuitry in a full 3-phase bridge configuration.

2.1

GENERAL CHARACTERISTICS (@ T_C = 25°C unless otherwise specified)

Omnirel Part Number	V_{Motor}	I_{OUT}*	I_{OUT} @ T_C = 100°C*	$R_{DS(on)}$	$I_{Rectifiers}$ @ T_C = 100°C*	MOSFET q_{j-c}
OM90335SF-30	100V	60A	30A	13m	N/A	0.65°C/W
OM90335SF-60, -60A	100V	120A	60A	8 m	N/A	0.35°C/W
OM90335SF-50	60V	75A	30A	28 m	60A	0.2°C/W
OM90335SF-100	60V	150A	60A	16m	60A	0.6°C/W

* See note on next page for package pin current limits.

LOGIC TABLE

Inputs A-Hi, B-Hi, C-Hi	Inputs A-Lo, B-Lo, C-Lo	Shut Down	Outputs qA, qB, qC
0	0	0	Open
0	1	0	Pull Down
1	0	0	Pull Up
1	1	0	Illegal State*
X	X	1	Open

H = Logic HI L = Logic Low X = Don't Care Open = Neither pull up nor pull down is on

* Causes destruction of module due to direct short across V_M Supply unless supply is current limited to safe levels.

ABSOLUTE MAXIMUM RATINGS

Motor Supply Voltage Range, V_M ..... 0 to 60V/100V
Continuous Output Current, I_{OUT} ..... See chart on page 1*
Pulsed Output Current, I_{DM} ..... 3 times continuous for 60V Units
..... 4 times continuous for 100V Units
Logic Supply Range, V_{DD} ..... 13V to 18V
Digital Inputs ..... -0.5V, V_{DD} +0.5V
Operating Frequency 50kHz
Max. Lead Soldering Temperature (5 sec. max.) ..... 300°C
Thermal Resistance, Junction to Case, R_{qJC} ..... See chart on page 1
Operating Case Temperature Range, T_C ..... -55°C to +125°C
Storage Temperature Range, T_{stg} ..... -65°C to +150°C
Weight ..... 4 oz

* Pin current limit is 50 amps RMS. If continuous stall (locked rotor) is a system requirement, then this is the maximum allowed RMS motor current. If, however, the locked rotor condition is not part of the system requirements, or is quickly sensed and the system shut down, than one of the following two options will allow higher current operation. Of course, under no condition can the MOSFET current limit be exceeded.

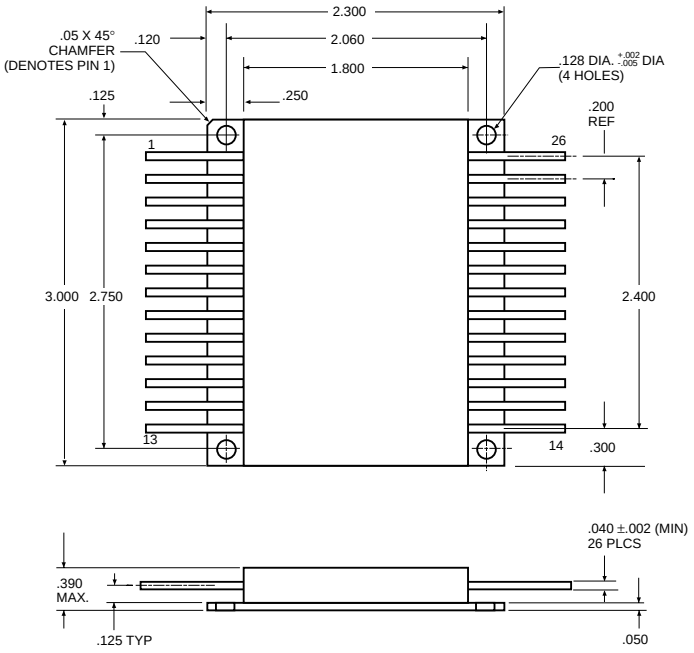
Option 1: Normal 6-step Brushless Motor Controller operation has a 66% duty cycle (on the phase pins). This allows operation at 60 amps RMS when on (on 2/3 of the time, open 1/3 of the time).

Option 2: The "-60A" model wires phase-out to 2 pins. When using both pins, the supply pins become the limiting factor. At a 33% duty cycle, 80 Amps RMS for the 1/3 of the time on (off 2/3 of the time) is allowed.

RECOMMENDED OPERATING CONDITIONS (Over Specified Temperature Range)

Supply Voltage, V_M 28V
Continuous Output Current, I_{OUT} ..... See chart on page 1
Logic Supply, V_{DD} ..... 15V±5%
Logic Thresholds, V_{INH} ..... 10V (min)
V_{INL} ..... 5.7V (max)

MECHANICAL OUTLINE (F-26)



ELECTRICAL CHARACTERISTICS

(Unless otherwise noted T_C = 25°C; V_{DD} = 15V and all outputs unloaded. $T_A = T_J$.)

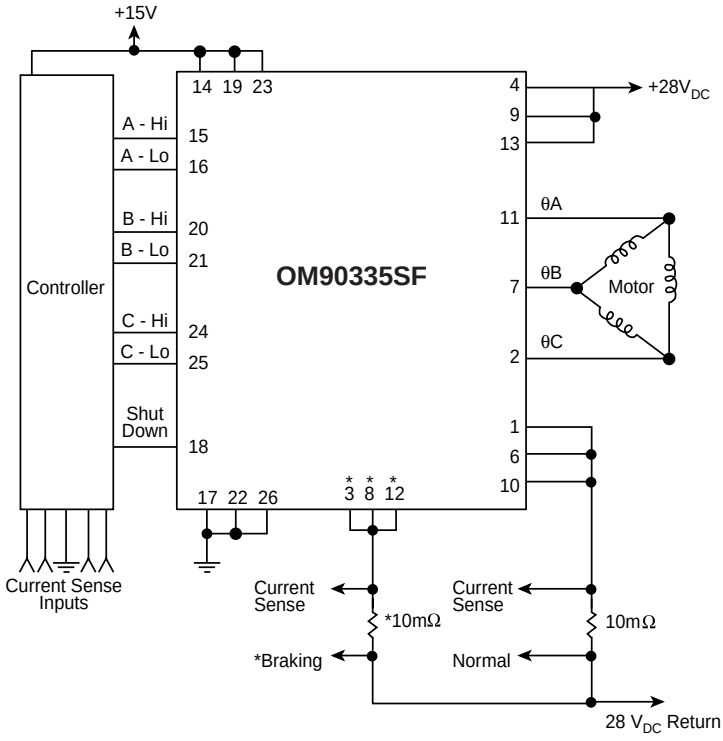
PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Power Output Section					
Leakage Current, I_{DSS}	V = 80% rated			250	µA
	@ T_C = +125°C			1000	
$R_{DS(on)}$(1)	See chart on page 1				
Overall					
V_{CC} Supply Current	Over Operating Range		32	50	mA
Under Voltage					
UV Inhibit Threshold	Over Operating Range		8.3		V
UV Restart Threshold			8.6		
Logic Inputs					
All Low Threshold	Over Operating Range	5.7	6		V
All High Threshold	Over Operating Range		9.5	10	V
All Input Current, Low	Over Operating Range		1	10	µA
All Input Current, High	Over Operating Range		15	70	µA
Hysteresis			2		V
Diode (-50 and -100 models only)					
V_F			0.7	0.925	V
t_{rr}	$I_F = I_R$ = 1A			50	ns

Notes:

1. At T_C = 100°C, $R_{DS(on)}$ increases by an average of 1.8 times value at T_C = 25°C.

REPRESENTATIVE APPLICATION

(*-50/-100 Models Only)



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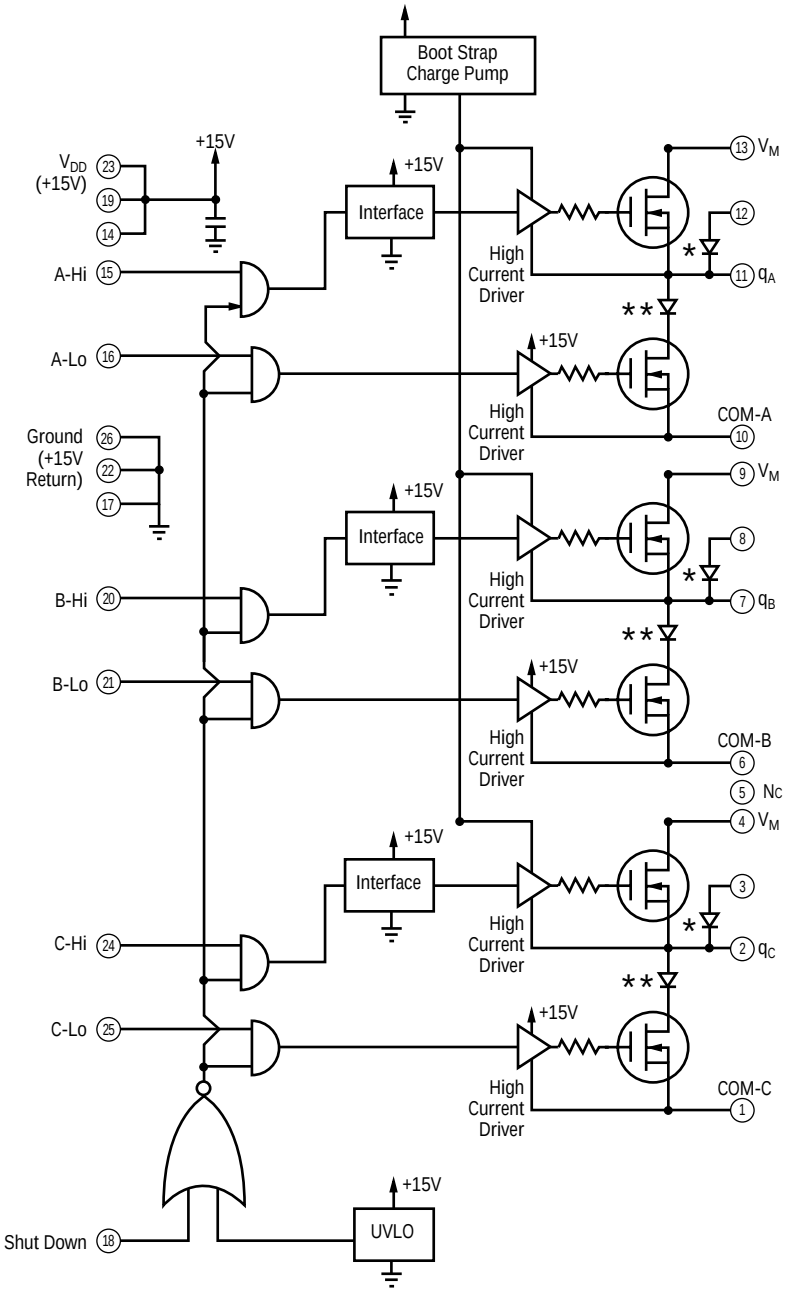
SCHEMATIC



Notes:

*This diode not present in OM90335SF-30/60 parts. Replace with short circuit in OM90335SF-60A part, 3 places.

**Replace this diode with short circuit OM90335SF-30/60/60A parts, 3 places.

Omnirel 205 Crawford Street, Leominster, MA 01453 USA (508) 534-5776 FAX (508) 537-4246