



ORIENT-CHIP

General Description

OCH2991F is a fan motor driver for the single coil brushless DC motor. With its high efficient direct PWM control mode, OCH2991F controls the speed of brushless DC motor with an external hall switch IC. OCH2991F is suitable to drive variable speed motors for personal computer's power supply radiation fans and CPU coolers.

OCH2991F integrates PWM fan speed control, minimum speed mode, soft start, soft switch, fan tachometer, lock protection, auto restart and Hall IC power circuit. PWM mode controls fan speed in low noise and low vibration ways by adjusting PWM signal duty. OCH2991F can set minimum fan speed by presetting MINSP voltage. With soft start function, OCH2991F can effectively reduce the peak current when power on. To reduce fan driver audible noise and power loss, the OCH2991F features a soft on/off phase transition and automatic phase-lock function of the motor winding BEMF and current.

Robust protections in OCH2991F include under-voltage lockout (UVLO), rotor deadlock protection, over current protection (OCP) and thermal shutdown.

The OCH2991F requires a minimal number of external components to save solution cost. The OCH2991F is available in TSSOP16L-EP、SOP-8L-EP packages.

Features

- Supporting speed: Max. 15000 Rpm/Min.
- Wide Operating Input Voltage Range: 3.0V~18V  
Integrated Power MOSFETs: Total 230mΩ(High side + Low side)
- PWM Fan Speed Control
- Programmable Minimum Fan Speed
- MINSP Setting Minimum Fan Speed
- Soft On/Off Phase Transition
- Soft Start and SoftRestart Function
- FG Output
- Over Temperature Protection
- External Hall Switch
- Lock-shutdown protection & auto-restart function
- Automatic Phase Lock Detection of Winding BEMF and Current Zero-Crossing
- 10KHZ to 60kHz PWM Input Frequency Range
- Fixed 26kHz Output Switching Frequency
- OCP (Over Current Protection)
- Current Limit & Soft Start and SoftRestart
- Thermal Protection and Automatic Recovery
- Built-In Input UVLO
- 40°C to + 105°C Temperature Range
- RoHS Compliant
- TSSOP-16L-EP、SOP-8L-EP packages

Applications

- Power、Industrial product、Equipment or Servers
- Single Coil DC Brushless DC Motor

Pin Configuration

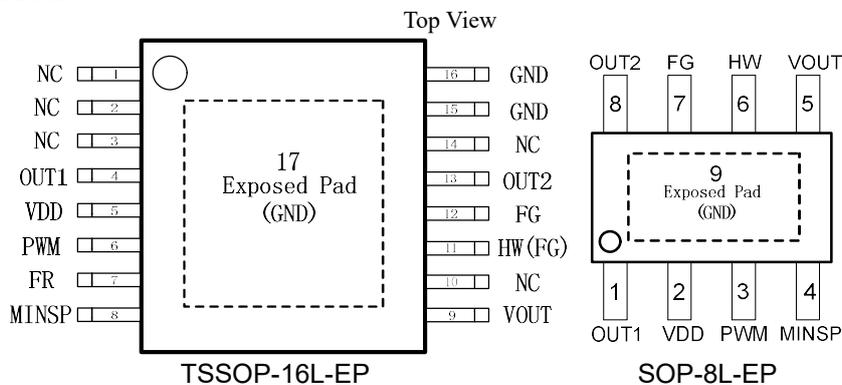


Figure 1, Pin Assignments Of OCH2991F

Pin Name	TSSOP16L-EP	SOP-8L-EP	Pin Function
NC	1,2,3,10,14	/	No Connection
OUT1	4	1	Output 1
VDD	5	2	Positive Power Supply
PWM	6	3	PWM Signal Input
FR	7	/	Inductive polarity Or Rotation Direction Control Pin,
MINSP	8	4	Input to set minimum speed or fan off range
VOUT	9	5	Regulator Output( Powersupply for external HALL switch)
HW/SCL	11	6	Hall switch input(connect the external Hall Switch output)
FG	12	7	Rotation Speed Detection. This is an open-drain output.
OUT2	13	8	Output 2
GND	15, 16, Exposed pad	Exposed pad	Ground



ORIENT-CHIP

■ Typical Application Circuit

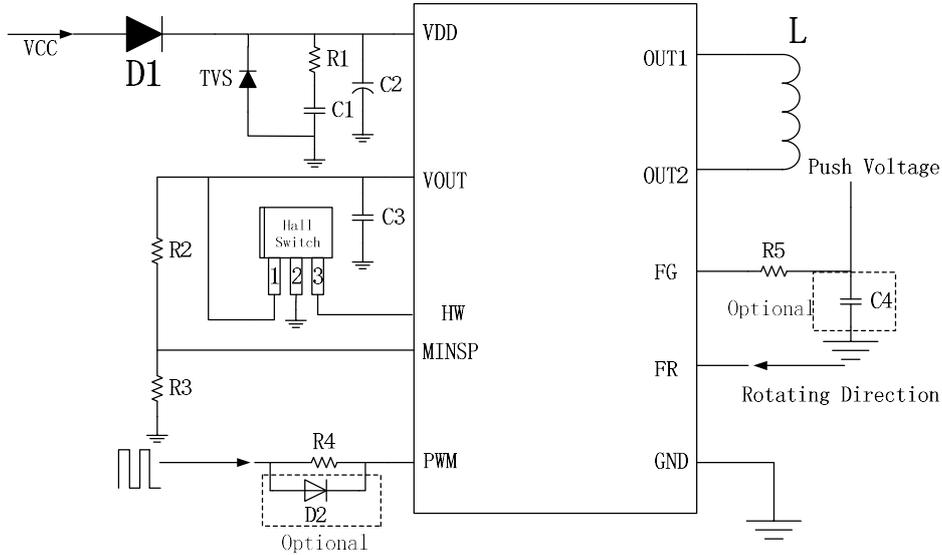


Figure 2, Typical Application Circuit Of OCH2991F (TSSOP16L-EP)

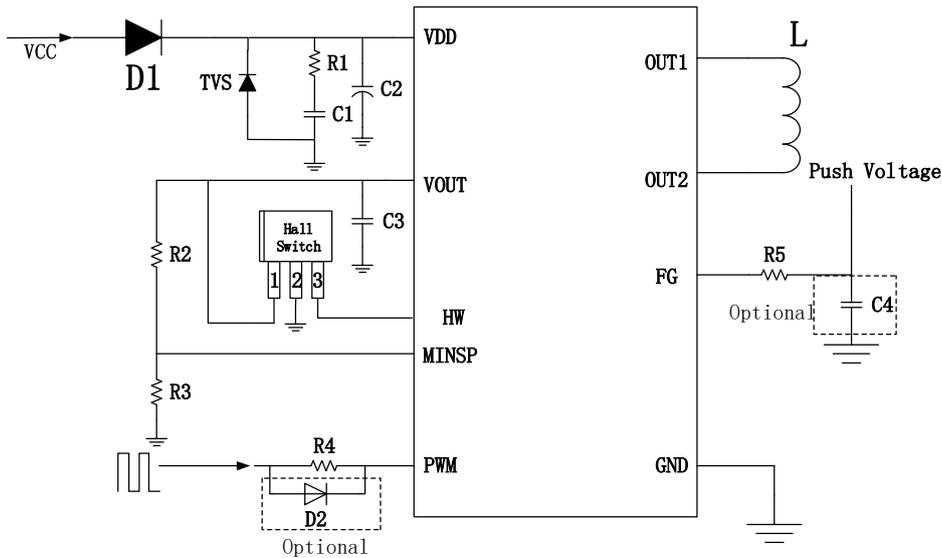


Figure 3, Typical Application Circuit Of OCH2991F (SOP-8L-EP)

Note1:

- 1) Must use least  $C1=4.7\mu F\sim 10\mu F$  and  $R1=1\sim 2\Omega$  (Typ.) for the decoupling between VDD and GND and place the capacitor as close to the IC as Possible.
- 2) A TVS diode is needed in application.
- 3) C2 is Electrolytic Capacitor, the typical value is  $10\mu F\sim 47\mu F$ .
- 4) C3 is Optional, the typical value is  $1\mu F$ .
- 5) C4 the typical value is  $2.2nF$
- 6) R2/R3 value decided the minimum output duty setting.
- 7) R4/R5, the typical value R4 is  $10k\Omega$ , R5 is  $100\Omega$ .
- 8) D2/C4 is optional.



**ORIENT-CHIP**  
■ **Block Diagram**

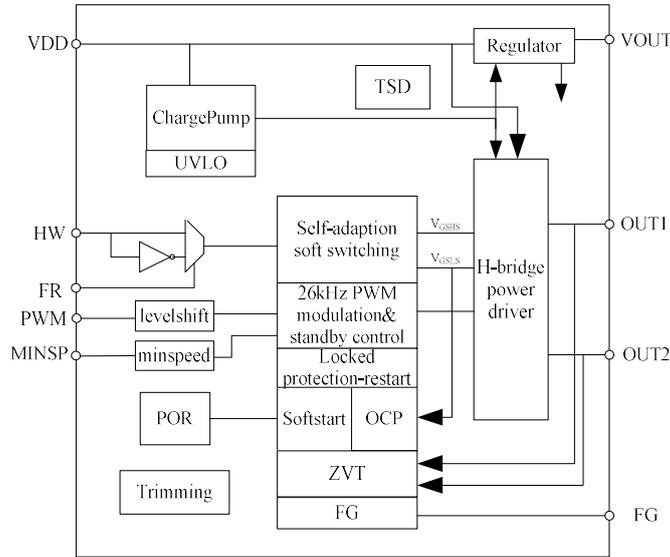


Figure 4, Block Diagram Of OCH2991F