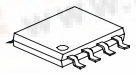
SINGLE-PHASE FULL-WAVE MOTOR DRIVER FOR FAN MOTOR



SOP-8

*Pb-free plating product number: F6908L

■ DESCRIPTION

UTC **F6908** is a single-phase full-wave motor driver for fan motor suitable for 5V and 12V openations.

■ FEATURES

* Soft switching drive for low noise
* Lock detection and automatic restart function
* Thermal shut-down protection

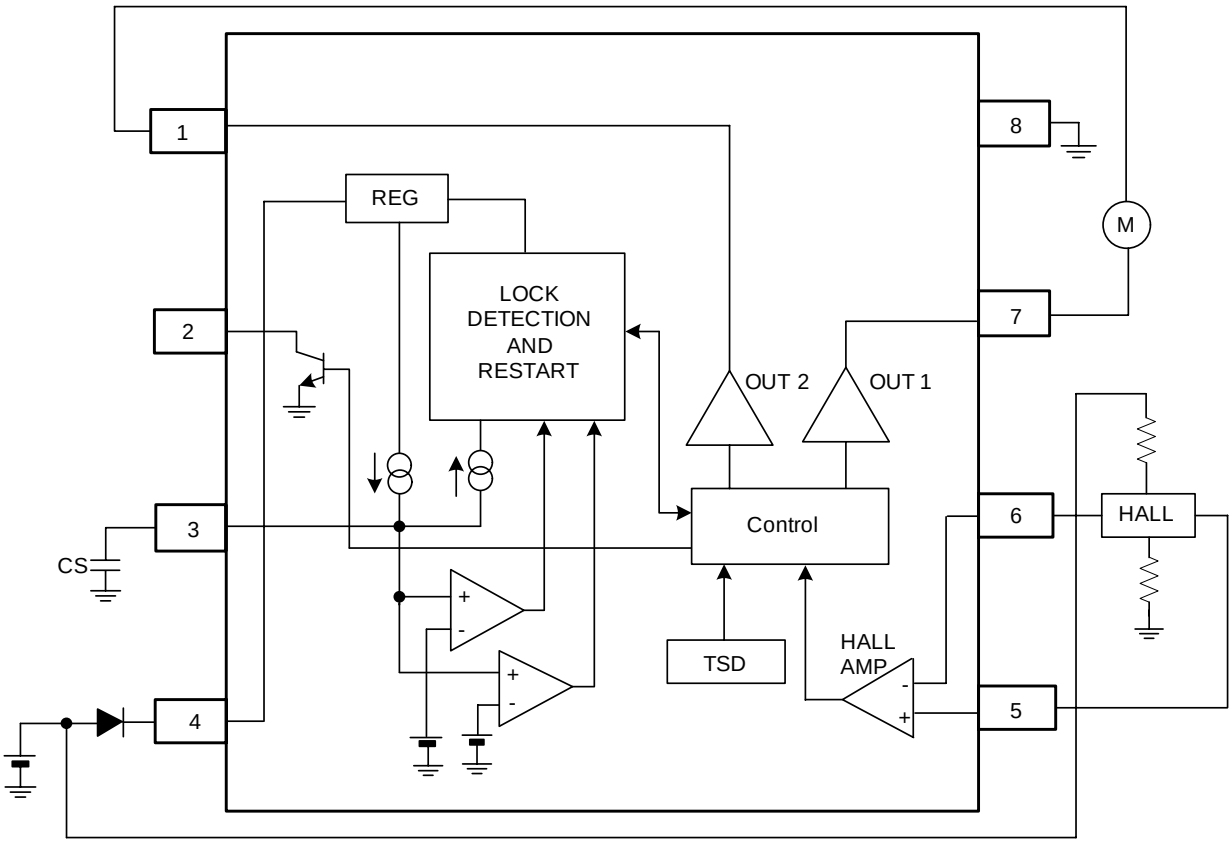
■ PIN DESCRIPTION

PIN NO.	PIN NAME	FUNCTION
1	OUT2	Output 2
2	HO	Hall signal output pin
3	LD	Capacitor terminal for Lock detection, Auto restart
4	V_{CC}	Power supply pin
5	H+	Hall signal input pin +
6	H-	Hall signal input pin -
7	OUT1	Output 1
8	GND	GROUND

■ ORDERING INFORMATION

Order Number		Package	Packing
Normal	Lead Free Plating		
F6908-S08-R	F6908L-S08-R	SOP-8	Tape Reel
F6908-S08-T	F6908L-S08-T	SOP-8	Tube

■ BLOCK DIAGRAM



■ HALL SIGNAL INPUT-OUTPUT TRUTH TABLE

H+	H-	OUT1	OUT2	HO
H	L	H	L	H
L	H	L	H	L

Condition: LD=0V

■ ABSOLUTE MAXIMUM RATINGS (Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	15	V
Output Voltage	V_{OUT}	15	V
Hall Signal Output Voltage	V_{HO}	15	V
Output Current	I_{OUT}	0.7*	A
Hall Signal Output Current	I_{HO}	15	mA
Power Dissipation	P_D	680 **	mW
Operating Temperature	T_{OPR}	-40 ~ +100	℃
Junction Temperature	T_J	+125	℃
Storage Temperature	T_{STG}	-40 ~ +150	℃

* This value is not to be over P_D and ASO.
** To use at temperature above Ta = 25℃ reduce 5.5 mW/℃.(On 70.0mm×70.0mm×1.6mm glass epoxy board)
The device is guaranteed to meet performance specification within 0℃ ~ 70℃ operating temperature range and assured by design from –40℃ ~ 100℃, characteristic and correlation with static process control.

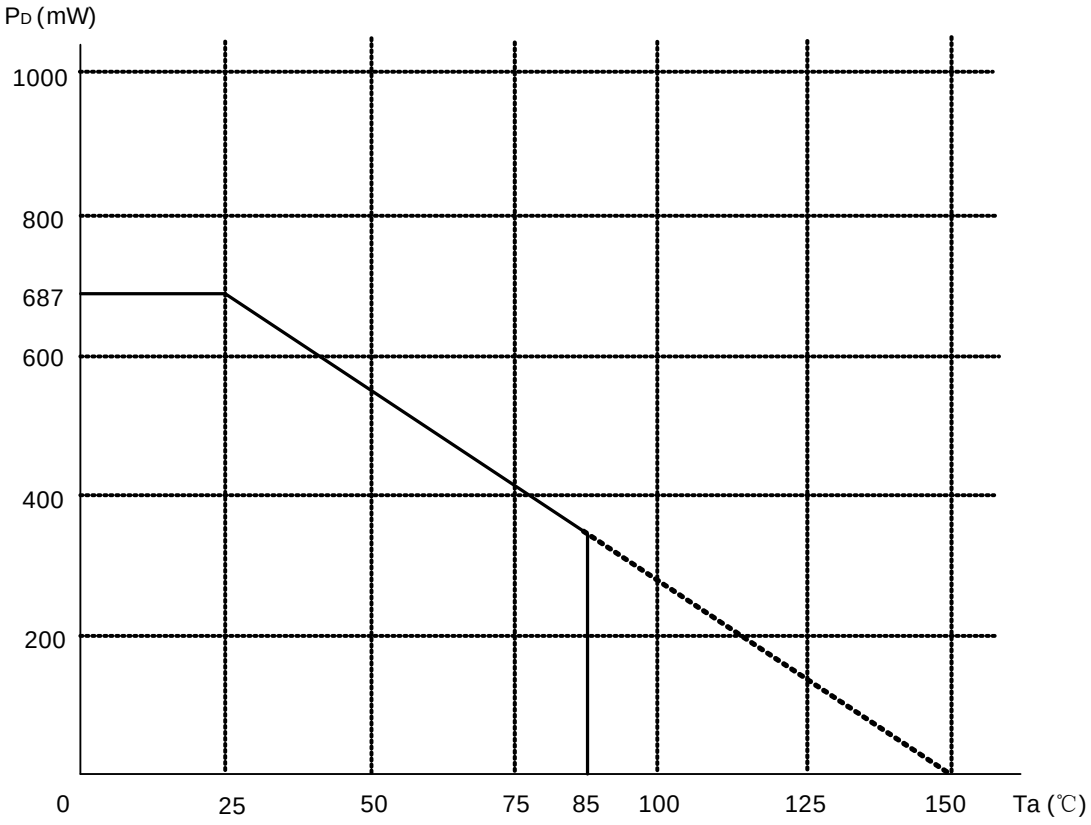
■ RECOMMENDED OPERATING CONDITIONS (Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	3 ~ 14	V

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified Ta = 25℃, Vcc = 5V)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Clamp Voltage of Capacitor for Lock Detection	V_{LDCL}		1.14	1.80	2.47	V
Reference Voltage of Capacitor for Lock Detection	V_{LDCP}		0.47	0.76	1.06	V
Output Voltage L	V_{OL}	I_{OUT}=200mA		0.2	0.3	V
Output Voltage H	V_{OH}	I_{OUT}=200mA	3.9	4.1		V
“HO” Terminal Voltage L	V_{HOL}	I_{HO}=5mA		0.3	0.5	V
Supply Current	Icc	At output: OFF	1.5	3.4	8.7	mA
Charge Current of Capacitor for Lock Detection	I_{LDC}	V_{LD}=1.1V	1.50	2.75	4.50	μA
Discharge Current of Capacitor for Lock Detection	I_{LDD}	V_{LD}=1.1V	0.24	0.48	0.90	μA
“HO” Terminal Leak Current	I_{HOL}	V_{HO}=15V		0	50	μA
Charge-Discharge Current Ratio of Capacitor for Lock Detection	R_{CD}	$r_{CD}=I_{LDC}/I_{LDD}$	4.2	5.7	9.5	
Hall Input Offset Voltage	H_{OFS}		-10		10	mV
Hall Input-Output Gain	GHO		320	500	680	
Thermal Shutdown				140		℃
TSD Hysteresis	TSD			25		℃

■ POWER DERATING CURE



To use at temperature above Ta=25℃ reduce 5.5mW/℃
(On 70.0mm×70.0mm×1.6mm glass epoxy board)

■ LOCK DETECT CIRCUIT, AUTOMATIC RESTART CIRCUIT

Charge and discharge time at motor lock condition varies with the value of external capacitor at LD terminal, and is given by the following equation.

$$T_{ON}\ (\text{Charge time}) = \frac{C\times(V_{LDCL}-V_{LDCP})}{I_{LDC}}$$

$$T_{OFF}\ (\text{Discharge time}) = \frac{C\times(V_{LDCL}-V_{LDCP})}{I_{LDD}}$$

C: Capacitor at LD pin

The following value shows charge time and discharge time at C=0.47μF for reference.

Charge time =0.18S (Output: ON)

Discharge time = 1.02S (Output: OFF)

■ SHOWS TIMING CHART OF LD PIN

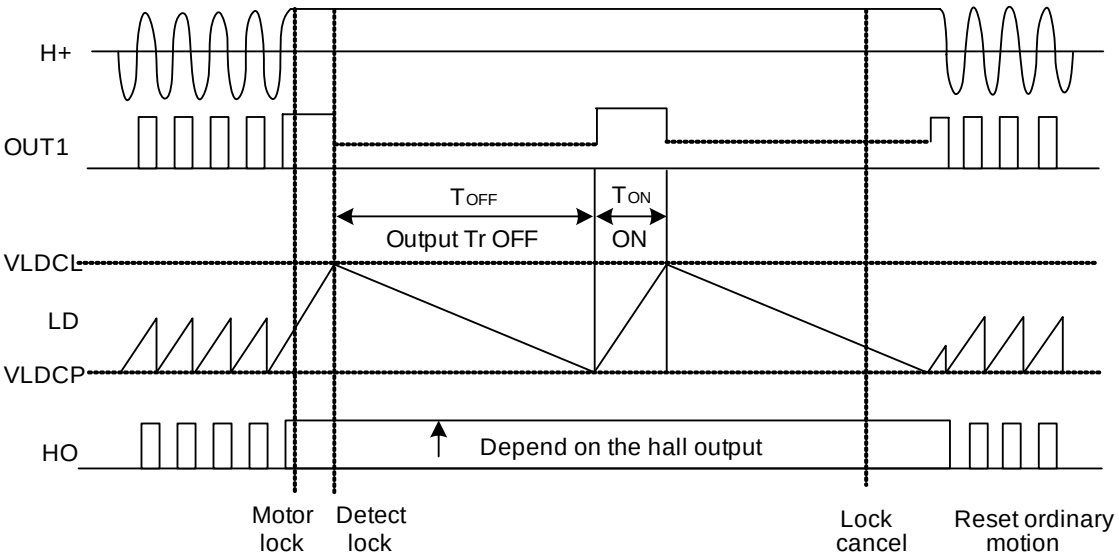


Fig.1 Timing chart (LD terminal, HO terminal)

■ CAUTIONS

(1) Power dissipation

IC power dissipation varies widely with supply voltage, output current and application of IC. Please pay attention not to exceed the allowable power rating.

(2) Hall signal input terminals (H+、H-)

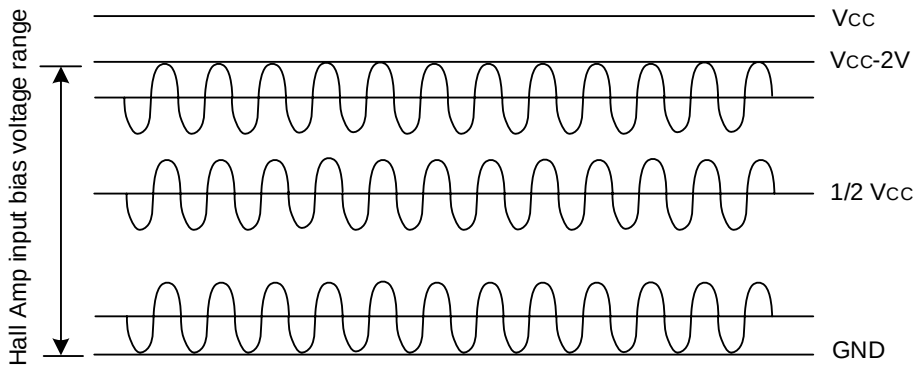


Fig.2 Hall amp input bias voltage range

A. Hall signal amplitude should be key within range 0V ~ V_{CC}-2V.
B. The output signal of this IC is the amplified by about 500 times of hall input signal coith pattern shown below for different leuel ok signal input.

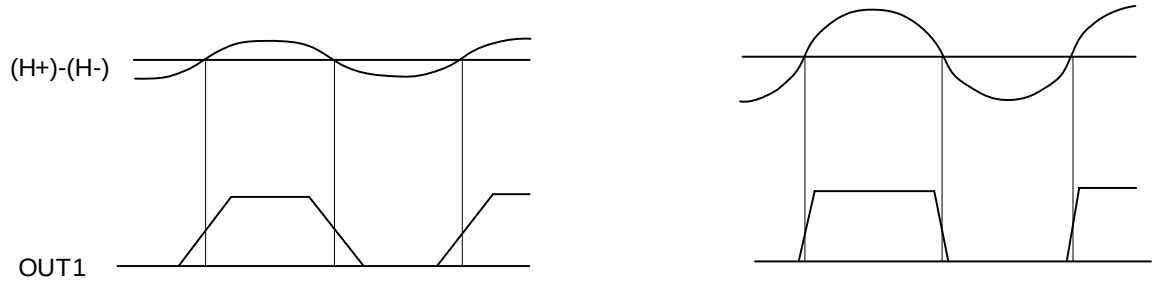


Fig.3 Difference of output signal depending on hall input signal