FEELING TECHNOLOGY

FD1257H

Smart motor driver with embedded Hall sensor

FEATURES

- Motor driver with integrated Hall sensor
- Lock-shutdown protection & auto-restart function
- Precise magnetic switching thresholds
- “Soft-switch” phase-switching technique to reduce vibration and acoustic noise
- Thermal shutdown protection
- Available in SIP-4L(FD1257H) packages
- For 12V systems

Pb Free

GENERAL DESCRIPTION

FD1257H is a single coil motor driver with embedded Hall sensor. It integrates the motor driver with the Hall sensor, which simplifies the PCB(printed circuit board) design and make the fabrication of small-size motors possible.
Lock-shutdown and auto-restart function keeps the motor from being over-heated and restarts the motor after being locked.
“Soft-switch” phase-switching technique is used to reduce the vibration and acoustic noise.
Thermal-shutdown protection ensures the motor driver to operate under specified temperature ranges.
All the protection mechanisms mentioned above combine to provide a complete protecting scenario for the motor system, keep the motor system from possible damages and guarantee correct operations.

BLOCK DIAGRAM

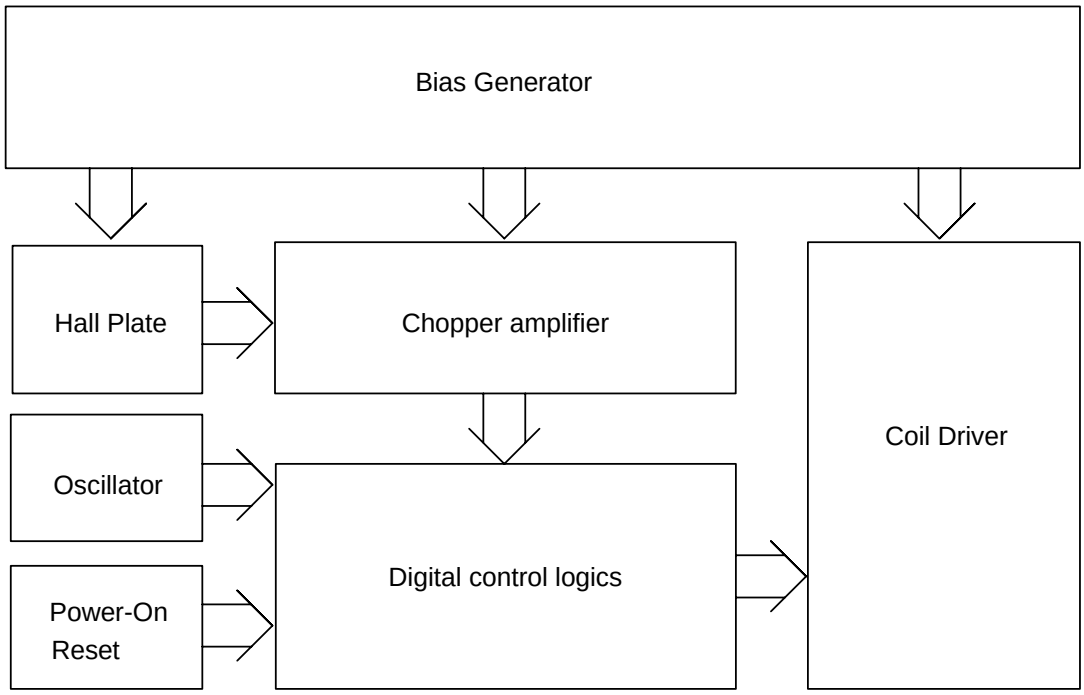


Figure.1

PIN CONNECTION

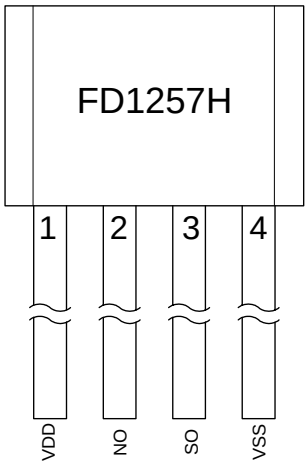


Figure.2

PIN DESCRIPTIONS

Name	I/O	FD1257H	Description
VDD	P	1	Positive power supply
NO	O	2	Driver output
SO	O	3	Driver output
VSS	G	4	Ground

Legend: I=input, O=output, I/O=input/output, P=power supply, G=ground

FUNCTIONAL DESCRIPTIONS

Refer to the block diagram (Figure.1), FD1257H is composed of the following building blocks:

- Bias generator

The bias generator provides precise, temperature- and process-insensitive bias references for the analog blocks. These references guarantee proper operation of the IC under all conditions specified in this specification.

- Oscillator

The built-in oscillator provides the clock signal for the digital control logics

- Power-on Reset

Used to detect the power-up ramp and reset the digital circuits to achieve correct operation as soon as the power is ready.

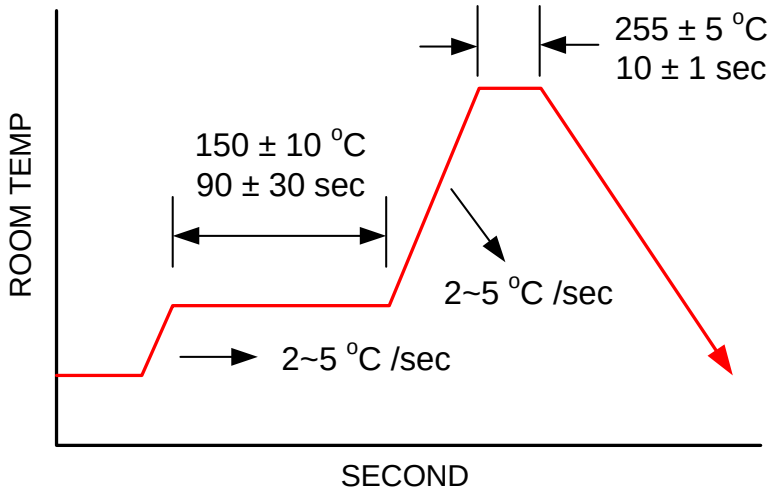
- Chopper Amplifier

To achieve a higher magnetic sensitivity the chopper amplifier structure is adopted in this design. Use of this structure dynamically removes both the offset and flicker noise at the same time.

- Digital control logics
  - Hall sensor part – generates controlling signals for the Hall sensor.
  - Coil driver part – generates controlling signals for the Coil driver.

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Conditions	Values		Unit
			min.	max.	
Operating Temperature	T_{OP}	-	-20	105	°C
Storage Temperature	T_{ST}	-	-40	150	°C
DC Supply Voltage	V_{dd}	-		16	V
Supply Current	I_{dd}	-		12	mA
Continuous Current	$I_{O(Cont.)}$			500	mA
Hold Current	$I_{O(Hold)}$			800	mA
Peak Current	$I_{O(Peak)}$	<100us		900	mA
Junction temperature	T_J			150	°C
Lead Temperature		10sec		260	°C



Soldering Condition

OPERATING CONDITIONS

Parameter	Conditions	Values			Unit
		min.	typ.	max.	
Supply Voltage	-	2.5		14.0	V
Ambient Temperature	-	-20		105	^{o}C

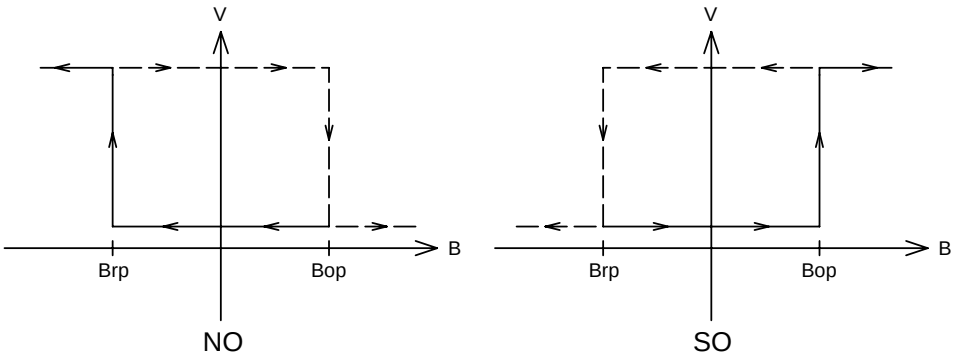
ELECTRICAL CHARACTERISTICS @ VDD=12.0V

Parameter	Conditions	Values			Unit
		min.	typ.	max.	
Average Supply Current(no load)	-		5		mA
On resistance(Rpmos+Rnmos)	-		2.5		Ohm
Thermal Shutdown Threshold	-		165		^{o}C

MAGNETIC CHARACTERISTICS

Parameter	Conditions	Values			Unit
		min.	typ.	max.	
Operate Points (B_{OP})	-		20		G
Release Points (B_{RP})	-		-20		G
Hysteresis	-		40		G

HYSTERESIS CHARACTERISTICS



Application Circuit Reference

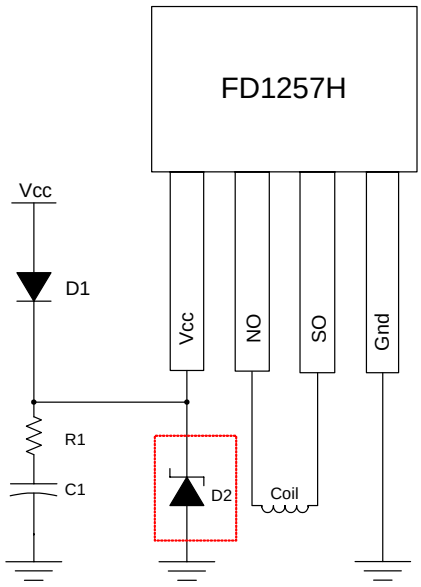
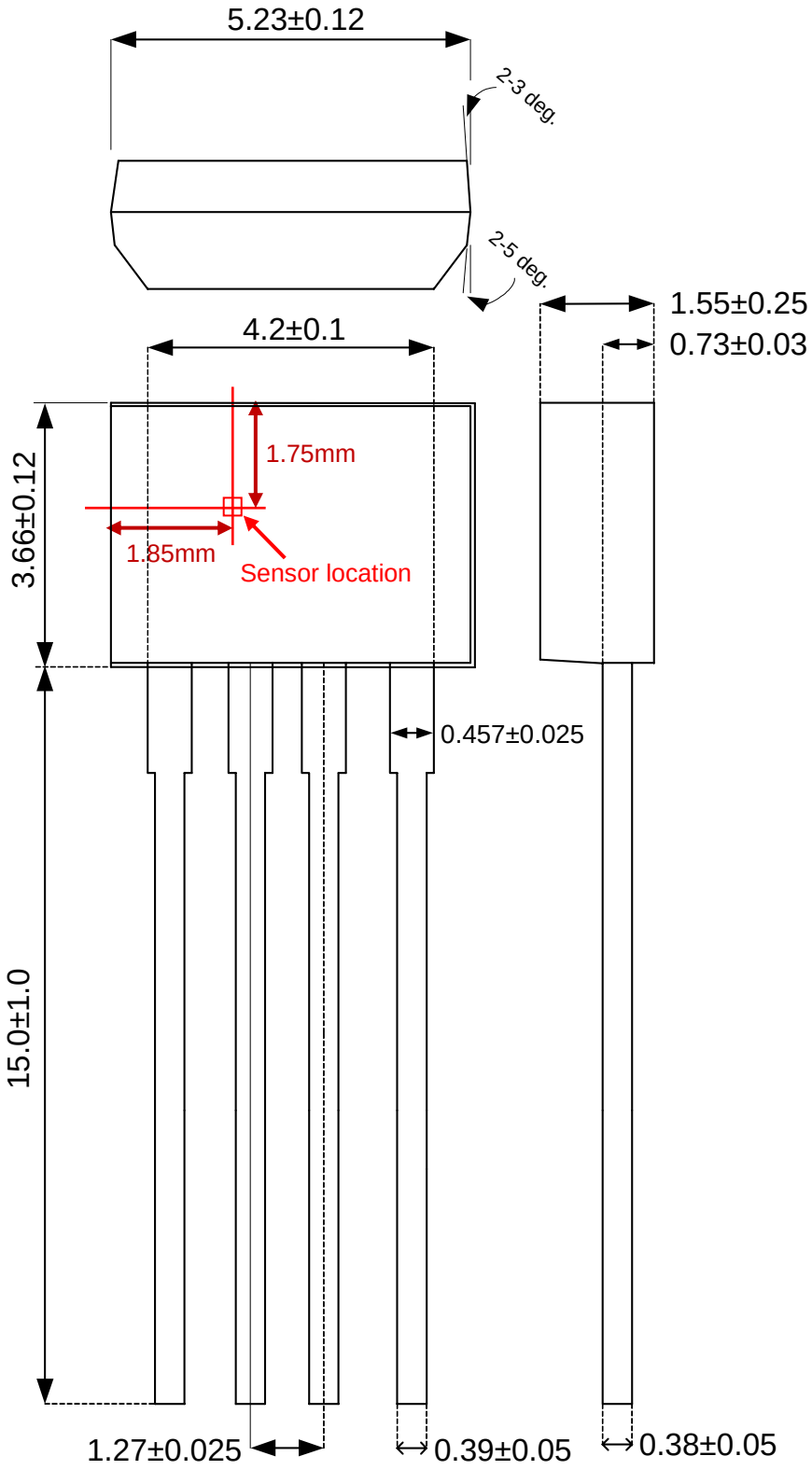


Figure.4

Note.

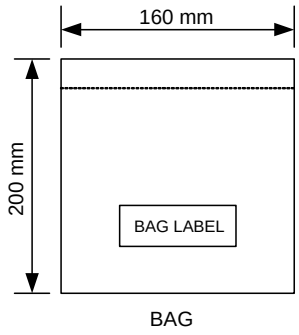
1. Must use least C1=1uF(electrolytic) capacitor & R1=5~10 Ohm for the decoupling between VDD and VSS and place the capacitor as close to the IC as possible (D2(OPTION)= 16V zener diode).

PACKAGE DIMENSION Unit:mm
SIP-4L(Lead Free)

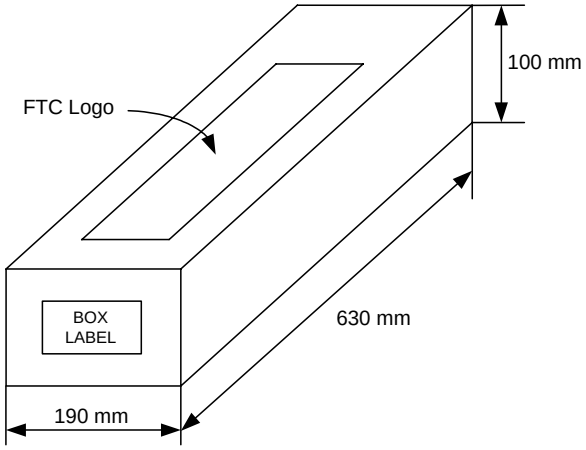


PACKING SPECIFICATION

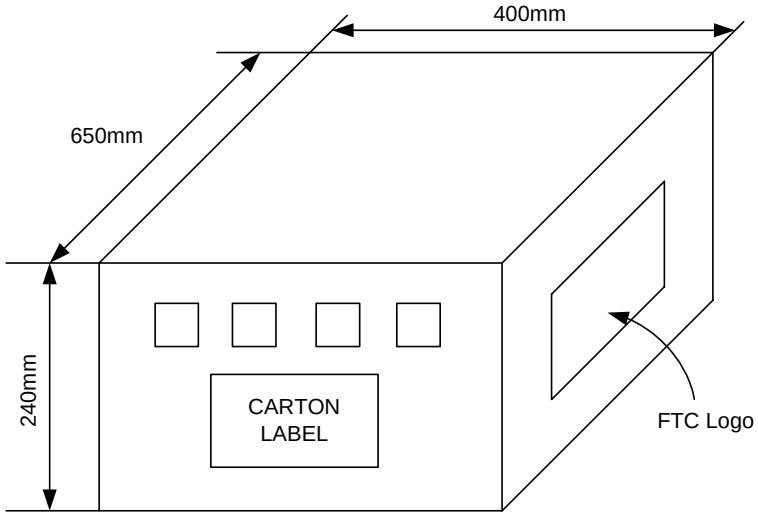
BAG & BOX DIMANSION



BAG



INSIDE BOX



CARTON

PACKING QUANTITY SPECIFICATIONS

1000 EA / 1 BAG

25 BAGS / 1 INSIDE BOX

4 INSIDE BOXES / 1 CARTON

ORDER INFORMATION

Part Number	Operating Temperature	Package	Description	Marking
FD1257H-LF	-20 °C to +105 °C	SIP-4L	±25G (B)	-