

Unipolar Hall Effect Switch CYDF41

The CYDF41 is an integrated Hall Effect latched sensor designed for electronic commutation of brush-less DC motor applications. The device includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall voltage, and a Schmitt trigger to provide switching hysteresis for noise rejection, and open-collector output. An internal band gap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

A north pole of sufficient strength will turn the output ON. In the absence of a magnetic field, the output is OFF.

Features

♦ Wide operating voltage range: 3.0V to 28V	♦ Reverse polarity protection
♦ Maximum output sink current	♦ Package : SIP-3L
♦ Open-Collector pre-driver	

Block Diagram

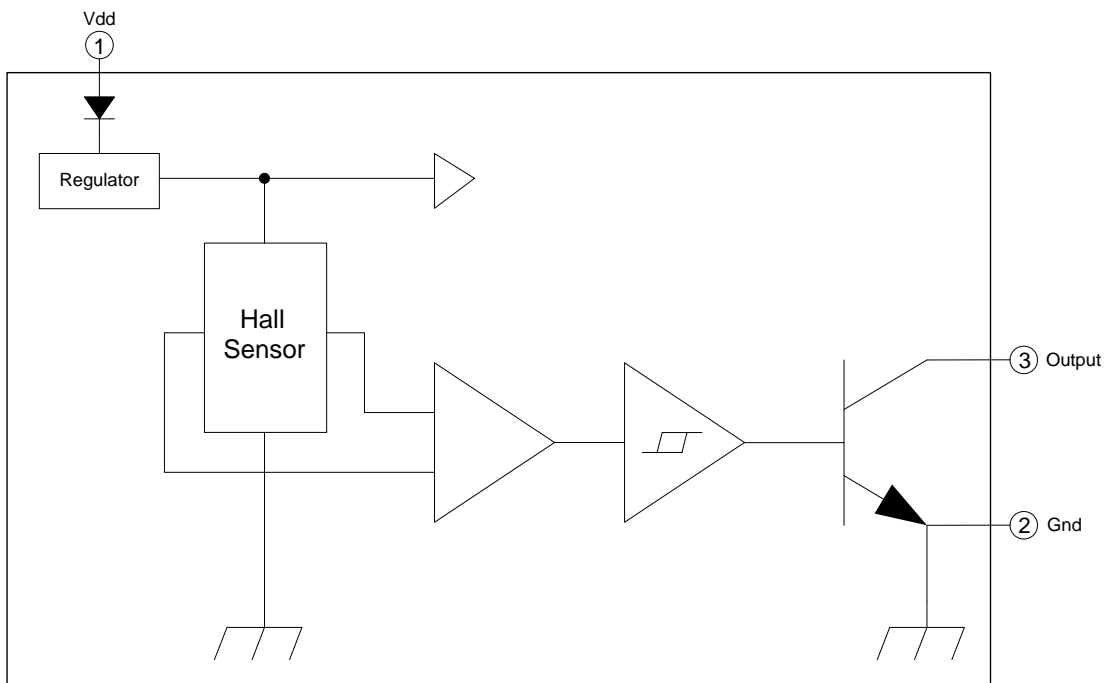
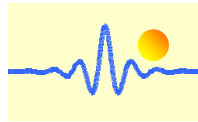


Figure 1

Recommended Operating Conditions

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Supply Voltage	V_{DD}	-	3.0		28	V
Operating Temperature Range	T_A	-	-40		125	°C



Electrical Characteristics $V_{DD}=12.0V$, $T_A=25^{\circ}C$ (unless otherwise specified)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Average Supply Current(no load)	I_{DD}	-		3.5	10	mA
Output Saturation Voltage	V_{SAT}	$I_{out}=20mA$		165	200	mV
Output Rise time	t_r	$RL=500\Omega$, $CL=20pF$ (Figure 7)	0.2	-	0.75	μs
Output Fall time	t_f	$RL=500\Omega$, $CL=20pF$ (Figure 7)	20	-	150	ns

Magnetic Characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Operate Points	B_{OP}		+60	-	+80	G
Release Points	B_{RP}		-80	-	-60	G
Hysteresis	B_{HYST}		30	-	120	G

Hysteresis Characteristics

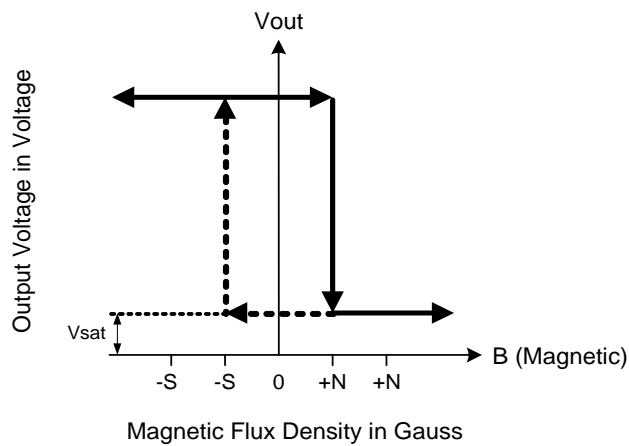


Figure 2

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Operating Temperature	T_{OP}	-	-40		125	$^{\circ}C$
Storage Temperature	T_{ST}	-	-65		150	$^{\circ}C$
DC Supply Voltage	V_{DD}	-	3.0		28	V
Supply Current	I_{DD}	-			10	mA
Continuous Current	$I_{O(CONT)}$				50	mA
Junction temperature	T_J				160	$^{\circ}C$
Power Dissipation	P_D	SIP-3L			500	mW
Thermal Resistance	θ_{JC}	SIP-3L		0.27		$^{\circ}C/mW$
Lead Temperature		10sec			260	$^{\circ}C$

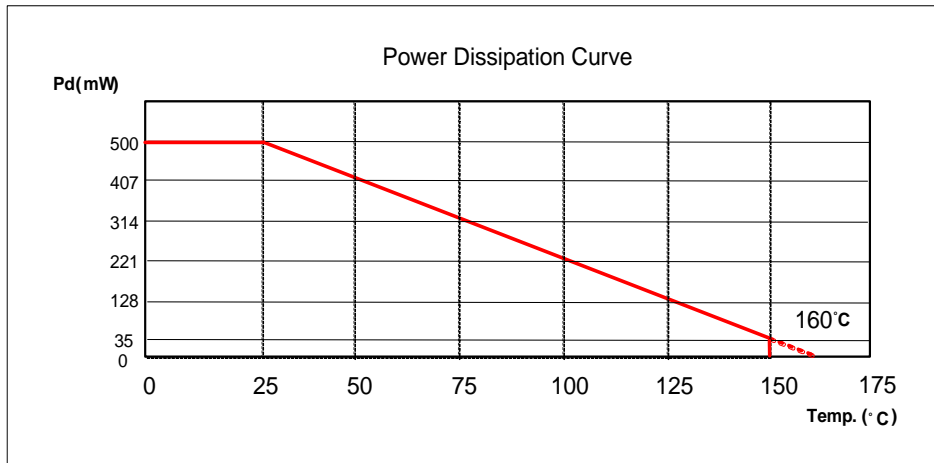
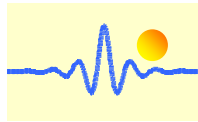


Figure 3

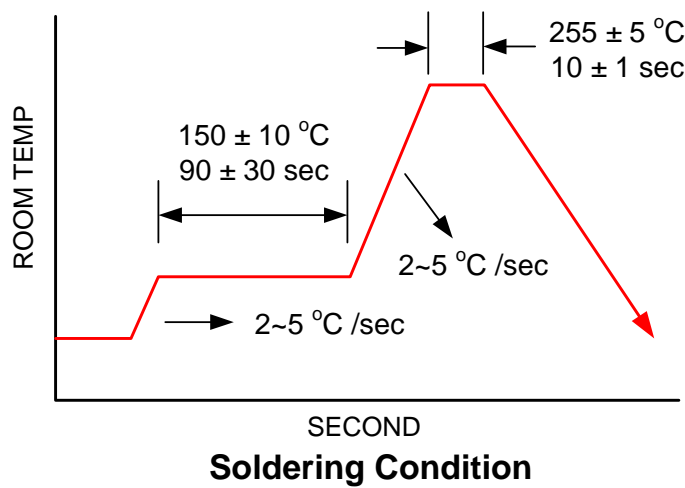


Figure 4

Pin Connection

[Top View]

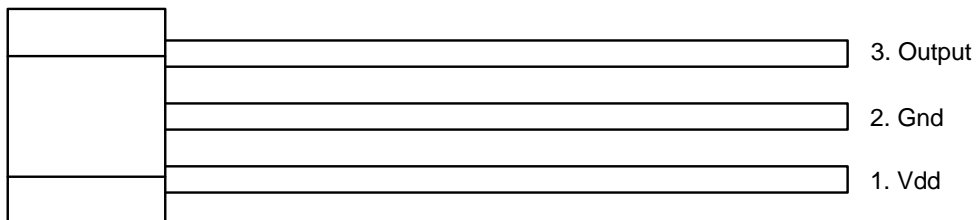
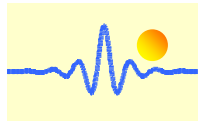


Figure 5



Pin Descriptions

Name	I/O	Pin No.	Description
Vdd	P	1	Positive power supply
Gnd	G	2	Ground
Output	O	3	Driver output

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

Marking Information

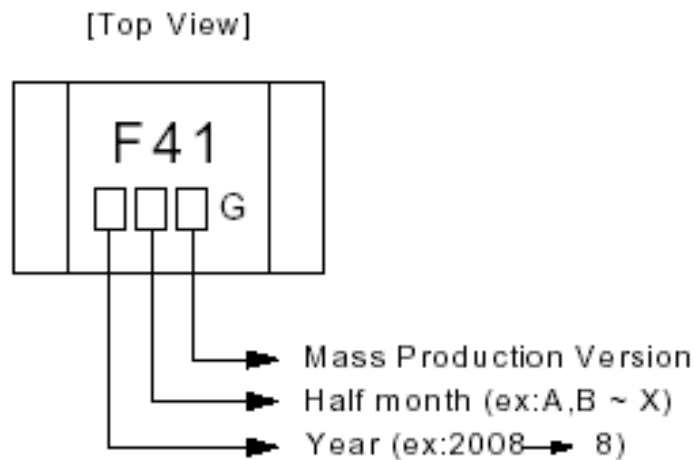
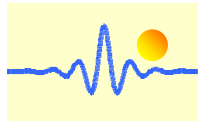


Figure 6

Order Information

Part Number	Operating Temperature	Package	MOQ
CYDF41	-40 °C to +125 °C	SIP-3L	1000ea



Package Dimension (Unit: mm)
SIP-3L (Pb Free)

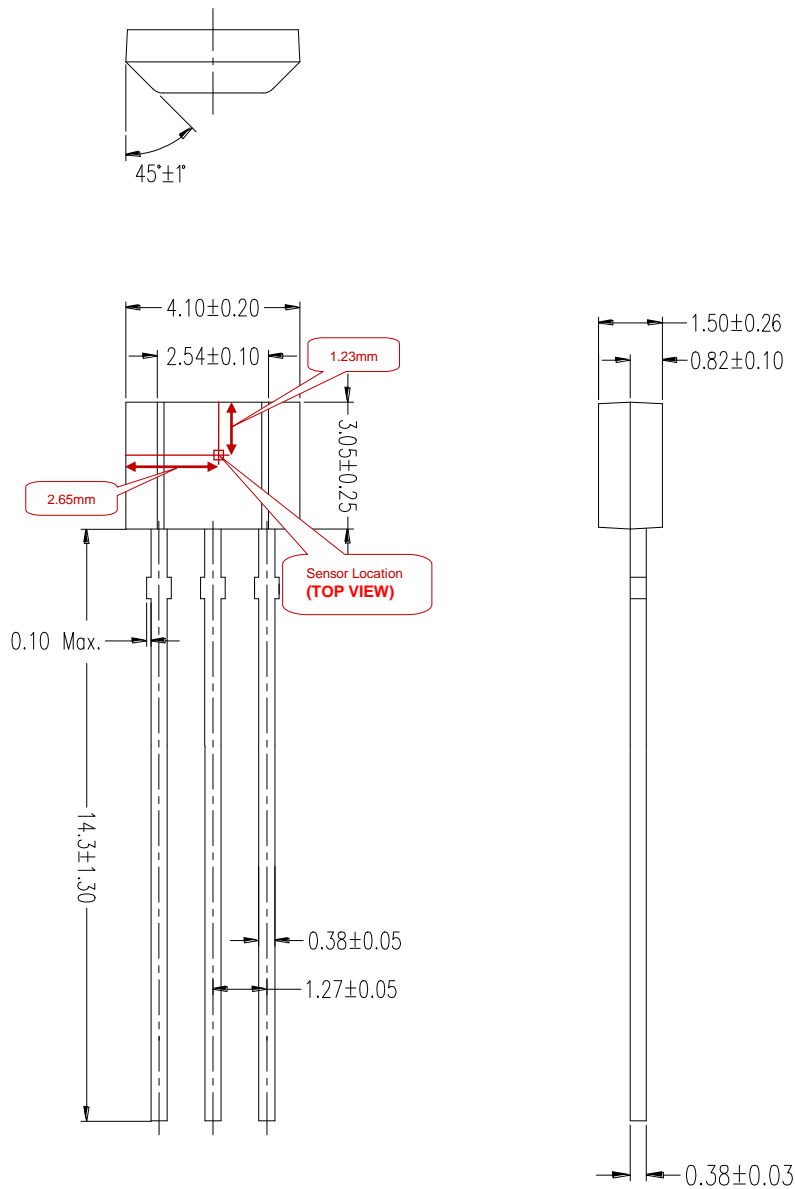
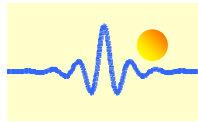


Figure 7



Test Circuit

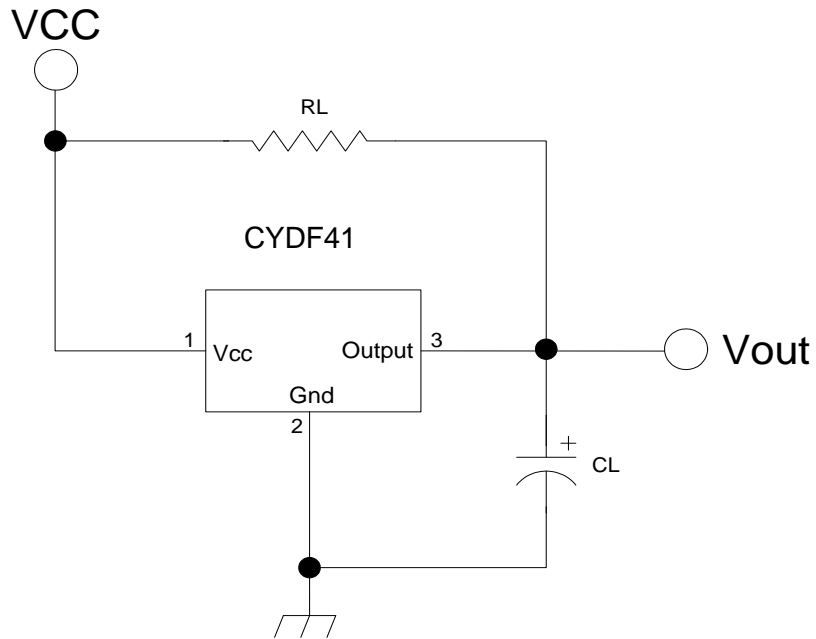


Figure 8

Functional Application Circuit

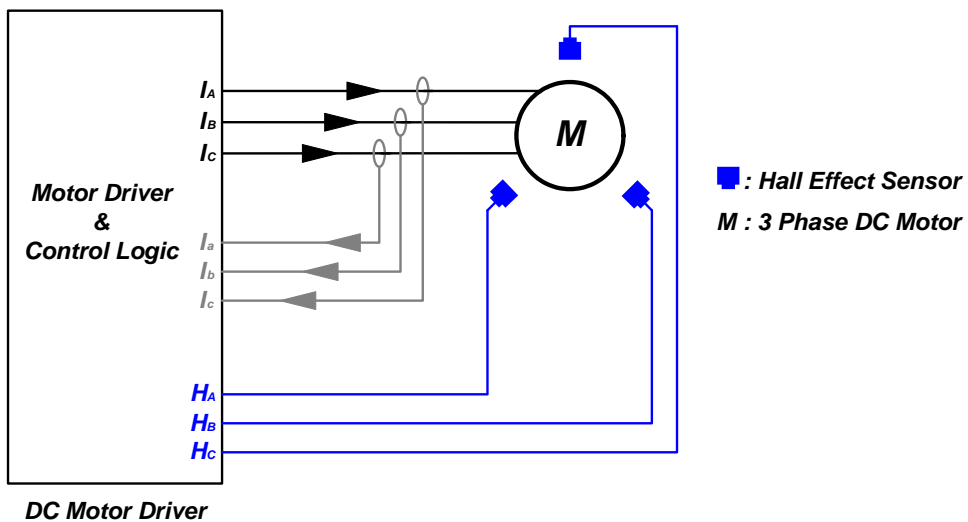


Figure 9