Version 1
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ChenYang
Technologies GmbH & Co. KG

Dual Channel Hall Effect Switch CYD8526

With Speed and Direction Outputs

The CYD8526 is a dual-channel Hall-effect sensor IC ideal for use in speed and direction sensing applications incorporating encode ring-magnet targets. The Hall elements are both photo lithographically aligned to better than 1um. Maintaining accurate displacement between the two active Hall elements eliminates the major manufacturing hurdle encountered in fine-pitch detection applications. The CYD8526 is a sensitive, temperature-stable magnetic device suitable for use in harsh automotive and industrial environments..

The Hall elements of the sensor CYD8526 are spaced 1.4mm apart, which provides excellent speed and ddirection information for small-geometric targets. Extremely low-drift amplifiers guarantee symmetry between the switches to maintain signal quadrature. An on-chip regulator allows the use of this device over a wide operating voltage range of 3.5V to 24V.

The CYD8526 is available in a 4-pin SIP package and a plastic SOT89B package. The packages are lead (Pb) free, with 100% matte tin leadframe plating.

Features

- Two matched Hall switches on a substrate
- Dual channel outputs for speed and direction
- Good temperature stability
- High sensitivity (B_{OP} and B_{RP})
- 3.5V to 24V supply voltage
- Solid-state reliability
- Small package sizes
- RoHS compliant

Applications

- Anti-pinch electric motor control
- Motor and fan control
- Magnetic encoder
- Rotating shaft monitoring
- Auto-motive transmission position
- Garage door openers
- Power sliding doors
- Sunroofs motors

Device information

Part number	Packing	Mounting	Temperature	B_{OP} (typ.)	BRP (Typ.)
CYD8526VB	Bulk, 1000pcs/bag	4-pin SIP	-40°C~150°C	+10.0mT	-10.0mT

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Electrical Specifications

Over operating free-air temperature range (V_{DD} = 5.0V, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{DD}	Operating supply voltage	$T_J < T_{J\ (max)}$	3.50	--	24	V
I_{DD}	Operating supply current	V_{DD}=3.5 to 24V	2.0	4.0	6.5	mA
t_{on}	Power on time		--	35	50	µs
I_{OL}	Off-state leakage current	Output Hi-Z	--	--	1	µA
$R_{DS(on)}$	FET on resistance	V_{DD}=5V, Io=10mA, TA=25°C	--	20	--	Ω
td	Output delay time	B=B_{RP} to B_{OP}	--	13	25	µs
tr	Output rise time	R1=1kΩ, Co=50pF	--	--	0.5	µs
tf	Output fall time	R1=1kΩ, Co=50pF	--	--	0.2	µs
f_{BW}	Bandwidth		40	--	--	kHz

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Magnetic Specifications

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
B_{OP}	Operating point	VB Package	7.0	10.0	13.0	mT
B_{RP}	Release point		-13.0	-10.0	-7.0	mT
B_{HYS}	Hysteresis		--	20	--	mT
Bo	Magnetic Offset	Bo=(B_{OP}+B_{RP})/2	--	0	--	mT

1mT = 10Gs

Absolute Maximum Ratings

Over operating free-air temperature range

Parameter	**Symbol**	**Min**	**Max.**	**Unit**
Supply Voltage	V_{DD}	-0.5	35	V
Output voltage	V_{OUT}	-0.5	35	V
Output Sink Current, I_{OUT}	I_{SINK}	0	30	mA
Operating Temperature Range	T_A	-40	150	°C
Maximum junction temperature	T_J	-55	165	°C
Storage Temperature Range	T_{STG}	-65	175	°C

Note: Stresses above those listed here may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

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Thermal Characteristics

Symbol	Parameter	Test Conditions	Rating	Units
R_{QJA}	VB Package thermal resistance	Single-layer PCB, with copper limited to solder pads	177	℃/W
R_{QJA}	BU Package thermal resistance	Single-layer PCB, with copper limited to solder pads	140	℃/W

ESD Protection

Human body model (HBM) tests according to: Standard EIA/JESD22-A114-B HBM

Parameter	Symbol	Min.	Max.	units
ESD-Protection	V_{ESD}	-6	6	KV

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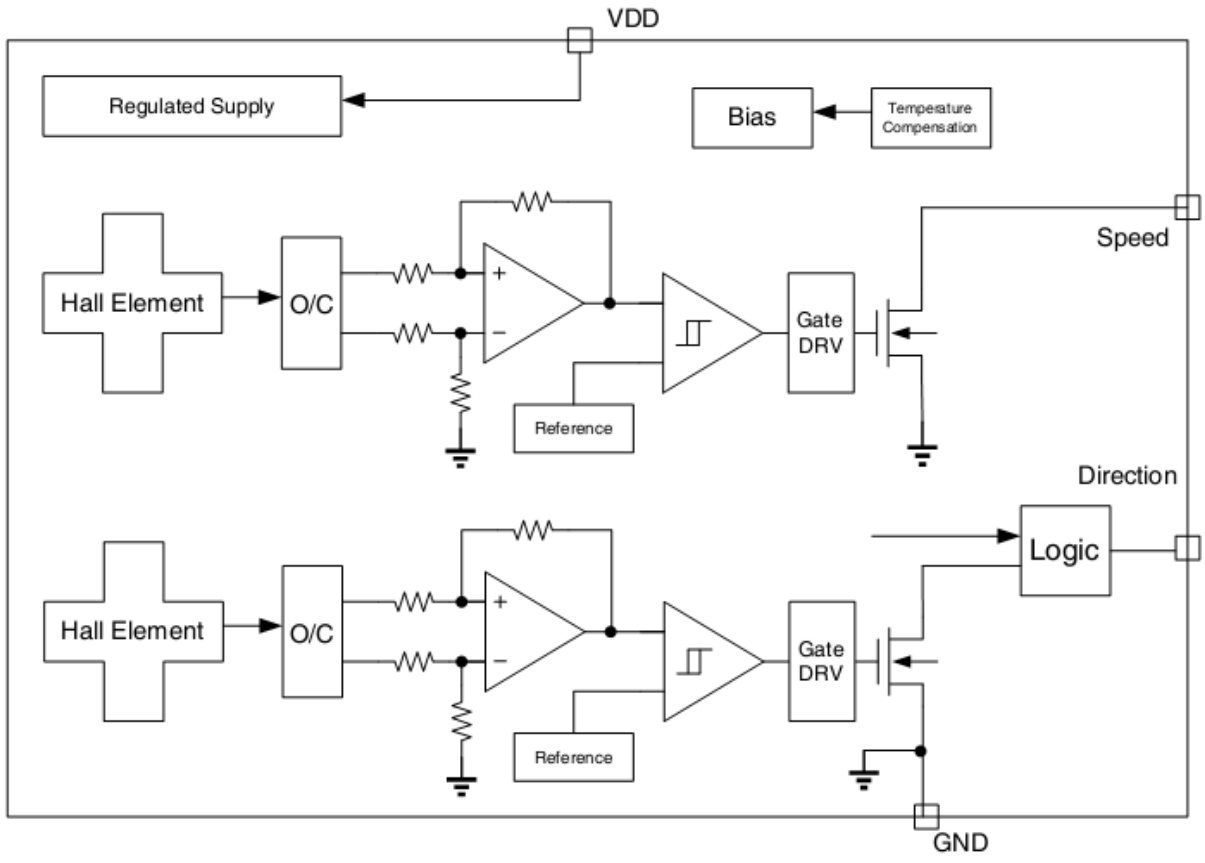
Functional Diagram



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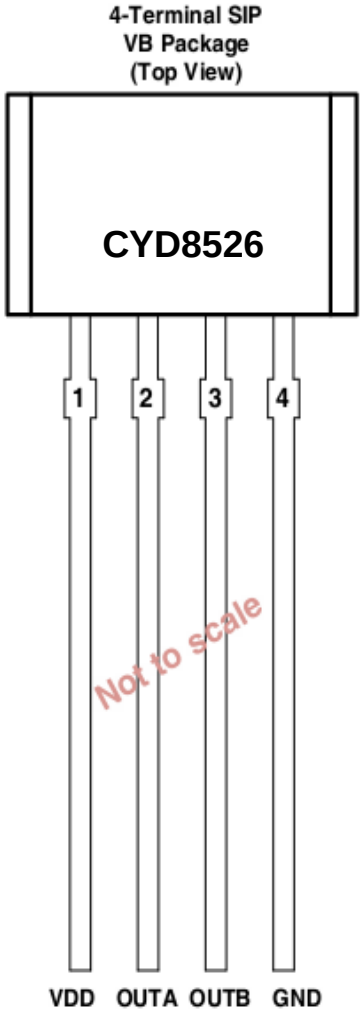
Terminal Configuration and Functions



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Pin Arrangement

Terminal		Type	Description
Name	Pin (VB Package)		
V_{DD}	1	Power supply	3.5 to 24 V power supply
Direction output	2	Output	Direction output, OC, needs a pull-up resistor
Speed output	3	Output	Speed output, OC, needs a pull-up resistor
GND	4	Ground	Ground terminal

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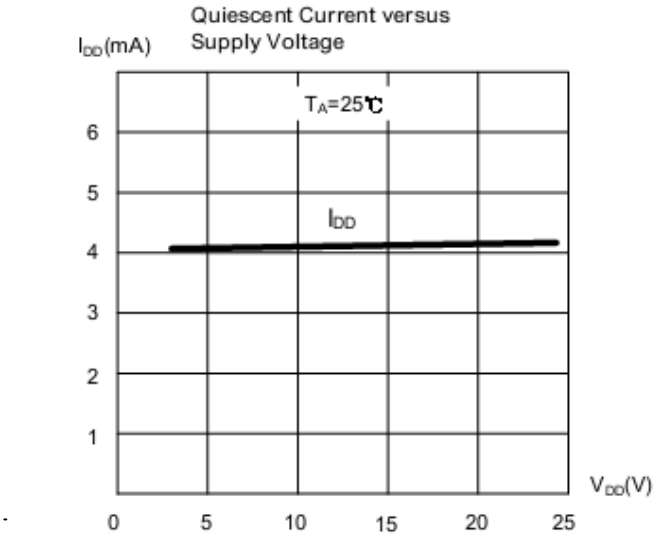
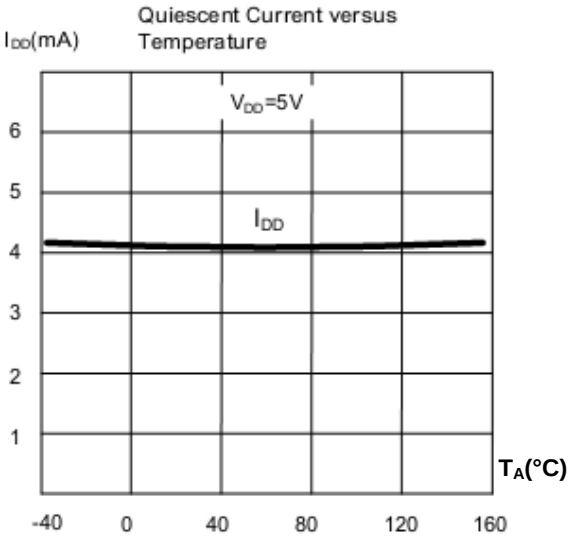
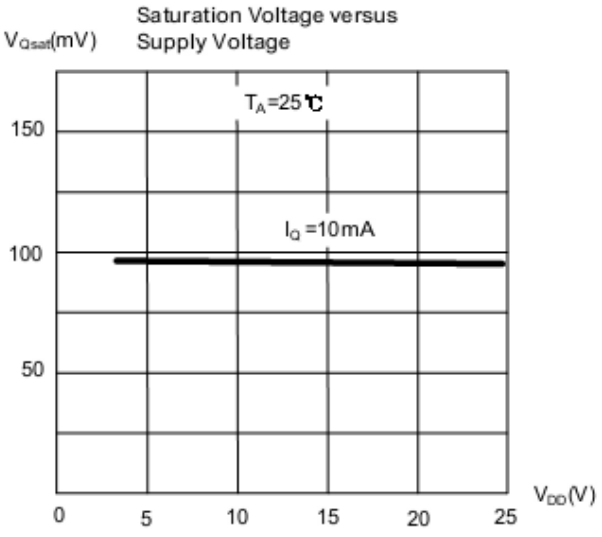
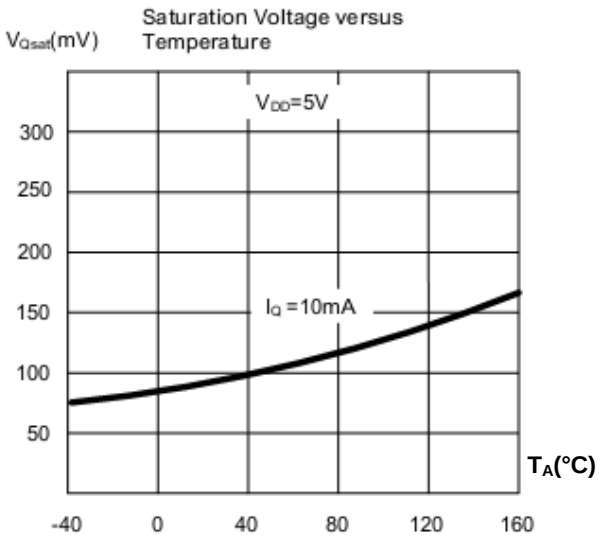
Characteristic Data









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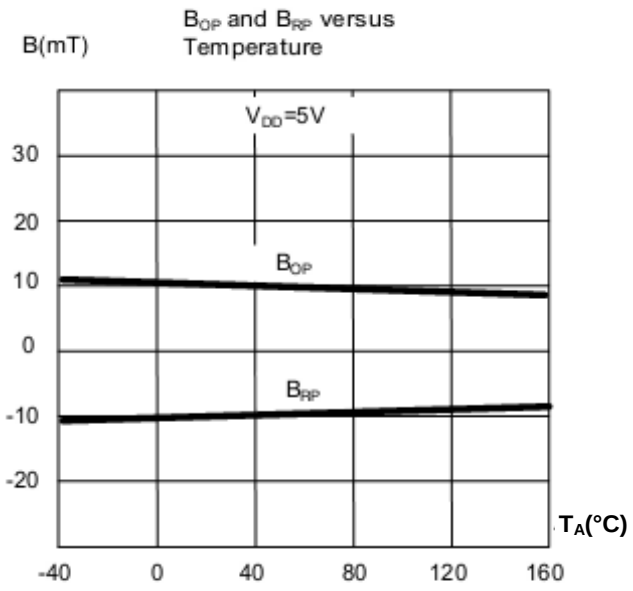
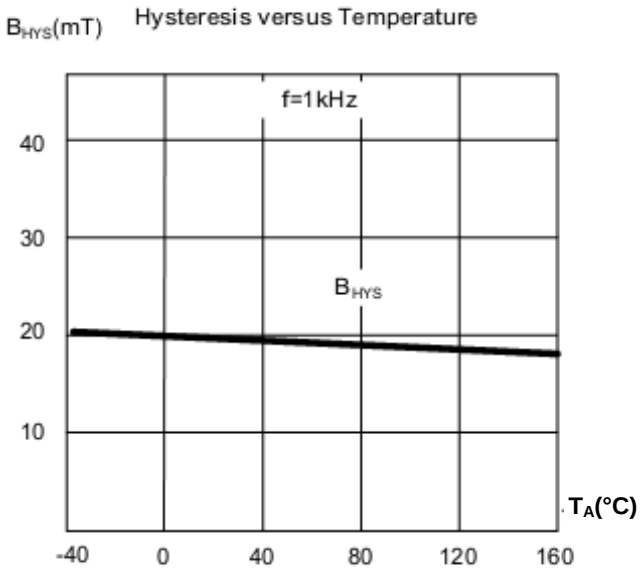
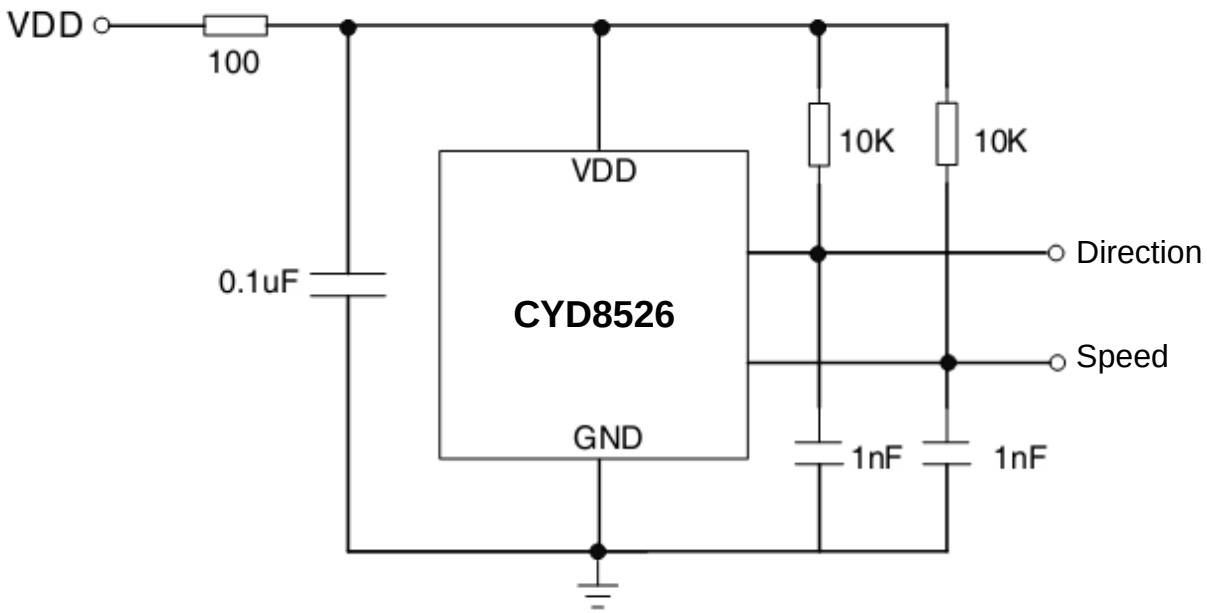
Characteristic Data (Continued)





Typical Application Circuit



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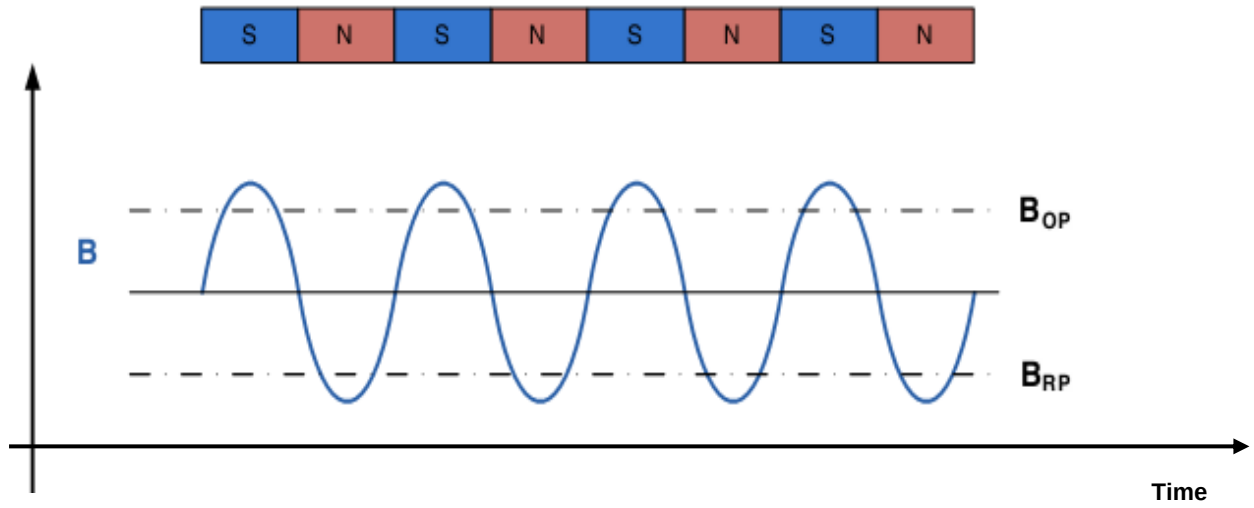
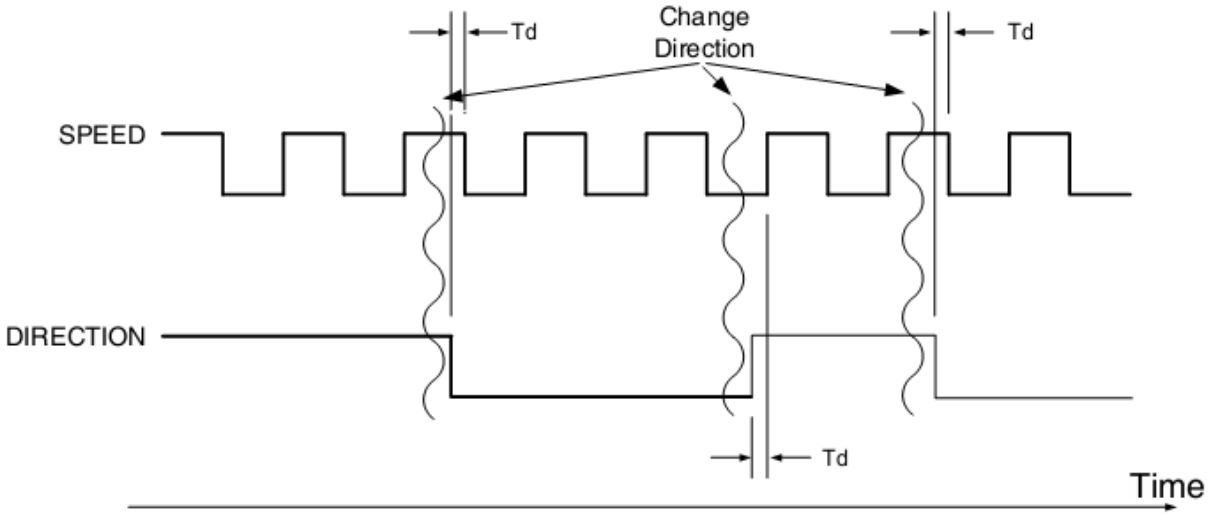
Typical Output Waveform





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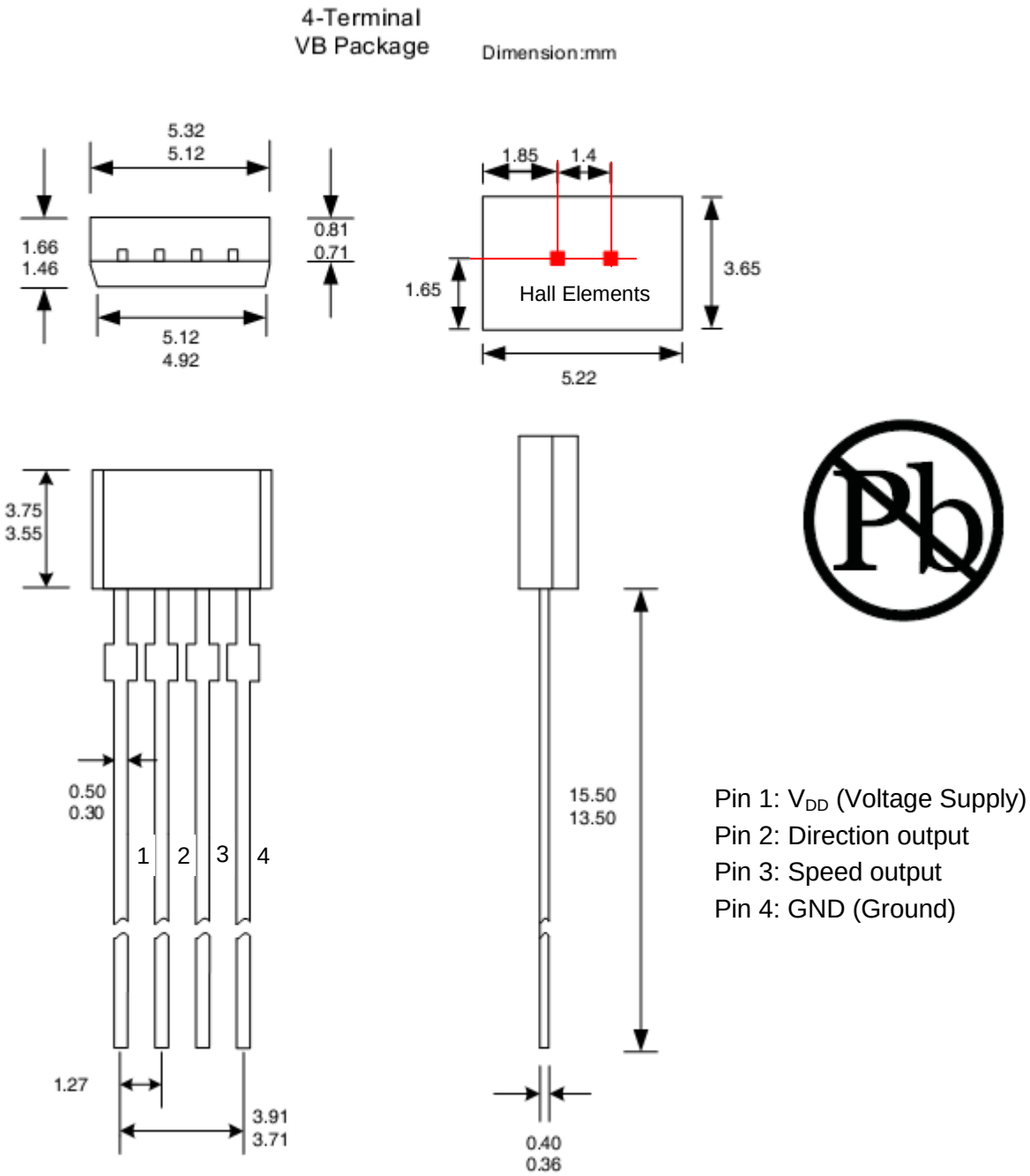
Geometric Dimensions (Package)



Pin 1: V_{DD} (Voltage Supply)
Pin 2: Direction output
Pin 3: Speed output
Pin 4: GND (Ground)

Notes:

1. Exact body and lead configuration at vendor's option within limits shown
2. Height does not include mold gate flash
   Where no tolerance is specified, dimension is nominal

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