

CYL840X Linear Hall Effect Sensor ICs

The CYL840X Series are high performance small versatile linear Hall Effect devices which are operated by the magnetic field from a permanent magnet or an electromagnet. The ratio metric output voltage is set by the supply voltage and varies in proportion to the strength of the magnetic field. The CYL840X family has a quiescent output voltage that is 50% of the supply voltage and output sensitivity options of 3.125mV/G and 5mV/G. The integrated circuitry provides increased temperature stability and sensitivity. The CYL840X provides high accuracy and temperature compensation. These linear position sensors have an operating temperature range of -40°C to +150°C, appropriate for industrial and automotive environments. They respond to either positive or negative magnetic field, monitoring either or both magnetic poles.

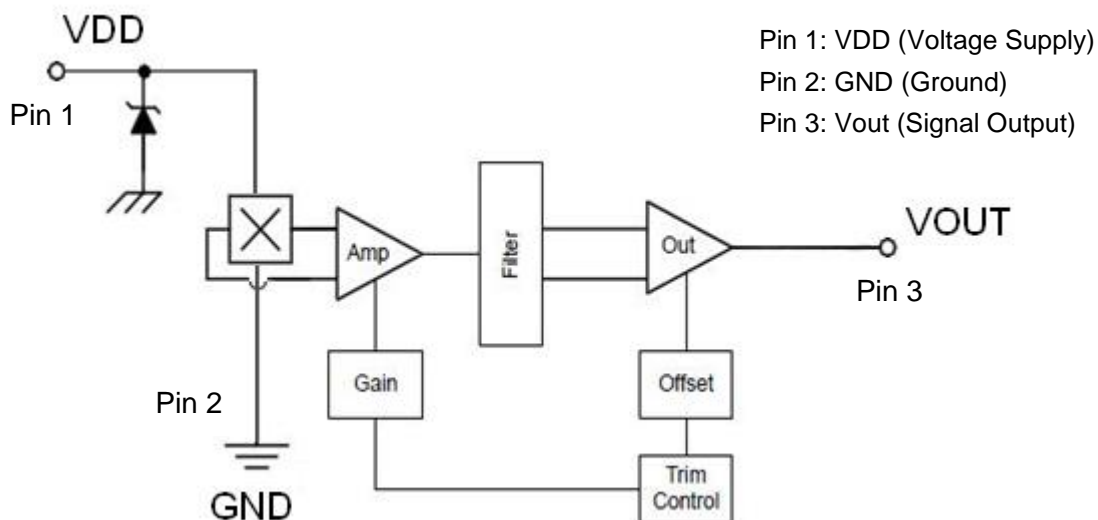
Features

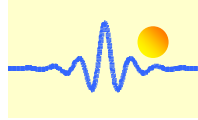
- 3.5 to 30 V operation
- Single current sourcing or current sinking output
- Precise sensitivity and temperature compensation
- Power consumption of 4.5mA at 5 VDC for energy efficiency
- Output voltage proportional to magnetic flux density
- Temperature range of -40°C to 150°C
- Ratiometric rail-to-rail output
- Robust EMC protection
- 3 pin in-line PCB terminals

Applications

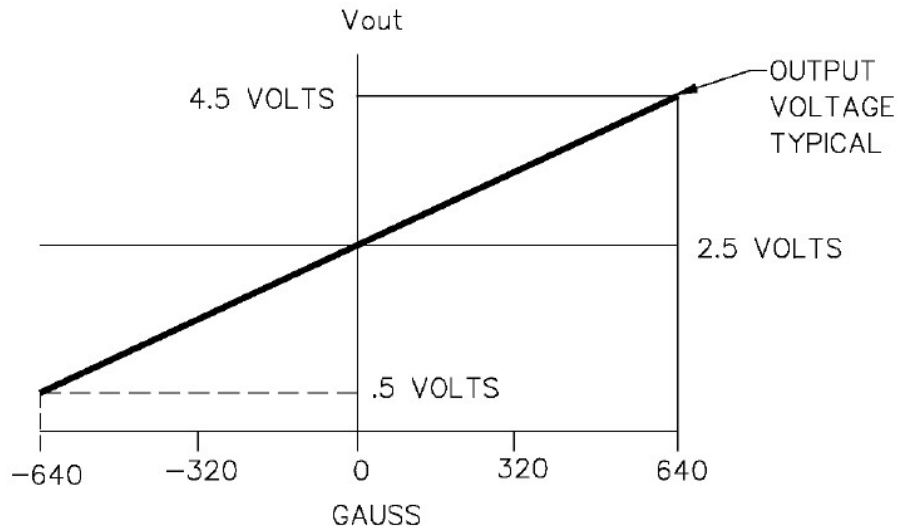
- Current sensing
- Position sensing
- Magnetic code reading
- Motor control
- Weight and liquid level sensing
- Motion detection
- Proximity detection
- Speed detection

Functional Diagram





Transfer Characteristics at $V_s=5.0\text{VDC}$



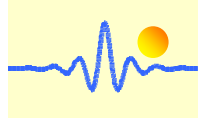
Absolute Maximum Ratings

Supply Voltage V_{DD}	35V
Supply Current I_{DD}	10mA
Output Sink Current, I_{OUT}	10mA
Power Dissipation, P_D	100mW
Operating Temperature Range, T_A	-40°C ~ +125°C
Storage Temperature Range, T_S	-65°C ~ +150°C
Maximum Junction Temperature, T_J	165°C

Electrical Specifications

DC Operating Parameters $T_A = -40^\circ\text{C}$ to 150°C , $V_{DD} = 3.5\text{V}$ to 30V (unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Supply Voltage	V_{DD}	Operating	3.5		30	V
Supply Current	I_{DD}	$V_{DD}=5\text{V}$, $T_A=25^\circ\text{C}$		4.5		mA
Quiescent Voltage	V_{null}	$B=0$, $T_A=25^\circ\text{C}$, $V_{DD}=5\text{V}$	2.45	2.50	2.55	V
Output Voltage	V_H	$B=+X$		4.7		V
	V_L	$B=-X$		0.3		V
Output Source Current Limit	$I_{out}(\text{LMT})$	$B \rightarrow 0$		-2.0		mA
Response time	t_r			5		μs
Frequency bandwidth (-3dB)	f_B		0	200	250	kHz



Magnetic Specifications

DC Operating Parameters $T_A = 25^\circ\text{C}$, $V_{DD} = 5\text{V}$ (unless otherwise specified)

Parameter	Symbol	Part Name	Min	Typ	Max	Units
Sensitivity	Sens	CYL8403	30.5	31.25	32.0	mV/mT
		CYL8405	49.0	50.0	51.0	mV/mT
Linearity	Lin	CYL840X Series			± 1.0	%
Thermal drift of zero offset		CYL840X Series		300		ppm/ $^\circ\text{C}$
Delta V_{null} v.s. Temperature	$V_{\text{null}} (\text{T})$	CYL840X Series			± 2.0	%
Radiometry, V_{null}	$V_{\text{null}} (\text{V})$	CYL840X Series			± 2.0	%
Delta Sens V.s. Temperature	Sens (T)	CYL840X Series			± 10	%

Dimensions

