

Understanding Key Specifications of Linear Hall Effect Sensors

TI Precision Labs – Magnetic Position Sensing

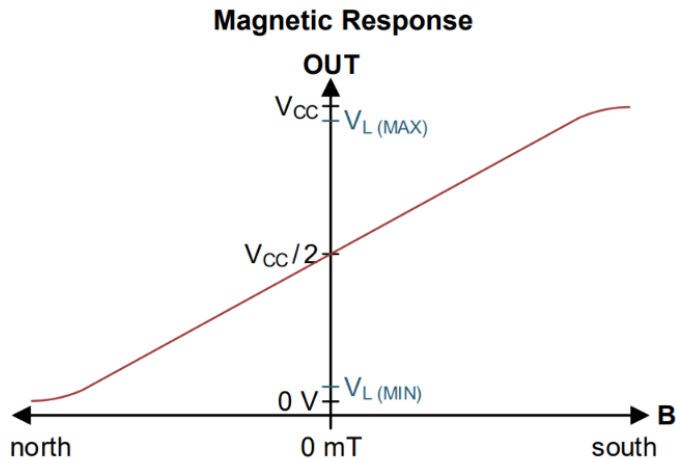
Presented by Ian Williams

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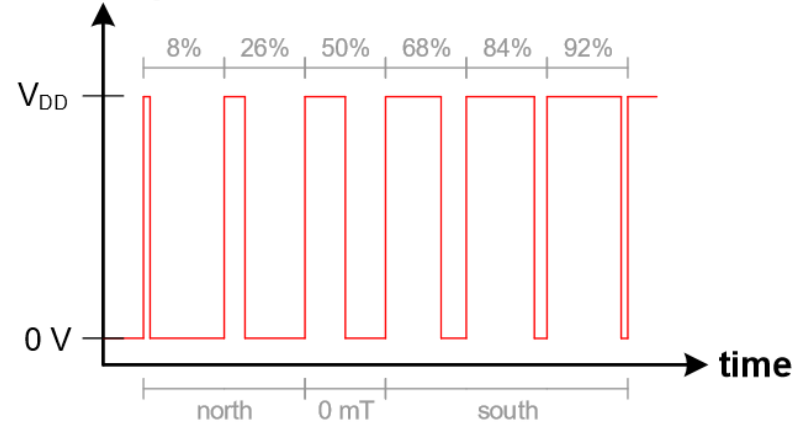
Linear Hall effect sensors

Linear Hall effect sensors

Outputs a signal that is proportional to magnetic flux density in order to measure precise movement.

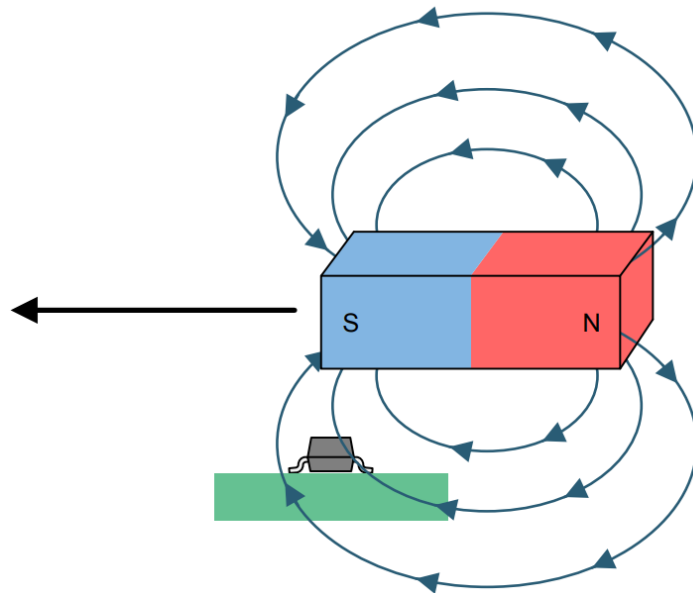
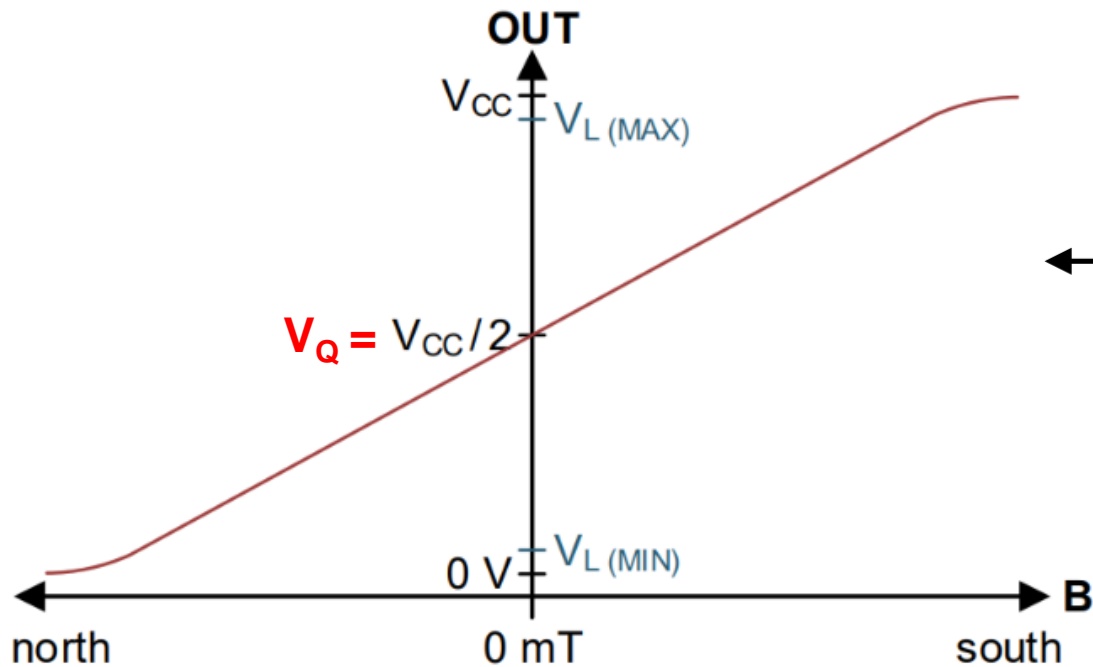


PWM output



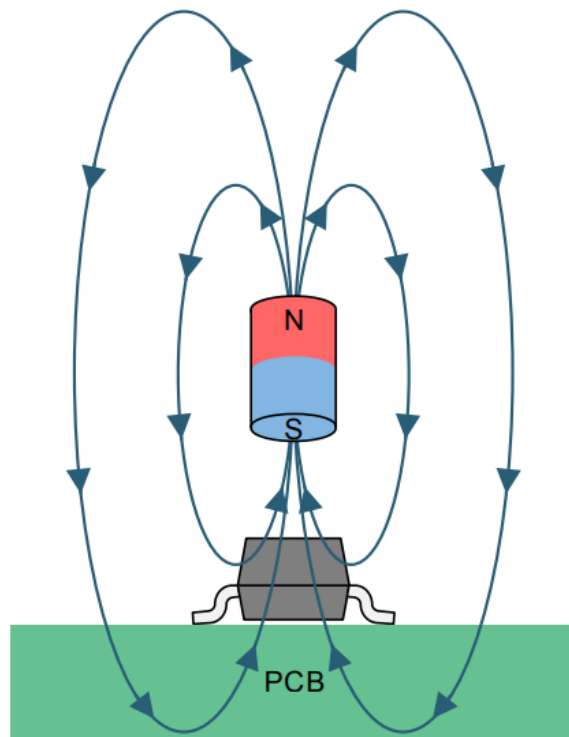
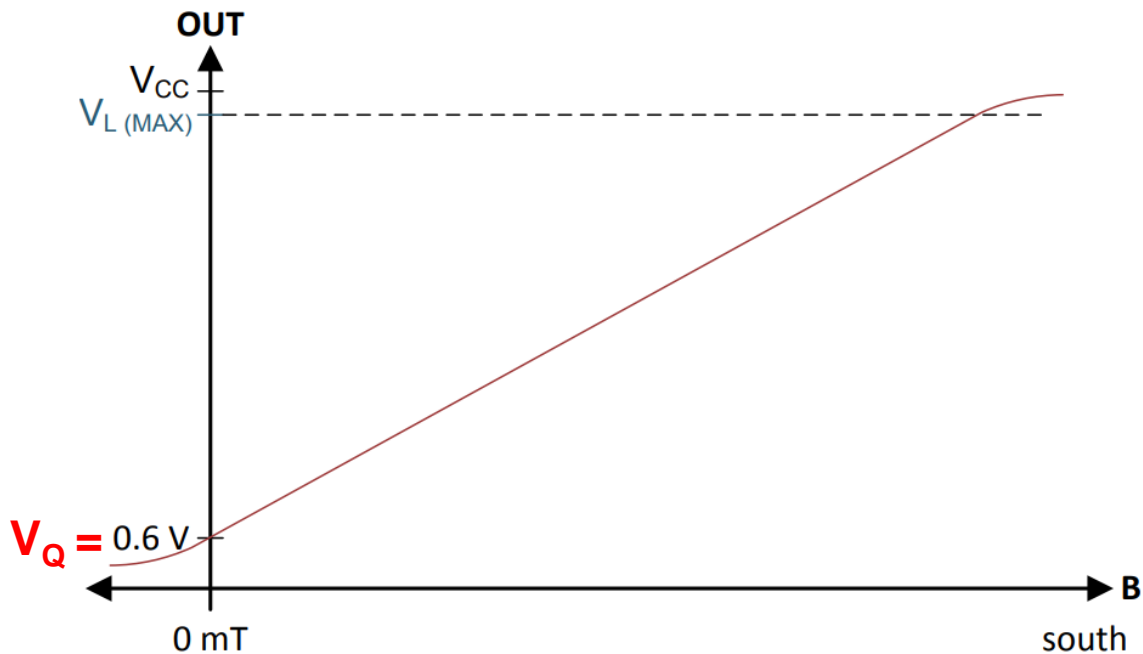
Voltage output linear Hall sensors – bipolar

Magnetic response – DRV5055



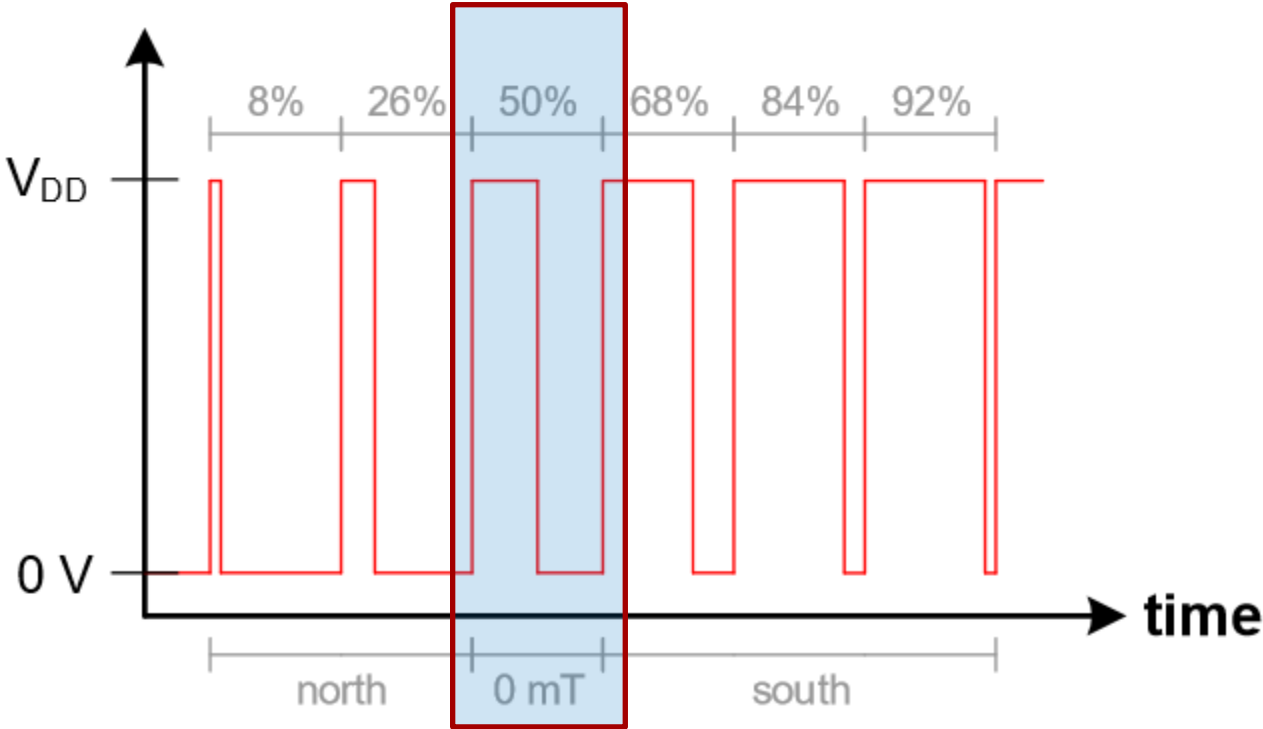
Voltage output linear Hall sensors – unipolar

Magnetic response – DRV5056

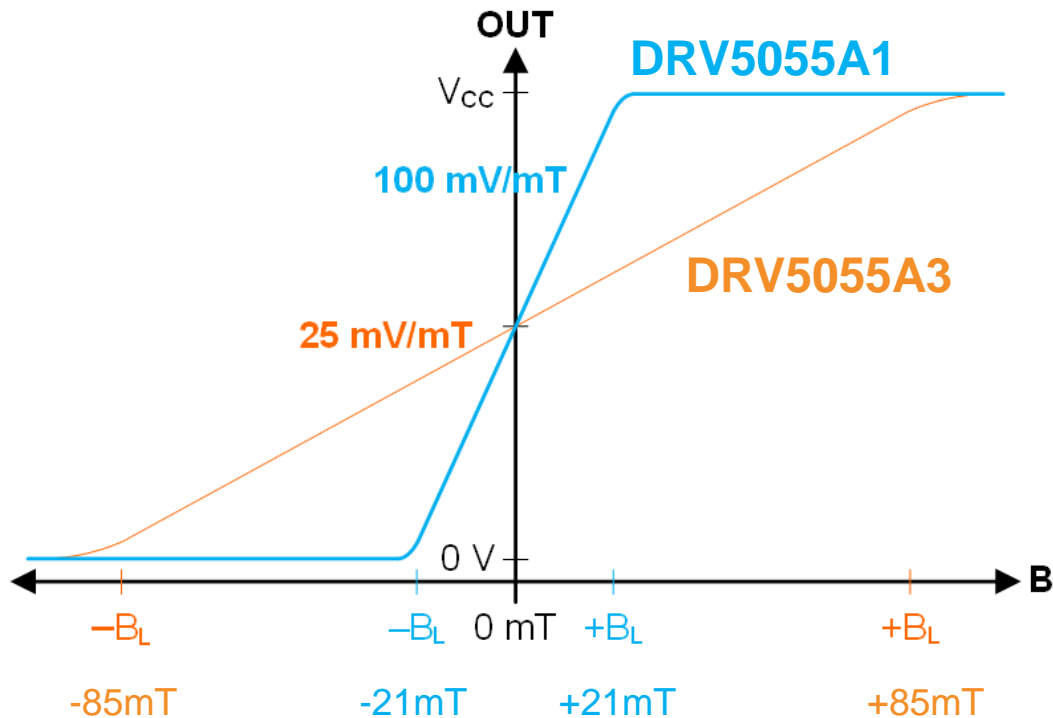


PWM output linear Hall sensors

PWM out – DRV5057



Sensitivity vs. sensing range



Key parameters affecting accuracy

PARAMETER		TEST CONDITIONS ⁽¹⁾		MIN	TYP	MAX	UNIT
V_Q	Quiescent voltage	$B = 0 \text{ mT}, T_A = 25^\circ\text{C}$	$V_{CC} = 5 \text{ V}$	2.43	2.5	2.57	V
S	Sensitivity	$V_{CC} = 5 \text{ V},$ $T_A = 25^\circ\text{C}$	DRV5055A1	95	100	105	mV/mT
			DRV5055A2	47.5	50	52.5	
			DRV5055A3	23.8	25	26.2	
			DRV5055A4	11.9	12.5	13.2	

Magnetic temperature compensation



	PARAMETER	MIN	TYP	MAX	UNIT
S _{TC}	Sensitivity temperature compensation for magnets ⁽⁵⁾		0.12		%/°C

To find more magnetic position sensing technical resources and search products, visit ti.com/halleffect