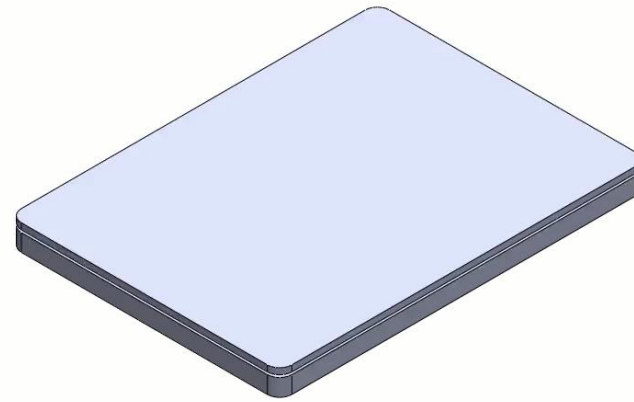


Hinge rotation

TI Precision Labs – TI Magnetic Sense Simulator (TIMSS)

Presented and prepared by Jesse Baker

Hinge motion



TIMSS simulation configuration

Function Hinge Save

Magnet Sensor Sim Settings

> Magnet Specifications ⓘ

> Magnet Geometry ⓘ

▼ Magnet Motion ⓘ

Origin Position

Position

X Axis Y Axis Z Axis

0 mm 0 mm 0 mm

Angle

X Axis Y Axis Z Axis

0 Deg 0 Deg 0 Deg

Final Position

Position

Arc Length

30 Deg

Initial location of the magnet center

Orientation of the magnet

Degrees the magnet rotates about the X-axis

Magnet Sensor Sim Settings

▼ Simulation Settings ⓘ

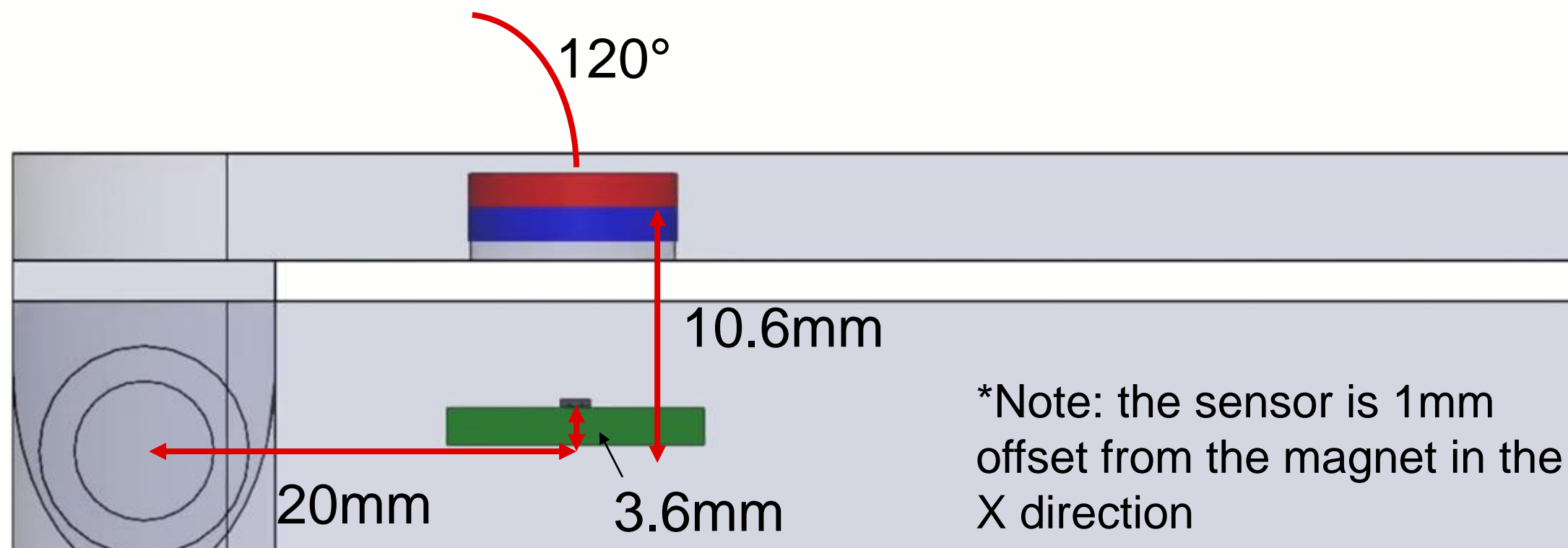
Angular Step Size

1 Deg

Simulation step size

Simulation configuration example


Magnet shape and dimensions:
Neodymium N52 bar magnet
4mm x 8mm x 1mm



Simulation configuration example

TI Magnetic Sense Simulator (TIMSS) Jesse


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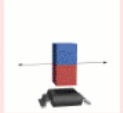
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Example Reference Designs Search




Angle Encoding
Function: Rotation Magnet shape: Diametric Cylinder

[View details](#) [Open Design](#)



Slide-By
Function: Linear Magnet shape: Axial Cylinder

[View details](#) [Open Design](#)



Incremental Encoding
Function: Rotation Magnet shape: Ring

[View details](#) [Open Design](#)

[>](#)

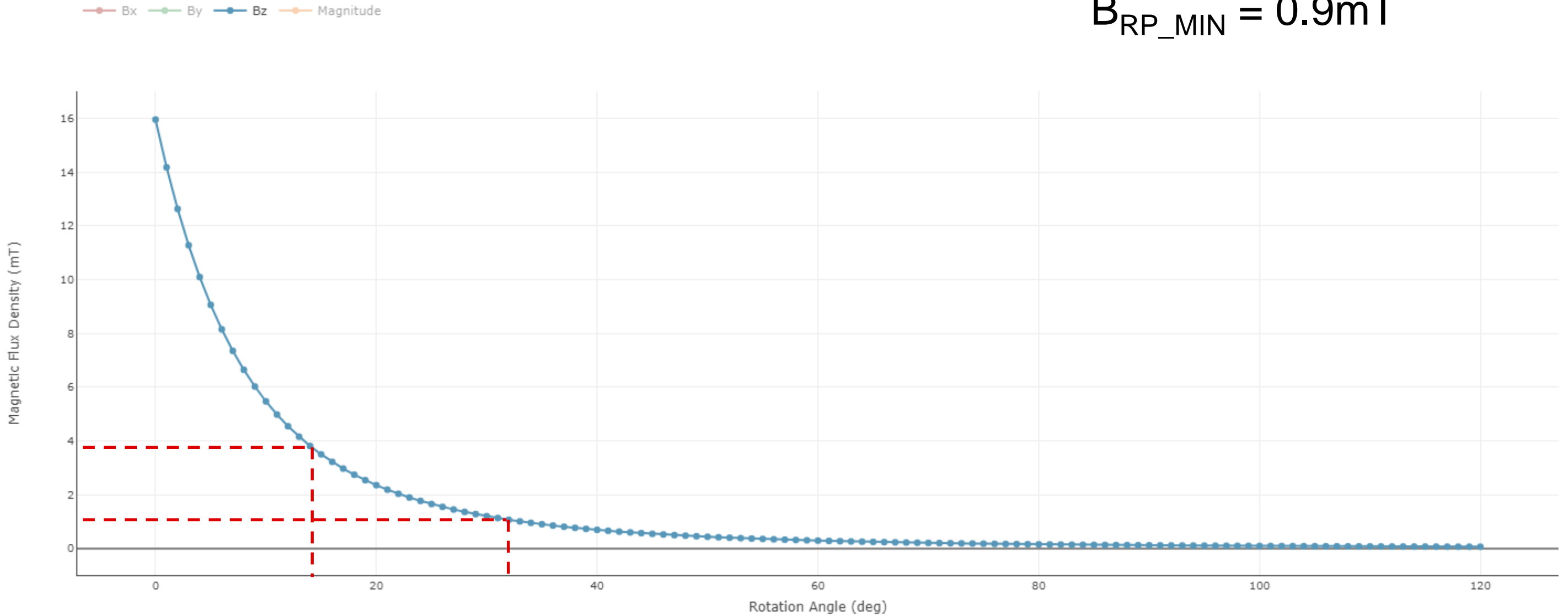
Hinge field behavior



Limit detection

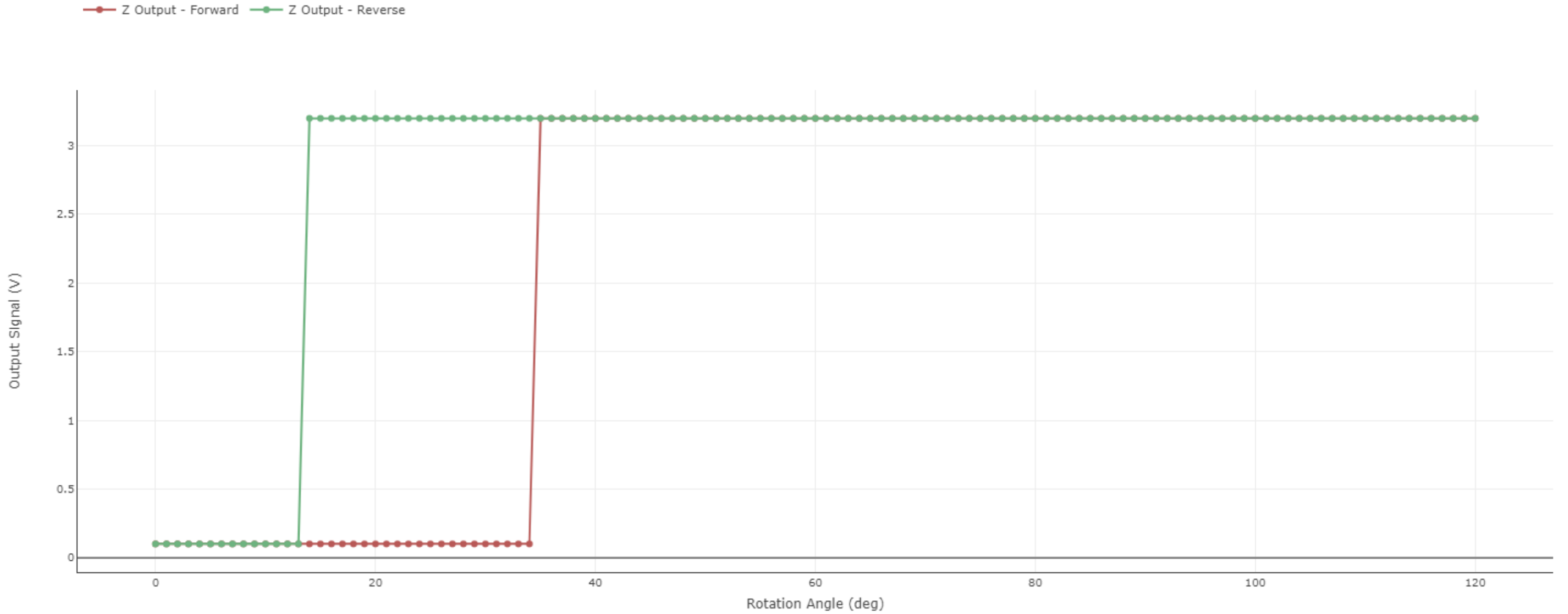
Magnet Field Density vs Distance

$B_{OP_MAX} = 3.9\text{mT}$
 $B_{RP_MIN} = 0.9\text{mT}$



Sensor output

Device Output 1



Learn More

- TI Magnetic Sense Simulator Product Folder
<https://www.ti.com/TIMSS>
- TI Magnetic Sense Simulator User's Guide
<https://www.ti.com/lit/ug/slyu067/slyu067.pdf>
- TI Magnetic Sense Simulator App Brief
<https://www.ti.com/lit/ab/slya083/slya083.pdf>
- HALL-HINGE-EVM
<https://www.ti.com/tool/HALL-HINGE-EVM>
- Transition Detection Using Hall-Effect Sensors App Brief
<https://www.ti.com/lit/ab/slya055a/slya055a.pdf>
- Position Sensing Demo Video Series
<https://www.ti.com/video/series/position-sensing-demos.html>
- TI Precision Labs: Magnetic Sensor Training Videos
<https://www.ti.com/video/series/precision-labs/ti-precision-labs-magnetic-sensors.html>
- Sensors E2E Forum
<https://e2e.ti.com/support/sensors-group/sensors/f/sensors-forum>
- TI Magnetic Sensor Portfolio
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