



# *Advanced Sensor Technology*

*Linear High Precision*

## *Analog Hall Sensors*

### *Overview*

*AST works with High End Analog Hall Sensors*

*Magnetic field range from a few  $\mu$ -Tesla up to 10 Tesla or even more!*

*Measures both strong and weak magnetic fields with high precision*

*No linearization needed - linearity error typically 0,1 % up to 1,5 T*

#### *Two basic platforms:*

##### *HE144*

- *Resolution in the order mT*
- *Low noise*
- *Wide temperature range*
- *Typical 1000 Ohm and 0,2 Volt/Tesla at 1 mA*

##### *HE244*

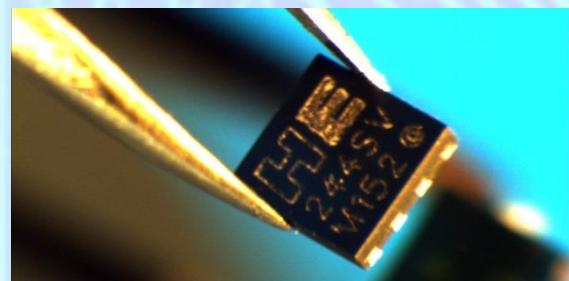
- *Resolution in the order  $\mu$ T*
- *Very low noise*
- *Very wide temperature range*
- *Typical 500 Ohm and 0,2 Volt/Tesla at 2 mA*
- *Extremely low offset - no offset compensation needed*
- *Very low temperature coefficient*

#### *Package types:*

- *SMD, lead frame, wired, ceramic*

#### *Temperature ranges:*

- *Standard range: up to 180°C*
- *Extended range: up to 250°C*

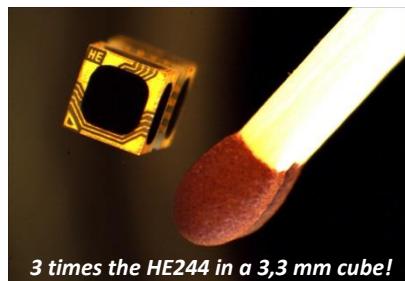


*When Performance Matters*  
*A sensor Technology AB, Sweden*

## **3-dimensional Hall sensor**

*Makes it possible to measure both magnetic field strength and 3D direction using one sensor.*

*All axes crosses in the same center point. Axes do not influence each other and they are separately accessible without PHE errors.*



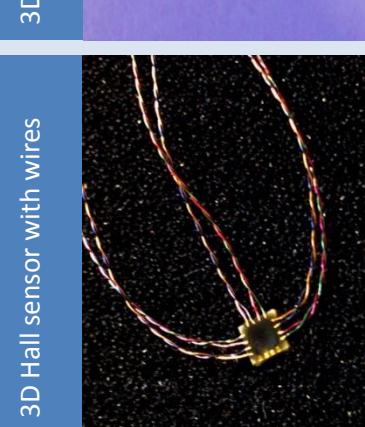
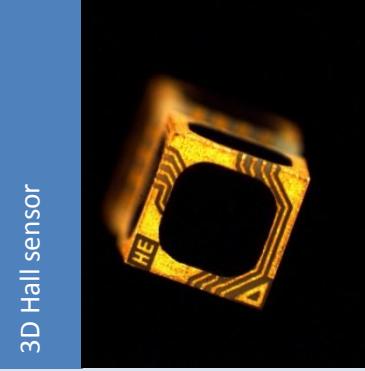
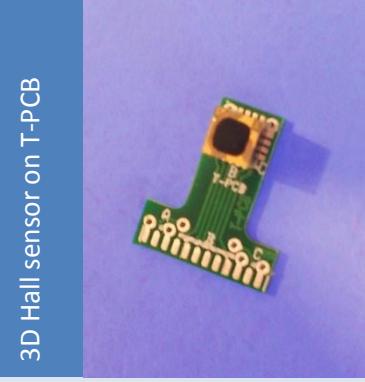
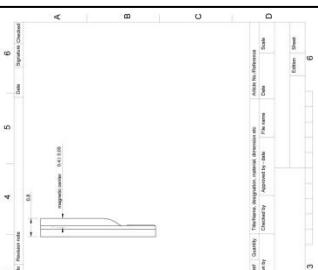
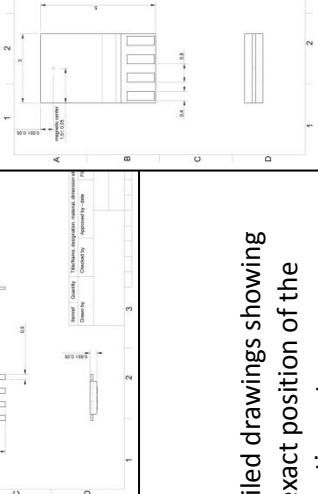
## **Some typical applications for our Hall sensors:**

- **Magnetic field measurements**
- **Position sensing**
- **Rotation sensing**
- **Movement sensing**
- **3D compass**
- **Pressure measurement**
- **Precise current and power sensors**
- **Multi-sensor and differential usage**
- **Control of motors**
- **Wind generators**
- **Oil drill direction measurement**
- **Measurements in small metal, magnet and ferrite gaps**
- **Sensing low DC current in strong AC current, as for example in windmills**
- **NMR, MRI**



## **AST can offer custom made packages**

- *to improve performance in customer applications*
- *to optimize for customer production*
- *We can for example make packages down to 0,4 mm thickness, ceramic packages for high temp applications, integrate temperature sensors...*

PACKAGE TYPES:		Available in two basic platforms: HE144 platform: HE244 platform:
PIN version	SOLDER PAD version Only on request	<p><b>HE144P</b> Body size 2,2 x 3,1 mm Max thickness 0,70 mm Total length 14,3 mm, pitch 1,27 mm</p> <p><b>HE244P</b> Not in production</p>
TWISTED WIRE version Standard or high temp	SMD version	<p><b>HE144S</b> Size 3,0 x 5,0 mm Max thickness 0,45 mm</p> <p><b>HE244S</b> Size 3,0 x 5,0 mm Max thickness 0,80 mm</p>
VERTICAL SMD version Only on request	HE144SV Size 3,0 x 3,0 mm Max thickness 0,70 mm	<p><b>HE144SH</b> Size 3,0 x 3,0 mm Max thickness 0,50 mm</p> <p><b>HE244SH</b> Size 3,0 x 3,0 mm Max thickness 0,70 mm</p>
<p><b>3D HALL SENSOR PACKAGES:</b></p> <p><b>3D Hall sensor</b></p> 		<p>All 3D Hall sensors are based on the HE244 platform x 3</p> <p><b>3D Hall sensor with wires</b></p> 
<p><b>3D Hall sensor on T-PCB</b></p> 		<p><b>HE444T</b> Size 3,3 mm - cubic 200 mm twisted wires attached</p>
<p><b>HE444 with T-PCB</b></p> 		<p><b>HE444</b> Size 3,3 mm - cubic Mounted on T-shaped PCB</p>
<p>Detailed drawings showing the exact position of the magnetic center are available upon request</p>		 

Electrical specifications		HE144 series	HE244 series
Advised supply current		0,1 to 2,0 mA recommended 1,0 mA*	0,2 to 4,0 mA recommended 2,0 mA*
Open-circuit Hall voltage B=1 T		typical 200 mV @ I=1 mA	typical 200 mV @ I=2 mA
Temperature coefficient of open-circuit Hall voltage B=1 T, @25°C		typical -0,015 %/K @ I=1 mA	typical -0,015 %/K @ I=2 mA
Ohmic offset voltage B=0 T		≤± 12 mV @ I=1 mA typical 10 mV **	≤± 250 µV @ I=1 mA ≤± 500 µV @ I=2 mA
Temperature coefficient of ohmic offset voltage B=0 T		typical 6,7 µT/K @ I=1 mA	typical <± 0,5 µV/K @ I=2 mA
Linearity of Hall voltage at advised currents	B=± 0 to 1 T	≤± 0,2 % typical ≤± 0,1 %	≤± 0,2 % typical ≤± 0,1 %
	B=± 1 to 2,4 T	Limit not specified typical ≤± 0,2 %	Limit not specified typical ≤± 0,2 %
Supply side internal resistance B=0 T		900 to 1250 Ω typical 1000 Ω	450 to 650 Ω typical 500 Ω
Hall side internal resistance B=0 T		900 to 1700 Ω typical 1000 Ω	450 to 850 Ω typical 500 Ω
Thermal conductivity in air		≥ 1,5 mW/K	≥ 1,5 mW/K
Thermal conductivity soldered		≥ 2,2 mW/K	≥ 2,2 mW/K
Bandwidth		Tested up to 200 kHz	Not specified yet

\* Optimal signal to noise ratio

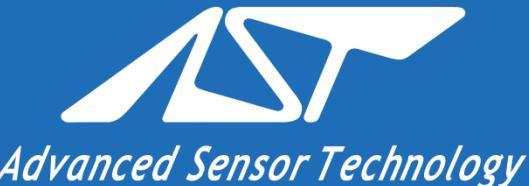
\*\* Variations within the same production batch are very small.

Absolute maximum ratings		HE144 series	HE244 series
Supply current		5 mA	10 mA
Operating temperature	P-version	-40 to +170 °C	N/A
	T-version, SH-version	-40 to +125 °C	-40 to +125 °C
	HT-version	-40 to +200 °C	-40 to +200 °C

For low temperature applications, contact us for more information.

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