AST444

Rev D

Advanced Sensor Technology

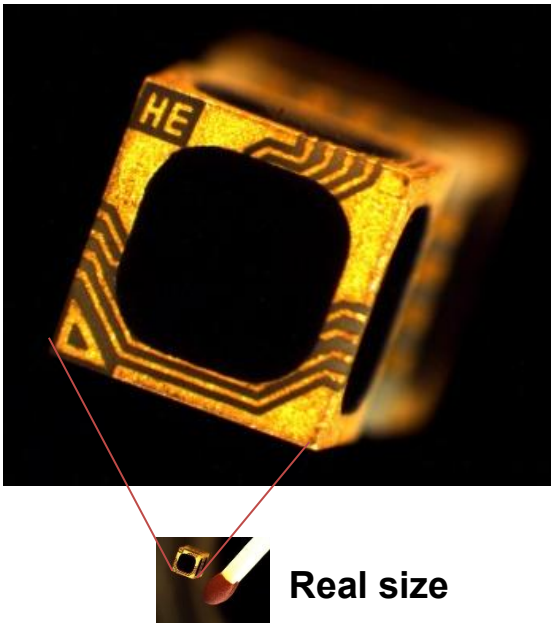
Linear High Precision

3D Analog Hall Sensor AST444

Measures both magnetic field strength and direction

Features

- 3 separate, 100% identical, independent axes
- Very large magnetic field range, from a few µ-Tesla to over 10 Tesla
- Magnetic axes cross in one point
- Very small linearity error, typically 0,1 % up to 1,5 T
- High sensitivity, low noise
- Very low offset voltage and drift
- Very wide operating temperature range
- Ceramic, small package
- Moves 3D Hall sensing into 6+ digits



Real size

Our products are lead free devices, compliant with RoHS, REACH and 'Japan green' demands.

Typical applications

- Universities, research facilities, particle accelerators, nuclear power plants
- Mapping of NMR, MRI scanners
- Mapping fields of small and large magnets with high resolution
- Measure oil pipe wall thickness/cracks from the inside
- Calibration of other 3D sensors
- Works in liquid Nitrogen and Helium
- Works at high temperatures in oven

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When Performance Matters

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Using the AST444 sensor

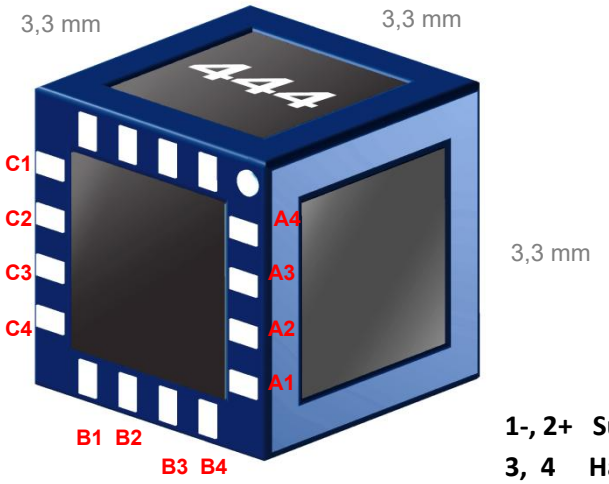
All Asensor Technology Hall sensors can be used with DC current excitation, but also with AC or lock-in systems for extremely low noise. This enables very deep measurements, for example a lock-in amplifier at 1 kHz with 1 Hz bandwidth will show a noise around 10 to 20 nano-Tesla.

The AST444 has a good temperature tracking between all axes. The sensor is, by nature, radiation hardened.

Different packages AST444

AST444 – Standard solder pad / bond pad version

The surface can be soldered, bonded with bond wires or micro welded

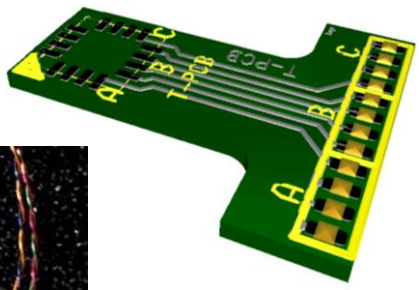


1-, 2+ Supply current
3, 4 Hall voltage

Note: component laser marking '444' or user defined, this picture shows the solder / bond pads at the bottom, marking can be at the top, this picture does not show all details

AST444T / AST444HT – Wired versions

AST444 soldered on our T-PCB, with fine twisted pair wires welded to the golden pads of the PCB. The standard version, AST444T, has a maximum temperature of 125 °C. A version with high temperature wires, AST444HT, able to handle temperatures up to 200 °C, is also available. Wire length is 20 cm, other lengths are deliverable on request. Parts can be delivered on customer specific PCB, flex foil or ceramics, thin/thick film. Minimum order quantities can apply.



Pin	Function	Wire color AST444T 125°C	Wire color AST444HT 200°C
1	- supply current	Green	Green
2	+ supply current	Red	Red
3	Hall voltage	Blue	Black
4	Hall voltage	Gold	Gold

Specifications AST444

Electrical specifications		Values
Advised supply current		0,2 to 4,0 mA recommended 2 mA*
Open-circuit Hall voltage B=1 T		typical 200 mV at I=2 mA min 180 to max 360
Temperature coefficient of open-circuit Hall voltage B=1 T, at 25°C		typical -0,015 %/K at I=2 mA min -0,02 to max 0,02
Ohmic offset voltage B=0 T		≤± 250 µV at I=1 mA ≤± 500 µV at I=2 mA
Temperature coefficient of ohmic offset voltage B=0 T		typical ≤ 5 ppm /°K at I=2 mA
Linearity of Hall voltage at I=2 mA (per axis)T	B = ± 0 to 1 T B = ± 1 to 2,4 T	≤± 0,2 % typical ≤± 0,1 % Limit not specified typical ≤± 0,2 %
Supply side internal resistance B=0 T		450 to 650 Ω typical 500 Ω
Hall side internal resistance B=0 T		450 to 850 Ω typical 500 Ω
Thermal conductivity in air		Not specified
Thermal conductivity soldered		Not specified
Bandwidth		Tested up to 200 kHz

* Optimal signal to noise ratio and low power consumption

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

Absolute maximum ratings		Values
Supply current per axis		10 mA
Operating temperature	**AST444**	-40 to +150 °C
	H-version (high temperature)	-40 to +250 °C
	T-version	-40 to +125 °C
	HT-version	-40 to +200 °C

For very low (cryogenic down to a few Kelvin) or very high (over 200 °C, up to 250 °C) temperature applications, contact us for more information.