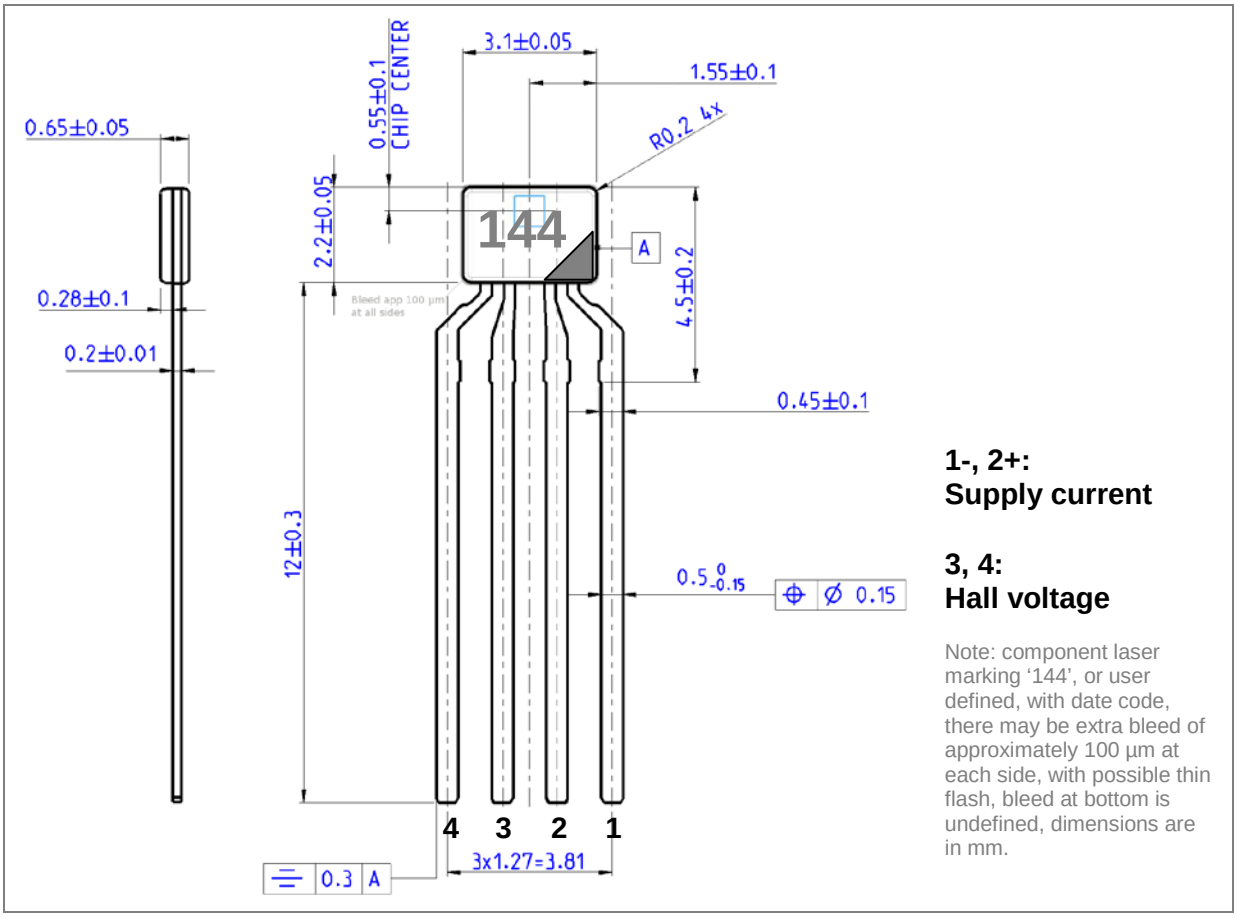
HE144 series Analog Hall sensors

Pin compatible with Siemens® / Infineon®
KSY14 and KSY44 Hall sensors



Features

- Precise tracking between sensors
- Large range, including strong fields
- Very small linearity error
- Low TC of sensitivity and drift
- Low noise, low drift
- Low EMC pickup
- High sensitivity
- Very low Planar Hall Effect (PHE) error
- Wide operating temperature range
- Very flat miniature package
- Low inductive zero component
- No breakdown in strong fields

Typical applications

- Multi-sensor and differential usage
- Current and power measurement
- Magnetic field measurement
- Rotation sensing
- Position sensing
- Measurement of distances
- Measurement of diaphragm
- Oil drill direction measurement
- Movement sensing
- Measurement of pressure
- Control of motors

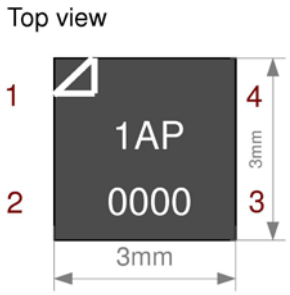
These are "green" devices, RoHS, lead free, and compliant with Japanese demands. The text on the device can be customer specific, depending on the type. A date and manufacturing code will be added.

Surface plating

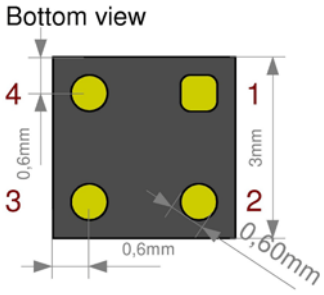
Standard RoHS Gold plating is used. Gold plating ensures good shelf lives, and prevents tin whiskers. Other plating possibilities, possible on demand but minimum order quantities apply:

- RoHS gold plated is the standard plating
- RoHS matte tin, electrochemical plated
- RoHS tin dipped, tin-silver-copper, giving a thick plating layer
- Leaded (non-RoHS), electro-chemical plated
- Leaded (non-RoHS), dipped, giving a thick plating layer

SMD version



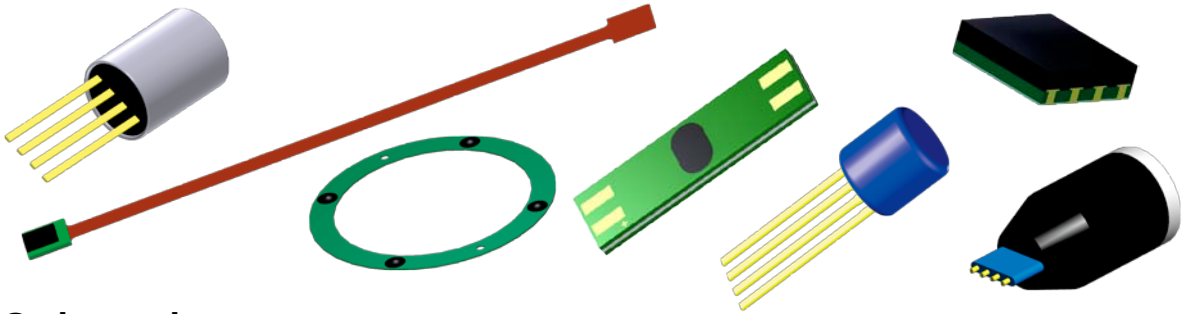
The Hall sensors are also available in a small BGA-like (ball-less) package. The thickness of the component is approximately 0.6 mm. Thickness can be adjusted to customer requirements, down to 0.4 mm. Thermal data (see below) does not apply here.
Use BGA soldering methods.



The pads are gold plated. The parts are RoHS. Use normal soldering methods. Pin1 is the – supply current, pin 2 is the + supply current, pin 3 and 4 are the Hall outputs.

Other packages and sensors

We can create any package you want, we can design and create packages, also specials and ceramics, even with 0.4 mm thickness. And we can use other chips (dice) in our non-magnetic packages, like GMR or AMR magnetoresistive sensors, or include temperature sensors.



Order codes

Version	Order code	More information
Pin	HE144 P	standard, cross to Siemens / Infineon KSY14 and K44
SMD	HE144S	BGA-like, ball-less, minimum order quantity of 1k applies
Pin	HE10	cross to Siemens / Infineon KSY10, minimum order quantity of 20k pieces applies

Standard items are delivered from stock.

Electrical parameters

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Operating temperature range[I]	T_A	-40 to +175	°C
Storage temperature rate[I]	T_{stg}	-50 to +180	°C
Supply current[II], note: **see Advised current**	I_1	10	mA

Characteristics, preliminary (T_A = 25°C)

Thermal Conductivity in air		G_{thA}	≥ 1.5 typical 1.8	mW/K
Thermal Conductivity soldered		G_{thC}	≥ 2.2 typical 3.4	mW/K
Nominal Supply Current, note: **see Advised current**		I_{1N}	5	mA
Advised supply current (S/R optimal, range)		I_{1A}	0 to 1	mA
Open-circuit Sensitivity[III]		K_{B0}	180..370	V/AT
Open-circuit Hall Voltage[IV] $I_1 = I_{1N}$, $B = 0.1$ T		V_{20}	90…185 typical 100	mV
Temperature coefficient of the open-circuit Hall voltage, $I_1 = I_{1N}$, $B = 0.2$ T @25°C		TC_{V20}	± 0.02 typical -0.003	%/K
Ohmic Offset Voltage[V], $I_1 = I_{1N}$, $B = 0$ T *Note: temporary spec, to be changed to typical ≤ ± 5 mV in later versions*		V_{R0}	≤ ± 60 |typical| 50 mV	mV
Temperature coefficient of the Ohmic Offset Voltage, $I_1 = I_{1N}$, $B = 0$ T		TC_{VR0}	±0.2 typical ~-0.06@25°C	%/K
Maximum change of the Ohmic Offset Voltage within the temperature range		$\|\Delta V_{R0}\|$	± 2 typical ± 0.3@0-50°C	mV
Drift of Ohmic Offset Voltage, $I_1 = I_{1N}$, $B = 0$ T	0.1 to 1.0 sec. after power up	dV_0	not specified	mV
	1.0 sec to 3 min. after power up	ΔV_0	not specified	mV
Supply side internal resistance[VI], $B = 0$ T		R_{10}	900...1250 typical 1000	Ω
Temperature coefficient of the Supply side internal resistance, $B = 0$ T		TC_{R10}	typical 0.35	%/K
Hall side internal resistance[VII], $B = 0$ T		R_{20}	900...1700 typical 1000	Ω
Temperature coefficient of the Hall side internal resistance, $B = 0$ T		TC_{R20}	typical 0.35	%/K
Linearity of Hall voltage	$B = 0…0.5$ T	$\Delta V_{20\text{-}0.5}$ (or $F_{L\text{-}0.5}$)	< ± 0.2 typical ≤ ± 0.1	%
	$B = 0…1.0$ T	$\Delta V_{20\text{-}1}$ (or $F_{L\text{-}1}$)	≤ ± 0.2 typical ≤ ± 0.1	%
	$B = 0…2.4$ T , $I_1 = 1$ mA	$\Delta V_{20\text{-}2}$ (or $F_{L\text{-}2}$)	limit not specified typical ≤ ± 0.2	%
Bandwidth (-3dB point)		B	tested up to 100 kHz, range several MHz	kHz
Rise time			not specified yet	
Noise figure[VIII]		F	≤ 10	dB

[I] In fact capable of a much larger temperature range, contact us for more information

[II] Allowed and advised to be smaller than 5 mA, leads to better noise behaviour and less drift
[III] Data subject to change
[IV] Data subject to change
[V] Will be improved in later parts, first series are typical 10 mV@1mA, but with very low temperature drift
[VI] Tracking devices follow delivered values typically within ± 30 milliOhm
[VII] Tracking devices follow delivered values typically within ± 30 milliOhm
[VIII] At advised current, contact us for advise

All data is subject to change without prior notice, future versions may be improved

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