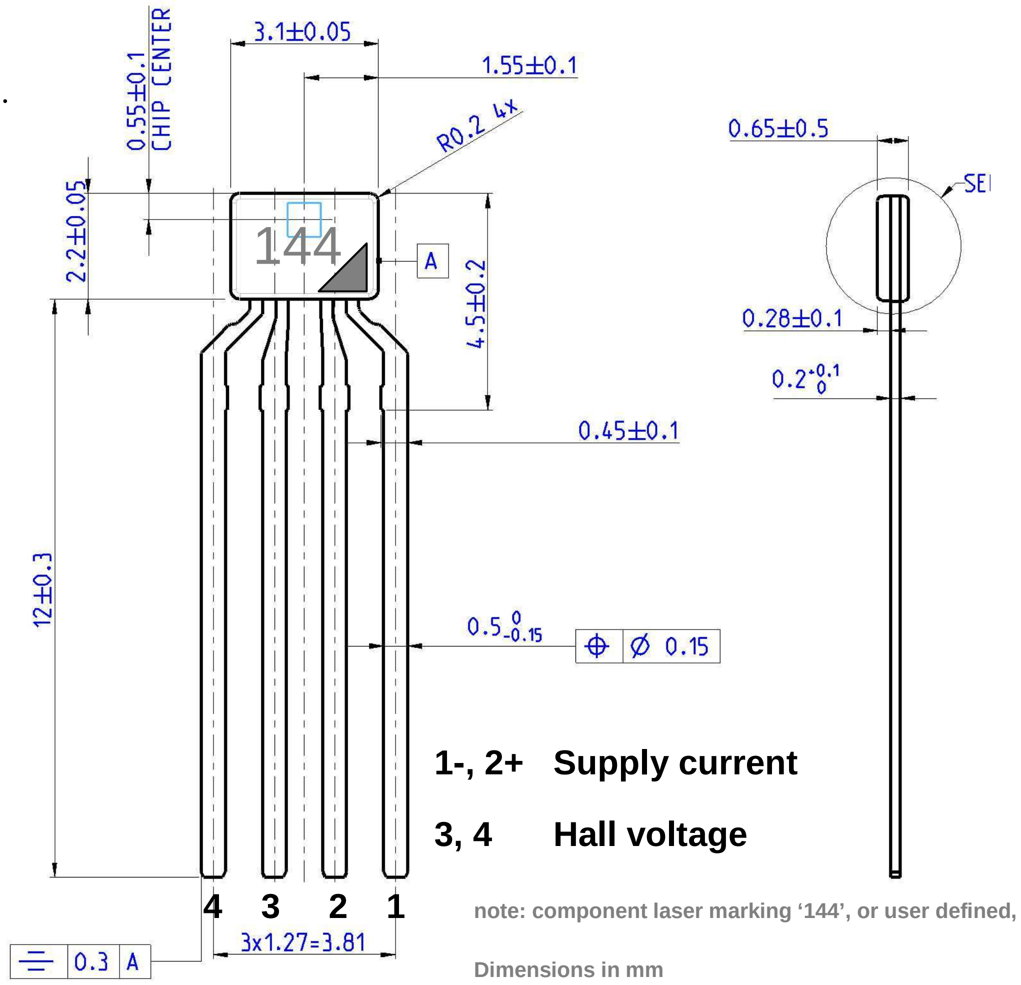
Hoeben Electronics

144 series Hall sensors, version 1

cross to Siemens® / Infineon® KSY14 and KSY44 Hall sensors



note: component laser marking '144', or user defined, with date code

Dimensions in mm

Features

- Precise tracking between sensors
- Large range, including strong fields
- Very small linearity error
- Low TC of sensitivity and drift
- Low noise
- Low EMC pickup
- High sensitivity
- Wide operating temperature range
- Very flat miniature package
- Low inductive zero component

Typical applications

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

Two enclosures are available "off the shelf": one that is compatible with the Infineon® KSY14 and KSY44 Hall sensors, and a SMD version. 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.

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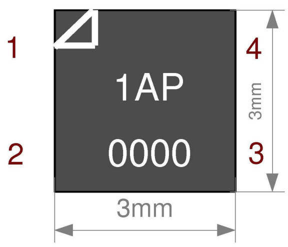
Surface plating possibilities

- RoHS gold plated
- RoHS matte tin electrochemical plated
- RoHS tin dipped (tin-silver-copper)
- Leaded (non-RoHS) on special request, dipped
- Leaded (non-RoHS) on special request, electro-chemical plated

Gold plating ensures better shelf lives, and prevents tin whiskers in sensitive applications as military or space.

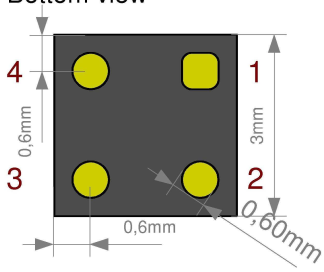
"SMD" version

Top view



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.

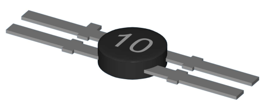
Bottom view



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

We can create any package you want, we can design and create packages, also specials and ceramics, even below 0.4 mm thickness. And we can use other sensor dice in our non-magnetic packages, like temperature sensors.



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]	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	I_{1N}	5	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	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

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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	$\lvert \Delta V_{R0} \rvert$	± 2 typical ± 0.3@0-50°C	mV
Drift[VI] of Ohmic Offset Voltage 0.1 to 1.0 sec. after power up, $I_1 = I_{1N}$, $B = 0\ T$	dV_0		mV
Drift[VII] of Ohmic Offset Voltage from 1.0 sec to 3 min. after power up, $I_1 = I_{1N}$, $B = 0\ T$	ΔV_0		mV
Supply side internal resistance[VIII], $B = 0\ T$	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[IX], $B = 0\ T$	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	%
Linearity of Hall voltage $B = 0…1.0\ T$	$\Delta V_{20\text{-}1}$ (or $F_{L\text{-}1}$)	≤ ± 0.7 typical ≤ ± 0.1	%
Linearity of Hall voltage $B = 0…2.4\ T$, $I_1 = 1\ mA$	$\Delta V_{20\text{-}2}$ (or $F_{L\text{-}2}$)	typical ≤ ± 0.1	%
Bandwidth (-3dB point)	B	<>	kHz
Rise time (to ?%)	<>	<>	
Noise figure[X]	F	≤ 10	dB

This sensor is now available in limited quantities, future versions may be improved

Hoeben Electronics

High precision Hall sensors

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[I] Capable of a much larger temperature range
[II] Allowed to be smaller, also larger when temperature is limited
[III] Data subject to change: precise data is given in a later stage
[IV] Data subject to change: precise data is given in a later stage
[V] Will be improved in later parts, first series are typical 50 mV@5mA, very low temperature drift
[VI] Specified later
[VII] Specified later
[VIII] Tracking devices follow delivered values within ± 30 milliOhm
[IX] Tracking devices follow delivered values within ± 30 milliOhm
[X] In fact much lower

