

1 Features and Benefits

- ▲ High sensitivity digital output
- ▲ Stable over the entire temperature range
- ▲ Wide operating voltage range: 4.5V ~ 24V
- ▲ Strong resistance to mechanical stress
- ▲ Reverse power supply protection
- ▲ Non-contact output, safety and reliable
- ▲ TO-92UA, SOT-23-3L and SOT-89 package options
- ▲ Developed according to the EU RoHS and REACH

2 Application Examples

- ▲ Automotive electronics, Consumer electronics and Industrial electronics
- ▲ Water flow sensing
- ▲ Electronic steering column lock
- ▲ Door latch system
- ▲ Seat adjustment
- ▲ Speed measurement and tachometer
- ▲ Motor control
- ▲ Brushless DC motor

3 Selection Guide

Part Number	Packing	Mounting	Operating, T	B _{RP} (Min)	B _{OP} (Max)
AH3134R/K-M	7-in. reel, 3000 pieces/reel	3-pin SOT23-3L surface mount	-40°C to 125°C	3.0mT	11.0mT
AH3134R/L-UA	Anti-static bag, 500 pieces/bag	3-pin SIP through hole	-40°C to 150°C	3.0mT	11.0mT
AH3134R/L-S	7-in. reel, 1000 pieces/reel	3-pin SOT89 surface mount	-40°C to 150°C	3.0mT	11.0mT

NOTE 1. Hall ICs are soldered tin brazing for assembly, and wave soldering of SOT-23-3L and SOT-89 surface-mounted components poses a risk of failure.



SOT-23-3L (Type M)



SOT-89 (Type S)



^{2.} A risk of circuit failure may happen in non-brazing processes such as electric resistance welding, high-frequency welding, etc.

^{3.} E: -40~85°C; K: -40~125°C; L: -40~150°C.

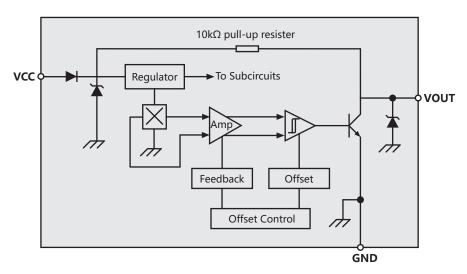


4 General Description

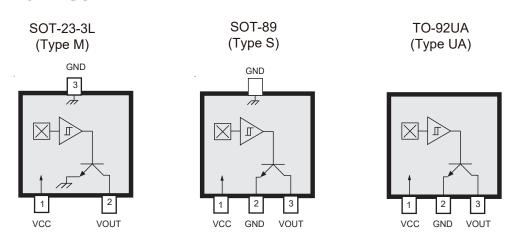
The AH3134R is a digital unipolar Hall IC with single output.

The AH3134R Hall-effect sensor includes the following on a single silicon chip: reverse voltage protector, voltage regulator, temperature compensation circuit, Hall-voltage generator, signal amplifier, Schmitt trigger, open-collector output driver and built-in pull-up resistor, etc. The integrated voltage regulator and temperature compensation circuit ensure that the sensor works stably in a wide voltage and temperature range. The reverse voltage protection circuit prevents the sensor from being damaged by reverse voltage.

The AH3134R, produced with bipolar technology, is more stable and reliable. It is available in three package types: SOT-23-3L (Type M), SOT-89 (Type S), and TO-92UA (Type UA). Each package is lead (Pb) free, with 100% matte tin plated leadframes.



5 Terminal List



Namo	Name Description		Number			
INAIIIE	Description	Type M	Type S	Type UA		
VCC	Power Supply	1	1	1		
GND	Ground	3	2	2		
VOUT	Output	2	3	3		



6 Absolute Maximum Ratings

Characteristic	Symbol	Note	Rating	Unit
Supply Voltage	Vcc		28	V
Reverse Supply Voltage	VRCC		-22	V
Output Off Voltage	Vout		28	V
Reverse Output Voltage	V _{ROUT}		-0.5	V
Output Current	loutsink		30	mA
Magnetic Flux Density	В		Unlimited	G
Operating Temperature	TA	L	-40 to 150	°C
Operating Temperature	TA	K	-40 to 125	°C
Maximum Junction Temperature	$T_{J(max)}$	Too high a Tj could lead to electrical or thermal breakdown	165	°C
Storage Temperature	T _{stg}		-50 to 160	°C
ESD sensitivity – HBM	-		6	kV

NOTE 1. Human Body Model according to AEC-Q100-002 standard.

7 Electrical Operating Characteristics

valid through the full operating temperature range; unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
Supply Voltage	Vcc	Operating, TJ<165°C	4.5	-	24	V
High-level Output Voltage	Voh	V_{CC} =24 V , R_{L} =10 $k\Omega$, $B < B_{\text{RP}}$	23.5	-	24	V
Low-level Output Voltage	Vol	IOUTMAX=25mA, B >BOP	0	-	0.5	V
Supply Current	Icc	Vcc=24V	-	4.0	8.0	mA
Output leakage Current	Іоитогг	V _{OUT} =24V, B <b<sub>RP</b<sub>	-	-	10	μA
Power-On Time	t PO		-	-	30	μs
Output-Rise Time	t _R	V_{CC} =12V, R_{L} =1.2k Ω , C=12pF	-	-	2	μs
Output-Fall Time	t₅	Vcc=12V, RL=1.2kΩ, C=12pF	-	-	2	μs

NOTE 1. Power-On Time, tPo, is defined as: the time it takes for the output voltage to settle within ±10% of its steady state value under an applied magnetic field, after the power supply has reached its minimum specified operating voltage, Vcc (min).

8 Magnetic Operating Characteristics

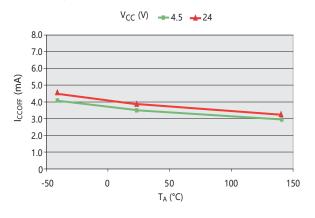
valid through the full operating temperature range; unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
Operating Point	Вор	Operating, TJ<165°C	-	9.0	11.0	mT
Release Point	Brp	$V_{\text{CC}}\text{=}24V,\ R_{\text{L}}\text{=}10k\Omega,\ \ B < B_{\text{RP}}$	3.0	5.0	-	mT
Hysteresis	Вн	Iout=25mA, B > Bop	-	4.0	-	mT

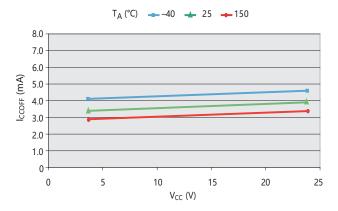


9 Characteristic Curves (Type UA)

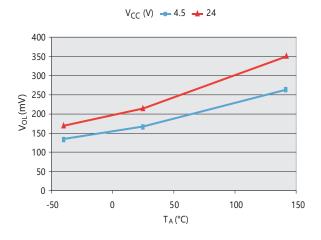
Supply Current (Off) versus Ambient Temperature



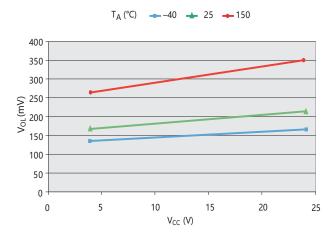
Supply Current (Off) versus Supply Voltage



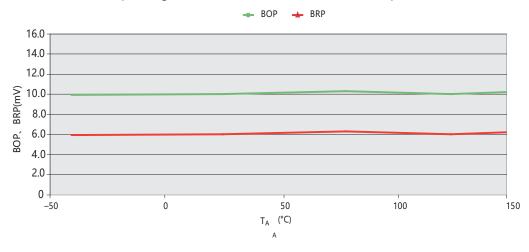
Low-level Output (On) versus Ambient Temperature



Low-level Output (On) versus Supply Voltage



Operating and Release Point versus Ambient Temperature

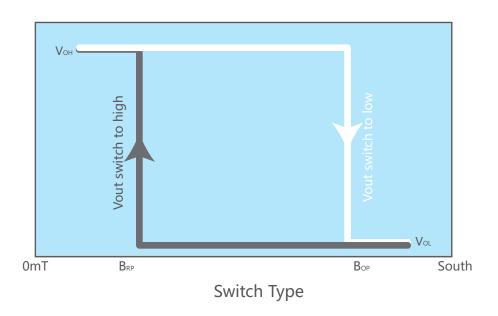




10 Magnetic Behavior

South Pole Active

When the S pole of the magnet faces the mark surface of the sensor and is close to it ($B \ge B_{OP}$), the sensor outputs a low level; when the S pole is away from the sensor ($B \le B_{RP}$), it outputs a high level. The sensor does not respond when the N pole faces its mark surface. The stable hysteresis ($B_H = |B_{OP} - B_{RP}|$) ensures that the sensor switch is stable. The magnetoelectric conversion characteristics of AH3134R are shown in the figure:



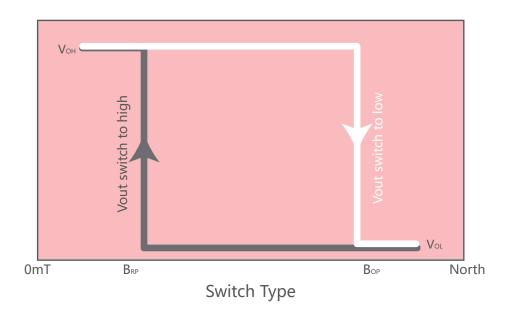






North Pole Active

When the N pole of the magnet faces the mark surface of the sensor and is close to it ($B \ge B_{OP}$), the sensor outputs a low level; when the N pole is away from the sensor ($B \le B_{RP}$), it outputs a high level. The sensor does not respond when the S pole faces its mark surface. The stable hysteresis ($B_H = |B_{OP} - B_{RP}|$) ensures that the sensor switch is stable. The magnetoelectric conversion characteristics of AH3134R are shown in the figure:

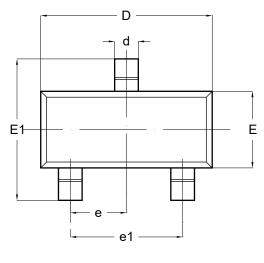


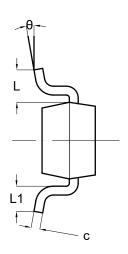


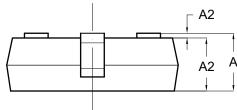


11 Package Information

SOT-23-3L



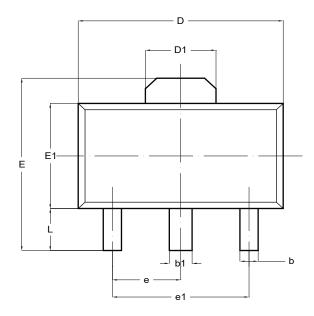


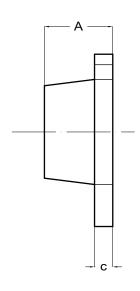


Symbol	Dimension (Unit: mm)			
Symbol	Min	Max		
Α	1.050	1.250		
A1	0.000	0.100		
A2	1.050	1.150		
b	0.300	0.500		
С	0.100	0.200		
D	2.820	3.020		
E	1.500	1.700		
E1	2.650	2.950		
е	0.950BSC.			
e1	1.800	2.000		
L	0.550REF.			
L1	0.300	0.600		
θ	0°	8°		



SOT-89

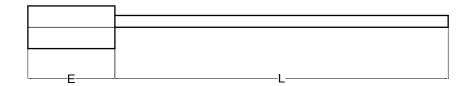


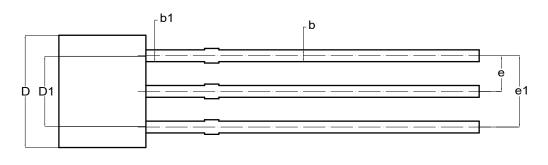


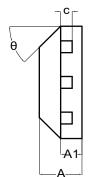
Symbol	Dimension (Unit: mm)			
Symbol	Min	Max		
Α	1.400	1.600		
b	0.320	0.520		
b1	0.380	0.580		
С	0.350	0.440		
D	4.400	4.600		
D1	1.550REF.			
E	3.940	4.250		
E1	2.300	2.600		
е	1.500TYP.			
e1	3.000TYP.			
L	0.900	1.200		



TO-92UA



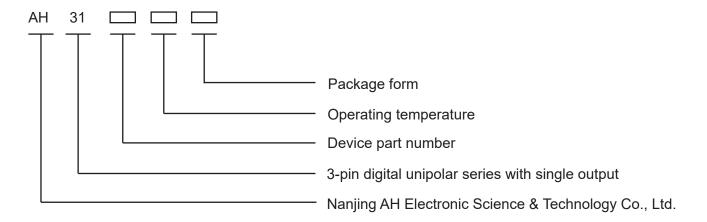




Symbol	Dimension (Unit: mm)			
Symbol	Min	Max		
Α	1.420	1.620		
A1	0.660	0.860		
b	0.330	0.480		
b1	0.400	0.510		
С	0.330	0.510		
D	3.900	4.100		
D1	2.280	2.680		
E	3.050	3.250		
е	1.270TYP.			
e1	2.440	2.640		
L	14.350 14.75			
θ	45°TYP.			



12 Marking Information



• Package Form:

M —— SOT-23-3L (SMD)

S —— SOT-89 (SMD)

UA — TO-92UA/TO-92S (SIP)

Note: M and S type are packed in reels, M 3k/reel, S 1k/reel;

UA type is packed in bags of 1k/bag or 0.5k/bag.

Operating Temperature:

E —— -40°C ~ +85°C

L —— -40°C ~ +150°C

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