

AK8772

Shipped in packet-tape reel(5000pcs/Reel)

AK8772 is ultra-small Hall effect IC of a single silicon chip composed of Hall element and a signal processing IC.

Bipolar Hall Effect Latch

Supply Voltage 1.6~5.5V

Power down Function

Ultra High Sensitivity
Bop: 1.8mT

Output CMOS

SON

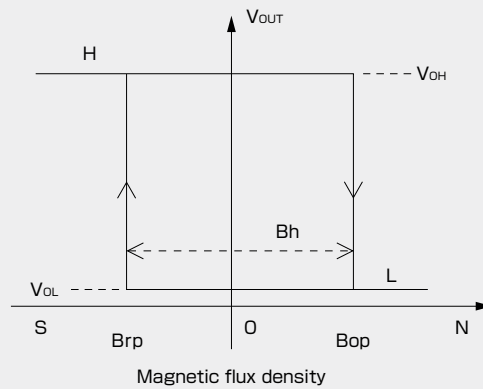
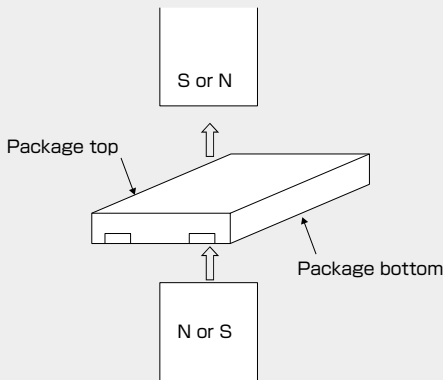
Notice:It is requested to read and accept "IMPORTANT NOTICE" written on the back of the front cover of this catalogue.

●Features

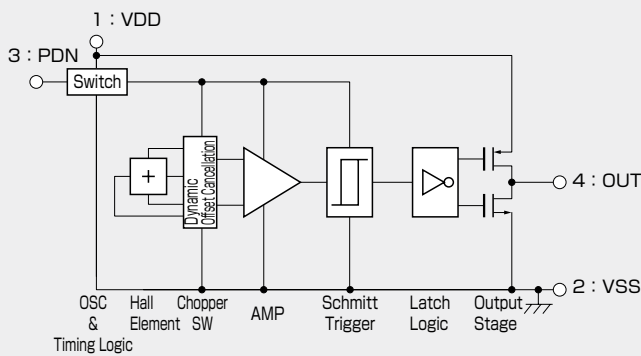
- Precision Bipolar Hall Effect Latch
- Power manageability through "PDN" pin
Current consumption in Power down mode is less than $1\mu A$
- Low current consumption at active mode : less than avg. $150\mu A@V_{DD}=3V$
- Ultra small SON package : $1.1 \times 1.4 \times t0.37mm$, Halogen free



●Operational Characteristics



●Functional Block Diagram



Item	Function
OSC	Generates operating clock
Timing Logic	Generates timing signal requires for Chopper SW, AMP and other circuits
Hall Element	Hall element fabricated by CMOS process
Chopper SW	Performs chopping in order to cancel the offset voltage of Hall sensor
AMP	Reduce offset voltage and amplifies Hall output voltage
Schmitt Trigger	Hysteresis comparator
Latch Logic Output Stage	CMOS output, During the power down mode, output is latched in its previous state

•Please be aware that our products are not intended for use in life support equipment, devices, or systems. Use of our products in such applications requires the advance written approval of our sales staff.
 Certain applications using semiconductor devices may involve potential risks of personal injury, property damage or loss of life. In order to minimize these risks, adequate design and operating safeguards should be provided by the customer to minimize inherent or procedural hazards. Inclusion of our products in such applications is understood to be fully at the risk of the customer using our devices or systems.

●Absolute Maximum Ratings

Item	symbol	Min.	Max.	Unit	Note
Power supply voltage	V _{DD}	-0.3	+6.5	V	
Output current	I _{OUT}	-0.5	+0.5	mA	OUT
Input voltage	V _{IN}	-0.3	V _{DD} +0.3*	V	PDN
Input current	I _{IN}	-10	+10	mA	PDN
Storage temperature	T _{STG}	-55	+125	°C	

*) Less than +6.5V.

Note) Stress beyond these listed values may cause permanent damage to the device.

●Recommended Operating Conditions

Item	symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V _{DD}	1.6	3.0	5.5	V
Operating temperature	T _a	-30		+85	°C

●Electrical Characteristics (T_a=25°C V_{DD}=3.0V)

Item	symbol	Min.	Typ.	Max.	Unit	Note
Current consumption 1	I _{DD1}			1	μA	PDN=0V
Current consumption 2	I _{DD2}		60	150	μA	PDN=V _{DD} ,Average
PDN input current	I _{IN}	-1		1	μA	
PDN input H voltage	V _{IH}	0.7V _{DD}			V	
PDN input L voltage	V _{IL}			0.3	V	
High level output voltage	V _{OH}	V _{DD} -0.4			V	I _{OUT} =-0.5mA
Low level output voltage	V _{OL}			0.4	V	I _{OUT} =+0.5mA
PDN mode transition time 1	T _{PD1}			(36.6)	μs	*Active→PDN
PDN mode transition time 2	T _{PD2}			100	μs	PDN→Active
Pulse drive period	T _{PD3}	0.5	1.0	1.5	ms	When PDN=V _{DD}
Pulse drive time	T _{PD4}	12.2	24.4	36.6	μs	
PDN 'H' input pulse width	T _w	100			μs	

*) This transition time is not guaranteed by inspection because PDN input timing and internal timing are asynchronous

●Magnetic Characteristics① (T_a=25°C V_{DD}=3.0V)

Item	symbol	Min.	Typ.	Max.	Unit
Operating point	B _{op}		1.8	4.0	mT
Releasing point	B _{rp}	-4.0	-1.8		mT
Hysteresis	B _h		3.6		mT

●Magnetic Characteristics② (T_a=-30~+85°C V_{DD}=1.6~5.5V)

Item	symbol	Min.	Typ.	Max.	Unit
Operating point	B _{op}		1.8	4.2	mT
Releasing point	B _{rp}	-4.2	-1.8		mT
Hysteresis	B _h		3.6		mT

Note) The specifications in Magnetic Characteristics ② are design targets.

C

g

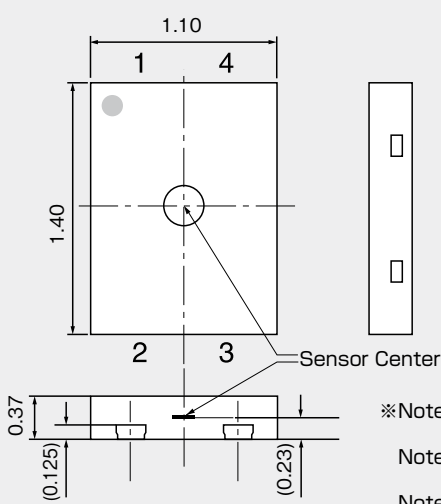
k

n

o

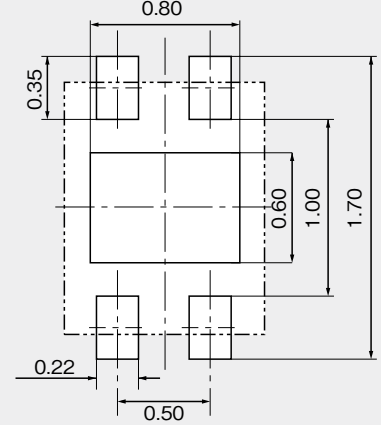
p

●Package (Unit:mm)



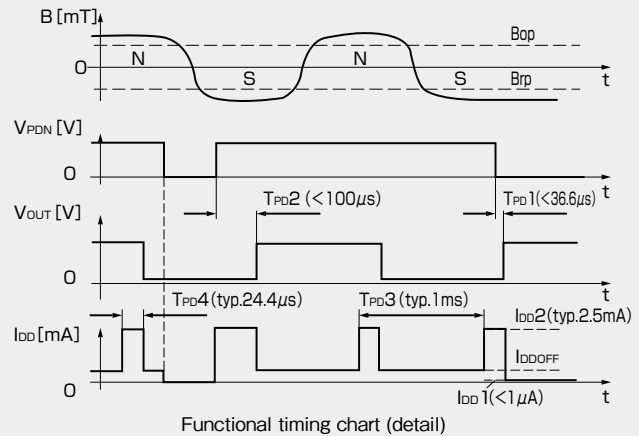
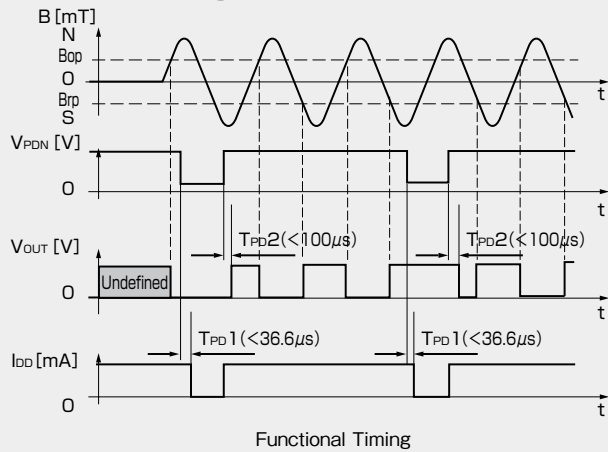
- ※Note 1) Sensitive area position referenced to the center of package within $\phi 0.3\text{mm}$ circle.
- Note 2) Tolerances of dimension otherwise noted is $\pm 0.05\text{mm}$.
- Note 3) Hatched area is plated.
- Note 4) Center pad area (TAB) should be tied to the VSS or floating

●Footprint (for reference)



No.	Pin name	Function	Note
1	VDD	Power supply	
2	VSS	Ground	
3	PDN	Power down H:Device active L:Device power down	CMOS Input. This pin has to be tied to "H" level when external power control is not used.
4	OUT	Output	CMOS Output

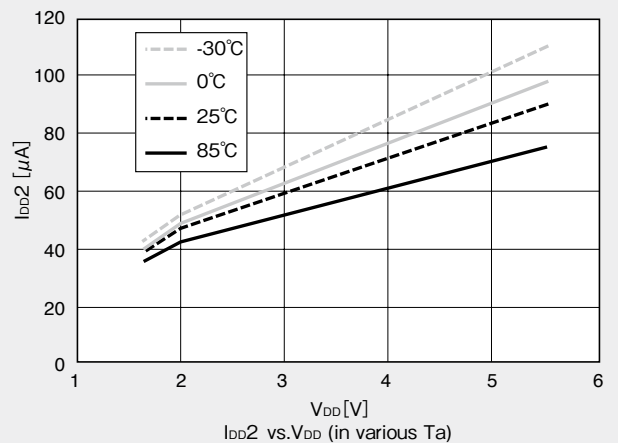
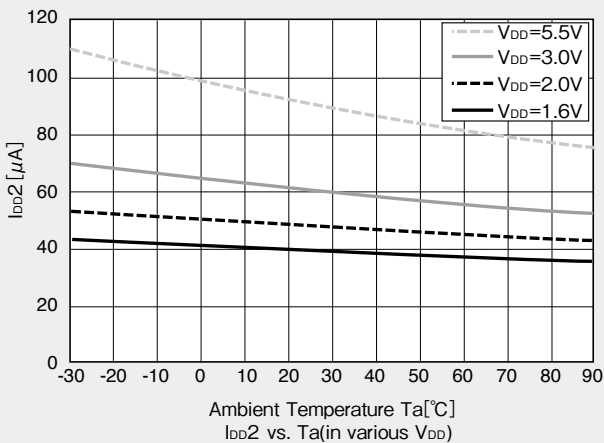
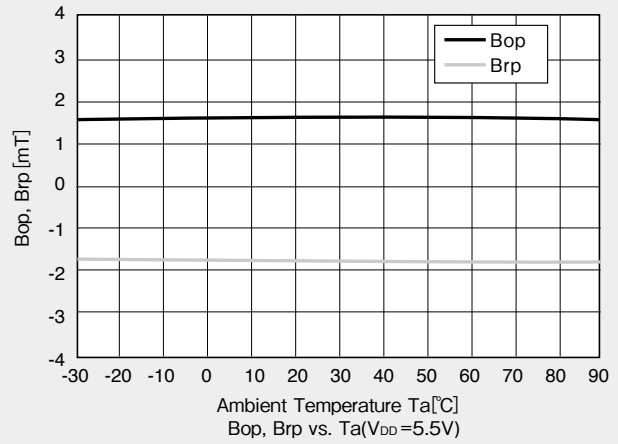
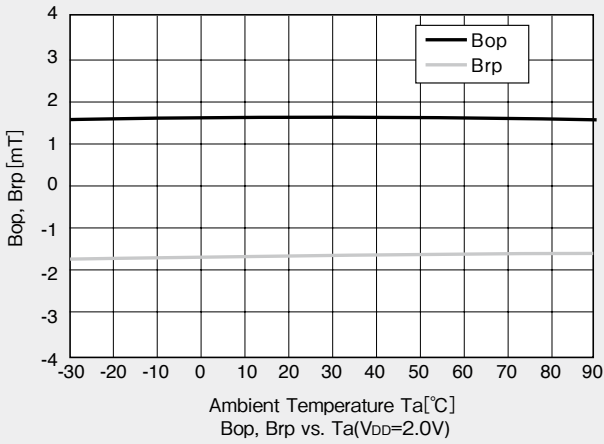
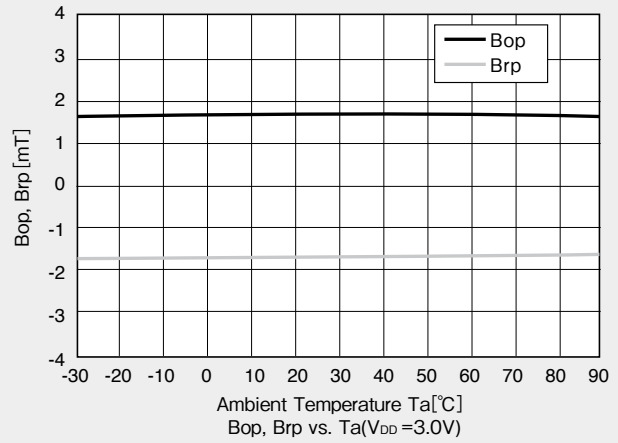
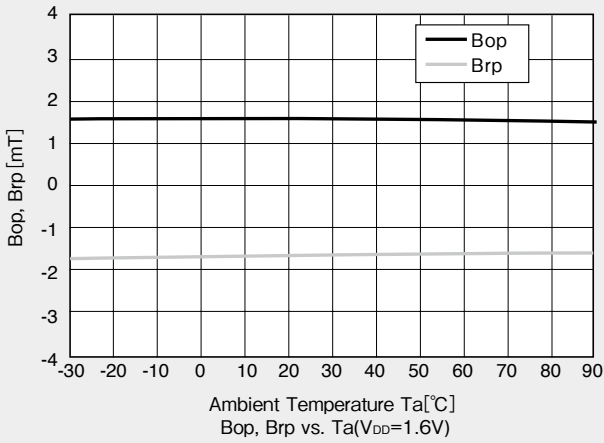
●Function Timing Chart



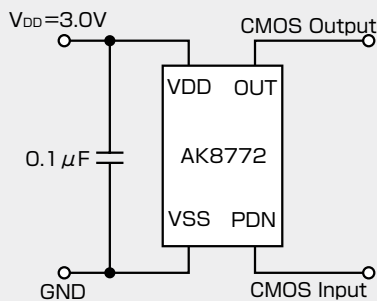
- Note 1) During power down mode, output is latched in its previous state.
- Note 2) When VDD is supplied, the time from reaching $V_{DD} = 1.6\text{V}$ to the update of the output state is equal to T_{PD2} .

When PDN pin set to 'L' from 'H' during sampling is performing, the device transits to power down mode after sampling is completed. And when PDN pin set to 'L' from 'H' while sampling is not performing, the device transits to power down mode immediately.

● Typical Characteristic Data (for reference)



● Application Circuit



C

σ

k

n

o

p

IMPORTANT NOTICE

- These products and their specifications are subject to change without notice. When you consider any use or application of these products, please make inquiries the sales office of Asahi Kasei Microdevices Corporation (AKM) or authorized distributors as to current status of the products.
- Descriptions of external circuits, application circuits, software and other related information contained in this document are provided only to illustrate the operation and application examples of the semiconductor products. You are fully responsible for the incorporation of these external circuits, application circuits, software and other related information in the design of your equipments. AKM assumes no responsibility for any losses incurred by you or third parties arising from the use of these information herein. AKM assumes no liability for infringement of any patent, intellectual property, or other rights in the application or use of such information contained herein.
- Any export of these products, or devices or systems containing them, may require an export license or other official approval under the law and regulations of the country of export pertaining to customs and tariffs, currency exchange, or strategic materials.
- AKM products are neither intended nor authorized for use as critical components^{Note1)} in any safety, life support, or other hazard related device or system^{Note2)}, and AKM assumes no responsibility for such use, except for the use approved with the express written consent by Representative Director of AKM. As used here:
 - Note1) A critical component is one whose failure to function or perform may reasonably be expected to result, whether directly or indirectly, in the loss of the safety or effectiveness of the device or system containing it, and which must therefore meet very high standards of performance and reliability.
 - Note2) A hazard related device or system is one designed or intended for life support or maintenance of safety or for applications in medicine, aerospace, nuclear energy, or other fields, in which its failure to function or perform may reasonably be expected to result in loss of life or in significant injury or damage to person or property.
- It is the responsibility of the buyer or distributor of AKM products, whodistributes, disposes of, or otherwise places the product with a third party, to notify such third party in advance of the above content and conditions, and the buyer or distributor agrees to assume any and all responsibility and liability for and hold AKM harmless from any and all claims arising from the use of said product in the absence of such notification.

April 1, 2015