

AK8788A

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

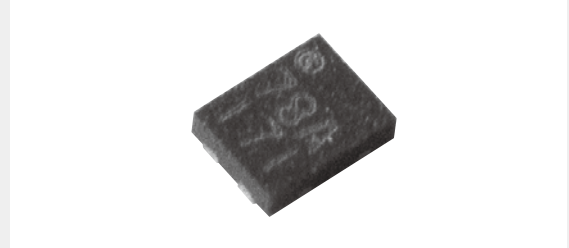
AK8788A is ultra-small Hall effect IC of a single silicon chip composed of Hall element and a signal processing IC.

Omnipolar Hall Effect Switch	Supply Voltage 1.6~5.5V	Hall Element Pulse Excitation	High Sensitivity Bop:3mT	Output CMOS	SON
------------------------------	-------------------------	-------------------------------	--------------------------	-------------	-----

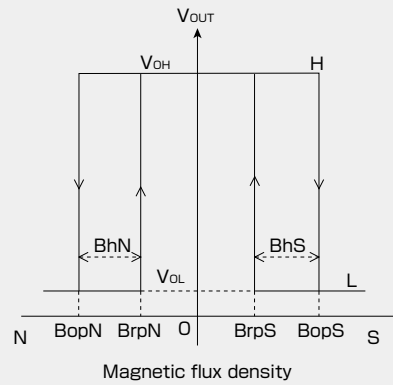
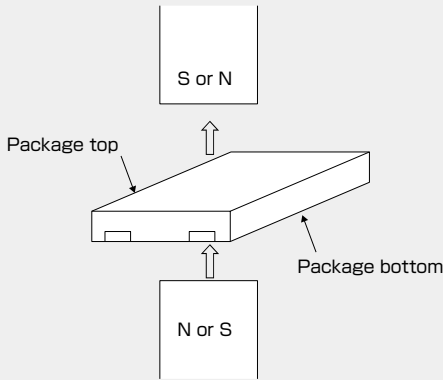
Notice:It is requested to read and accept "IMPORTANT NOTICE" written on the back of the front cover of this catalogue.

●Features

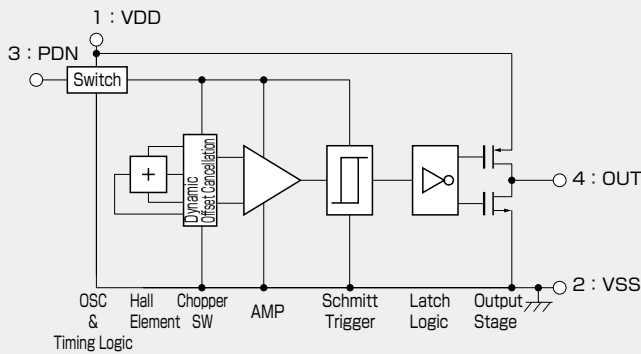
- High sensitive omnipoler operation
- Micropower operation
Typ.4.5μA (average : V_{DD}=1.85V)
- Ultra small SON package : 1.1 × 1.4 × t0.37mm
Halogen free



●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
Power supply voltage	V _{DD}	-0.3	+6.5	V
Output current	I _{OUT}	-0.5	+0.5	mA
Storage temperature	T _{STG}	-55	+125	°C

Note) Stresses 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	1.85	5.5	V
Operating temperature	T _a	-40		+85	°C

●Electrical Characteristics① (T_a=25°C V_{DD}=1.85V Unless otherwise noted)

Item	symbol	Min.	Typ.	Max.	Unit	Note
Current consumption	I _{DD}		4.5	9	μA	Average
	I _{DD2}		7.5	12	μA	Average, V _{DD} =5.5V
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
Pulse drive period	T _{PD1}	25	50	100	ms	
Pulse drive time	T _{PD2}	43	85.4	170	μs	

●Electrical Characteristics② (T_a=-40~+85°C V_{DD}=1.6~5.5V)

Item	symbol	Min.	Typ.	Max.	Unit	Note
Current consumption	I _{DD}		4.5	15	μA	Average
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
Pulse drive period	T _{PD1}	25	50	100	ms	
Pulse drive time	T _{PD2}	43	85.4	170	μs	

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

●Magnetic Characteristics① (T_a=25°C V_{DD}=1.85V)

Item	symbol	Min.	Typ.	Max.	Unit
Operating points	BopS	*1.9	3.0	3.7	mT
	BopN	-3.7	-3.0	*-1.9	mT
Releasing points	BrpS	1.6	2.4	*3.4	mT
	BrpN	*-3.4	-2.4	-1.6	mT
Hysteresis	BhS,BhN	*0.3	0.6	*1.5	mT

Note) The characteristics with * mark are design targets.

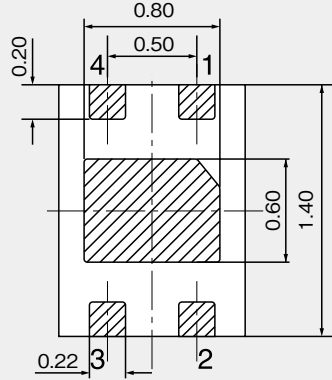
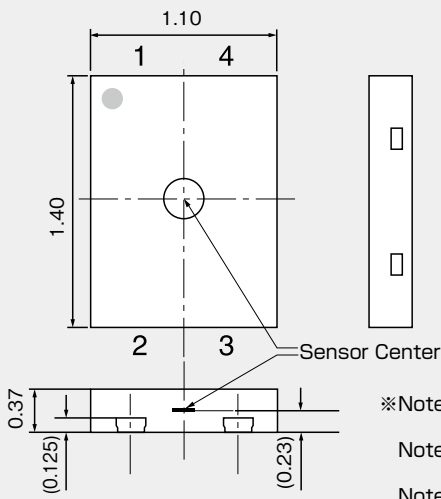
●Magnetic Characteristics② (T_a=-40~+85°C V_{DD}=1.6~5.5V)

Item	symbol	Min.	Typ.	Max.	Unit
Operating points	BopS	1.7	3.0	4.1	mT
	BopN	-4.1	-3.0	-1.7	mT
Releasing points	BrpS	1.4	2.4	3.8	mT
	BrpN	-3.8	-2.4	-1.4	mT
Hysteresis	BhS,BhN	0.1	0.6	1.7	mT

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

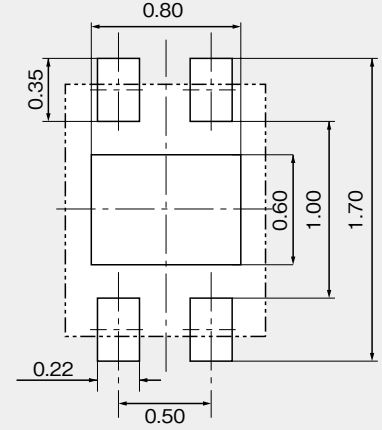
b
f
k
n
o
p

●Package (Unit:mm)



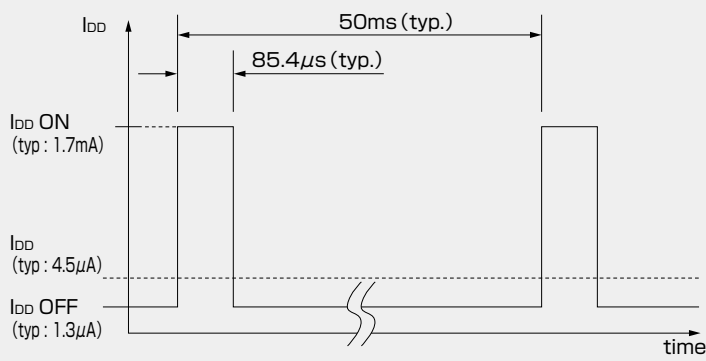
- ※Note 1) Sensitive area position referenced to the center of package within $\phi 0.3\text{mm}$ circle.
- Note 2) Tolerances of dimension otherwise noted is $\pm 0.05\text{mm}$.
- Note 3) Hatched area is plated.
- Note 4) Center pad area (TAB) should be tied to the VSS or floating

●Footprint (for reference)

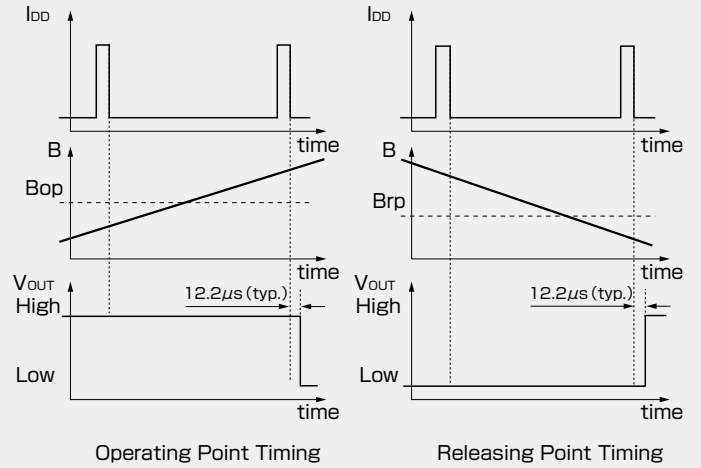


Pin No.	Pin name	Function	Note
1	VDD	Power supply	
2	VSS	Ground	
3	N.C.	(No internal connection)	Connect to VSS externally
4	OUT	Output	CMOS output

●I_{DD} Timing Chart

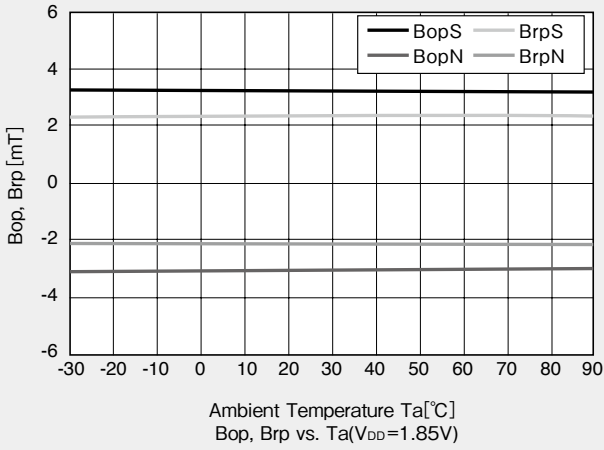


●Functional Timing Chart

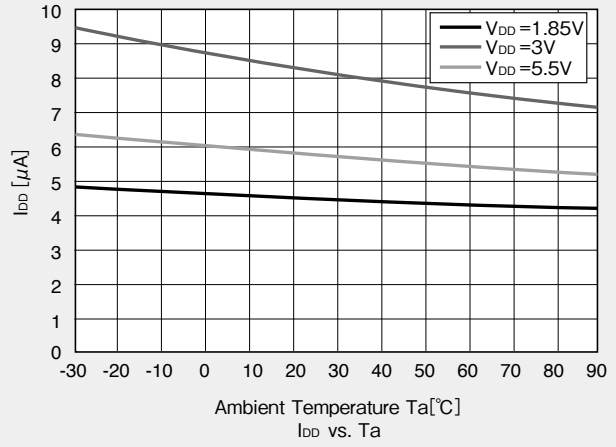


Note) Hall effect IC's output is held as internal data just before the internal circuit turns off. And after 12.2 μs (typ.) the output changes.

● Typical Characteristics Data (for reference)

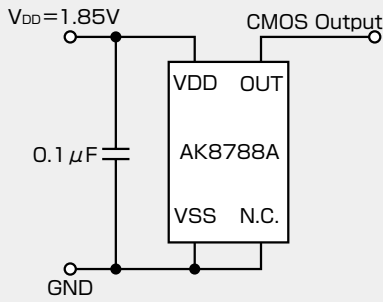


Temperature dependence of sensitivity



Temperature dependence of current consumption (Average)

● Application Circuit



b

f

k

n

o

p

IMPORTANT NOTICE

0. Asahi Kasei Microdevices Corporation (“AKM”) reserves the right to make changes to the information contained in this document without notice. When you consider any use or application of AKM product stipulated in this document (“Product”), please make inquiries the sales office of AKM or authorized distributors as to current status of the Products.
1. All information included in this document are provided only to illustrate the operation and application examples of AKM Products. AKM neither makes warranties or representations with respect to the accuracy or completeness of the information contained in this document nor grants any license to any intellectual property rights or any other rights of AKM or any third party with respect to the information in this document. You are fully responsible for use of such information contained in this document in your product design or applications. **AKM ASSUMES NO LIABILITY FOR ANY LOSSES INCURRED BY YOU OR THIRD PARTIES ARISING FROM THE USE OF SUCH INFORMATION IN YOUR PRODUCT DESIGN OR APPLICATIONS.**
2. The Product is neither intended nor warranted for use in equipment or systems that require extraordinarily high levels of quality and/or reliability and/or a malfunction or failure of which may cause loss of human life, bodily injury, serious property damage or serious public impact, including but not limited to, equipment used in nuclear facilities, equipment used in the aerospace industry, medical equipment, equipment used for automobiles, trains, ships and other transportation, traffic signaling equipment, equipment used to control combustions or explosions, safety devices, elevators and escalators, devices related to electric power, and equipment used in finance-related fields. Do not use Product for the above use unless specifically agreed by AKM in writing.
3. Though AKM works continually to improve the Product’s quality and reliability, you are responsible for complying with safety standards and for providing adequate designs and safeguards for your hardware, software and systems which minimize risk and avoid situations in which a malfunction or failure of the Product could cause loss of human life, bodily injury or damage to property, including data loss or corruption.
4. Do not use or otherwise make available the Product or related technology or any information contained in this document for any military purposes, including without limitation, for the design, development, use, stockpiling or manufacturing of nuclear, chemical, or biological weapons or missile technology products (mass destruction weapons). When exporting the Products or related technology or any information contained in this document, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations. The Products and related technology may not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations.
5. Please contact AKM sales representative for details as to environmental matters such as the RoHS compatibility of the Product. Please use the Product in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. AKM assumes no liability for damages or losses occurring as a result of noncompliance with applicable laws and regulations.
6. Resale of the Product with provisions different from the statement and/or technical features set forth in this document shall immediately void any warranty granted by AKM for the Product and shall not create or extend in any manner whatsoever, any liability of AKM.
7. This document may not be reproduced or duplicated, in any form, in whole or in part, without prior written consent of AKM.