



AK8789

Shipped in packet-tape reel(10000pcs/Reel)

AK8789 is ultra-small Hall effect IC of a single silicon chip composed of Hall element and a signal processing IC.

Unipolar Hall
Effect Switch
Two output for S
and N-poleSupply Voltage
1.6~5.5VHall Element
Pulse
ExcitationHigh Sensitivity
Bop:2.5mTOutput
CMOS
Two output
for S and N-pole

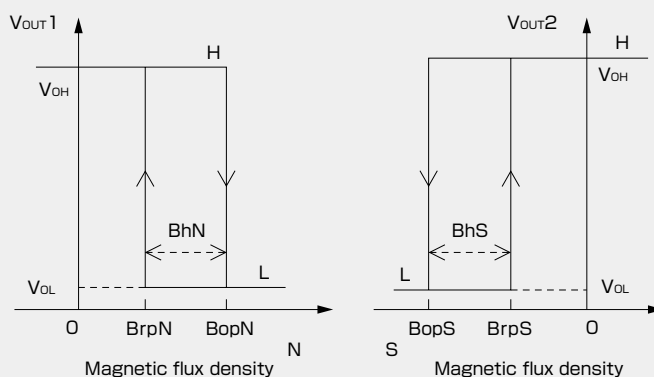
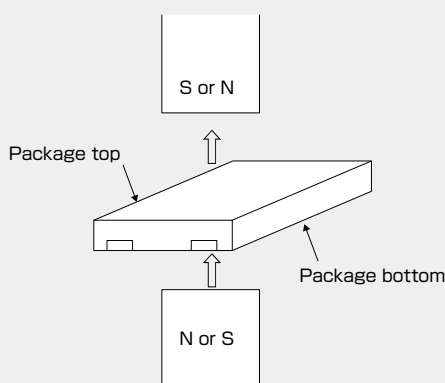
SON

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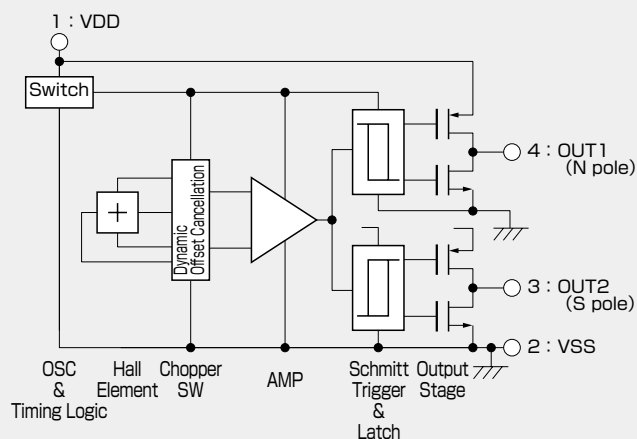
●Features

- High sensitive omnipolar operation
- Dual output
- Micropower operation
Typ.6.5 μ A (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	−30		+85	°C

●Electrical Characteristics (T_a=25°C V_{DD}=1.85V)

Item	symbol	Min.	Typ.	Max.	Unit	Note
Current consumption	I _{DD}		6.5	9	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}	73	146	292	μs	

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

Item	symbol	Min.	Typ.	Max.	Unit
Operating points	BopN	1.4	2.5	3.2	mT
	BopS	−3.2	−2.5	−1.4	mT
Releasing points	BrpN	1.2	2.0	3.0	mT
	BrpS	−3.0	−2.0	−1.2	mT
Hysteresis	BhN, BhS	0.1	0.5		mT

Note) The above specifications are guaranteed by design.

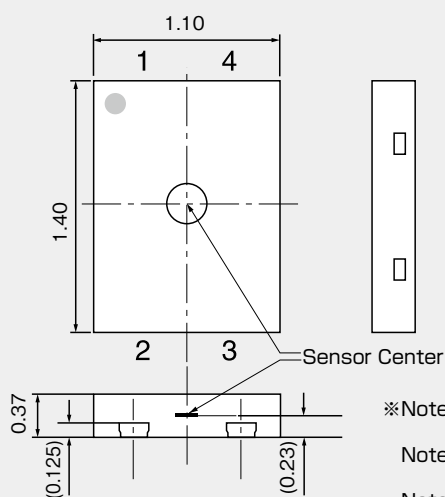
●Magnetic Characteristics② (T_a=−30~+85°C V_{DD}=1.6~5.5V)

Item	symbol	Min.	Typ.	Max.	Unit
Operating points	BopN	*1.3	2.5	3.9	mT
	BopS	−3.9	−2.5	*−1.3	mT
Releasing points	BrpN	0.9	2.0	*3.7	mT
	BrpS	*−3.7	−2.0	−0.9	mT
Hysteresis	BhN, BhS	*0.1	0.5		mT

Note) The characteristics with * marks are guaranteed by design.

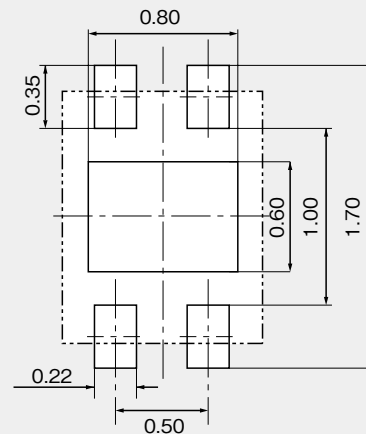


●Package (Unit:mm)

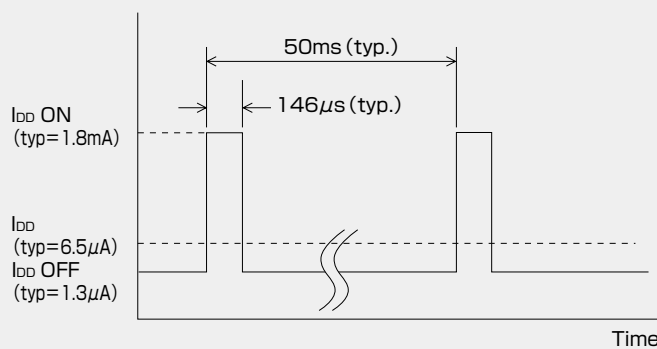


- ※Note 1) Sensitive area position referenced to the center of package within $\phi 0.3\text{mm}$ circle.
 Note 2) Tolerances of dimension otherwise noted is $\pm 0.05\text{mm}$.
 Note 3) Hatched area is plated.
 Note 4) Center pad area (TAB) should be tied to the VSS or floating

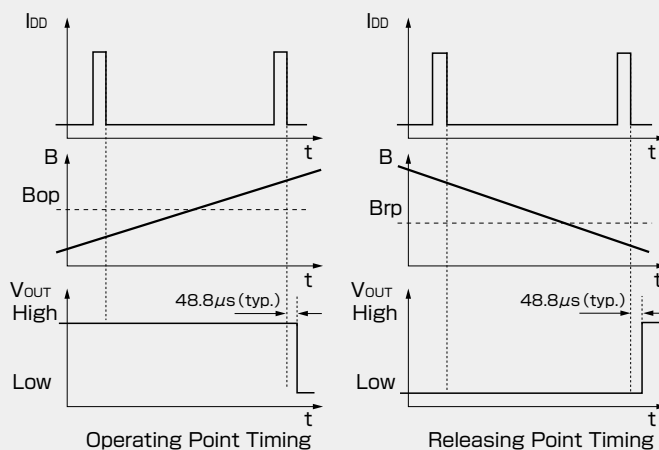
●Footprint (for reference)



No.	Pin name	Function	Note
1	VDD	Power supply	
2	VSS	Ground	
3	OUT2	S pole detection output	CMOS Output
4	OUT1	N pole detection output	CMOS Output

● I_{DD} Timing Chart

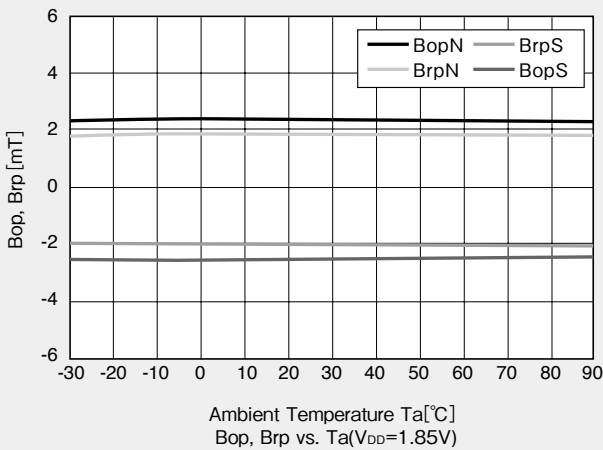
●Functional Timing Chart



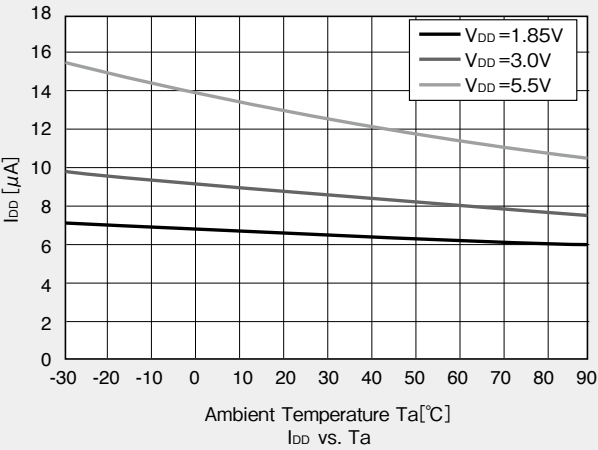
Note) Hall effect IC's output is held as internal data just before the internal circuit turns off. And after 48.8ms (typ.) the output changes.

a

●Typical Characteristics Data (for reference)



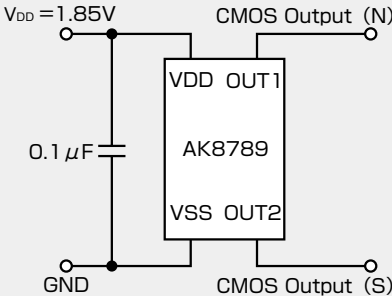
Temperature dependence of sensitivity



Temperature dependence of current consumption (Average)

f

●Application Circuit



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