AK8789

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

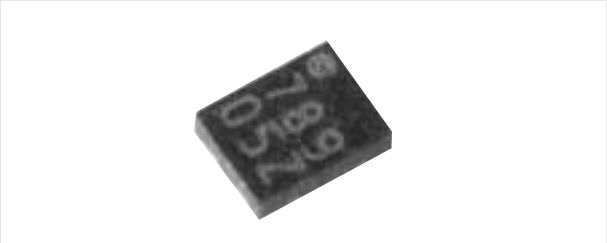
AK8789 is ultra-small Hall effect IC of a single silicon chip composed of Hall element and a signal processing IC.

Unipolar Hall Effect Switch Two output for S and N-pole	Supply Voltage 1.6~5.5V	Hall Element Pulse Excitation	High Sensitivity Bop:2.5mT	Output CMOS Two output for S and N-pole	SON

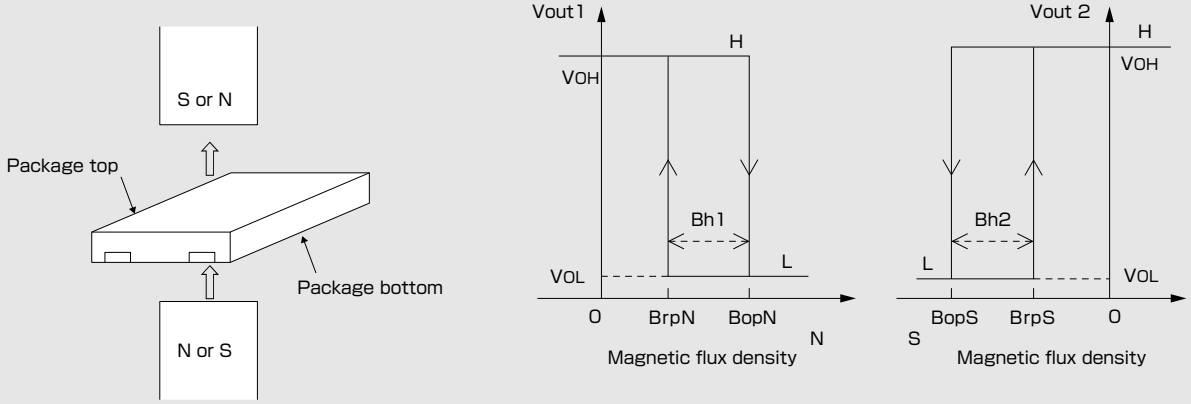
Notice:It is requested to read and accept "IMPORTANT NOTICE" written on the back of the front cover of this catalogue.

●Features

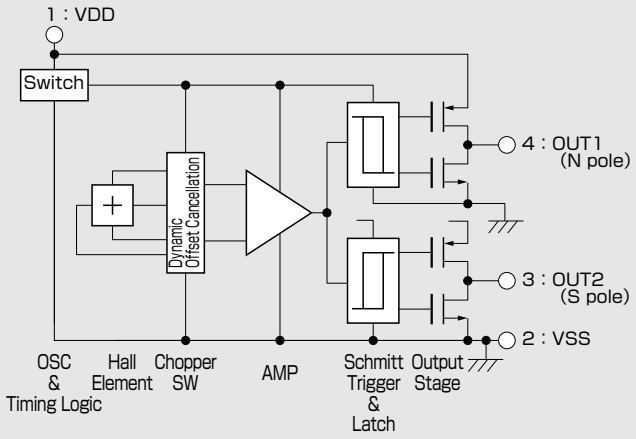
- High sensitive omnipolar operation
- Dual output
- Micropower operation
  Typ.6.5μA (average:V_{DD}=1.85V)
- Ultra small SON package : 1.1×1.4×t0.37mm
  Halogen free



●Operational Characteristics



●Functional Block Diagram



Item	Function
OSC	Generates operating clock
Timing logic	Generates timing signal requires for Chopper SW, AMP and COMP
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
Output Stage	CMOS output, During the power down mode, output is latched in its previous state

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●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	℃

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	
Operating temperature	T_a	−30		+85	

●Electrical Characteristics (Ta=25℃ VDD=1.85V)

Item	symbol	Min.	Typ.	Max.	Unit	Note
Current consumption	I_{DD1}		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	220	μs	

●Magnetic Characteristics① (Ta=25℃ VDD=1.85V)

Item	symbol	Min.	Typ.	Max.	Unit
Operating points	$B_{op}N$	*1.4	2.5	3.2	mT
	$B_{op}S$	−3.2	−2.5	*−1.4	mT
Releasing points	$B_{rp}N$	1.2	2.0	*3.0	mT
	$B_{rp}S$	*−3.0	−2.0	−1.2	mT
Hysteresis	BhN,BhS	*0.1	0.5		mT

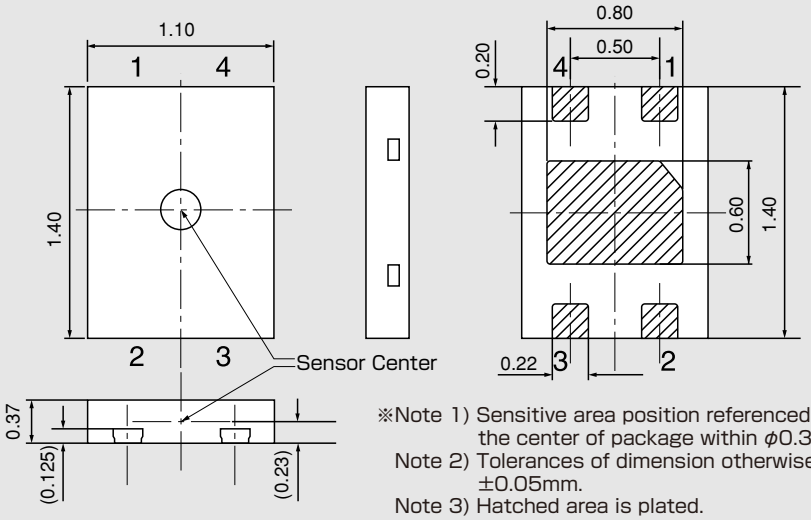
The characteristics with * marks are design targets.

●Magnetic Characteristics② (Ta=−30℃～85℃ VDD=1.6～5.5V)

Item	symbol	Min.	Typ.	Max.	Unit
Operating points	$B_{op}N$	1.3	2.5	3.5	mT
	$B_{op}S$	−3.5	−2.5	−1.3	mT
Releasing points	$B_{rp}N$	1.1	2.0	3.3	mT
	$B_{rp}S$	−3.3	−2.0	−1.1	mT
Hysteresis	BhN,BhS	0.1	0.5		mT

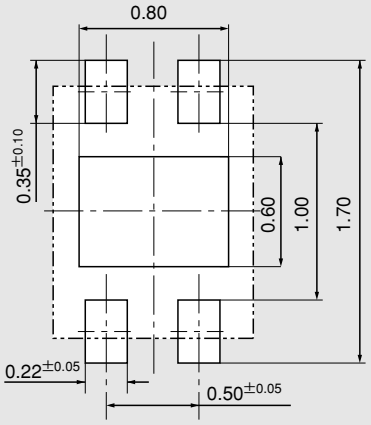
The specifications in Magnetic Characteristics ② are design targets.

●Package (Unit:mm)



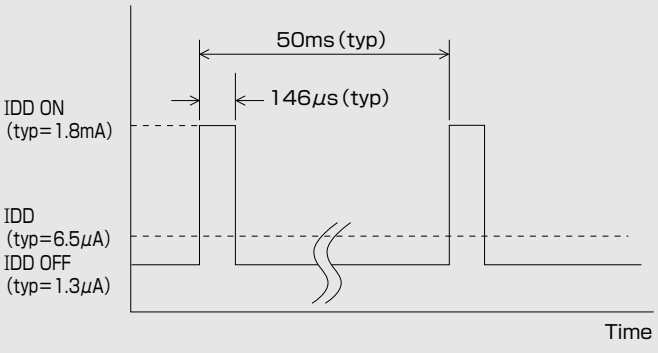
※Note 1) Sensitive area position referenced to the center of package within ϕ0.3mm circle.
Note 2) Tolerances of dimension otherwise noted is ±0.05mm.
Note 3) Hatched area is plated.
Note 4) Center pad area (TAB) should be tied to the VSS or floating

●Footprint (for reference)

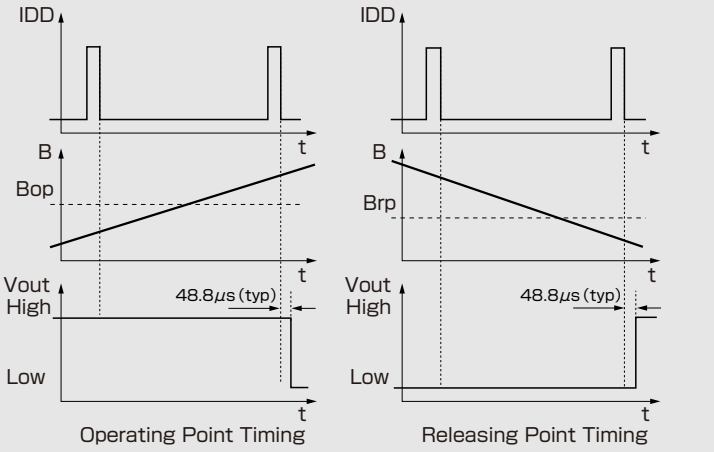


No.	Pin name	Function	Note
1	VDD	Power supply pin	
2	VSS	Ground pin	
3	OUT2	S pole detection output pin	CMOS Output*
4	OUT1	N pole detection output pin	CMOS Output*

●IDD Timing Chart

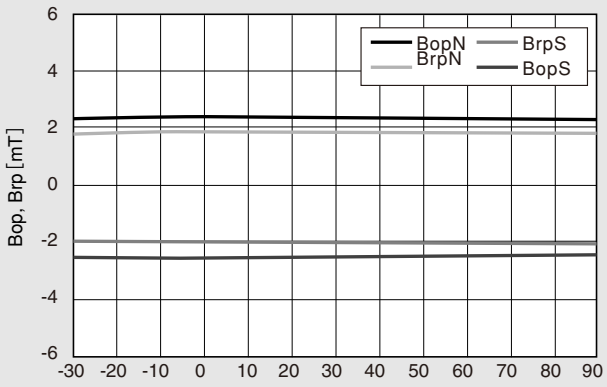


●Functional Timing Chart



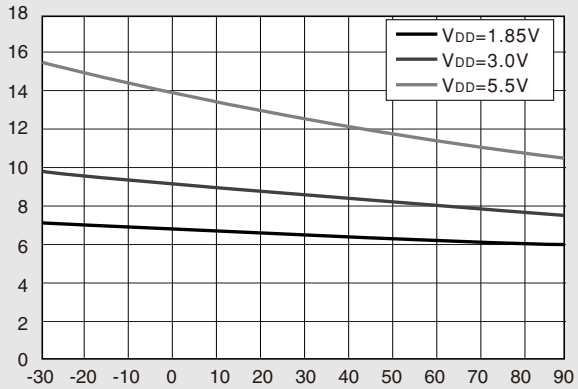
Note: Hall IC's output is held as internal data just before the internal circuit turns off. And after 48.8ms (typ.) the output changes.

●Typical Characteristics Data (for reference)



Bop, Brp vs. Ta(VDD=1.85V)

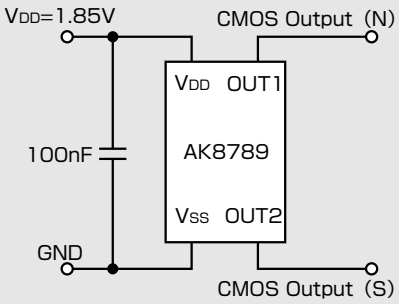
Temperature dependence of sensitivity



IDD vs. Ta

Temperature dependence of current consumption (Average)

●Application Circuit



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October 8, 2010