AK8788

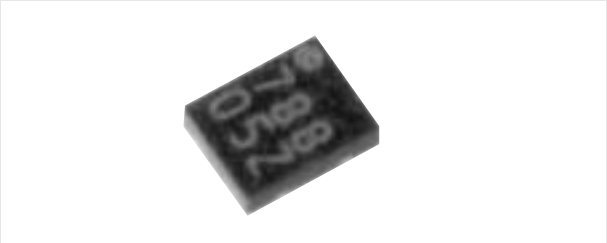
Shipped in packet-tape reel(5000pcs/Reel)

AK8788 is ultra-small Hall effect IC of a single silicon chip composed of Hall element and a signal processing IC.

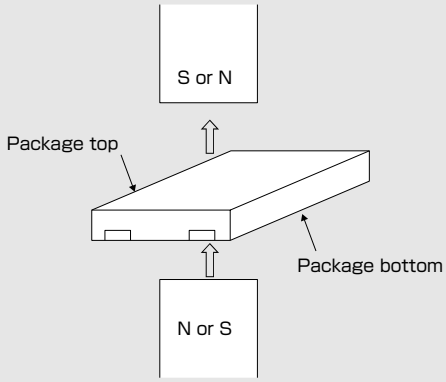
Omnipolar Hall Effect Switch	Supply Voltage 1.6~5.5V	Hall Element Pulse Excitation	High Sensitivity Bop:3mT	Output CMOS	SON

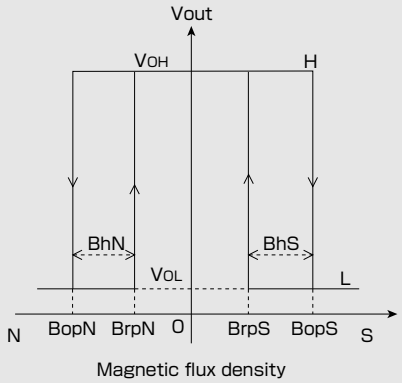
●Features

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

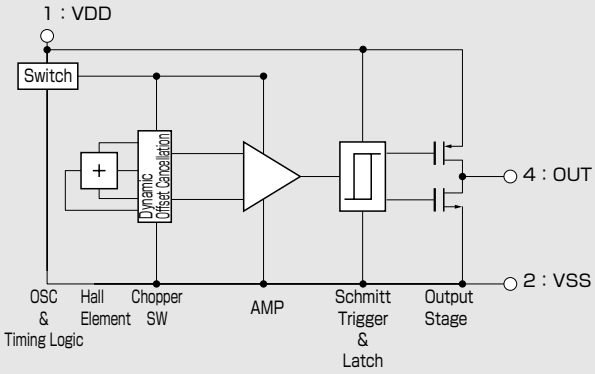


●Operational Characteristics





●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	V
Operating temperature	T_a	−30		+85	℃

●Electrical Characteristics① (Ta=25℃ VDD=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 (Ta=−30℃～85℃ VDD=1.6～5.5V)

Item	symbol	Min.	Typ.	Max.	Unit	Note
Current consumption	I_{DD}		4.5	15	μA	
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 (Ta=25℃ VDD=1.85V)

Item	symbol	Min.	Typ.	Max.	Unit
Operating points	$B_{op}S$	*1.4	3.0	4.0	mT
	$B_{op}N$	−4.0	−3.0	*−1.4	mT
Releasing points	$B_{rp}S$	1.1	2.2	*3.7	mT
	$B_{rp}N$	*−3.7	−2.2	−1.1	mT
Hysteresis	BhS,BhN	*0.3	0.8	*1.5	mT

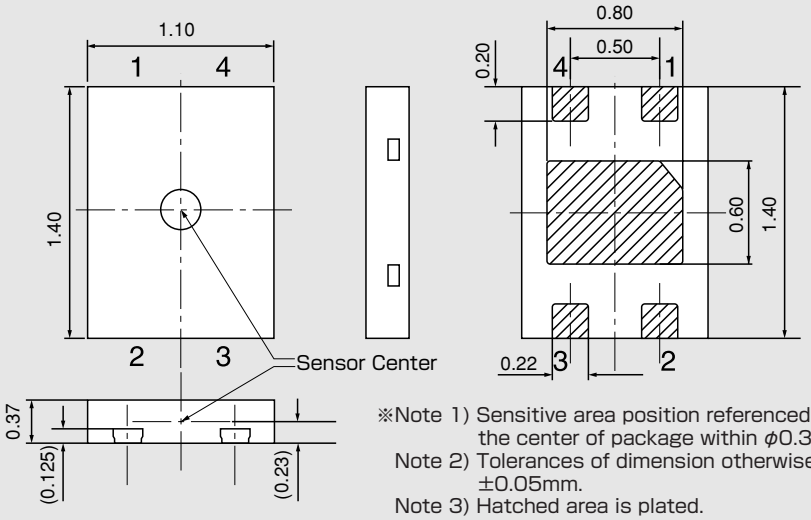
Note) The characteristics with * mark are design targets.

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

Item	symbol	Min.	Typ.	Max.	Unit
Operating points	$B_{op}S$	1.2	3.0	4.4	mT
	$B_{op}N$	−4.4	−3.0	−1.2	mT
Releasing points	$B_{rp}S$	0.9	2.2	4.1	mT
	$B_{rp}N$	−4.1	−2.2	−0.9	mT
Hysteresis	BhS,BhN	0.1	0.8	1.7	mT

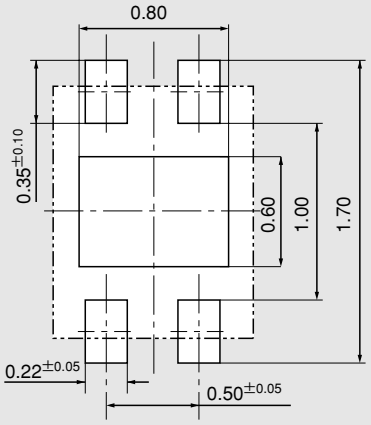
Note) The specifications in Magnetic Characteristics ② are design targets.

●Package (Unit:mm)



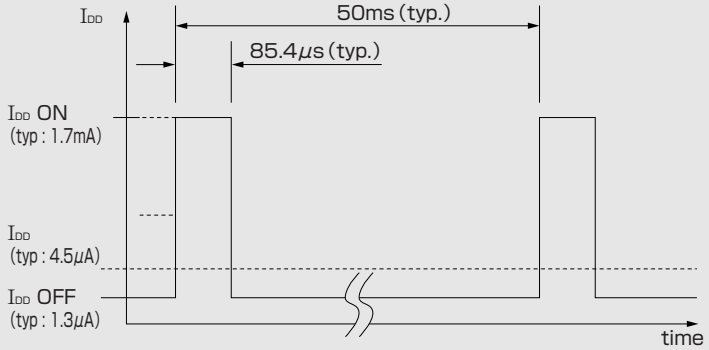
※Note 1) Sensitive area position referenced to the center of package within ϕ0.3mm circle.
Note 2) Tolerances of dimension otherwise noted is ±0.05mm.
Note 3) Hatched area is plated.
Note 4) Center pad area (TAB) should be tied to the VSS or floating

●Footprint (for reference)

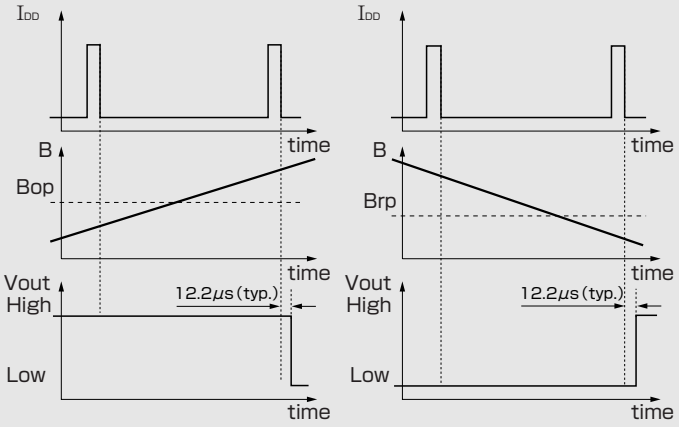


Pin No.	Pin name	Function	Note
1	VDD	Power supply pin	
2	VSS	Ground pin	
3	N.C.	(No internal connection)	Connect to VSS externally
4	OUT	Output pin	CMOS output

●IDD Timing Chart



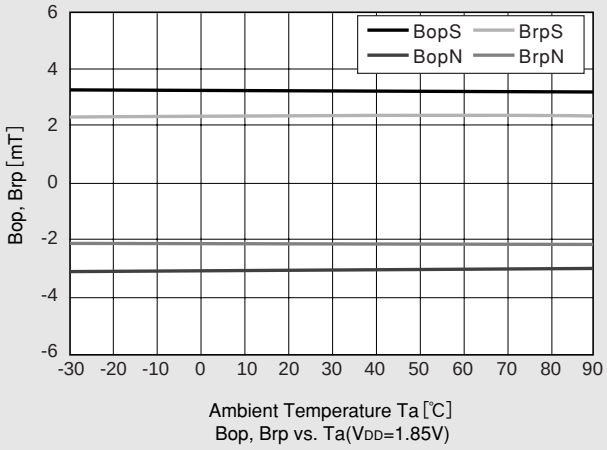
●Functional Timing Chart



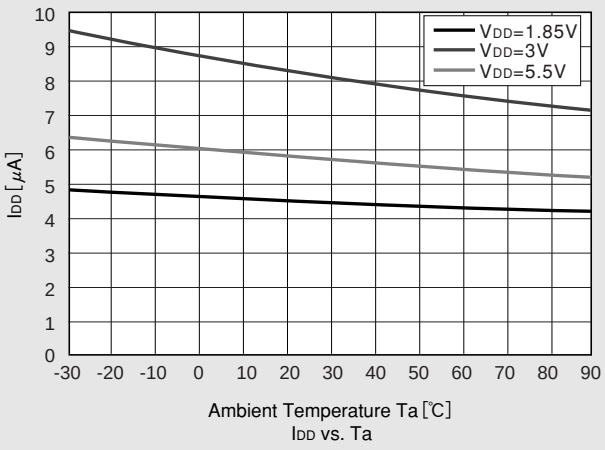
Operating Point Timing Releasing Point Timing

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

●Typical Characteristics Data (for reference)

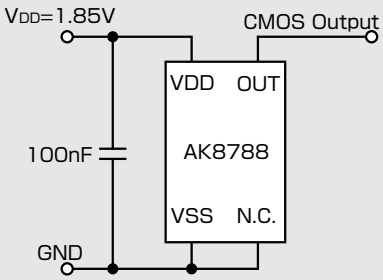


Temperature dependence of sensitivity



Temperature dependence of current consumption (Average)

●Application Circuit



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April 4, 2012