

Features

- Micropower operation
- Operation with magnetic field of either north or south pole (omnipolar)
- 2.5V to 5.5V battery operation
- Chopper stabilized
 - Superior temperature stability
 - Extremely Low Switch-Point Drift
 - Insensitive to Physical Stress
- Good RF noise immunity
- -40°C to 85°C operating temperature
- ESD (HBM) > 5KV
- DFN2015-6 and DFN3020-6: Available in "Green" Molding Compound (No Br, Sb)
- Lead Free Finish/ RoHS Compliant (Note 1)

General Description

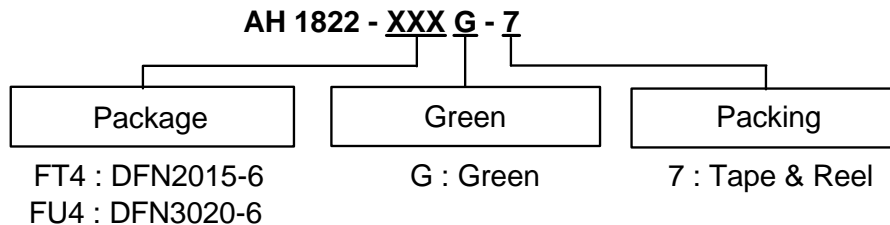
AH1822 is comprised of two Hall effect plates and an open-drain output driver, mainly designed for battery-operation, hand-held equipment (such as Cellular and Cordless Phone, PDA). The total power consumption in normal operation is typically 24μW with a 3V power source.

Either north or south pole of sufficient strength will turn the output on. The output will be turned off under no magnetic field. While the magnetic flux density (**B**) is larger than operating point (**Bop**), the output will be turned on (low), the output is held until **B** is lower than release point (**Brp**), then turned off.

Applications

- Cover switch in clam-shell cellular phones
- Cover switch in Notebook PC/PDA
- Contact-less switch in consumer products

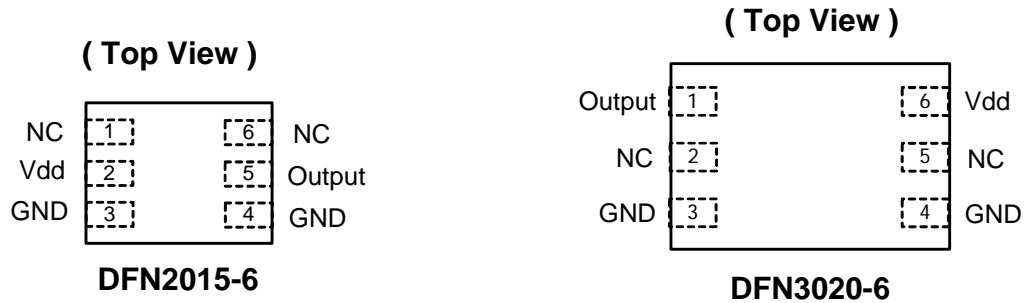
Ordering Information



| Device | Package Code | Packaging (Note 2) | 7" Tape and Reel | |
|---------------|--------------|--------------------|------------------|--------------------|
| | | | Quantity | Part Number Suffix |
| AH1822-FT4G-7 | FT4 | DFN2015H4-6 | 3000/Tape & Reel | -7 |
| AH1822-FU4G-7 | FU4 | DFN3020H4-6 | 3000/Tape & Reel | -7 |

Notes: 1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied, see *EU Directive 2002/95/EC Annex Notes*.
 2. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.

Pin Assignments

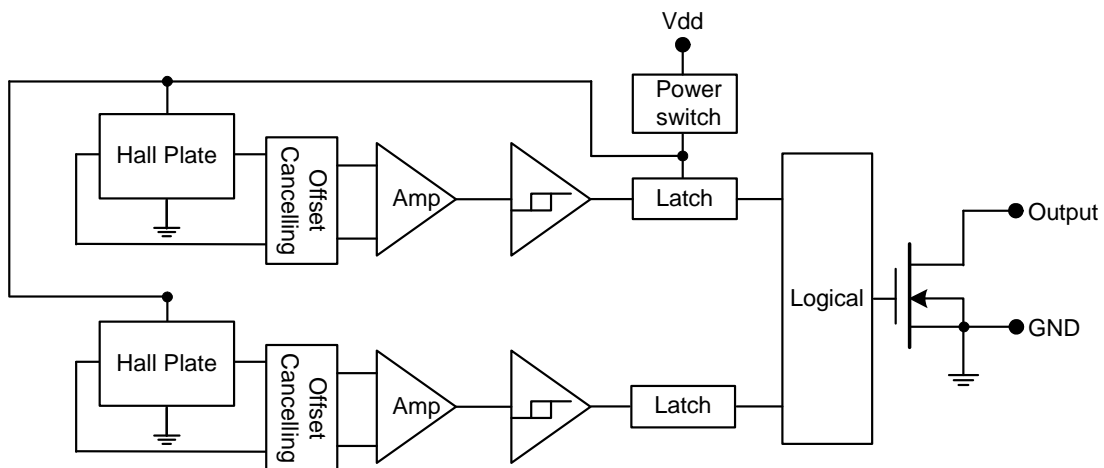


Notes: 3. NC is "No Connection" which is recommended to be tied to ground.

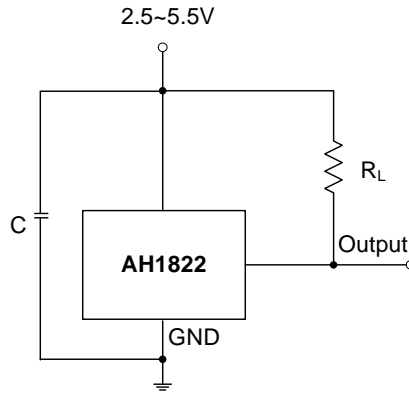
Pin Descriptions

| Pin Name | P/I/O | Description |
|----------|-------|--------------------|
| Vdd | P/I | Power Supply Input |
| GND | P/I | Ground |
| Output | O | Output Pin |
| NC | NC | No Connected |

Block Diagram



Typical Circuit



Notes: 4. C is for power stabilization and to strengthen the noise immunity, the recommended capacitance is 10nF~100nF.
 R_L is the pull-up resistor, the recommended resistance is 10K Ω ~100K Ω .

Absolute Maximum Ratings (at $T_A = 25^\circ\text{C}$)

| Symbol | Characteristics | Values | Unit |
|-----------------|------------------------------|-------------|------|
| V _{dd} | Supply voltage | 7 | V |
| B | Magnetic flux density | Unlimited | |
| T _{ST} | Storage Temperature Range | -65 to +150 | °C |
| P _D | Package Power Dissipation | 230 | mW |
| T _J | Maximum Junction Temperature | 150 | °C |

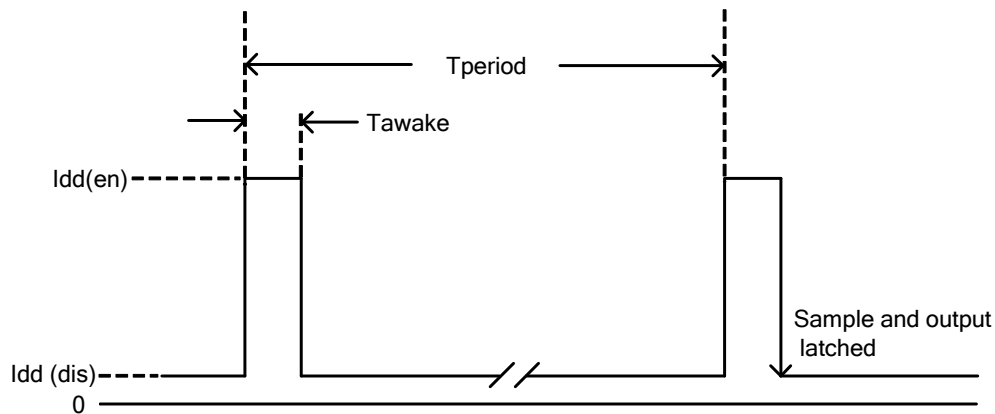
Recommended Operating Conditions

| Symbol | Parameter | Conditions | Rating | Unit |
|-----------------|-----------------------------|------------|------------|------|
| V _{dd} | Supply Voltage | Operating | 2.5~5.5 | V |
| T _A | Operating Temperature Range | Operating | -40 to +85 | °C |

Electrical Characteristics (TA = +25°C, Vdd = 3V; unless otherwise specified)

| Symbol | Characteristic | Conditions | Min | Typ. | Max | Unit |
|----------|------------------------|--|-----------------------------|------|-----|------|
| Vout | Output On Voltage | Iout=1mA | — | 0.1 | 0.3 | V |
| Ioff | Output Leakage Current | Vout=5.5V, Output off | — | <0.1 | 1 | μA |
| Idd(en) | Supply Current | Chip enable, TA= 25°C, Vdd = 3V | — | 3 | 6 | mA |
| Idd(en) | | Chip enable, TA= -40~85°C, Vdd = 2.5~5.5V | — | 3 | 10 | mA |
| Idd(dis) | | Chip disable, TA= 25°C, Vdd = 3V | — | 5 | 10 | μA |
| Idd(dis) | | Chip disable, TA= -40~85°C, Vdd = 2.5~5.5V | — | 5 | 18 | μA |
| Idd(avg) | | Average supply current, TA= 25°C, Vdd = 3V | — | 8 | 16 | μA |
| Idd(avg) | | Average supply current, TA= -40~85°C, Vdd = 2.5~5.5V | — | 8 | 28 | μA |
| Fc | | Chopping Frequency | For design information only | — | 300 | — |
| Tawake | Awake Time | (Note 5) | — | 75 | 150 | μs |
| Tperiod | Period | (Note 5) | — | 75 | 150 | ms |
| D.C. | Duty Cycle | | — | 0.1 | — | % |

Notes: 5. When power is initially on, the operating Vdd (2.5V to 5.5V) must be applied to be guaranteed for the output sampling. The output state is valid after the second operating phase (typical 150ms).

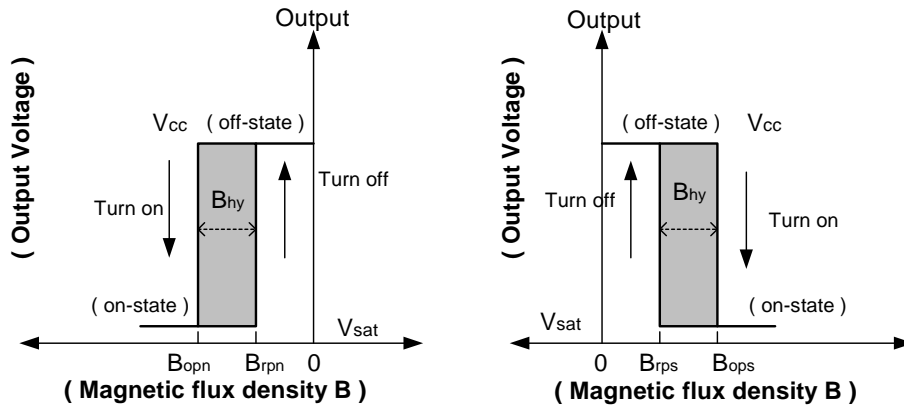


Magnetic Characteristics (TA=25°C, Vdd=3V, Note 6, 7)

(1mT=10 Gauss)

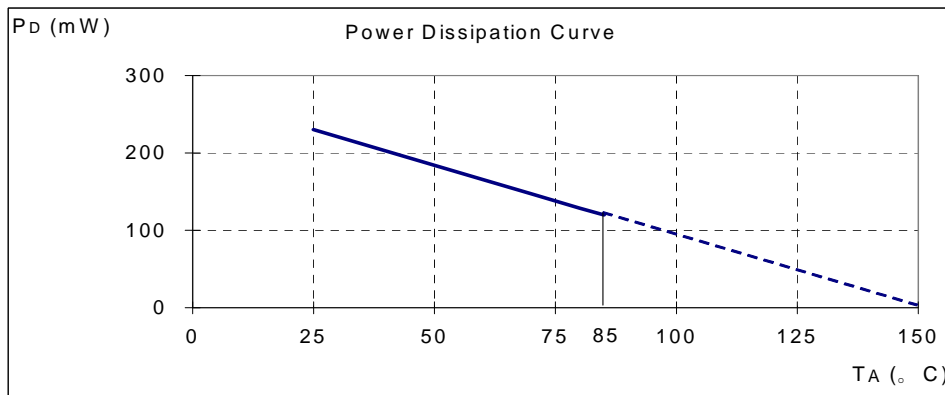
| Symbol | Characteristic | Min | Typ. | Max | Unit |
|--------------------------------|----------------|-----|------|-----|-------|
| Bops(south pole to brand side) | Operate Point | - | 28 | 55 | Gauss |
| Bopn(north pole to brand side) | | -55 | -28 | - | |
| Brps(south pole to brand side) | Release Point | 10 | 20 | - | |
| Brpn(north pole to brand side) | | - | -20 | -10 | |
| Bhy(Bopx - Brpx) | Hysteresis | 5 | 8 | - | |

Notes: 6. Typical data is at Ta = 25°C, Vdd = 3V, and for design information only.
7. Operating point and release point will vary with supply voltage and operating temperature.



Performance Characteristics

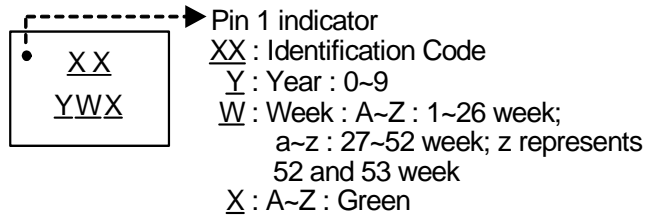
| TA (°C) | 25 | 50 | 60 | 70 | 80 | 85 | 90 | 100 | 110 | 120 | 130 | 140 | 150 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| PD (mW) | 230 | 184 | 166 | 147 | 129 | 120 | 110 | 92 | 74 | 55 | 37 | 18 | 0 |



Marking Information

(1) DFN2015-6

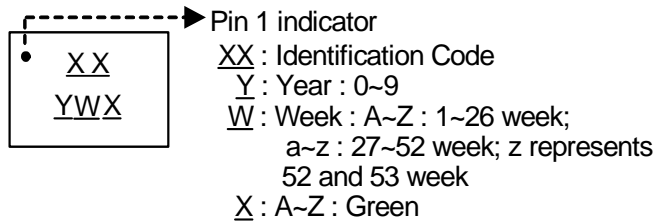
(Top View)



| Part Number | Package | Identification Code |
|-------------|-----------|---------------------|
| AH1822 | DFN2015-6 | K7 |

(2) DFN3020-6

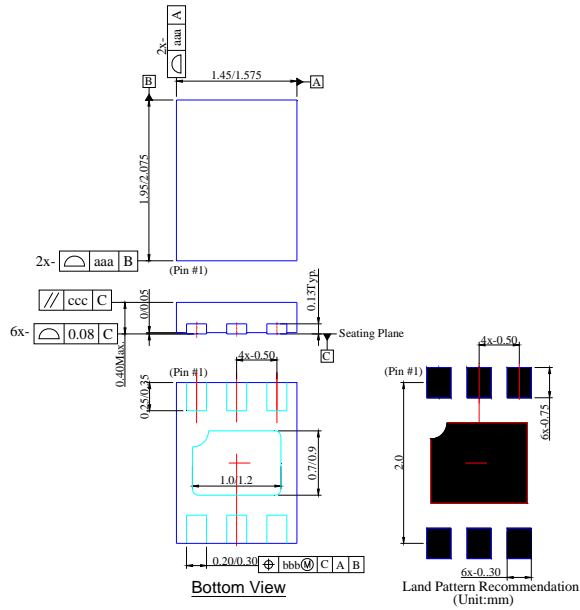
(Top View)



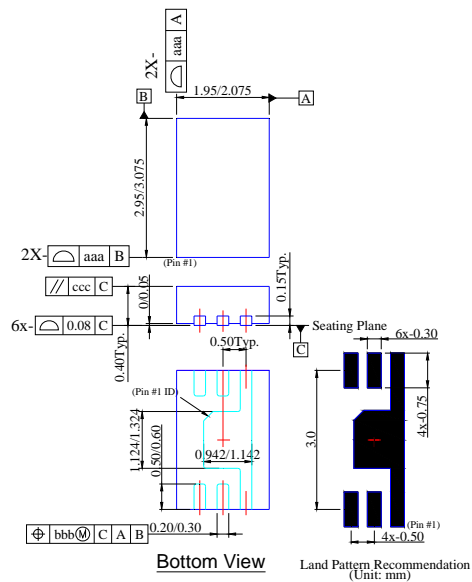
| Part Number | Package | Identification Code |
|-------------|-----------|---------------------|
| AH1822 | DFN3020-6 | K8 |

Package Information (All Dimensions in mm)

(1) Package type: DFN2015-6

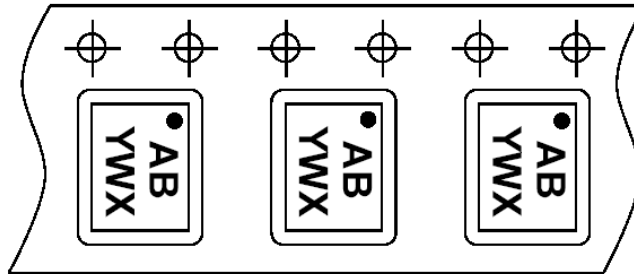


(2) Package type: DFN3020-6

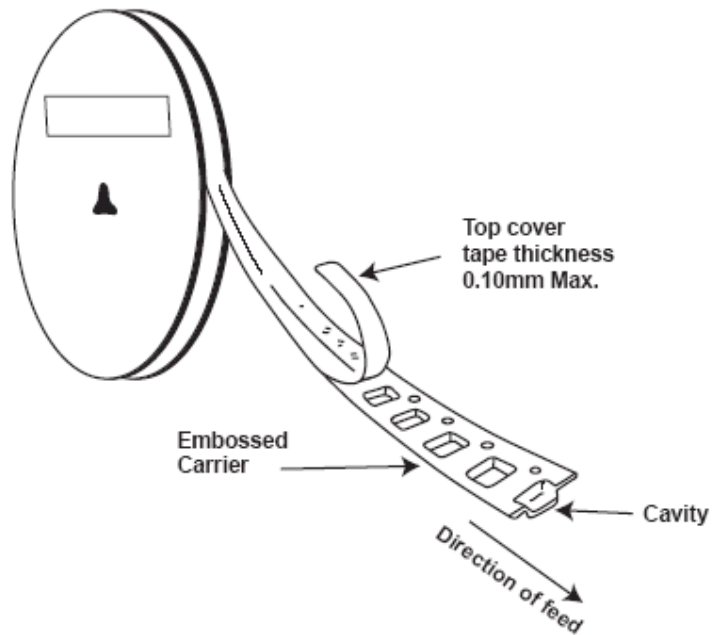
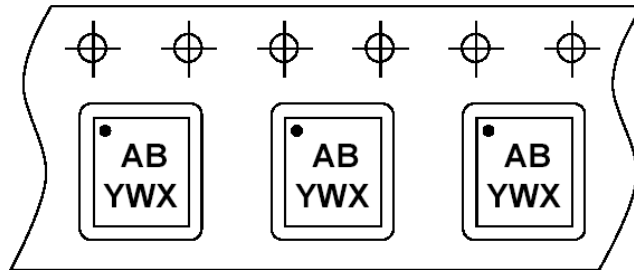


Taping Orientation

(1) DFN2015-6



(2) DFN3020-6



Notes: 8. The taping orientation of the other package type can be found on our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

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