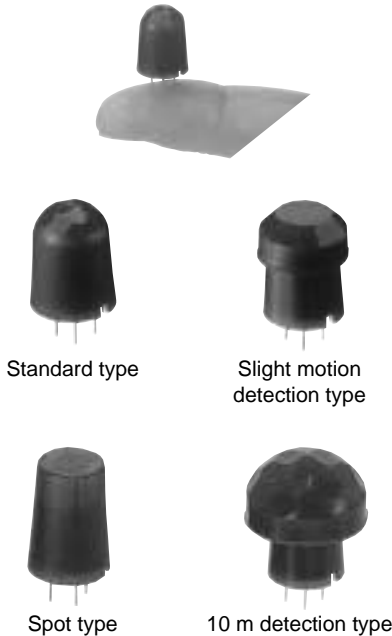


NAiS

MOTION SENSOR (PASSIVE INFRARED TYPE)

MP MOTION SENSOR 'NaPiOn'

NaPiOn web page URL:
<http://www.napion.com/>



FEATURES

1. The world's smallest with a built-in amplifier

Extremely compact. Ideal for use in miniaturized devices.

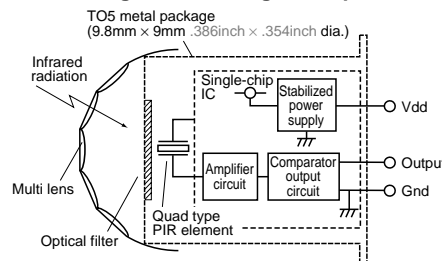
2. Dual lens colors (white and black) are provided

With an ultrasmall design and dual lens colors (white and black), it is inconspicuous, allowing the user to select either white or black to match the equipment color. This provides greater flexibility in equipment design.

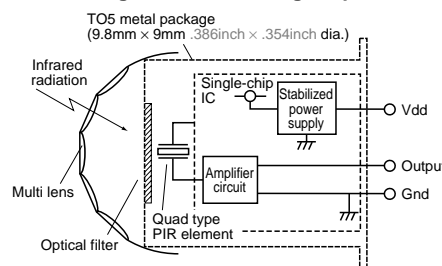
3. Both digital output and analog output (with adjustable sensitivity) are available.

Has a built-in amplifier, and can be connected directly to a microcomputer.

• Block diagram of the digital output circuit



• Block diagram of the analog output circuit



5. Detects even slight motion of a person

With our sensor, even slight motions made by people will be detected easily.

• Fine motion detection capability within approximately 2 meters of sensor.

Standard type:

Detects movement of approximately 30cm 11.811inch.

Slight motion detection type:

Detects movement of approximately 20cm 7.874inch.

6. Noise withstanding capability

Circuitry is contained in a TO5 metal package, providing at least twice the noise withstanding capability as conventional type.

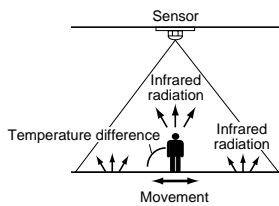
• Comparison example of noise withstanding capability

| | Distance at which motion sensor is not affected by cellular phone noise |
|-------------------|---|
| Conventional type | Min. 1 to 2m 3.281 to 6.562ft |
| MP Motion Sensor | Min. 1 to 2cm .394 to .787inch |

What is passive infrared type?

This sensor detects changes in infrared radiation which occur when there is movement by a person (or object) which is different in temperature from the surroundings.

- As this sensor detects temperature differences, it is well suited to detecting the motion of people by their body temperature.
- Wide sensing area.



APPLICATIONS

1. Home appliances

Useful for saving energy in air conditioner, television, personal computer, or ventilator and air purifier

2. Amusement machine market

Useful for saving energy and for automated guidance in theme parks and large video games

3. Equipment in service market

Useful for automated guidance, automated announcements and energy saving in vending machines, ATMs, etc.

4. Lighting market

Automated on/off controls, etc. for lamps, desk lamps, indoor lights, halls, stairway lights, etc.

ORDERING INFORMATION

Output

- Digital output
- Analog output

Detection performance

- Standard detection type
- Slight motion detection type
- Spot detection type
- 10m detection type

Feature

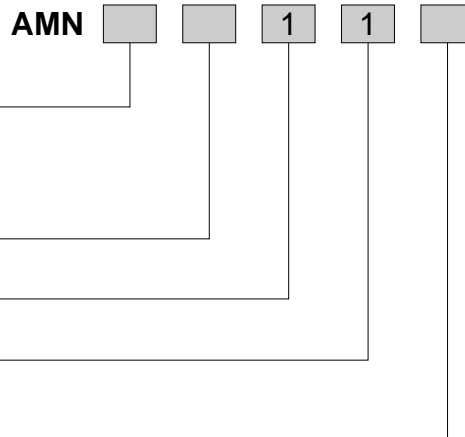
- PC board mounting type

Operating voltage

- 5V DC

Lens color

- Black
- White



PRODUCT TYPES

1. Digital output

| Rated operating voltage | Detection performance | Ambient temperature | Lens color | Part No. | Packing quantity | |
|-------------------------|------------------------------|---------------------------|------------|----------|------------------|------------|
| | | | | | Inner | Outer |
| 3 to 6 V DC | Standard detection type | -20 to +60°C -4 to +140°F | Black | AMN11111 | 50 pcs. | 1,000 pcs. |
| | | | White | AMN11112 | | |
| | Slight motion detection type | | Black | AMN12111 | | |
| | | | White | AMN12112 | | |
| | Spot detection type | | Black | AMN13111 | | |
| | | | White | AMN13112 | | |
| | 10m detection type | | Black | AMN14111 | | |
| | | | White | AMN14112 | | |

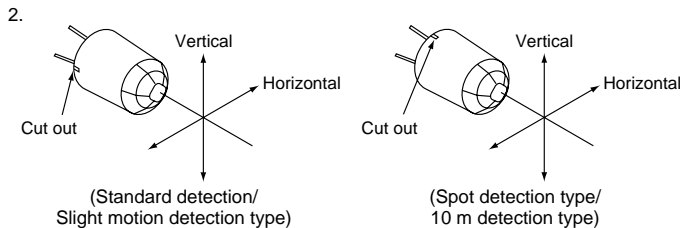
2. Analog output

| Rated operating voltage | Detection performance | Ambient temperature | Lens color | Part No. | Packing quantity | |
|-------------------------|------------------------------|---------------------------|------------|----------|------------------|------------|
| | | | | | Inner | Outer |
| 4.5 to 5.5 V DC | Standard detection type | -20 to +60°C -4 to +140°F | Black | AMN21111 | 50 pcs. | 1,000 pcs. |
| | | | White | AMN21112 | | |
| | Slight motion detection type | | Black | AMN22111 | | |
| | | | White | AMN22112 | | |
| | Spot detection type | | Black | AMN23111 | | |
| | | | White | AMN23112 | | |
| | 10m detection type | | Black | AMN24111 | | |
| | | | White | AMN24112 | | |

PERFORMANCE

1. Detection performance

| Items | | Standard detection type | Slight motion detection type | Spot detection type | 10m detection type | Conditions of objects to be detected |
|---|-------------------------------------|-------------------------|------------------------------|---------------------|---------------------|---|
| Rated detection distance* ^{Remark 1} | | 5m 16.404ft (Max.) | 2m 6.562ft (Max.) | 5m 16.404ft (Max.) | 10m 32.808ft (Max.) | 1. Detectable difference in temperature between the target and background for the spot type is more than 4°C 39.2°F. 2. Movement speed • Standard detection type/Spot detection type/ 10m detection type: 1.0 m/s • Slight motion detection type: 0.5 m/s 3. Detection object = human body (size is 700mm × 250mm 27.559inch × 9.843inch, but for the slight motion detection type the size is 200mm × 200mm 7.874inch × 7.874inch) |
| Detection range | Horizontal* ^{Remark 2} | 100° | 91° | 38° | 110° | |
| | Vertical* ^{Remark 2} | 82° | 91° | 22° | 93° | |
| | Detection zone* ^{Remark 3} | 64 zones | 104 zones | 24 zones | 80 zones | |



*Remarks 1. Depending on the difference in temperature between the background and detection target and the speed at which the target moves, these sensors may be capable of detection beyond the detection distances stated above. Nevertheless, they should be used within the prescribed detection distances. For further details, refer to the detection range diagram on page 7.

3. Regarding of detection zone, please refer to "DETECTION PERFORMANCE" on page 7.

2. Rating (Measuring condition: ambient temp. = 25°C 77°F) (Common to All types)

| Items | Specified value | Remarks |
|----------------------------|--------------------------|--|
| Power supply voltage | -0.3 to 7 V DC | |
| Usable ambient temperature | -20 to 60°C -4 to +140°F | No freezing and condensing at low temperature. |
| Storage temperature | -20 to 70°C -4 to +158°F | |

3. Electrical characteristics (Measuring condition: ambient temp. = 25°C 77°F; operating voltage = 5V) (Common to All types)

1) Digital output

| Items | | Symbol | Specified value | Measured conditions |
|--|---------|------------------|---|---|
| Reted operating voltage | Minimum | V _{dd} | 3.0 V DC | |
| | Typical | | — | |
| | Maximum | | 6.0 V DC | |
| Reted consumption current (Standby)* ^{Remark} | | I _w | 170 μA | I _{out} = 0 |
| | | | 300 μA | |
| Output (when detecting) | Current | I _{out} | 100 μA | V _{out} 7 V _{dd} -0.5 |
| | Voltage | V _{out} | V _{dd} -5 V _{dd} (Same as operating voltage) | Open when not detecting |
| Circuit stability time | | T _{wu} | 7 s | |
| | | | 30 s | |

Remark: The current which is consumed during detection consists of the standby consumed current plus the output current.