
**GYROSTAR®**

 GYROSTAR® is the trademark of  
Murata Manufacturing Co., Ltd.

**muRata**

## Piezoelectric Vibrating Gyroscope **ENC** Series

# Ultra-Small angular velocity sensor with Murata's unique ceramic bimorph vibrating unit.

This product is an angular velocity sensor that uses the phenomenon of Coriolis force, which is generated when a rotational angular velocity is applied to the oscillating body. To achieve its ultra-small size, ultra-lightweight, and quick-response capability, the circuitry has been converted to a custom IC in addition to a sensor element using a Murata's original, ultra-small, ceramic bimorph vibrating unit. This product offers many excellent features such as a quick-response feature when detecting a moving object or the increased flexibility of installment because of its small and lightweight design.

### ■ FEATURES

1. Ultra-small and ultra-lightweight
2. Quick response
3. Low driving voltage ; low current consumption
4. Reliable features achieved by a built-in-AGC circuit

### ■ APPLICATIONS

1. Detecting hand movement involved in video and still cameras
2. Detecting vibrations in various vibration free table and isolators
3. Detecting the own movement

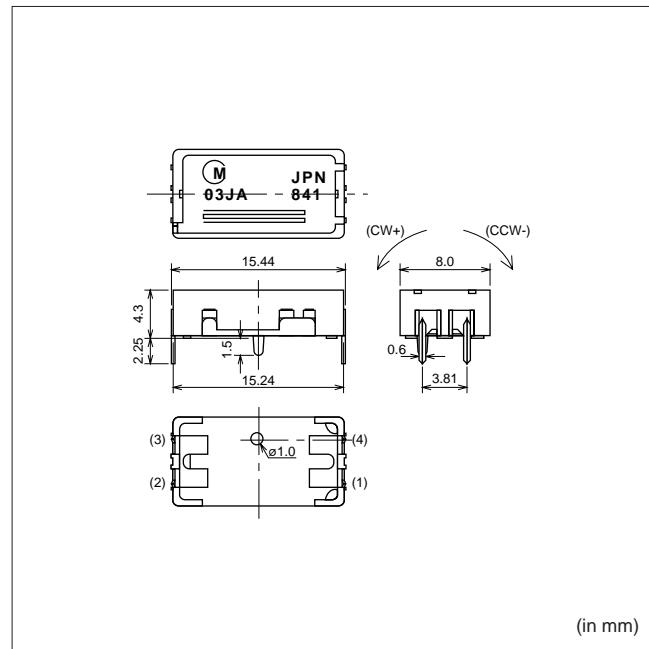
### ■ RATINGS

|                                       |              |
|---------------------------------------|--------------|
| Part Number                           | ENC-03J      |
| Supply voltage (Vdc)                  | +2.7 to +5.5 |
| Current consumption (mA max.)         | 5            |
| Max. angular velocity ('/s)           | ±300         |
| Output (at angular velocity=0) (Vdc)  | +1.35        |
| Scale factor (mV/'/s)                 | 0.67         |
| Temp. coefficient of scale factor (%) | ±20          |
| Linearity (%FS)                       | ±5           |
| Response (Hz max.)                    | 50           |
| Operating temperature range (°C)      | -5 to +75    |
| Storage temperature range (°C)        | -30 to +85   |
| Size (mm)                             | 15.5×8.0×4.3 |
| Weight (g max.)                       | 1.0          |

All typical values.

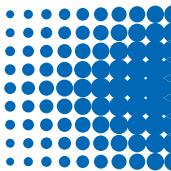


### ■ EXTERNAL DIMENSIONS



### ■ TERMINAL DESCRIPTIONS

| Terminal | Descriptions        |
|----------|---------------------|
| (1)      | Supply voltage      |
| (2)      | Comparative voltage |
| (3)      | Ground (GND)        |
| (4)      | Sensor output       |



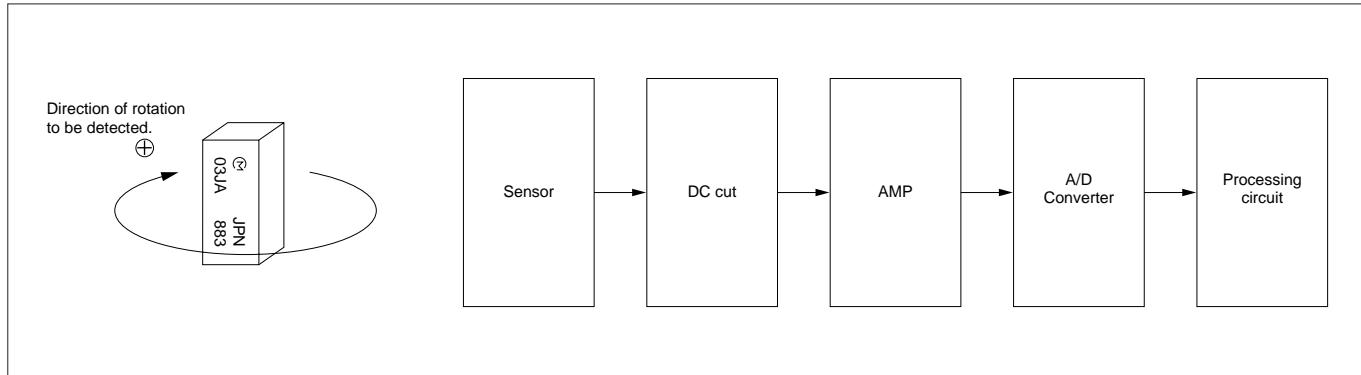
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## ■ APPLICATION



1. One sensor per axis of rotation to be detected.
2. For high-precision measurements, the effect of temperature drift (fluctuation of output in stationary state due to changes in ambient temperature) must be eliminated by removing the output's DC component. This can be accomplished by connecting a high-pass filter with low cut-off frequency to the sensor's output.
3. A low-pass filter capable of blocking out high frequency components above the response frequency must be connected to suppress the noise components in the sensor element near 25kHz.



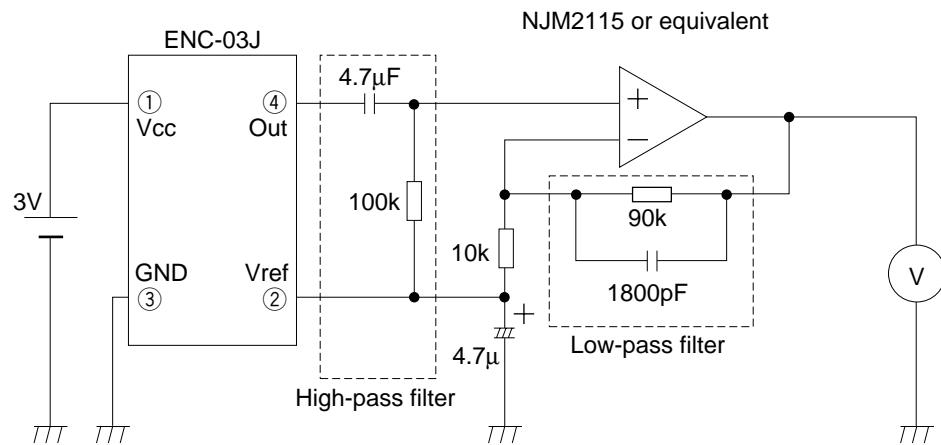
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## ■SAMPLE AMPLIFIER CIRCUIT



The high-pass filter's cut-off frequency in this circuit is approx. 0.3Hz. The low-pass filter's cut-off frequency in this circuit is approx. 1kHz.

## ■NOTICE

1. Incorrect handling may affect sensor characteristics.  
Please note the following precautions ;
  - (1) Do not subject the sensor to shock that exceeds the rated limit.
  - (2) Do not install the sensor in a location in which condensation is likely to form on it.
  - (3) Do not wash the sensor.
2. This sensor must be installed in the correct position relative to the direction of rotation to be detected.
3. This sensor must be installed where temperature does not vary significantly.
4. Precision electronic parts, such as ICs, are used for the sensor ; therefore, it is necessary to take anti-static measures when handling.


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**⚠ Note:**

## 1. Export Control

&lt;For customers outside Japan&gt;

Murata products should not be used or sold for use in the development, production, stockpiling or utilization of any conventional weapons or mass-destructive weapons (nuclear weapons, chemical or biological weapons, or missiles), or any other weapons.

&lt;For customers in Japan&gt;

For products which are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.

## 2. Please contact our sales representatives or product engineers before using our products listed in this catalog for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property, or when intending to use one of our products for other applications than specified in this catalog.

① Aircraft equipment

② Aerospace equipment

③ Undersea equipment

④ Medical equipment

⑤ Transportation equipment (vehicles, trains, ships,etc.)

⑥ Traffic signal equipment

⑦ Disaster prevention / crime prevention equipment

⑧ Data-processing equipment

⑨ Application of similar complexity and/or reliability requirements to the applications listed in the above

## 3. Product specifications in this catalog are as of March 1999. They are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before your ordering. If there are any questions, please contact our sales representatives or product engineers.

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## 6. None of ozone depleting substances (ODS) under the Montreal Protocol is used in manufacturing process of us.

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