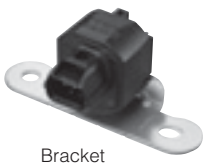
Electrostatic capacitance detection sensor 1-axis acceleration sensor

GF1

Discontinued


Direct mount


Bracket

Features

- High precision, High reliability : Superior offset voltage temperature characteristics (±33 mg (Typ.))
- High sensitivity : 1.333 to 3.0 V/g
- Compact size : 58×36.5×33 mm 2.283×1.437×1.299 inch (Direct-mount type)
- RoHS compliant

Typical Applications

- Automobiles : 4WD-ABS control, neutral control, idling stop system and suspension control
- Special vehicles : Inclination detection (for enhanced safety and operating efficiency) of agricultural machine, construction machine and welfare vehicles
- Photovoltaic generation : Sun tracking panels

Ordering Information

AGF 1 ☐ ☐ ☐ 1

- Number of detectable axis (Method): 1 : 1-axis accleration sensor (Electrostatic capacitance type)
- Installation type: 0 : Direct mount; 1 : Bracket
- Detection sensitivity: 3 : 0.136 V/(m/s²) (1.333 V/g); 7 : 0.306 V/(m/s²) (3.0 V/g)
- Operation power supply voltage: 1 : 5 V.DC; 2 : 12 V.DC; 3 : 24 V.DC
- Installation direction type: 1 : Horizontal type

Product Types

Carton : 80 pcs. (Bracket), 150 pcs. (Direct mount)

Product name	Operation power supply voltage	Acceleration detection range	Detection sensitivity	Installation type	Part number
1-axis accleration sensor GF1	5 V.DC	±11.76 m/s² (±1.2 g)	0.136 V/(m/s²) (1.333 V/g)	Bracket	AGF11311
		±4.9 m/s² (±0.5g)	0.306 V/(m/s²) (3.0 V/g)	Direct mount	AGF10711
	12 V.DC	±11.76 m/s² (±1.2 g)	0.136 V/(m/s²) (1.333 V/g)	Direct mount	AGF10321
		±4.9 m/s² (±0.5g)	0.306 V/(m/s²) (3.0 V/g)	Direct mount	AGF10721
	24 V.DC	±11.76 m/s² (±1.2 g)	0.136 V/(m/s²) (1.333 V/g)	Direct mount	AGF10331
		±4.9 m/s² (±0.5g)	0.306 V/(m/s²) (3.0 V/g)	Direct mount	AGF10731

Absolute Maximum Ratings

Product name		Unit	Absolute maximum ratings			Remarks
			AGF1☐☐11 (Power supply: 5 V.DC type)	AGF1☐☐21 (Power supply: 12 V.DC type)	AGF1☐☐31 (Power supply: 24 V.DC type)	
Maximum allowable voltage		V.DC	7	16	30	Max. Ta=25 °C 68 °F
Maximum applied acceleration	AGF1☐3☐1	g	15			Max.
	AGF1☐7☐1		5			Max.
Storage temperature range		°C °F	–30 to 85 –22 to 185			
Operation temperature range		°C °F	–30 to 85 –22 to 185			
Anti-shock characteristic		g	5,000			Max.
Grade of protection *			IP67			

Note : ✻ Performance when matching connector is connected.

Electrical Characteristics

● AGF1□3□1 (Sensitivity : 1.333 V/g type)

Item	Unit	Performance			Remarks
		AGF1□□11 (Power supply: 5 V.DC type)	AGF1□□21 (Power supply: 12 V.DC type)	AGF1□□31 (Power supply: 24 V.DC type)	
Operation power supply voltage	V.DC	5 V.DC±5 %	12 V.DC±10 %	24 V.DC±10 %	−30 °C to +85 °C −22 °F to +185 °F
Acceleration detection range *1	g (°)	±1.2 (90)			
Current consumption	mA	10	15		0g, Ta=20 °C 68 °F, Max.
Sensitivity	V/g	1.333±3 %			−30 °C to +85 °C −22 °F to +185 °F
Offset voltage (0g)	V	2.5±0.1			Ta=20 °C 68 °F
Offset voltage temperature characteristic	V	±0.093			−30 °C to +85 °C −22 °F to +185 °F
Other axis sensitivity	%	±5			Ta=20 °C 68 °F
Non-linearity *2	%FS	±1			Ta=20 °C 68 °F
Frequency response	Hz	10 to 15			−3 dB point
Clamping voltage VH *3	V	4.5	–	–	Typ.
Clamping voltage VL *3	V	0.5	–	–	Typ.

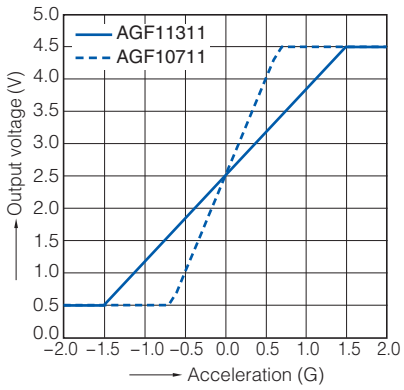
● AGF1□7□1 (Sensitivity : 3.0 V/g type)

Item	Unit	Performance			Remarks
		AGF1□□11 (Power supply: 5 V.DC type)	AGF1□□21 (Power supply: 12 V.DC type)	AGF1□□31 (Power supply: 24 V.DC type)	
Operation power supply voltage	V.DC	5 V.DC±5 %	12 V.DC±10 %	24 V.DC±10 %	−30 °C to +85 °C −22 °F to +185 °F
Acceleration detection range *1	g (°)	±0.5 (30)			
Current consumption	mA	10	15		0g, Ta=20 °C 68 °F, Max.
Sensitivity	V/g	3.0±3 %			−30 °C to +85 °C −22 °F to +185 °F
Offset voltage (0g)	V	2.5±0.1			Ta=20 °C 68 °F
Offset voltage temperature characteristic	V	±0.21			−30 °C to +85 °C −22 °F to +185 °F
Other axis sensitivity	%	±5			Ta=20 °C 68 °F
Non-linearity *2	%FS	±1			Ta=20 °C 68 °F
Frequency response	Hz	10 to 15			−3 dB point
Clamping voltage VH *3	V	4.5	–	–	Typ.
Clamping voltage VL *3	V	0.5	–	–	Typ.

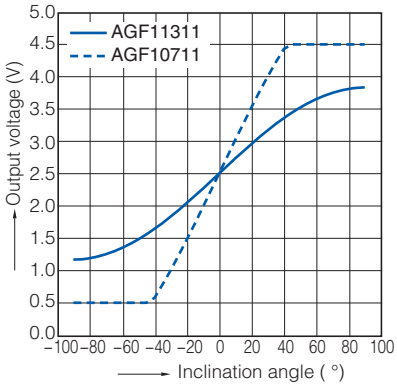
Note : ✻1 The acceleration unit "g" means 9.8 m/s^2.
✻2 Maximum error from linear output that connects +1.2 g and −1.2 g output. (AGF1□3□1)
Maximum error from linear output that connects +0.5 g and −0.5 g output. (AGF1□7□1)
✻3 The 12 V and 24 V.DC operating power supply voltage types can also be compatible with the clamping voltage. Please consult us.

Reference Data

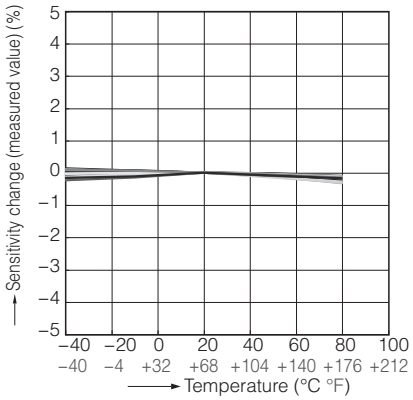
1. Output characteristics



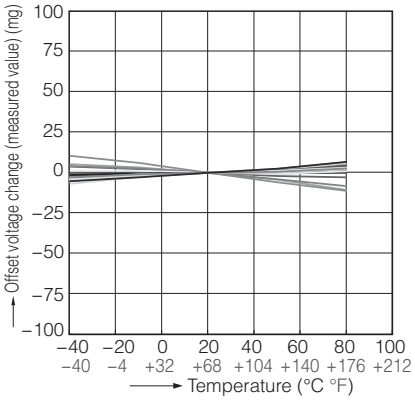
2. Inclination angle - Output voltage characteristics



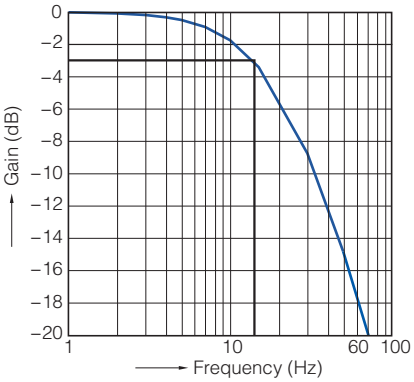
3. Sensitivity temperature characteristics



4. Offset voltage temperature characteristics



5. Frequency characteristics

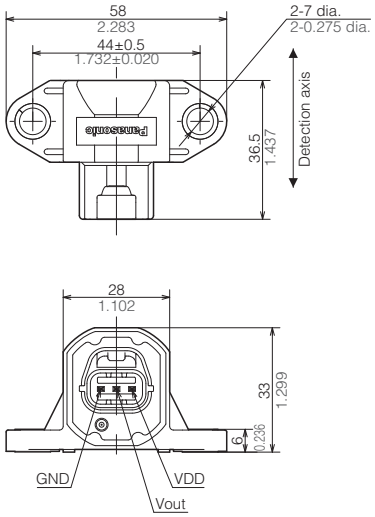


Dimensions

The CAD data of the products with a CAD Data mark can be downloaded from: http://industrial.panasonic.com/

● Direct mount (AGF10□□1)

CAD Data

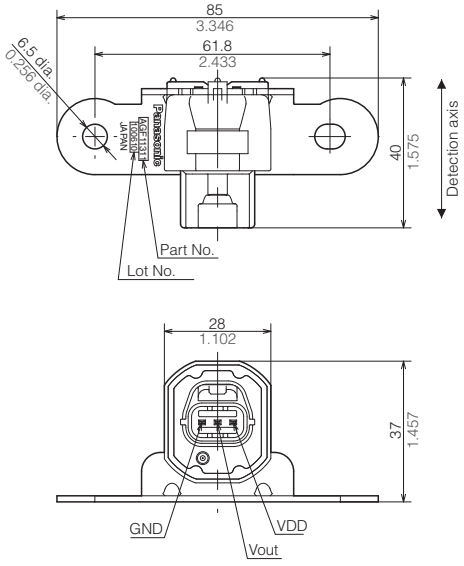


Matching connector:
Manufacturing company : Yazaki Corporation
Housing : 7283-8730-30

unit : mm inch

● Bracket (AGF11□□1)

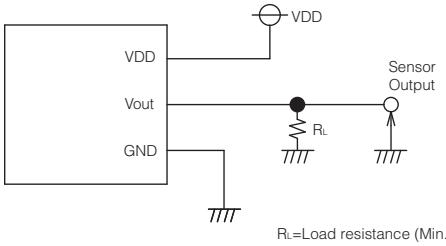
CAD Data



Matching connector :
Manufacturing company : Yazaki Corporation
Housing: 7283-8730-30

unit : mm inch

Wiring Diagram



RL=Load resistance (Min.50 kΩ)

Safety and Legal Matters to Be Observed

Product specifications and applications

■ Please be advised that this product and product specifications are subject to change without notice for improvement purposes. Therefore, please request and confirm the latest delivery specifications that explain the specifications in detail before the final design, or purchase or use of the product, regardless of the application. In addition, do not use this product in any way that deviates from the contents of the company's delivery specifications.

■ Unless otherwise specified in this catalog or the product specifications, this product is intended for use in general electronic equipment (AV products, home appliances, commercial equipment, office equipment, information and communication equipment, etc.).
When this product is used for the following special cases, the specification document suited to each application shall be signed/sealed (with Panasonic Industry and the user) in advance..These include applications requiring special quality and reliability, wherein their failures or malfunctions may directly threaten human life or cause harm to the human body (e.g.: space/aircraft equipment, transportation/traffic equipment, combustion equipment, medical equipment, disaster prevention/crime prevention equipment, safety equipment, etc.).

Safety design and product evaluation

■ Please ensure safety through protection circuits, redundant circuits, etc., in the customer's system design so that a defect in our company's product will not endanger human life or cause other serious damage.

■ This catalog shows the quality and performance of individual parts. The durability of parts varies depending on the usage environment and conditions. Therefore, please ensure to evaluate and confirm the state of each part after it has been mounted in your product in the actual operating environment before use.
If you have any doubts about the safety of this product, then please notify us immediately, and be sure to conduct a technical review including the above protection circuits and redundant circuits at your company.

Laws / Regulations / Intellectual property

■ The transportation of dangerous goods as designated by UN numbers, UN classifications, etc., does not apply to this product. In addition, when exporting products, product specifications, and technical information described in this catalog, please comply with the laws and regulations of the countries to which the products are exported, especially those concerning security export control.

■ Each model of this product complies with the RoHS Directive (Restriction of the use of hazardous substances in electrical and electronic equipment) (2011/65/EU and (EU) 2015/863). The date of compliance with the RoHS Directive and REACH Regulation varies depending on the product model.
Further, if you are using product models in stock and are not sure whether or not they comply with the RoHS Directive or REACH Regulation, please contact us by selecting "Sales Inquiry" from the inquiry form.

■ During the manufacturing process of this product and any of its components and materials to be used, Panasonic Industry does not intentionally use ozone-depleting substances stipulated in the Montreal Protocol and specific bromine-based flame retardants such as PBBs (Poly-Brominated Biphenyls) / PBDEs (Poly-Brominated Diphenyl Ethers). In addition, the materials used in this product are all listed as existing chemical substances based on the Act on the Regulation of Manufacture and Evaluation of Chemical Substances.

■ With regard to the disposal of this product, please confirm the disposal method in each country and region where it is incorporated into your company's product and used.

■ The technical information contained in this catalog is intended to show only typical operation and application circuit examples of this product. This catalog does not guarantee that such information does not infringe upon the intellectual property rights of Panasonic Industry or any third party, nor imply that the license of such rights has been granted.

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Panasonic Industry will assume no liability whatsoever if the use of our company's products deviates from the contents of this catalog or does not comply with the precautions. Please be advised of these restrictions.

NOTES

■ Before using the products, carefully check the quality under actual use conditions to enhance stability.

■ Wire connection

Correctly wire as in the connection diagram. Reverse connection may damage the product and degrade the performance.

■ Cleaning

Avoid ultrasonic cleaning as this may cause disconnection of the wire.

■ Environment

- Avoid use and storage in the corrosive gas (organic solvent, sulfurous acid and hydrogen sulfide gases) which negatively affects the product.
- Use surge absorbers as applying the external surge voltage may damage the internal circuit.
- Malfunction may occur near electric noises from static electricity, lightning, broadcast or amateur radio stations and mobile phones.
- Avoid use in an environment where these products cause dew condensation. When water attached to the sensor chip freezes, the sensor output may be fluctuated or damaged.
- Do not apply high-frequency oscillation, such as ultrasonic waves, to the product.
- Do not use in direct sunlight or other comparable light.

■ Other precautions

These specifications are for individual components. Before use, carefully check the performance and quality under actual use conditions to enhance stability.

- Misconnection and the wrong range of acceleration detection may invite the risk of accidents.
- Avoid use beyond the specified acceleration range, as such use may damage the product.
- Carefully handle as static electricity may damage the product.

■ Special notes

We exert maximum efforts for quality control of the product, Please mind also about the following.

1) To prevent occurrence of unexpected circumstances, please inform us of the specifications of your product, customers, use conditions and details of the attachment position.
2) Have sufficient margin values of driving/ performance guarantee described in the specifications and apply safety measures with double circuits, if serious effects on human lives or property are predicted due to a quality failure of the product. Those countermeasures are also for the product liability.
3) A warranty period is one year after the delivery to your company. Quality assurance is limited to the items and the scopes described in the specifications.
   If a defect is found after the delivery, we will promptly provide a replacement or change/ repair the defect part at the place of delivery in good faith. Exceptions are below.
   - Damages by a failure or a defect which arose after the delivery.
   - After the delivery, when storing and transporting, if conditions other than conditions in the specifications are applied to the product.
   - Damages by unforeseen phenomenon which cannot be predicted with the technologies available at the time of delivery.
   - Damages by natural and anthropogenic disasters, such as earthquake, flood, fire and war, which are beyond our reasonable control.