


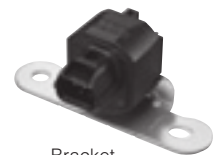
## Electrostatic capacitance detection sensor 1-axis acceleration sensor

### GF1

 This series is not a recommended product.  
Not recommended for new design.



Direct mount



Bracket

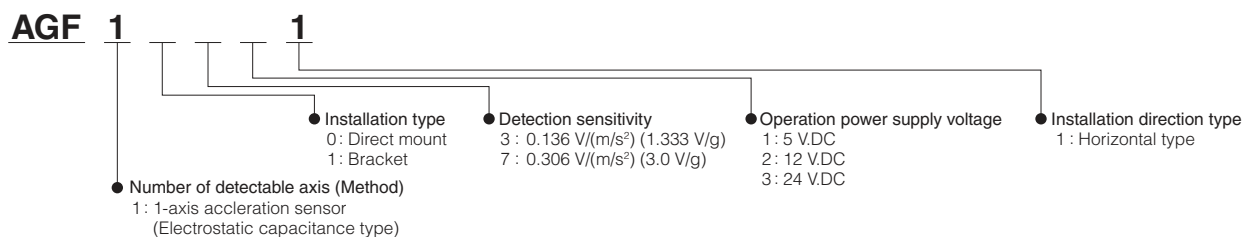
### Features

- High precision, High reliability : Superior offset voltage temperature characteristics ( $\pm 33$  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



### 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 acceleration sensor GF1	5 V.DC	$\pm 11.76$ m/s <sup>2</sup> ( $\pm 1.2$ g)	0.136 V/(m/s <sup>2</sup> ) (1.333 V/g)	Bracket	<b>AGF11311</b>
		$\pm 4.9$ m/s <sup>2</sup> ( $\pm 0.5$ g)	0.306 V/(m/s <sup>2</sup> ) (3.0 V/g)	Direct mount	<b>AGF10711</b>
	12 V.DC	$\pm 11.76$ m/s <sup>2</sup> ( $\pm 1.2$ g)	0.136 V/(m/s <sup>2</sup> ) (1.333 V/g)	Direct mount	<b>AGF10321</b>
		$\pm 4.9$ m/s <sup>2</sup> ( $\pm 0.5$ g)	0.306 V/(m/s <sup>2</sup> ) (3.0 V/g)	Direct mount	<b>AGF10721</b>
	24 V.DC	$\pm 11.76$ m/s <sup>2</sup> ( $\pm 1.2$ g)	0.136 V/(m/s <sup>2</sup> ) (1.333 V/g)	Direct mount	<b>AGF10331</b>
		$\pm 4.9$ m/s <sup>2</sup> ( $\pm 0.5$ g)	0.306 V/(m/s <sup>2</sup> ) (3.0 V/g)	Direct mount	<b>AGF10731</b>

### 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	g	AGF1□3□1	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<sup>2</sup>.

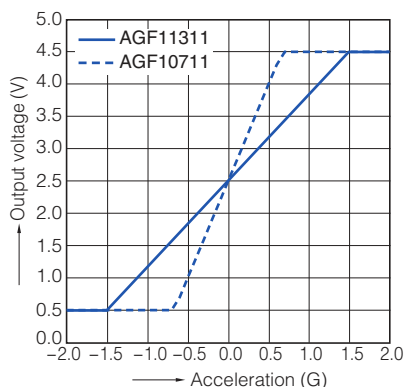
\*2 Maximum error from linear output that connects +1.2 g and -1.2 g output. (AGF1□3□1)

Maximum error from linear output that connects +0.5 g and -0.5 g output. (AGF1□7□1)

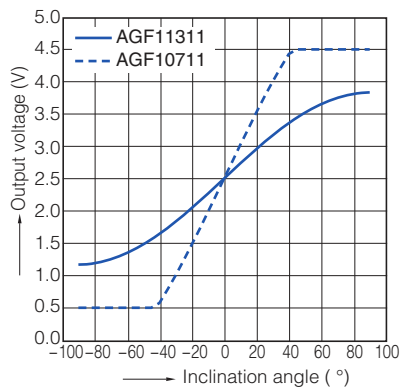
\*3 The 12 V and 24 V.DC operating power supply voltage types can also be compatible with the clamping voltage. Please consult us.

## Reference Data

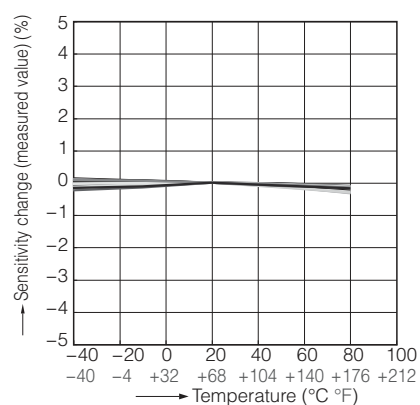
1. Output characteristics



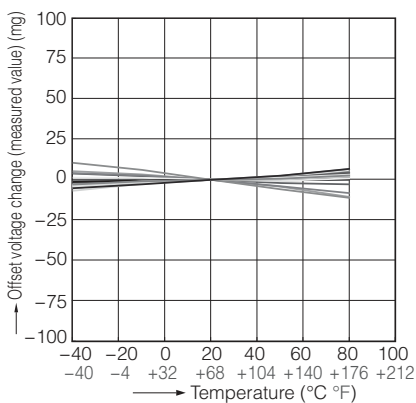
2. Inclination angle - Output voltage characteristics



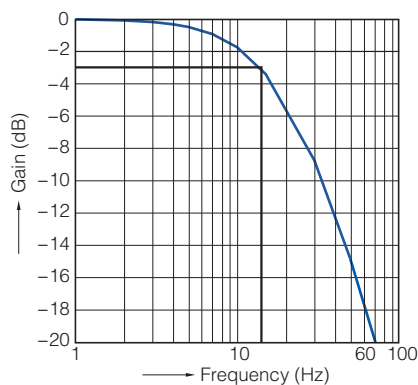
3. Sensitivity temperature characteristics



4. Offset voltage temperature characteristics



5. Frequency characteristics

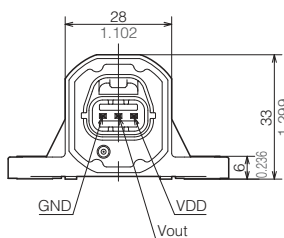
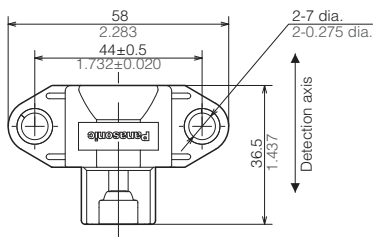


## Dimensions

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

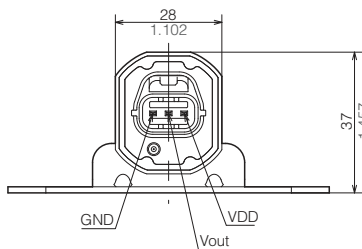
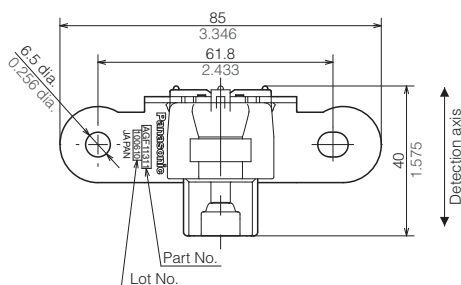
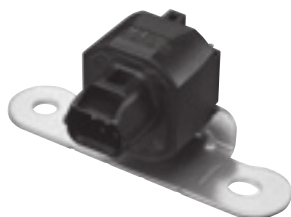


Matching connector:  
Manufacturing company : Yazaki Corporation  
Housing : 7283-8730-30

unit : mm inch

### ● Bracket (AGF11□□1)

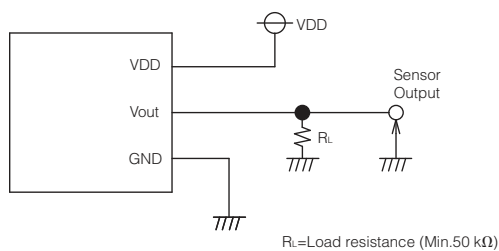
#### CAD Data



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

unit : mm inch

## Wiring Diagram



## 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.

## Guidelines and precautions regarding the technical information and use of our products described in this online catalog.

- If you want to use our products described in this online catalog for applications requiring special qualities or reliability, or for applications where the failure or malfunction of the products may directly jeopardize human life or potentially cause personal injury (e.g. aircraft and aerospace equipment, traffic and transportation equipment, combustion equipment, medical equipment, accident prevention, anti-crime equipment, and/or safety equipment), it is necessary to verify whether the specifications of our products fit to such applications. Please ensure that you will ask and check with our inquiry desk as to whether the specifications of our products fit to such applications use before you use our products.
- The quality and performance of our products as described in this online catalog only apply to our products when used in isolation. Therefore, please ensure you evaluate and verify our products under the specific circumstances in which our products are assembled in your own products and in which our products will actually be used.
- If you use our products in equipment that requires a high degree of reliability, regardless of the application, it is recommended that you set up protection circuits and redundancy circuits in order to ensure safety of your equipment.
- The products and product specifications described in this online catalog are subject to change for improvement without prior notice. Therefore, please be sure to request and confirm the latest product specifications which explain the specifications of our products in detail, before you finalize the design of your applications, purchase, or use our products.
- The technical information in this online catalog provides examples of our products' typical operations and application circuits. We do not guarantee the non-infringement of third party's intellectual property rights and we do not grant any license, right, or interest in our intellectual property.
- If any of our products, product specifications and/or technical information in this online catalog is to be exported or provided to non-residents, the laws and regulations of the exporting country, especially with regard to security and export control, shall be observed.

## <Regarding the Certificate of Compliance with the EU RoHS Directive/REACH Regulations>

- The switchover date for compliance with the RoHS Directive/REACH Regulations varies depending on the part number or series of our products.
- When you use the inventory of our products for which it is unclear whether those products are compliant with the RoHS Directive/REACH Regulation, please select "Sales Inquiry" in the website inquiry form and contact us.

**We do not take any responsibility for the use of our products outside the scope of the specifications, descriptions, guidelines and precautions described in this online catalog.**

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