





# Sensors

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- Humidity Sensors ————— 11
- Pressure Sensors ————— 16
- Resistive Position Sensors ——— 21

# Magnetic Sensors

## List of Varieties

Series	HGDE*/HGDF*	HGAR	HGDVST	HGPRDT
Photo				
Package specifications	MAP type SOT23 type	DFN type MSOP type TSSOP8 type TSSOP16 type	SOT23 type	
Type	Switching (Surface mount)	Angle (Surface mount)	Switching (Surface mount)	Encoder (Surface mount)
Dimensions (mm)	1.3×0.9×0.525 2.9×2.8×1.1	1.8×1.05×0.65 2.95×4.0×1.1 3.0×4.9×1.1 5.0×6.4×1.1	2.9×2.8×1.1	
Function	Dual polarity/Dual output Dual polarity/Single output Single polarity/Single output	Sin/Cos output Sin/Cos output x2	Single polarity/Single output	2-phase alternating output Alternating output/ Direction of rotation output
Operating magnetic field	1.3mT 2.0mT 3.0mT	10 to 120mT 20 to 60mT	Hoff typ. 1.4mT Hon typ. 2.0mT	Hoff: -0.8mT Typ Hon: +0.8mT Typ
Drive voltage	Typ. 1.8V (1.6V min. to 3.6V max.) Typ. 5V (4.5V min. to 5.5V max.)	5.5V max.	3 to 30V	12V Typ. (3 to 30V)
Current consumption	3μA Ave (at VDD=1.8V) Typ. 1.65mA (at VDD=5V)	—	2.5mA Max. (at VDD=12V)	1.6mA Typ. (at VDD=12V)
Operating temperature range	-10°C to +85°C -40°C to +85°C	-40°C to +105°C -40°C to +150°C	-40°C to +140°C (at VDD=9V)	
Automotive	—	○	●	●

### Note

● Indicates applicability to all products in the series, while ○ indicates applicability to some products in the series.





Sensors Magnetic Sensors

Analog Linear Output Type  
**HGAR Series**

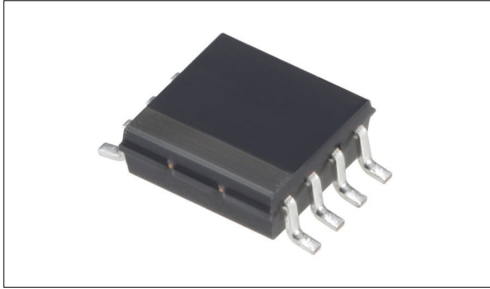
High output suitable for high-resolution absolute angle and position detection.

 Automotive

※Please check the product list for compatible products

■ Type: Angle (Surface mount)

Applications: Energy\_Industrial: Robots, drones, Industrial equipment, Converters  
 Game: Virtual/augmented reality  
 Healthcare: Healthcare equipment, Nursing care equipment, Analysis, test equipment  
 Automotive: Navigation/audio systems, HVAC, Shifter, Steering



■ Product List

Products No.	Package specifications	Function	Operating magnetic field	Drive voltage	Size (mm)	Automotive	Drawing No.
HGARPS011A	TSSOP8 type	Sin/Cos output	10 to 120mT	5.5V max.	3.0×4.9×1.1	●	1
HGARPS001A	TSSOP16 type	Sin/Cos output x2	10 to 120mT	5.5V max.	5.0×6.4×1.1	●	2
HGARAP001A	MSOP type	Sin/Cos output	20 to 60mT	5.5V max.	2.95×4.0×1.1	●	3
HGARAN008A	DFN type	Sin/Cos output	20 to 60mT	5.5V max.	1.8×1.05×0.65	—	4

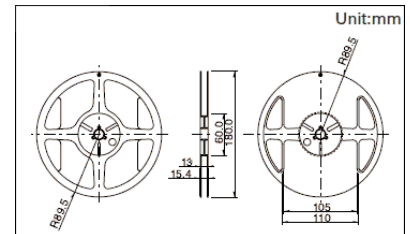
 Note

1. This catalog shows only outline specifications. When using the products, please obtain formal specifications for supply.
2. Place your purchase order in N minimum package units (N: integer).

■ Packing Specifications

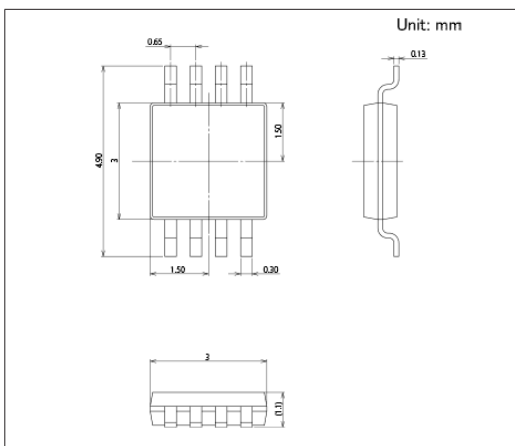
Taping

Products No.	Number of packages(pcs.)			Tape width (mm)	Export package measurements (mm)
	1 reel	1 case / Japan	1 case / export packing		
HGARPS011A	3,000	3,000	21,000	12	378×381×276
HGARPS001A	2,500	2,500	10,000	12	284×224×278
HGARAP001A	3,000	3,000	3,000	12	210 x 210 x 230
HGARAN008A	3,000	3,000	3,000	8	210 x 210 x 230

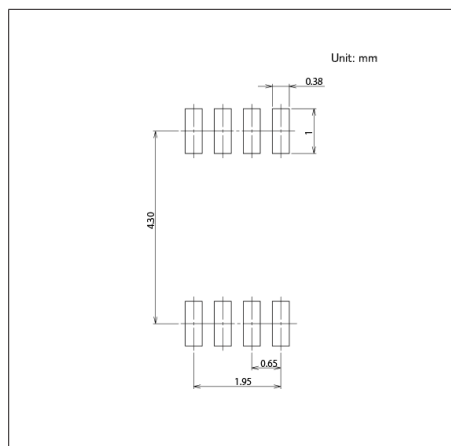


Drawing No.1

■ Dimensions



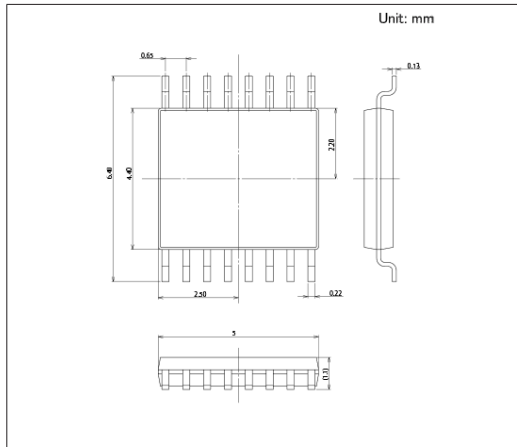
■ Land Dimensions



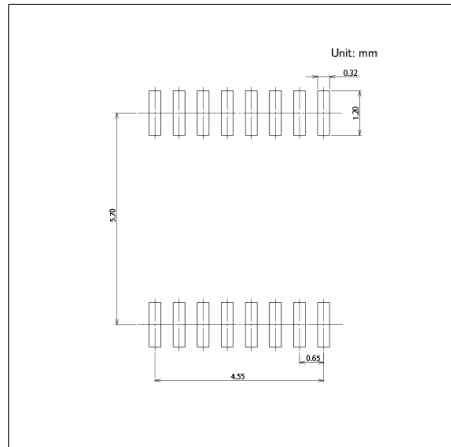
Analog Linear Output Type  
**HGAR Series**

**Drawing No.2**

■ Dimensions

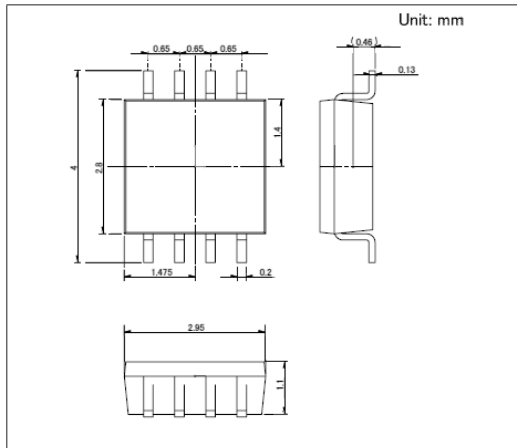


■ Land Dimensions



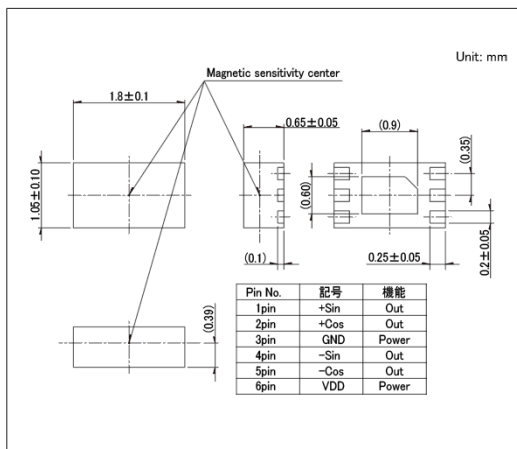
**Drawing No.3**

■ Dimensions



**Drawing No.4**

■ Dimensions



Sensors Magnetic Sensors

Switching Output Type  
**HGDVST Series**

Magnetic switch with wide operating voltage range and compact package.

Automotive



■ Type: Switching (Surface mount)

Applications: Game: Virtual/augmented reality  
 Healthcare: Healthcare equipment, Nursing care equipment, Analysis, test equipment  
 Home: Major home appliances  
 Audio\_TV: Visual, Audio, Pro audio, Cameras  
 Automotive: Shifter, Navigation/audio systems, HVAC

■ Product List

Products No.	Package specifications	Function	Operating magnetic field	Drive voltage	Current consumption	Size (mm)	Automotive	Drawing No.
<b>HGDVST022A</b>	SOT23 type	Single polarity/Single output	Hon typ. 2.0mT Hoff typ. 1.4mT	3 to 30V	2.5mA Max. (at VDD=12V)	2.9x2.8x1.1	●	1

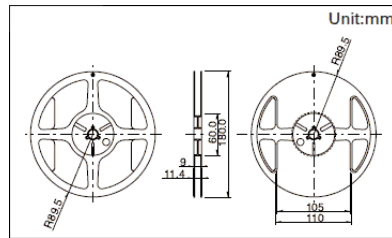
Note

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■ Packing Specifications

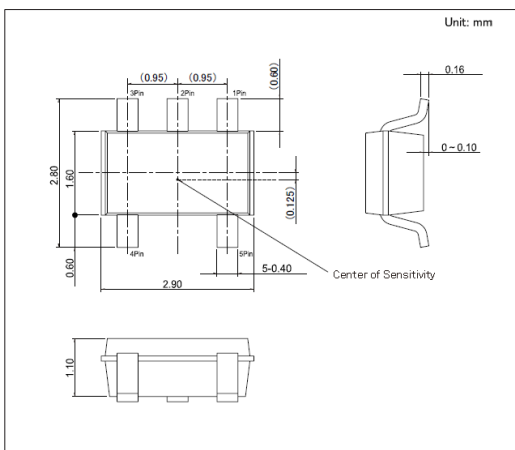
Taping

Number of packages (pcs.)			Tape width (mm)	Export package measurements (mm)
1 reel	1 case / Japan	1 case / export packing		
3,000	3,000	3,000	8	210 x 210 x 230

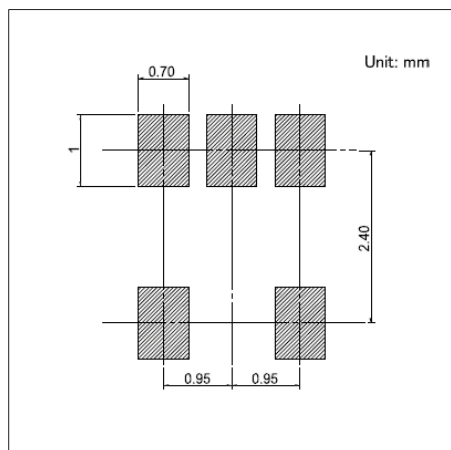


Drawing No. 1

■ Dimensions



■ Land Dimensions



Sensors Magnetic Sensors

Incremental Encode Output Type  
**HGPRDT Series**

Incorporates dual-phase output in a small package, contributing to miniaturization and design flexibility of encoder systems.

Automotive



■ Type:Encoder (Surface mount)

Applications:Automotive:Navigation/audio systems, HVAC,Tailgate, Power Windows,Steering

■ Product List

Products No.	Package specifications	Function	Operating magnetic field	Drive voltage	Current consumption	Size (mm)	Automotive	Drawing No.
<b>HGPRDT006A</b>	SOT23 type	Alternating output/ Direction of rotation output	Hon: +0.8mT Typ Hoff: -0.8mT Typ	12V Typ. (3 to 30V)	1.6mA Typ. (at VDD=12V)	2.9×2.8×1.1	●	1
<b>HGPRDT007A</b>	SOT23 type	2-phase alternating output	Hon: +0.8mT Typ Hoff: -0.8mT Typ	12V Typ. (3 to 30V)	1.6mA Typ. (at VDD=12V)	2.9×2.8×1.1	●	

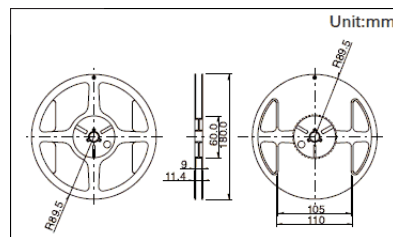
Note

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2. Place your purchase order in N minimum package units (N: integer).

■ Packing Specifications

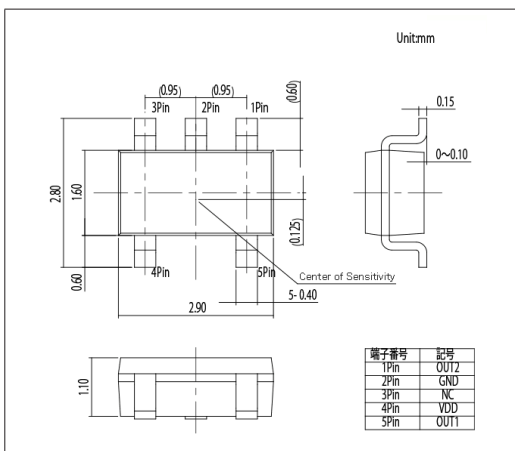
Taping

Number of packages (pcs.)			Tape width (mm)	Export package measurements (mm)
1 reel	1 case / Japan	1 case / export packing		
3,000	3,000	45,000	8	210 x 210 x 230

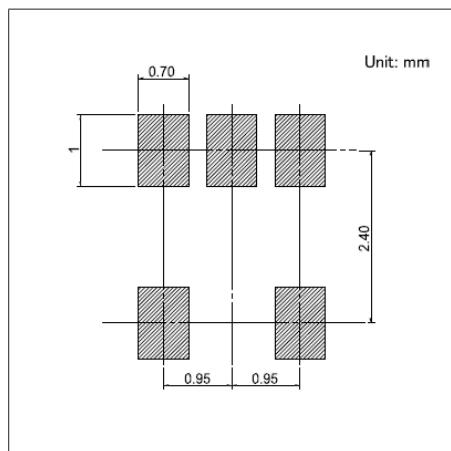


Drawing No.1

■ Dimensions




■ Land Dimensions



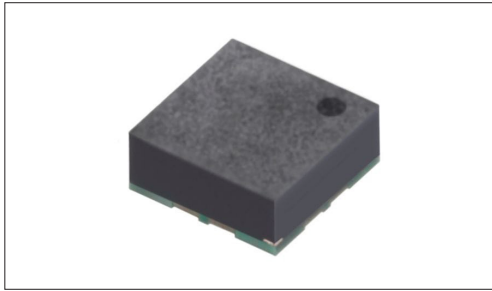
# Geomagnetic Sensors

## List of Varieties

Series		HSCD
Photo		
Type		Electric compass
Dimensions (mm)		1.55×1.55×0.62 16pin LGA
Operating voltage	AVDD: Drive voltage	+1.6 to +2.0V
	DVDD_io: Drive voltage	+1.14 to AVDD
Operating magnetic field		±2.4mT
Current consumption		369μA typ. (ODR=100 Hz) 19μA typ. (stanby)
Operating temperature range		-40°C to +85°C
Interface		I <sup>2</sup> C
Automotive		—

# Geomagnetic Type HSCD Series

High azimuth accuracy and low current consumption.



■ Type: Electric compass

Applications: Mobile: Smartphones, tablets, Headsets, wearables  
 Energy\_Industrial: Robots, drones, Industrial equipment, Converters  
 Game: Home handheld consoles, Virtual/augmented reality  
 Healthcare: Healthcare equipment, Nursing care equipment, Analysis, test equipment  
 Audio\_TV: Visual, Audio, Pro audio, Cameras

■ Product List

Products No.	Measurement range	Interface	Operating voltage		Current consumption	Size (mm)	Automotive	Drawing No.
			AVDD: Drive voltage	DVDD_io: Drive voltage				
HSCDTD015A	±2.4mT	I <sup>2</sup> C	+1.6 to +2.0V	+1.14 to AVDD	369μA typ. (ODR=100 Hz) 19μA typ. (standby)	1.55×1.55×0.62 16pin LGA	—	1

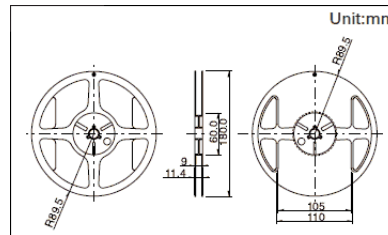
**Note**

1. This catalog shows only outline specifications. When using the products, please obtain formal specifications for supply.
2. Place your purchase order in N minimum package units (N: integer).
3. Azimuth accuracy (margin of error) may be influenced by environmental conditions and other devices.

■ Packing Specifications

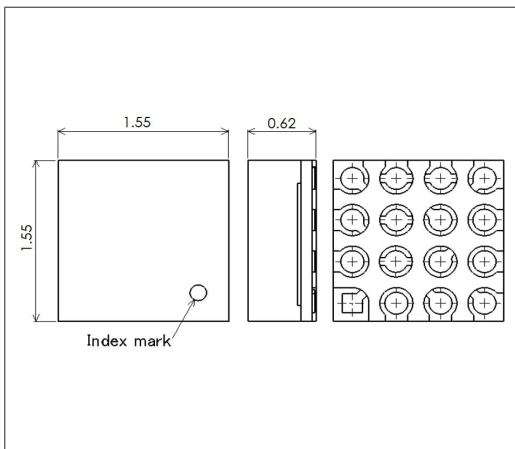
Taping

Number of packages (pcs.)			Tape width (mm)	Export package measurements (mm)
1 reel	1 case / Japan	1 case / export packing		
3,000	3,000	45,000	8	210×210×230





Drawing No. 1

■ Dimensions



# Humidity Sensors

## List of Varieties

Series	HSHCA (SMD)	HSHCA (Connector)
Photo		
Type	Surface mount	Connector pre-mounted on PCB
Mounting method	Surface mount	Connector
Dimensions (mm)	2.0×2.0×0.88 2.5×2.2×1.0	24.0×16.0 30.0×13.0
Humidity range	0 to 100%RH	
Operating temperature range	-10°C to +85°C -20°C to +85°C	-20°C to +60°C -20°C to +85°C -25°C to +85°C
Supply voltage	1.8V ±5% 2.2 to +3.6V	2.15 to 5.5V 2.5 to 5.5V 4.75 to 5.25V
Automotive	—	—

Sensors Humidity Sensors

# Humidity Sensor HSHCA (SMD) Series

Accurately detects humidity up to 100% in a compact package.



■ Type: Surface mount

Applications: Mobile: Smartphones, tablets, Headsets, wearables  
 Game: Virtual/augmented reality  
 Healthcare: Healthcare equipment, Nursing care equipment, Analysis, test equipment  
 Home: Major home appliances, Office equipment

■ Product List

Products No.	Features	Humidity range	Operating temperature	Supply voltage	Size (mm)	Automotive	Drawing No.
<b>HSHCAA006A</b>	Humidity sensor with analog output	0 to 100%RH	-10°C to +85°C	2.2 to +3.6V	2.5×2.2×1.0	—	1
<b>HSHCAL001B</b>	I <sup>2</sup> C digital output and temperature measurement function	0 to 100%RH	-20°C to +85°C	1.8V ±5%	2.0×2.0×0.88	—	2

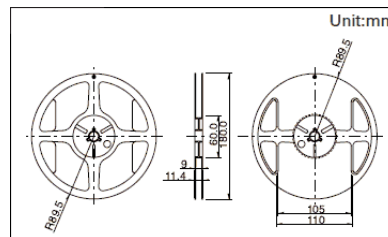
Note

1. This catalog shows only outline specifications. When using the products, please obtain formal specifications for supply.
2. Please place purchase orders per minimum order unit (integer).

■ Packing Specifications

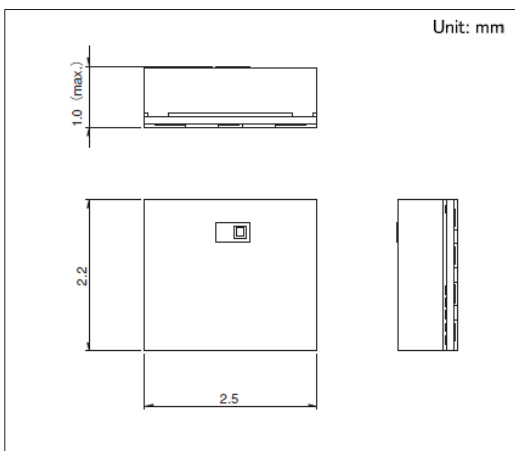
Taping

Number of packages (pcs.)			Tape width (mm)	Export package measurements (mm)
1 reel	1 case / Japan	1 case / export packing		
3,000	3,000	45,000	8	210×210×230



Drawing No.1

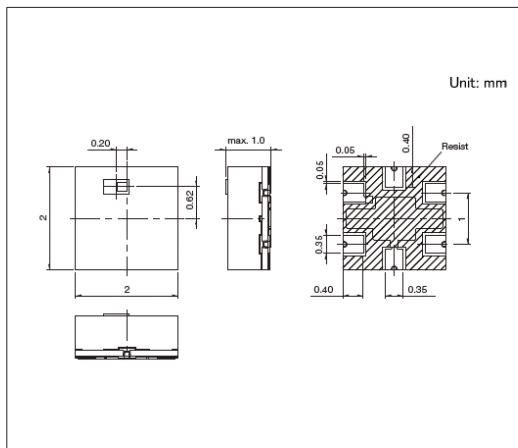
■ Dimensions



Humidity Sensor  
**HSHCA (SMD) Series**

**Drawing No.2**

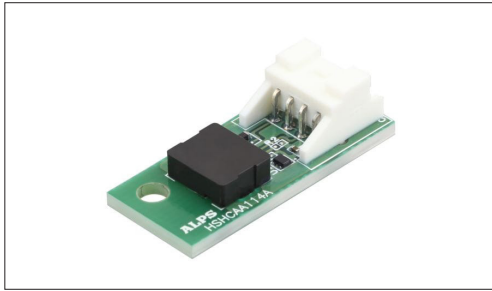
■ Dimensions



Sensors Humidity Sensors

# Humidity Sensor HSHCA (Connector) Series

Connector-type design equipped with a compact humidity sensor, easy to use in various locations.



■ Type: Connector pre-mounted on PCB

Applications: Game: Virtual/augmented reality  
 Healthcare: Healthcare equipment, Nursing care equipment,  
 Analysis, test equipment  
 Home: Major home appliances, Office equipment  
 Energy\_Industrial: Industrial equipment

■ Product List

Products No.	Features	Humidity range	Operating temperature	Supply voltage	Size (mm)	Automotive	Drawing No.
HSHCAA114A	With moisture-resistant coating	0 to 100%RH	-20°C to +60°C	4.75 to 5.25V	30.0×13.0	—	1
HSHCAL101B	I <sup>2</sup> C digital output and temperature measurement function	0 to 100%RH	-20°C to +85°C	2.5 to 5.5V	24.0×16.0	—	2
HSHCAD140A	I <sup>2</sup> C digital output and temperature measurement function	0 to 100%RH	-25°C to +85°C	2.15 to 5.5V	24.0×16.0	—	3

**⚠ Note**

1. This catalog shows only outline specifications. When using the products, please obtain formal specifications for supply.
2. Please place purchase orders per minimum order unit (integer).

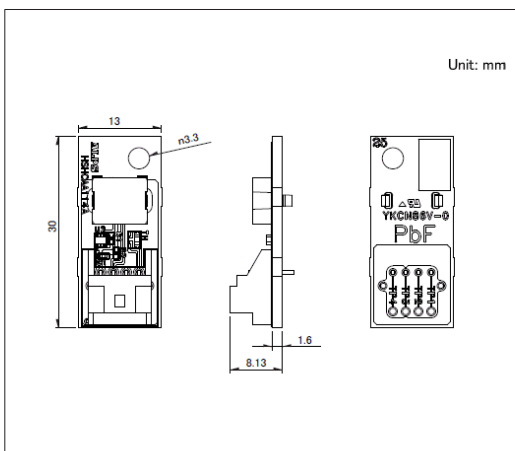
■ Packing Specifications

Tray

Products No.	Number of packages(pcs.)		Export package measurements (mm)
	1 case / Japan	1 case / export packing	
HSHCAA114A	1,000	1,000	360×240×307
HSHCAL101B HSHCAD140A	1,000	1,000	360×240×252

Drawing No.1

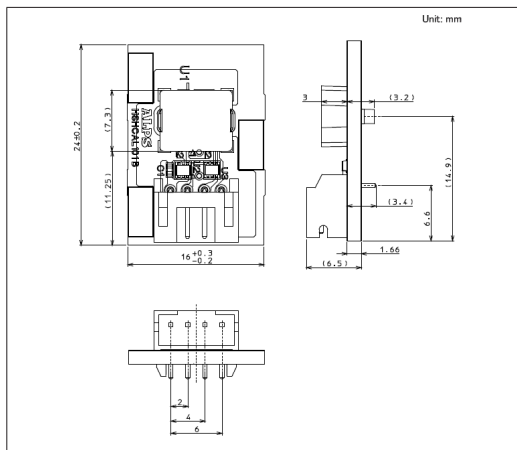
■ Dimensions



Sensors Humidity Sensors  
 Humidity Sensor  
**SHCA (Connector) Series**

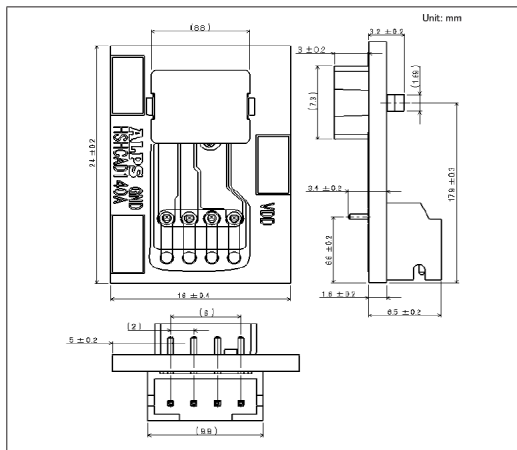
**Drawing No.2**

■ Dimensions



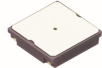


**Drawing No.3**

■ Dimensions



# Pressure Sensors

## List of Varieties

Series	HSPPAR	HSPPAD (Water-proof)	HSFPAR
Photo			
Type	Atmospheric pressure detection	Atmospheric pressure detection, Depth of water detection	Load detection
Water-proof	—	●	—
Mounting method	Surface mount		
Dimensions (mm)	2.5×2.5×0.7	3.1×3.1×2.6	1.5×0.85×0.68 2.0×1.6×0.66
Interface	Differential voltage	I <sup>2</sup> C	—
Operating temperature range	-20°C to +85°C	-40°C to +85°C	
Supply voltage	—	1.7 to 3.6V	1.5 to 3.6V
Automotive	—	—	—

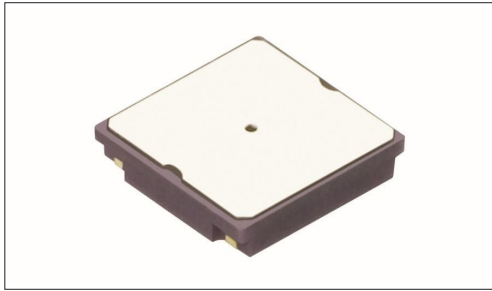
 **Note**

● Indicates applicability to all products in the series, while ○ indicates applicability to some products in the series.

Sensors Pressure Sensors

MEMS Pressure Sensor  
**HSPPAR Series**

Compact type expanding application possibilities.



- Type: Atmospheric pressure detection
- Mounting method: Surface mount

Applications: Mobile: Smartphones, tablets, Headsets, wearables, Notebooks, peripherals  
 Energy\_Industrial: Robots, drones, Industrial equipment, Converters  
 Game: Virtual/augmented reality  
 Healthcare: Healthcare equipment, Nursing care equipment, Analysis, test equipment  
 Home: Major home appliances

■ Product List

Products No.	Function	Features	Interface	Pressure measurement range	Operating temperature range	Size (mm)	Automotive	Drawing No.
HSPPAR003D	Atmospheric pressure detection	Pressure sensor element contained within housing	Differential voltage	500 to 1100hPa	-20°C to +85°C	2.5×2.5×0.7	—	1

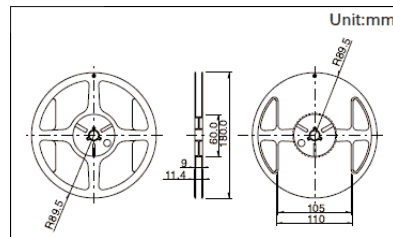
⚠ Note

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2. Place your purchase order in N minimum package units (N: integer).

■ Packing Specifications

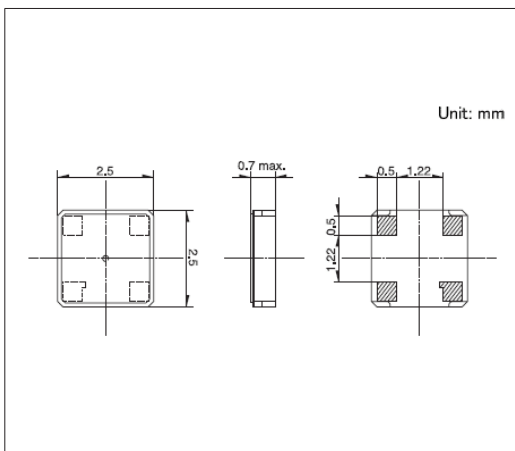
Taping

Number of packages (pcs.)			Tape width (mm)	Export package measurements (mm)
1 reel	1 case / Japan	1 case / export packing		
3,000	3,000	45,000	8	210×210×230



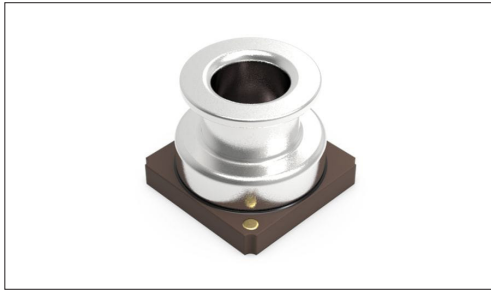
Drawing No.1

■ Dimensions



# MEMS Pressure Sensor HSPPAD (Water-proof Type) Series

Water-proof piezoresistive design, suitable for water depth detection.



- Type: Atmospheric pressure detection, Depth of water detection
- Mounting method: Surface mount

Applications: Infrastructure: Smart meters  
 Healthcare: Healthcare equipment, Nursing care equipment,  
 Analysis, test equipment  
 Mobile: Headsets, wearables

■ Product List

Products No.	Function	Features	Interface	Pressure measurement range	Operating temperature range	Size (mm)	Automotive	Drawing No.
HSPPAD143C	Atmospheric pressure detection, Depth of water detection (Water-proof)	Water-proof pressure sensor, output range 300 to 2000hPa	I <sup>2</sup> C	300 to 2000hPa	-40°C to +85°C	3.1×3.1×2.6	—	1
HSPPAD147A	Atmospheric pressure detection, Depth of water detection (Water-proof)	Water-proof pressure sensor, output range 30 to 750kPa	I <sup>2</sup> C	30 to 750kPa	-40°C to +85°C	3.1×3.1×2.6	—	
HSPPAD148A	Atmospheric pressure detection, Depth of water detection (Water-proof)	Water-proof pressure sensor, output range 30 to 3200kPa	I <sup>2</sup> C	30 to 3200kPa	-40°C to +85°C	3.1×3.1×2.6	—	

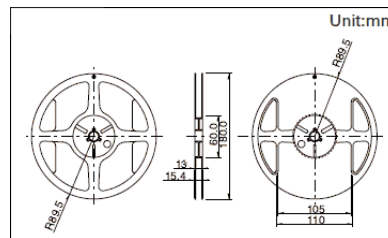
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2. Place your purchase order in N minimum package units (N: integer).

■ Packing Specifications

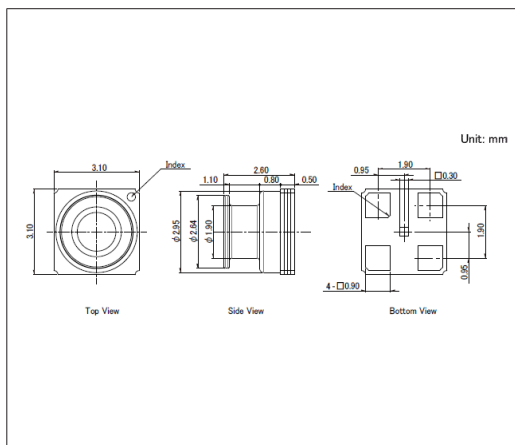
Taping

Number of packages (pcs.)			Tape width (mm)	Export package measurements (mm)
1 reel	1 case / Japan	1 case / export packing		
500	500	5,000	12	210×210×230



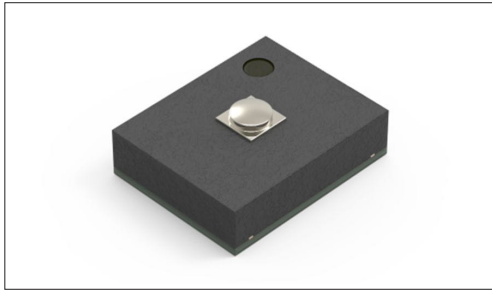
Drawing No. 1

■ Dimensions



# Force Sensor HSFPAR Series

High-sensitivity load detection in a compact package.



- Type: Load detection
- Mounting method: Surface mount

Applications: Mobile: Smartphones, tablets, Headsets, wearables, Notebooks, peripherals  
 Game: Virtual/augmented reality  
 Healthcare: Healthcare equipment, Nursing care equipment, Analysis, test equipment

■ Product List

Products No.	Function	Features	Force range	Operating temperature range	Supply voltage	Size (mm)	Automotive	Drawing No.
HSFPAR004A	Load detection	High-sensitivity load detection with a compact package	0 to 8N	-40°C to +85°C	1.5 to 3.6V	2.0×1.6×0.66	—	1
HSFPAR007A	Load detection	High-sensitivity load detection with a compact package	0 to 8N	-40°C to +85°C	1.5 to 3.6V	1.5×0.85×0.68	—	2

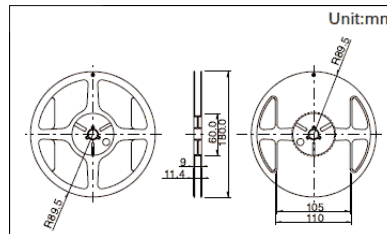
Note

1. This catalog shows only outline specifications. When using the products, please obtain formal specifications for supply.
2. Please place purchase orders for taping products per minimum order unit (1 reel or a case).

■ Packing Specifications

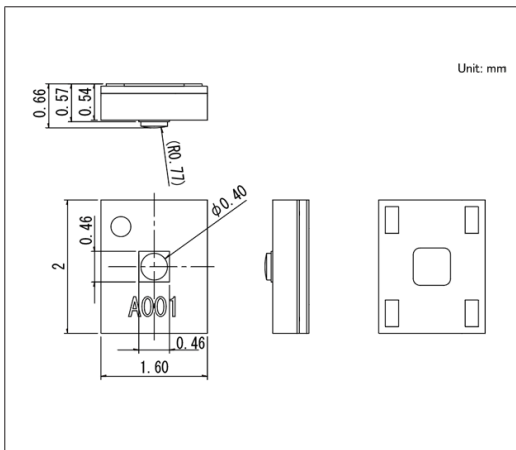
Taping

Number of packages (pcs.)			Tape width (mm)	Export package measurements (mm)
1 reel	1 case / Japan	1 case / export packing		
3,000	3,000	45,000	8	210×210×230



## Drawing No. 1

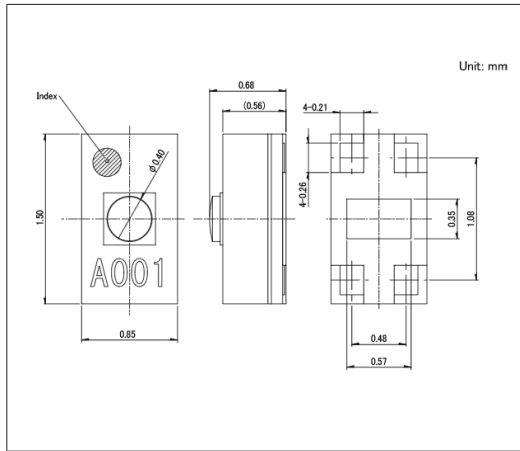
■ Dimensions



Force Sensor  
**HSFPAR Series**

**Drawing No.2**






■ Dimensions



## Sensors

## Resistive Position Sensors

## List of Varieties

Series		RDC50	RDC90	RD6R1A	RDC10	RD7
Photo						
Control part orientation		Horizontal Vertical	Vertical	—	Vertical	Horizontal Vertical
Type		Rotary			Linear	
Terminal style		Insertion Reflow	Reflow	Connector terminal	Insertion	
Dimensions (mm)		11.0×3.9×13.5 11.0×12.0×2.2 11.0×12.0×2.75 11.0×12.0×3.5	11.0×13.7×3.2	20.6×32.5×3.6	6.5×17.3×2.1 6.9×23.5×2.9 6.9×31.5×2.9 6.9×41.5×2.9 6.9×56.5×3.0 6.9×96.7×3.45	9.0×15.8×3.7 10.0×5.0×15 10.0×5.0×19.0 10.0×15.0×4.5 10.0×18.0×5.0
Total resistance		4.7kΩ 10kΩ	3.3kΩ 10kΩ	3.8kΩ	10kΩ	2.2kΩ 4.7kΩ 5kΩ 10kΩ
Effective electrical range		150° 333.3°	80° 260°	320°	—	
Linearity guarantee range		140° 320°	60° 244°	310°	9.2mm 12mm 20mm 30mm 45mm 85mm	6mm 7mm 9mm
Linearity		±2%	±3%	±2%	±0.5% ±1%	±1%
Operating force		—			0.25N max.	2N max.
Rotational torque		2mN·m max.		100mN·m	—	
Electrical performance	Total resistance tolerance	±30%		±20%	±30%	±20%
	Rated voltage	5V DC				—
Environmental test	Cold	-40°C 168h			-40°C 240h	-40°C 96h
	Dry heat	120°C 168h		85°C 168h	80°C 240h 85°C 240h 90°C 240h	105°C 96h
	Damp heat	60°C, 90 to 95%RH 96h		80°C, 90 to 95%RH 96h	60°C, 90 to 95%RH 240h	40°C, 90 to 95%RH 96h
Automotive		●	●	●	○	●

 Note

● Indicates applicability to all products in the series, while ○ indicates applicability to some products in the series.

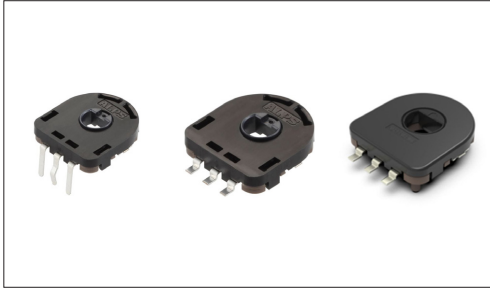
# Rotary Type RDC50 Series

Compact, high-precision, and high-heat-resistant design, suitable for all position detection needs.

 Automotive

■ Type: Rotary

Applications: Energy\_Industrial: Robots, drones, Industrial equipment  
 Healthcare: Healthcare equipment, Nursing care equipment  
 Analysis, test equipment: Analysis, test equipment  
 Home: Major home appliances, Office equipment  
 Audio\_TV: Visual, Audio  
 Automotive: Navigation/audio systems, HVAC



## ■ Product List

Products No.	Control part orientation	Mounting method	Linearity guarantee range	Linearity	Total resistance	Operating life (cycles)	Dimensions (mm)	Automotive	Drawing No.
<b>RDC501051A</b>	Vertical	Manual, DIP	320°	±2%	10kΩ	1,000,000	11.0×12.0×3.5	●	1
<b>RDC501052A</b>	Vertical	Manual, DIP	320°	±2%	10kΩ	1,000,000	11.0×12.0×3.5	●	2
<b>RDC502012A</b>	Horizontal	Manual, DIP	320°	±2%	10kΩ	1,000,000	11.0×3.9×13.5	●	3
<b>RDC503051A</b>	Vertical	Reflow	320°	±2%	10kΩ	1,000,000	11.0×12.0×2.75	●	4
<b>RDC503052A</b>	Vertical	Reflow	320°	±2%	10kΩ	1,000,000	11.0×12.0×2.75	●	5
<b>RDC503061A</b>	Vertical	Reflow	140°	±2%	4.7kΩ	1,000,000	11.0×12.0×2.75	●	4
<b>RDC506018A</b>	Vertical	Reflow (Low-profile)	320°	±2%	10kΩ	1,000,000	11.0×12.0×2.2	●	6
<b>RDC506A03A</b>	Vertical	Reflow (Low-profile, Long-life, Without case hole)	320°	±2%	10kΩ	2,000,000	11.0×12.0×2.2	●	7

## ⚠ Note

1. This catalog shows only outline specifications. When using the products, please obtain formal specifications for supply.
2. Please place purchase orders per minimum order unit (integer).

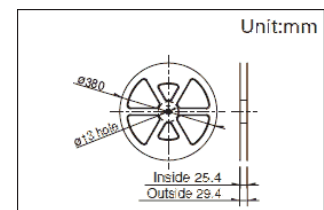
## ■ Packing Specifications

### Tray

Products No.	Number of packages(pcs.)		Export package measurements (mm)
	1 case / Japan	1 case / export packing	
<b>RDC501051A</b> <b>RDC501052A</b>	1,500	3,000	526×370×191
<b>RDC502012A</b>	1,600	1,600	370×280×92

### Taping

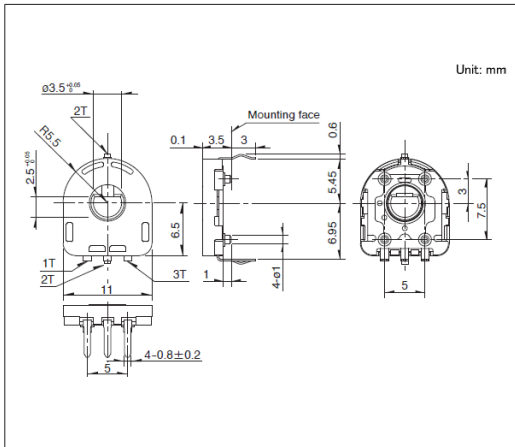
Products No.	Number of packages(pcs.)			Tape width (mm)	Export package measurements (mm)
	1 reel	1 case / Japan	1 case / export packing		
<b>RDC503051A</b> <b>RDC503052A</b> <b>RDC503061A</b>	1,300	3,900	3,900	24	415×407×135
<b>RDC506018A</b> <b>RDC506A03A</b>	1,200	3,600	3,600	24	415×407×135



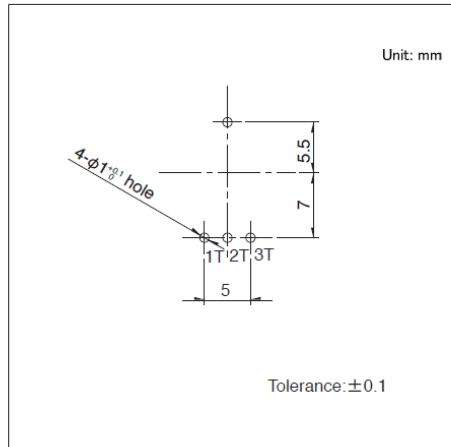
Rotary Type  
RDC50 Series

Drawing No.1

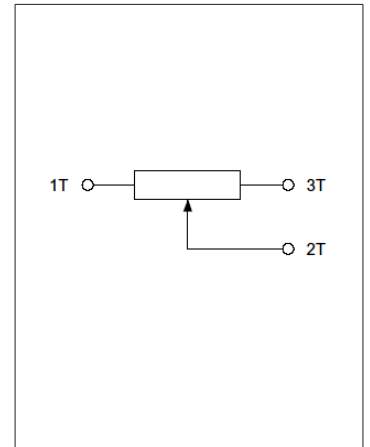
■ Dimensions



■ Mounting Hole Dimensions



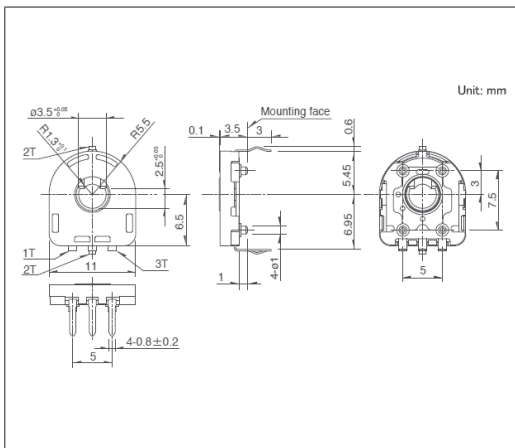
■ Circuit Diagram



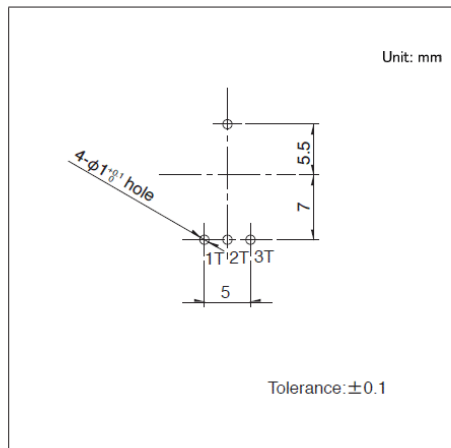
Viewed from mounting side

Drawing No.2

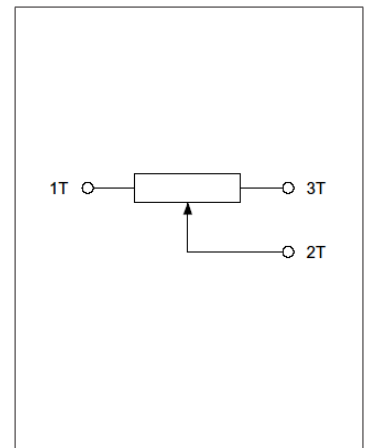
■ Dimensions



■ Mounting Hole Dimensions



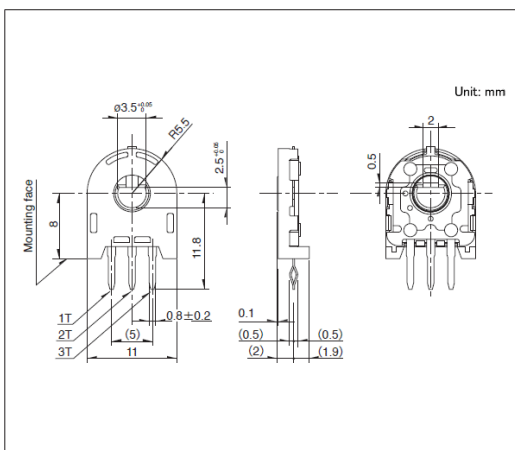
■ Circuit Diagram



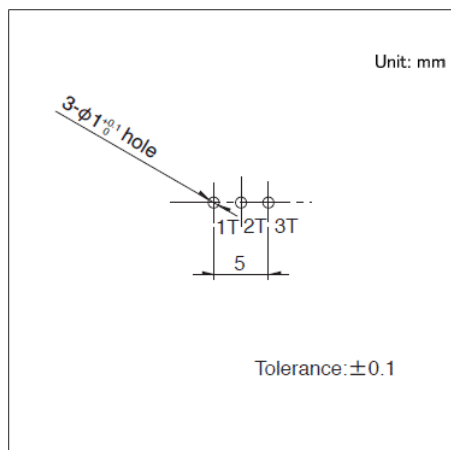
Viewed from mounting side

Drawing No.3

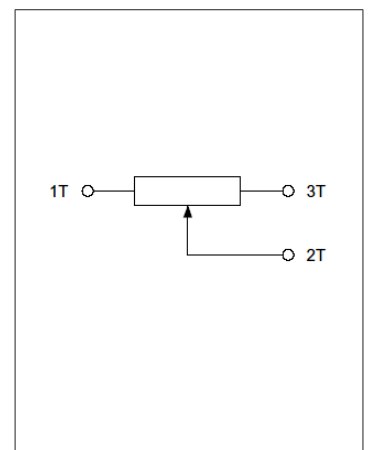
■ Dimensions



■ Mounting Hole Dimensions



■ Circuit Diagram

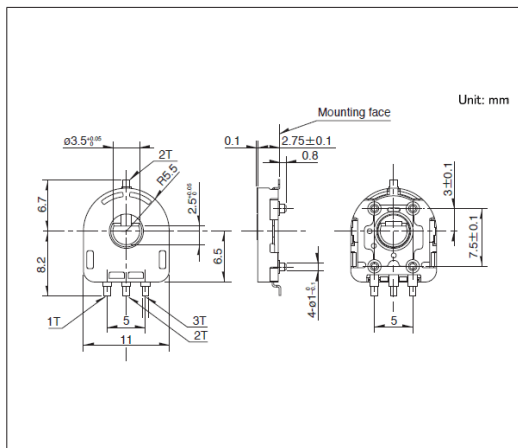


Viewed from mounting side

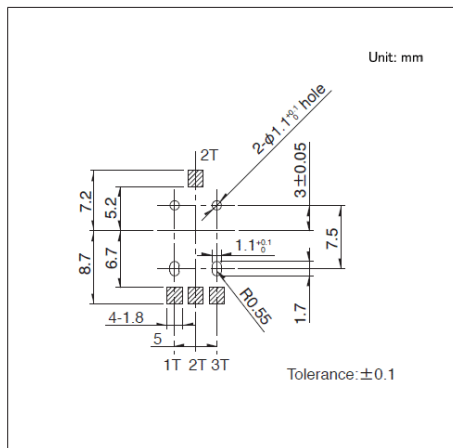
Rotary Type  
RDC50 Series

Drawing No.4

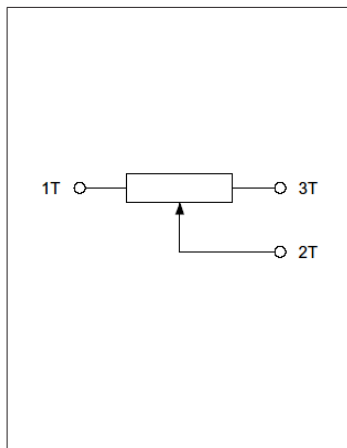
■ Dimensions



■ Mounting Hole Dimensions



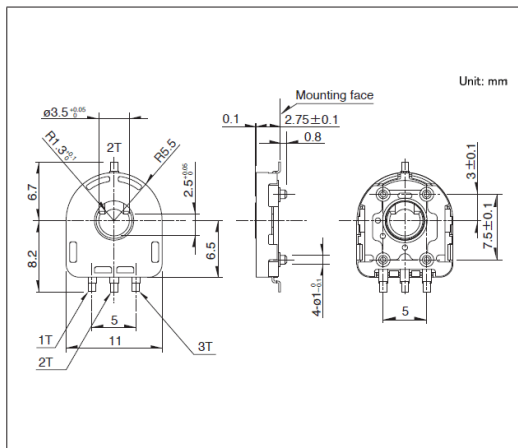
■ Circuit Diagram



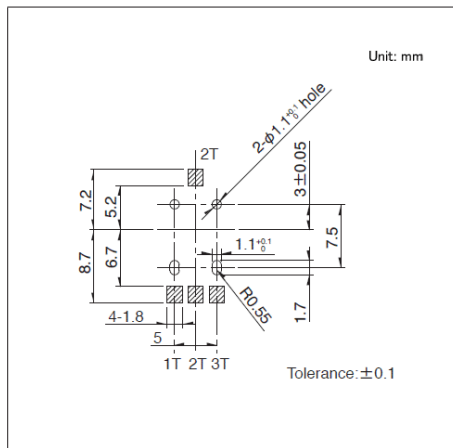
Viewed from mounting side

Drawing No.5

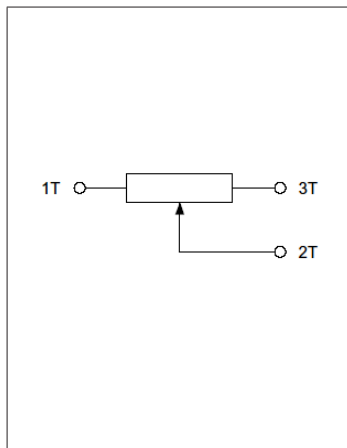
■ Dimensions



■ Mounting Hole Dimensions



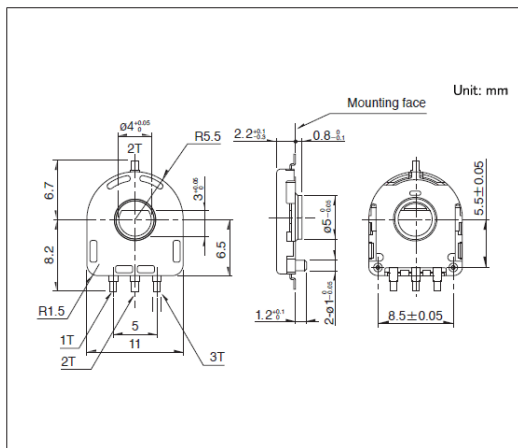
■ Circuit Diagram



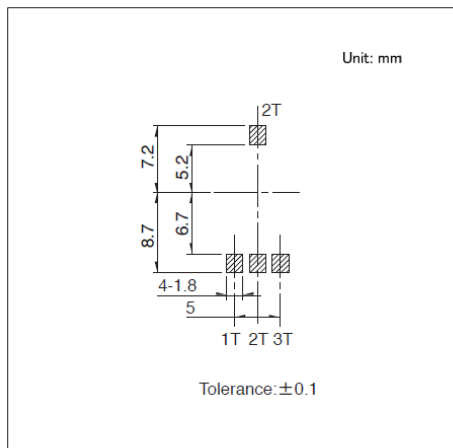
Viewed from mounting side

Drawing No.6

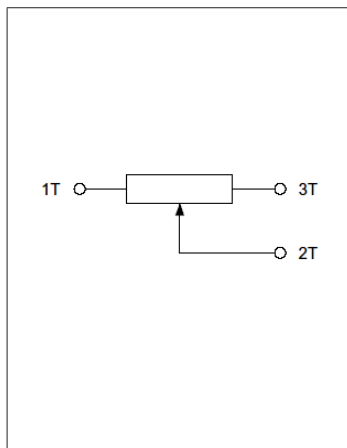
■ Dimensions



■ Land Dimensions



■ Circuit Diagram



Viewed from mounting side

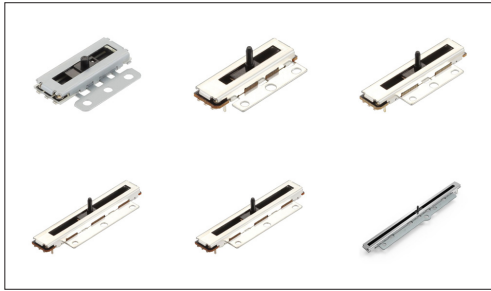






## Linear Type RDC10 Series

High-precision ( $\pm 0.5\%$  relative linearity) space-saving design, contributing to set miniaturization.



 Automotive

※Please check the product list for compatible products

### ■ Type: Linear

Applications: Energy\_Industrial: Robots, drones  
 Game: Home handheld consoles, Virtual/augmented reality  
 Healthcare: Healthcare equipment, Analysis, test equipment  
 Nursing care equipment: Nursing care equipment  
 Home: Major home appliances, Office equipment  
 Automotive: Navigation/audio systems, HVAC

### ■ Product List

Products No.	Control part orientation	Travel (mm)	Linearity guarantee range	Linearity	Total resistance	Operating life (cycles)	Dimensions (mm)	Automotive	Drawing No.
<b>RDC1010A12</b>	Vertical	10	9.2mm	$\pm 0.5\%$	10k $\Omega$	50,000	6.5×17.3×2.1	—	1
<b>RDC1014A09</b>	Vertical	14	12mm	$\pm 0.5\%$	10k $\Omega$	200,000	6.9×23.5×2.9	●	2
<b>RDC1022A05</b>	Vertical	22	20mm	$\pm 0.5\%$	10k $\Omega$	200,000	6.9×31.5×2.9	●	
<b>RDC10320RB</b>	Vertical	32	30mm	$\pm 0.5\%$	10k $\Omega$	200,000	6.9×41.5×2.9	●	
<b>RDC1047A03</b>	Vertical	47	45mm	$\pm 0.5\%$	10k $\Omega$	200,000	6.9×56.5×3.0	●	
<b>RDC1087A01</b>	Vertical	87	85mm	$\pm 1\%$	10k $\Omega$	100,000	6.9×96.7×3.45	—	3

### Note

1. This catalog shows only outline specifications. When using the products, please obtain formal specifications for supply.
2. Please place purchase orders per minimum order unit (integer).
3. RDC1014, RDC1022, RDC1032 and RDC1047 Series are available in different varieties to product line.

### ■ Packing Specifications

Tray

Products No.	Number of packages(pcs.)		Export package measurements (mm)
	1 case / Japan	1 case / export packing	
<b>RDC1010A12</b>	980	2,940	360×270×230
<b>RDC1014A09</b>	2,400	4,800	508×374×272
<b>RDC1022A05</b>	2,100	4,200	508×374×302
<b>RDC10320RB</b>	900	1,800	540×360×205
<b>RDC1047A03</b>	1,000	2,000	508×374×272
<b>RDC1087A01</b>	540	540	540×360×130



Linear Type (Exclusively Used to Detect the Angle of Vehicle Head Lights)

**RD7 Series**

High-precision, space-saving design dedicated to headlight angle detection.


 Automotive

■ Type: Linear

Applications: Automotive: Headlights

## ■ Product List

Products No.	Control part orientation	Travel (mm)	Linearity guarantee range	Linearity	Total resistance	Operating life (cycles)	Dimensions (mm)	Automotive	Drawing No.
<b>RD708A029A</b>	Horizontal	8	6mm	±1%	4.7kΩ	100,000	10.0×5.0×15	●	1
<b>RD7081015A</b>	Vertical	8	7mm	±1%	5kΩ	100,000	10.0×15.0×4.5	●	2
<b>RD7091008A</b>	Vertical	9	7mm	±1%	5kΩ	100,000	9.0×15.8×3.7	●	3
<b>RD712A028A</b>	Horizontal	12	9mm	±1%	2.2kΩ	100,000	10.0×5.0×19.0	●	4
<b>RD7121008A</b>	Vertical	12	9mm	±1%	10kΩ	100,000	10.0×18.0×5.0	●	5

 Note

1. This catalog shows only outline specifications. When using the products, please obtain formal specifications for supply.
2. For Linearity, various specifications will be available, depending on the applications. Please consult with us when placing your orders.
3. Please place purchase orders per minimum order unit (integer).

## ■ Packing Specifications

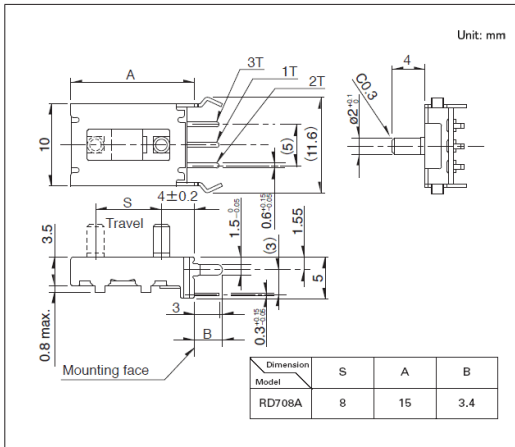
Tray

Products No.	Number of packages(pcs.)		Export package measurements (mm)
	1 case / Japan	1 case / export packing	
<b>RD708A029A</b> <b>RD712A028A</b>	2,000	4,000	527×363×215
<b>RD7081015A</b>	1,500	3,000	507×363×216
<b>RD7091008A</b>	1,800	3,600	508×364×192
<b>RD7121008A</b>	1,800	3,600	507×363×216

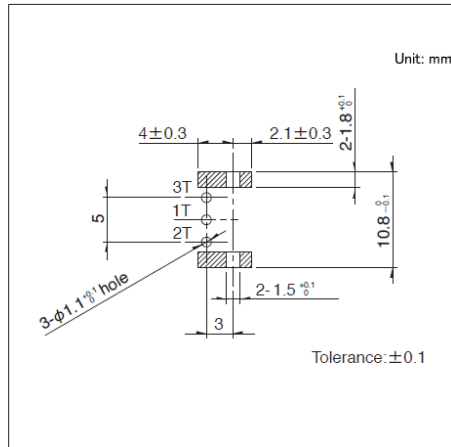
Linear Type (Exclusively Used to Detect the Angle of Vehicle Head Lights)  
**RD7 Series**

**Drawing No.1**

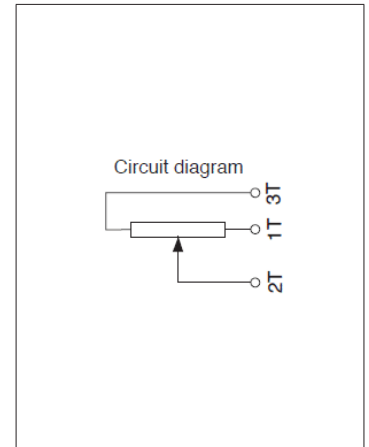
■ Dimensions



■ Mounting Hole Dimensions



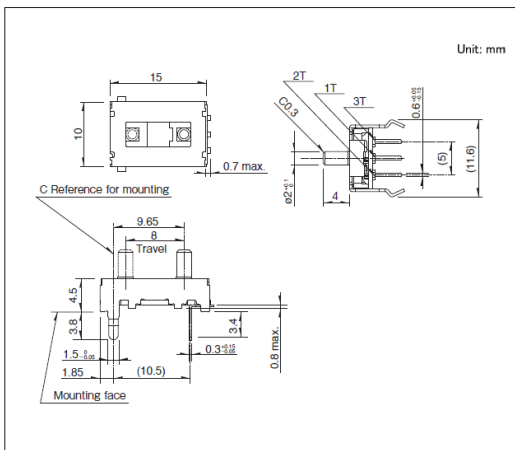
■ Circuit Diagram



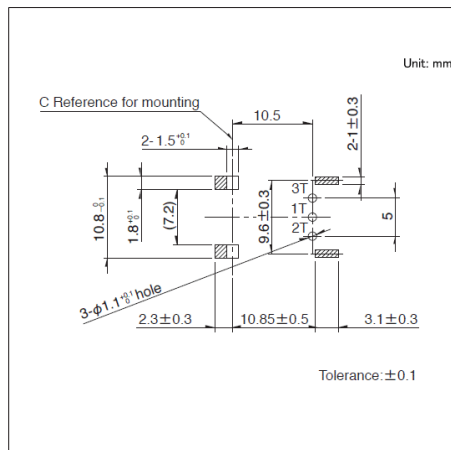
Viewed from mounting side  
 Do not wire the shaded area

**Drawing No.2**

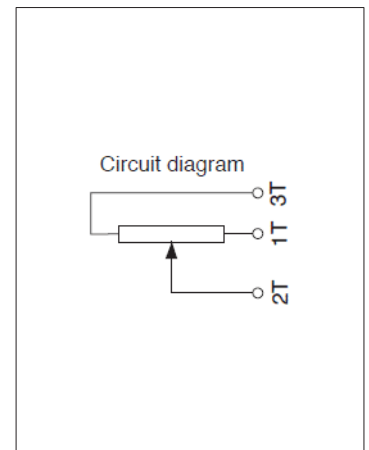
■ Dimensions



■ Mounting Hole Dimensions



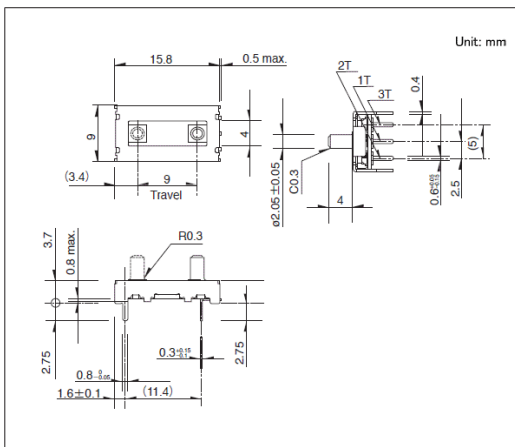
■ Circuit Diagram



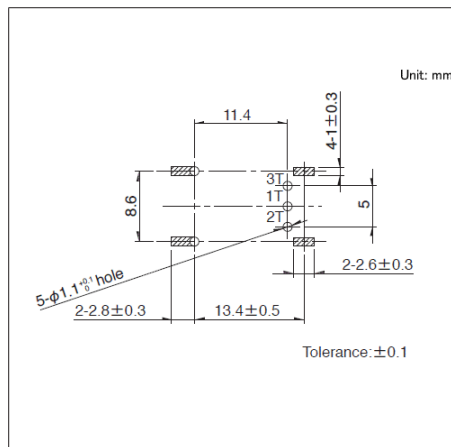
Viewed from mounting side  
 Do not wire the shaded area

**Drawing No.3**

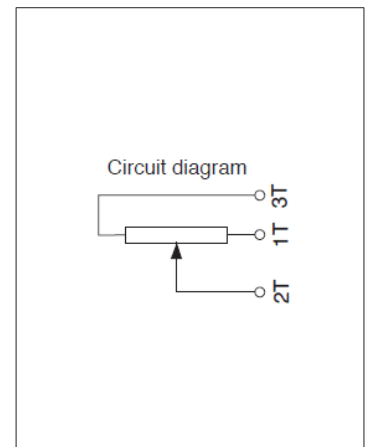
■ Dimensions



■ Mounting Hole Dimensions



■ Circuit Diagram

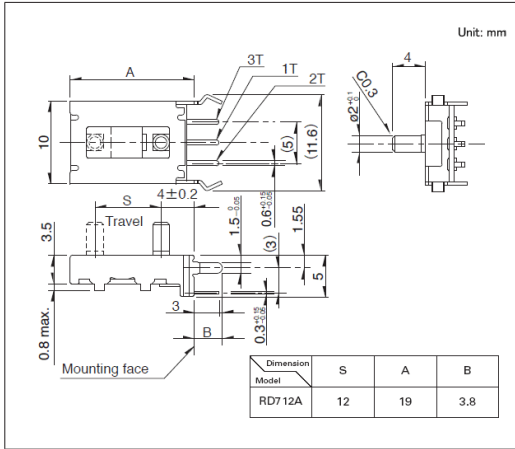


Viewed from mounting side  
 Do not wire the shaded area

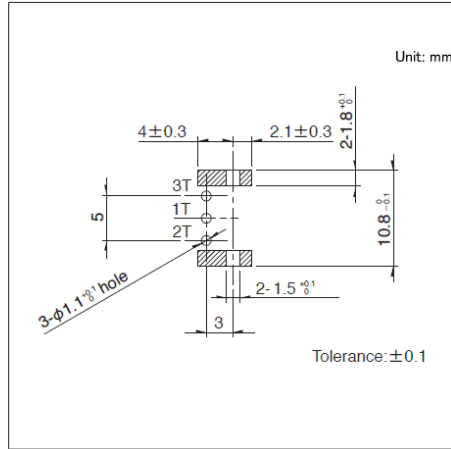
Linear Type (Exclusively Used to Detect the Angle of Vehicle Head Lights)  
**RD7 Series**

**Drawing No.4**

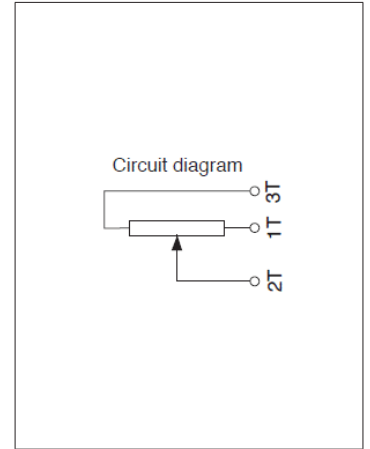
■ Dimensions



■ Mounting Hole Dimensions



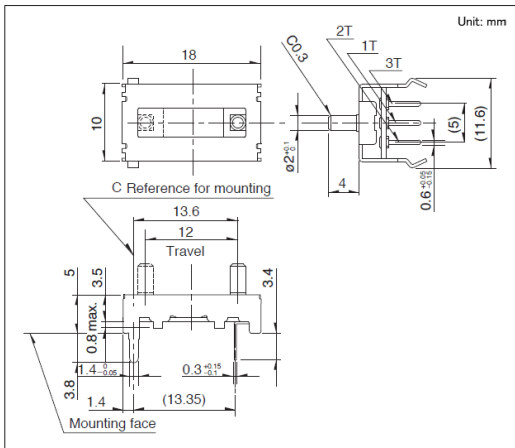
■ Circuit Diagram



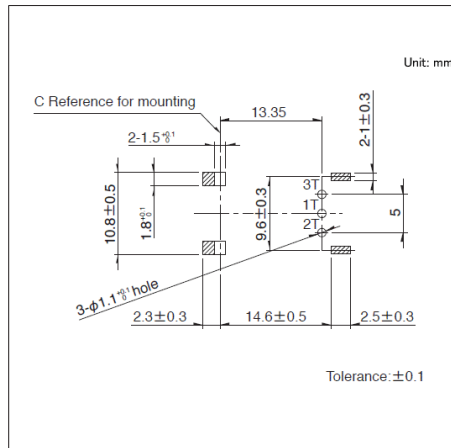
Viewed from mounting side  
 Do not wire the shaded area

**Drawing No.5**

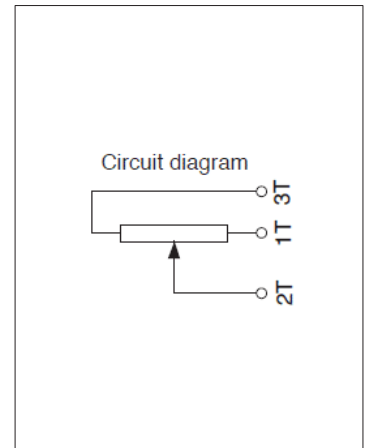
■ Dimensions



■ Mounting Hole Dimensions



■ Circuit Diagram



Viewed from mounting side  
 Do not wire the shaded area

## Resistive Position Sensors / Soldering Conditions

### ■ Reference for Manual Soldering

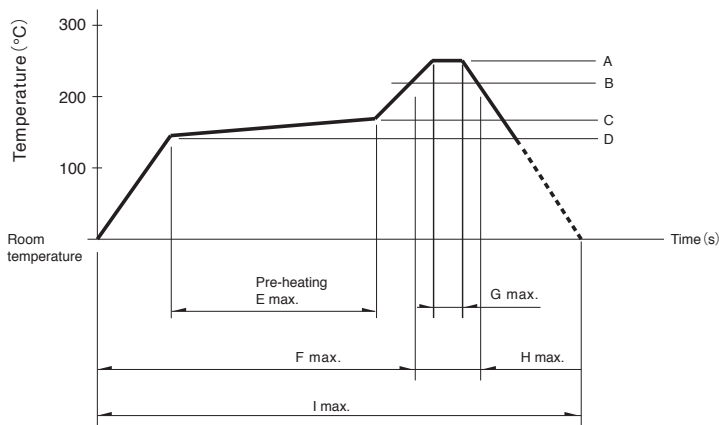
Series	Tip temperature	Soldering time
RDC50, RDC90	350±5°C	3 <sup>+1</sup> <sub>0</sub> s
RDC10, RD7	350°C max.	3s max.

### ■ Reference for Dip Soldering

Series	Preheating		Dip soldering		No. of solders
	Soldering surface temperature	Heating time	Soldering temperature	Soldering time	
RDC501, RDC502	100 to 150°C	1 min. max.	260±5°C	10±1s	1 time
RD7	100°C max.	1 min. max.	260°C max.	5s max.	1 time

### ■ Example of Reflow Soldering Condition

- Cleaning sensors should not be attempted.
- Type of solder to be used Use cream solder that contains 10 to 15 wt % flux.
- Number of solder applications - apply solder only once
- Recommended reflow conditions



Series	A	B	C	D	E	F	G	H	I	No. of reflows
RDC503 RDC506	250°C	230°C	180°C	150°C	2min.	—	5s	40s	4min.	1 time
RDC90	255°C	230°C	—	—	—	2min.	10s	1 min.	4min.	1 time

#### ⚠️ Note

- When using an infrared reflow oven, solder may not always be applied as intended. Be sure to use a hot air reflow oven or a type that uses infrared rays in combination with hot air.
- The temperatures given above are the maximum temperatures at the terminals of the sensor when employing a hot air reflow method. The temperature of the PC board and the surface temperature of the sensor may vary greatly depending on the PC board material, its size and thickness. Ensure that the surface temperature of the sensor does not rise to 250°C or greater.
- Conditions vary to some extent depending on the type of reflow bath used. Be sure to give due consideration to this prior to use.

## Resistive Position Sensors / Cautions

### Use of Chemicals

The sensors make use of synthetic resins, therefore avoid use in environments where there is a strong presence of gases from chemicals such as ammonia, amines, alkaline aqueous solutions, aromatic hydrocarbons, ketones, esters and halogenated hydrocarbons.

### Measures to Deal with Noise Problems

While data is being received from the sensor, on rare occasions, penetrating external noise may cause interference with the outputs.

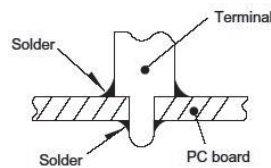
To minimize the probability of this phenomenon pay attention to the following when you program the relevant software

ex)

- Receiving of data should always be repeated a number of times to ensure that you obtain a mean value.
- Have the system determine when/how to invalidate any data received in error.
- When doubt occurs let the system receive the subject data again and reconfirm that you have eliminated the anomaly.

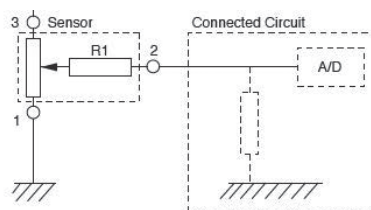
### Soldering

Avoid wiring and soldering that causes the solder to seep through to the top of the PC board (as illustrated). This can lead to a contact failure in the terminal section. If solder seepage is unavoidable, please consult with us.



### Connection Impedance

Resistive position sensors are constructed in a way that contact resistance ( $R1$  below) occurs within the sensor. To reduce the effect of contact resistance ( $R1$ ), set the impedance within the circuit connected to the output terminal to greater than  $1M \Omega$ .



### Dew Condensation

Avoid using the sensor where dew or water vapor might be caused to condense on the surface of the resistor - deterioration of insulation or shorting may occur.

### Storage

1. Store the products as delivered, at a normal temperature and humidity, without direct sunshine and corrosive gas ambient. Use them at an earliest possible timing, not later than six months upon receipt.
2. After breaking the seal, keep the products in a plastic bag to shut out ambient air, store them in the same environment as above, and use them up as soon as possible.
3. Do not stack too many switches.