

Sensors

- Magnetic Sensors — A-2
- Geomagnetic Sensors — A-9
- Humidity Sensors — A-11
- Pressure Sensors — A-16
- Resistive Position Sensors — A-21

Magnetic Sensors

List of Varieties

Series	HGDE*	HGAR	HGDVST	HGPRDT
Photo				
Package specifications	MAP type SOT23 type	DFN type MSOP type TSSOP8 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	2.9×2.8×1.1	
Function	Dual polarity/Dual output Dual polarity/Single output Single polarity/Single output	Sin/Cos output	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.)	5.5V max.	3 to 30V	12V Typ. (3 to 30V)
Current consumption	3μA Ave (at VDD=1.8V)	—	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

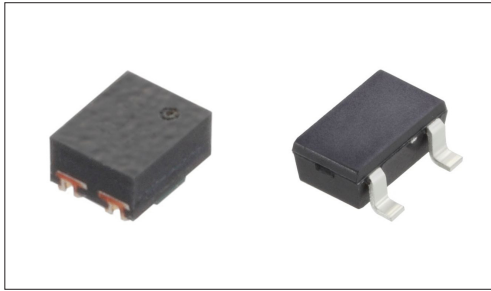
● Indicates applicability to all products in the series, while ○ indicates applicability to some products in the series.

Sensors

Magnetic Sensors

Switching Output Type
HGDE* Series

High reliability with a compact, thin profile based on magnetic sensing device technology.



■ 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
 Mobile: Notebooks, peripherals

■ Product List

Products No.	Package specifications	Function	Operating magnetic field	Drive voltage	Current consumption	Size (mm)	Automotive	Drawing No.
HGDESM013A	MAP type	Single polarity/Single output	1.3mT	Typ. 1.8V (1.6V min. to 3.6V max.)	3μA Ave (at VDD=1.8V)	1.3×0.9×0.525	—	1
HGDEPM013A	MAP type	Dual polarity/Single output	1.3mT	Typ. 1.8V (1.6V min. to 3.6V max.)	3μA Ave (at VDD=1.8V)	1.3×0.9×0.525	—	
HGDEDM013A	MAP type	Dual polarity/Dual output	1.3mT	Typ. 1.8V (1.6V min. to 3.6V max.)	3μA Ave (at VDD=1.8V)	1.3×0.9×0.525	—	
HGDESM023A	MAP type	Single polarity/Single output	2.0mT	Typ. 1.8V (1.6V min. to 3.6V max.)	3μA Ave (at VDD=1.8V)	1.3×0.9×0.525	—	
HGDESM033A	MAP type	Single polarity/Single output	3.0mT	Typ. 1.8V (1.6V min. to 3.6V max.)	3μA Ave (at VDD=1.8V)	1.3×0.9×0.525	—	
HGDEST021B	SOT23 type	Single polarity/Single output	2.0mT	Typ. 1.8V (1.6V min. to 3.6V max.)	3μA Ave (at VDD=1.8V)	2.9×2.8×1.1	—	2
HGDEPT021B	SOT23 type	Dual polarity/Single output	2.0mT	Typ. 1.8V (1.6V min. to 3.6V max.)	3μA Ave (at VDD=1.8V)	2.9×2.8×1.1	—	

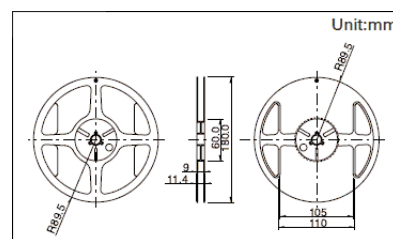
⚠ Note

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. High and low sensitivity types also available. Please contact us for details.
4. Some products can be provided halogen-free. Please contact us for details.

■ Packing Specifications

Taping

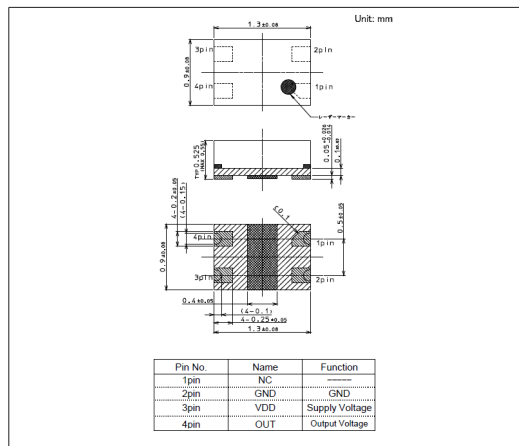
Number of packages (pcs.)			Tape width (mm)	Export package measurements (mm)
1 reel	1 case / Japan	1 case / export packing		
3,000	3,000	45,000	8	210 x 210 x 230



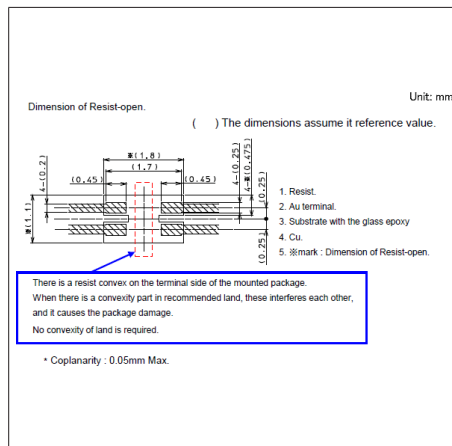
Switching Output Type HGDE* Series

Drawing No.1

■ Dimensions

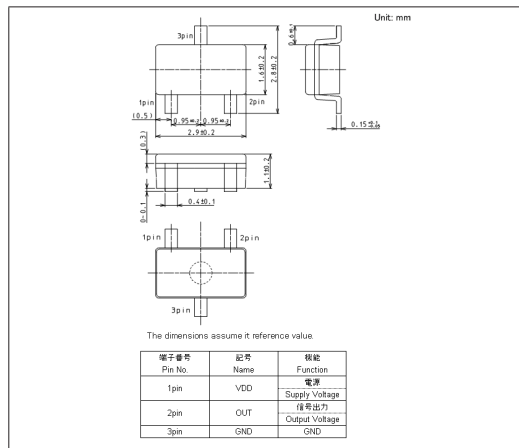


■ Land Dimensions

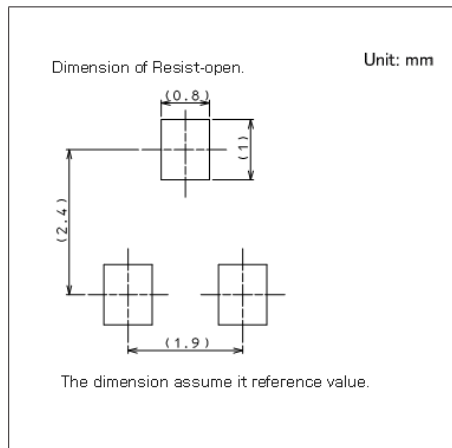


Drawing No.2

■ Dimensions



■ Land Dimensions



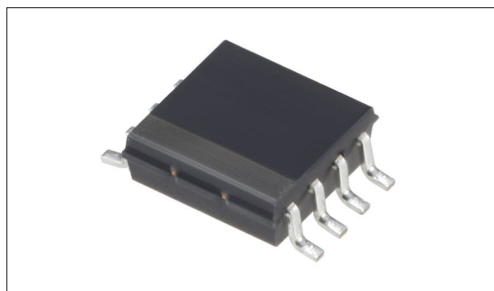
Sensors

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
HGARAP001A	MSOP type	Sin/Cos output	20 to 60mT	5.5V max.	2.95×4.0×1.1	●	2
HGARAN008A	DFN type	Sin/Cos output	20 to 60mT	5.5V max.	1.8×1.05×0.65	—	3

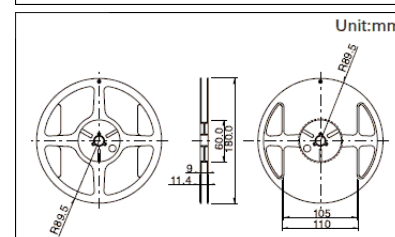
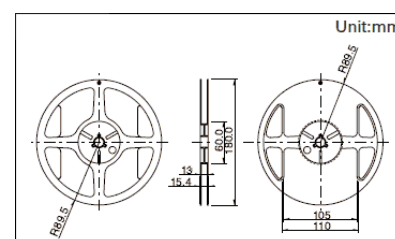
Note

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

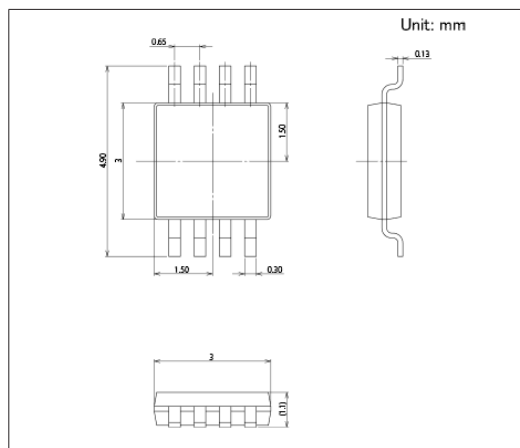
Products No.	Number of packages(pcs.)			Tape width (mm)	Export package measurements (mm)
	1 reel	1 case / Japan	1 case / export packing		
HGARPS011A	3,000	3,000	21,000	12	378×381×276
HGARAP001A	3,000	3,000	3,000	12	210 x 210 x 230
HGARAN008A	3,000	3,000	3,000	8	210 x 210 x 230



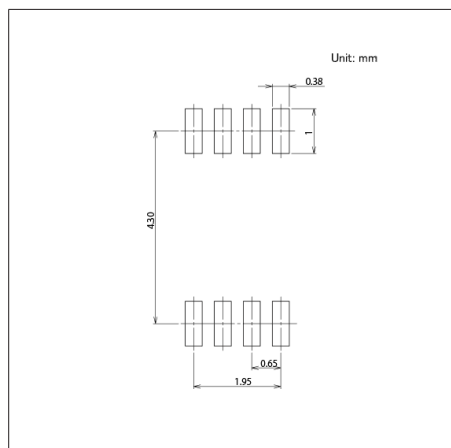
Analog Linear Output Type **HGAR Series**

Drawing No.1

■ Dimensions

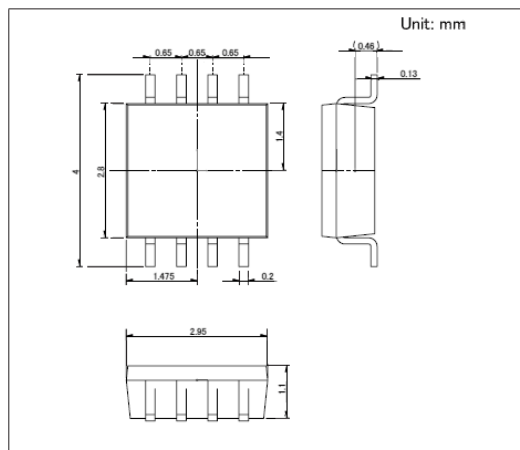


■ Land Dimensions



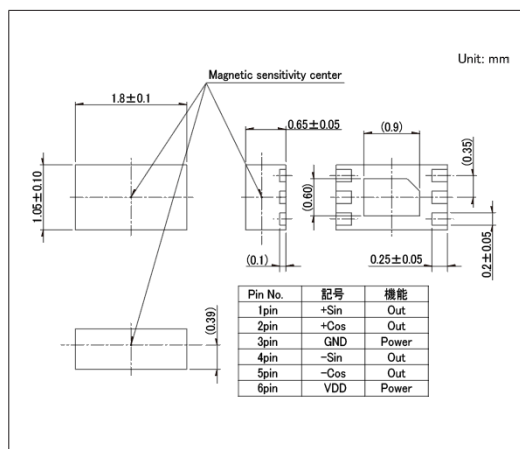
Drawing No.2

■ Dimensions



Drawing No.3

■ 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.
HGPRDT006A	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
HGPRDT007A	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	●	

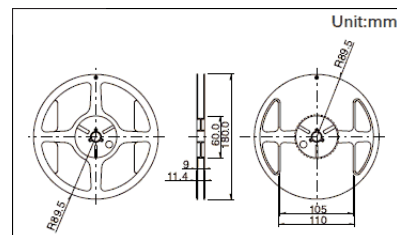
 Note

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

■ Packing Specifications

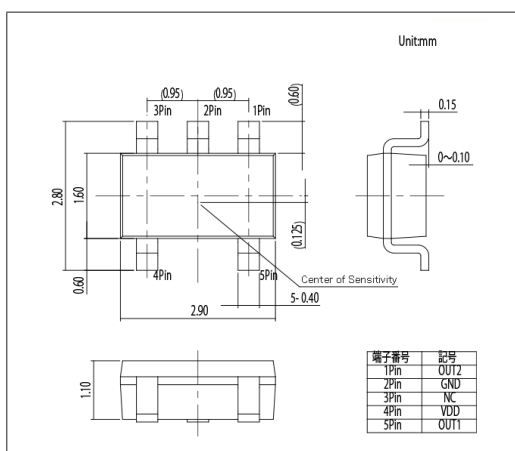
Taping

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

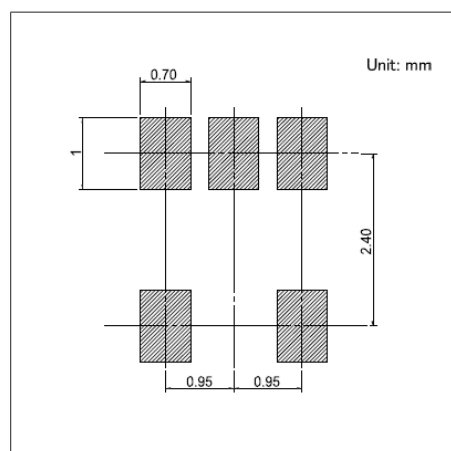


Drawing No.1

■ Dimensions



■ Land Dimensions



Geomagnetic Sensors

List of Varieties

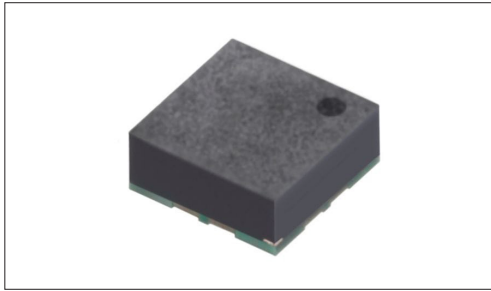
Series		HSCD
Photo		
Type		Electric compass
Dimensions (mm)		1.55×1.55×0.62 16pin LGA
Operating voltage	AVDD: Drive voltage	+1.6 to +2.0V
	DVDD_io: Drive voltage	+1.14 to AVDD
Operating magnetic field		±2.4mT
Current consumption		369μA typ. (ODR=100 Hz) 19μA typ. (stanby)
Operating temperature range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

Sensors

Geomagnetic Sensors

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 ² 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

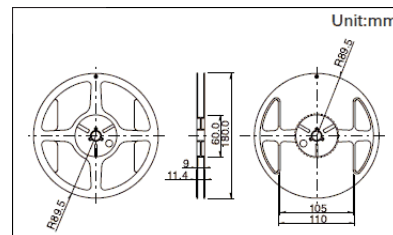
⚠ Note

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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

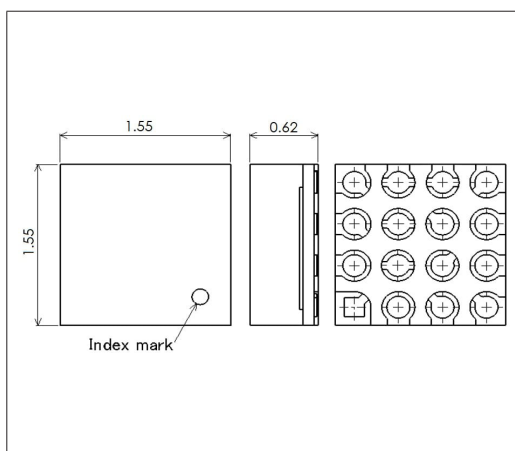
Taping

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℃ to +85℃ -20℃ to +85℃	-20℃ to +60℃ -20℃ to +85℃ -25℃ to +85℃
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.
HSHCAA006A	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
HSHCAL001B	I ² 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

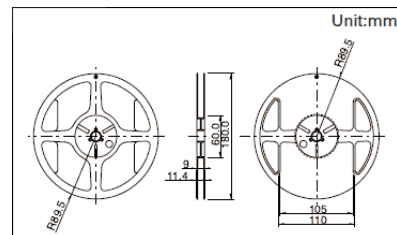
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■ Packing Specifications

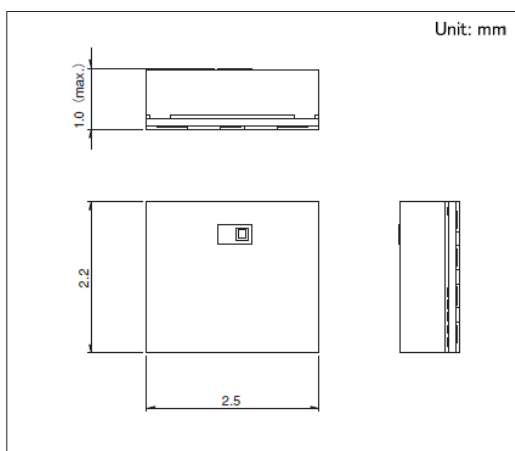
Taping

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



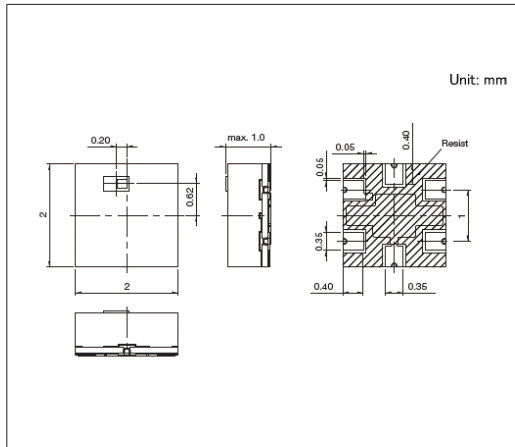
Drawing No.1

■ Dimensions



Drawing No.2

■ Dimensions



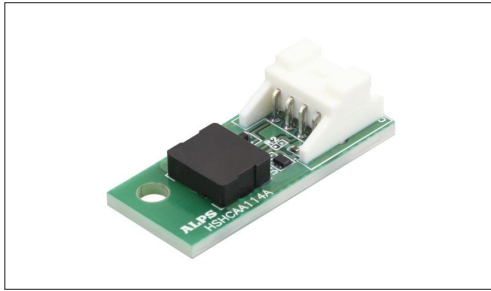
Sensors

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 ² 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 ² 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

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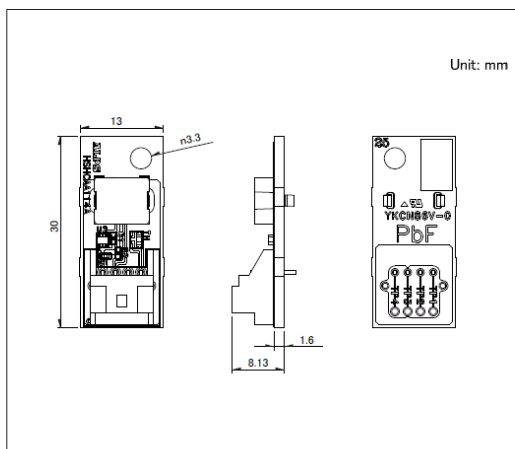
■ Packing Specifications

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

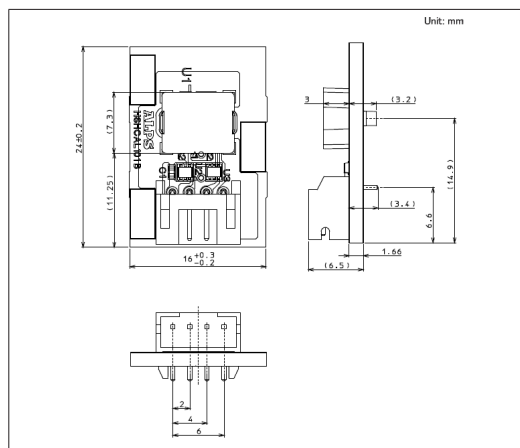
Drawing No. 1

■ Dimensions

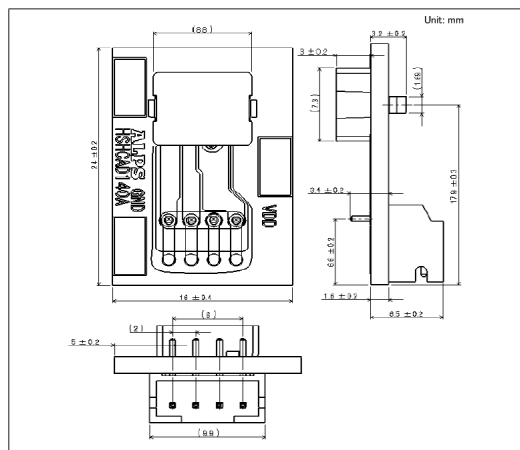


Drawing No.2

■ 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 4.20×3.60×2.69
Interface	Differential voltage	I ² C	Analog voltage
Operating temperature range	-20℃ to +85℃	-40℃ to +85℃	
Supply voltage	—	1.7 to 3.6V	1.5 to 3.6V 1.5 to 6V
Automotive	—	—	—



Note

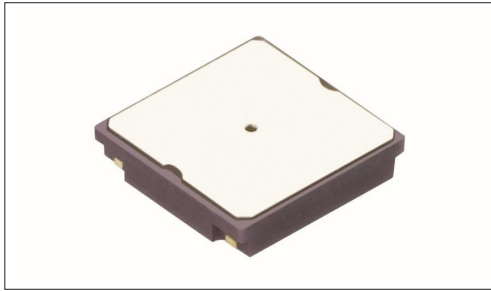
● Indicates applicability to all products in the series, while ○ indicates applicability to some products in the series.

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

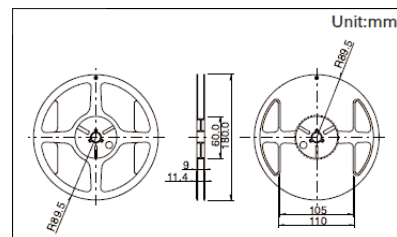
⚠ Note

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■ Packing Specifications

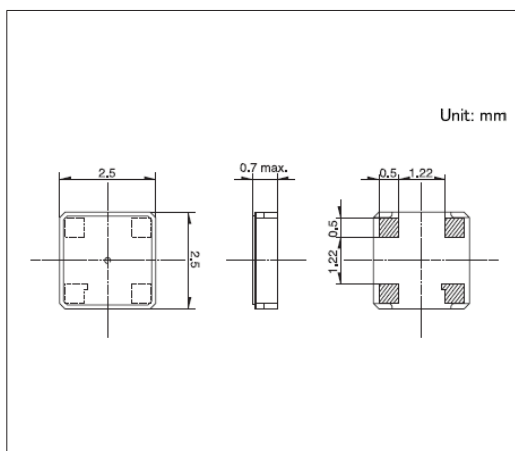
Taping

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



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

Mobile: Headsets, wearables

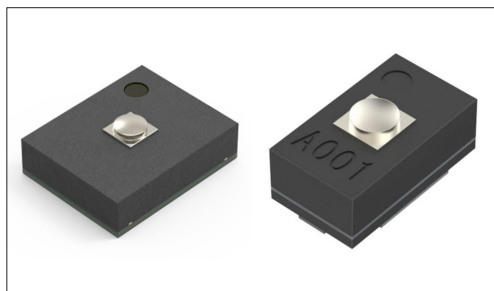
Sensors

Pressure Sensors

Force Sensor

HSFPAR Series

High-sensitivity load detection in a compact package.



Automotive

※Please check the product list for compatible products

- Type: Load detection
- Mounting method: Surface mount

Applications: Mobile: Smartphones, tablets, Headsets, wearables,
Notebooks, peripherals
Game: VR-AR, Virtual/augmented reality
Healthcare: Healthcare equipment, Nursing care
equipment, Analysis, test equipment
Automotive: Navigation/audio systems, HVAC, Motorcycles

■ Product List

Products No.	Function	Features	Interface	Force range	Operating temperature range	Supply voltage	Size (mm)	Automotive	Drawing No.
HSFPAR004A	Load detection	High-sensitivity load detection with a compact package	Analog voltage	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	Analog voltage	0 to 8N	-40°C to +85°C	1.5 to 3.6V	1.5×0.85×0.68	—	2
HSFPAR304A	Load detection	SMD-unit type	Analog voltage	0 to 20N	-40°C to +85°C	1.5 to 6V	4.20×3.60×2.69	●	3

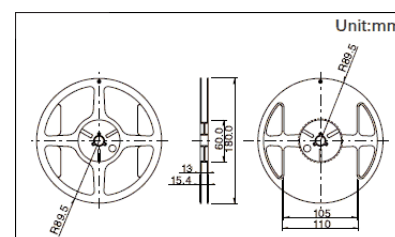
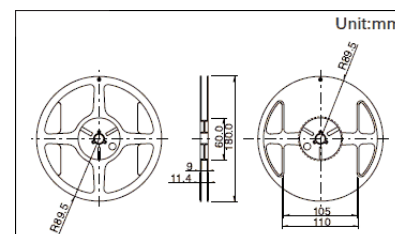
Note

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2. Please place purchase orders for taping products per minimum order unit (1 reel or a case).

■ Packing Specifications

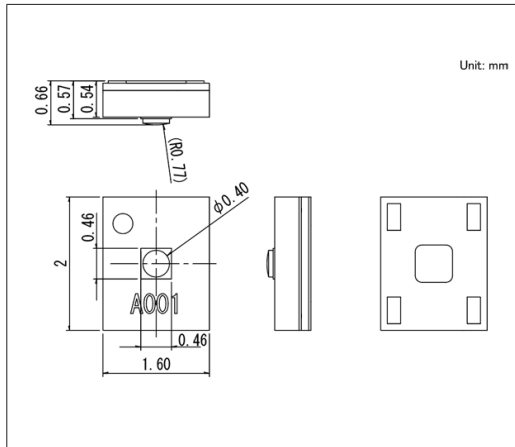
Taping

Products No.	Number of packages(pcs.)			Tape width (mm)	Export package measurements (mm)
	1 reel	1 case / Japan	1 case / export packing		
HSFPAR004A HSFPAR007A	3,000	3,000	45,000	8	210×210×230
HSFPAR304A	400	400	4,000	12	210×210×230

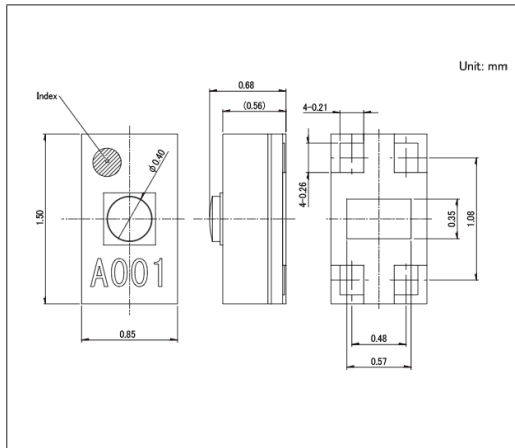


Drawing No.1

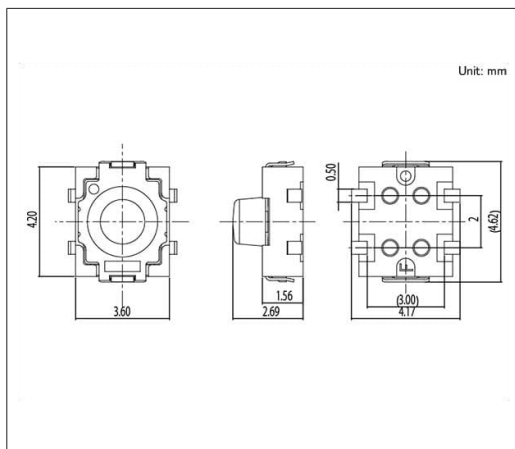
■ Dimensions

**Drawing No.2**

■ Dimensions

**Drawing No.3**

■ 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	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	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 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.

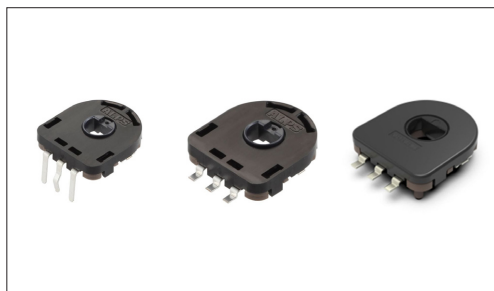
Sensors

Resistive Position Sensors

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.
RDC501051A	Vertical	Manual, DIP	320°	±2%	10kΩ	1,000,000	11.0×12.0×3.5	●	1
RDC501055A	Vertical	Manual, DIP (Without case hole)	320°	±2%	10kΩ	1,000,000	11.0×12.0×3.5	●	2
RDC501052A	Vertical	Manual, DIP	320°	±2%	10kΩ	1,000,000	11.0×12.0×3.5	●	3
RDC502012A	Horizontal	Manual, DIP	320°	±2%	10kΩ	1,000,000	11.0×3.9×13.5	●	4
RDC503051A	Vertical	Reflow	320°	±2%	10kΩ	1,000,000	11.0×12.0×2.75	●	5
RDC503062A	Vertical	Reflow (Without case hole)	320°	±2%	10kΩ	1,000,000	11.0×12.0×2.75	●	6
RDC503052A	Vertical	Reflow	320°	±2%	10kΩ	1,000,000	11.0×12.0×2.75	●	7
RDC503061A	Vertical	Reflow	140°	±2%	4.7kΩ	1,000,000	11.0×12.0×2.75	●	5
RDC506018A	Vertical	Reflow (Low-profile)	320°	±2%	10kΩ	1,000,000	11.0×12.0×2.2	●	8
RDC506A03A	Vertical	Reflow (Low-profile, Long-life, Without case hole)	320°	±2%	10kΩ	2,000,000	11.0×12.0×2.2	●	9

⚠ 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).

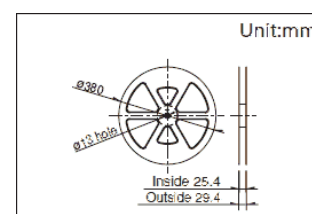
■ Packing Specifications

Tray

Products No.	Number of packages(pcs.)		Export package measurements (mm)
	1 case / Japan	1 case / export packing	
RDC501051A RDC501052A RDC501055A	1,500	3,000	526×370×191
RDC502012A	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		
RDC503051A RDC503052A RDC503061A RDC503062A	1,300	3,900	3,900	24	415×407×135
RDC506018A RDC506A03A	1,200	3,600	3,600	24	415×407×135

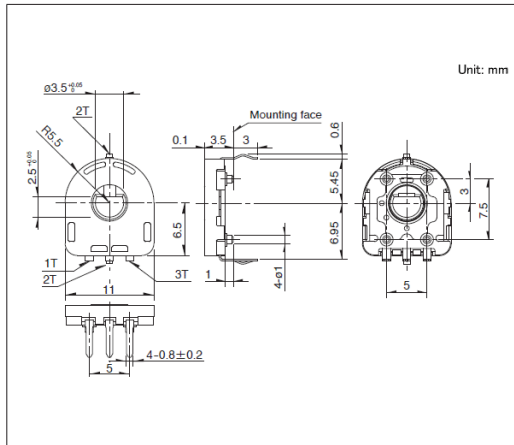


Rotary Type

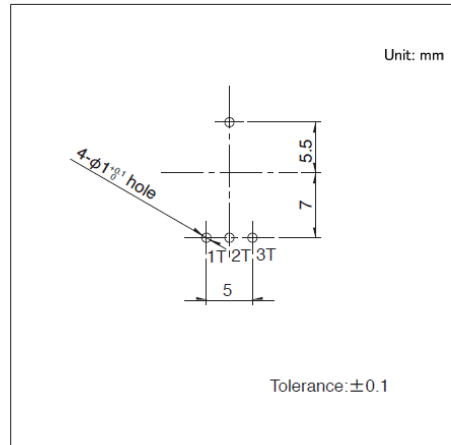
RDC50 Series

Drawing No.1

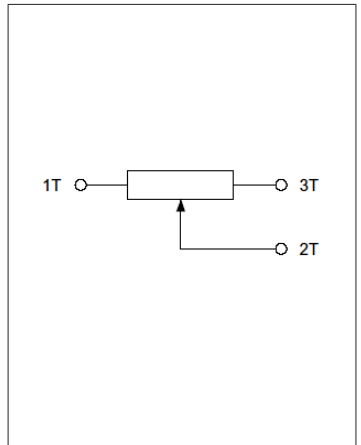
■ Dimensions



■ Mounting Hole Dimensions



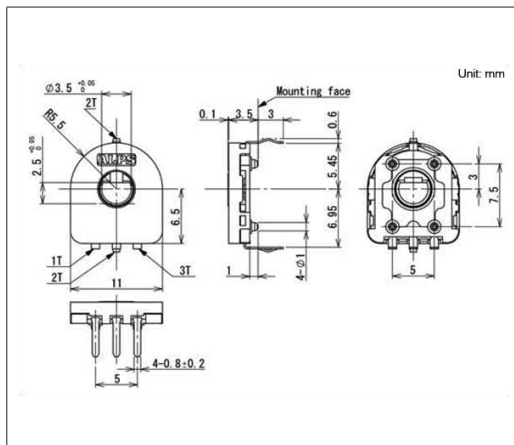
■ Circuit Diagram



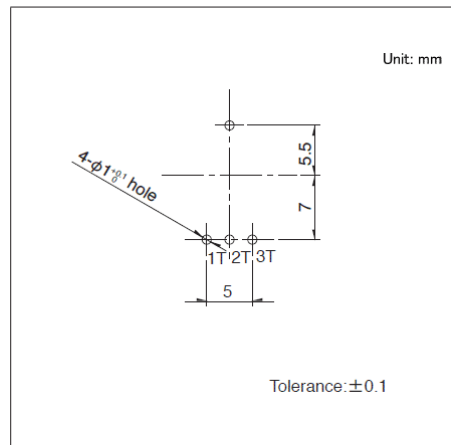
Viewed from mounting side

Drawing No.2

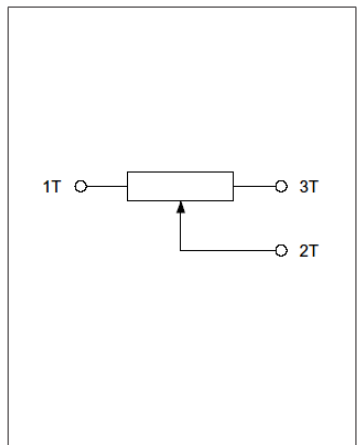
■ Dimensions



■ Mounting Hole Dimensions



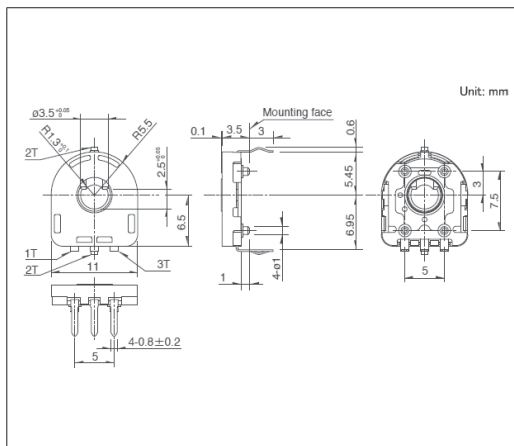
■ Circuit Diagram



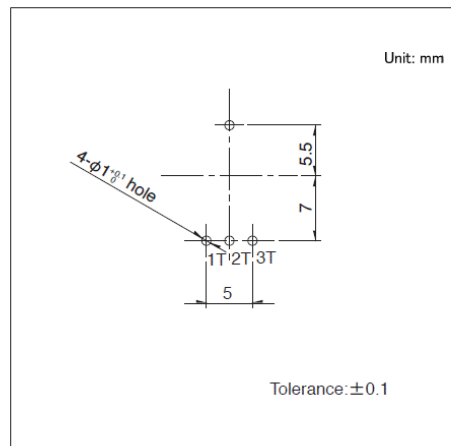
Viewed from mounting side

Drawing No.3

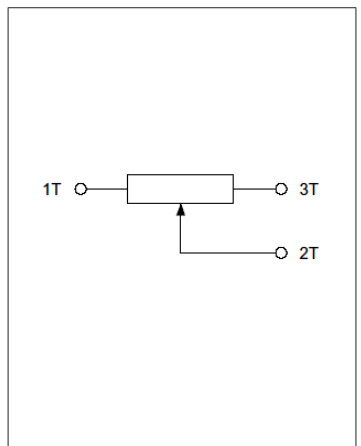
■ Dimensions



■ Mounting Hole Dimensions



■ Circuit Diagram



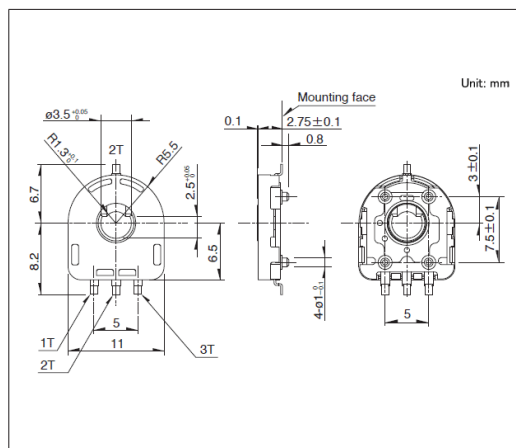
Viewed from mounting side

Rotary Type

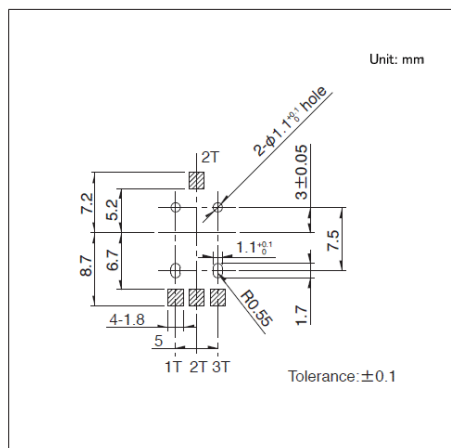
RDC50 Series

Drawing No.7

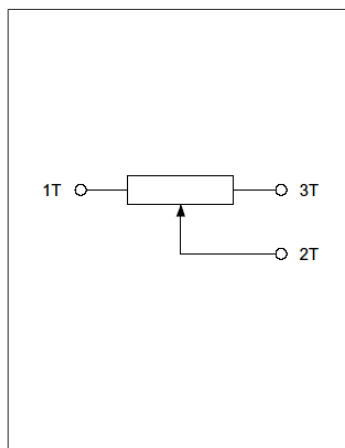
■ Dimensions



■ Mounting Hole Dimensions



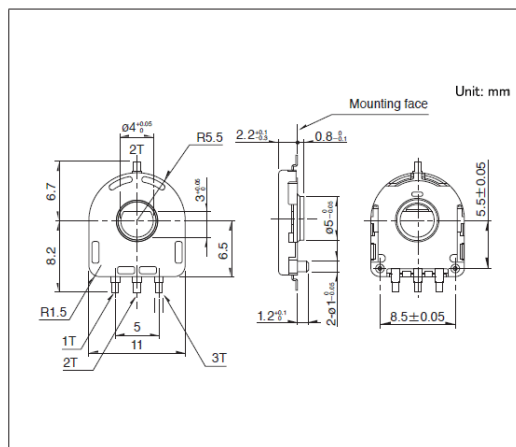
■ Circuit Diagram



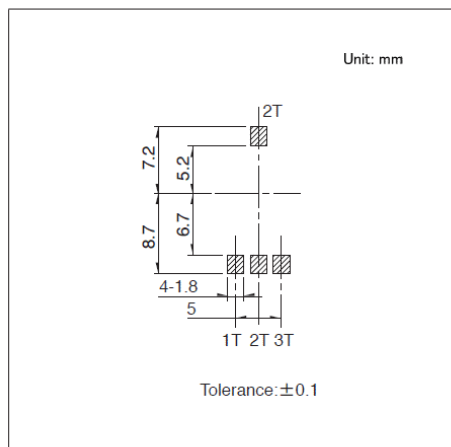
Viewed from mounting side

Drawing No.8

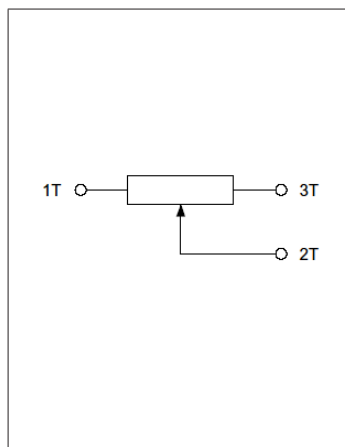
■ Dimensions



■ Land Dimensions



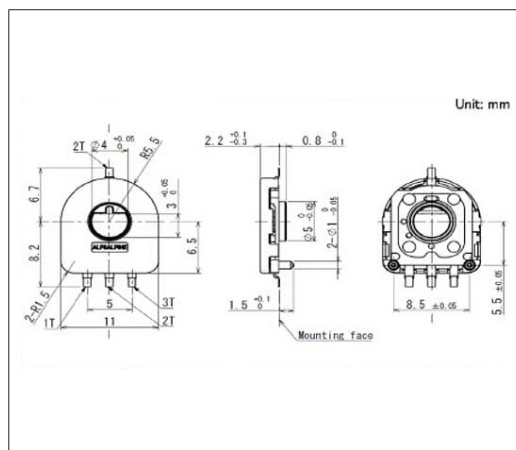
■ Circuit Diagram



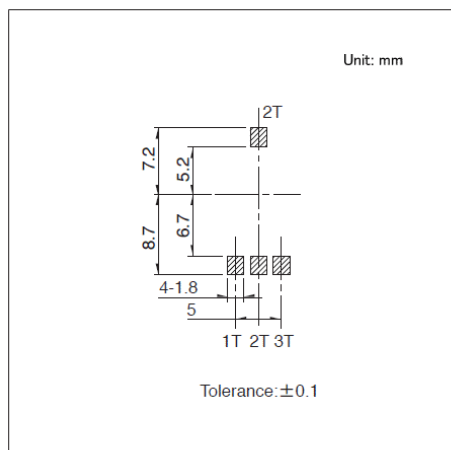
Viewed from mounting side

Drawing No.9

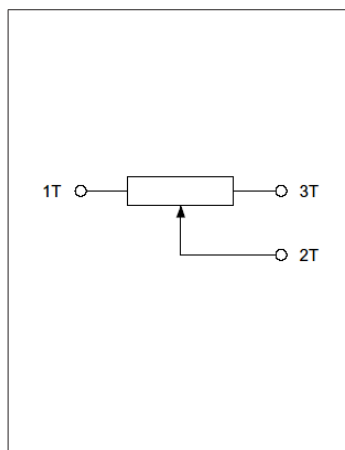
■ Dimensions



■ Land Dimensions



■ Circuit Diagram



Viewed from mounting side

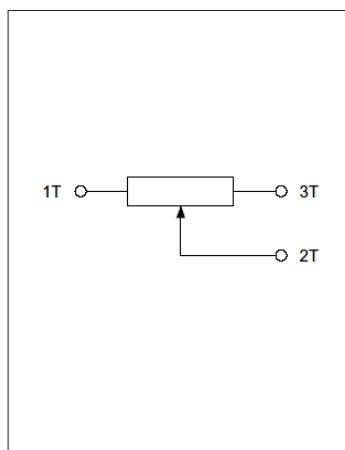
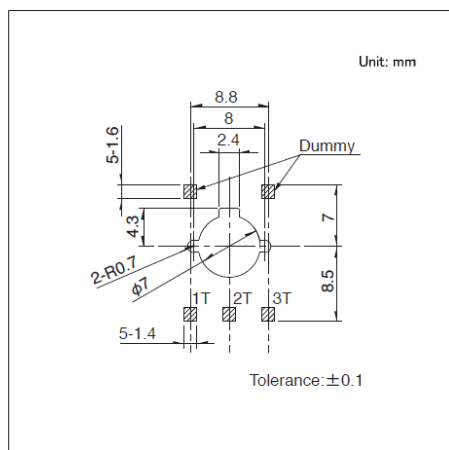
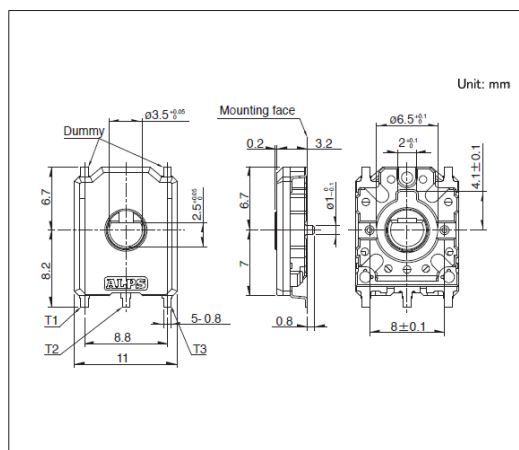
10 million operation cycles in a compact design.



Applications:Energy_Industrial:Robots, drones,Industrial equipment
Home:Major home appliances,Office equipment
Navigation/audio systems, HVAC:Navigation/audio systems,
HVAC

Products No.	Control part orientation	Mounting method	Linearity guarantee range	Linearity	Total resistance	Operating life (cycles)	Dimensions (mm)	Automotive	Drawing No.
RDC9010006	Vertical	Reflow (Long-life)	60°	±3%	3.3kΩ	10,000,000	11.0×13.7×3.2		1
RDC9010007	Vertical	Reflow (Long-life)	244°	±3%	10kΩ	10,000,000	11.0×13.7×3.2		

Number of packages(pcs.)		Export package measurements (mm)
1 case / Japan	1 case / export packing	
1,960	1,960	300×240×270



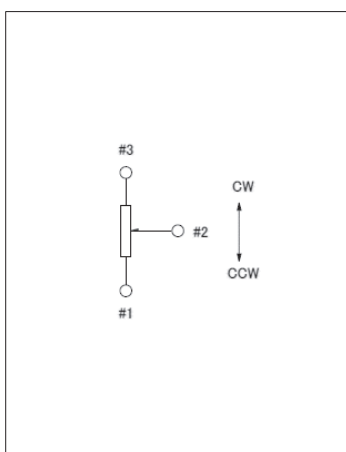
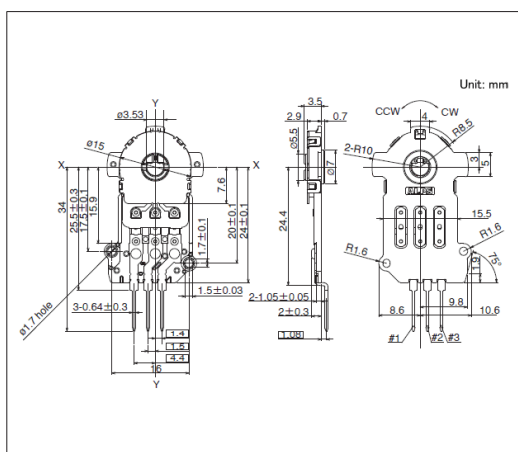
Long-life sensor compliant with absolute linearity specifications.

Automotive

Applications: Automotive: Navigation/audio systems, HVAC

Products No.	Mounting method	Linearity guarantee range	Linearity	Total resistance	Operating life (cycles)	Dimensions (mm)	Automotive	Drawing No.
RD6R1A0008	Connector type	310°	±2%	3.8kΩ	500,000	20.6×32.5×3.6		1

Number of packages(pcs.)		Export package measurements (mm)
1 case / Japan	1 case / export packing	
1,800	1,800	540×360×250



Sensors

Resistive Position Sensors

Linear Type
RDC10 SeriesHigh-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.
RDC1010A12	Vertical	10	9.2mm	$\pm 0.5\%$	10k Ω	50,000	6.5×17.3×2.1	—	1
RDC1014A09	Vertical	14	12mm	$\pm 0.5\%$	10k Ω	200,000	6.9×23.5×2.9	●	2
RDC1022A05	Vertical	22	20mm	$\pm 0.5\%$	10k Ω	200,000	6.9×31.5×2.9	●	
RDC10320RB	Vertical	32	30mm	$\pm 0.5\%$	10k Ω	200,000	6.9×41.5×2.9	●	
RDC1047A03	Vertical	47	45mm	$\pm 0.5\%$	10k Ω	200,000	6.9×56.5×3.0	●	

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

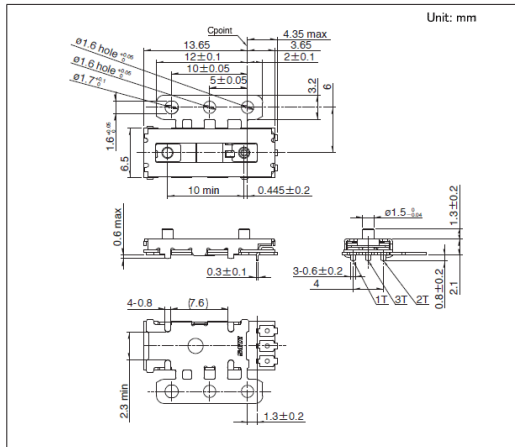
Tray

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

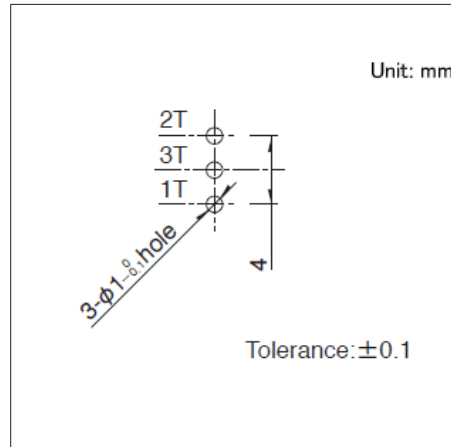
Linear Type RDC10 Series

Drawing No.1

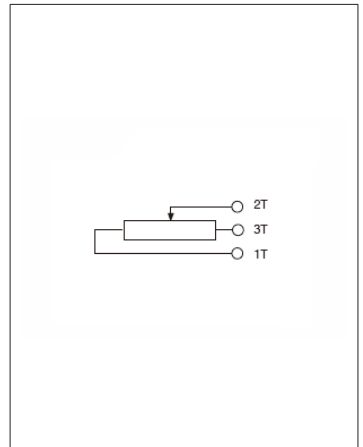
■ Dimensions



■ Mounting Hole Dimensions

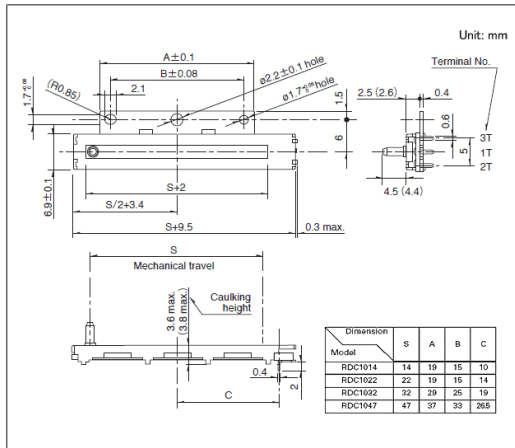


■ Circuit Diagram

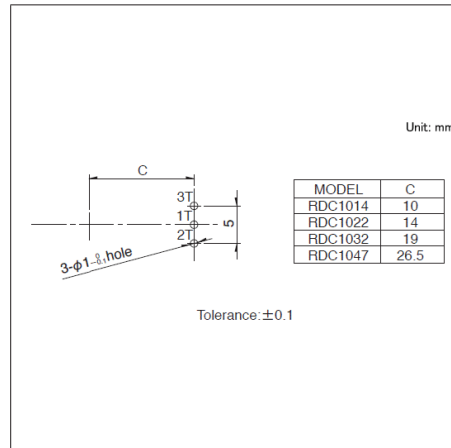


Drawing No.2

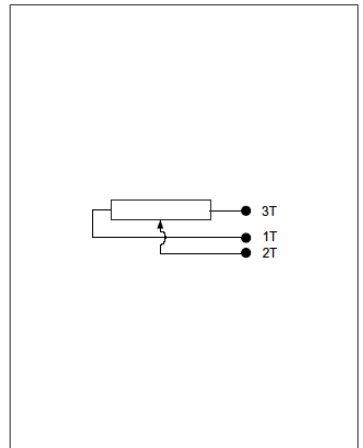
■ Dimensions



■ Mounting Hole Dimensions



■ Circuit Diagram



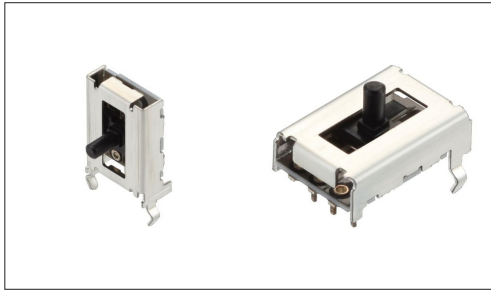
Sensors

Resistive Position Sensors

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.
RD708A029A	Horizontal	8	6mm	±1%	4.7kΩ	100,000	10.0×5.0×15	●	1
RD7081015A	Vertical	8	7mm	±1%	5kΩ	100,000	10.0×15.0×4.5	●	2
RD7091008A	Vertical	9	7mm	±1%	5kΩ	100,000	9.0×15.8×3.7	●	3
RD712A028A	Horizontal	12	9mm	±1%	2.2kΩ	100,000	10.0×5.0×19.0	●	4
RD7121008A	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

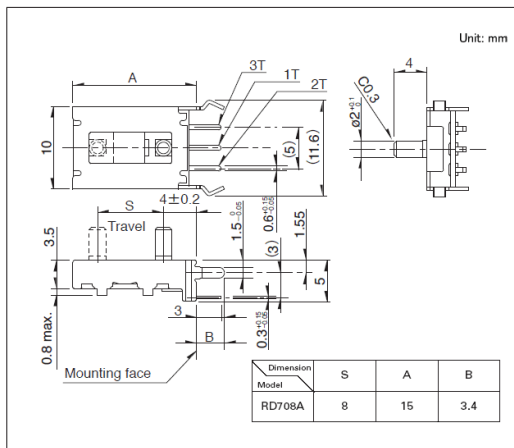
Tray

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

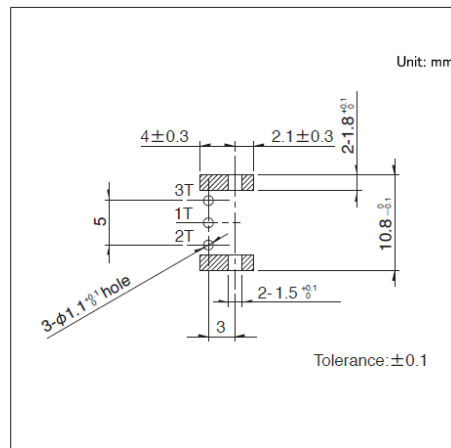
Linear Type (Exclusively Used to Detect the Angle of Vehicle Head Lights)

RD7 Series**Drawing No.1**

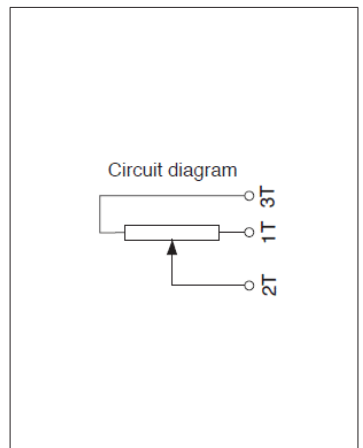
■ Dimensions



■ Mounting Hole Dimensions



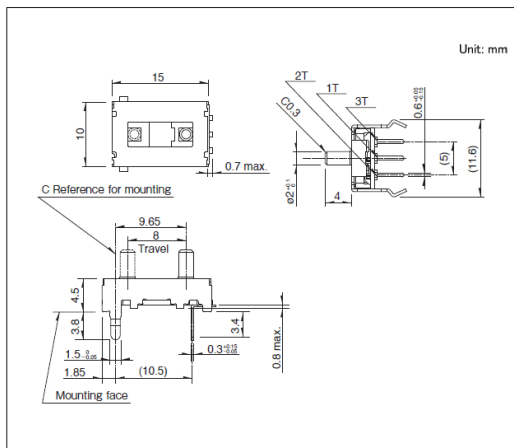
■ Circuit Diagram



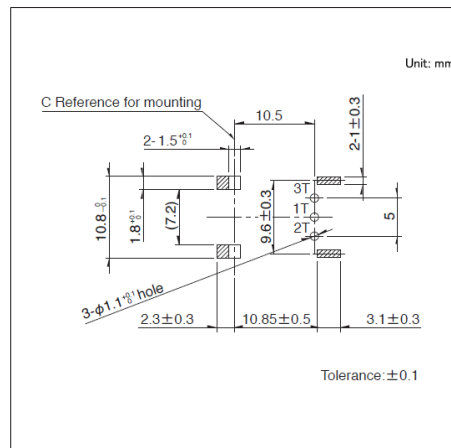
Viewed from mounting side
Do not wire the shaded area

Drawing No.2

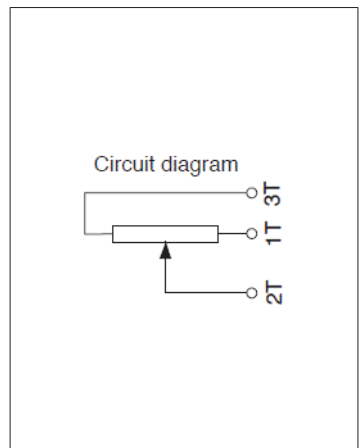
■ Dimensions



■ Mounting Hole Dimensions



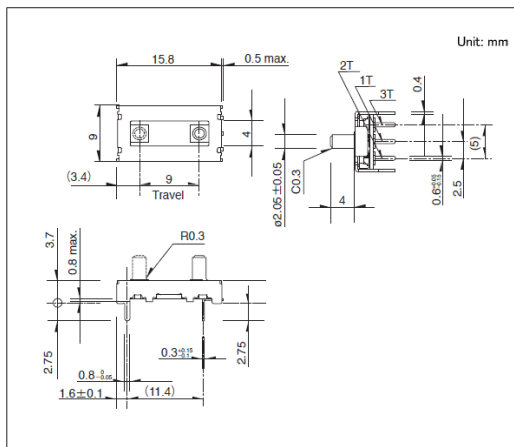
■ Circuit Diagram



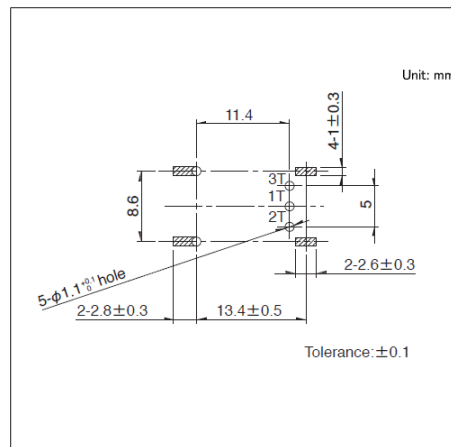
Viewed from mounting side
Do not wire the shaded area

Drawing No.3

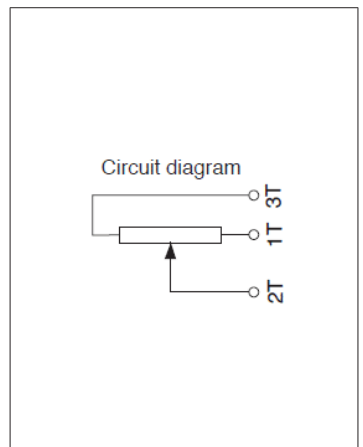
■ Dimensions



■ Mounting Hole Dimensions



■ Circuit Diagram

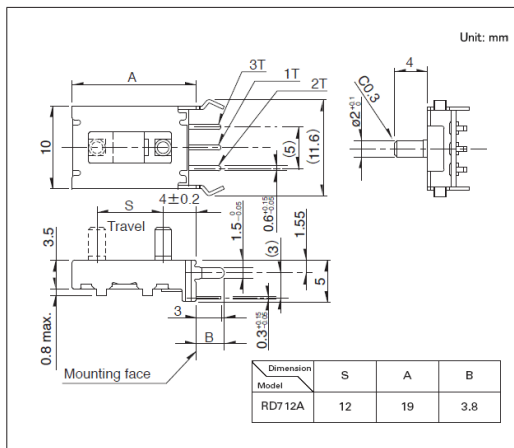


Viewed from mounting side
Do not wire the shaded area

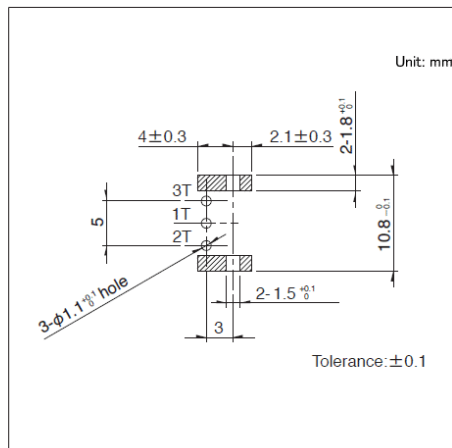
Linear Type (Exclusively Used to Detect the Angle of Vehicle Head Lights)

RD7 Series**Drawing No.4**

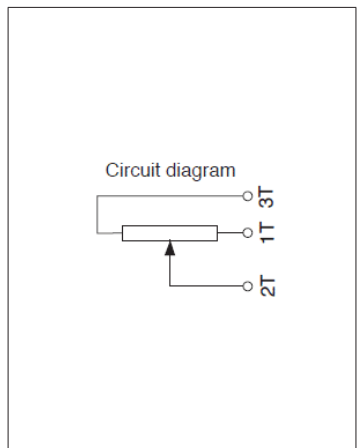
■ Dimensions



■ Mounting Hole Dimensions



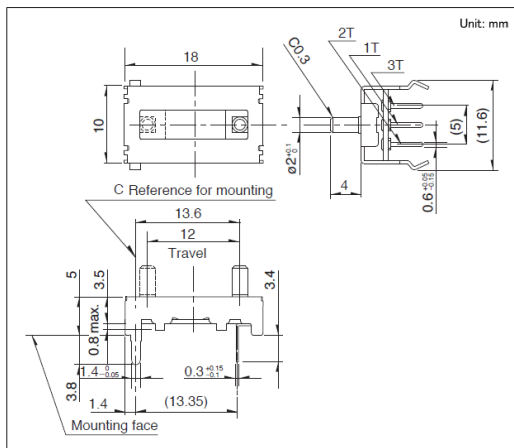
■ Circuit Diagram



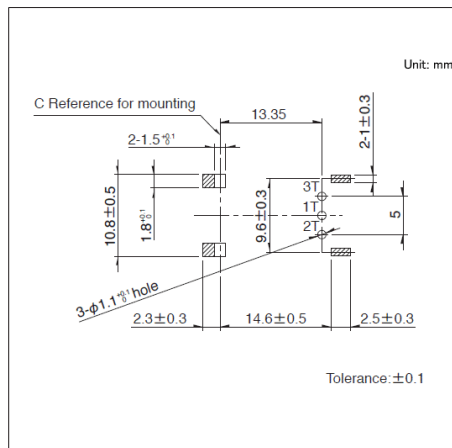
Viewed from mounting side
Do not wire the shaded area

Drawing No.5

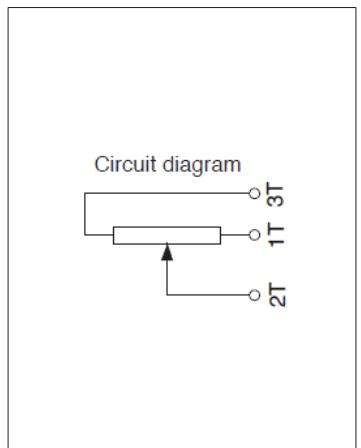
■ Dimensions



■ Mounting Hole Dimensions



■ Circuit Diagram



Viewed from mounting side
Do not wire the shaded area

Resistive Position Sensors / Soldering Conditions

■ Reference for Manual Soldering

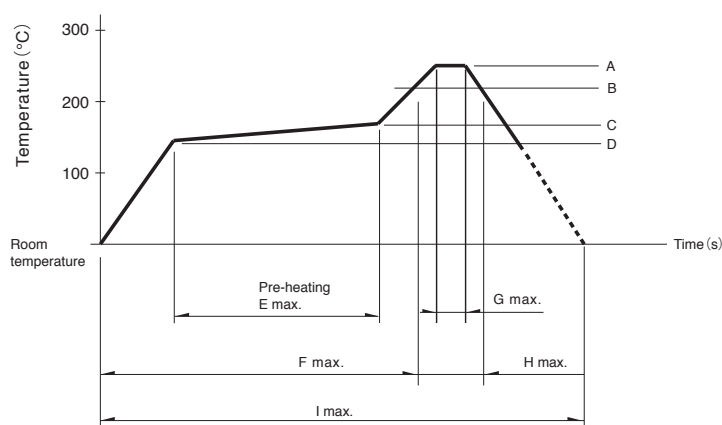
Series	Tip temperature	Soldering time
RDC50, RDC90	350±5°C	3 ⁺¹ ₀ s
RDC10, RD7	350°C max.	3s max.

■ 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	1min.	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.

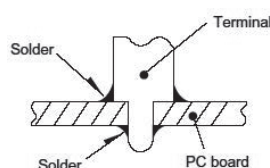
To minimize the probability of this phenomenon pay attention to the following when you program the relevant software

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.

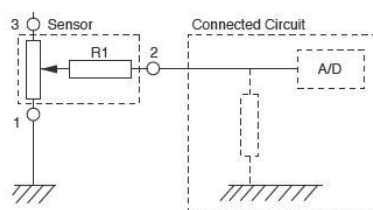
Soldering

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 (R_1 below) occurs within the sensor. To reduce the effect of contact resistance (R_1), set the impedance within the circuit connected to the output terminal to greater than $1\text{ M}\Omega$.



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.