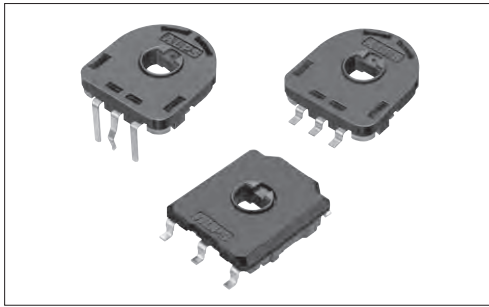


Rotary sensors catering to diverse position detection needs



■ Typical Specifications

Items	Specifications	
	RDC50	RDC90
Rated voltage	5V DC	
Operating life	1,000,000 cycles	10,000,000 cycles
Total resistance	10kΩ	3.3kΩ (RDC9010006) 10kΩ (RDC9010007)
Operating temperature range	-40°C to +120°C	

■ Product Line

Control part orientation	Mounting method	Linearity guarantee range	Linearity	Hollow shaft variation	Operating life (cycles)	Minimum order unit (pcs.)		Model No.	Drawing No.
						Japan	Export		
Vertical	Manual, DIP	320°	±2%	φ3.5	1,000,000	1,500	3,000	RDC501051A	1
Horizontal				φ3.5 dia with radius				RDC501052A	2
Vertical	Reflow			φ3.5		1,600	1,600	RDC502012A	3
				φ3.5 dia with radius		3,900	3,900	RDC503051A	4
	Reflow (Low-profile)	φ4	3,600	3,600	RDC503052A	5			
		φ4	3,600	3,600	RDC506018A	6			
Reflow (Long-life)	60°	±3%	φ3.5	10,000,000	1,960	1,960	RDC9010006	7	
	244°						RDC9010007		

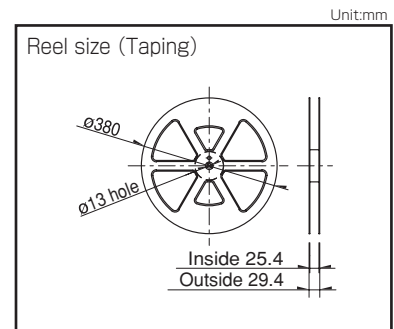
Note

Other varieties are also available. Please inquire.

■ Packing Specifications

Tray / Taping


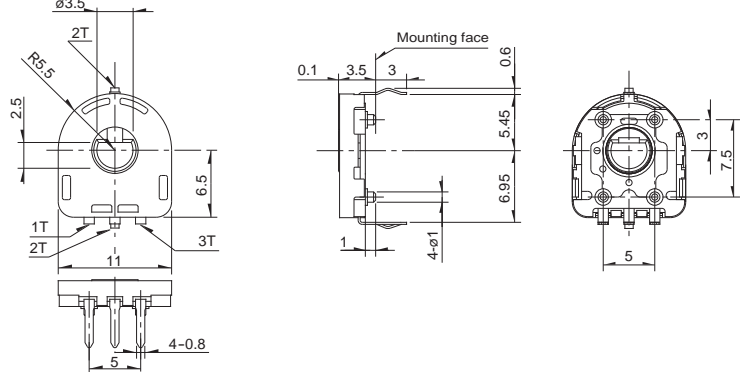

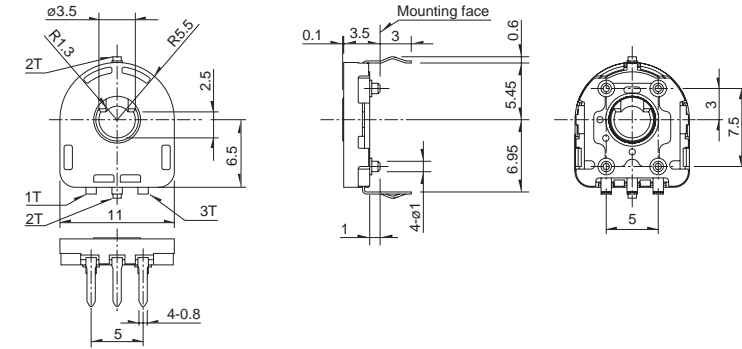
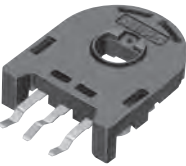
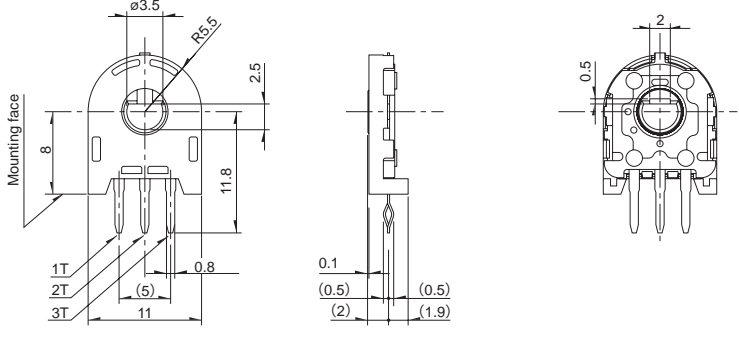

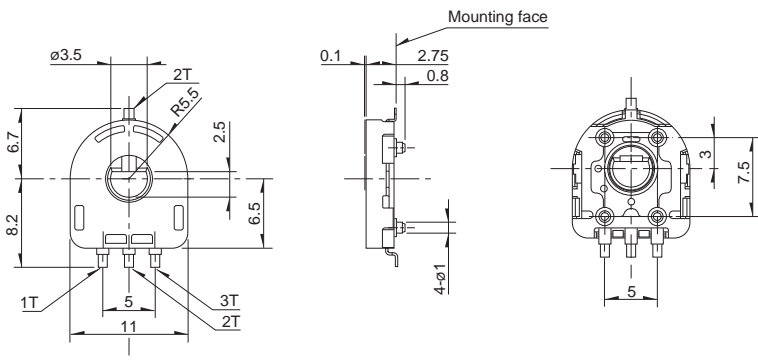
Series	Packing Specifications	Number of packages (pcs.)		Tape width (mm)	Export package measurements (mm)
		1 case /Japan	1 case /export packing		
RDC501	Tray	1,500	3,000	—	526×370×191
RDC502		1,600	1,600		370×280×92
RDC503	Taping	3,900	3,900	24	415×407×135
RDC506		3,600	3,600		
RDC90	Tray	1,960	1,960	—	300×240×270



Refer to P.426 for product specifications.
Refer to P.427 for soldering conditions.

■ Dimensions

Unit:mm

No.	Photo	Style
1		
2		
3		
4		

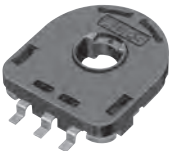
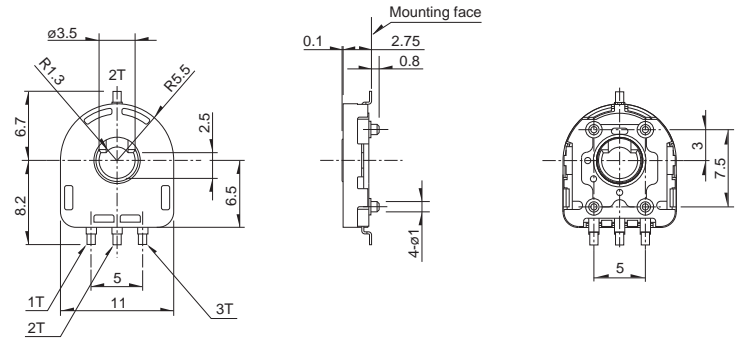
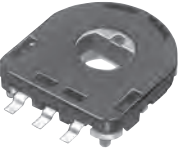
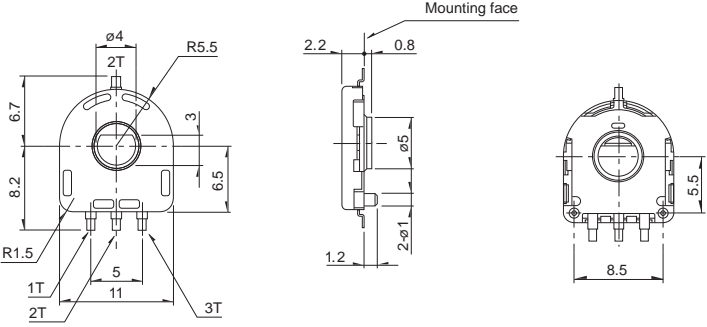
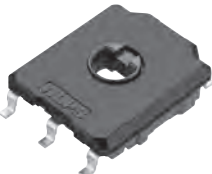
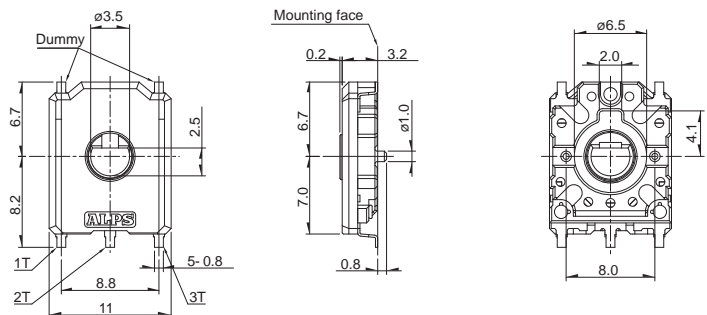
Resistive
Position Sensors

Rotary Type

Linear Type

■ Dimensions

Unit:mm

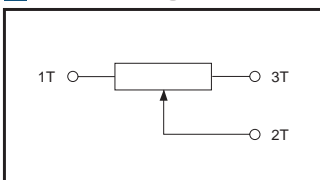
No.	Photo	Style
5	 <p>RDC503 (Reflow, $\phi 3.5$ dia with radius)</p>	
6	 <p>RDC506 (Reflow, low-profile)</p>	
7	 <p>RDC90 (Reflow, Long-life)</p>	

Resistive
Position Sensors

Rotary Type





Linear Type

■ Circuit Diagram



Resistive Position Sensors

List of Varieties

Type	Rotary Type		
Series	RDC50		RD6R1A
Photo			
Direction of lever	Vertical	Horizontal	Vertical
Reference taper	100%/333.3°		100%/320°
Linearity guarantee range	320°		310°
Operating temperature range	-40°C to +120°C		-40°C to +85°C
Operating life	1,000,000 cycles		500,000 cycles
Available for automotive use	●		●
Life cycle (availability)			
Mechanical performance	Rotational torque	2mN·m max.	
Electrical performance	Total resistance tolerance	±30%	
	Linearity	±2%	±2% (320°)
	Rated voltage	5V DC	
Environmental performance	Cold	-40°C 168h	
	Dry heat	120°C 168h	95°C 168h
	Damp heat	60°C, 90 to 95%RH 96h	80°C, 90 to 95%RH 96h
Terminal style		Insertion / Reflow	Connector
Page		417	420

Resistive Position Sensors Measurement and Test Methods	426
Resistive Position Sensors Soldering Conditions	427
Resistive Position Sensors Cautions	428

Note

● Indicates applicability to all products in the series.

Resistive Position Sensors

Rotary Type

Linear Type

Method for Regulating the Linearity

Model RDC50 / RDC90 / RD6R1A

- Reference taper : 100%/A
- Index point (0°) is 50% output point (RDC50/RDC90)
The center (0°) is in the configuration diagram condition (RD6R1A)

Series	A	B	C
RDC50	333.3°	±160°	±2%
RDC90	80°	±30°	±3%
	260°	±122°	
RD6R1A	320°	±155°	±2%

Model RDC10 / RD7

With rated voltage applied between terminals 1 and 3, the straight line which connects the measured output values V_B and V_A at specified reference positions B and A is assumed to be an ideal straight line, so that deviation against the ideal straight line when the voltage applied between terminals 1 and 3 is assumed to be 100% can be expressed as a percentage.

Resistive Position Sensors / Measurement and Test Methods

Resistive Position Sensor

[Total Resistance]

Unless otherwise specified, total resistance is the resistance measured between resistor terminals 1 and 3.

[Rating Voltage]

The rating voltage corresponding to the rated power shall be determined by the following equation. When the resulting rated voltage exceeds the maximum operating voltage of a specific resistor, the maximum operating voltage shall be taken as the rated voltage.

$$E = \sqrt{P \cdot R}$$

E : Rated voltage (V)
P : Rated power (W)
R : Total nominal resistance (Ω)

Reference for Manual Soldering

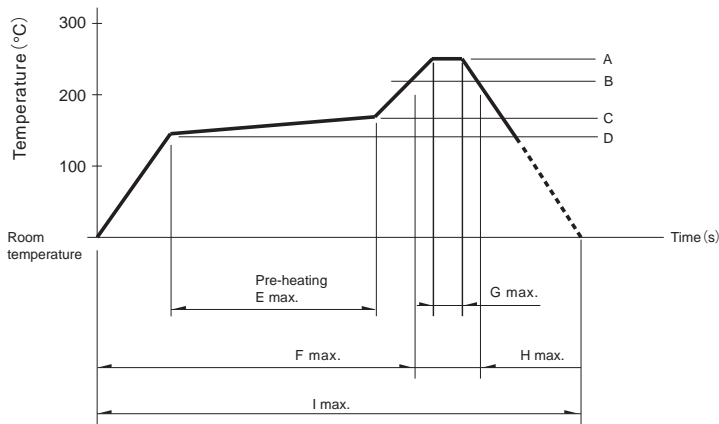
Series	Tip temperature	Soldering time
RDC50, RDC90	350±5°C	3 ⁺ ₀ s
RDC10, RD7	350°C max.	3s max.

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

1. Cleaning sensors should not be attempted.
2. Type of solder to be used Use cream solder that contains 10 to 15 wt % flux.
3. Number of solder applications - apply solder only once
4. 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	2 min.	—	5s	40s	4 min.	1 time
RDC90	255°C	230°C	—	—	—	2 min.	10s	1 min.	4 min.	1 time

Notes

1. 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.
2. 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.
3. Conditions vary to some extent depending on the type of reflow bath used. Be sure to give due consideration to this prior to use.