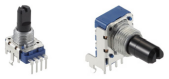
Potentiometers

Rotary Potentiometer (Insulated shaft type)

List of Varieties

Series		RK09K/RK09D	RK09Y11L	RK11K	RK12L	RK14K
Photo						
Dimensions		9mm Size		11mm Size	12mm Size	14mm Size
Control part orientation	Horizontal	●	●	●	●	●
	Vertical	●	—	●	●	●
Number of resistor elements		Single-unit			Dual-unit	
Shaft types		Driver Flat Knob	Flat			
Length of the shaft LM1 (mm)		15.0 20.0 25.0	—	22.5	25.0 30.0	22.5
Detent		Center detent Without	Without	Center detent Without		
Operating temperature range		-10℃ to +70℃				
Operating life (cycles)		5,000	1,000,000	15,000		
Electrical performance	Total resistance	10kΩ				
	Resistance taper	1B	Linear	1B 15A		
	Total resistance tolerance	±20%	±30%	±20%		
	Rated power	0.05W	0.01W	0.05W		
	Maximum operating voltage	50V AC, 20V DC	50V AC, 5V DC	50V AC, 20V DC	50V AC for AC only	
	Gang error	—			-40dB to 0dB 3dB max. Within 2dB at center	
	Insulation resistance	100MΩ min. 250V DC		100MΩ min. 500V DC	100MΩ min. 250V DC	
	Voltage proof	250V AC for 1 minute		500V AC for 1 minute	300V AC for 1 minute	
Mechanical performance	Total rotational angle	280° ±5° 300° ±5°	300° ±5° (Effective electrical rotational angle 60° ±5°)	300° ±5°		
	Rotational torque	1 to 8mN·m	5mN·m max.	3 to 20mN·m	2 to 15mN·m	3 to 20mN·m
	Stopper strength	0.3N·m	—	0.6N·m	0.5N·m	0.6N·m
	Push-pull strength	50N max.	30N max.	80N max.		
	Vibration	10 to 55 to 10Hz/min., the amplitude is 1.5mm for all the frequencies, in the 3 direction of X, Y and Z and for 2 hours respectively				
Automotive		—	—	—	—	—

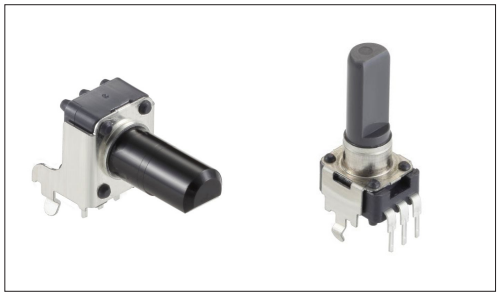
⚠Note

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

Potentiometers Rotary Potentiometer (Insulated shaft type)

9mm Size Insulated Shaft Snap-in Type
RK09K/RK09D Series

Compact type with a 9.8mm body width, supporting high-density set designs.



- Total resistance tolerance:±20%
- Maximum operating voltage:50V AC, 20V DC
- Rotational torque:1 to 8mN·m
- Operating life:5,000 cycles
- Operating temperature range:-10℃ to +70℃

Applications:Home:Major home appliances,Office equipment
Audio_TV:Visual,Audio,Pro audio

■ Product List

Products No.	Type	Number of resistor elements	Control part orientation (Mounting height)	Shaft types	Length of the shaft LM1 (mm)	Detent	Total resistance	Resistance taper	Automotive	Drawing No.
RK09K113004U	—	Single-unit	Vertical	Flat	15.0	Center detent	10kΩ	1B	—	1
RK09K1130A6S		Single-unit	Vertical	Flat	15.0	Without	10kΩ	1B	—	
RK09K11300DR		Single-unit	Vertical	Knob	15.0	Center detent	10kΩ	1B	—	2
RK09K1130A8G		Single-unit	Vertical	Knob	15.0	Without	10kΩ	1B	—	
RK09K1130081		Single-unit	Vertical	Knob	20.0	Center detent	10kΩ	1B	—	3
RK09K1130A5R		Single-unit	Vertical	Knob	20.0	Without	10kΩ	1B	—	
RK09K1130AP5		Single-unit	Vertical	Driver	15.0	Without	10kΩ	1B	—	4
RK09K1130AST		Single-unit	Vertical	Driver	20.0	Without	10kΩ	1B	—	5
RK09K111009J		Single-unit	Horizontal	Flat	15.0	Center detent	10kΩ	1B	—	6
RK09K1110AK4		Single-unit	Horizontal	Flat	15.0	Without	10kΩ	1B	—	
RK09K11100DN		Single-unit	Horizontal	Flat	20.0	Center detent	10kΩ	1B	—	7
RK09K1110AAR		Single-unit	Horizontal	Flat	20.0	Without	10kΩ	1B	—	
RK09K1110077		Single-unit	Horizontal	Knob	20.0	Center detent	10kΩ	1B	—	8
RK09K1110A0J		Single-unit	Horizontal	Knob	20.0	Without	10kΩ	1B	—	
RK09K1110AMJ		Single-unit	Horizontal	Flat	15.0	Without	10kΩ	1B	—	9
RK09K1110B26		Single-unit	Horizontal	Flat	20.0	Without	10kΩ	1B	—	10
RK09D1130C3W		Single-unit	Vertical	Flat	20.0	Center detent	10kΩ	1B	—	11
RK09D1130C1B		Single-unit	Vertical	Flat	20.0	Without	10kΩ	1B	—	
RK09D1130C3C		Single-unit	Vertical	Flat	25.0	Center detent	10kΩ	1B	—	12
RK09D1130C2P		Single-unit	Vertical	Flat	25.0	Without	10kΩ	1B	—	
RK09D1110C1A		Single-unit	Horizontal	Flat	25.0	Without	10kΩ	1B	—	13
RK09K1130D62	Clear-shaft	Single-unit	Vertical	Knob	20.0	Without	10kΩ	1B	—	14

⚠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. Products other than those listed in above products are also available. Please contact us for details.

9mm Size Insulated Shaft Snap-in Type

RK09K/RK09D Series

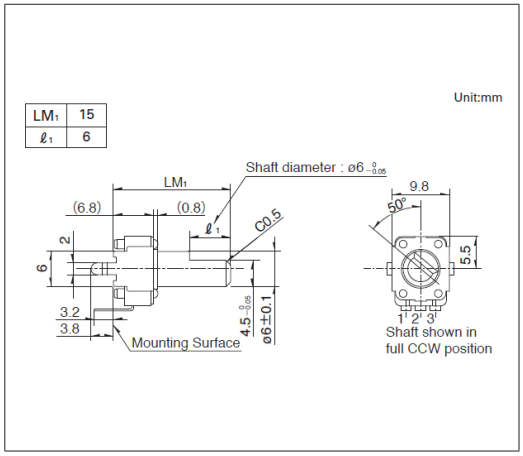
■ Packing Specifications

Bulk

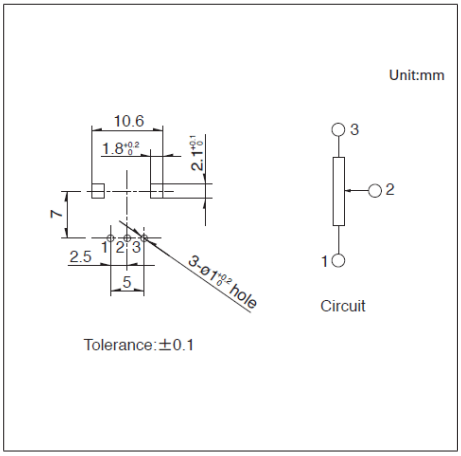
Number of packages(pcs.)		Export package measurements (mm)
1 case / Japan	1 case / export packing	
1,000	2,000	528 x 369 x 178

Drawing No.1

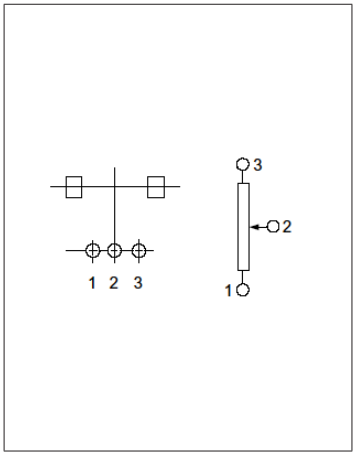
■ Dimensions



■ Mounting Hole Dimensions



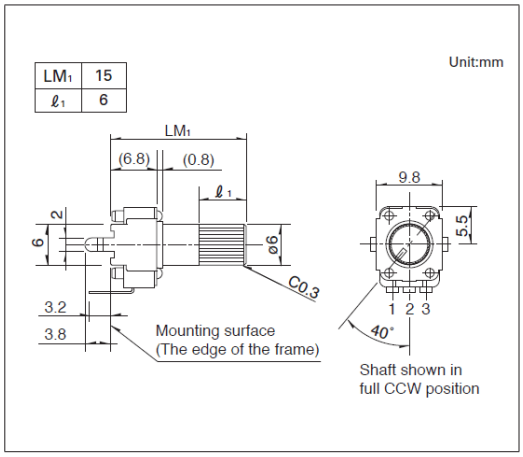
■ Terminal Layout / Circuit Diagram



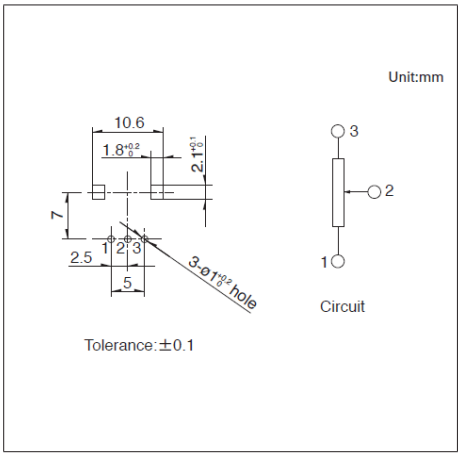
Viewed from mounting side.

Drawing No.2

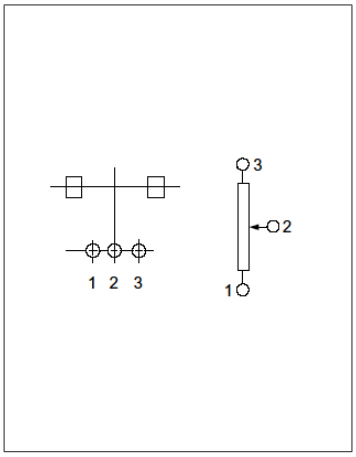
■ Dimensions



■ Mounting Hole Dimensions



■ Terminal Layout / Circuit Diagram



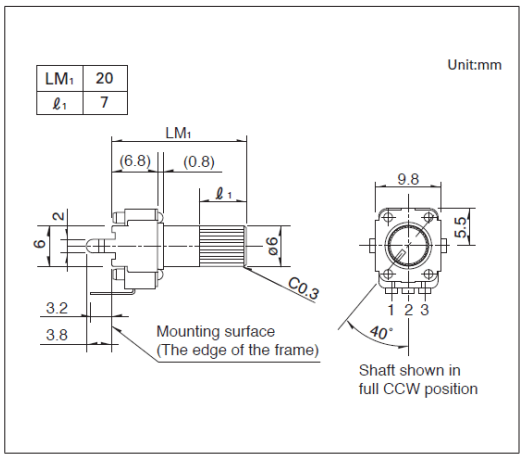
Viewed from mounting side.

9mm Size Insulated Shaft Snap-in Type

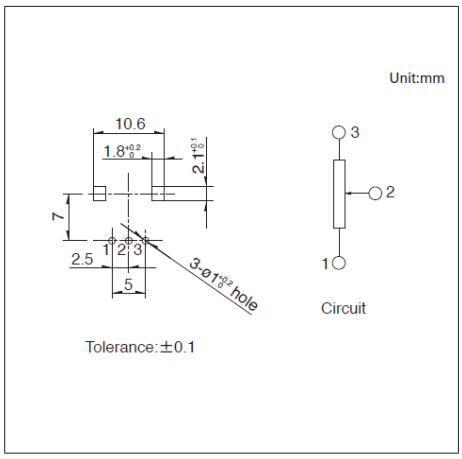
RK09K/RK09D Series

Drawing No.3

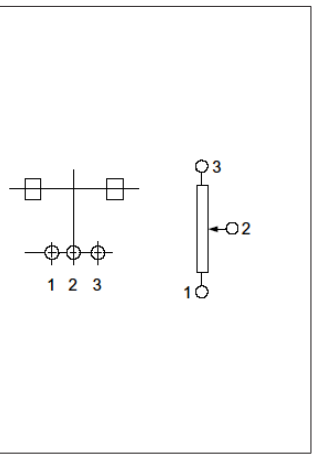
■ Dimensions



■ Mounting Hole Dimensions



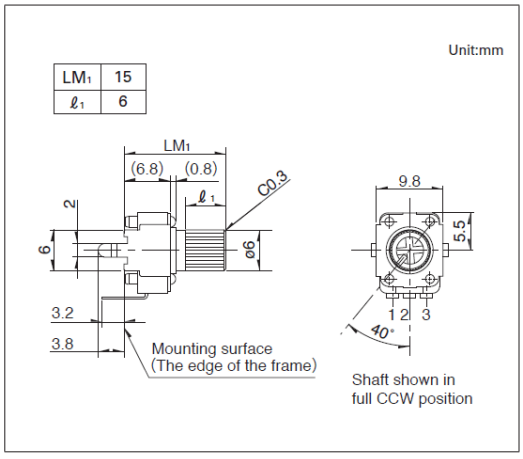
■ Terminal Layout / Circuit Diagram



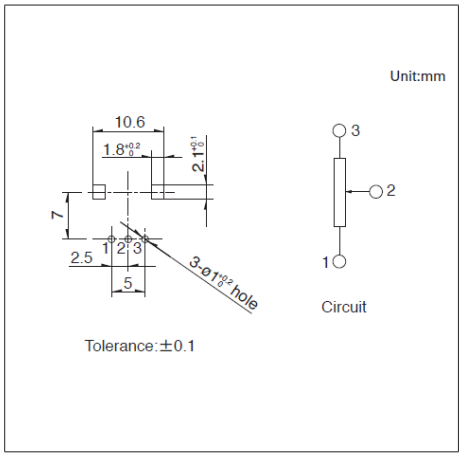
Viewed from mounting side.

Drawing No.4

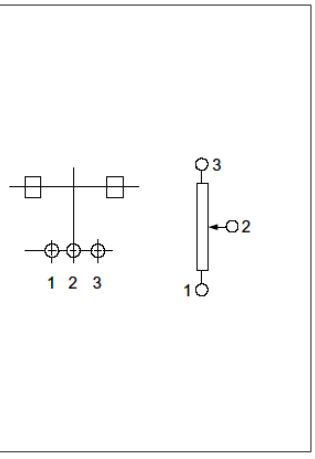
■ Dimensions



■ Mounting Hole Dimensions



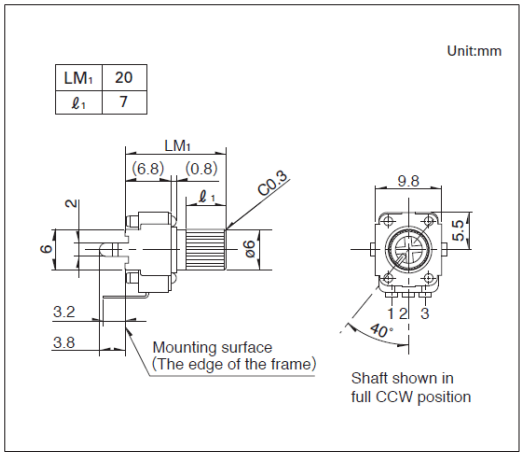
■ Terminal Layout / Circuit Diagram



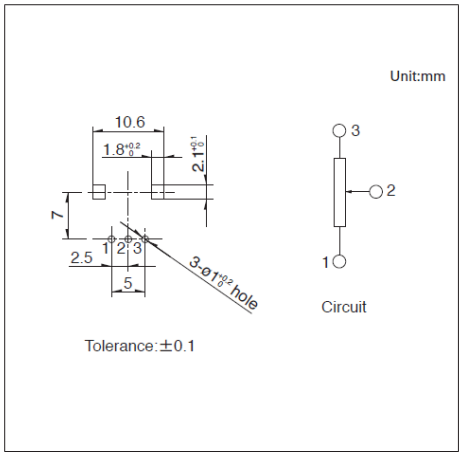
Viewed from mounting side.

Drawing No.5

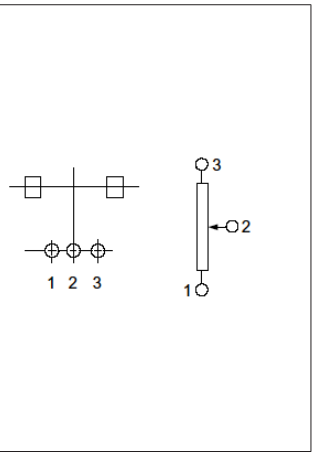
■ Dimensions



■ Mounting Hole Dimensions



■ Terminal Layout / Circuit Diagram



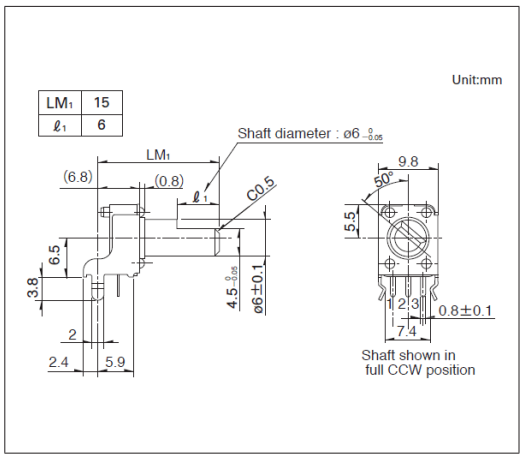
Viewed from mounting side.

9mm Size Insulated Shaft Snap-in Type

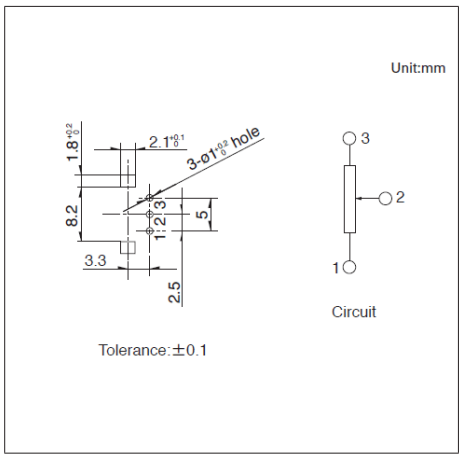
RK09K/RK09D Series

Drawing No.6

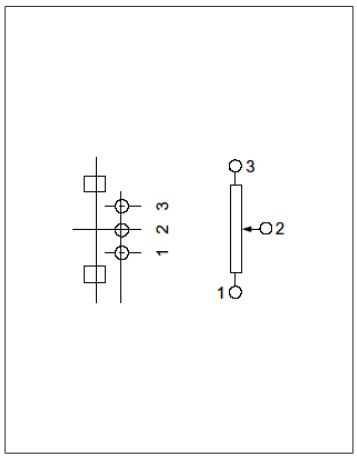
■ Dimensions



■ Mounting Hole Dimensions



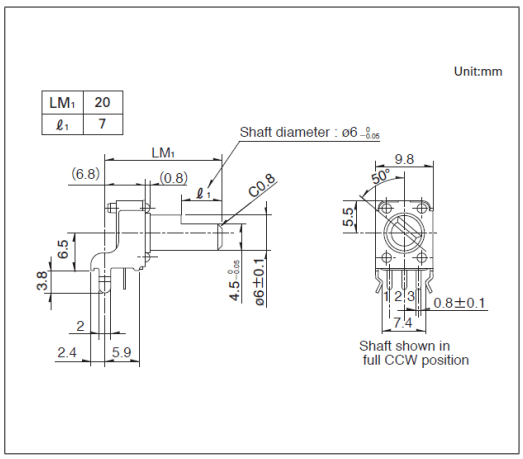
■ Terminal Layout / Circuit Diagram



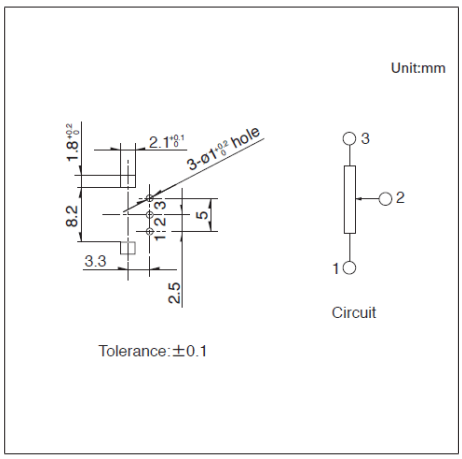
Viewed from mounting side.

Drawing No.7

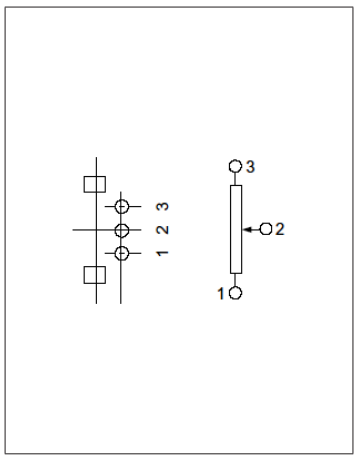
■ Dimensions



■ Mounting Hole Dimensions



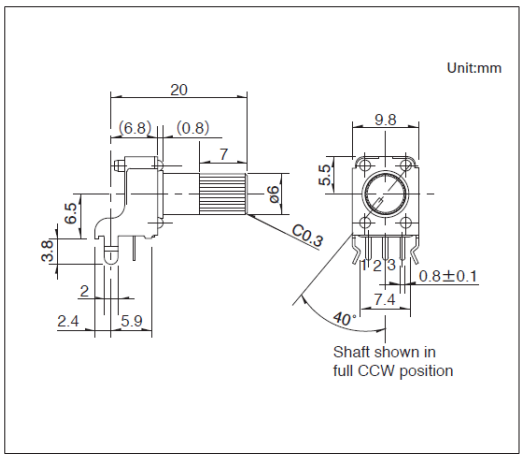
■ Terminal Layout / Circuit Diagram



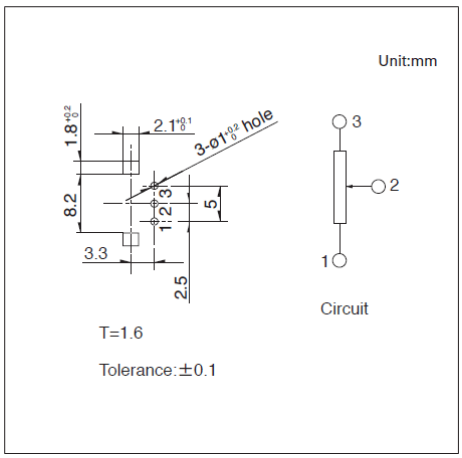
Viewed from mounting side.

Drawing No.8

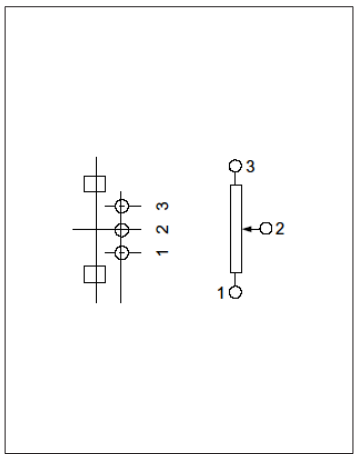
■ Dimensions



■ Mounting Hole Dimensions



■ Terminal Layout / Circuit Diagram



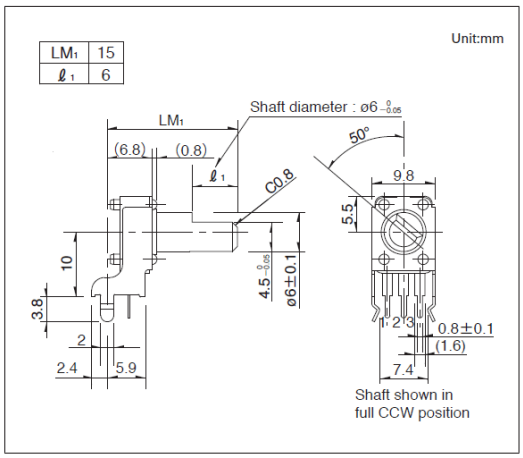
Viewed from mounting side.

9mm Size Insulated Shaft Snap-in Type

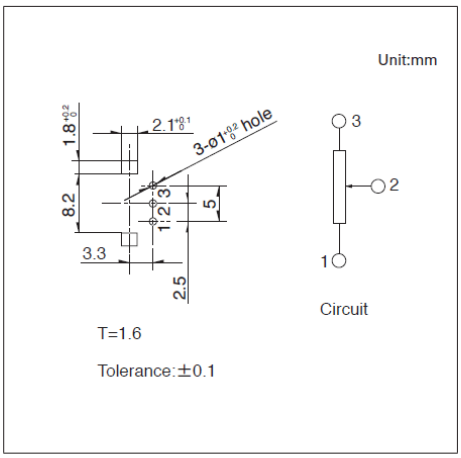
RK09K/RK09D Series

Drawing No.9

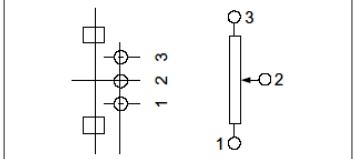
■ Dimensions



■ Mounting Hole Dimensions



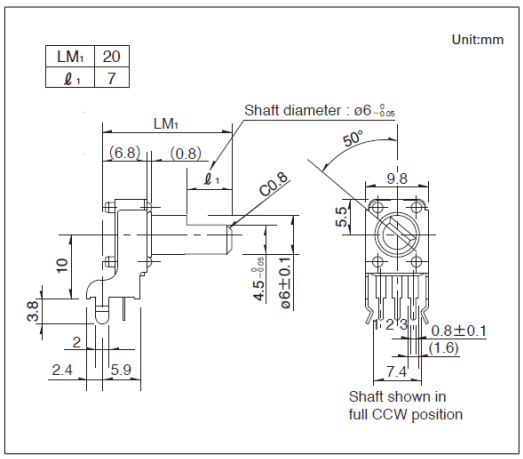
■ Terminal Layout / Circuit Diagram



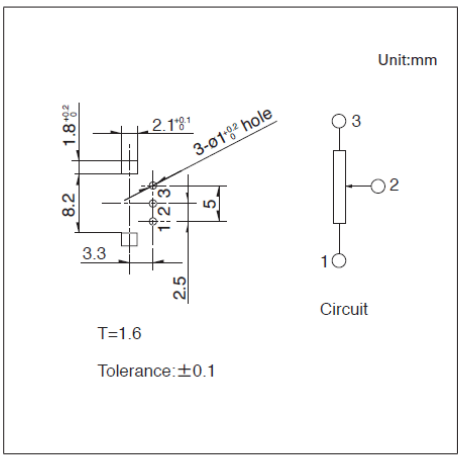
Viewed from mounting side.

Drawing No.10

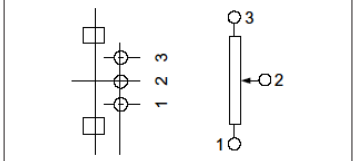
■ Dimensions



■ Mounting Hole Dimensions



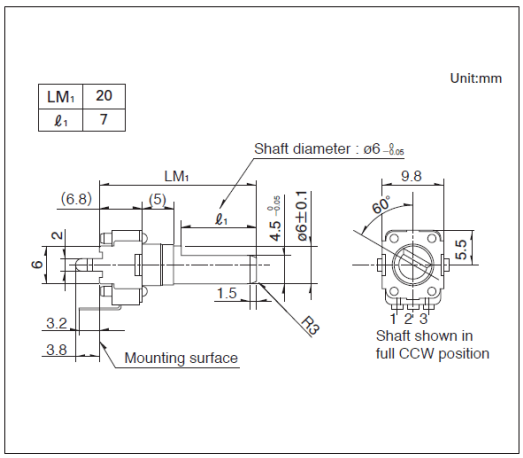
■ Terminal Layout / Circuit Diagram



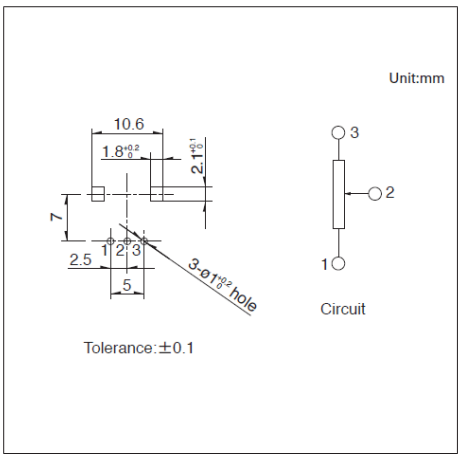
Viewed from mounting side.

Drawing No.11

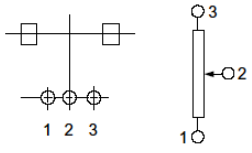
■ Dimensions



■ Mounting Hole Dimensions



■ Terminal Layout / Circuit Diagram



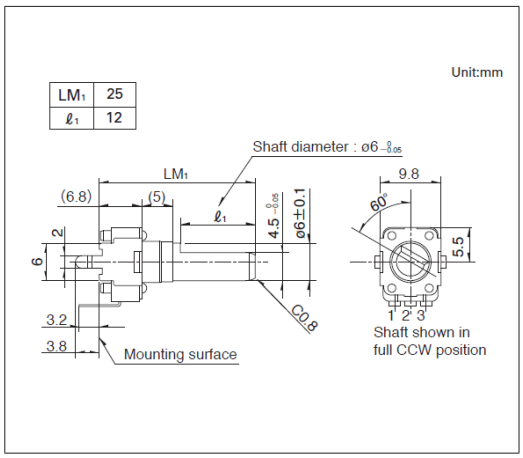
Viewed from mounting side.

9mm Size Insulated Shaft Snap-in Type

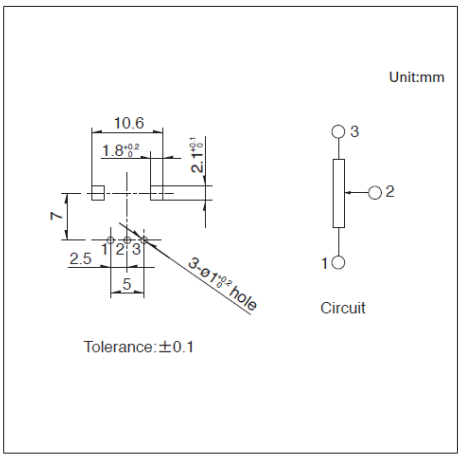
RK09K/RK09D Series

Drawing No.12

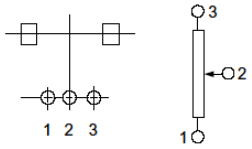
■ Dimensions



■ Mounting Hole Dimensions



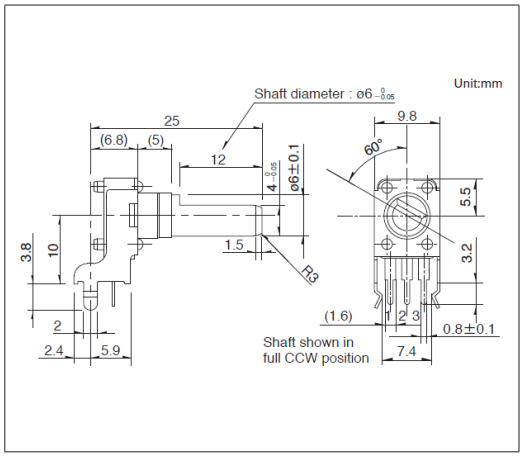
■ Terminal Layout / Circuit Diagram



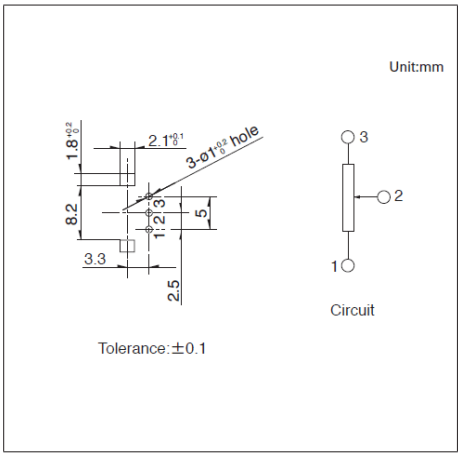
Viewed from mounting side.

Drawing No.13

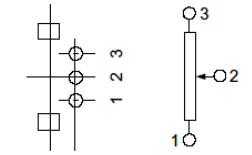
■ Dimensions



■ Mounting Hole Dimensions



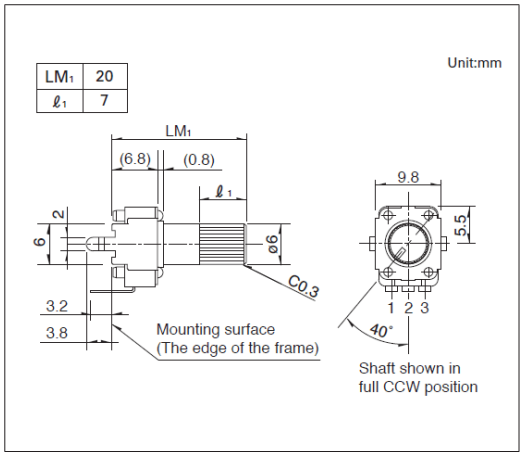
■ Terminal Layout / Circuit Diagram



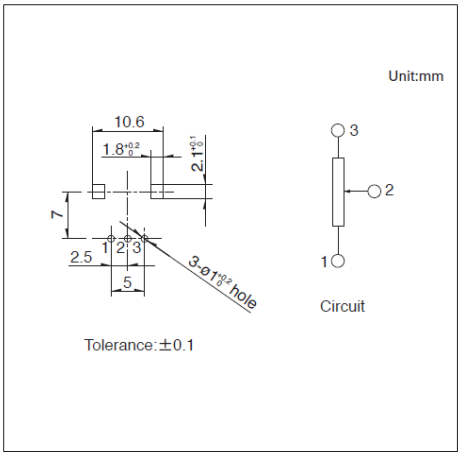
Viewed from mounting side.

Drawing No.14

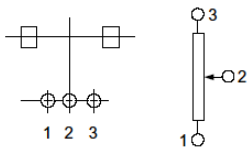
■ Dimensions



■ Mounting Hole Dimensions



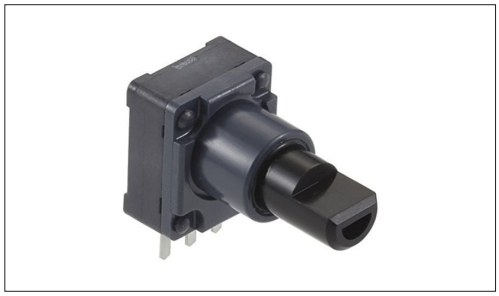
■ Terminal Layout / Circuit Diagram



Viewed from mounting side.

9mm Size Insulated Shaft Long-life Type
RK09Y11L Series

Compact design with a rotational life of 1 million cycles.



- Total resistance tolerance:±30%
- Maximum operating voltage:50V AC, 5V DC
- Rotational torque:5mN·m max.
- Operating life:1,000,000 cycles
- Operating temperature range:-10℃ to +70℃

Applications:Game:Home handheld consoles,Virtual/augmented reality

■ Product List

Products No.	Number of resistor elements	Control part orientation	Shaft types	Length of the shaft	Detent	Total resistance	Resistance taper	Automotive	Drawing No.
RK09Y11L0001	Single-unit	Horizontal	Flat	12.0mm	Without	10kΩ	Linear	—	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).

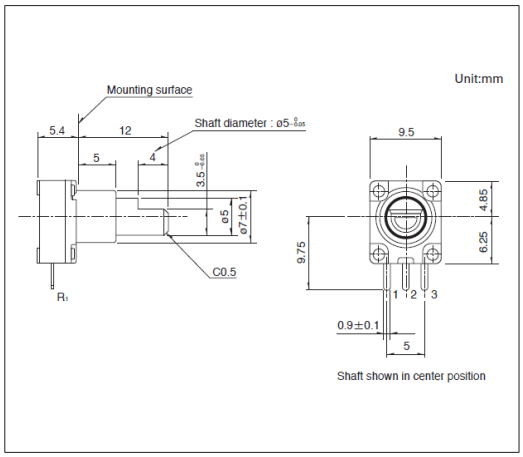
■ Packing Specifications

Bulk

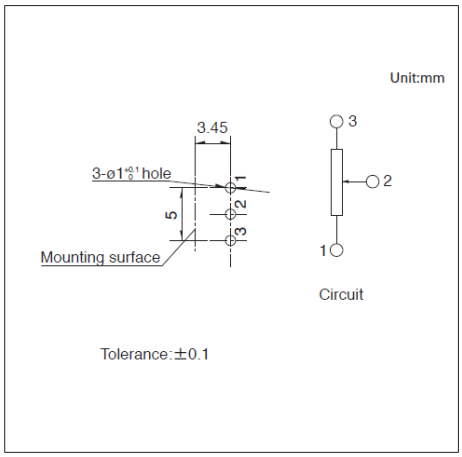
Number of packages(pcs.)		Export package measurements (mm)
1 case / Japan	1 case / export packing	
3,500	7,000	528 x 369 x 178

Drawing No.1

■ Dimensions



■ Mounting Hole Dimensions

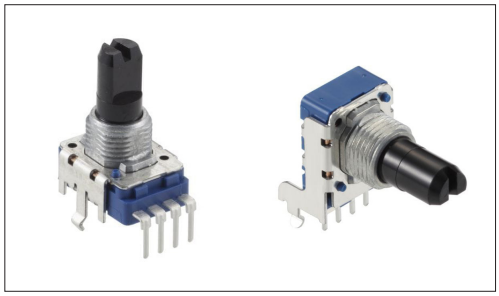


Viewed from mounting side.

Potentiometers
Rotary Potentiometer (Insulated shaft type)

11mm Size Insulated Shaft Snap-in Type
RK11K Series

Body width of 11mm, widely compatible with audio, video, and electronic musical instruments.



- Total resistance tolerance:±20%
- Maximum operating voltage:50V AC, 20V DC
- Rotational torque:3 to 20mN·m
- Operating life:15,000 cycles
- Operating temperature range:-10℃ to +70℃

Applications:Home:Major home appliances,Office equipment
Audio_TV:Visual,Audio,Pro audio

■ Product List

Products No.	Number of resistor elements	Control part orientation	Shaft types	Length of the shaft LM1 (mm)	Detent	Total resistance	Resistance taper	Automotive	Drawing No.
RK11K1140AHZ	Single-unit	Vertical	Flat	22.5	Without	10kΩ	15A	—	1
RK11K1140097	Single-unit	Vertical	Flat	22.5	Center detent	10kΩ	1B	—	
RK11K1120A13	Single-unit	Horizontal	Flat	22.5	Without	10kΩ	15A	—	2
RK11K112000P	Single-unit	Horizontal	Flat	22.5	Center detent	10kΩ	1B	—	

⚠Note

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2. Please place purchase orders per minimum order unit (integer).
3. Products other than those listed in above products are also available. Please contact us for details.
4. Nut and washer are not attached. Please specify if required.

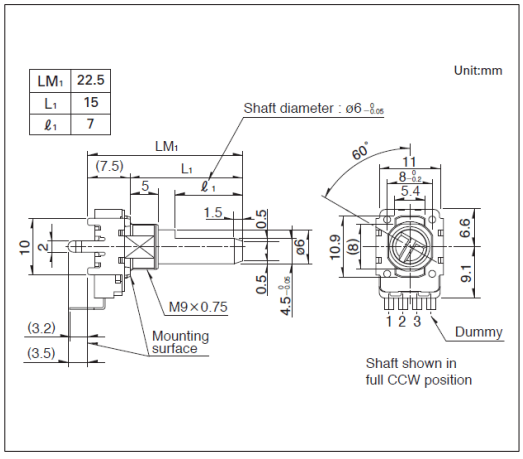
■ Packing Specifications

Tray

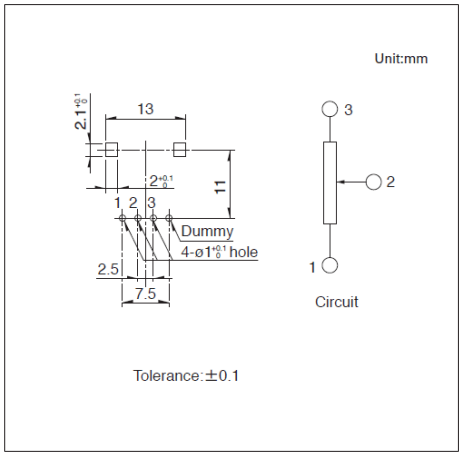
Number of packages(pcs.)		Export package measurements (mm)
1 case / Japan	1 case / export packing	
1,000	2,000	543 x 377 x 250

Drawing No.1

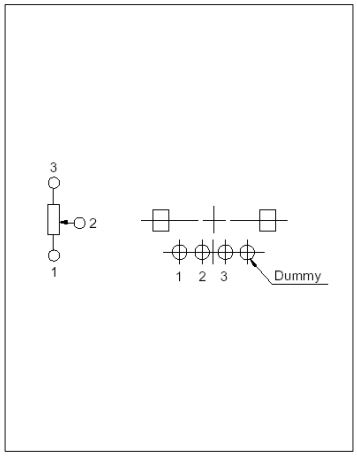
■ Dimensions



■ Mounting Hole Dimensions



■ Terminal Layout / Circuit Diagram



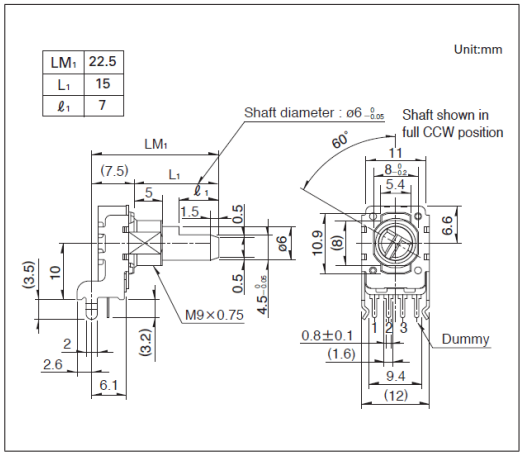
Viewed from mounting side.

11mm Size Insulated Shaft Snap-in Type

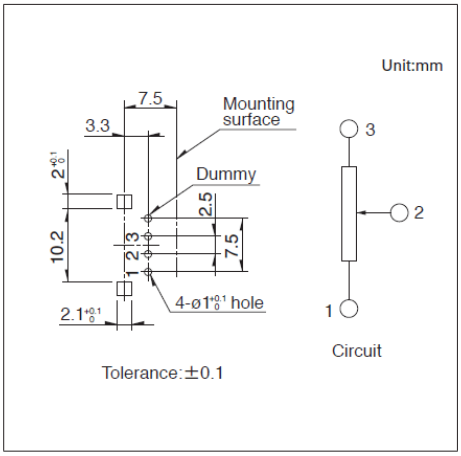
RK11K Series

Drawing No.2

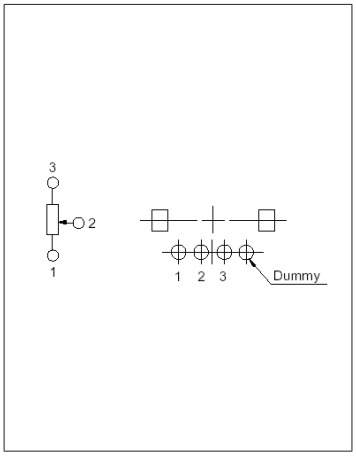
■ Dimensions



■ Mounting Hole Dimensions



■ Terminal Layout / Circuit Diagram

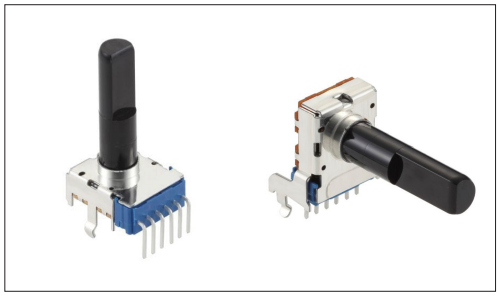


Viewed from mounting side.

12mm Size Insulated Shaft Snap-in Type

RK12L Series

Body width of 12mm, delivering high performance.



- Total resistance tolerance:±20%
- Maximum operating voltage:50V AC for AC only
- Rotational torque:2 to 15mN·m
- Operating life:15,000 cycles
- Operating temperature range:-10℃ to +70℃

Applications:Home:Major home appliances,Office equipment
Audio_TV:Visual,Audio,Pro audio

■ Product List

Products No.	Number of resistor elements	Control part orientation	Shaft types	Length of the shaft LM1 (mm)	Detent	Total resistance	Resistance taper	Automotive	Drawing No.
RK12L1230C1K	Dual-unit	Vertical	Flat	25.0	Center detent	10kΩ	1B	—	1
RK12L1230C0Q	Dual-unit	Vertical	Flat	25.0	Without	10kΩ	1B	—	
RK12L123000G	Dual-unit	Vertical	Flat	30.0	Center detent	10kΩ	1B	—	2
RK12L1230A08	Dual-unit	Vertical	Flat	30.0	Without	10kΩ	1B	—	
RK12L1210C1T	Dual-unit	Horizontal	Flat	30.0	Center detent	10kΩ	1B	—	3
RK12L1210C0V	Dual-unit	Horizontal	Flat	30.0	Without	10kΩ	1B	—	
RK12L12C0A0E	Dual-unit	Vertical	Flat	25.0	Without	10kΩ	15A	—	1
RK12L12C0A0G	Dual-unit	Vertical	Flat	30.0	Without	10kΩ	15A	—	2
RK12L12A0C0R	Dual-unit	Horizontal	Flat	30.0	Without	10kΩ	15A	—	3

⚠Note

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3. Products other than those listed in above products are also available. Please contact us for details.

■ Packing Specifications

Tray

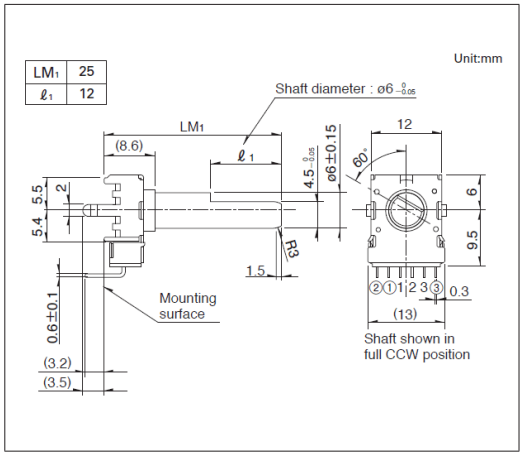
Number of packages(pcs.)		Export package measurements (mm)
1 case / Japan	1 case / export packing	
800	1,600	543 x 377 x 250

12mm Size Insulated Shaft Snap-in Type

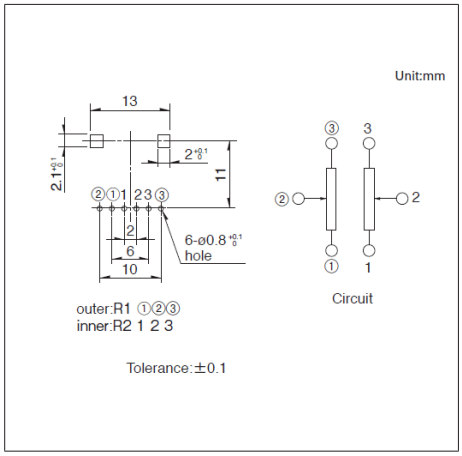
RK12L Series

Drawing No.1

■ Dimensions



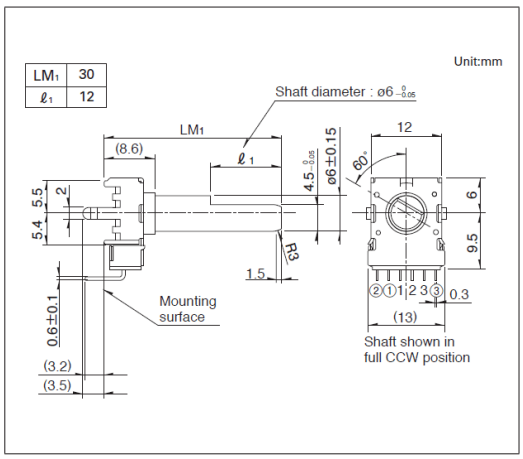
■ Mounting Hole Dimensions



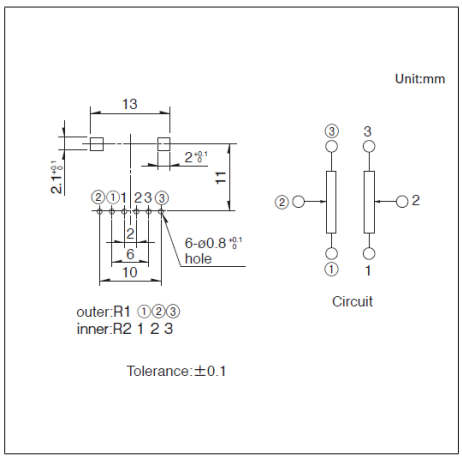
Viewed from mounting side.

Drawing No.2

■ Dimensions



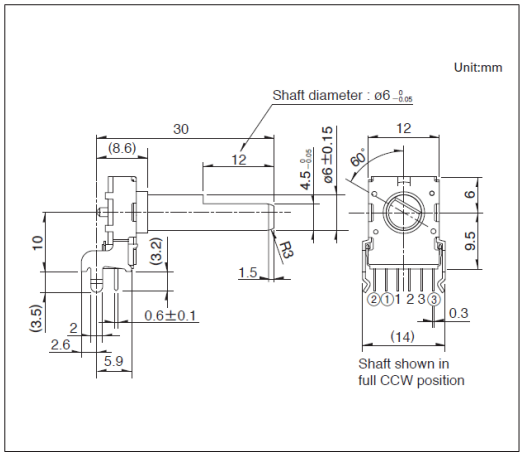
■ Mounting Hole Dimensions



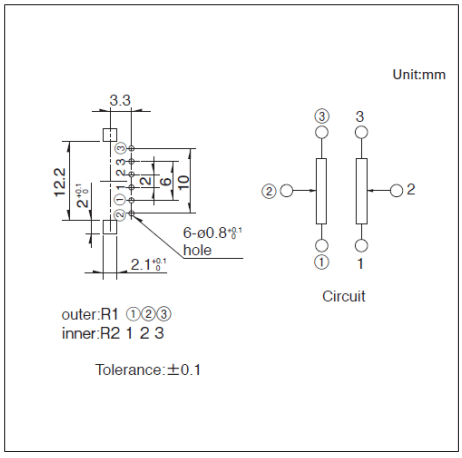
Viewed from mounting side.

Drawing No.3

■ Dimensions



■ Mounting Hole Dimensions



Viewed from mounting side.

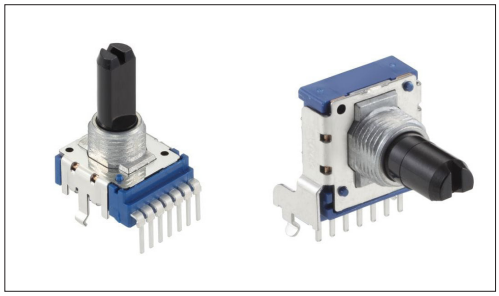
Potentiometers

Rotary Potentiometer (Insulated shaft type)

14mm Size Insulated Shaft Snap-in Type

RK14K Series

Body width of 14mm, widely compatible with audio, video, and electronic musical instruments.



- Total resistance tolerance:±20%
- Maximum operating voltage:50V AC for AC only
- Rotational torque:3 to 20mN·m
- Operating life:15,000 cycles
- Operating temperature range:-10℃ to +70℃

Applications:Home:Major home appliances,Office equipment
Audio_TV:Visual,Audio,Pro audio

■ Product List

Products No.	Number of resistor elements	Control part orientation	Shaft types	Length of the shaft LM1 (mm)	Detent	Total resistance	Resistance taper	Automotive	Drawing No.
RK14K124003H	Dual-unit	Vertical	Flat	22.5	Center detent	10kΩ	1B	—	1
RK14K1220012	Dual-unit	Horizontal	Flat	22.5	Center detent	10kΩ	1B	—	2
RK14K12D0A5V	Dual-unit	Vertical	Flat	22.5	Without	10kΩ	15A	—	3
RK14K12B0A0E	Dual-unit	Horizontal	Flat	22.5	Without	10kΩ	15A	—	4

⚠Note

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2. Please place purchase orders per minimum order unit (integer).
3. Products other than those listed in above products are also available. Please contact us for details.
4. Nut and washer are not attached. Please specify if required.

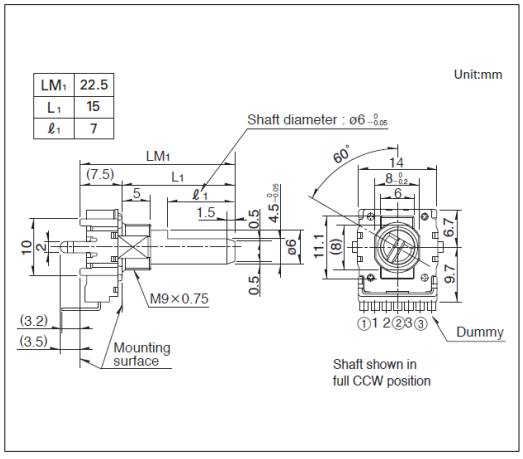
■ Packing Specifications

Tray

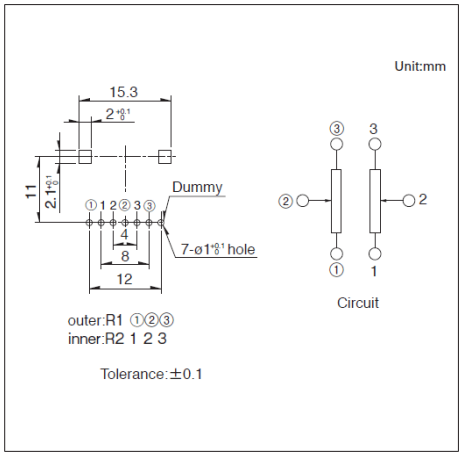
Number of packages(pcs.)		Export package measurements (mm)
1 case / Japan	1 case / export packing	
1,000	2,000	543 x 377 x 250

Drawing No.1

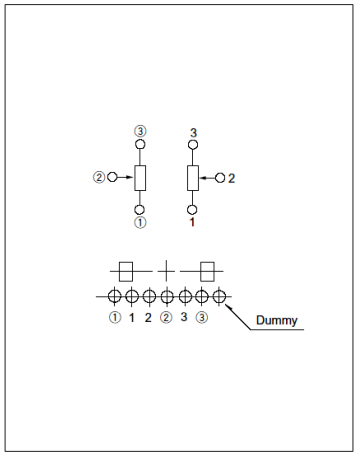
■ Dimensions



■ Mounting Hole Dimensions



■ Terminal Layout / Circuit Diagram



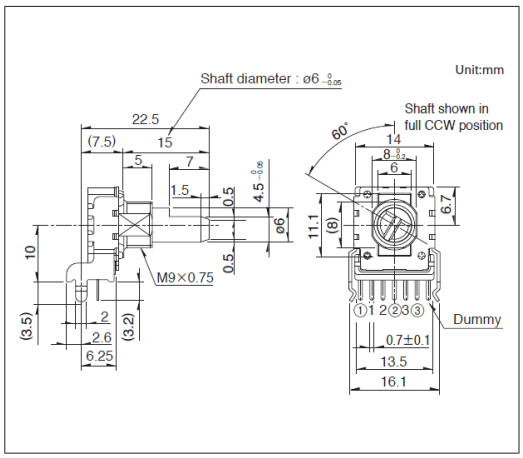
Viewed from mounting side.

14mm Size Insulated Shaft Snap-in Type

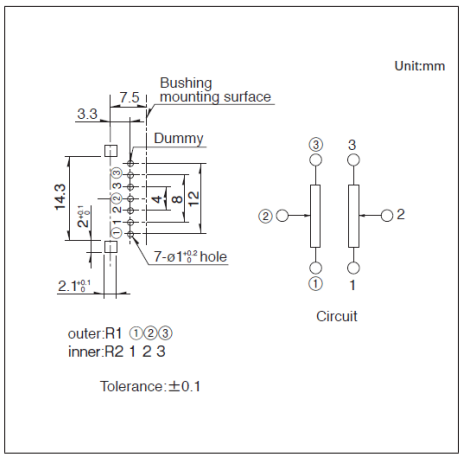
RK14K Series

Drawing No.2

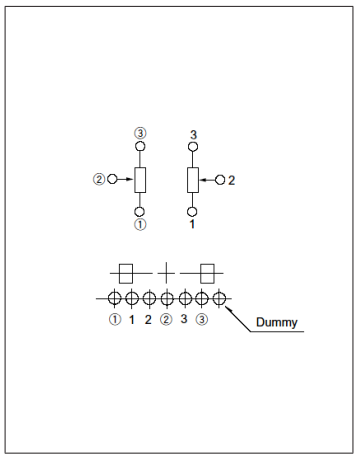
■ Dimensions



■ Mounting Hole Dimensions



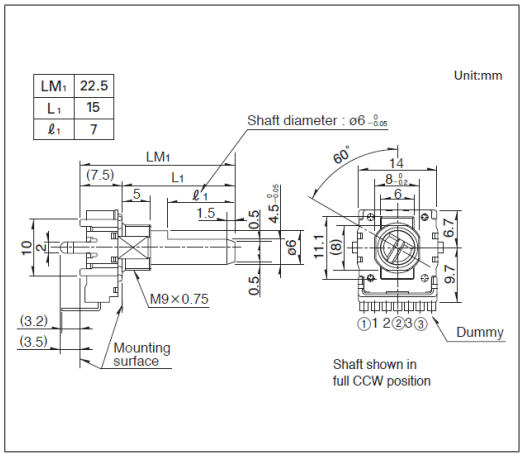
■ Terminal Layout / Circuit Diagram



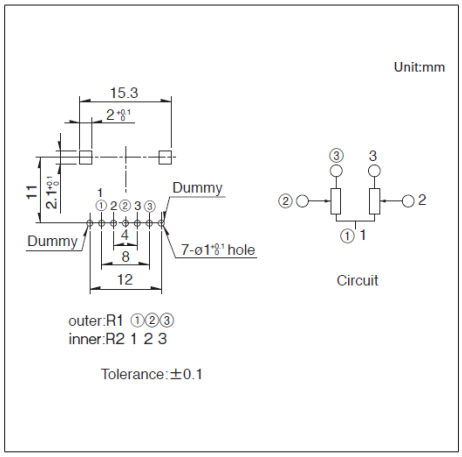
Viewed from mounting side.

Drawing No.3

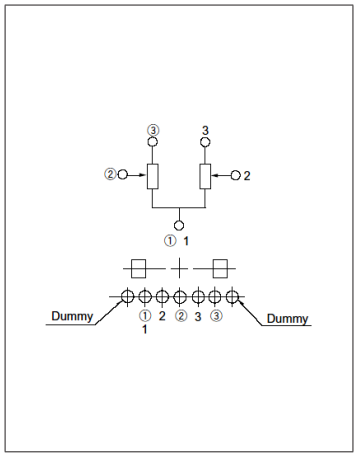
■ Dimensions



■ Mounting Hole Dimensions



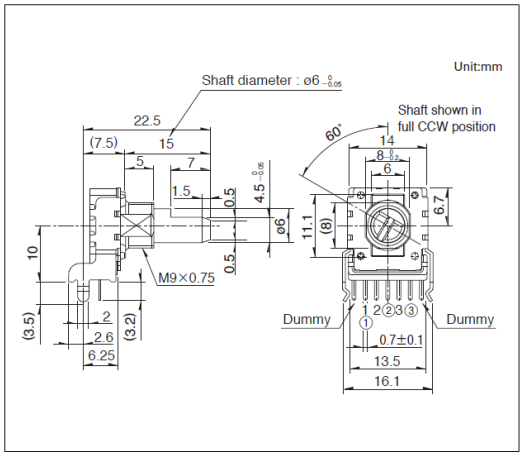
■ Terminal Layout / Circuit Diagram



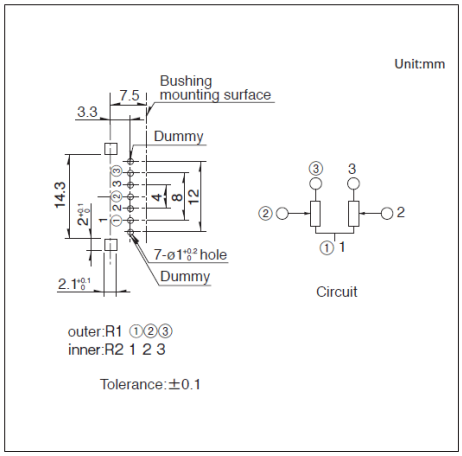
Viewed from mounting side.

Drawing No.4

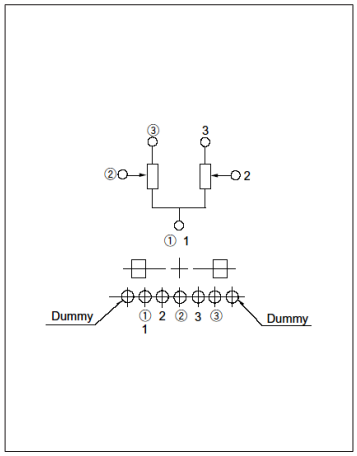
■ Dimensions



■ Mounting Hole Dimensions



■ Terminal Layout / Circuit Diagram



Viewed from mounting side.

Rotary Potentiometer (Insulated shaft type) / Soldering Conditions

■ Reference for Manual Soldering

Series	Tip temperature	Soldering time	No. of solders
RK09D, RK09K, RK09Y11L, RK11K, RK12L, RK14K	350℃ max.	3s max.	1 time

■ Reference for Dip Soldering

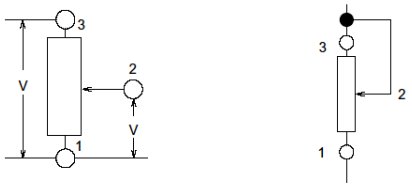
Series	Preheating		Dip soldering		No. of solders
	Soldering surface temperature	Heating time	Soldering temperature	Soldering time	
RK12L	100℃	1 min. max.	260℃ max.	5s max.	2 time max.

Potentiometers / Cautions

Recommended Circuit Configuration

Please use the potentiometer in the voltage adjustment circuit (Fig. A). Avoid using it in the current adjustment circuit (Fig. B) as it is affected by the contact resistance between the resistive element and the wiper.

A.Voltage divider type B.Current controller type



Direct Voltage

When direct voltage is flown through this part, terminal to terminal insulation may deteriorate depending on the use environment. This is due to a migration phenomenon. Contact us if you are planning to use this part under direct voltage.

Impedance on the Output Side

There is a possibility that might de affected by contact resistance of resistive element and wiper in case of low impedance of output side in voltage regulation circuit. For this reason, we require that you adjust to impedance of output side more than 100 times of total resistance.

Residual Resistance

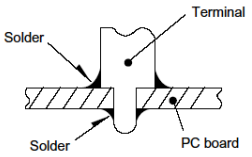
Although electric poles of resistors are generally formed by silver printing, we provide carbon coating over the silver poles to enhance reliability against sulfurization. Contact us if you wish to use the part in a low residual resistance state.

Dew Condensation

Avoid using the potentiometer where dew or water drops might occur on the surface of the resistor, etc. Deterioration of insulation or shorting may occur.

Soldering

To avoid potential contact issues, please do not solder wires to the top surface of the printed circuit board as shown in the diagram.
Solder all metal lugs into a substrate before use.



Stress Being Applied to the Terminals

Always pay special attention not to apply excessive stress when handling the terminals. Also, be sure to design appropriate soldering conditions.

Looseness of the Shaft

When lengthy shaft lengths are being employed, the looseness (deviation) tends to grow in proportion to the shaft length. Conducting a test under actual operating conditions is recommended.

Potentiometers / Cautions

Chassis Mounting

The use of a nut to fasten this part may lead to excessive tightening and can deteriorate the rotary contact performance, or strip the threads. Handle with care when tightening the nut.

Use of Chemicals

Since synthetic resins such as polycarbonate are being used as the material for the insulated type shafts, avoid using this part under gassy environments of such chemicals as ammonia, amines, alkali water solutions, aromatic hydrocarbons, ketones, esters and halogenated hydrocarbons, especially, under their intensive gas environments.

Operation at Low Temperature

When these products are expected to be used under low temperature environments such as applications for car radios and car stereos, we can customize them for easier and more smooth rotary movements. When placing orders, indicate whether the low temperature specification is necessary or not.

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.

The above operation notes are quoted from the
"Precaution and Guideline of Potentiometer for Electrical Devices" , which is a technical report issued by the Japan Electronics and Information Technology Industries Association RCR-2191A (in March 2002).
For details, see the above technical report.