



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

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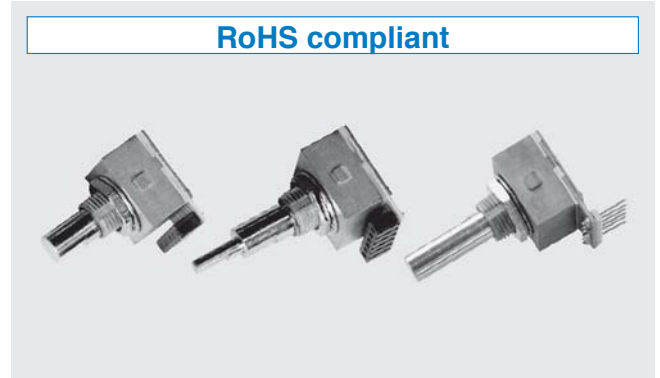
Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

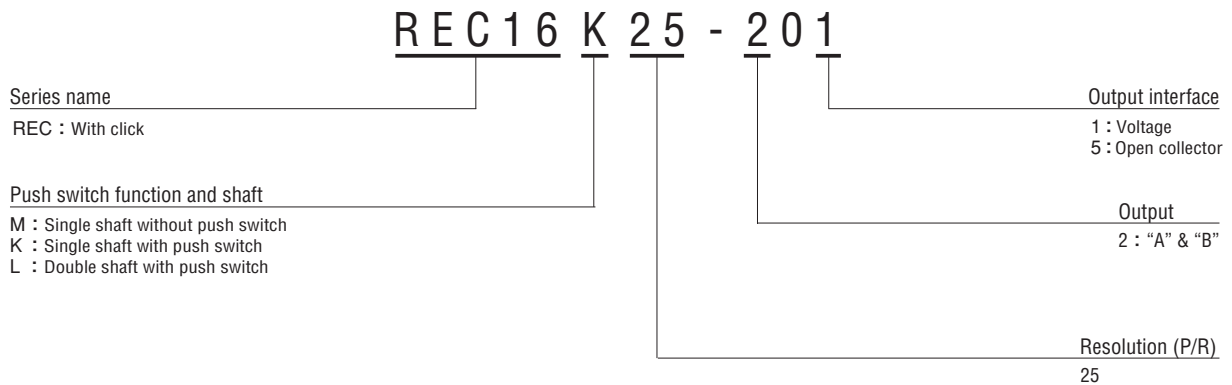


## FEATURES

- 16mm square compact size
- Excellent click & switch feelings
- Long life of 2 million cycles



## PART NUMBER DESIGNATION



## LIST OF PART NUMBERS

Resolution	Click	Push switch function	Shaft	Output interface	Part number
25 (P/R)	With Click	No	Single Shaft	Voltage (PIN HEADER Type)	REC16M25-201
		Yes		Double Shaft	Open Collector (SCOKET Type)

The products indicated by ➡ mark are manufactured upon receipt of order basis.

# REC16K/REC16L/REC16M

## OPTICAL ENCODERS

### STANDARD SPECIFICATIONS

#### Electrical characteristics

Input voltage	DC5 ± 5 %	
Input current	30 mA maximum	
Output wave form	Square wave	
Output phases	A, B	
(P/R) Resolution	25	
Phase difference of outputs A & B	90° ± 45°	
Maximum frequency response	100 Hz	
Output signal	"1 (High)"	+ 4.5 V minimum
	"0 (Low)"	+ 0.5 V maximum
Light source	LED	

#### Switch characteristics

Maximum contact rating	DC15 V, 20 mA
Contact resistance	2 Ω maximum (Initial value)

Note) Manual setting only.

#### Mechanical characteristics

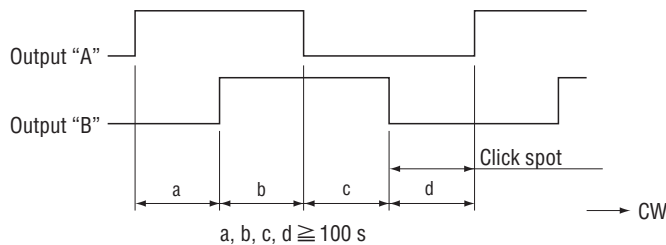
Click torque	7.35 mN·m ± 2.5 maximum (75 ± 25 gf·cm) <REC : With click>	
Click number	25	
Shaft loading (Pull-push)	19.6 N maximum (2 kgf)	
Switch operation force	2.45 ± 1.47 N (250 ± 150 gf)	
Switch stroke	0.3 ± 0.2 mm	
Rotational life (Mechanical)	2 million cycles	
Switching life	1 million cycles	
Shaft loading (When mounting)	Radial	4.90 N maximum (500 gf)
	Axial	2.94 N maximum (300 gf)
Net weight	Approx. 12 g	
Strength of tighten screw	1 N·m {10.2 kgf·cm} maximum	

#### Environmental characteristics

Operating temp. range	0 ~ 50 °C
Storage temp. range	-20 ~ 80 °C
Protection grade	IP40

### OUTPUT

#### Click spot for 25P/R



The click spot is located somewhere outputs A & B are at Lo level.

# REC16K/REC16L/REC16M

## OPTICAL ENCODERS

### RELIABILITY TEST

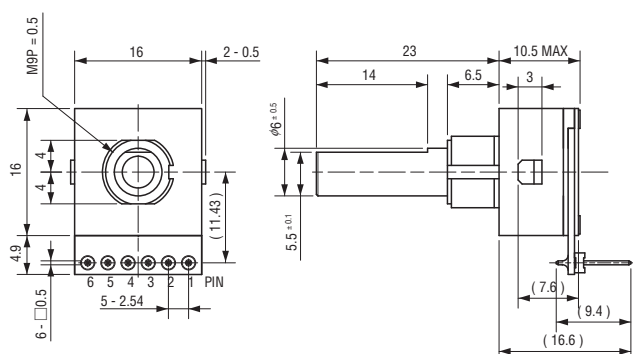
The output shall satisfy the criteria below after the following tests.

Test item		Test conditions	
Vibration	Power OFF	Amplitude : 1.52 mm or 98.1 m/s <sup>2</sup> (10 G) whichever is smaller. 10 ~ 500 Hz excursion 15 min/cycle, 8 cycles each for X, Z, directions.	
Shock	Power OFF	3 times each in directions (X, Z) at 490 m/s <sup>2</sup> (50 G), 11 ms.	
High temperature exposure	Power OFF	80 °C 96 h	(To be measured after leaving samples for 1 h at normal temperature and humidity after the test.)
	Power ON	50 °C 96 h	
Low temperature exposure	Power OFF	- 20 °C 96 h	
	Power ON	0 °C 96 h	
Humidity	Power OFF	40 °C Relative humidity 90 ~ 95 % 96 h (To be measured after wiping out moisture and leaving samples for 1 h at normal temperature and humidity after the test.)	
Thermal shock	Power OFF	To be done 10 cycles with the following condition (To be measured after leaving samples for 1 h at normal temperature and humidity after the test.) 80 °C 0.5 h, - 20 °C 0.5 h	

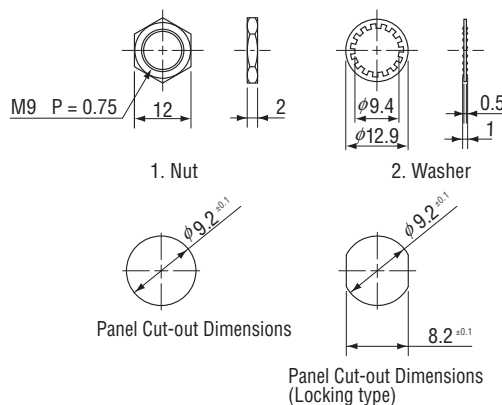
### OUTLINE DIMENSIONS

Unless otherwise specified, tolerance: ± 0.4 (Unit: mm)

#### Single shaft and PIN HEADER



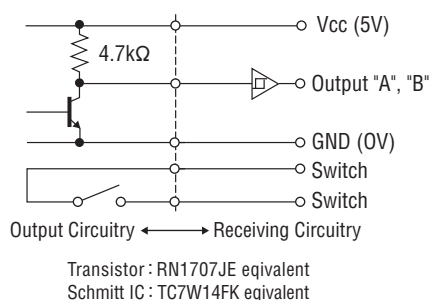
#### Accessories



### PIN ASSIGNMENT

Pin No.	Without switch	With switch
1	Power 0 (V)	Power 0 (V)
2	N C	For switch
3	N C	For switch
4	Output "B"	Output "B"
5	Output "A"	Output "A"
6	Power + 5V	Power + 5V

### OUTPUT CIRCUITRY AND RECEIVING CIRCUITRY





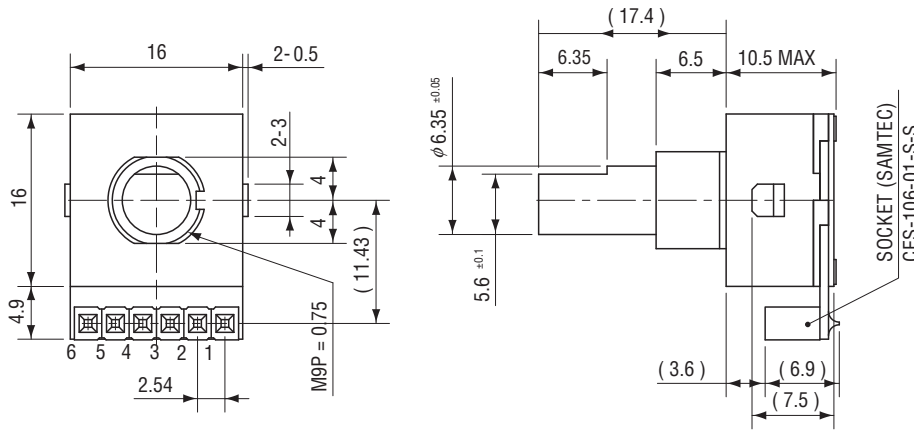
# REC16K/REC16L/REC16M

## OPTICAL ENCODERS

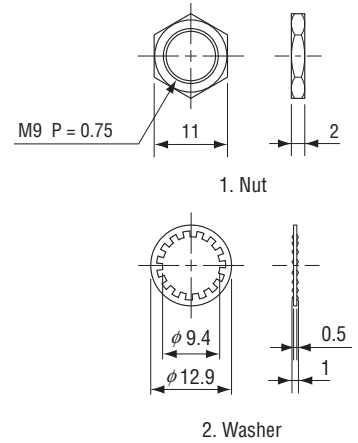
### OUTLINE DIMENSIONS

Unless otherwise specified, tolerance:  $\pm 0.4$  (Unit: mm)

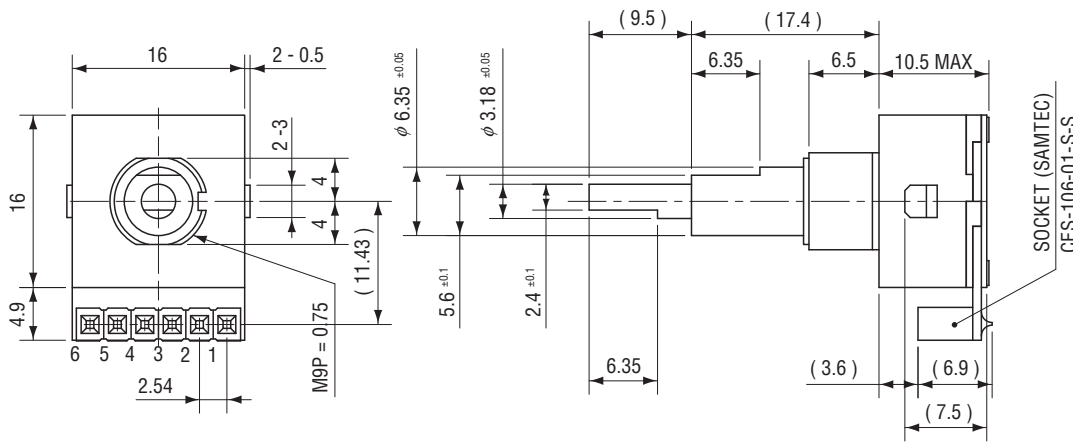
#### Single shaft and SOCKET



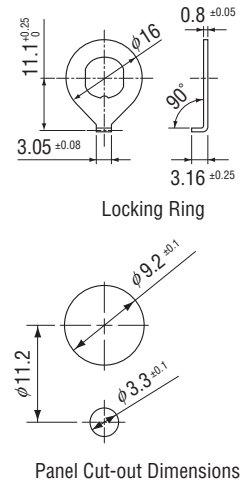
#### <Accessories>



#### Double shaft and SOCKET



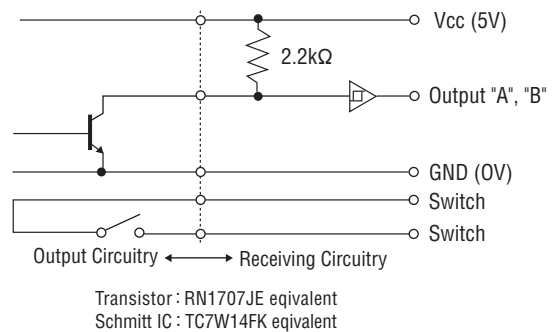
#### <Option>



### PIN ASSIGNMENT

Pin No.	Function
1	Power 0 (V)
2	For switch
3	For switch
4	Output "B"
5	Output "A"
6	Power +5 V

### OUTPUT CIRCUITRY AND RECEIVING CIRCUITRY

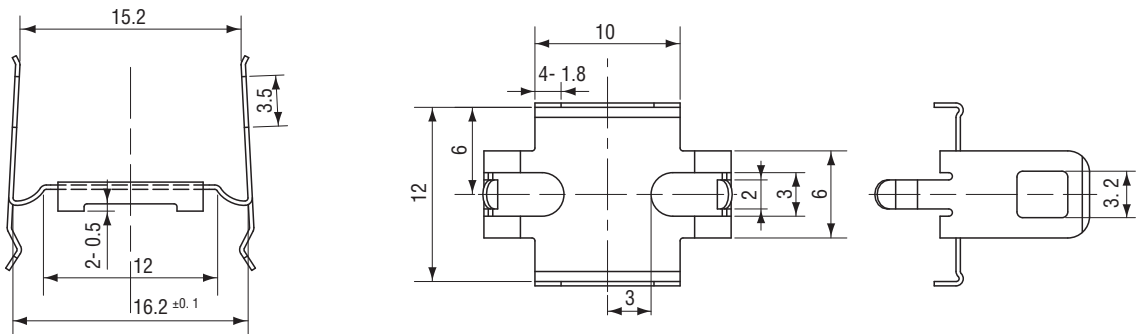


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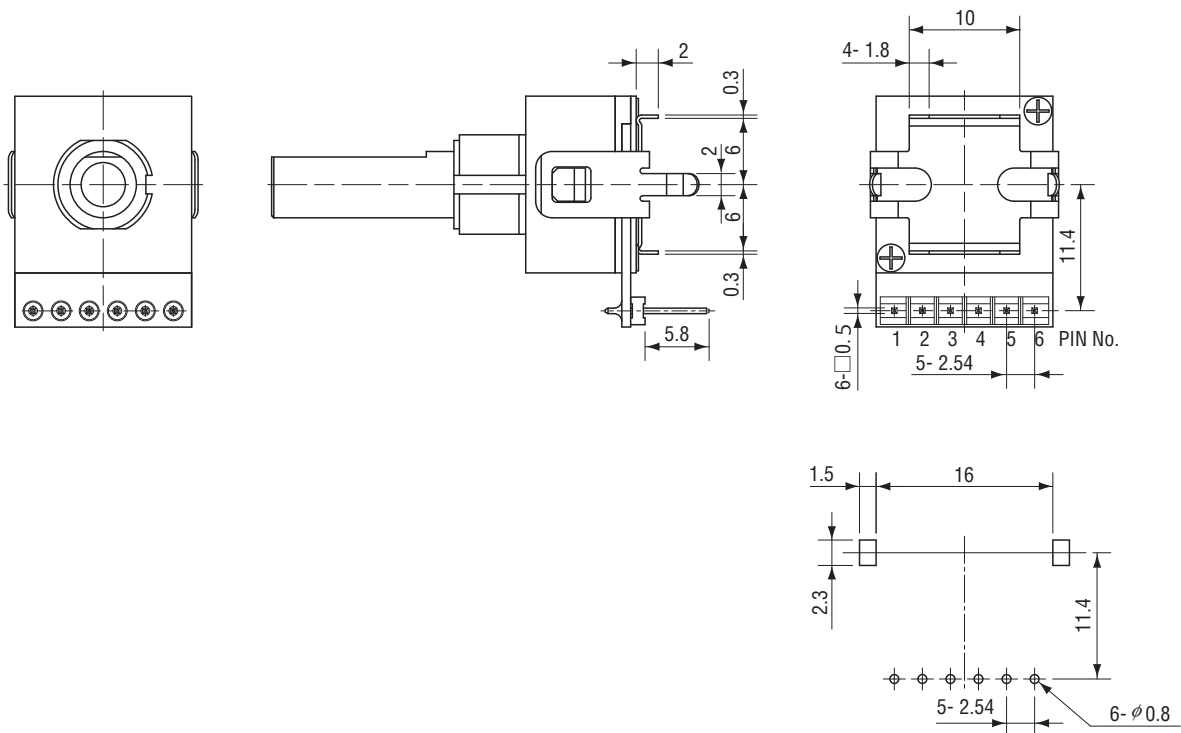
## OPTICAL ENCODERS

### ■ Option (Snap-in Holder)

● Available mounting on PC board with Snap-in Holder as an optional item separately.



### ● With Snap-in Holder



Mounting hole dimensions  
 (Tolerance :  $\pm 0.1$ )  
 (Thickness :  $t = 1.6$ )