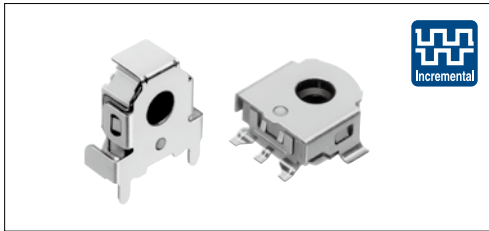


EC05E 5mm Size Through Shaft Type

Compact type employing Alps' DRUMCODE™ technology



Typical Specifications



Items	Specifications
Rating	Each lead 0.55mA 5.5V DC max. Common lead 1.1mA 5.5V DC max.
Operating life	100,000 cycles
Operating temperature range	-30°C to +85°C

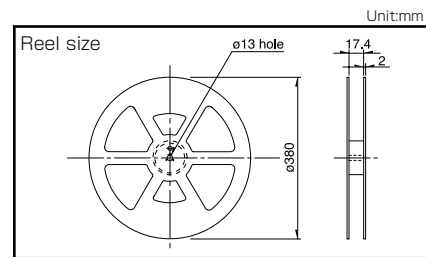
Product Line

Detent torque (mN·m)	Number of detent	Number of pulse	Operating direction	Mount height (mm)	Minimum order unit (pcs.)		Product No.	Drawing No.
					Japan	Export		
1.6±1.3	12	12	Horizontal	4.5	4,000	8,000	EC05E1220202	1
			Vertical	—	8,000	16,000	EC05E1220203	2
							EC05E1220401	3

Packing specifications

Taping

Operating direction	Number of packages (pcs.)			Tape width (mm)	Export package measurements (mm)
	1 reel	1 case /Japan	1 case /export packing		
Horizontal	1,000	4,000	8,000	16	485×410×246
Vertical	2,000	8,000	16,000		


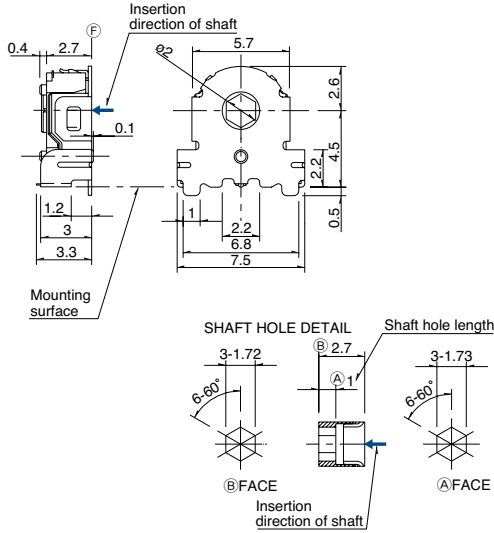
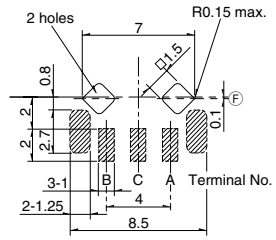

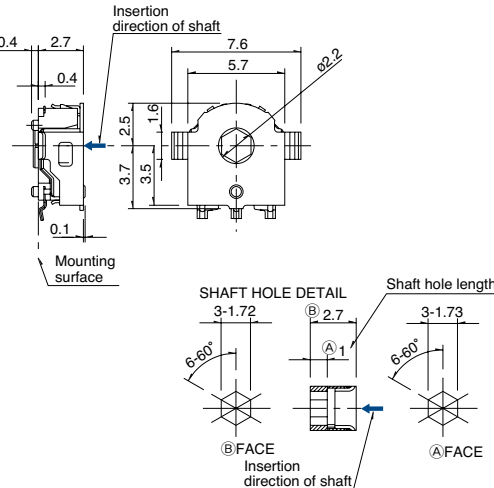
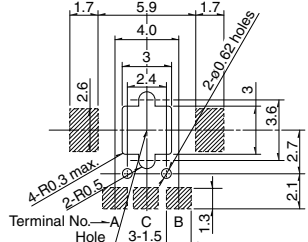


Dimensions

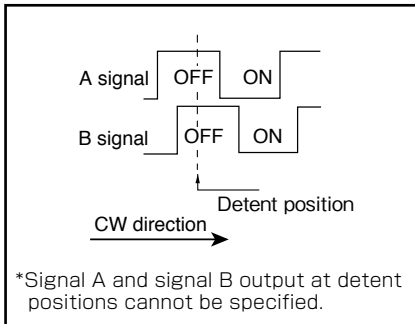
No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
1			

■ Dimensions

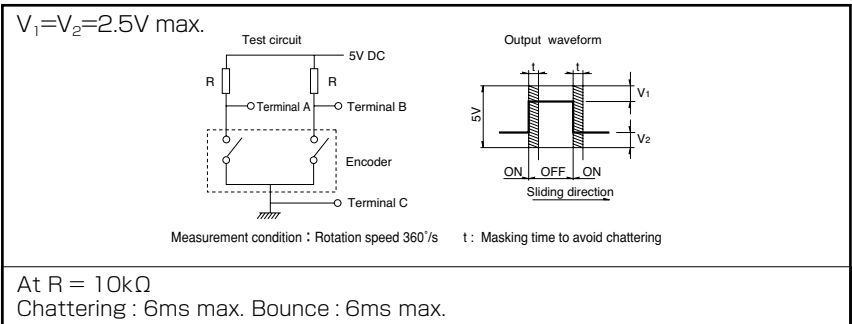
Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
2			 <p>Shaded area: Solder land</p>
3			 <p>Shaded area: Solder land</p>

■ Output Wave



■ Sliding Noise



Encoders

Metal Shaft









Insulated Shaft

Through Shaft Type

Ring Type

Encoders

List of Varieties

Type		Through shaft type			Ring type			
		5mm size		10mm size	21mm size			
Series		EC05E		EC10E	EC21A	EC21C		
Photo								
Output		Incremental (Two phase A and B)						
Shaft types		Through shaft			Ring type			
Operating direction		Vertical	Horizontal	Horizontal	—	—		
Number of pulse / Number of detent		12/12		12/24 12/12	9/18 15/30	15/30		
Features		Surface mount type		—	—	—		
Dimensions (mm)		W	5.7	7.5	9.8	21.6		
		D	6	3.3	4.4	21.6		
		H	2.7	7.25	10.6/12.6/14.6	4		
Operating temperature range		-30°C to +85°C		-5°C to +45°C -40°C to +85°C (For Automotive)	-40°C to +85°C			
Operating life		100,000 cycles			50,000 cycles			
Automotive use		—	○	●	●	●		
Life cycle (availability)								
Electrical performance		Rating	0.55mA 5.5V DC		1mA 5V DC	10mA 5V DC		
		Max./min. operating current (Resistive load)	0.55mA / —		—	10mA / 1mA		
		Insulation resistance	50MΩ min. 50V DC			100MΩ min. 250V DC		
		Voltage proof	50V AC for 1 minute			300V AC for 1minute or 360V AC for 2s	300V AC for 1minute or 360V AC for 1s	
Mechanical performance		Rotational torque (Without detent)	—	—	—	—		
		Detent torque	1.6±1.3mN·m		5±3mN·m 6±3mN·m	7±5mN·m 12±5mN·m 16±7mN·m	17±8mN·m (Initial) 12±4mN·m (After reflow)	
		Push-pull strength	—	—	100N			
Shaft configuration		Through shaft			Ring type			
Terminal type		Reflow	Insertion		Insertion			
Switch Specifications		Switch type	—	—	—	—		
		Contact arrangement	—	—	—	—		
		Travel (mm)	—	—	—	—		
		Operating force (N)	—	—	—	—		
		Rating	—	—	—	—		
		Contact resistance	—	—	—	—		
		Operating life	—	—	—	—		
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Notes

- The operating temperature range for automotive applications can be raised upon Request. Please contact us for details.
- Indicates applicability to all products in the series, while ○ indicates applicability to some products in the series.

Reference for Manual Soldering

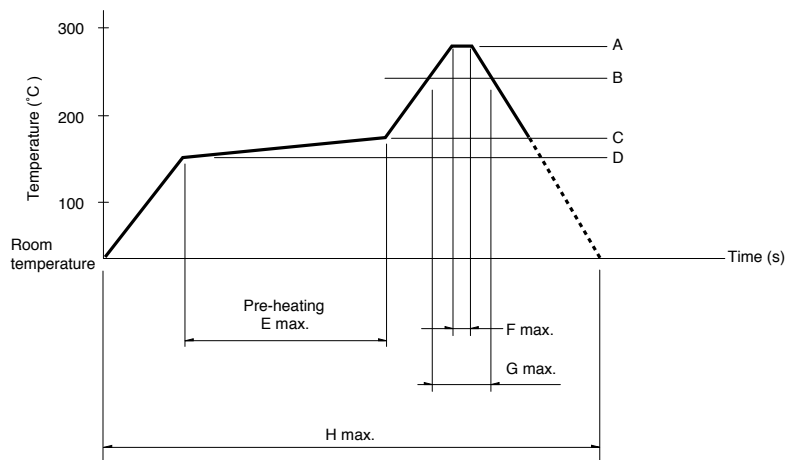
Series	Tip temperature	Soldering time	No. of solders
EC05E, EC09E, EC10E, EC111, EC11B, EC11E, EC11G, EC11K, EC11M, EC11N, EC12D, EC12E, EC18A, EC21A, EC28A, EC35A, EC35AH, EC40A, EC45A, EC50A, EC60B, EM11B, EC21C, EC28C, EC35CH	350°C max.	3s max.	1 time
EC11J	350±10°C	3 ⁺¹ ₀ s	2 times

Reference for Dip Soldering

Series	Preheating		Dip soldering		No. of solders
	Soldering surface temperature	Heating time	Soldering temperature	Soldering time	
EC09E, EC11B, EC111, EC11E, EC11G, EC11K, EC11M, EC11N, EC18A, EC21A, EC28A, EC35A, EC35AH, EC50A, EC60B	100°C max.	2 min. max.	260±5°C	5±1s	2 times max.
EM11B	100°C max.	1 min. max.	260°C max.	3s max.	2 times max.
EC10E, EC12D, EC12E	100°C max.	1 min. max.	260±5°C	3±1s	2 times max.
EC40A	110°C max.	1 min. max.	260°C max.	10s max.	1 time
EC45A	100°C max.	2 min. max.	260°C max.	5s max.	2 times max.

Example of Reflow Soldering Condition

Temperature profile



Series	A	B	C	D	E	F	G	H	No. of reflows
EC11J	260°C	230°C	180°C	150°C	2 min. max.	3s	40s	4 min. max.	2 times max.
EC05E	250°C min.	230°C min.	180°C	150°C	60s to 120s	—	30s to 40s	—	2 times max.
EC21C	230°C to 245°C	220°C	200°C	150°C	60s to 120s	—	25s to 60s	300s max.	1 time max.
EC28C, EC35CH	260°C	230°C	180°C	150°C	2 min. min.	3s	40s	230s max.	1 time max.

Notes

- When using an infrared reflow oven, solder may sometimes not be applied. 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 encoder when employing a hot air reflow method. The temperature of the PC board and the surface temperature of the encoder may vary greatly depending on the PC board material, its size and thickness. Ensure that the surface temperature of the encoder 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.

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