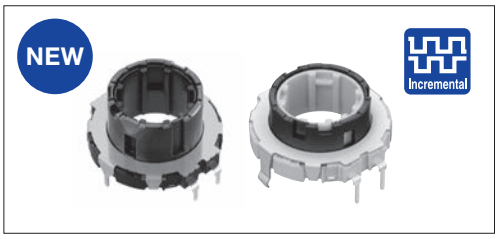
EC21A EC21C 21mm Size Ring Type

Ring encoder with 4mm height contribute to space saving and multifunctioning



Typical Specifications

Items	Specifications
Rating	10mA 5V DC
Operating life	50,000 cycles
Operating temperature range	−40℃ to +85℃

Product Line

Structure	Actuator length (mm)	Detent torque (mN·m)	Number of detent	Number of pulse	Minimum order unit (pcs.) Japan	Minimum order unit (pcs.) Export	Product No.	No.
Dip	9	7±5	30	15	600	1,200	**EC21A1540401**	1
		16±7					**EC21A1520401**	
			18	9	240	480	**EC21A0920401**	2
	15		30	15	600	1,200	**EC21A1520407**	3
Reflow	12	17±8 (Initial), 12^{+7}_{-4} (After reflow)			640	640	**EC21C1520401**	4

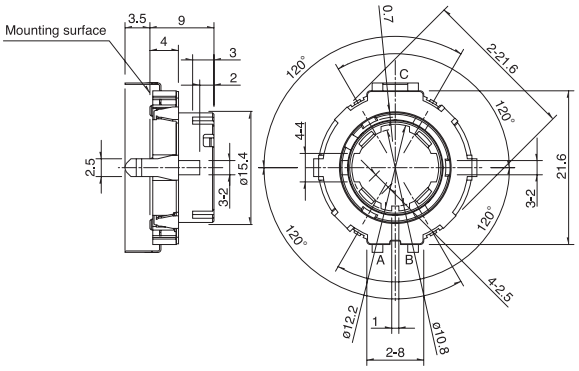
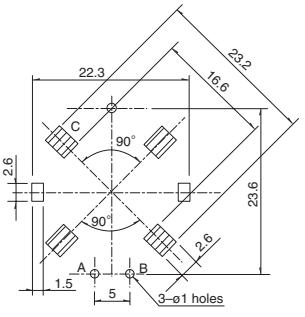
Packing Specifications

Tray

Product No.	Number of packages (pcs.) 1 case /Japan	Number of packages (pcs.) 1 case /export packing	Export package measurements (mm)
EC21A09	240	480	375×285×223
EC21A15	600	1,200	364×508×192
EC21A1520407	600	1,200	360×540×290
EC21C	640	640	310×400×185

Dimensions

Unit:mm

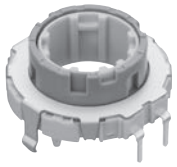
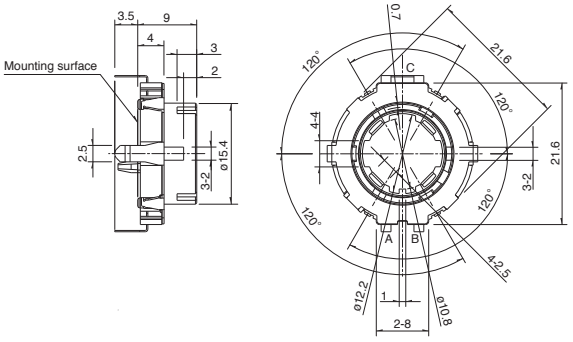
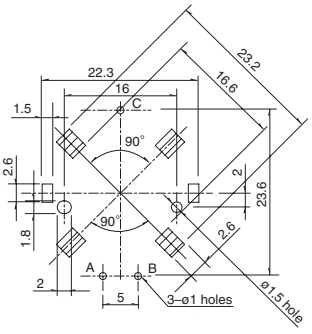
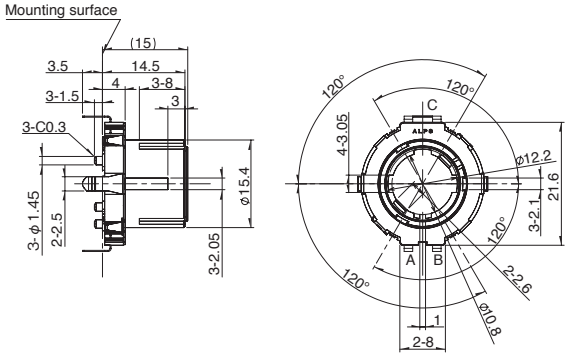
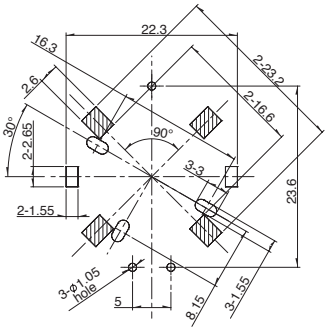
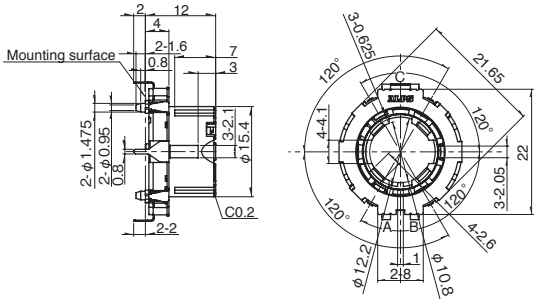
No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
1			 Do not wire the shaded area

ALPS

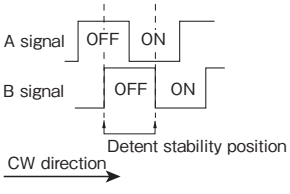
Refer to P.307 for soldering conditions.

Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
2			 Do not wire the shaded area
3			 Do not wire the shaded area
4			

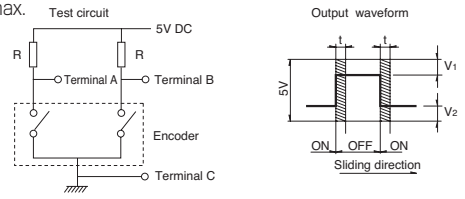
Output Wave



※Detent position cannot be specified for B signal.

Sliding Noise

V_1=V_2=2.5V max.



easurement condition：Rotation speed 360˚/s　t：Masking time to avoid chatterir

At R = 5kΩ
Chattering : 5ms max. Bounce : 5ms max.

Type			Ring type					
			21mm size		28mm size	35mm size		
Series			**EC21A**	**EC21C**	**EC28A**	**EC35A**	**EC35AH**	**EC35B**
Photo				NEW 				
Output			Incremental (Two phase A and B)				Incremental (Three phase A, B and C)	Incremental (Two phase A and B)/ Self-return switch
Shaft types			Ring type					
Number of pulse / Number of detent			9/18 15/30	15/30	15/30 18/18	15/30	6×ABC/18 10×ABC/30	15/30
Dimensions (mm)	W		21.6	22	28	35		35
	D			21.6	29			37
	H		4			4.5		12.1
Operating temperature range			−40℃ to +85℃					
Operating life			50,000 cycles					30,000 cycles
Automotive use			●	●	●	●	●	●
Life cycle (availability)			★2	★2	★2	★2	★2	★2
Electrical performance	Rating		10mA 5V DC					
	Max./min. operating current (Resistive load)		10mA / 1mA					
	Insulation resistance		100MΩ min. 250V DC					
	Voltage proof		300V AC for 1minute or 360V AC for 2s	300V AC for 1minute or 360V AC for 1s	300V AC for 1minute or 360V AC for 2s			300V AC for 1minute or 360V AC for 1s
Mechanical performance	Detent torque		7±5mN·m 16±7mN·m	17±8mN·m (Initial) 12^{+7}_{-4}mN·m (After reflow)	7±5mN·m 12±7mN·m 20±10mN·m	18±7mN·m	12±5mN·m 18±7mN·m 30±15mN·m	20±10mN·m
	Push-pull strength	Push	100N					
		Pull	100N					
Shaft configuration			Ring type					
Terminal type			Insertion					
Switch Specifications	Switch type		—	—	—	—	—	Self-return switch
	Contact arrangement		—	—	—	—	—	Single pole and double throw
	Travel (mm)		—	—	—	—	—	2.8±0.5
	Operating force (N)		—	—	—	—	—	3.8±1.5
	Switch ON position		—	—	—	—	—	15°±5°
	Rotational torque		—	—	—	—	—	40±25mN·m
	Rating		—	—	—	—	—	10mA 5V DC
	Contact resistance		—	—	—	—	—	200mΩ max.
	Operating life		—	—	—	—	—	15,000 cycles
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Note

● Indicates applicability to all products in the series.

Reference for Manual Soldering

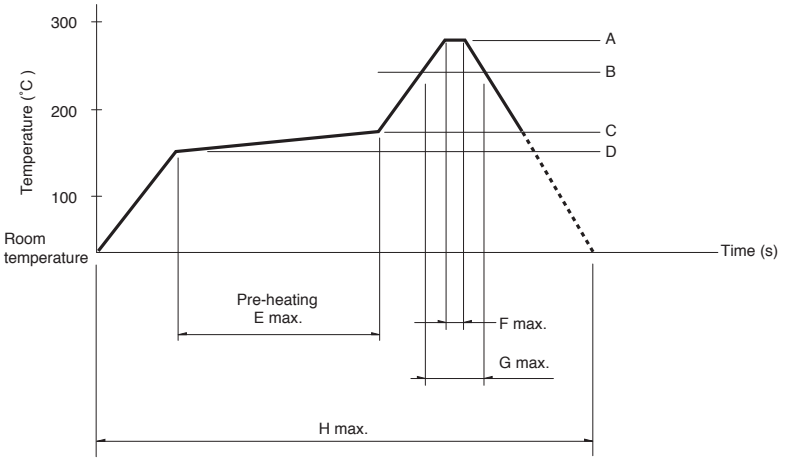
Series	Tip temperature	Soldering time	No. of solders
EC05E, EC09E, EC10E, EC111, EC11B, EC11E, EC11G, EC11K, EC12D, EC12E, EC18A, EC21A, EC28A, EC35A, EC35AH, EC35B, EC40A, EC45A, EC50A, EC60B, EM11B, EM20B, EC21C	350℃ max.	3s max.	1 time
EC11J	350±10℃	3^{+1}_{0}s	2 time

Reference for Dip Soldering

Series	Preheating		Dip soldering		No. of solders
	Soldering surfacetemperature	Heating time	Soldering temperature	Soldering time	
EC09E, EC11B, EC111, EC11E, EC11G, EC11K, EC18A, EC21A, EC28A, EC35A, EC35AH, EC35B, EC50A, EC60B	100℃ max.	2 min. max.	260±5℃	5±1s	2 time max.
EC10E, EC12D, EC12E, EM11B	100℃ max.	1 min. max.	260±5℃	3±1s	2 time max.
EC40A	110℃ max.	1 min. max.	260℃ max.	10s max.	1 time
EC45A	100℃ max.	2 min. max.	260℃ max.	5s max.	2 time max.
EM20B	80℃ max.	1 min. max.	260℃ max.	3s max.	2 time max.

Example of Reflow Soldering Condition

Temperature profile



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

注記

1. 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.
2. 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℃ 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.

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