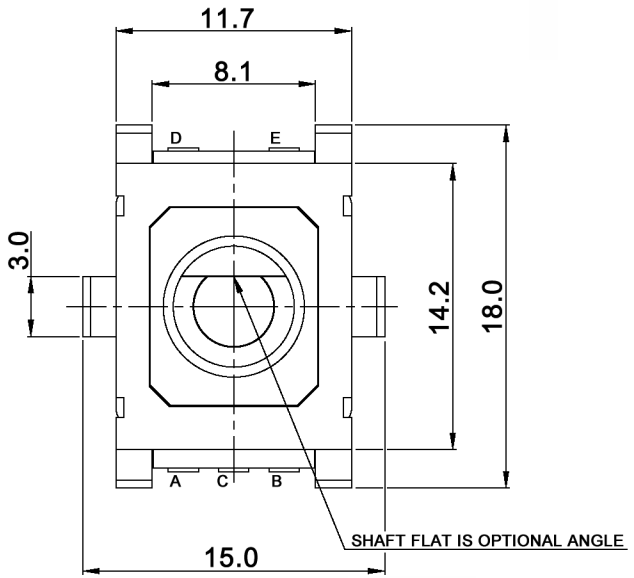
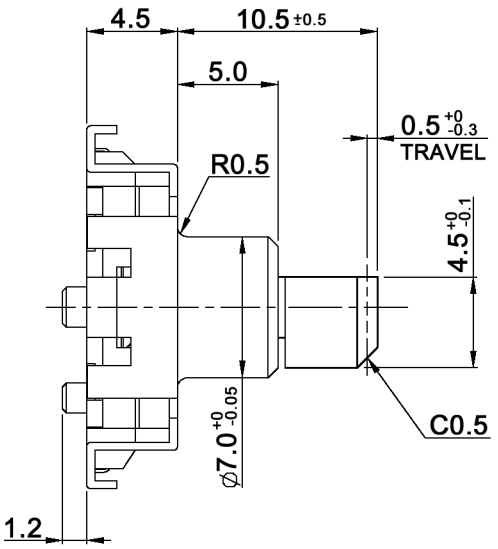
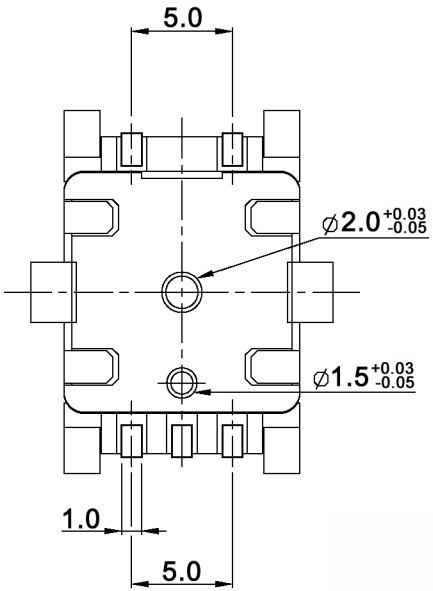
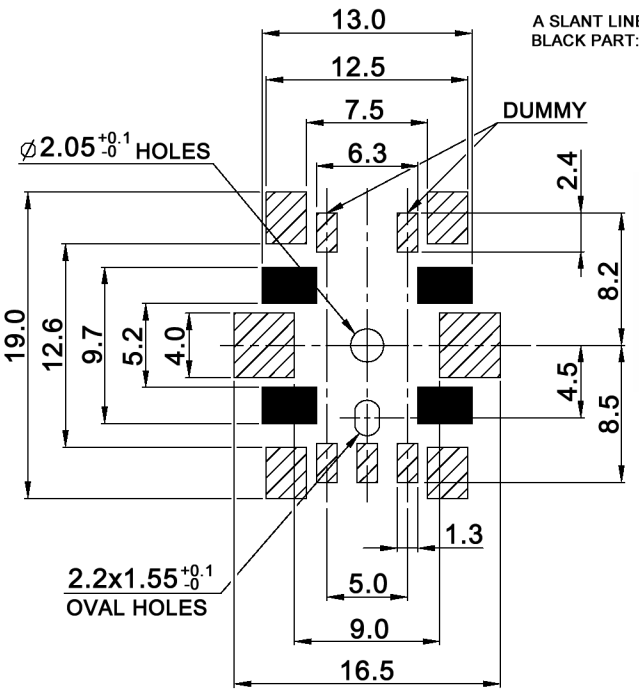




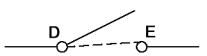


P.C.B. MOUNTING
(TOLERANCE ±0.1)
VIEWED FROM MOUNTING SIDE

A SLANT LINE PART SHOWS THE SOLDER LAND.
BLACK PART: DO NOT SOLDER AND NO WIRING FOR ELECTRICAL CONTACT.



CIRCUIT DIAGRAM



Compliance: RohS II (2011/65/EU)

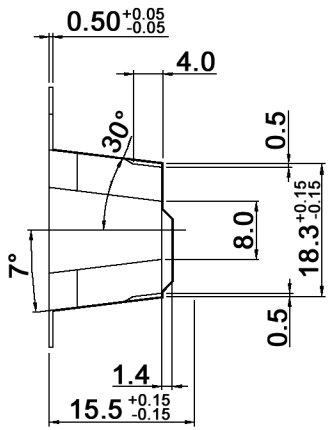
Tolerances: <10: ±0.3mm 10-100: ±0.5mm			Date 08/15	Name dr
Specifications	05/19	dr	knitter-switch	30 34 14
Soldering conditions	11/15	dr		
Modifications	Date	Name		

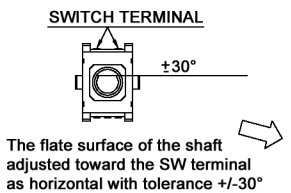
MERPS11-15110T

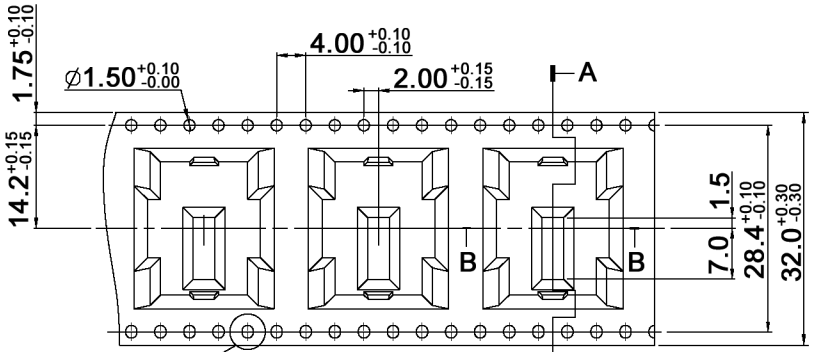
Page 1/6

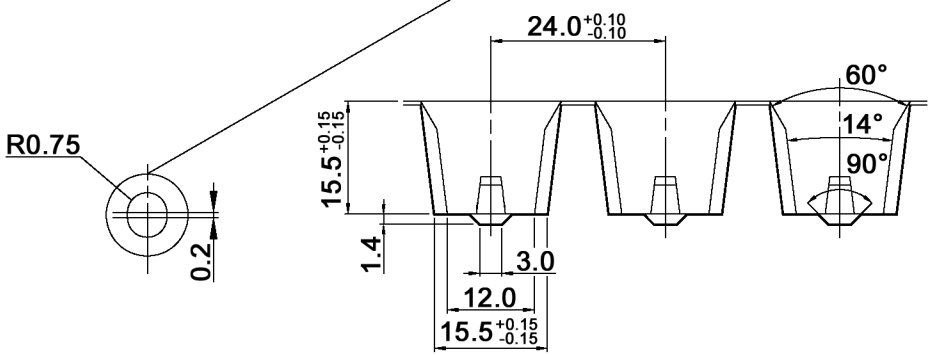
Packaging:

A-A









Packaging unit: 160 pcs. / reel
10 sprocket hole pitch cumulative tolerance +/-0.2mm
Camber not to exceed 1mm in 100mm
Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole
Material: polystyrene, black
Compliance: RohS II (2011/65/EU)

Tolerances: <10: ±0.3mm 10-100: ±0.5mm			Date	Name	MERPS11-15110T	
			08/15	dr		
Specifications	05/19	dr	knitter-switch		30 34 14	Page 2/6
Soldering conditions	11/15	dr				
Modifications	Date	Name				

General

1.1 Application

This specification applies to 11mm size rotary encoder (incremental) for microscopic current circuits used in electronic equipment.

1.2 Standard atmospheric conditions
Unless otherwise specified the standard range of atmospheric conditions for making measurements and tests is as follows:

Ambient temperature:	15 to 35 °C
Relative humidity:	25 to 85 %
Air pressure:	860 to 1060 hPa

1.3 Temperature range

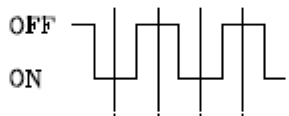
For operation:	-40 to +85 °C
For storage:	-40 to +85 °C

Electrical characteristics of Encoder (Pushbutton characteristics see end of document)

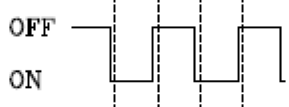
2.1 Resolution
Number of pulses in 360° rotation: 15 (2 detents per pulse)

2.2 Output signal format
Signals A and B are phase-different, broken line is for detent positions.

Rotation clockwise
Terminal A - C



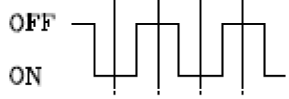
Terminal B - C



Rotation counter clockwise
Terminal A - C



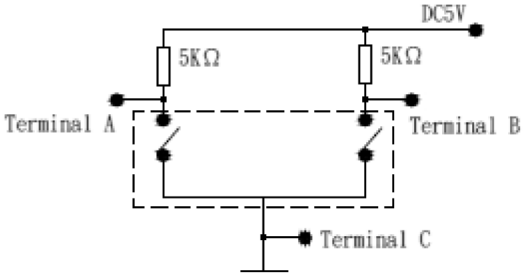
Terminal B - C



2.3 Switching characteristics
Measurements shall be made at a rotation speed of 360°/s and the following schematic:

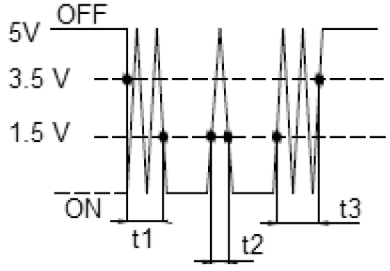
Compliance: RohS II (2011/65/EU)

Tolerances: <10: ±0.3mm 10-100: ±0.5mm			Date 08/15	Name dr	MERPS11-15110T	
Specifications	05/19	dr	knitter-switch		30 34 14	Page 3/6
Soldering conditions	11/15	dr				
Modifications	Date	Name				



2.4 Sliding noise
In the following, ON-area is defined by voltage ≤ 1.5 V, OFF-area by voltage ≥ 3.5 V.

2.4.1 Chattering
Chattering is specified by the signal's passage time from 3.5 V to 1.5 V (time t1) and from 1.5 V to 3.5 V (time t3)



Chattering t1, t3: ≤ 2 ms

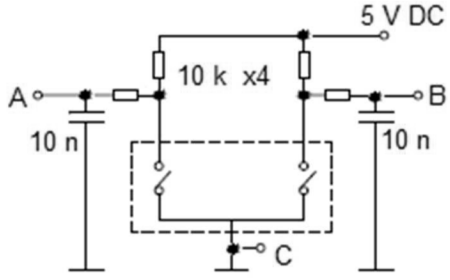
2.4.2 Bounce
Bounce is specified by the period of time the voltage change exceeds 1.5V in ON area (time t2). When t2 is ≤ 1 ms it is considered as part of chattering.
If the time period between 2 bounces is ≤ 1 ms, the 2 bounces count as 1.

Bounce t2: ≤ 2 ms

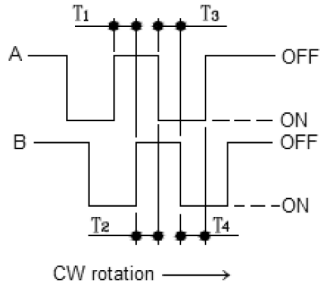
2.4.3. Sliding noise
The voltage change in OFF area: ≥ 3.5 V

Note:

To avoid chattering a masking time for t1 and t2 is recommended in signal processing equipment as well as RC-filter as shown in the schematic. Masking time and RC components should be de-find according to actual operation environment.



2.5 Phase difference
Measurement shall be made under constant shaft rotation speed of 360°/s



Phase difference: ΔT ≥ 4 ms

Compliance: RohS II (2011/65/EU)

Tolerances: <10: ±0.3mm 10-100: ±0.5mm			Date 08/15	Name dr	**MERPS11-15110T**
Specifications	05/19	dr	**knitter-switch**	30 34 14	Page 4/6
Soldering conditions	11/15	dr			
Modifications	Date	Name			

2.6 Insulation resistance
Resistance is determined at 250 V DC and measured between terminals and bushing

Resistance: ≥ 100 MΩ

2.7 Dielectric strength

Time is determined at 300 V AC or 360 V AC and a leakage current ≤ 1 mA. There shall be no damage, arc or breakdown.

Dielectric strength: 1 min (300 V), 2 s (360 V)

2.8 Rating 5V DC, 10 mA

Mechanical

3.1 total rotational angle: 360° (endless)

3.2 detent torque: 1 ± 0.7 Ncm

3.3 detents per turn/step angle: 30 detents, angle 12° ± 3°

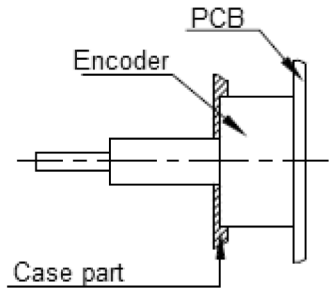
3.4 Push-pull strength of shaft: 100 N for 10 s

3.5 Shaft wobble at 5 N to the tip: ≤ 0.55 mm

3.6 rotation play in detent position: ≤ 5°

Note:

Consider to fix the encoder by case parts in addition to solder joints



4.1 rotational life

Determined by applying 500 cycles per hour. 1 cycle is 360° CW rotation followed by 360° CCW rotation. Detent torque must remain within +10%/-30% of specified value. t1, t2, t3 must remain ≤ 3 ms, spec chapter 2 and 3.1 and 3.3 to 3.6 are valid.

Rotational life: 100 000 cycles

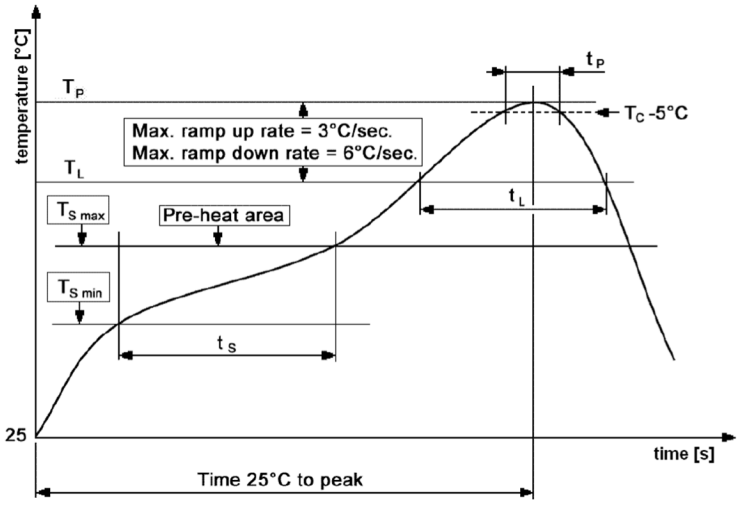
Soldering

5.1. Reflow soldering

Soldering should be done by IR-reflow oven, single pass. Limitations:

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Tolerances: <10: ±0.3mm 10-100: ±0.5mm			Date	Name	MERPS11-15110T
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Modifications	Date	Name			



T_P = 260°C
t_P = 10sec. max.

T_L = 217°C
t_L = 90sec. max.

$T_{S\,max}$ = 200°C
$T_{S\,min}$ = 150°C
t_S = 120sec. max.

Pushbutton Switch Characteristics

6.1 Contact resistance determined by voltage drop:	≤ 100 mΩ
6.2 Bounce during a speed of 1 cycle per second:	≤ 10 ms
6.3 Insulation resistance:	see 2.6
6.4 Dielectric strength:	see 2.7
6.5 Rating:	see 2.8
7.1 Switch function:	SPST, momentary ON
7.2 Switch travel:	0.5 +0/-0.3 mm
7.3 Actuation force:	3.5 N ± 1 N

8.1 Mechanical life
Mechanical life is determined at approx. 50 operations per second , contact resistance remains ≤ 200 mΩ, chapter 6.1. to 6.4 and 71 to 7.3 are valid

Mechanical life:	100 000 cycles

Compliance: RohS II (2011/65/EU)

Tolerances: <10: ±0.3mm 10-100: ±0.5mm			Date	Name	MERPS11-15110T
			08/15	dr	
Specifications	05/19	dr	knitter-switch		30 34 14
Soldering conditions	11/15	dr			
Modifications	Date	Name			

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knitter-switch:

MAV19A0F20E-724-JR MSS 3112 D ATE1F MFP213N-RA MTW 206 P MTA 106 E MMS238T MTE106E DRS 3110 MFS106D MPS203R MSS3122N-R SBS 5102 T TST 1 G ATE 1 E DRR 3016 DRS13016 KL 105 MMP 1010 D-RA-1 STM106DRA ATE 2 D DPW 1 CG-R KR 207 MAV16CBRE-3-JR-12V MFP 223 P MPE106D MTW 206 N APE1F CO106 MTE 106 D