Evaluation tools for encoder IC

SEIKO NPC CORPORATION

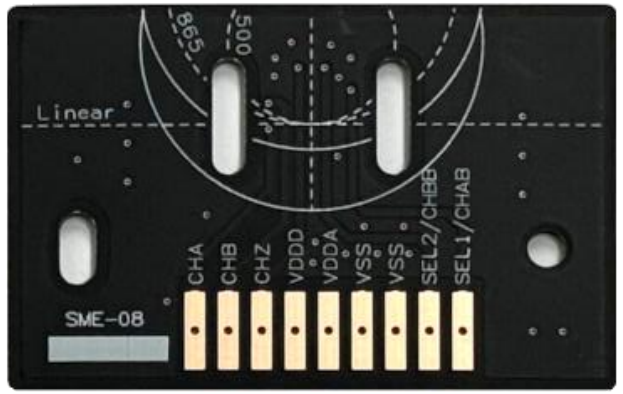
Contents

1-1. SME-08A/B Evaluation circuit boards

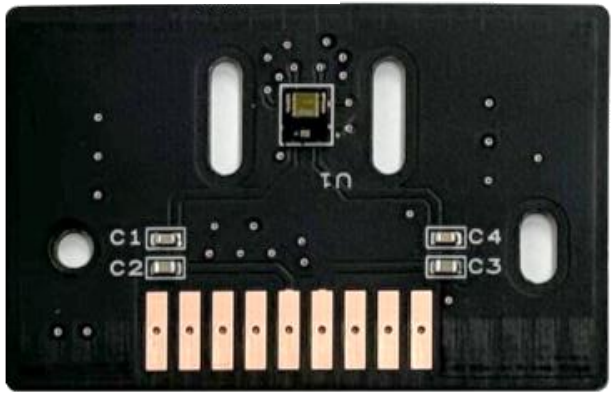
- Signal monitoring wires should be connected to the terminal pattern at the board end.

Evaluation board

Top View



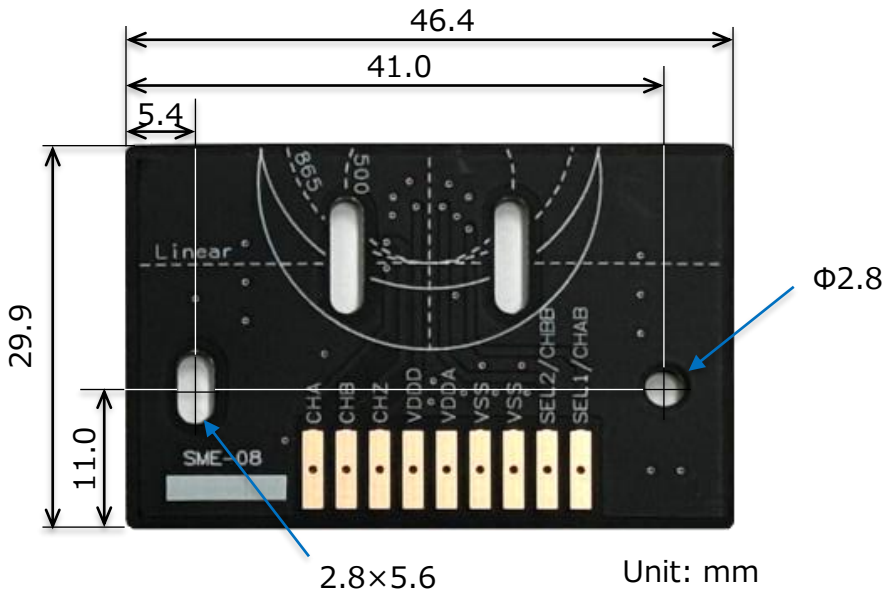
Bottom View



- Guidelines for aligning the NPC evaluation scale are provided on top surface of the evaluation board.
- The dotted line is a guide to the center of scale pattern.
- The solid line is a guide for the outline of the rotary scale.
- The upper circle is a guide for use at 865PPR and the lower circle is a guide for use at 500PPR.

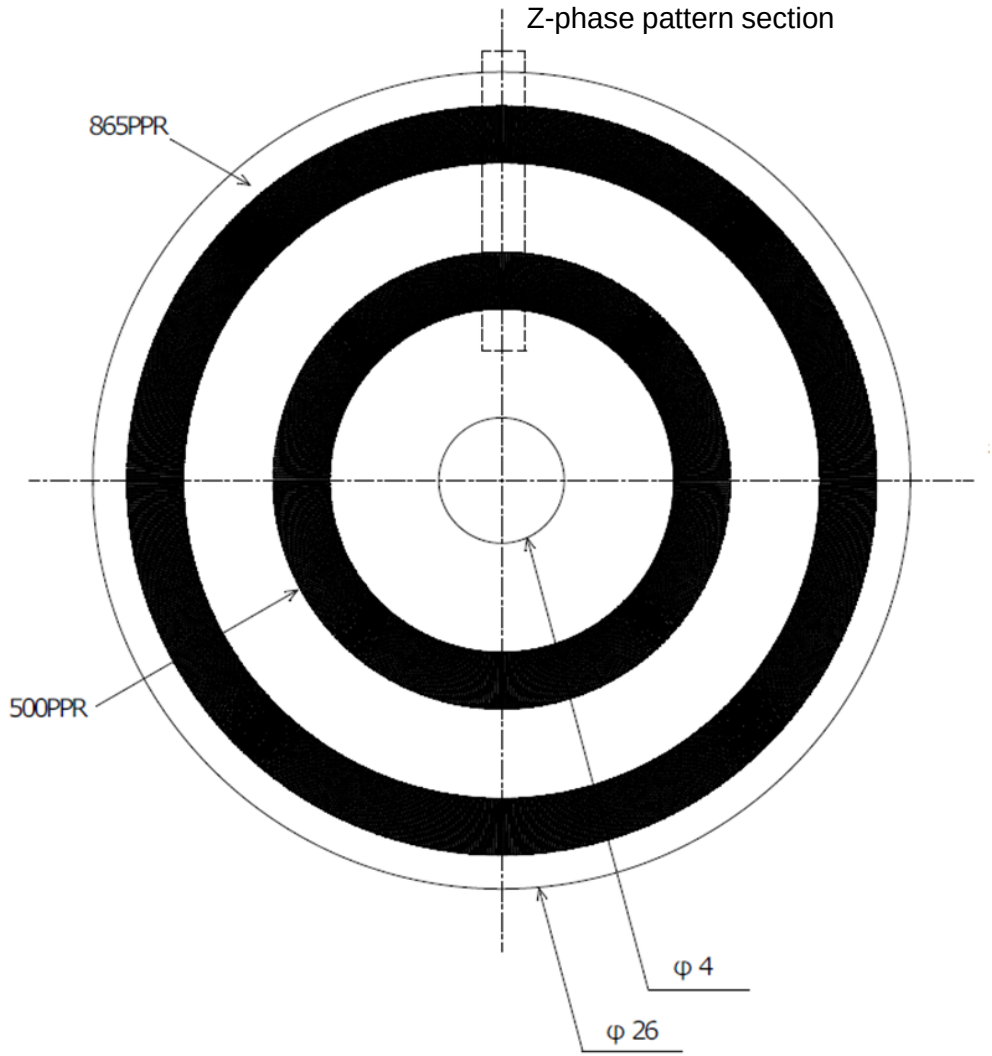
1-1. SME-08A/B Evaluation circuit boards

[Evaluation board: External dimensions]



1-2. SME-08A/B Evaluation scale

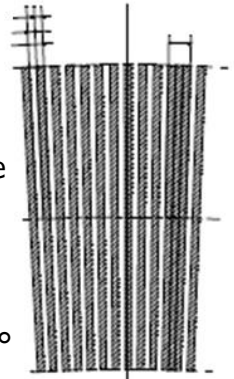
[SME-08A: Metal rotary scale]



[Detail view of Z-phase pattern section]

865PPR

Pattern period
360/865=0.416185°
Non reflective pattern angle
period/2=0.2080925°
Reflective pattern angle
period/2=0.2080925°
Z-phase pattern angle
0.2080925°*3=0.624277°



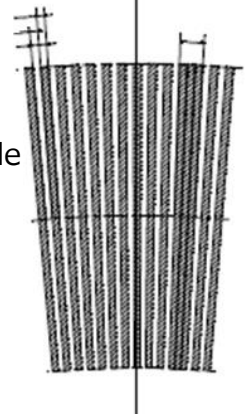
Outer diameter: φ23.827
(865*0.08/PI + 1.8)

Center diameter: φ22.027
(865*0.08/PI)

Inner diameter: φ20.227
(865*0.08/PI -1.8)

500PPR

Pattern period
360/500=0.72°
Non reflective pattern angle
period/2=0.36°
Reflective pattern angle
period/2=0.36°
Z-phase pattern angle
0.36°*3=1.08°



Outer diameter: φ14.532
(500*0.08/PI + 1.8)

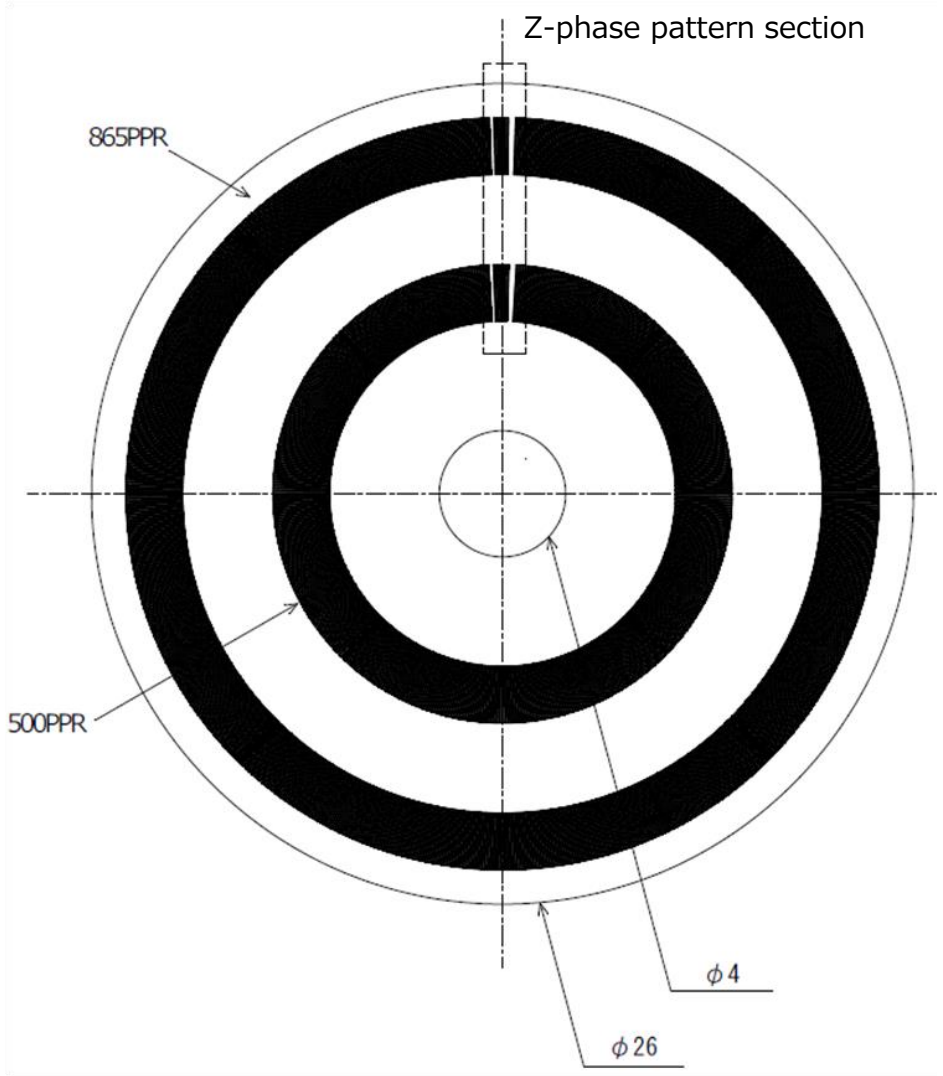
Center diameter: φ12.732
(500*0.08/PI)

Inner diameter: φ10.932
(500*0.08/PI -1.8)

Scale Base Material: Metal
Scale Thickness: 0.07mm

1-2. SME-08A/B Evaluation scale

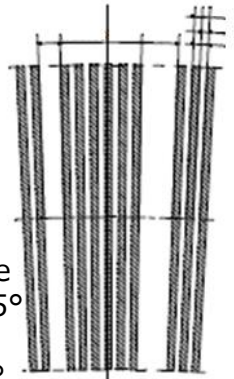
[SME-08B: Metal rotary scale]



[Detail view of Z-phase pattern section]

865PPR

Pattern period
360/865=0.416185°
Non reflective pattern angle
period/2=0.2080925°
Reflective pattern angle
period/2=0.2080925°
Z-phase pattern(right) angle
0.2080925°*5=1.0404625°
Z-phase pattern(left) angle
0.2080925°*3=0.624277°
Z-phase pattern spacing angle
0.2080925°*11=2.289018°



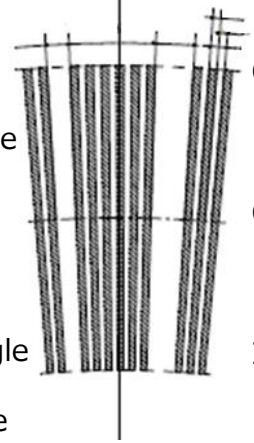
Outer diameter: φ23.827
(865*0.08/PI + 1.8)

Center diameter: φ22.027
(865*0.08/PI)

Inner diameter: φ20.227
(865*0.08/PI -1.8)

500PPR

Pattern period
360/500=0.72°
Non reflective pattern angle
period/2=0.36°
Reflective pattern angle
period/2=0.36°
Z-phase pattern angle
0.36°*3=1.08°
Z-phase pattern(right) angle
0.36°*5=1.8°
Z-phase pattern(left) angle
0.36°*3=1.08°
Z-phase pattern spacing angle
0.36°*11=3.96°



Outer diameter: φ14.532
(500*0.08/PI + 1.8)

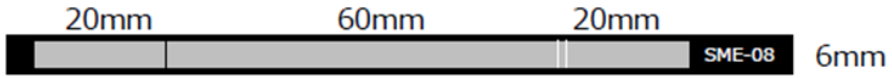
Center diameter: φ12.732
(500*0.08/PI)

Inner diameter: φ10.932
(500*0.08/PI -1.8)

Scale Base Material: Metal
Scale Thickness: 0.07mm

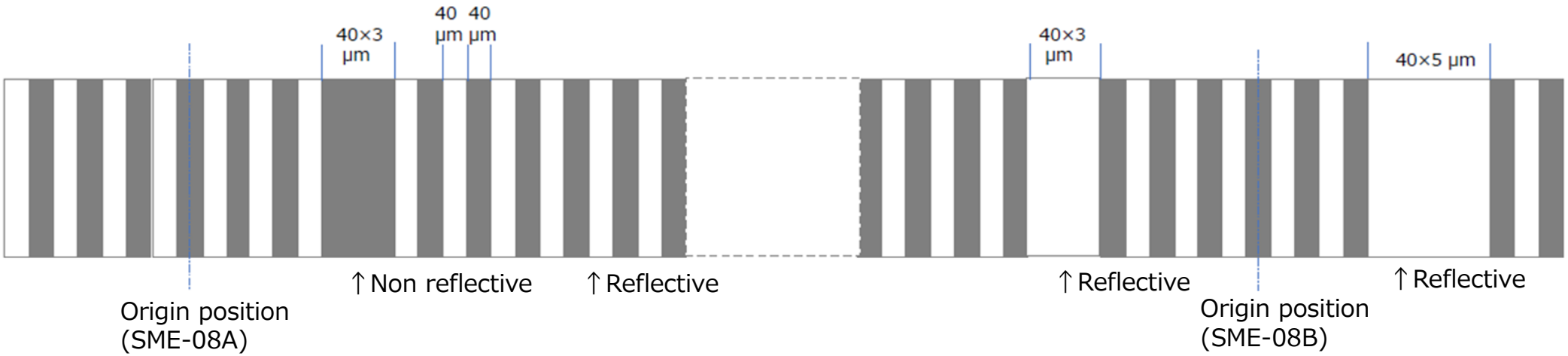
1-2. SME-08A/B Evaluation scale

[SME-08A, SME-08B: PET linear scale]



SME-08 L10mm

LED placed on the upper side

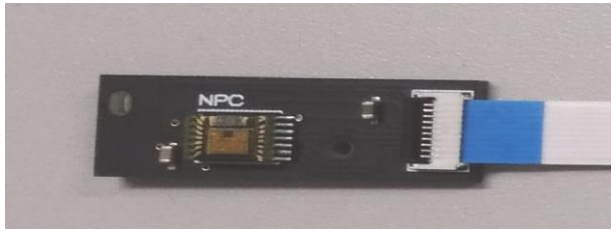


Scale Base Material: PET
Scale Thickness: 0.2mm

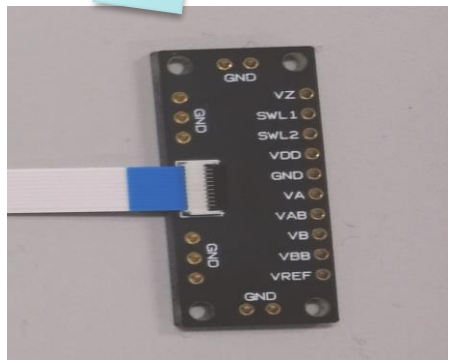
2-1. SMD-01B, SMD-04B Evaluation circuit boards

- Connect the monitor board and the evaluation board via FFC.
- The signal is output from the designated PIN on the monitor board.

Evaluation board



Monitor board

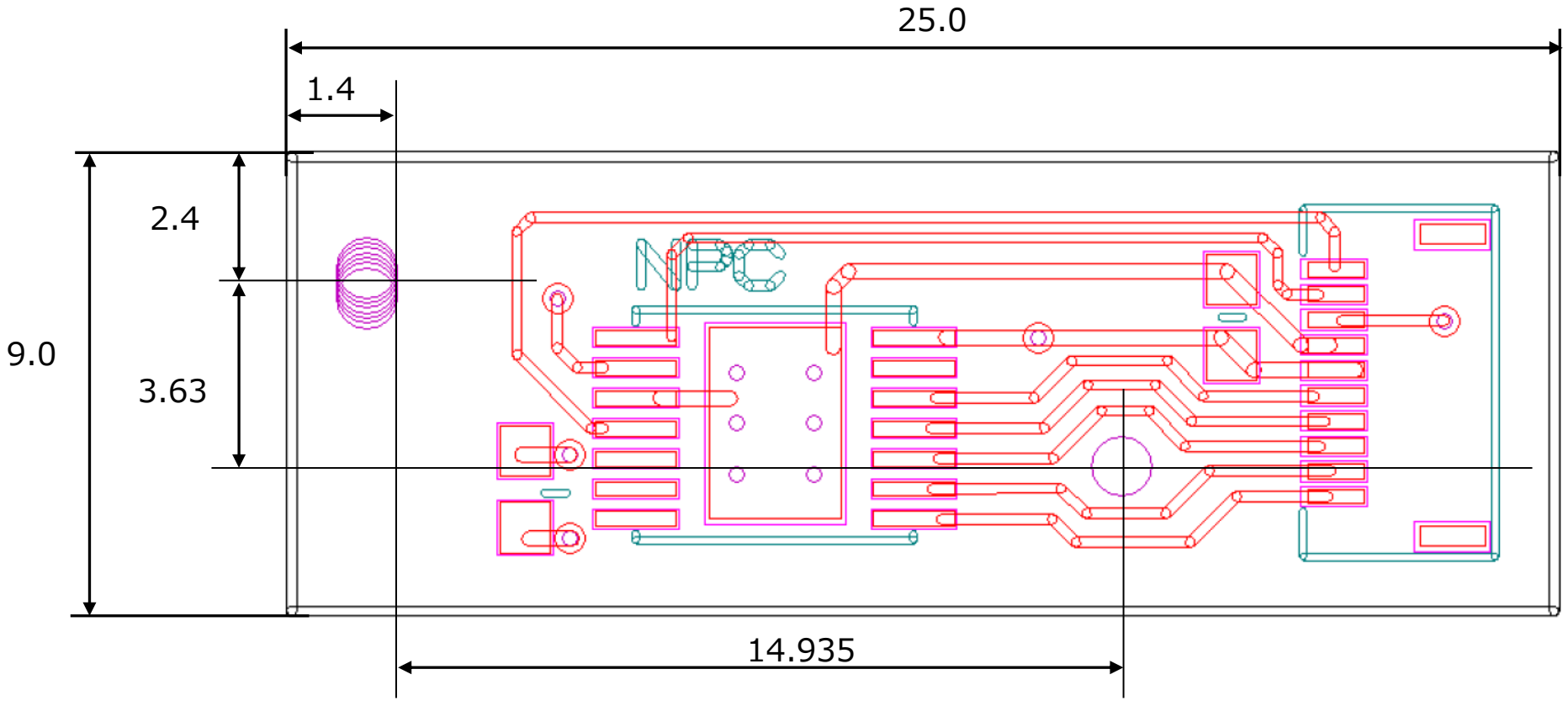


- The SMD-01B and SMD-04B evaluation boards are identical.
- Monitor board is different between SMD-01B and SMD-04B.

2-1. SMD-01B, SMD-04B Evaluation circuit boards

[Evaluation board: External dimensions]

Top view
[Unit: mm]

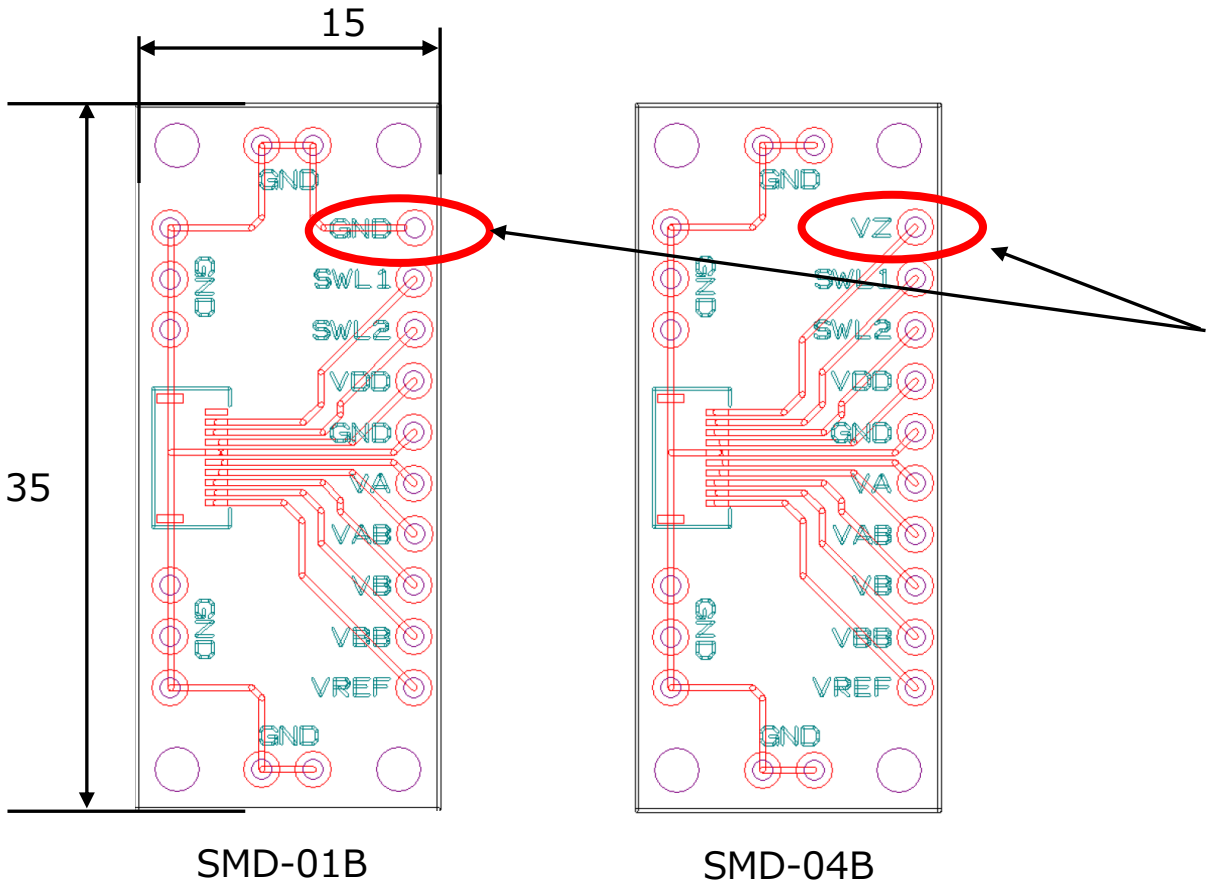


* PCB thickness 1.6mm
Figure shows part surface pattern only

2-1. SMD-01B, SMD-04B Evaluation circuit boards

[Monitor board top view: External dimensions]

Top view
[Unit: mm]

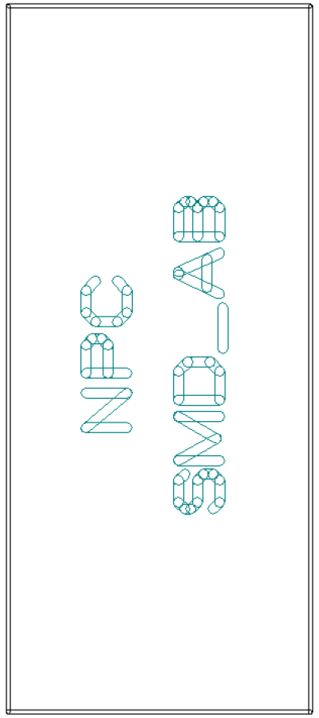


SMD-01B　　SMD-04B

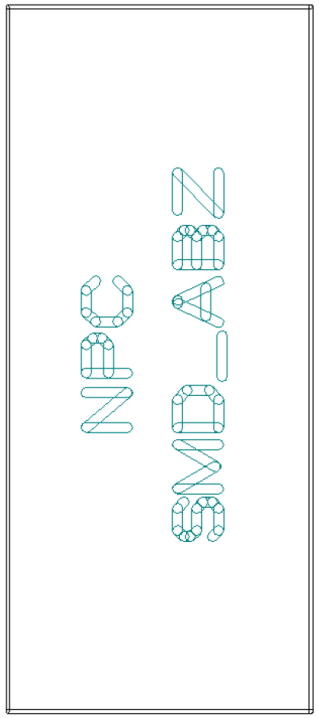
* The signal of the upper right pin is different
SMD-01B: GND
SMD-04B: VZ

2-1. SMD-01B, SMD-04B Evaluation circuit boards

[Monitor board bottom view]



SMD-01B

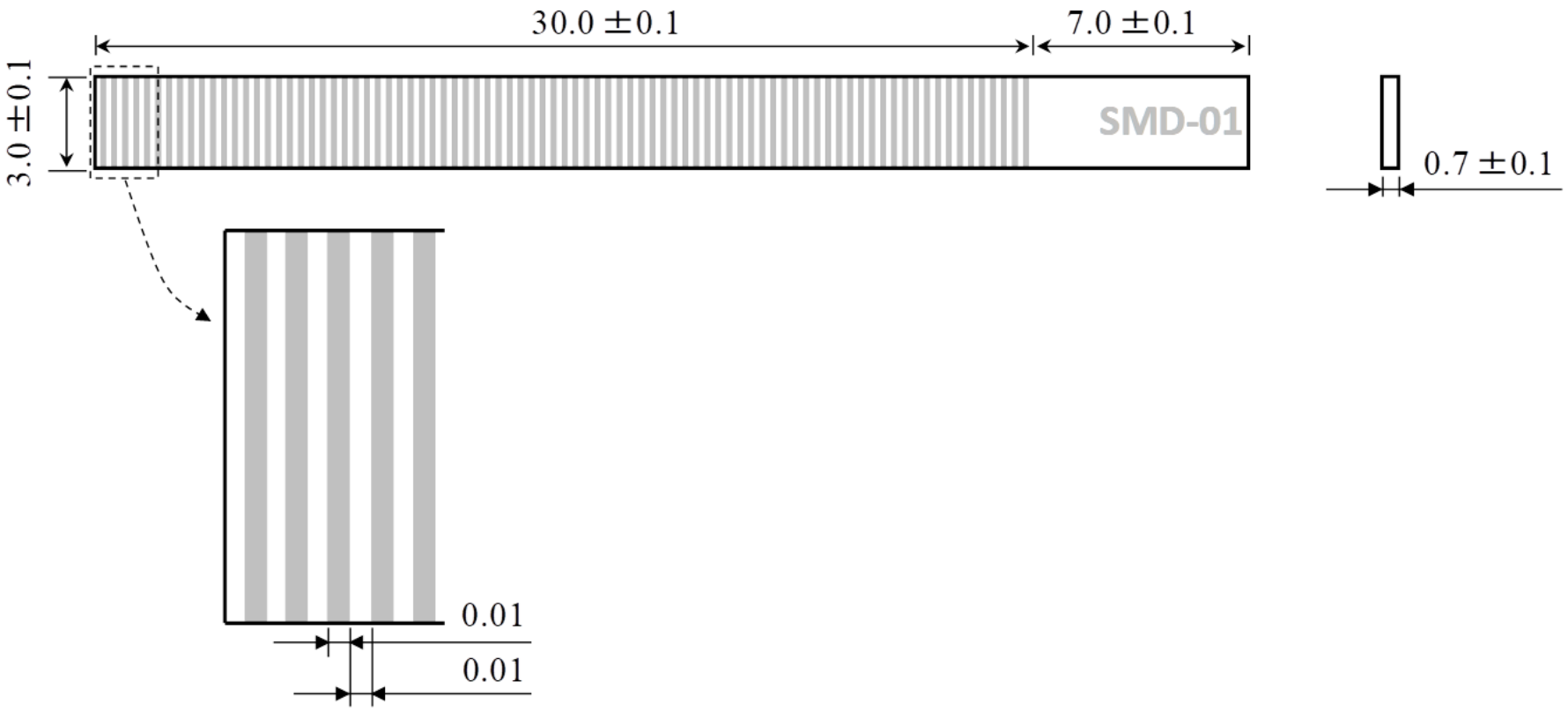


SMD-04B

2-3. SMD-01B, SMD-04B Evaluation scale

[SMD-01B: Glass linear scale]

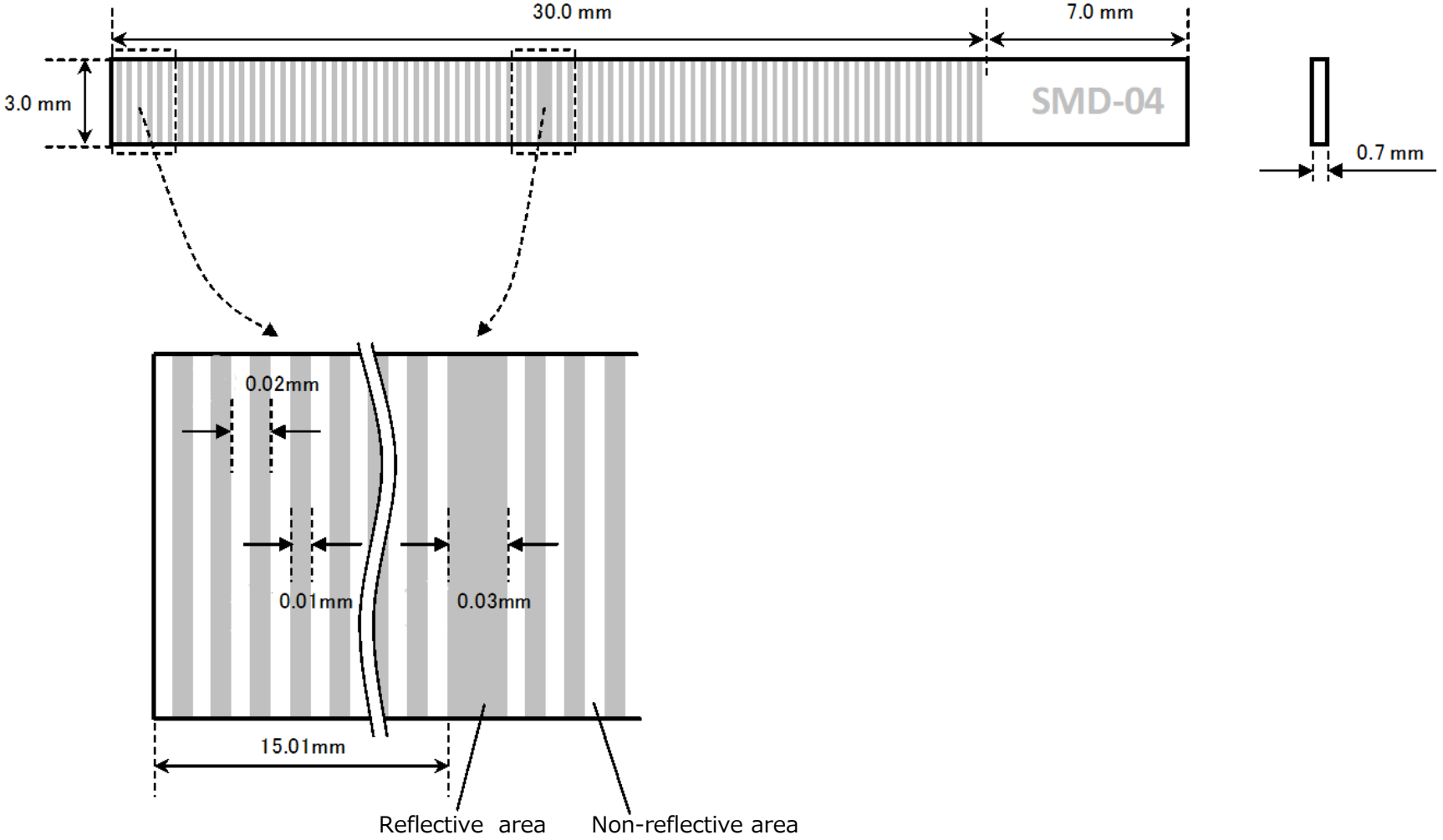
Top view
[Unit: mm]



2-3. SMD-01B, SMD-04B Evaluation scale

[SMD-04B: Glass linear scale]

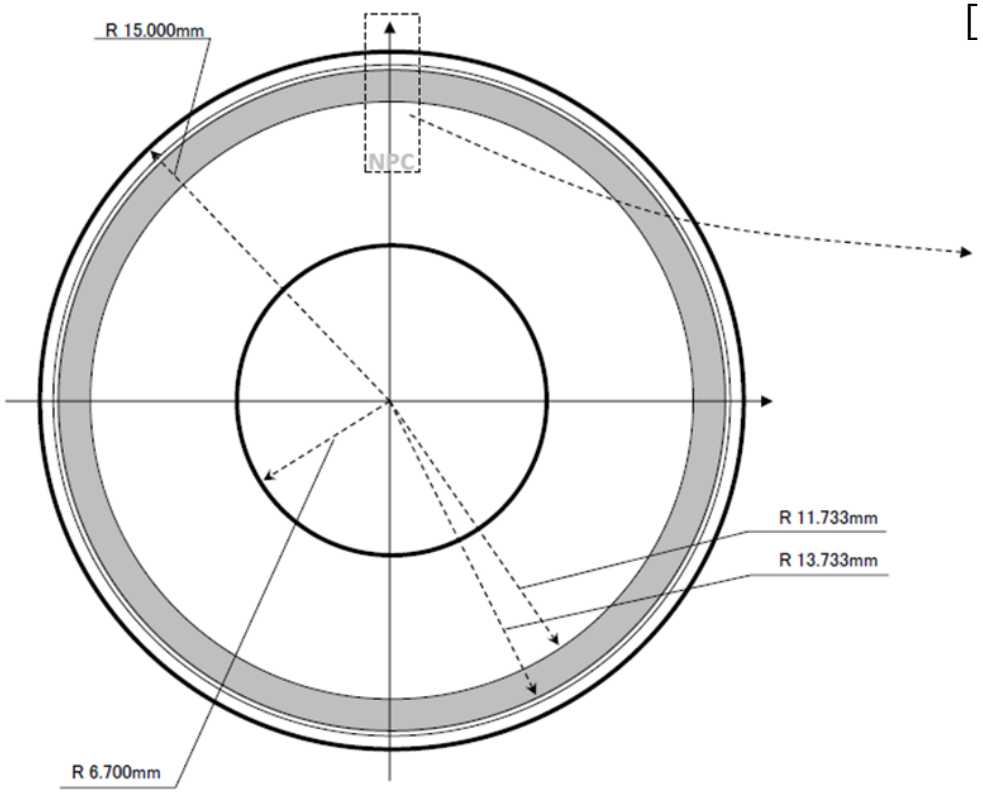
Top view
[Unit: mm]



2-3. SMD-01B, SMD-04B Evaluation scale

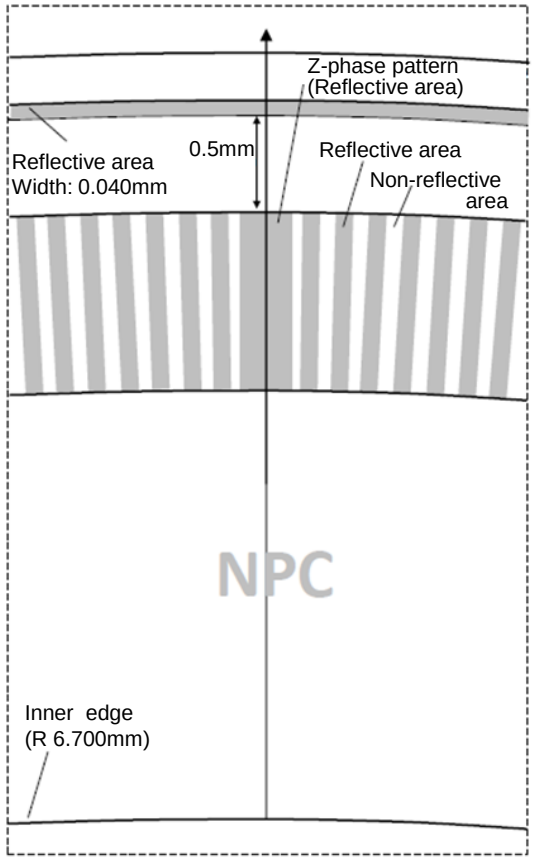
[SMD-01B, SMD-04B: Glass rotary scale]

Top view
[Unit: mm]



Scale Thickness: 1.0mm

[Detail view of Z-phase pattern section]

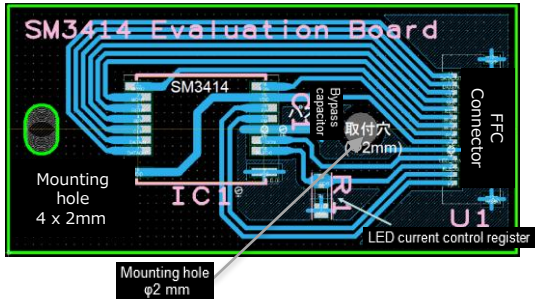


* The Z-phase signal generated by the Z-phase pattern is output only on the SMD-04B.
When used with SMD-01B, the amplitude of the incremental signal is slightly affected near the Z-phase pattern.

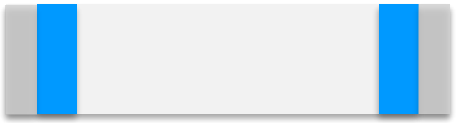
3-1. SM3414B Evaluation circuit boards

Basic configuration

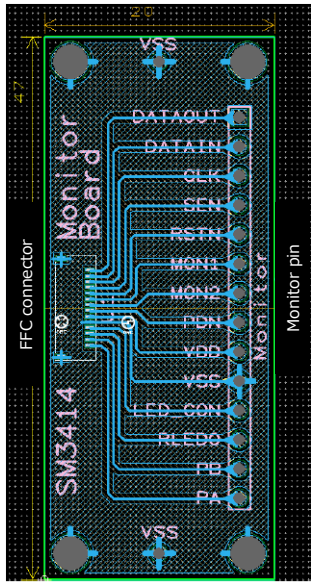
Evaluation board



14pin FFC/FPC



Monitor board



Power supply, control signals
VDD, VSS, RSTN, PDN

LED brightness control signals
LED_CON, RLEDO

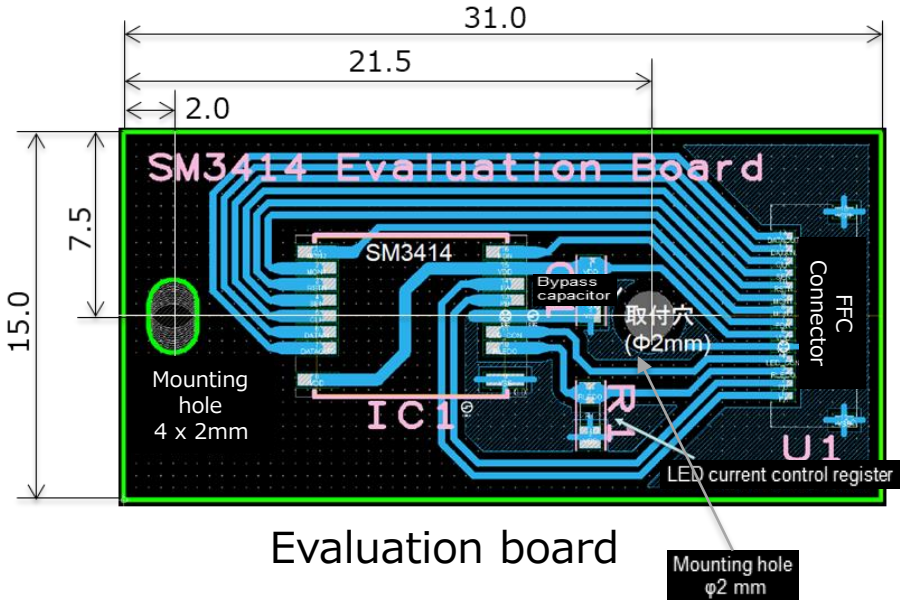
IC output signals
PA, PB, MON1, MON2

Serial communication signals
CLK, SEN, DATAOUT, DATAIN

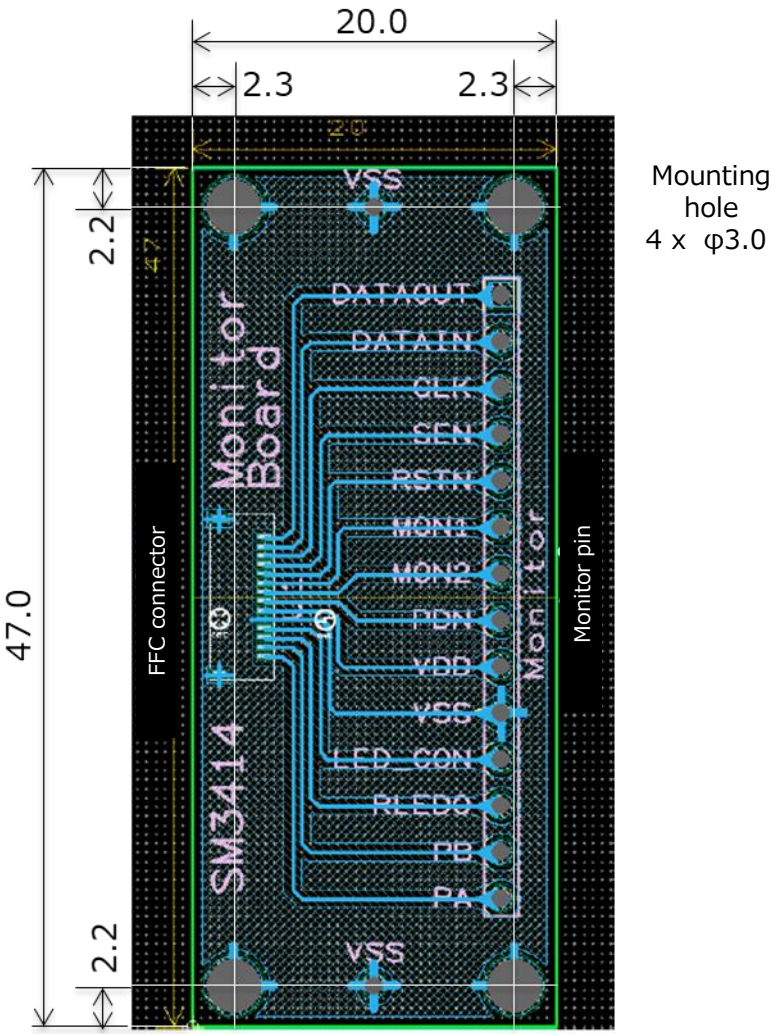
- Use signals from the monitor pin positions on the monitor board.
- For details on each signal, refer to the datasheet and application note.
- Before using absolute output, initialization of registers via serial communication is required.
- Please initialize the registers by referring to the datasheet and the application note.
- LED_VDD is connected to VDD on the evaluation board.
- LED current adjustment resister is already mounted; if you need to change the LED current, please change the resister value.

3-1. SM3414B Evaluation circuit boards

External dimensions (Unit: mm)



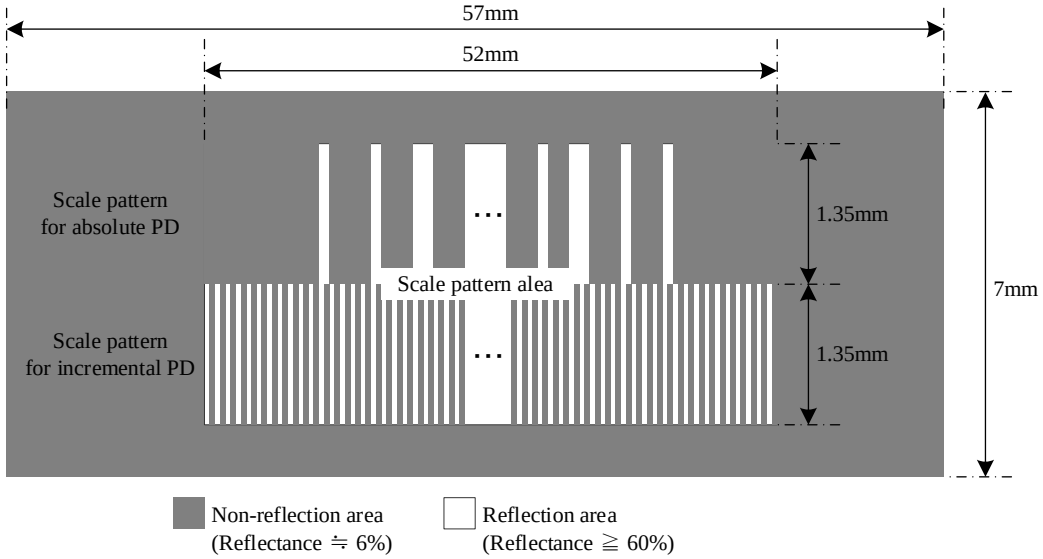
Evaluation board



Monitor board

3-2. SM3414B Evaluation scale

Dimensions (Unit: mm)



Material: PET
Thickness: 0.22mm (including adhesive tape)

- Note that if the encoder IC is moved beyond the valid range of the absolute pattern, the amplitude of the incremental signal will decrease.