# artist of light

## Specification

For LED Neon Flex Ribbon

**C-FR-F22BT**



**CLEAR** LIGHTING

NICHIA

c UL US LISTED  CE  TÜV SÜD  RoHS COMPLIANT

# Table of Contents

# Introduction

C-FR-ProF22BT is a new member of the Artist of Light series with monochromatic light with Nichia LEDs to achieve your desired artistic effect with 180° lighting angle, which employs constant current design-eliminating linear fade.

Built-in protection circuit design which means single LED failure has no effect on other LEDs working in the same unit and the whole light can keep constant lighting.

C-FR-ProF22BT is UL/cUL, CE, TUV and RoHS compliant. Moreover, it has passed rigorous environmental resistance, optical, mechanical and electrical tests in our lab under the support of advanced experimental equipments and technology to ensure it meets the requirements of harsh environments. Also it has passed relevant tests of third party inspection authority.
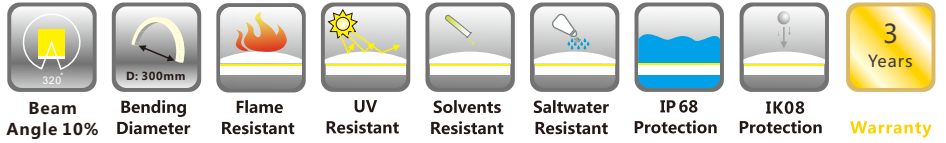
Fully encapsulated in the flexible PVC chamber by utilizing consummate extrusion technology, assembled with multiple patented connectors to achieve IP68 protection; easy for installation and applicable for various interior or exterior circumstances, especially suited for task lighting or high illumination applications.

C-FR-ProF22BT differs in its appearance from the rest of Artist of Light series as it emits from three sides, making it unprecedented over 800lm per meter. The three-dimensional exquisite frosted effects and seamless dot free illumination will create a feature in any space.
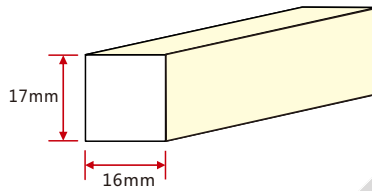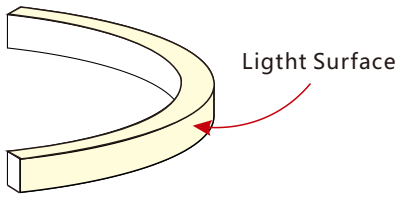
Applications:
1. Outdoor or Indoor Contour/Border Lighting
2. Architectural Outline/Decorative Lighting
3. Cove/Accent Lighting
4. Facade/Terrace Floor Lighting
5. Display Lighting

# 1. Specifications & Parameters

**NICHIA -inside**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Beam Angle 10% | Bending Diameter | Flame Resistant | UV Resistant | Solvents Resistant | Saltwater Resistant | IP 68 Protection | IK08 Protection | 3 Years Warranty |

## 1.1 Dimensions of Light

Ligtht Surface

17mm

16mm

Note: Unless otherwise stated, the tolerance of the light is ±0.3mm.

## 1.2 Technical Parameters

| Technical Parameters | |
|---|---|
| Article No. | C-FR-ProF22BT-24CC |
| Color | Warm White/White |
| Working Voltage | DC24V |
| Rated Power/m | 12W |
| LED Qty/m | 108LEDs |
| LED Distance | 9.26mm |
| Min. Cutting Unit | 6LEDs (1unit) |
| Min. Cutting Length | 5.56cm(1unit) |
| Continuous Length | 10m |
| Weight/m | 325g |
| Storage Temperature | -20~60℃ |
| Environmental Working Temperature | -20~45℃ |
| Environmental Installation Temperature | 0~45℃ |
| IP Rating | IP68 |

## 1.3 Optical Parameters

Photometric Data

| Article No. | C-FR-ProF22BT | |
|---|---|---|
| LED Type | Nichia SMD | |
| Beam angle | 320° | |
| Color | CCT | Lumen/m |
| 2500 | 2460±120K | >700lm |
| 2700 | 2725±145K | >700lm |
| 3000 | 3045±175K | >700lm |
| 3500 | 3465±245K | >700lm |
| 4000 | 3985±275K | >700lm |
| 4500 | 4503±243K | >700lm |
| 5000 | 5029±283K | >700lm |

Candle power distribution
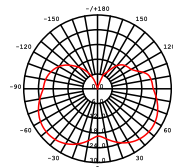
Illuminance Characteristics
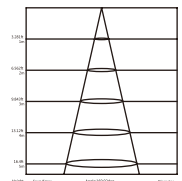
# 2. Functions & Features

## 2.1 Product Features

1. High quality Nichia SMD LED chip,each LED circuit protected.

2. 180° lighting angle,three-dimensional exquisite frosted effcets.

3. UV & flame resistant construction(PVC).

4. Extremely flat profile for slimline projects.

5. Perfect uniform & even light source with invisible light dots.

6. High illumination.

7. Easily to be installed.

8. High IP rating (IP68)

9.The product IP rate is ultimately in line with properly applied IP rated connectors.

10. Continuous length up to 15m (R, A)/10m (G, B, W) by powering one end.

11. Environmentally friendly & energy efficient.

12. Automated production, high reliability & long warranty.

13. 5 years life span(Do not continuously operate over 8 hours per day )

## 2.2 Minimum Bend Diameter

Light Surface

φ 300 mm

φ 300 mm
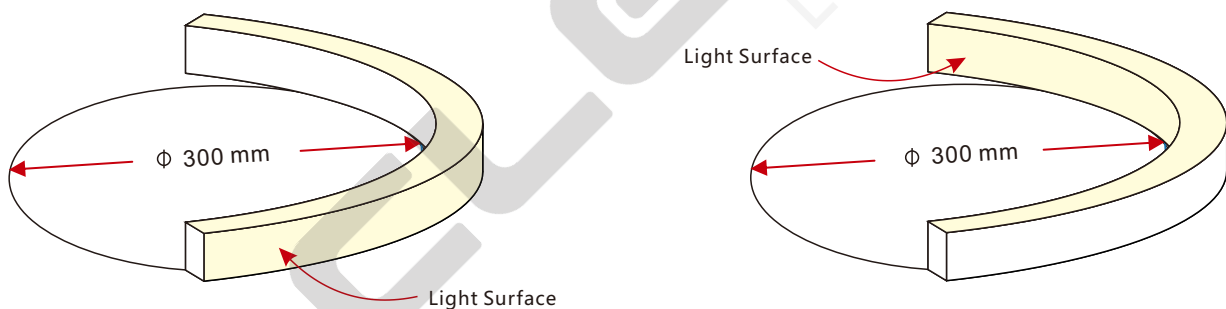
Light Surface

The light can only be bent along the light surface. Do not bend smaller than allowed minimum bend diameter.
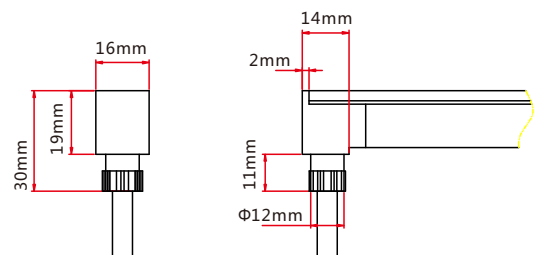
# 3. Types of Connector
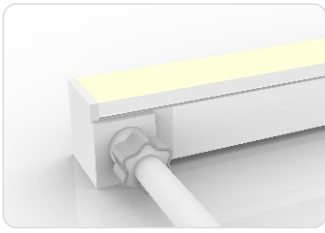
## 3.1 Injection-moulded  Connector

Note: Unless otherwise stated, the tolerance of the connector is ±0.5mm.

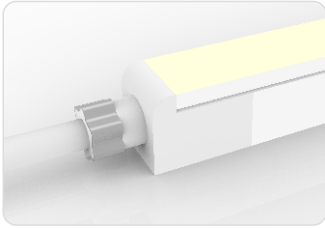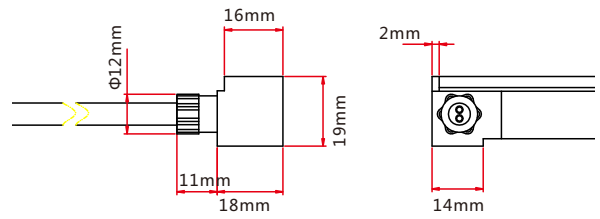### Injection-moulded Front Connector (bottom)

Connects light to power supply with pre-installed bottom feed cable IP67. Available in 0.3m, 1m, 3m, 5m, 10m, 15m, 20m lengths.

16mm

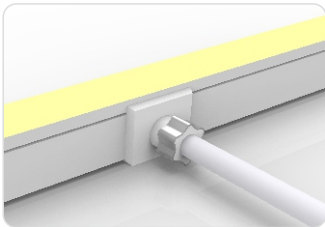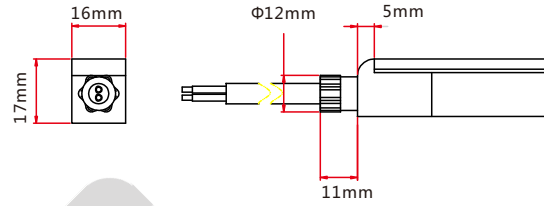19mm

30mm

14mm

2mm

11mm

Φ12mm

## Injection-moulded Front Connector (side)

Connects light to power supply with pre-installed side feed cable, IP67. Available in 0.3m, 1m, 3m, 5m, 10m, 15m, 20m lengths.
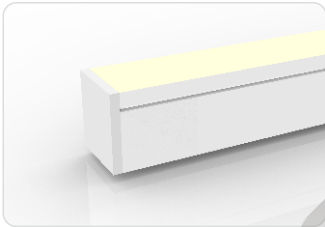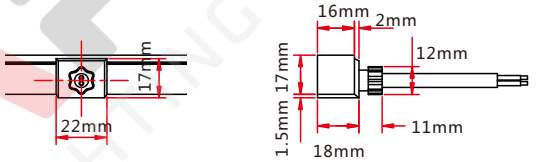
## Injection-moulded Front Connector (end)

Connects light to power supply with pre-installed end feed cable, IP67. Available in 0.3m, 1m, 3m, 5m, 10m, 15m, 20m lengths.
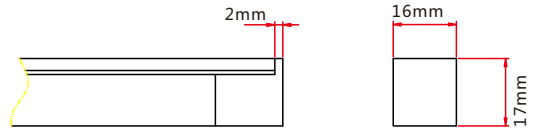
## Injection-moulded Middle Feed Connector

Connects light to power supply with pre-installed end feed cable, IP67. Available in 0.3m, 1m, 3m, 5m, 10m, 15m, 20m lengths.
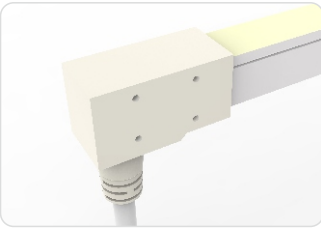
## Injection-moulded End Cap

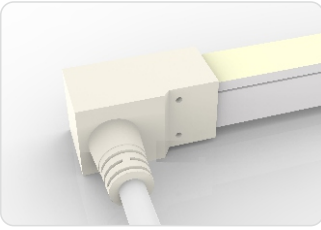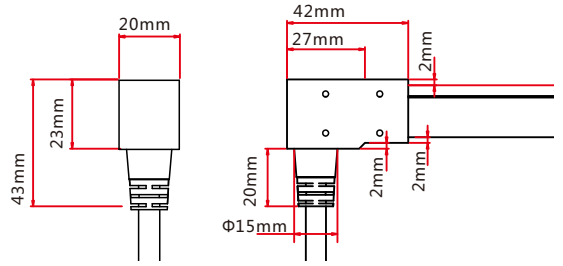Pre-installed termination protection of the light, IP67.

# 3.2 Dual Injection-moulded Connector

Note: Unless otherwise stated, the tolerance of the connector is ±0.5mm.
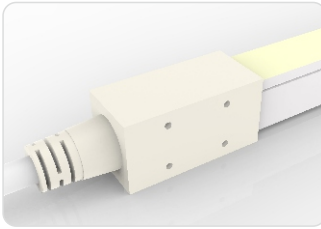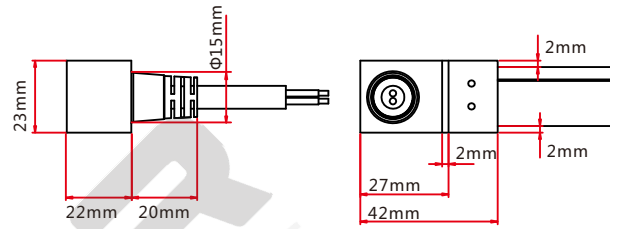
### Dual Injection-moulded Front Connector (bottom)

Connects light to power supply with pre-installed bottom feed cable, IP68. Cable length available in 0.3m, 1m, 3m, 5m, 10m, 15m, 20m.
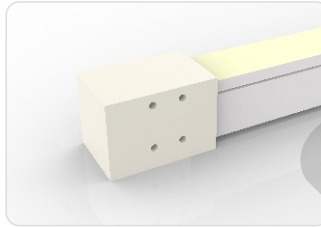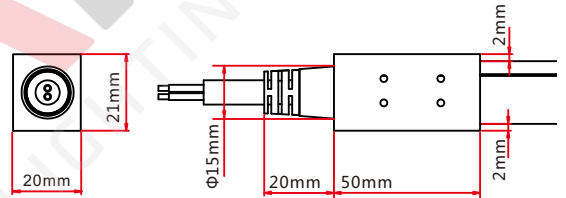
### Dual Injection-moulded Front Connector (side)

Connects light to power supply with pre-installed side feed cable, IP68. Cable length available in 0.3m, 1m, 3m, 5m, 10m, 15m, 20m.
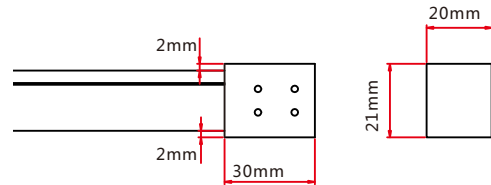
### Dual Injection-moulded Front Connector (top end)

Connects light to power supply with pre-installed end feed cable, IP68. Cable length available in 0.3m, 1m, 3m, 5m, 10m, 15m, 20m.
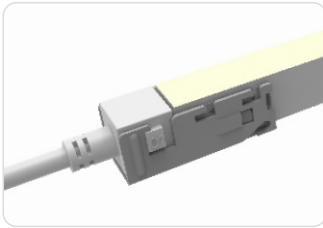
### Dual Injection-moulded End Cap

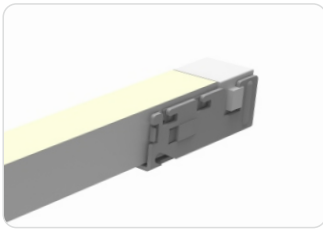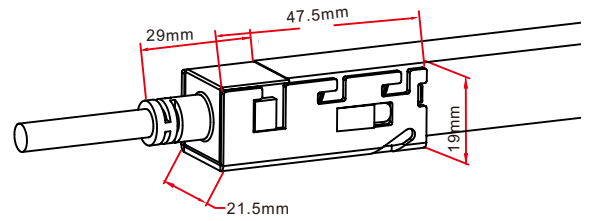Pre-installed termination protection of the light, IP68.

# 3.3 Clasp Connector

Note: Unless otherwise stated, the tolerance of the connector is ±0.5mm.

## Clasp Front Connector

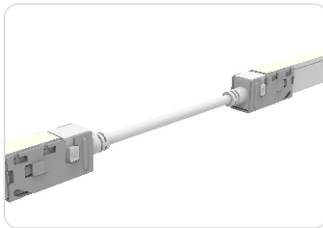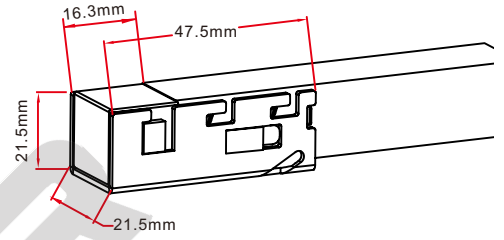Connects light to power supply, IP67 DIY connector. Cable available in 0.3m, 1m, 3m, 5m, 10m, 15m, 20m lengths.

Feed connector with silicone gasket *1 (Two-pin)
Anti-skidding clip *1
U steel plate *1

29mm    47.5mm    19mm    21.5mm

## Clasp End Cap

Termination protection of the light, IP67 DIY connector.

Tail plug *1
Silicone gasket *1
Anti-skidding clip *1
U steel plate *1

16.3mm    47.5mm    21.5mm    21.5mm

## Clasp Jumper

Connects two pieces of lights together with a flexible cable. IP67 DIY connector. L available in 0.3m, 1m and 3m.
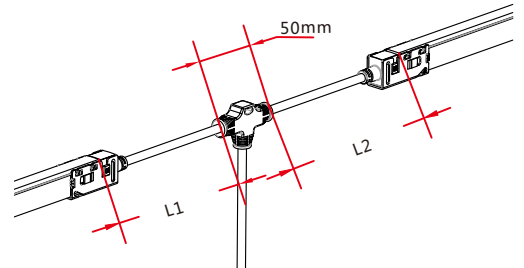
Double-end feed connector*1 (Two-pin)
Silicone gasket*2
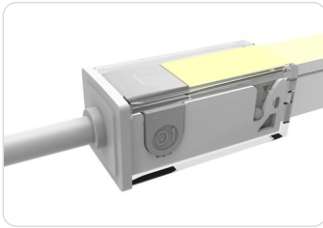U steel plate*2
Anti-skidding clip*2

L
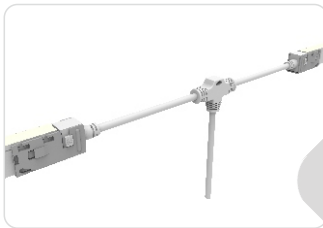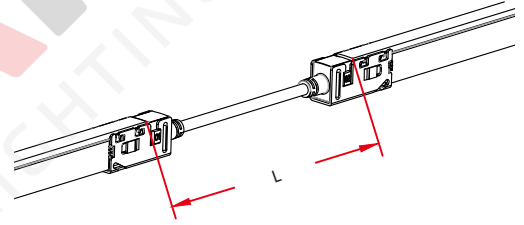
## Clasp Power T-feed

Connects two pieces of lights together with a T joint, energized from middle. IP67 DIY connector. L1 and L2 available in 0.3m.

T joint*1 (Two-pin)
Silicone gasket*2
U steel plate*2
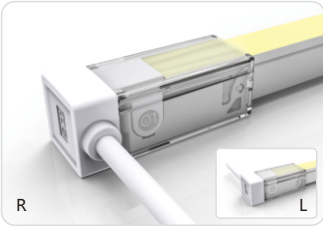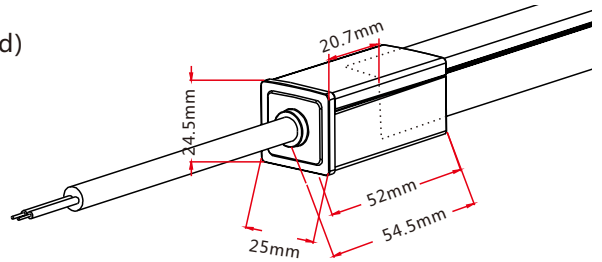Anti-skidding clip*2

50mm    L2    L1

# 3.4 Swivel Connector

Note: Unless otherwise stated, the tolerance of the connector is ±0.5mm.

## Snap Front Connector(top end)

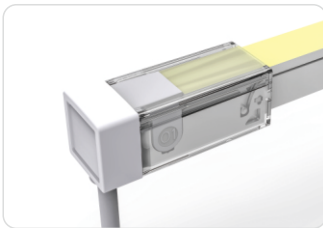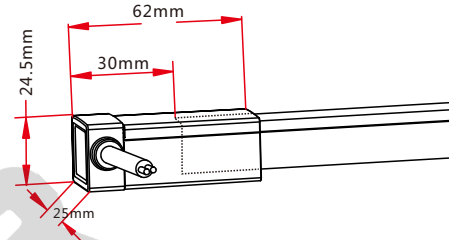Connects light to power supply, IP67 DIY connector. Cable available in 0.3m, 1m, 3m, 5m, 10m, 15m, 20m lengths.

Feed connector with silicone gasket *1 (Two-pin)
Anti-skidding clip *1
U steel plate *1
PC Cover * 1

## Snap Front Connector(side right/left)

Connects light to power supply, IP67 DIY connector. Cable available in 0.3m, 1m, 3m, 5m, 10m, 15m, 20m lengths.

Feed connector with silicone gasket *1 (Two-pin)
Anti-skidding clip *1
U steel plate *1
PC Cover * 1

R          L

## Snap Front Connector(bottom)

Connects light to power supply, IP67 DIY connector. Cable available in 0.3m, 1m, 3m, 5m, 10m, 15m, 20m lengths.

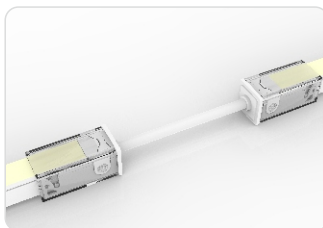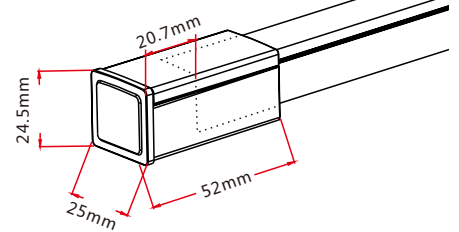Feed connector with silicone gasket *1 (Two-pin)
Anti-skidding clip *1
U steel plate *1
PC Cover * 1
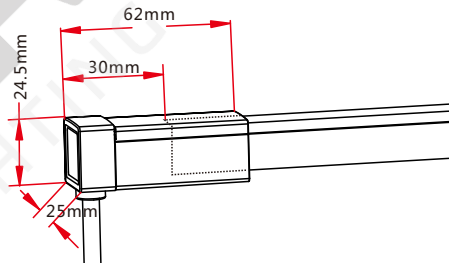
## Snap End Cap

Termination protection of the light, IP67 DIY connector.

Tail plug wite silicone gasket *1
Anti-skidding clip *1
U steel plate *1
PC Cover * 1

## Snap Jumper

Connects two pieces of lights together with a flexible cable. IP67 DIY connector. L available in 0.3m, 1m and 3m.

Double-end feed connector*1 (Two-pin)
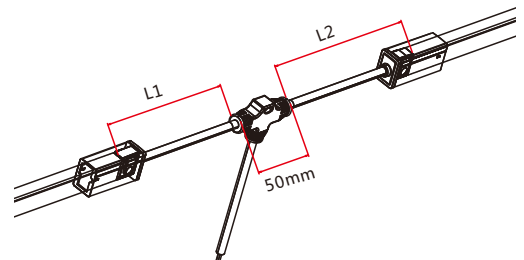Silicone gasket*2
U steel plate*2
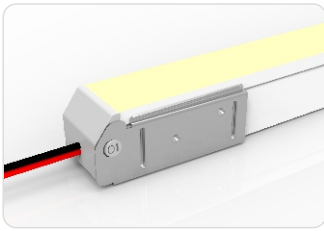Anti-skidding clip*2
PC cover*2
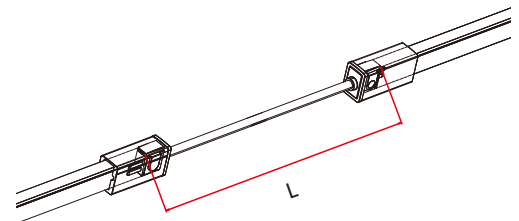
## Snap Power T-feed

Connects two pieces of lights together with a T joint, energized from middle. IP67 DIY connector. L1 and L2 available in 0.3m.

T joint*1 (Two-pin)
Silicone gasket*2
U steel plate*2
Anti-skidding clip*2
PC cover*2

## 3.5 Swivel Connector

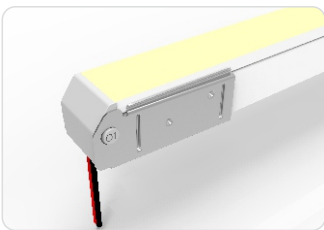Note: Unless otherwise stated, the tolerance of the connector is ±0.5mm.



### Swivel Front Connector (top end)

Connects light to power supply. IP20 DIY connector. Cable length available in 0.3m, 1m.



17.5mm
17.5mm
40mm



### Swivel Front Connector (side right/left)

Connects light to power supply. IP20 DIY connector. Cable length available in 0.3m, 1m.

R          L



17.5mm
17.5mm
40mm
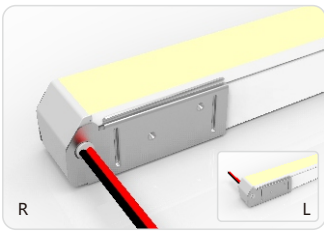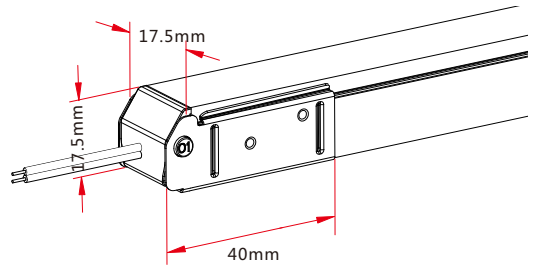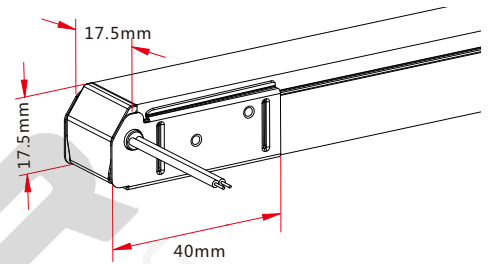


### Swivel Front Connector (bottom)

Connects light to power supply. IP20 DIY connector. Cable length available in 0.3m, 1m.



17.5mm
17.5mm
40mm
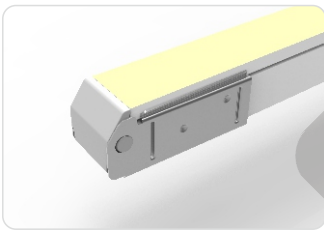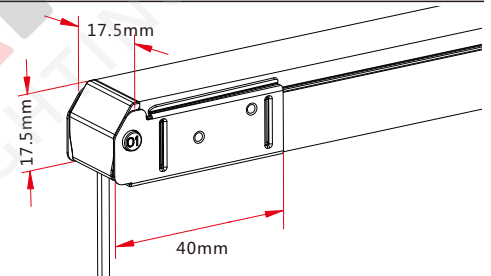


### Swivel End Cap

Termination protection of the light,IP20 DIY connector.



17.5mm
17.5mm
40mm
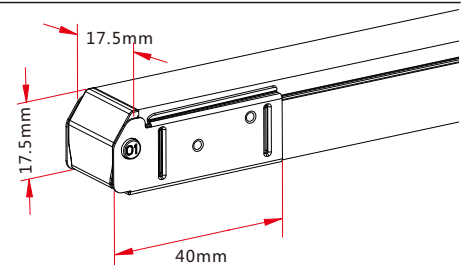
## 3.6 Anti-wicking Ferrule

Note: Unless otherwise stated, the tolerance is ±0.5mm.



### Anti-wicking Ferrule

The anti-wicking ferrule is located at 115mm (±5mm tolerance) from the connector on the cable.

For protection against water ingress from inside of cable wire and hence damage the light.



Φ12mm
30mm

# 4. Mounting Profile

## 4.1 Standard Aluminum Profile
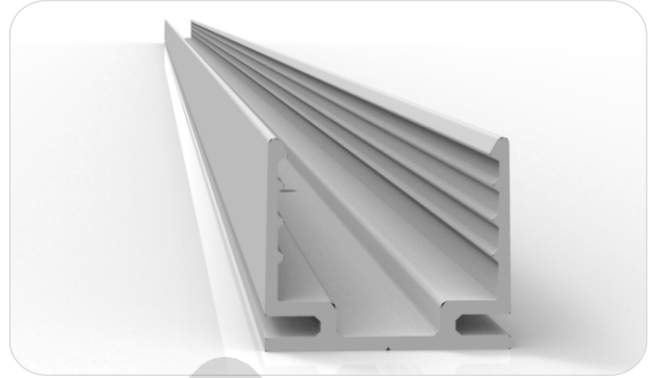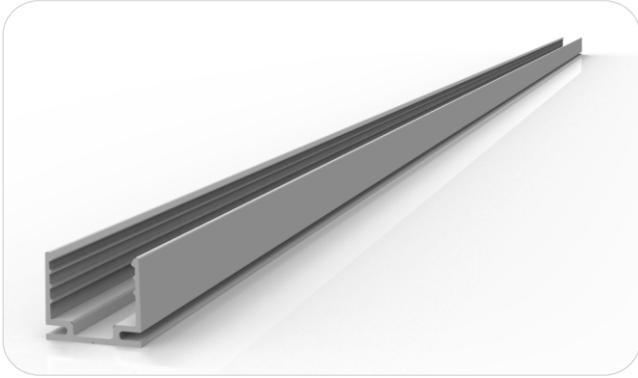


### Dimensions  Note: Unless otherwise stated, the tolerance of the profile is ±0.5mm.
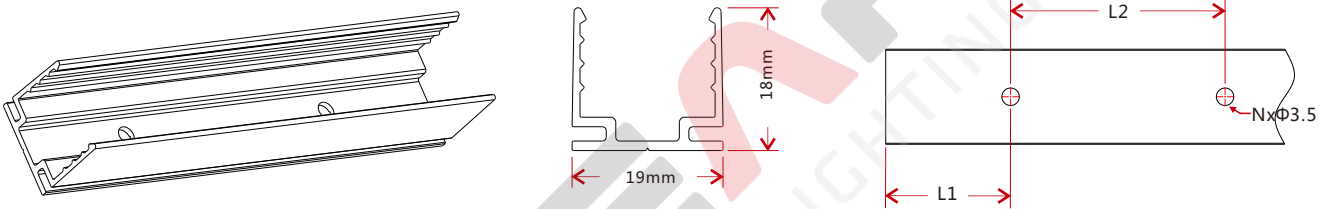


| Model | W*H(mm) | Standard Length (mm) | L1 (mm) | L2 (mm) | Screw Hole (mm) | Hole Number | For Product |
|---|---|---|---|---|---|---|---|
| F22-A/PL | 19*18 | 35 | 17.5 | / | Φ3.5 | 1 | F22 |
| | | 500 | 50 | 200 | Φ3.5 | 3 | F22 |
| | | 1000 | 100 | 200 | Φ3.5 | 5 | F22 |
| | | 2000 | 100 | 200 | Φ3.5 | 10 | F22 |

## 4.2 Plastic Profile



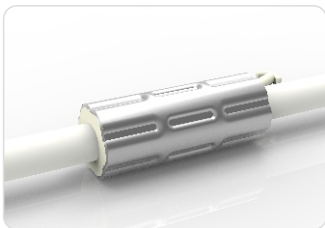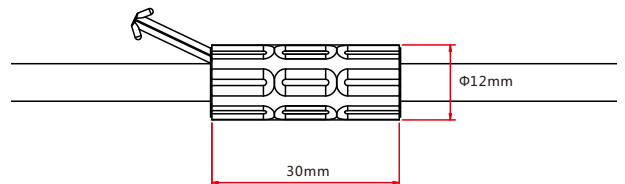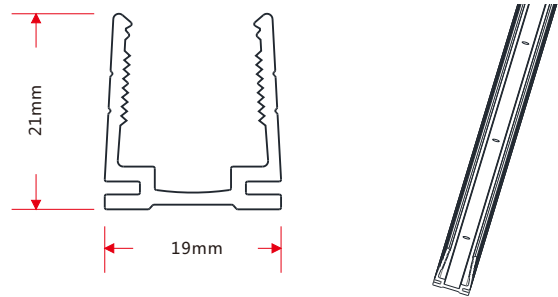Note: Unless otherwise stated, the tolerance of the profile is ±0.5mm.
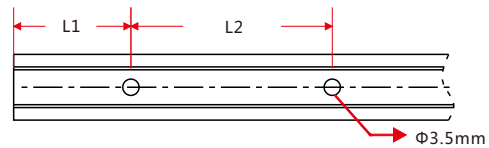
| Model | W*H(mm) | Standard Length (mm) | L1 (mm) | L2 (mm) | Screw Hole (mm) | Hole Number | For Product |
|---|---|---|---|---|---|---|---|
| F22-PC/PL | 19*21 | 500 | 50 | 200 | Φ3.5 | 3 | F22 |
| | | 1000 | 100 | 200 | Φ3.5 | 5 | F22 |
| | | 2000 | 100 | 200 | Φ3.5 | 10 | F22 |

## 4.3 Self-locking Aluminum Profile (Using with the Clip)



### Dimensions
Note: Unless otherwise stated, the tolerance of the profile is ±0.5mm.
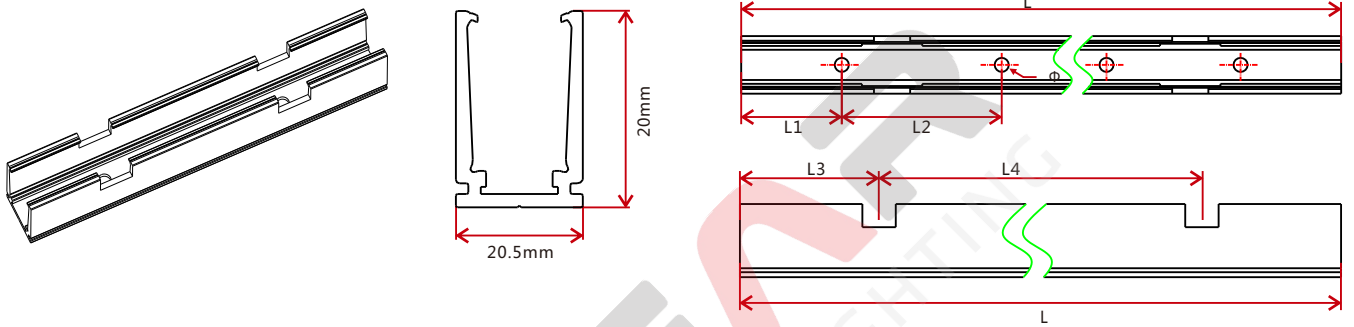


| Model | W*H(mm) | Standard Length(mm) | L1(mm) | L2(mm) | L3(mm) | L4(mm) | Hole Screw(mm) | Hole Number | Clip Number |
|---|---|---|---|---|---|---|---|---|---|
| F22-SLA/PL | 20.5*20 | 35 | 17.5 | 25 | 5 | / | Φ3.5 | 2 | 1 |
| | | 500 | 50 | 200 | 75 | 350 | Φ3.5 | 3 | 2 |
| | | 1000 | 100 | 200 | 150 | 350 | Φ3.5 | 5 | 3 |
| | | 2000 | 100 | 200 | 125 | 350 | Φ3.5 | 10 | 6 |

## 4.4 Self-locking Aluminum Profile Ver 2.0 (Using with the Clip)



Note: Unless otherwise stated, the tolerance of the profile is ±0.5mm.
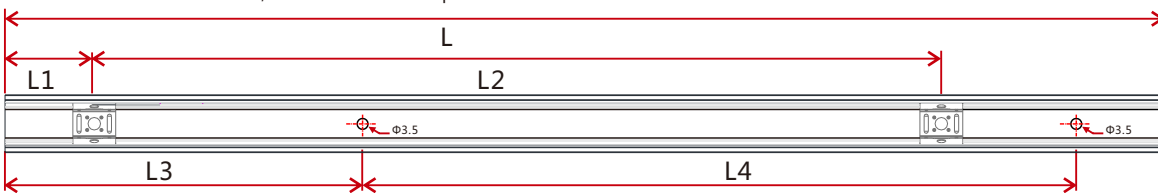


| Model | W*H(mm) | Standard Length(mm) | L1(mm) | L2(mm) | L3(mm) | L4(mm) | Hole Screw(mm) | Hole Number | Clip Number |
|---|---|---|---|---|---|---|---|---|---|
| F22-SLA/PL2 | 20.7*22.3 | 35 | 17.5 | / | 5 | 25 | Φ3.5 | 2 | 1 |
| | | 500 | 25 | 150 | 50 | 200 | Φ3.5 | 3 | 4 |
| | | 1000 | 25 | 190 | 100 | 200 | Φ3.5 | 5 | 6 |
| | | 2000 | 25 | 195 | 100 | 200 | Φ3.5 | 10 | 11 |

## 4.5 Plastic & Aluminum Combination Profile
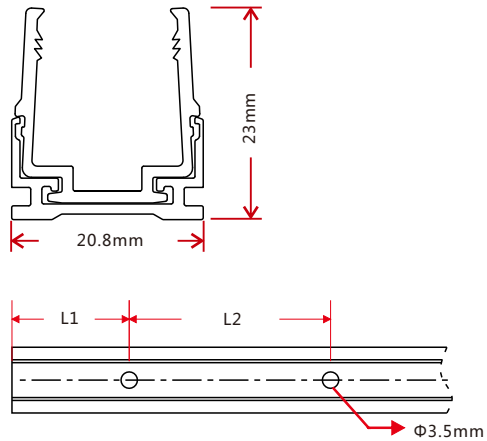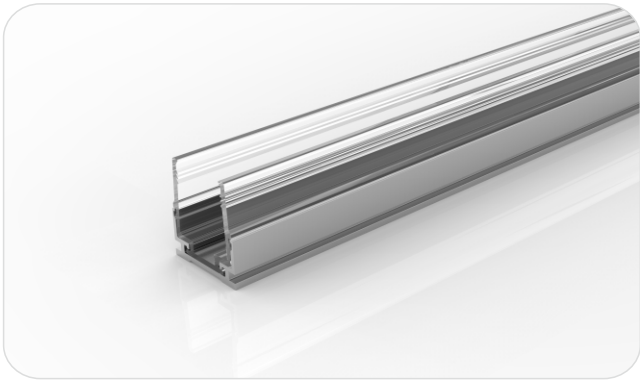


Note: Unless otherwise stated, the tolerance of the profile is ±0.5mm.

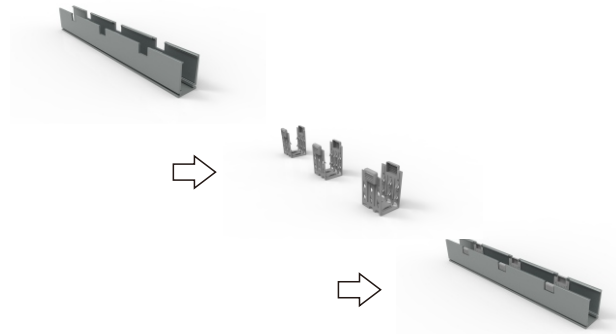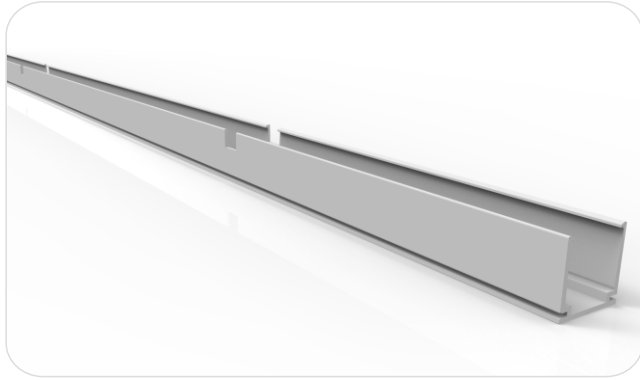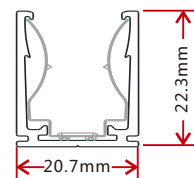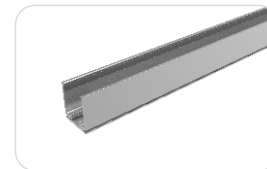| Model | W*H(mm) | Standard Length (mm) | L1 (mm) | L2 (mm) | Screw Hole (mm) | Hole Number | For Product |
|-------|---------|----------------------|---------|---------|-----------------|-------------|-------------|
| F22-PA/PL | 20.8*23 | 35 | 17.5 | / | Φ3.5 | 1 | F22 |
| | | 500 | 50 | 200 | Φ3.5 | 3 | F22 |
| | | 1000 | 100 | 200 | Φ3.5 | 5 | F22 |
| | | 2000 | 100 | 200 | Φ3.5 | 10 | F22 |

## 4.6 L Shape Self-locking Aluminum Profile Ver. 2 (Using with the Clip)
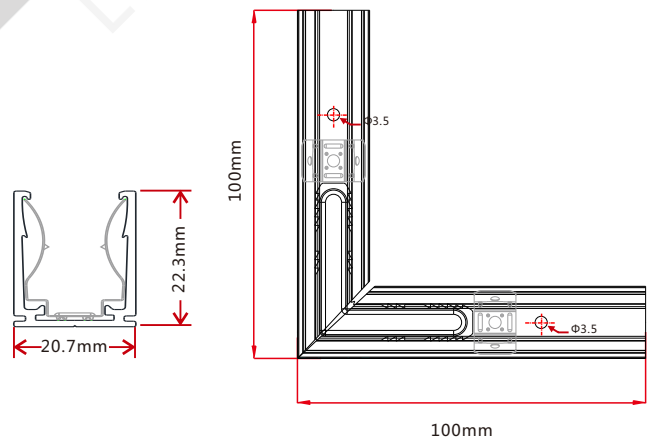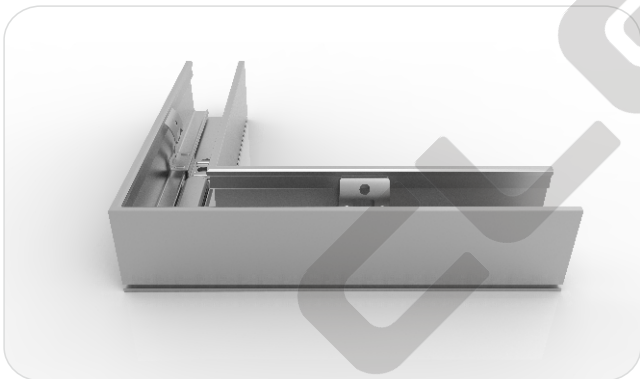


Model: SLA/PL2-L

Note: Unless otherwise stated, the tolerance of the profile is ±0.5mm.

## 4.7 T Shape Self-locking Aluminum Profile Ver. 2 (Using with the Clip)



Model: SLA/PL2-T

Note: Unless otherwise stated, the tolerance of the profile is ±0.5mm.

## 4.8 X Shape Self-locking Aluminum Profile Ver. 2 (Using with the Clip)

Model: SLA/PL2-X

Note: Unless otherwise stated, the tolerance of the profile is ±0.5mm.

## 4.9 Self-locking Aluminum Profile Ver. 2, Bottom Feed (Using with the Clip)
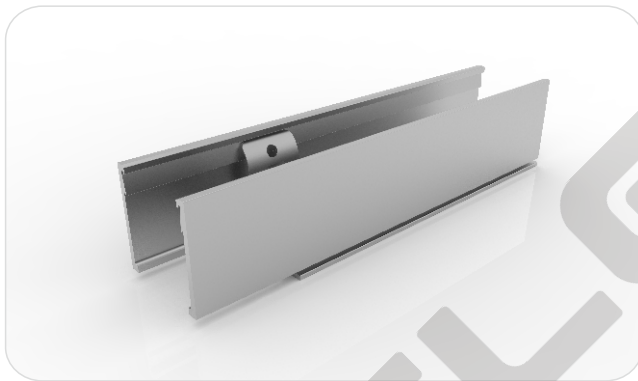
Model: SLA/PL2-B

Note: Unless otherwise stated, the tolerance of the profile is ±0.5mm.
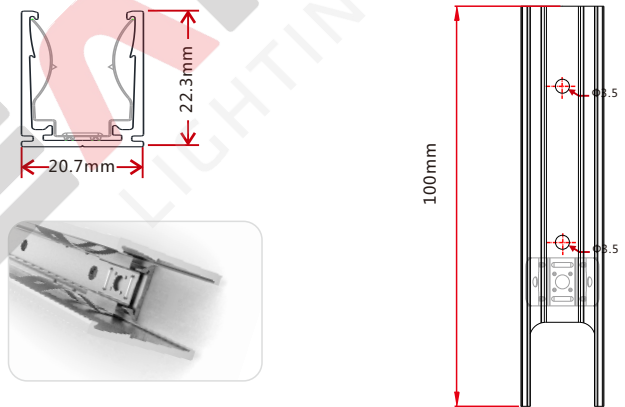
## 4.10 Self-locking Aluminum Profile Ver. 2, Middle Feed (Using with the Clip)
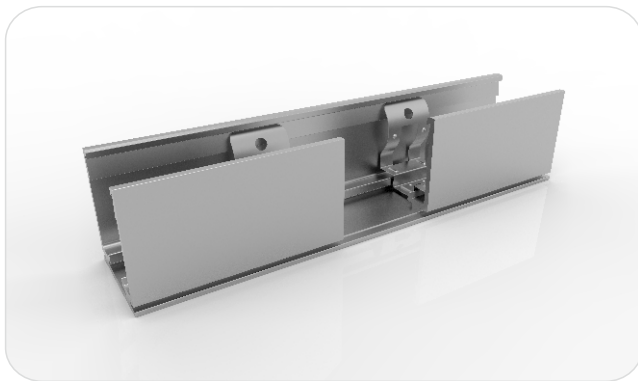
Model: SLA/PL2-M

Note: Unless otherwise stated, the tolerance of the profile is ±0.5mm.
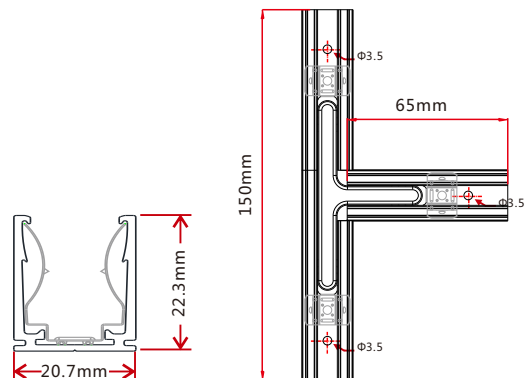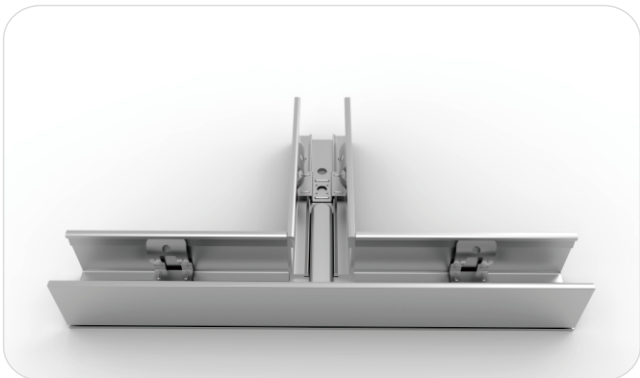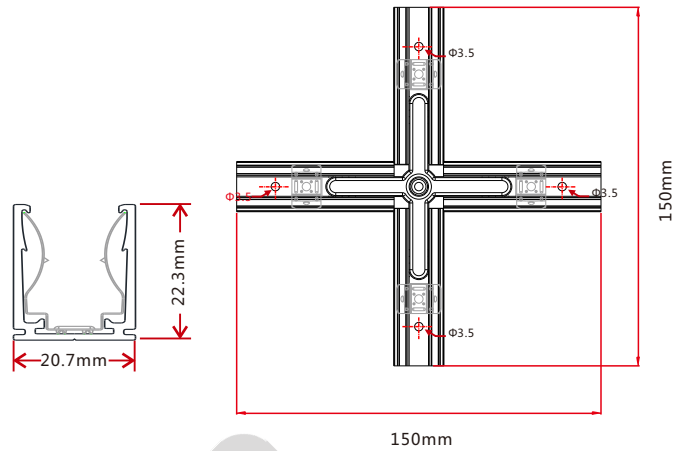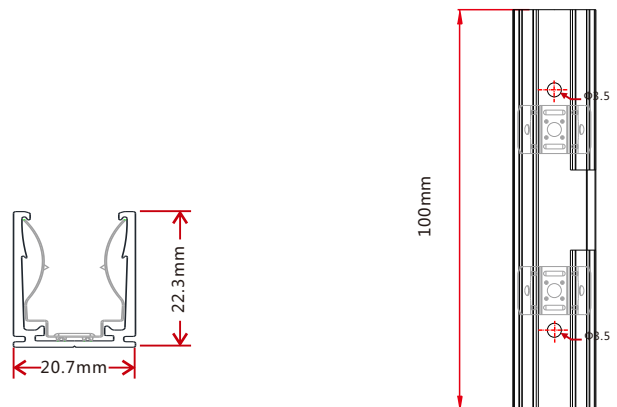
## 4.11 Self-locking Aluminum Profile Ver. 2, Side Feed From Left (Using with the Clip)
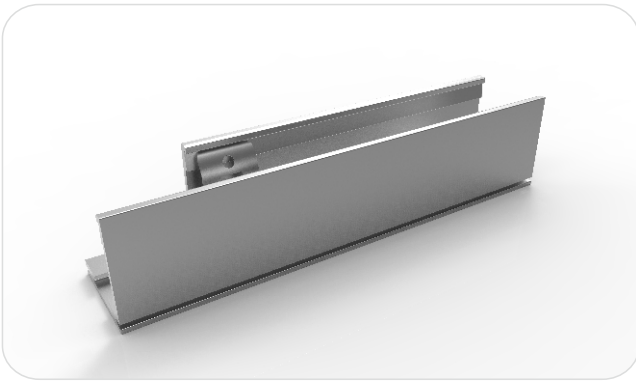


Model: SLA/PL2-SL

Note: Unless otherwise stated, the tolerance of the profile is ±0.5mm.

22.3mm
20.7mm
Ø3.5
Ø3.5
100mm
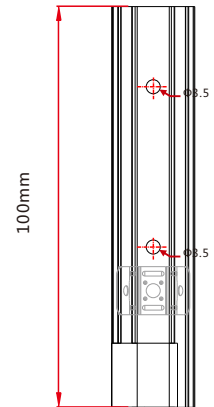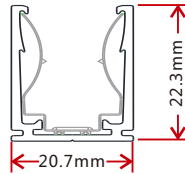
## 4.12 Self-locking Aluminum Profile Ver. 2, Side Feed From Right (Using with the Clip)
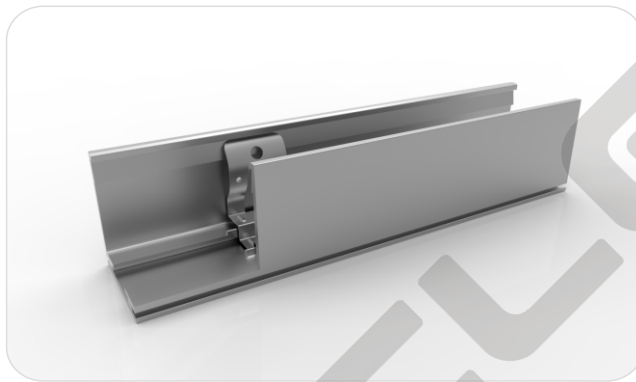


Model: SLA/PL2-SR

Note: Unless otherwise stated, the tolerance of the profile is ±0.5mm.

22.3mm
20.7mm
Ø3.5
Ø3.5
100mm
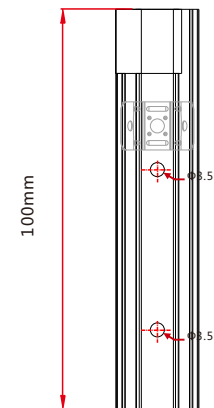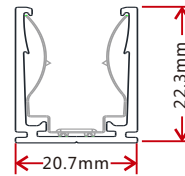
## 4.13 Curve Stainless Steel Profile
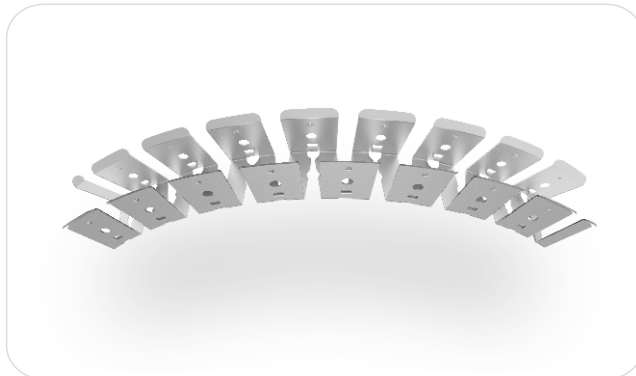


Model: F22-CS/PL

Note: Unless otherwise stated, the tolerance of the profile is ±0.5mm.

100/300/500/900mm
14.9mm
0.4mm
20mm
17.5mm
14.3mm
14.3mm
4.8mm
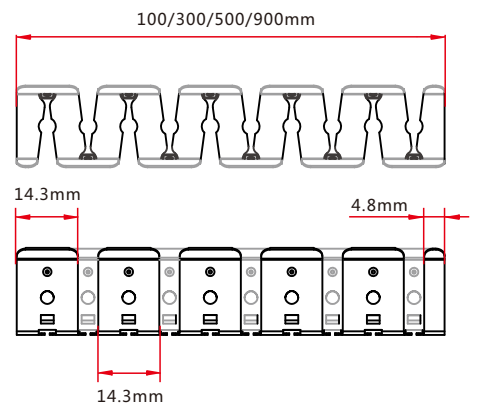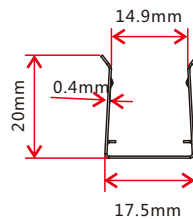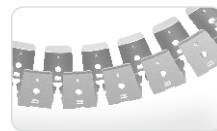
# 5.Packaging

## Packaging Method
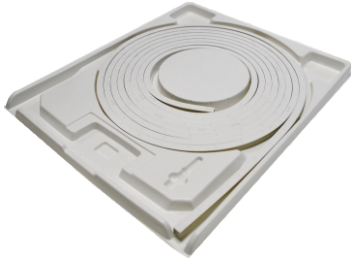


Plastic Plate
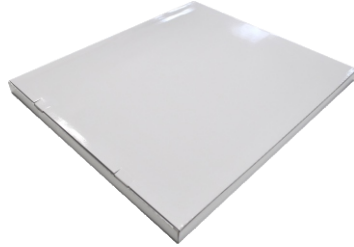


White Box



Carton



## Packaging  Detail

| Light Length | White Box Dimension (cm) | Carton Dimension (cm) | Numbers of White Box | Carton Weight (kg) |
|---|---|---|---|---|
| <4.5m | 39*5.2*50 | 52*41*28 | 5 | <8 |
| 5-8m | 51*5.2*62 | 64*53*17.5 | 3 | 6-9 |
| 5-8m | 51*5.2*62 | 64*53*28 | 5 | 9-14 |
| 10m | 60*3.7*71 | 73*62*20 | 5 | 17 |
| 15m | 68*5.2*79 | 81*70*12.5 | 2 | 11 |

# 6. Appendix

## 6.1 Product Naming Convention

C-FR-XXX(-)X-XX-XXX-XXX-XXX-XXX

| | |
|---|---|
| | LED Quantity/Meter |
| | Cover Color |
| | Color/CCT |
| | Working Voltage |
| | Bending Direction |
| | Light Output |
| | Product Type |
| | Product Category(FR: Flexible Ribbon Light) |
| | Abbreviation of Company Name: CLEAR |
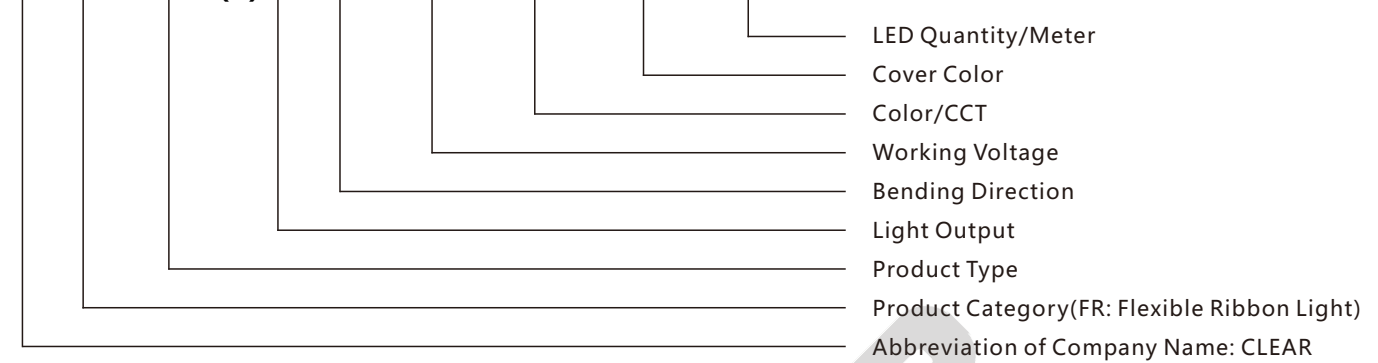
For Example: C-FR-ProF22BT-VB-24CC-30K-WM-108

## 6.2 Certificate

| Certificating Type | Testing Organization | Certificate Serial Number | Report Reference |
|---|---|---|---|
| UL 2108 | UL | 20160726-E360029 | E360029-20130322 |
| CE-EMC | SGS | SZEM1702001259LMV | SZEM160600421302 |

## 6.3 Third-Party Test Report

| Testing Item | Testing Organization | Report Number |
|---|---|---|
| RoHS | SGS | CANEC1202163502 A01 |
| IP68: Screw type | TUV SUD | 68.140.12.136.02 |
| IP68: Clasp type | SGS | GZES140200135301 |
| | | GZES140200135401 |
| | | GZES140200135501 |
| | | GZES140200135701 |
| | | GZES140200135801 |
| IPX8: Molding type | SGS | SZES141200357301 |
| | | SZES141200357401 |
| | | SZES141200357501 |
| IPX8: Snap type | SGS | GZES160600792031 |
| Flame retardant | TUV SUD | 68.140.13.068.01 |
| UV@340nm: Light | AOV | A002R130308065—1R01 |
| UV@340nm: PVC | AOV | A002R130308065—2R01 |

>>Note: The testing reports and certificates are available from the related official website.

## 6.4 Reliability Test of Light

| TESTING ITEM | PERFORMANCE | STANDARD/REFERENCE VALUE/DESCRIPTION |
|---|---|---|
| PHOTOMETRIC TESTING | Spectrum Analysis | IES LM 79 (lumen, CCT, CRI, XY, SDCM, wave length) |
| | Photometric Distribution | IES LM 79(lumen intensity distribution & Lux diagram) |
| | Lumen Maintenance & Life Time | IES LM84 & IES TM28 |
| TEMPERATURE RISE TESTING | Normal Temperature Test | UL1598 & UL2388 & IEC60598-1 & IEC60598-2-21 |
| | Abnormal Operation Test | UL1598 & UL2388 & IEC60598-1 & IEC60598-2-21 |
| MECHANICS & PHYSICS TESTING | Bending Test | Manufacturer-defined, 500 cycles |
| | Swing Test | UL2388, >750 cycles |
| | Tensile Test | Manufacturer-defined, > the weight of light in maximum connection length with both ends feed |
| | Twist Test | Manufacturer-defined, >200 cycles |
| | Ball Impact | UL1598 & UL2388 & IEC60598-1 & IEC60598-2-21 |
| | IK07 IK08 | IEC62262 |
| WEATHERING TESTING | Swimming Pool Water Immersion Test | GB9667, PH6.8-7.6, free chlorine 0.3-0.6mg/L |
| | Sea Water Immersion Test | IEC60598-1, Salinity 4% |
| | Salt Spray Test | IEC68-2-11 |
| | Outdoor Exposure | Manufacturer-defined |
| ENVIROMENT TESTING | Flame Resistant Test | UL94 |
| | UV Exposure Test | ASTMG 154 , ISO 4892-3 , UVA@340nm |
| | IPX5 IPX6 IPX7 IPX8 | IEC60529 |
| ENDURANCE & THERMAL TEST LAB | Temperature Shock Test | Manufacturer-defined , -40℃-60℃ (typical temperature range) |
| | Constant Temperature Test | Manufacturer-defined , 70℃ (typical temperature) |

## 6.5 Figures of Typical Characteristics



Luminous Flux vs. Working Voltage



Working Temperature vs. Current
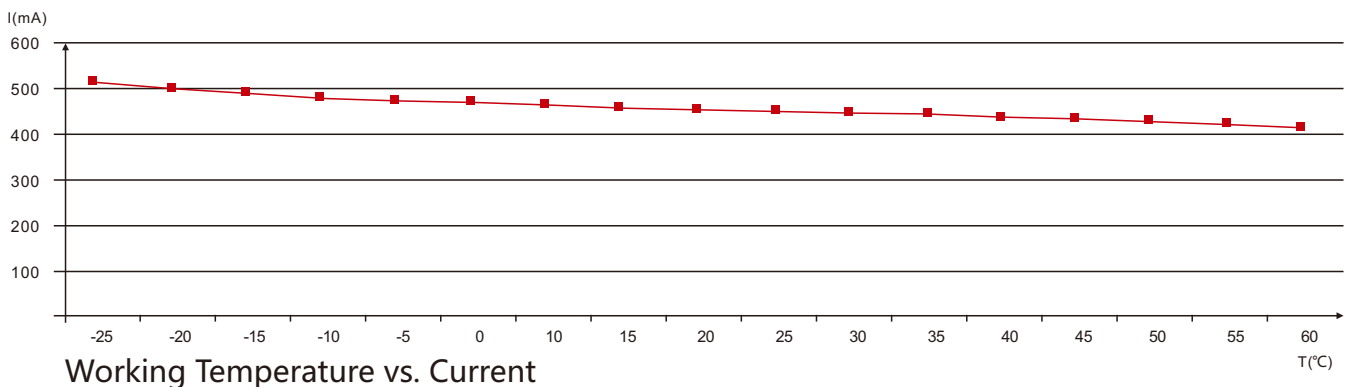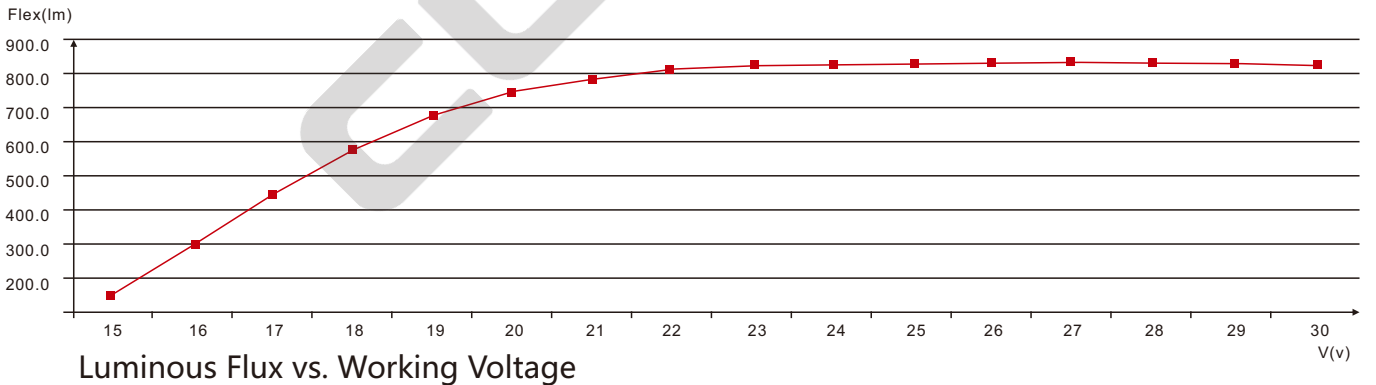
## 6.6  (X,Y) Chromaticity Diagram
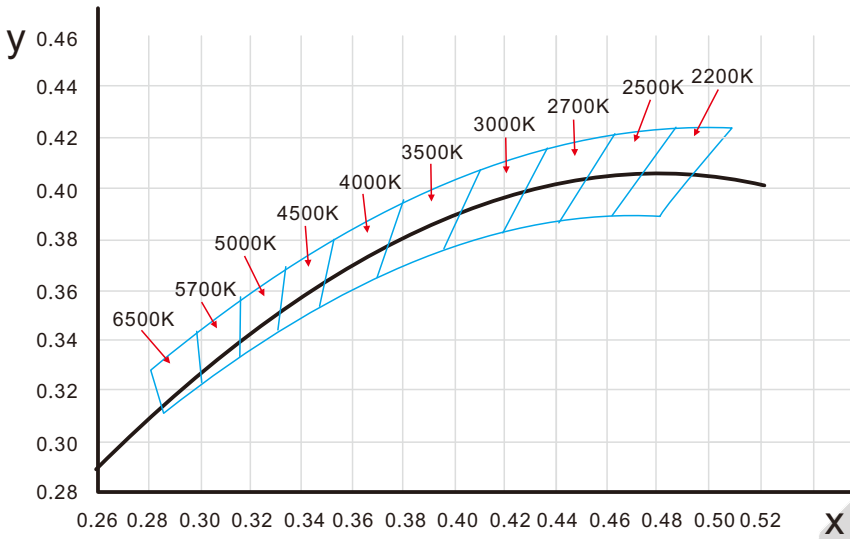


## 6.7 Correlated Color Temperature

### ANSI STANDARD

#### Nominal CCT Categories

| Nominal CCT | Target CCT and tolerance(K) | Target $D_{uv}$ | $D_{uv}$ Tolerance Range |
|---|---|---|---|
| 2200K | 2238 ±102 | 0.0000 | Tx:CCT of the source |
| 2500K | 2460±120 | 0.0000 | For Tx<2870K |
| 2700K | 2725 ±145 | 0.0000 | 0.000±0.0060 |
| 3000K | 3045±175 | 0.0001 | For Tx≥2870K |
| 3500K | 3465±245 | 0.0005 | Duv(Tx)±0.0060 |
| 4000K | 3985±275 | 0.0010 | where |
| 4500K | 4503±243 | 0.0015 | Duv(Tx)=57700 x (1/Tx)2 |
| 5000K | 5029±283 | 0.0020 | -44.6 x (1/Tx) |
| 5700K | 5667±355 | 0.0025 | +0.00854 |
| 6500K | 6532±510 | 0.0031 | |
| Flexible CCT (2200-6500K) | $T_F{}^{1)} \pm \Delta T^{2)}$ | | $D_{uv}T_F{}^{3)}$ |

Remark:
1) $T_F$ is chosen to be at 100K steps (2300,2400,......,6400K),excluding the ten nominal CCTs listed in Table 1.
2) $\Delta T = 1.1900 \times 10^8 \times T^3 - 1.5434 \times 10^4 \times T^2 + 0.7168 \times T - 902.55$
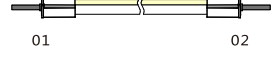3) Same as in the $D_{uv}$ Tolerance Range.

## 6.8 Wavelength of Color Light
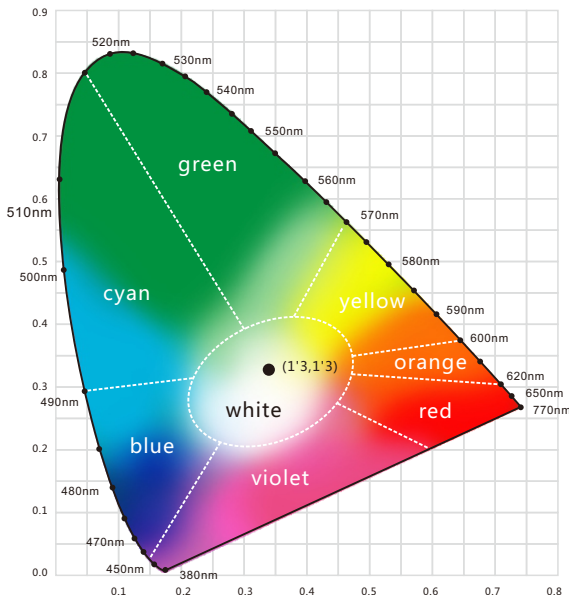


**Light Color**

**Red**
620-630nm

**Green**
520-530nm

**Blue**
465-475nm

# 6.9 Loading Chart

| Type. | Rated Power /mtr | Power Supply | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 35w | 60w | 75w | 80w | 100w | 120w | 150w | 185w | 240w | 320w |
| F22 | 6.5w/7.2w/8w | 3m | 6m | 7.5m | 8m | 10m | 12m | 15m | 18m | 24m | 30m |
| | 10.6w/11w/12w | 2m | 3.5m | 4.5m | 5m | 6m | 7m | 10m | 12m | 14m | 20m |
| Energizing way | | DC input ▬▭▬▭▬ 01/02 | | | | | | | DC input ▬▭▬▭▬ DC input 01　　　　02 | | |

Note : 1. These are the light maximum recommended running length subject to selected power supply.
2. For example: It is recommended to use one 80W power supply loading maximum 8m light (7.2w/m) or
maximum 5m light (12w/m) by energizing the light one end.