

小型チップLED
Ultra-compact Chip LED

CITILED®

世界トップレベルの品揃えと SMD の組み立てやすさで あらゆる電子機器に展開できる CITILED

Featuring world-class product variations and ease of SMD assembly.
Ultra-small Chip-LEDs for use in various electronic products.

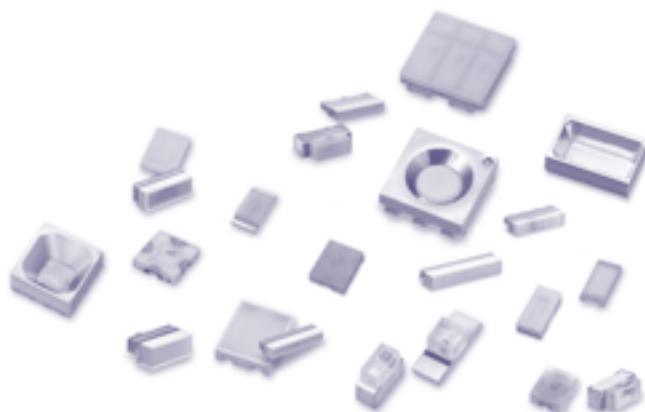


情報通信機器の小型化・高性能化が進む中で、チップ型 LED へのニーズは急速に伸びています。この領域において当社の CITILED（登録商標）は、装着のオートメーション化が可能な SMD（表面実装）タイプとして、コストダウンに大きく貢献します。また、充実した品揃えやフレキシブルな納入方法によってお客様のニーズに的確にお応えし、生産量において世界トップシェアを実現しています。

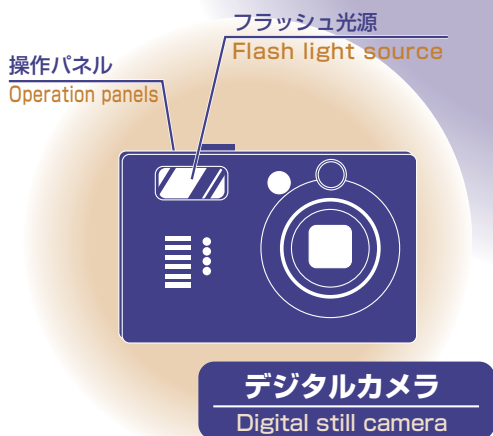
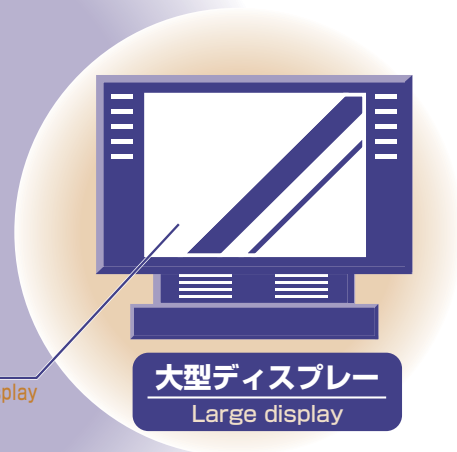
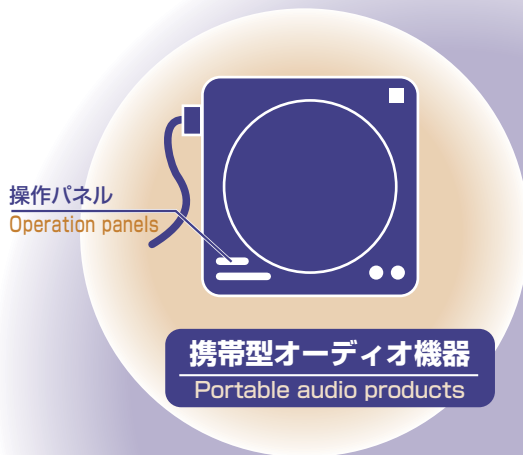
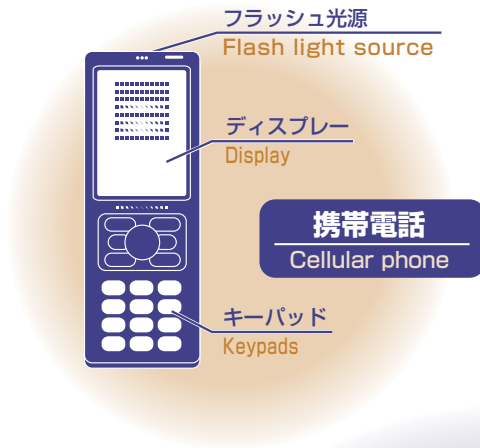
As information devices become ever more compact and sophisticated, the demand for chip-type LEDs has accelerated drastically. Citizen has this field covered as well, with its series of CITILED (Citizen trademark) products. These SMD type LEDs allow automated mounting, thereby reducing production costs. The flexible lineup contains products suitable for every need, making Citizen the leading manufacturer worldwide in this sector.

■ 特徴 Features

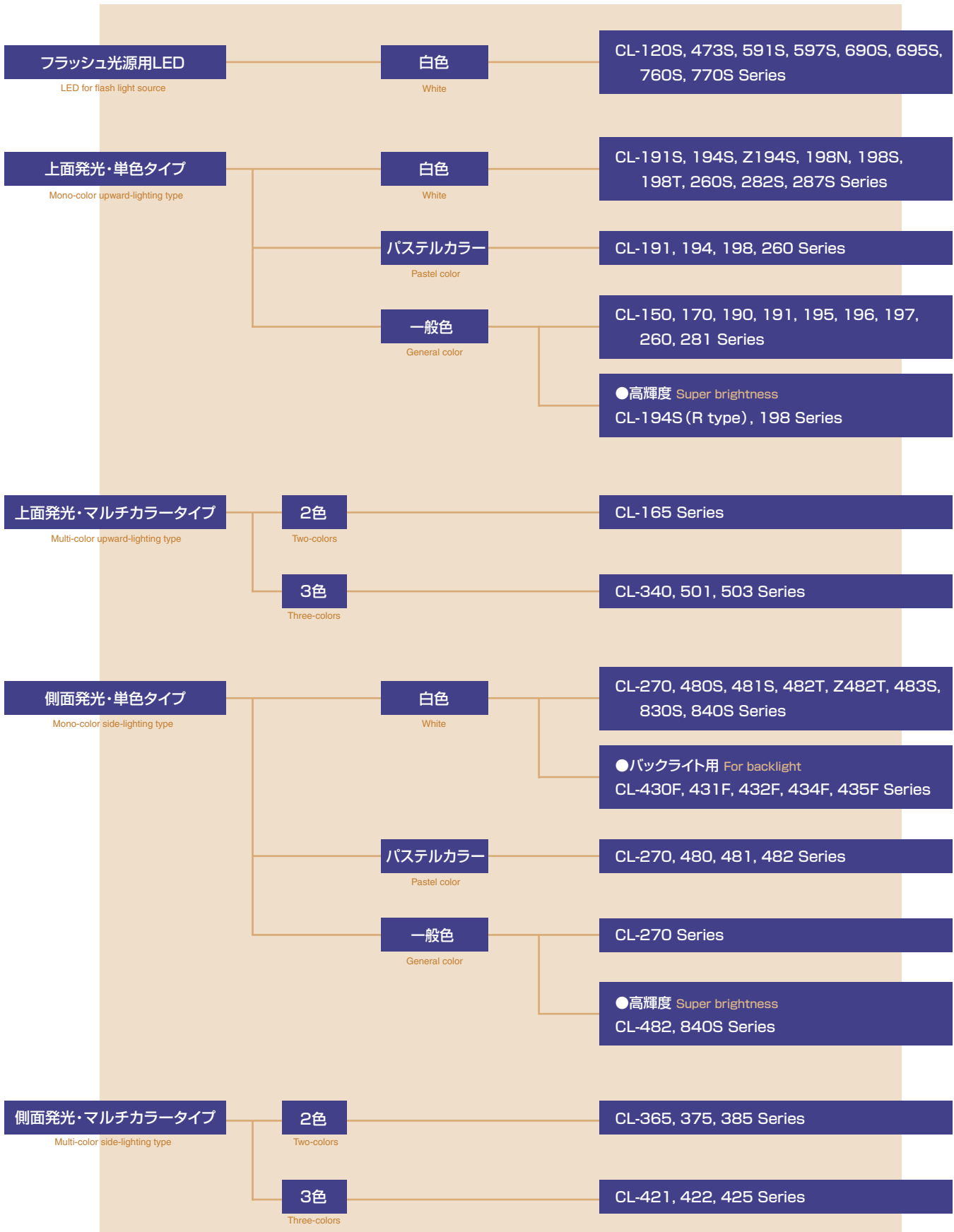
1. 全機種 SMD(表面実装デバイス) タイプの LED ランプです。
 2. 寸法は標準型から極小型、超小型まで各種を取り揃えており、高密度実装が可能です。
 3. 全機種に標準タイプ、高輝度タイプ、超高輝度タイプがあります。
 4. 全ての CITILED 製品は、チップマウンターによる自動マウントが可能で高い装着率が得られます。
 5. 全ての CITILED はリフローはんだが可能です。
 6. バルクやテーピングの納入をはじめ、基板にアッセンブリしたユニットでの納入にもお応えします。
 7. 全ての CITILED 製品は、鉛フリー対応製品です。
1. All are SMD(surface mount device) LED lamps.
 2. Varieties range from the standard to very small and ultra-small sizes and high density mounting is available.
 3. There are standard brightness type, super brightness type and ultra brightness type.
 4. Automated chip machine mounting allows for efficient mounting.
 5. Reflow soldering is available.
 6. Shippable in bulk, on tape and mounted as an assembly.
 7. All CITILED are lead free correspondence products.



■ 用途 Application



■ 製品構成 Composition of Products



| フラッシュ光源用LED LED for flash light source | | 上面発光・単色タイプ Mono-color upward-lighting type | | CL-287S Series NEW ●超小型 Ultra small size type 1.0 (L) × 0.5 (W) × 0.25 (H) mm P.18・51 | |
|--|---|--|--|---|--|
| 白色 White | | 白色 White | | パステルカラー Pastel color | |
| CL-120S Series ●超高輝度 Ultra brightness 5.0 (L) × 8.0 (W) × 2.45 (H) mm P.16・26  | CL-191S Series ●小型 Small size type 1.6 (L) × 0.8 (W) × 0.6 (H) mm P.18  | CL-191 Series ●小型 Small size type 1.6 (L) × 0.8 (W) × 0.6 (H) mm P.20  | | | |
| CL-473S Series ●高輝度 Brightness 3.5 (L) × 3.5 (W) × 1.0 (H) mm P.16・27  | CL-194S Series ●小型・薄型 Small size and thin type 1.6 (L) × 0.8 (W) × 0.3 (H) mm P.18・39  | CL-194 Series ●小型・薄型 Small size and thin type 1.6 (L) × 0.8 (W) × 0.3 (H) mm P.20  | | | |
| CL-591S Series ●超高輝度 Ultra brightness 5.0 (L) × 5.0 (W) × 1.5 (H) mm P.16・28  | CL-Z194S Series ●小型・薄型 Small size and thin type 1.6 (L) × 0.8 (W) × 0.3 (H) mm P.18・41  | CL-198 Series ●小型・超薄型 Small size and super thin type 1.6 (L) × 0.8 (W) × 0.2 (H) mm P.20  | | | |
| CL-597S Series ●超高輝度 Ultra brightness 5.0 (L) × 5.0 (W) × 1.5 (H) mm P.16・29  | CL-198N Series NEW ●小型・超薄型 Small size and super thin type 1.6 (L) × 0.8 (W) × 0.25 (H) mm P.45  | CL-260 Series ●小型 Small size type 3.4 (L) × 1.25 (W) × 1.1 (H) mm P.20  | | | |
| CL-690S Series ●超高輝度 Ultra brightness 3.3 (L) × 3.3 (W) × 1.5 (H) mm P.16・30  | CL-198S Series ●小型・超薄型 Small size and super thin type 1.6 (L) × 0.8 (W) × 0.2 (H) mm P.18・46  | 青色 (広指向性) Blue (wide directivity) | | | |
| CL-695S Series ●高輝度 Brightness 3.3 (L) × 3.3 (W) × 0.935 (H) mm P.16・32  | CL-198T Series ●小型・超薄型 Small size and super thin type 1.6 (L) × 0.8 (W) × 0.2 (H) mm P.18・47  | CL-194S (R type) Series ●小型・薄型 Small size and thin type 1.6 (L) × 0.8 (W) × 0.3 (H) mm P.22・40  | | | |
| CL-760S Series ●高輝度 Brightness 3.2 (L) × 2.8 (W) × 0.8 (H) mm P.16・33  | CL-260S Series ●小型 Small size type 3.4 (L) × 1.25 (W) × 1.1 (H) mm P.18  | 一般色 General color | | | |
| CL-770S Series ●高輝度 Brightness 2.0 (L) × 1.6 (W) × 0.7 (H) mm P.16・34  | CL-282S Series ●超小型・超薄型 Ultra small size and super thin type 1.0 (L) × 0.5 (W) × 0.2 (H) mm P.18・50  | CL-150 Series ●標準型 Standard size type 3.2 (L) × 1.6 (W) × 1.1 (H) mm P.35  | | | |

| | | |
|--|--|---|
| <p>CL-170 Series</p> <p>●小型 Small size type 2.0 (L) × 1.25 (W) × 1.1 (H) mm</p>  <p>P.36</p> | <p>上面発光・マルチカラータイプ Multi-color upward-lighting type</p> | <p>側面発光・単色タイプ Mono-color side-lighting type</p> |
| <p>CL-190 Series</p> <p>●小型 Small size type 1.6 (L) × 0.8 (W) × 0.8 (H) mm</p>  <p>P.37</p> | | |
| <p>CL-191 Series</p> <p>●小型 Small size type 1.6 (L) × 0.8 (W) × 0.6 (H) mm</p>  <p>P.22・38</p> | <p>CL-340 Series NEW</p> <p>●小型・薄型 Small size and thin type 1.7 (L) × 1.4 (W) × 0.35 (H) mm</p>  <p>P.53</p> | <p>CL-270S Series</p> <p>●小型 Small size type 1.6 (L) × 1.15 (W) × 0.6 (H) mm</p>  <p>P.18</p> |
| <p>CL-195 Series</p> <p>●小型 Small size type 1.6 (L) × 0.8 (W) × 0.8 (H) mm</p>  <p>P.42</p> | <p>CL-501 Series</p> <p>●小型 Small size type 1.5 (L) × 1.3 (W) × 0.6 (H) mm</p>  <p>P.54</p> | <p>CL-430F Series</p> <p>●超高輝度 Ultra brightness 2.8 (L) × 1.0 (W) × 1.0 (H) mm</p>  <p>P.18・57</p> |
| <p>CL-196 Series</p> <p>●小型 Small size type 1.6 (L) × 0.8 (W) × 0.6 (H) mm</p>  <p>P.43</p> | <p>CL-503 Series</p> <p>●小型・薄型 Small size and thin type 1.5 (L) × 1.3 (W) × 0.35 (H) mm</p>  <p>P.55</p> | <p>CL-431F Series</p> <p>●超高輝度 Ultra brightness 2.8 (L) × 1.0 (W) × 0.8 (H) mm</p>  <p>P.18・58</p> |
| <p>CL-197 Series</p> <p>●小型・薄型 Small size and thin type 1.6 (L) × 0.8 (W) × 0.4 (H) mm</p>  <p>P.22・44</p> | <p>2色 Two-colors</p> | <p>CL-432F Series</p> <p>●超高輝度 Ultra brightness 2.8 (L) × 1.0 (W) × 0.6 (H) mm</p>  <p>P.18・59</p> |
| <p>CL-198 Series</p> <p>●高輝度 Super brightness 1.6 (L) × 0.8 (W) × 0.2 (H) mm</p>  <p>P.22</p> | <p>CL-165 Series</p> <p>●小型 Small size type 1.5 (L) × 1.2 (W) × 0.7 (H) mm</p>  <p>P.52</p> | <p>CL-434F Series</p> <p>●超高輝度 Ultra brightness 2.8 (L) × 0.85 (W) × 0.5 (H) mm</p>  <p>P.18・60</p> |
| <p>CL-260 Series</p> <p>●小型 Small size type 3.4 (L) × 1.25 (W) × 1.1 (H) mm</p>  <p>P.22・48</p> | | <p>CL-435F Series</p> <p>●超高輝度 Ultra brightness 2.8 (L) × 0.85 (W) × 0.4 (H) mm</p>  <p>P.18・61</p> |
| <p>CL-281 Series</p> <p>●超小型 Ultra small size type 1.0 (L) × 0.5 (W) × 0.35 (H) mm</p>  <p>P.49</p> | | <p>CL-480S Series</p> <p>●小型 Small size type 1.8 (L) × 1.1 (W) × 0.5 (H) mm</p>  <p>P.18・62</p> |
| | | <p>CL-481S Series</p> <p>●小型 Small size type 1.8 (L) × 1.1 (W) × 0.4 (H) mm</p>  <p>P.18・63</p> |

CL-482T Series

●小型・薄型 Small size and thin type
1.8(L)×1.0(W)×0.3(H) mm



P.18・64

CL-Z482T Series

●小型・薄型 Small size and thin type
1.8(L)×1.0(W)×0.3(H) mm



P.18・65

CL-483S Series

●小型・薄型 Small size and thin type
1.8(L)×0.88(W)×0.2(H) mm



P.18・66

CL-830S Series

●超小型・薄型
Ultra small size and thin type
1.0(L)×0.5(W)×0.3(H) mm



P.18・67

CL-840S Series

●薄型 Thin type
1.8(L)×1.0(W)×0.3(H) mm



P.18・68

一般色
General color

CL-270 Series

●小型 Small size type
1.6(L)×1.15(W)×0.6(H) mm



P.22・56

CL-482 Series

●高輝度 Super brightness
1.8(L)×1.1(W)×0.3(H) mm



P.22

CL-840S Series

●高輝度 Super brightness
1.8(L)×1.0(W)×0.3(H) mm



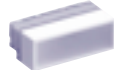
P.22

側面発光・マルチカラータイプ
Multi-color side-lighting type

3色
Three-colors

CL-421 Series

2.8(L)×1.35(W)×1.0(H) mm



P.72

CL-422 Series

4.6(L)×1.35(W)×0.8(H) mm



P.73

CL-425 Series

3.25(L)×1.35(W)×0.45(H) mm



P.74

パステルカラー
Pastel color

CL-270 Series

●小型 Small size type
1.6(L)×1.15(W)×0.6(H) mm



P.20

CL-480 Series

●小型 Small size type
1.8(L)×1.1(W)×0.5(H) mm



P.20

CL-481 Series

●小型 Small size type
1.8(L)×1.1(W)×0.4(H) mm



P.20

CL-482 Series

●小型・薄型 Small size and thin type
1.8(L)×1.1(W)×0.3(H) mm



P.20

2色
Two-colors

CL-365 Series

2.4(L)×0.85(W)×0.35(H) mm



P.69

CL-375 Series

2.4(L)×1.35(W)×1.0(H) mm



P.70

CL-385 Series

2.8(L)×1.0(W)×0.6(H) mm



P.71

フラッシュ光源用LED

CITILIGHT®

LED For Flash Light Source



業界トップレベルの 140 ルクス*を実現。
カメラ付携帯電話の行動力を高めます。

140 lux*, World-Leading level of luminance.

Outstanding performance of Camera Phone for your active life.

※撮影距離50cm、I_{fp}=100mA時(CL-690S-3WN)

※Shooting distance 50 cm at 100 mA pulse mode (CL-690S-3WN)

■ 特徴 Features

1. カメラ付き携帯電話に内蔵され、暗所で静止画や動画を撮影する際に、被写体を照明します。
2. 表面実装が可能で、パッケージは最薄タイプ。
3. 反射枠を取り付け正面輝度を向上させたタイプから、フラットな指向性をもつタイプまで、用途に合わせてお選びいただけます。
4. 超高輝度パッケージの採用により、50cmの距離で、パルス点灯時 Typ140ルクス、連続点灯時Typ47ルクスの明るさを実現しました。
5. パルス点灯による静止画照明と、連続点灯による動画照明の2つのモードに対応できます。
6. 全てのCITILIGHTは鉛フリー対応製品です。

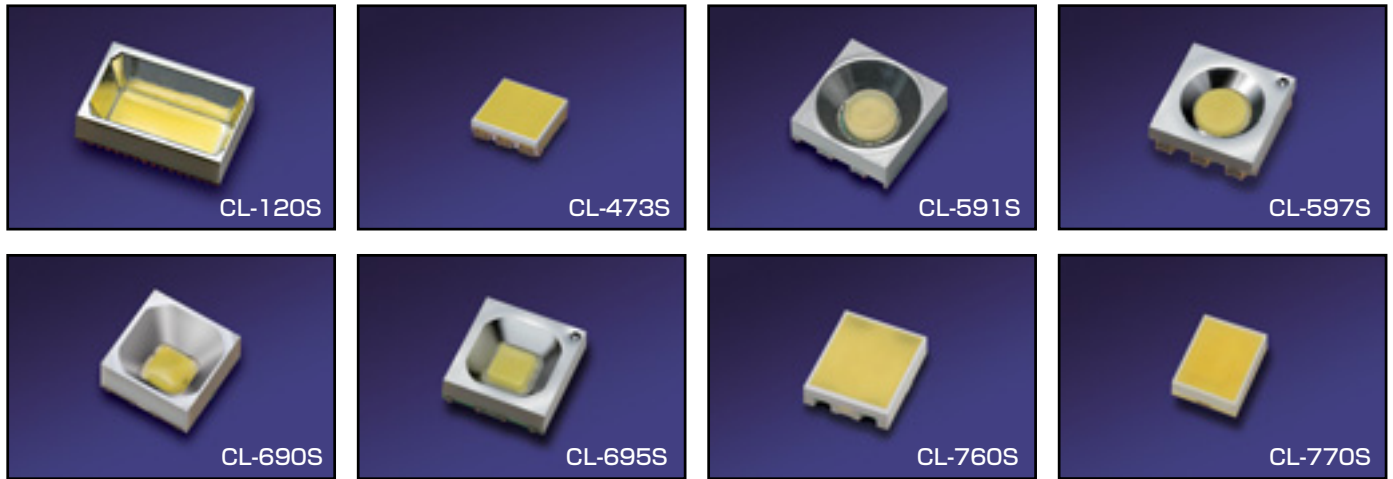
1. This can be built into a cellular telephone terminal with a camera to be used for illuminating a subject when taking static images or time-varying images under low light conditions.
2. The slim package can be easily mounted on any surface.
3. There are two types of white LED we can offer you:
One is the front-luminance-enhanced type realized with the reflection frame, and the other is the broad directivity type. You can choose a type to meet your needs.
4. Brightness of 140 lux for pulse lighting and 47 lux for continuous lighting at a distance of 50 cm can be achieved because of super high efficiency lighting.
5. This supports two modes; static image illumination with pulse firing and time-varying image illumination with continuous firing.
6. All CITILIGHT are lead free correspondence products.

● 絶対最大定格 Absolute Maximum Rating

(Ta 25°C)

| Type | P (mW) | I _F (mA) | I _{FP} * (mA) | V _R (V) | Top (°C) | Tst (°C) |
|------|--------|---------------------|------------------------|--------------------|----------|----------|
| WQ | 72 | 20 | 100 | 5 | -25~+80 | -30~+85 |

※ I_{FP}の条件はduty 1/10、パルス巾30msecです。Condition for I_{FP} is pulse of 1/10 duty and 30msec width.



●電氣的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Series | 順電圧 ^{*1} Forward voltage | | 逆電流 ^{*1} Reverse current | 光度 ^{*2} Luminous intensity | | 色度座標 ^{*3} Chromaticity coordinates | | |
|---------|--|-----|---|---|-----|---|--------------------------------------|--------------------------------------|
| | Symbol : Vf Condition : If=20mA Unit : V | | Symbol : Ir Condition : Vr=5V Unit : μA | Symbol : Iv Condition : If=20mA Unit : cd | | Symbol : x, y Condition : If=20mA | | |
| | TYP | MAX | MAX | MIN | TYP | X(±0.02) | Y(±0.02) | |
| CL-120S | 8WQ | 3.2 | 3.6 | 100 | — | 24.0 | a=0.27 b=0.27 c=0.35 d=0.35 | a=0.22 b=0.29 c=0.40 d=0.33 |
| CL-473S | 4WQ | 3.2 | 3.6 | 100 | — | 8.8 | | |
| CL-591S | 4WQ | 3.2 | 3.6 | 100 | — | 16.0 | | |
| CL-597S | 4WQ | 3.2 | 3.6 | 100 | — | 14.4 | | |
| CL-690S | WQ | 3.2 | 3.6 | 100 | 2.8 | 5.6 | | |
| | 2WQ | 3.2 | 3.6 | 100 | 5.0 | 10.1 | | |
| | 3WQ | 3.2 | 3.6 | 100 | 7.2 | 14.3 | | |
| CL-695S | 2WQ | 3.2 | 3.6 | 100 | — | 7.4 | | |
| CL-760S | 2WQ | 3.2 | 3.6 | 100 | — | 4.8 | | |
| CL-770S | 4WQ | 3.2 | 3.6 | 100 | — | 6.7 | | |

※1 1素子当たりの値です。 The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯時の値です。 Compliant with NIST. The values are based on the condition that each die lights simultaneously.

※3 色度座標はa、b、c、dに囲まれた範囲です。 Chromaticity coordinates is surrounded with a.b.c.d.

●CITILIGHTセレクションガイド CITILIGHT Selection Guide

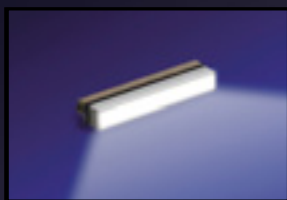
(Ta 25°C)

| Series | Size (mm) | Type | Luminous intensity (cd) | 鉛フリー Lead free | Page |
|---------|----------------------------|---------------------------|-------------------------|----------------|------|
| CL-120S | 8WQ 5.0(L)×8.0(W)×2.45(H) | 上面発光 Upward Lighting Type | 24.0 | ○ | P.26 |
| CL-473S | 4WQ 3.5(L)×3.5(W)×1.0(H) | 上面発光 Upward Lighting Type | 8.8 | ○ | P.27 |
| CL-591S | 4WQ 5.0(L)×5.0(W)×1.5(H) | 上面発光 Upward Lighting Type | 16.0 | ○ | P.28 |
| CL-597S | 4WQ 5.0(L)×5.0(W)×1.5(H) | 上面発光 Upward Lighting Type | 14.4 | ○ | P.29 |
| CL-690S | WQ | 上面発光 Upward Lighting Type | 5.6 | ○ | P.30 |
| | 2WQ | | 10.1 | | |
| | 3WQ | | 14.3 | | |
| CL-695S | 2WQ 3.3(L)×3.3(W)×0.935(H) | 上面発光 Upward Lighting Type | 7.4 | ○ | P.32 |
| CL-760S | 2WQ 3.2(L)×2.8(W)×0.8(H) | 上面発光 Upward Lighting Type | 4.8 | ○ | P.33 |
| CL-770S | 4WQ 2.0(L)×1.6(W)×0.7(H) | 上面発光 Upward Lighting Type | 6.7 | ○ | P.34 |

高輝度白色LED

WHITE LED

High Brightness White Chip LED



世界トップレベルの薄さと明るさ。
高いコストパフォーマンスを誇る白色LED。

With the world's thinnest surface
and highest brightness,
the white LED boasts superb cost performance.

■ カラーLCDバックライト用 For Color LCDs Backlight Light Source

- カラーLCDバックライトに適した、超高輝度から超薄型まで5種類のパッケージより選べます。

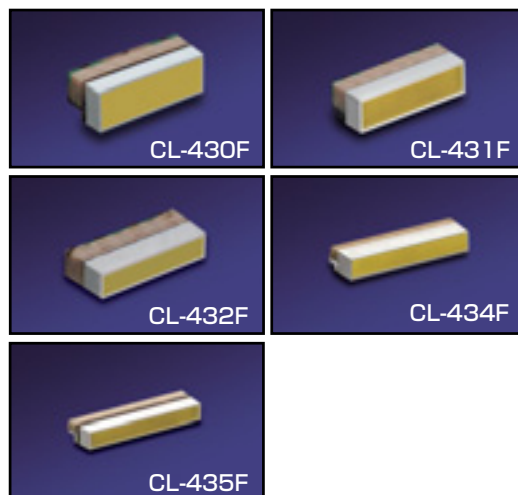
Five kinds of packages (can achieve a luminous efficacy/a thin surface structured) are available, as to the LCD back light sources.

- 全てのWhite LEDは鉛フリー対応製品です。

All White LED are lead free correspondence products.

● パッケージ Package

| Series | Reflector | Size(L·W·H)mm | Page |
|---------|-----------|---------------|------|
| CL-430F | ○ | 2.8x1.0x1.0 | P.57 |
| CL-431F | ○ | 2.8x1.0x0.8 | P.58 |
| CL-432F | ○ | 2.8x1.0x0.6 | P.59 |
| CL-434F | ○ | 2.8x0.85x0.5 | P.60 |
| CL-435F | ○ | 2.8x0.85x0.4 | P.61 |



● 絶対最大定格 Absolute maximum rating

(Ta 25°C)

| Type | P(mw) | I _F (mA) | I _{FP} (mA) | V _R (V) | Top(°C) | Tst(°C) |
|------|-------|---------------------|----------------------|--------------------|---------|---------|
| WQ | 114 | 30 | 100 | 5 | -25~+85 | -30~+90 |
| WX | 114 | 30 | 100 | 5 | -25~+85 | -30~+90 |

●電氣的光学的特性 Electro-optical Characteristics

(Ta 25°C)

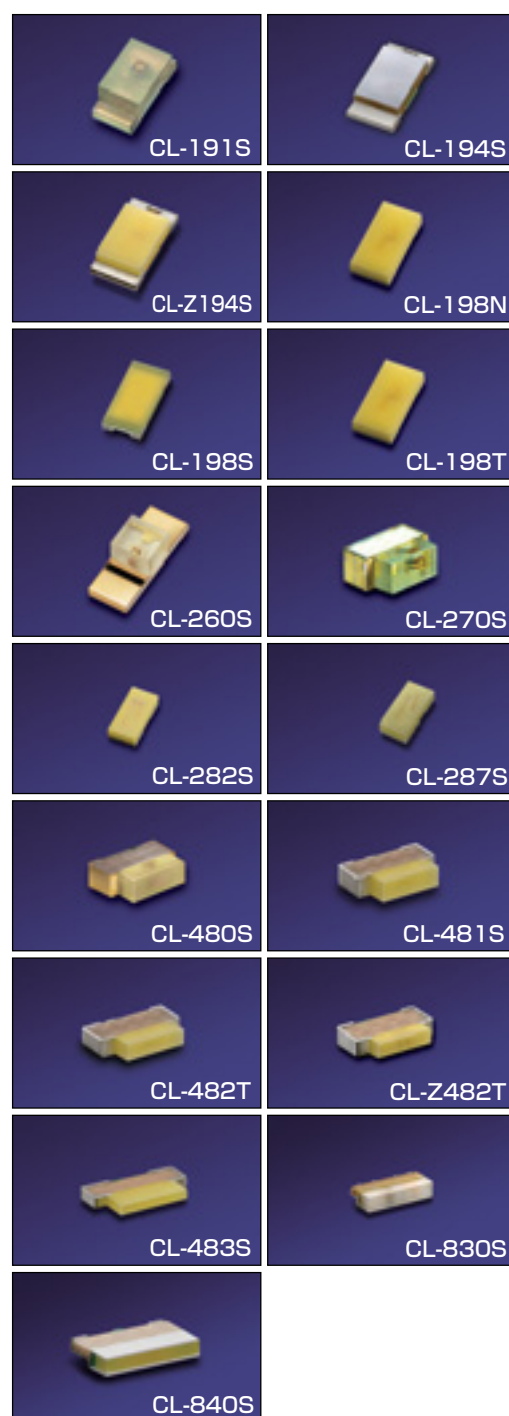
| If=20mA | | | | | If=20mA | | | | |
|---------------|--------|--------|----------|----------|---------------|--------|--------|----------|----------|
| Product code | VF(V) | | IV(mcd) | | Product code | VF(V) | | IV(mcd) | |
| | Typ(V) | Max(V) | Min(mcd) | Typ(mcd) | | Typ(V) | Max(V) | Min(mcd) | Typ(mcd) |
| CL-430F-WQ-SD | 3.3 | 3.6 | 1400 | 2000 | CL-434F-WX-SD | 3.3 | 3.6 | 1400 | 1850 |
| If=20mA | | | | | If=20mA | | | | |
| Product code | VF(V) | | IV(mcd) | | Product code | VF(V) | | IV(mcd) | |
| | Typ(V) | Max(V) | Min(mcd) | Typ(mcd) | | Typ(V) | Max(V) | Min(mcd) | Typ(mcd) |
| CL-431F-WQ-SD | 3.3 | 3.6 | 1440 | 1800 | CL-435F-WQ-SD | 3.3 | 3.6 | 1000 | 1380 |
| If=20mA | | | | | If=20mA | | | | |
| Product code | VF(V) | | IV(mcd) | | Product code | VF(V) | | IV(mcd) | |
| | Typ(V) | Max(V) | Min(mcd) | Typ(mcd) | | Typ(V) | Max(V) | Min(mcd) | Typ(mcd) |
| CL-432F-WQ-SD | 3.3 | 3.6 | 1200 | 1680 | | | | | |

■ キーパッド用 For Key Pad

- 絶対最大定格の異なる5種類のタイプからお選びいただけます。
Five different kinds of types for absolute maximum rating are available.
- 実装形態に合わせて選べる16種類のパッケージを用意しました。
16 kinds of packages are available to suit your set designing.

●パッケージ Package

| Series | Type | Size(L·W·H)mm | Page |
|----------|---|---------------|------|
| CL-191S | 上面発光 Upward-lighting type | 1.6×0.8×0.6 | — |
| CL-194S | 上面発光 Upward-lighting type | 1.6×0.8×0.3 | P.39 |
| CL-Z194S | 上面発光 Upward-lighting type | 1.6×0.8×0.3 | P.41 |
| CL-198N | 上面発光 Upward-lighting type | 1.6×0.8×0.25 | P.45 |
| CL-198S | 上面発光 Upward-lighting type | 1.6×0.8×0.2 | P.46 |
| CL-198T | 上面発光 Upward-lighting type | 1.6×0.8×0.2 | P.47 |
| CL-260S | 上面発光・裏面実装 Upward-lighting type, but mountable from bottom side of PCB | 3.4×1.25×1.1 | — |
| CL-270S | 側面発光 Side-lighting type | 1.6×1.15×0.6 | — |
| CL-282S | 上面発光 Upward-lighting type | 1.0×0.5×0.2 | P.50 |
| CL-287S | 上面発光 Upward-lighting type | 1.0×0.5×0.25 | P.51 |
| CL-480S | 側面発光 Side-lighting type | 1.8×1.1×0.5 | P.62 |
| CL-481S | 側面発光 Side-lighting type | 1.8×1.1×0.4 | P.63 |
| CL-482T | 側面発光 Side-lighting type | 1.8×1.0×0.3 | P.64 |
| CL-Z482T | 側面発光 Side-lighting type | 1.8×1.0×0.3 | P.65 |
| CL-483S | 側面発光 Side-lighting type | 1.8×0.88×0.2 | P.66 |
| CL-830S | 側面発光 Side-lighting type | 1.0×0.5×0.3 | P.67 |
| CL-840S | 側面発光リフレクタータイプ・高輝度 Side-lighting type, high brightness | 1.8×1.0×0.3 | P.68 |



●絶対最大定格 Absolute maximum rating (Ta 25°C)

| Type | P(mw) | If(mA) | IFP(mA) | VR(V) | Top(°C) | Tst(°C) |
|------|-------|--------|---------|-------|---------|---------|
| S-WM | 76 | 20 | 50 | 5 | -25~+80 | -30~+85 |
| S-WQ | 66 | 20 | 100 | | | |
| S-WS | 76 | 20 | 50 | | | |
| S-WT | 35 | 10 | 50 | 4 | -40~+85 | -40~+85 |
| S-WZ | 33 | 10 | 50 | 5 | -25~+80 | -30~+85 |

※ 一部の機種において、Pの数値が上表と異なるものがあります。詳細は製品仕様書をご覧ください。
The P value for some types differs from the values given above. For details refer to the product specifications.

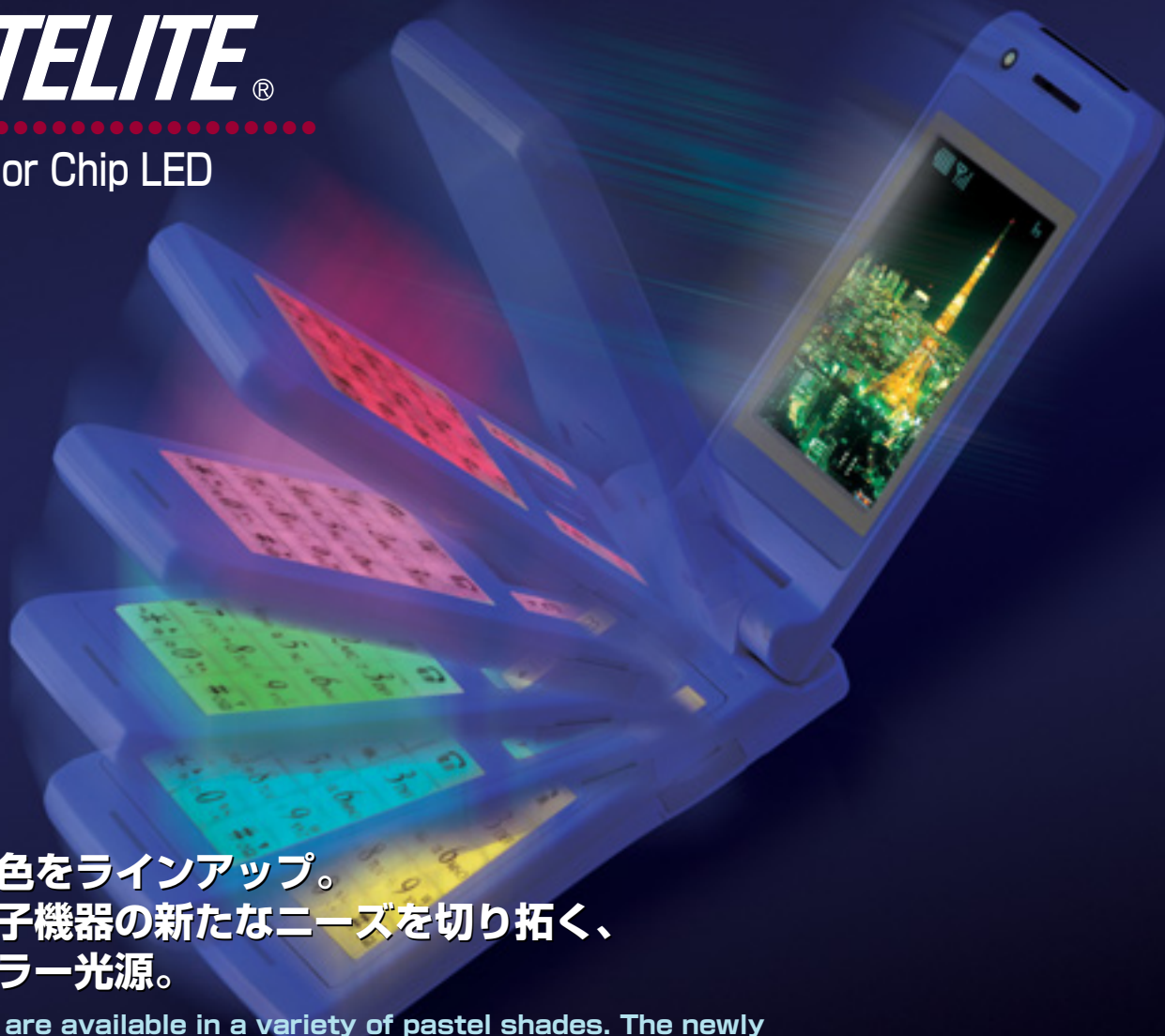


CL-260S:プリント基板に実装された状態
Parts mounted on P.C.board

パステルカラーチップLED

PASTELITE®

Pastel Color Chip LED



多彩な 12 色をラインアップ。
世界初、電子機器の新たなニーズを切り拓く、
パステルカラー光源。

Twelve colors are available in a variety of pastel shades. The newly developed light source meets the needs of today's electronic devices.

■ 特徴 Features

1. 世界初のパステル色発光を実現しました。
 2. 低電流で高輝度発光が得られます。
 3. 設計者の好みに合うよう、多彩な 12 色のバリエーションをそろえました。
 4. 実装形態に合わせて選べる 8 種類のパッケージを用意しました。
 5. 全ての PASTELITE は鉛フリー対応製品です。
1. PASTELITE is the world first pastel color chip LED introduced by Citizen Electronics Co.,Ltd.
 2. High brightness is achieved by low electric current.
 3. Twelve-colors variety is available to meet designers' taste.
 4. Eight kinds of packages are available to suit your set designing.
 5. All PASTELITE are lead free correspondence products.

● パッケージ Package

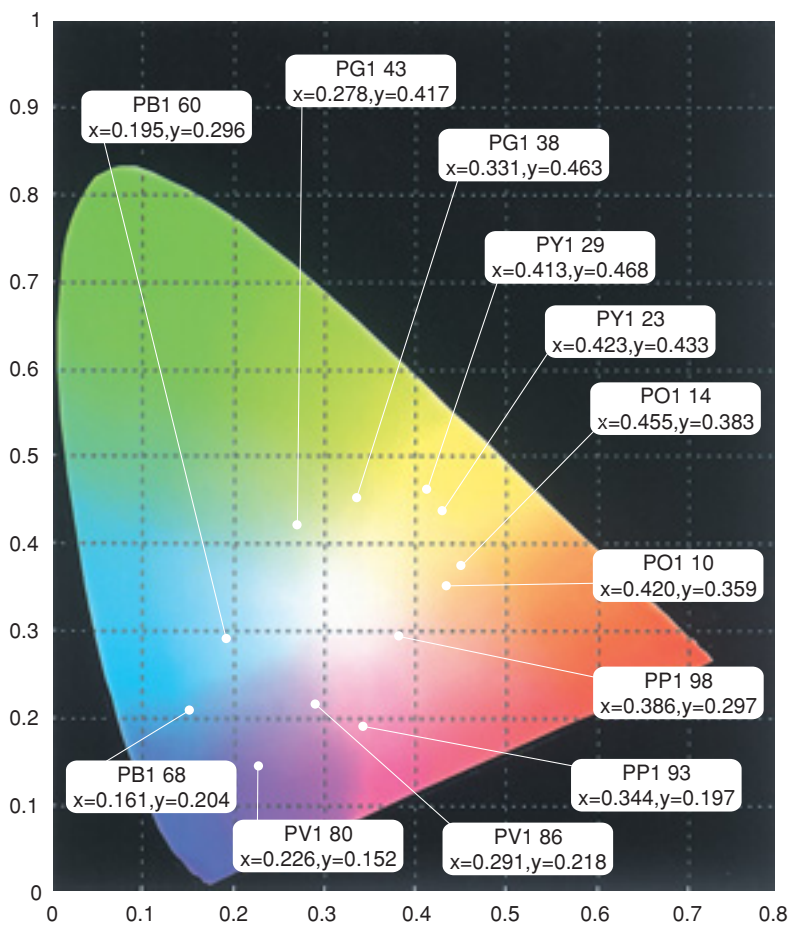
| Series | Type | Size(mm) | 鉛フリー Lead free | Outline drawing |
|--------|---|---------------------------|-------------------|--------------------|
| CL-191 | 上面発光 Upward-lighting type | 1.6(L) x 0.8(W) x 0.6(H) | ○ | P.38 |
| CL-194 | 上面発光 Upward-lighting type | 1.6(L) x 0.8(W) x 0.3(H) | ○ | P.39 |
| CL-198 | 上面発光 Upward-lighting type | 1.6(L) x 0.8(W) x 0.2(H) | ○ | P.46 |
| CL-260 | 上面発光・裏面実装 Upward-lighting type, but moun- table from bottom side of PCB | 3.4(L) x 1.25(W) x 1.1(H) | ○ | P.48 |
| CL-270 | 側面発光 Side-lighting type | 1.6(L) x 1.15(W) x 0.6(H) | ○ | P.56 |
| CL-480 | 側面発光 Side-lighting type | 1.8(L) x 1.1(W) x 0.5(H) | ○ | P.62 |
| CL-481 | 側面発光 Side-lighting type | 1.8(L) x 1.1(W) x 0.4(H) | ○ | P.63 |
| CL-482 | 側面発光 Side-lighting type | 1.8(L) x 1.1(W) x 0.3(H) | ○ | - |



●電気的光学的特性 Electro-optical Characteristics

| Lighting color | Color code | lv(mcd) | V _F (V) | |
|-------------------------------------|------------|---------|--------------------|-----|
| | | Typ | Typ | Max |
| パステルローズピンク Pastel rose pink | PP1 93 | 28 | 3.6 | 4.0 |
| パステルチェリーピンク Pastel cherry pink | PP1 98 | 73 | 3.6 | 4.0 |
| パステルサンセットオレンジ Pastel sunset orange | PO1 10 | 79 | 3.6 | 4.0 |
| パステルライトオレンジ Pastel light orange | PO1 14 | 71 | 3.6 | 4.0 |
| パステルサンライズイエロー Pastel sunrise yellow | PY1 23 | 92 | 3.6 | 4.0 |
| パステルレモンイエロー Pastel lemon yellow | PY1 29 | 111 | 3.6 | 4.0 |
| パステルライムグリーン Pastel lime green | PG1 38 | 54 | 3.6 | 4.0 |
| パステルエメラルドグリーン Pastel emerald green | PG1 43 | 70 | 3.6 | 4.0 |
| パステルミントブルー Pastel mint blue | PB1 60 | 42 | 3.6 | 4.0 |
| パステルスカイブルー Pastel sky blue | PB1 68 | 25 | 3.6 | 4.0 |
| パステルラベンダー Pastel lavender | PV1 80 | 33 | 3.6 | 4.0 |
| パステルアメジスト Pastel amethyst | PV1 86 | 40 | 3.6 | 4.0 |

※スペックにつきましては高輝度版に変更となる可能性がありますので、発注時にお問い合わせください。
The specifications can be changed to a high luminous intensity version. Please consult us when ordering.



● Code of Colors

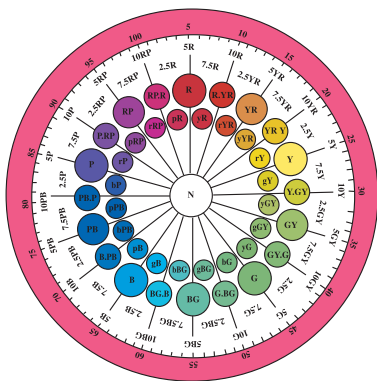
PASTELITEのカラーコードは、3文字の英数字と2桁の数字から成り立っており、2桁の数字はマンセル表色系の色相環に基づいています。

The color code in PASTELITE P/Ns consists of 3 alphanumeric and 2-digit number. The 2-digit number is based on the Munsell color system.

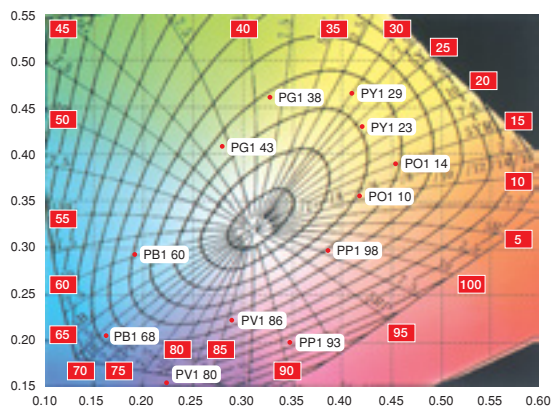
例) パステルローズピンク : PP□ 93

EXP) Pastel Rose Pink
Pastel rose pink
マンセル表色系の色相番号
Coming from Munsell system

●マンセル表色系の色相環 Munsell system



●CIE色度図上におけるマンセル表色系 CIE xy-standard colorimetric system + Munsell system



超高輝度青色・緑色チップLED

HB1・HB8・HBA・MB3・BG1・MG3

Blue or Green Chip LED of Super-luminance HB1, HB8, HBA, MB3, BG1, MG3

■ 特徴 Features

1. InGaN系LED素子を用いた超高輝度チップLEDです。
 2. 発光色は青色、青緑色、緑色。
1. A chip LED of super-luminance using InGaN type LED elements.
 2. Light emitted is blue, blue-green or green.

■ 取扱上の注意 Precautions

本LEDは、静電気に対して非常に敏感です。取扱い時には十分な静電気・サージ対策を施して下さい。

These LEDs are highly susceptible to static electricity. Take thorough precautions against static electricity and surges when handling these chip LEDs.

● 絶対最大定格 Absolute Maximum Rating (Ta 25°C)

| Lighting color | Pd (mW) | I _F (mA) | I _{FP} (mA) | V _R (V) | Top (°C) | Tst (°C) |
|----------------|---------|---------------------|----------------------|--------------------|----------|----------|
| HB1 | 80 | 20 | 100*1 | 4 | -25~+80 | -30~+85 |
| HB8 | 76 | | | 5 | | |
| HBA | 76 | | | 4 | | |
| MB3 | 76 | | | | | |
| BG1 | 80 | | | | | |
| MG3 | 76 | | | | | |

*1 I_{FP}の条件はduty 1/10、パルス巾30msecです。

*1 Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

● 電気的光学的特性 Electro-optical Characteristics

<HB1>

(Ta 25°C)

| Product code | V _F | | | λ _P typ (nm) | Δλ typ (nm) | I _V * | | | Outline drawing |
|--------------|---------------------|---------|---------|-------------------------|-------------|---------------------|-----------|-----------|-----------------|
| | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) | |
| CL-191HB1 | 20 | 3.4 | 3.8 | 470 | 26 | 20 | 20 | 60 | P.38 |
| CL-197HB1 | 20 | 3.4 | 3.8 | 470 | 26 | 20 | 20 | 60 | P.44 |
| CL-260HB1 | 20 | 3.4 | 3.8 | 470 | 26 | 20 | 20 | 60 | P.48 |
| CL-270HB1 | 20 | 3.4 | 3.8 | 470 | 26 | 20 | 20 | 60 | P.56 |

※NIST規格に準拠 Per NIST standards

<HB8>

(Ta 25°C)

| Product code | V _F | | | λ _P typ (nm) | Δλ typ (nm) | I _V * | | | Outline drawing |
|---------------------|---------------------|---------|---------|-------------------------|-------------|---------------------|-----------|-----------|-----------------|
| | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) | |
| CL-194S(R type)-HB8 | 5 | 2.9 | 3.15 | 470 | 26 | 5 | 45 | 65 | P.40 |
| CL-198-HB8 | 5 | 2.9 | 3.15 | 470 | 26 | 5 | 50 | 65 | P.46 |
| CL-482-HB8 | 5 | 2.9 | 3.15 | 470 | 26 | 5 | 22 | 32 | - |

※NIST規格に準拠 Per NIST standards

<HBA>**(Ta 25°C)**

| Product code | V _F | | | λ _P typ (nm) | Δλ typ (nm) | I _V [*] | | | Outline drawing |
|--------------|------------------------|------------|------------|-------------------------------|-------------------|-----------------------------|--------------|--------------|-----------------|
| | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) | |
| CL-840S-HBA | 5 | 2.9 | 3.15 | 470 | 26 | 5 | 25 | 45 | P.68 |

*NIST規格に準拠 Per NIST standards

<MB3>**(Ta 25°C)**

| Product code | V _F | | | λ _P typ (nm) | Δλ typ (nm) | I _V [*] | | | Outline drawing |
|---------------|------------------------|------------|------------|-------------------------------|-------------------|-----------------------------|--------------|--------------|-----------------|
| | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) | |
| CL-191S-MB3-D | 20 | 3.4 | 3.8 | 470 | 25 | 20 | 30 | 95 | P.38 |
| CL-260S-MB3-D | 20 | 3.4 | 3.8 | 470 | 25 | 20 | 30 | 95 | P.48 |
| CL-270S-MB3-D | 20 | 3.4 | 3.8 | 470 | 25 | 20 | 30 | 95 | P.56 |

*NIST規格に準拠 Per NIST standards

<BG1>**(Ta 25°C)**

| Product code | V _F | | | λ _P typ (nm) | Δλ typ (nm) | I _V [*] | | | Outline drawing |
|--------------|------------------------|------------|------------|-------------------------------|-------------------|-----------------------------|--------------|--------------|-----------------|
| | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) | |
| CL-191BG1 | 20 | 3.5 | 4.0 | 502 | 30 | 20 | 29.5 | 80 | P.38 |
| CL-260BG1 | 20 | 3.5 | 4.0 | 502 | 30 | 20 | 29.5 | 80 | P.48 |
| CL-270BG1 | 20 | 3.5 | 4.0 | 502 | 30 | 20 | 29.5 | 80 | P.56 |

*NIST規格に準拠 Per NIST standards

<MG3>**(Ta 25°C)**

| Product code | V _F | | | λ _P typ (nm) | Δλ typ (nm) | I _V [*] | | | Outline drawing |
|---------------|------------------------|------------|------------|-------------------------------|-------------------|-----------------------------|--------------|--------------|-----------------|
| | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) | |
| CL-191S-MG3-D | 20 | 3.3 | 3.8 | 515 | 35 | 20 | 110 | 300 | P.38 |
| CL-260S-MG3-D | 20 | 3.3 | 3.8 | 515 | 35 | 20 | 110 | 300 | P.48 |
| CL-270S-MG3-D | 20 | 3.3 | 3.8 | 515 | 35 | 20 | 110 | 300 | P.56 |

*NIST規格に準拠 Per NIST standards

4元素系超高輝度LED

SYG・TLY・TD2・TR1

Four Elements Type LED of Super-luminance SYG, TLY, TD2, TR1

■ 特徴 Features

1. 4元素LED素子を用いた超高輝度チップLED。
2. 発光色は黄緑色、黄色、橙色、赤色。

1. A chip LED of super-luminance using four types of LED elements.
2. Light emitted is yellow-green, yellow, orange or red.

■ 取扱上の注意 Precautions

本LEDは、静電気に対して非常に敏感です。取扱い時には十分な静電気・サージ対策を施して下さい。

These LEDs are highly susceptible to static electricity. Take thorough precautions against static electricity and surges when handling these chip LEDs.

● 絶対最大定格 Absolute Maximum Rating (Ta 25°C)

| Pd (mW) | I _F (mA) | I _{FP} (mA) | V _R (V) | Top (°C) | Tst (°C) |
|------------|------------------------|-------------------------|-----------------------|-------------|-------------|
| 78 | 30 | 100*1 | 4 | -25~+80 | -30~+85 |

*1 I_{FP}の条件はduty 1/10、パルス巾30msecです。

*1 Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

● 電気的光学的特性 Electro-optical Characteristics

<SYG>

(Ta 25°C)

| Product code | V _F | | | λ _P typ (nm) | Δλ typ (nm) | I _V *1 | | | Outline drawing |
|--------------|------------------------|------------|------------|-------------------------------|-------------------|------------------------|--------------|--------------|-----------------|
| | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) | |
| CL-191SYG | 20 | 2.2 | 2.6 | 574 | 12 | 20 | 20 | 58 | P.38 |
| CL-260SYG | 20 | 2.2 | 2.6 | 574 | 12 | 20 | 20 | 58 | P.48 |
| CL-270SYG | 20 | 2.2 | 2.6 | 574 | 12 | 20 | 20 | 58 | P.56 |

*NIST規格に準拠 Per NIST standards

<TLY>

(Ta 25°C)

| Product code | V _F | | | λ _P typ (nm) | Δλ typ (nm) | I _V *1 | | | Outline drawing |
|--------------|------------------------|------------|------------|-------------------------------|-------------------|------------------------|--------------|--------------|-----------------|
| | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) | |
| CL-191TLY | 20 | 2.0 | 2.6 | 590 | 13 | 20 | 16 | 60 | P.38 |
| CL-260TLY | 20 | 2.0 | 2.6 | 590 | 13 | 20 | 16 | 60 | P.48 |
| CL-270TLY | 20 | 2.0 | 2.6 | 590 | 13 | 20 | 16 | 60 | P.56 |

*NIST規格に準拠 Per NIST standards

<TD2>**(Ta 25°C)**

| Product code | V _F | | | λ _P typ (nm) | Δλ typ (nm) | I _V [*] | | | Outline drawing |
|--------------|------------------------|------------|------------|-------------------------------|-------------------|-----------------------------|--------------|--------------|-----------------|
| | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) | |
| CL-191TD2 | 20 | 2.1 | 2.6 | 612 | 15 | 20 | 83 | 70 | P.38 |
| CL-260TD2 | 20 | 2.1 | 2.6 | 612 | 15 | 20 | 83 | 70 | P.48 |
| CL-270TD2 | 20 | 2.1 | 2.6 | 612 | 15 | 20 | 83 | 70 | P.56 |

*NIST規格に準拠 Per NIST standards

<TR1>**(Ta 25°C)**

| Product code | V _F | | | λ _P typ (nm) | Δλ typ (nm) | I _V [*] | | | Outline drawing |
|--------------|------------------------|------------|------------|-------------------------------|-------------------|-----------------------------|--------------|--------------|-----------------|
| | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) | |
| CL-191TR1 | 20 | 2.0 | 2.6 | 624 | 13 | 20 | 25 | 80 | P.38 |
| CL-260TR1 | 20 | 2.0 | 2.6 | 624 | 13 | 20 | 25 | 80 | P.48 |
| CL-270TR1 | 20 | 2.0 | 2.6 | 624 | 13 | 20 | 25 | 80 | P.56 |

*NIST規格に準拠 Per NIST standards

CL-120S Series

LED For Flash Light Source **CL-120S Series**



5.0(L)×8.0(W)×2.45(H)mm

- リフレクター付きの高出カタイプです。
- High output type with reflector equipped.

●絶対最大定格 Absolute Maximum Rating※1

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP※2 (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------|--------|----------|----------|
| CL-120S-8WQ | 72 | 20 | 100 | 5 | -25~+80 | -30~+85 |

※1 1素子当たりの値です。The values are based on 1-die performance.

※2 IFPの条件はduty 1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

●電氣的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|---------------------------------|--------|-------------------|-----------------------------|------|------|---------------|
| 順電圧 Forward Voltage※1 | V_F | $I_F=20\text{mA}$ | — | 3.2 | 3.6 | V |
| 逆電流 Reverse Current※1 | I_R | $V_R=5\text{V}$ | — | — | 100 | μA |
| 光度 Luminous Intensity※2 | I_v | $I_F=20\text{mA}$ | — | 24 | — | cd |
| 色度座標 Chromaticity coordinates※3 | x, y | $I_F=20\text{mA}$ | $x(\pm 0.02)$ $y(\pm 0.02)$ | | | |
| | | | a | 0.27 | 0.22 | |
| | | | b | 0.27 | 0.29 | |
| | | | c | 0.35 | 0.40 | |
| d | 0.35 | 0.33 | | | | |

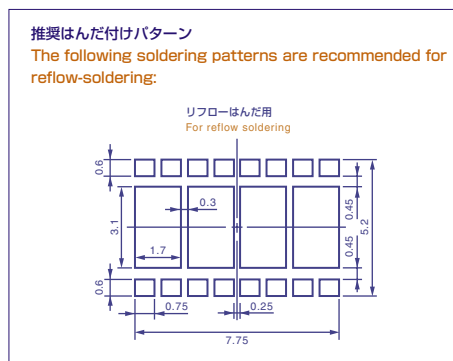
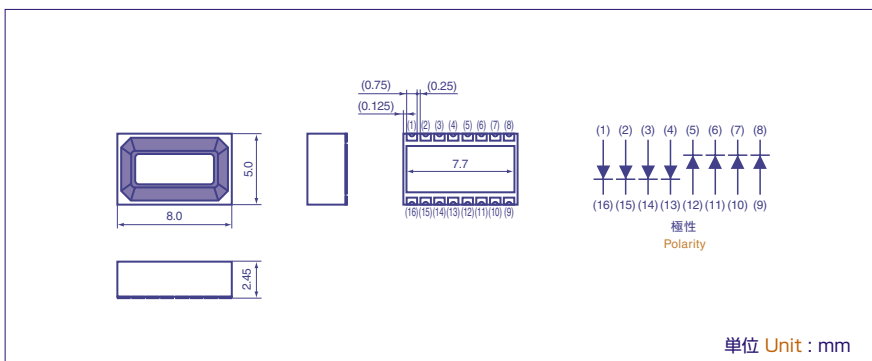
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯の値です。

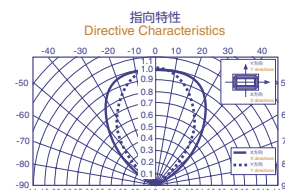
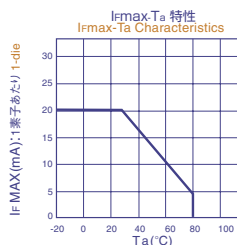
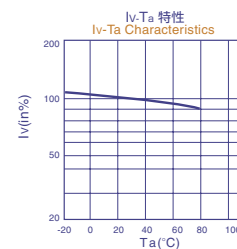
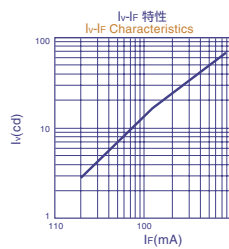
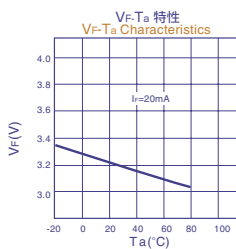
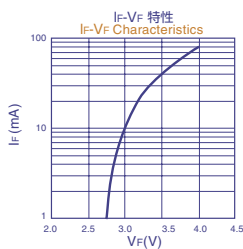
Compliant with NIST. The values are based on the condition that each die lights simultaneously.

※3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

●外形寸法図 Outline drawing

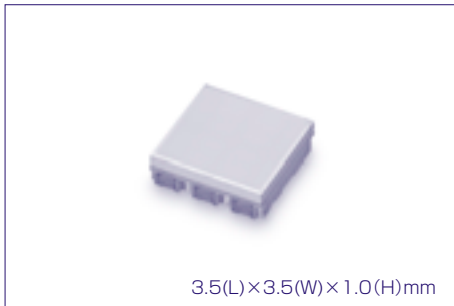


■ 諸特性 Characteristics



CL-473S Series

LED For Flash Light Source **CL-473S Series**



3.5(L)×3.5(W)×1.0(H)mm

● 薄型・高出カタイプです。

● Thin and high output type.

● 絶対最大定格 Absolute Maximum Rating*1

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP*2 (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------|--------|----------|----------|
| CL-473S-4WQ | 72 | 20 | 100 | 5 | -25~+80 | -30~+85 |

*1 1素子当たりの値です。The values are based on 1-die performance.

*2 IFPの条件はduty 1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

● 電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|------------------------------------|--------|-------------------|-----|-----------------|-----------------|---------------|
| 順電圧 Forward Voltage*1 | V_F | $I_F=20\text{mA}$ | — | 3.2 | 3.6 | V |
| 逆電流 Reverse Current*1 | I_R | $V_R=5\text{V}$ | — | — | 100 | μA |
| 光度 Luminous Intensity*2 | I_v | $I_F=20\text{mA}$ | — | 8.8 | — | cd |
| 色度座標 Chromaticity coordinates*3 | x, y | $I_F=20\text{mA}$ | | x(± 0.02) | y(± 0.02) | |
| | | | a | 0.27 | 0.22 | |
| | | | b | 0.27 | 0.29 | |
| | | | c | 0.35 | 0.40 | |
| d | 0.35 | 0.33 | | | | |

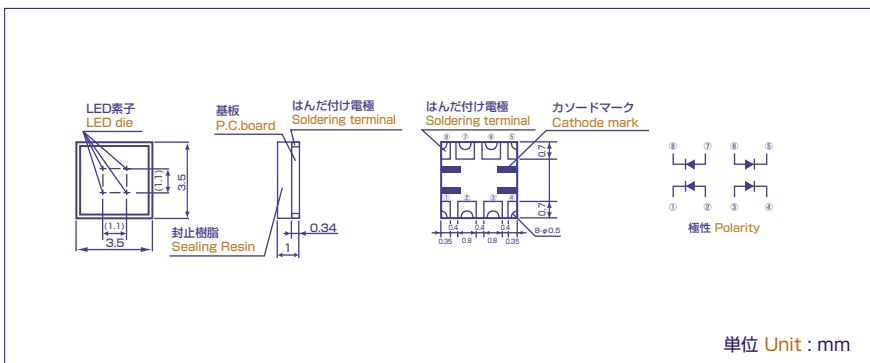
*1 1素子当たりの値です。The values are based on 1-die performance.

*2 NIST規格に準拠、各素子同時点灯時の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

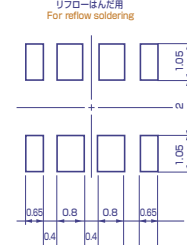
*3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

● 外形寸法図 Outline drawing

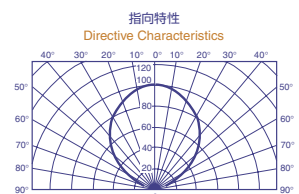
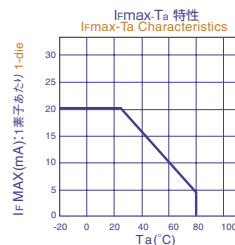
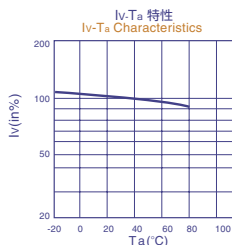
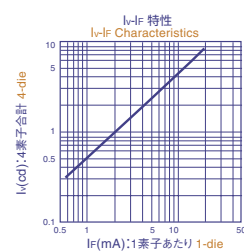
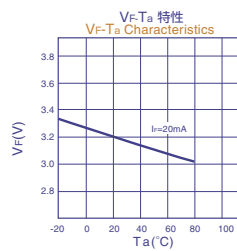
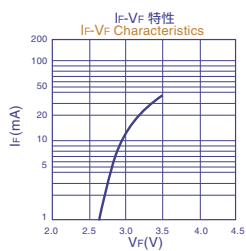


推奨はんだ付けパターン

The following soldering patterns are recommended for reflow soldering:



■ 諸特性 Characteristics



CL-591S Series

LED For Flash Light Source **CL-591S Series**



5.0(L)×5.0(W)×1.5(H)mm

- リフレクター付きの高出力タイプです。
- High output type with reflector equipped.

●絶対最大定格 Absolute Maximum Rating^{※1}

(Ta 25°C)

| Product code | Pd (mW) | I _F (mA) | I _{FP} ^{※2} (mA) | V _R (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------------------|------------------------------------|--------------------|----------|----------|
| CL-591S-4WQ | 72 | 20 | 100 | 5 | -25~+80 | -30~+85 |

※1 1素子当たりの値です。The values are based on 1-die performance.

※2 I_{FP}の条件はduty 1/10、パルス巾30msecです。Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|---|----------------|----------------------|----------|------|----------|------|
| 順電圧 Forward Voltage ^{※1} | V _F | I _F =20mA | — | 3.2 | 3.6 | V |
| 逆電流 Reverse Current ^{※1} | I _R | V _R =5V | — | — | 100 | μA |
| 光度 Luminous Intensity ^{※2} | I _v | I _F =20mA | — | 16.0 | — | cd |
| 色度座標 Chromaticity coordinates ^{※3} | x, y | I _F =20mA | x(±0.02) | | y(±0.02) | |
| | | | a | 0.27 | 0.22 | |
| | | | b | 0.27 | 0.29 | |
| | | | c | 0.35 | 0.40 | |
| d | 0.35 | 0.33 | | | | |

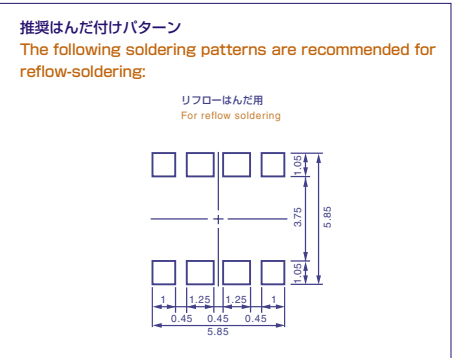
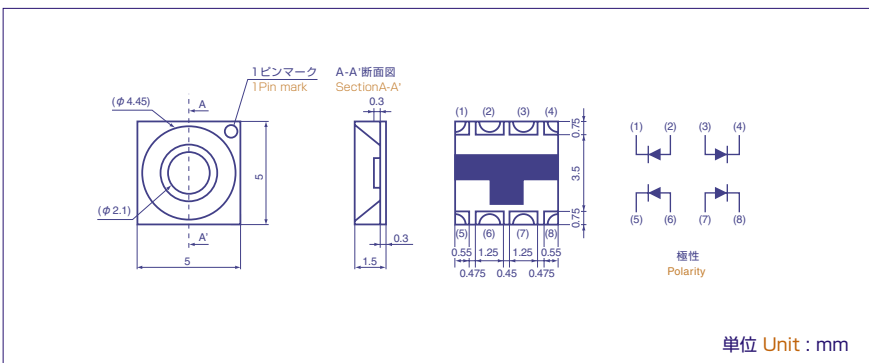
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯の値です。

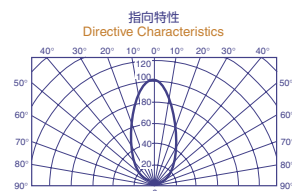
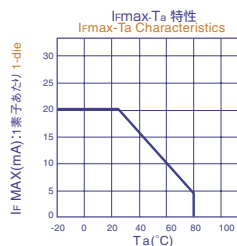
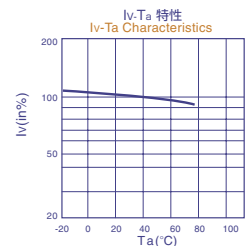
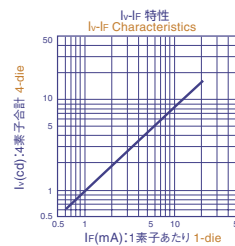
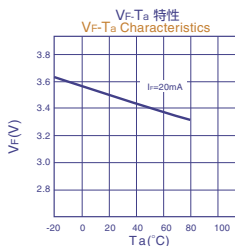
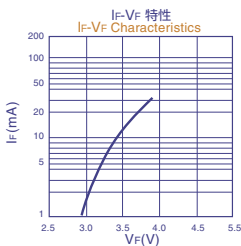
Compliant with NIST. The values are based on the condition that each die lights simultaneously.

※3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

●外形寸法図 Outline drawing

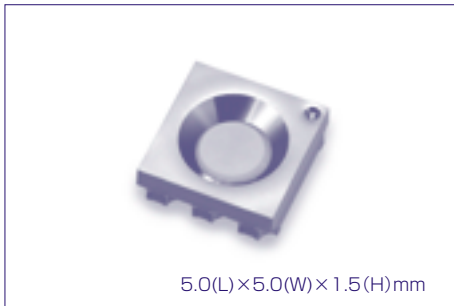


■ 諸特性 Characteristics



CL-597S Series

LED For Flash Light Source **CL-597S Series**



5.0(L)×5.0(W)×1.5(H)mm

- リフレクター付きの高出力タイプです。
- High output type with reflector equipped.

●絶対最大定格 Absolute Maximum Rating*1

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP*2 (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------|--------|----------|----------|
| CL-597S-4WQ | 72 | 20 | 100 | 5 | -25~+80 | -30~+85 |

*1 1素子当たりの値です。The values are based on 1-die performance.

*2 IFPの条件はduty1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|---------------------------------|--------|-------------------|-----|---------------|---------------|---------------|
| 順電圧 Forward Voltage*1 | V_F | $I_F=20\text{mA}$ | — | 3.2 | 3.6 | V |
| 逆電流 Reverse Current*1 | I_R | $V_R=5\text{V}$ | — | — | 100 | μA |
| 光度 Luminous Intensity*2 | I_v | $I_F=20\text{mA}$ | — | 14.4 | — | cd |
| 色度座標 Chromaticity coordinates*3 | x, y | $I_F=20\text{mA}$ | | $x(\pm 0.02)$ | $y(\pm 0.02)$ | |
| | | | a | 0.27 | 0.22 | |
| | | | b | 0.27 | 0.29 | |
| | | | c | 0.35 | 0.40 | |
| d | 0.35 | 0.33 | | | | |

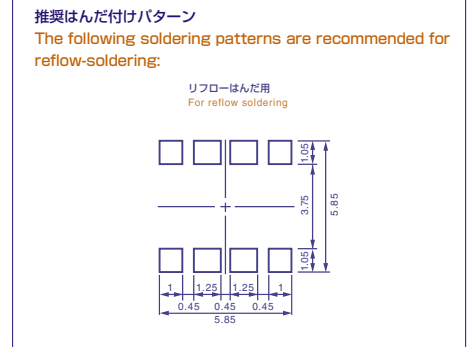
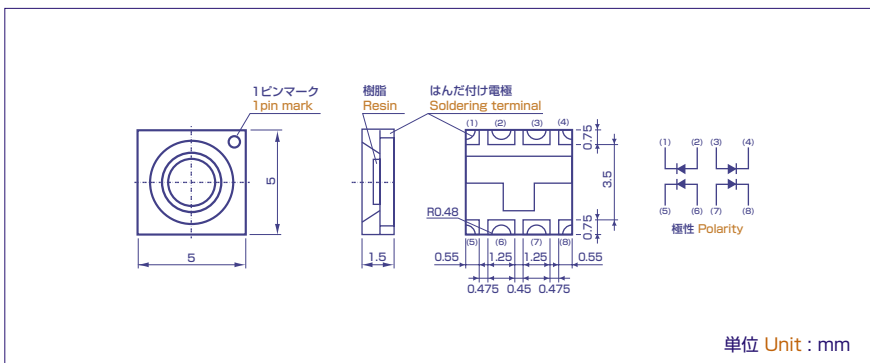
*1 1素子当たりの値です。The values are based on 1-die performance.

*2 NIST規格に準拠、各素子同時点灯の値です。

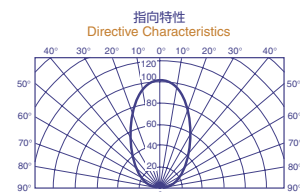
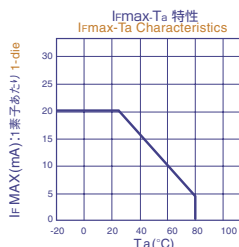
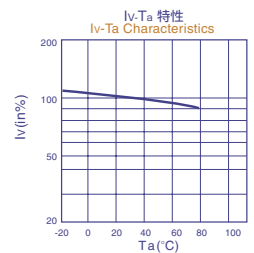
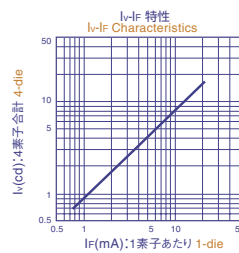
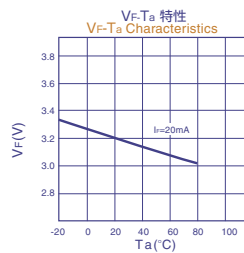
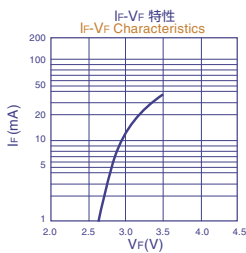
Compliant with NIST. The values are based on the condition that each die lights simultaneously.

*3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

●外形寸法図 Outline drawing



■ 諸特性 Characteristics



CL-690S Series

LED For Flash Light Source **CL-690S Series**



3.3(L)×3.3(W)×1.5(H)mm

- リフレクター付きの高出力タイプです。
- リフレクター形状を最適化することにより、小型化・高出力化を両立しています。
- High output type with reflector equipped.
- Compatibility achieved between compact design and high power thanks to optimization of reflector shape.

●絶対最大定格 Absolute Maximum Rating^{※1}

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP ^{※2} (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------------------|--------|----------|----------|
| CL-690S-WQ | 72 | 20 | 100 | 5 | -25~+80 | -30~+85 |
| CL-690S-2WQ | | | | | | |
| CL-690S-3WQ | | | | | | |

※1 1素子当たりの値です。The values are based on 1-die performance.

※2 IFPの条件はduty1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

●電氣的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit | |
|--|--------|------------|----------|------|----------|------|----------------------------|
| 順電圧 Forward Voltage ^{※1} | VF | IF=20mA | - | 3.2 | 3.6 | V | |
| | | | | | | | CL-690S-WQ |
| | | | | | | | CL-690S-2WQ CL-690S-3WQ |
| 逆電流 Reverse Current ^{※1} | IR | VR=5V | - | - | 100 | μA | |
| 光度 Luminous Intensity ^{※2} | lv | IF=20mA | 2.8 | 5.0 | 5.6 | - | |
| | | | | | | | CL-690S-WQ |
| | | | | | | | CL-690S-2WQ CL-690S-3WQ |
| 色度座標 Chromaticity coordinates ^{※3} | x, y | IF=20mA | x(±0.02) | | y(±0.02) | | cd |
| | | | a | 0.27 | 0.22 | | |
| | | | b | 0.27 | 0.29 | | |
| | | | c | 0.35 | 0.40 | | |
| | | | d | 0.35 | 0.33 | | |

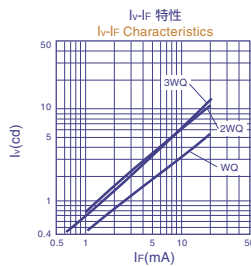
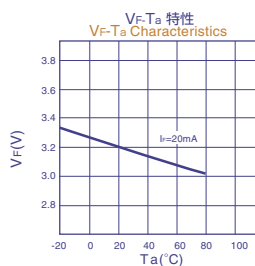
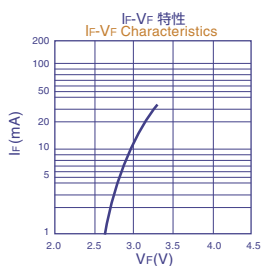
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯時の値です。

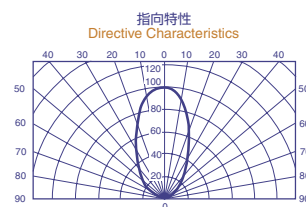
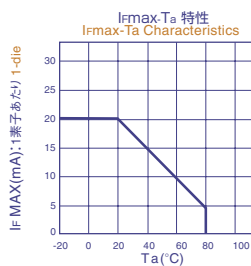
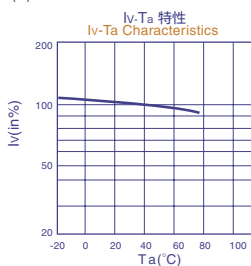
Compliant with NIST. The values are based on the condition that each die lights simultaneously.

※3 色度座標は、a, b, c, dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

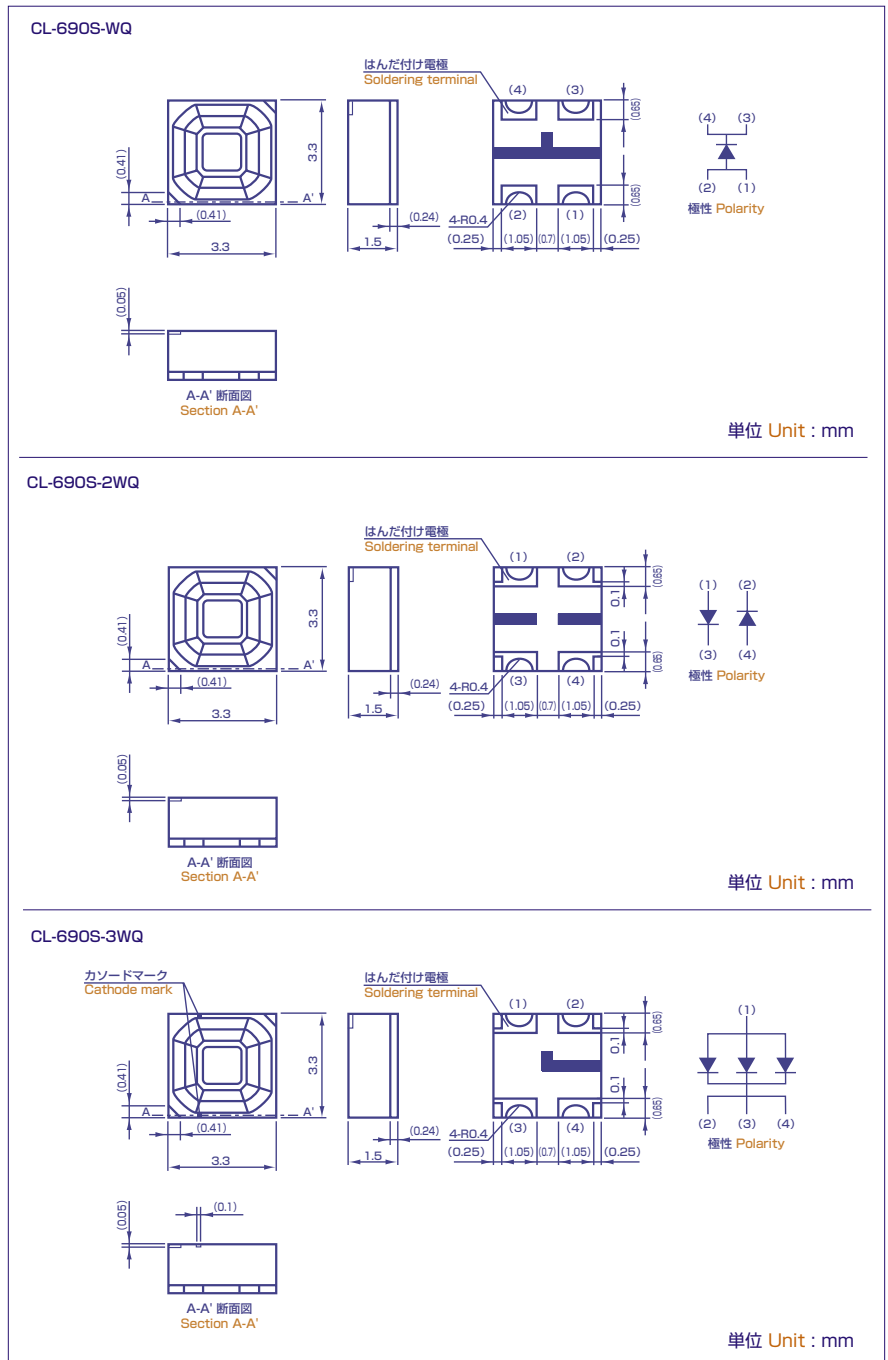
■ 諸特性 Characteristics



*lv (cd) の数値は、2WQは「2素子合計」、3WQは「3素子合計」となります。
lv (cd) for 2WQ is the 2-die total, that for 3WQ is the 3-die total.



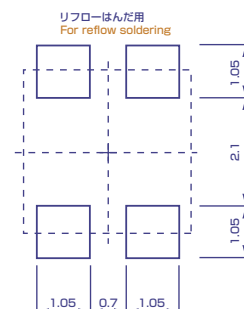
●外形寸法図 Outline drawing



推奨はんだ付けパターン

The following soldering patterns are recommended for reflow-soldering:

- CL-690S-WQ
- CL-690S-2WQ
- CL-690S-3WQ



CL-695S Series

LED For Flash Light Source **CL-695S Series**



3.3(L)×3.3(W)×0.935(H)mm

- リフレクター付きの高出力タイプです。
- CL-690Sシリーズを薄型化して、指向性も上げています。
- High output type with reflector equipped.
- This model has slimmer body and broader directivity than the CL-690S series.

●絶対最大定格 Absolute Maximum Rating^{※1}

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP ^{※2} (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------------------|--------|----------|----------|
| CL-695S-2WQ | 72 | 20 | 100 | 5 | -25~+80 | -30~+85 |

※1 1素子当たりの値です。The values are based on 1-die performance.

※2 IFPの条件はduty 1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

●電氣的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|--|----------------|----------------------|----------|------|----------|------|
| 順電圧 Forward Voltage ^{※1} | V _F | I _F =20mA | — | 3.2 | 3.6 | V |
| 逆電流 Reverse Current ^{※1} | I _R | V _R =5V | — | — | 100 | μA |
| 光度 Luminous Intensity ^{※2} | I _v | I _F =20mA | — | 7.4 | — | cd |
| 色度座標 Chromaticity coordinates ^{※3} | x, y | I _F =20mA | x(±0.02) | | y(±0.02) | |
| | | | a | 0.27 | 0.22 | |
| | | | b | 0.27 | 0.29 | |
| | | | c | 0.35 | 0.40 | |
| d | 0.35 | 0.33 | | | | |

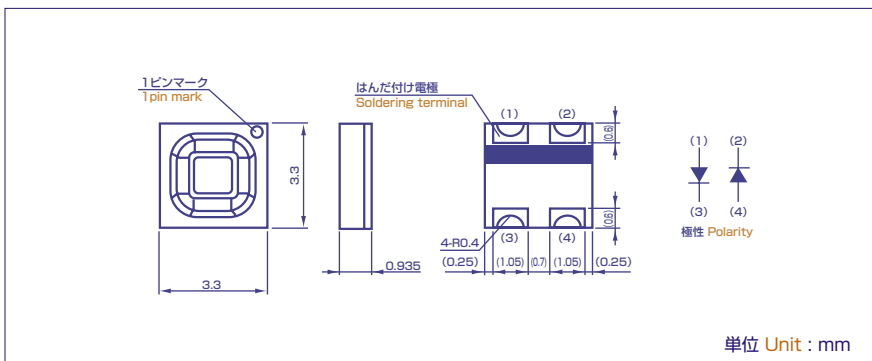
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

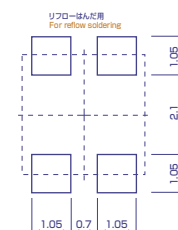
※3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

●外形寸法図 Outline drawing

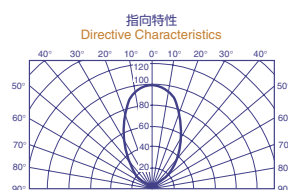
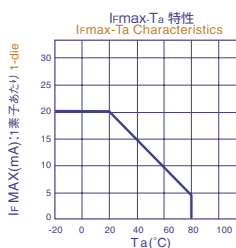
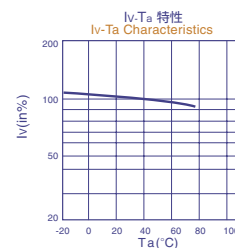
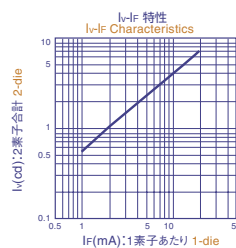
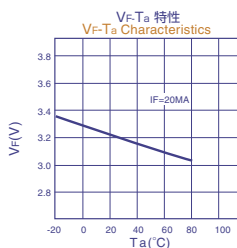
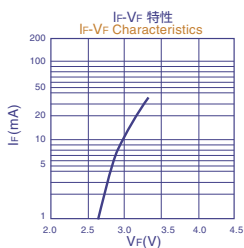


推奨はんだ付けパターン

The following soldering patterns are recommended for reflow-soldering:



■諸特性 Characteristics



CL-760S Series

LED For Flash Light Source **CL-760S Series**



- 小型・薄型タイプです。
- Compact and thin type

●絶対最大定格 Absolute Maximum Rating*1

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP*2 (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------|--------|----------|----------|
| CL-760S-2WQ | 72 | 20 | 100 | 5 | -25~+80 | -30~+85 |

*1 1素子当たりの値です。The values are based on 1-die performance.

*2 IFPの条件はduty1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|------------------------------------|--------|-------------------|-----|-----------------|-----------------|---------------|
| 順電圧 Forward Voltage*1 | V_F | $I_F=20\text{mA}$ | — | 3.2 | 3.6 | V |
| 逆電流 Reverse Current*1 | I_R | $V_R=5\text{V}$ | — | — | 100 | μA |
| 光度 Luminous Intensity*2 | I_v | $I_F=20\text{mA}$ | — | 4.8 | — | cd |
| 色度座標 Chromaticity coordinates*3 | x, y | $I_F=20\text{mA}$ | | x(± 0.02) | y(± 0.02) | |
| | | | a | 0.27 | 0.22 | |
| | | | b | 0.27 | 0.29 | |
| | | | c | 0.35 | 0.40 | |
| d | 0.35 | 0.33 | | | | |

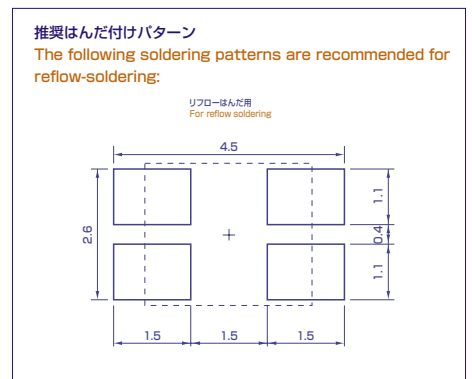
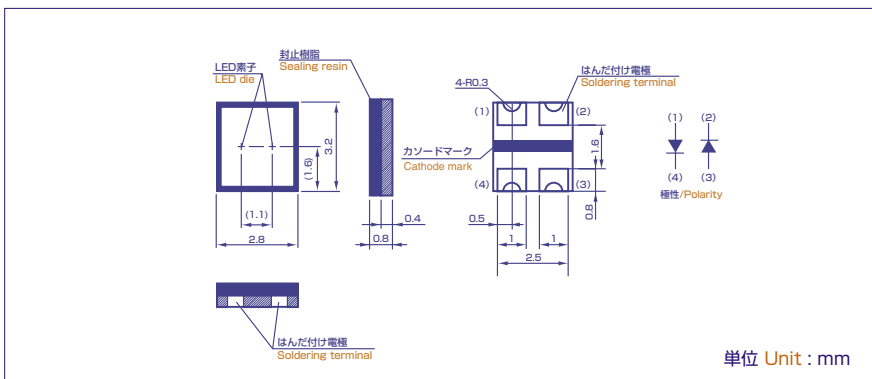
*1 1素子当たりの値です。The values are based on 1-die performance.

*2 NIST規格に準拠、各素子同時点灯の値です。

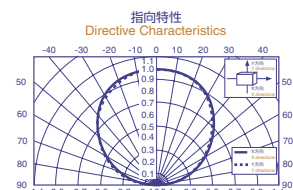
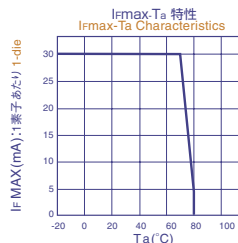
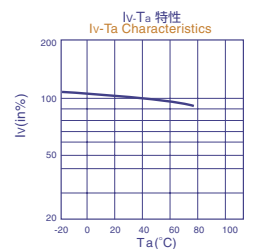
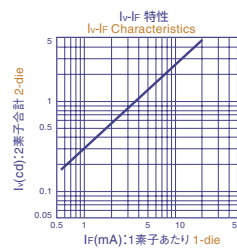
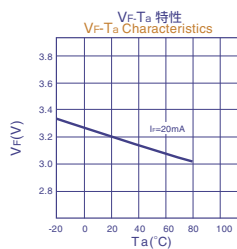
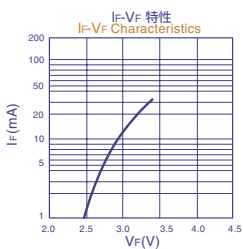
Compliant with NIST. The values are based on the condition that each die lights simultaneously.

*3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

●外形寸法図 Outline drawing



■ 諸特性 Characteristics



CL-770S Series

LED For Flash Light Source **CL-770S Series**



- 小型・薄型タイプです。
- Compact and thin type

●絶対最大定格 Absolute Maximum Rating^{※1}

(Ta 25°C)

| Product code | Pd (mW) | I _F (mA) | I _{FP} ^{※2} (mA) | V _R (V) | T _{op} (°C) | T _{st} (°C) |
|--------------|---------|---------------------|------------------------------------|--------------------|----------------------|----------------------|
| CL-770S-4WQ | 72 | 20 | 100 | 5 | -25~+80 | -30~+85 |

※1 1素子当たりの値です。The values are based on 1-die performance.

※2 I_{FP}の条件はduty 1/10、パルス巾30msecです。Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|--|----------------|----------------------|----------|------|----------|------|
| 順電圧 Forward Voltage ^{※1} | V _F | I _F =20mA | — | 3.2 | 3.6 | V |
| 逆電流 Reverse Current ^{※1} | I _R | V _R =5V | — | — | 100 | μA |
| 光度 Luminous Intensity ^{※2} | I _v | I _F =20mA | — | 6.7 | — | cd |
| 色度座標 Chromaticity coordinates ^{※3} | x, y | I _F =20mA | x(±0.02) | | y(±0.02) | |
| | | | a | 0.27 | 0.22 | |
| | | | b | 0.27 | 0.29 | |
| | | | c | 0.35 | 0.40 | |
| d | 0.35 | 0.33 | | | | |

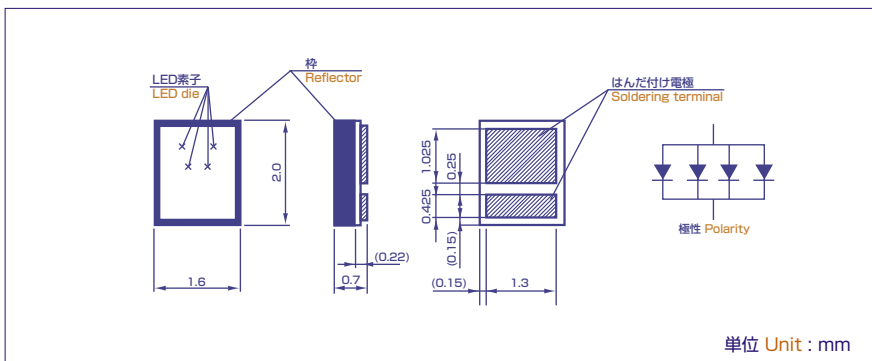
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

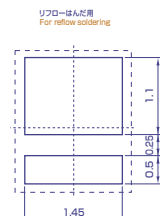
※3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

●外形寸法図 Outline drawing

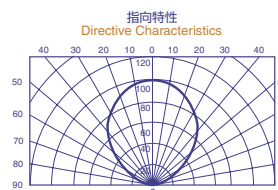
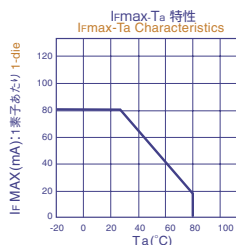
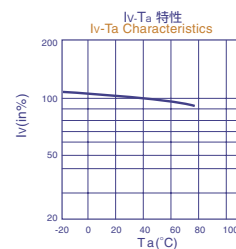
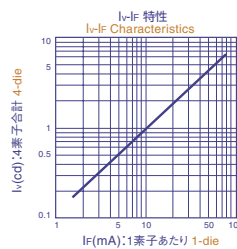
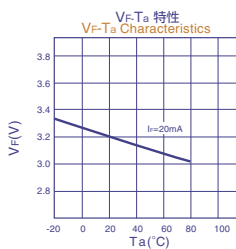
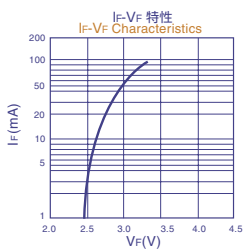


推奨はんだ付けパターン

The following soldering patterns are recommended for reflow-soldering:

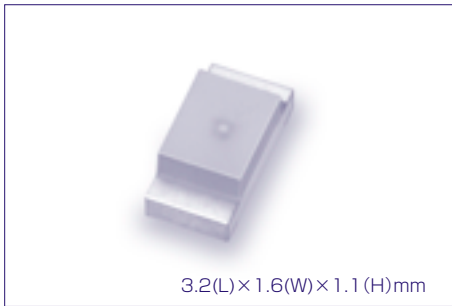


■ 諸特性 Characteristics



CL-150 Series

Mono-Color Upward-Lighting Type **CL-150 Series**



3.2(L)×1.6(W)×1.1(H)mm

● 標準サイズのチップLEDです。

● Standard size chip LED

発光色のラインアップにつきましては、発注時にお問い合わせの上、ご確認ください。

Please contact us at the time of order for the lineup of luminescent colors.

●絶対最大定格 Absolute Maximum Rating (Ta 25°C)

| Product code | Pd (mW) | I _F (mA) | I _{FP} (mA) | V _R (V) | Top (°C) | Tst (°C) |
|---------------------------------------|---------|---------------------|----------------------|--------------------|----------|----------|
| CL-150 (UR,HRを除く) Except UR and HR | 65 | 25 | 100*1 | 5 | -25~+80 | -30~+85 |
| CL-150UR/HR | 78 | 30 | | | | |

*1 I_{FP}の条件はduty 1/10、パルス巾30msecです。

*1 Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

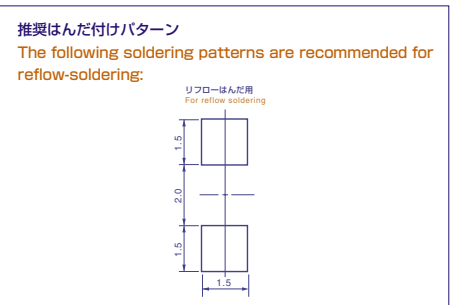
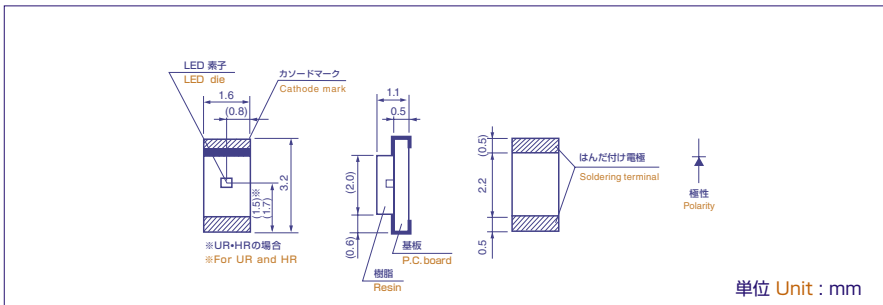
●電気的光学的特性 Electro-optical Characteristics (Ta 25°C)

| Product code | Lighting color | V _F | | | λ _p typ (nm) | Δλ typ (nm) | I _V ** | | |
|--------------|-------------------------|---------------------|---------|---------|-------------------------|-------------|---------------------|-----------|-----------|
| | | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) |
| CL-150R | Red | 20 | 2.2 | 2.6 | 700 | 100 | 20 | 0.5 | 1.3 |
| CL-150D | Orange | 20 | 2.2 | 2.6 | 605 | 40 | 20 | 2.4 | 7.1 |
| CL-150Y | Yellow | 20 | 2.1 | 2.6 | 589 | 40 | 20 | 2.6 | 6.4 |
| CL-150YG | Yellow green | 20 | 2.2 | 2.6 | 570 | 30 | 20 | 5 | 18 |
| CL-150G | Green | 20 | 2.2 | 2.6 | 567 | 26 | 20 | 2.5 | 10 |
| CL-150FG | Fresh green | 20 | 2.2 | 2.6 | 560 | 26 | 20 | 2.2 | 6.5 |
| CL-150PG | Pure green | 20 | 2.2 | 2.6 | 557 | 24 | 20 | 1 | 3 |
| CL-150SR | Super brightness red | 20 | 2 | 2.6 | 650 | 40 | 20 | 1.5 | 4.3 |
| CL-150SD | Super brightness orange | 20 | 2 | 2.6 | 630 | 40 | 20 | 2 | 6.2 |
| CL-150UR | Ultra brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 3.5 | 13 |
| CL-150HR | High brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 5 | 23 |

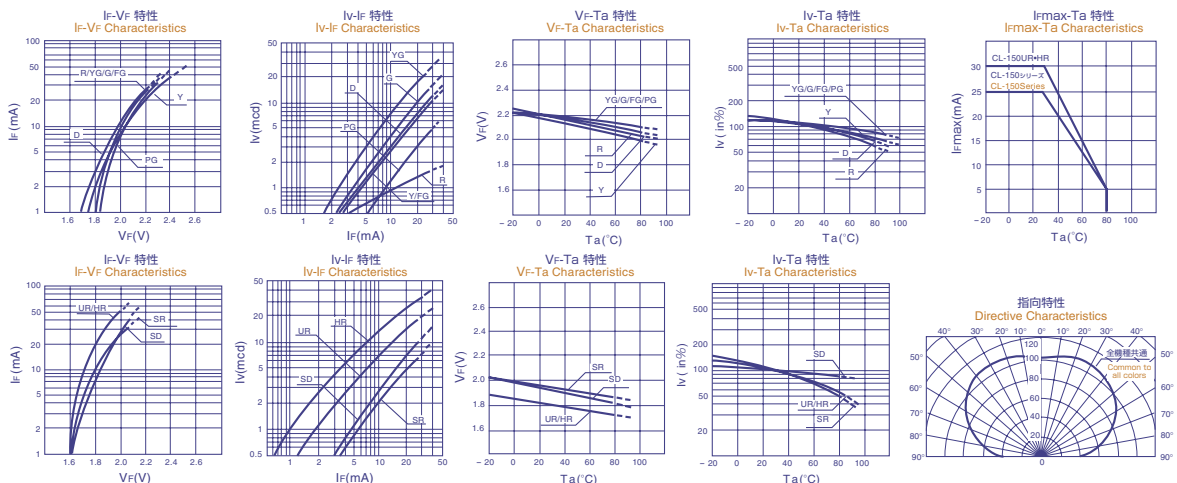
*NIST規格に準拠

*Per NIST standards

●外形寸法図 Outline drawing

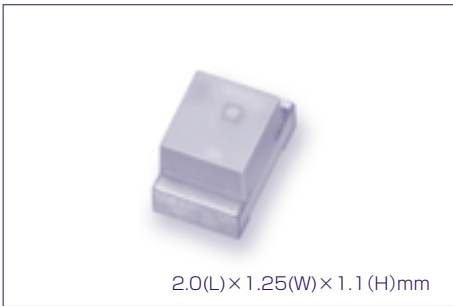


■ 諸特性 Characteristics



CL-170 Series

Mono-Color Upward-Lighting Type **CL-170 Series**



● 小型のチップLEDです。

● Compact chip LED

発光色のラインアップにつきましては、発注時にお問い合わせの上、ご確認ください。

Please contact us at the time of order for the lineup of luminescent colors.

●絶対最大定格 Absolute Maximum Rating

(Ta 25°C)

| Product code | Pd (mW) | I _F (mA) | I _{FP} (mA) | V _R (V) | T _{op} (°C) | T _{st} (°C) |
|---------------------------------------|---------|---------------------|----------------------|--------------------|----------------------|----------------------|
| CL-170 (UR,HRを除く Except UR and HR) | 65 | 25 | 100*1 | 5 | -25~+80 | -30~+85 |
| CL-170UR/HR | 78 | 30 | | | | |

*1 I_{FP}の条件はduty 1/10、パルス巾30msecです。

*1 Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

●電光的学的特性 Electro-optical Characteristics

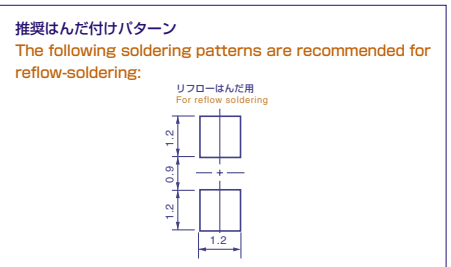
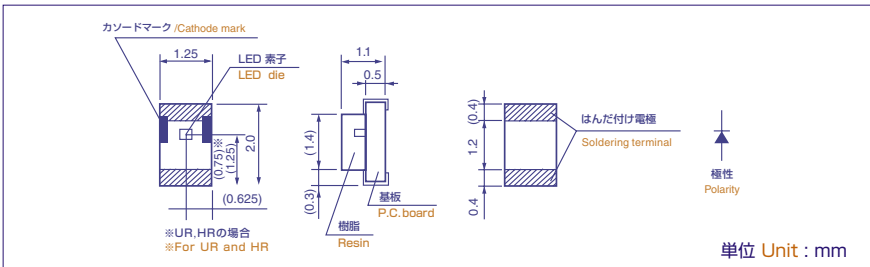
(Ta 25°C)

| Product code | Lighting color | V _F | | | λ _p typ (nm) | Δλ typ (nm) | I _v * (mcd) | | |
|--------------|-------------------------|---------------------|---------|---------|-------------------------|-------------|------------------------|-----------|-----------|
| | | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) |
| CL-170R | Red | 20 | 2.2 | 2.6 | 700 | 100 | 20 | 0.5 | 1.3 |
| CL-170D | Orange | 20 | 2.2 | 2.6 | 605 | 40 | 20 | 2.4 | 7.1 |
| CL-170Y | Yellow | 20 | 2.1 | 2.6 | 589 | 40 | 20 | 2.6 | 6.4 |
| CL-170YG | Yellow green | 20 | 2.2 | 2.6 | 570 | 30 | 20 | 5 | 18 |
| CL-170G | Green | 20 | 2.2 | 2.6 | 567 | 26 | 20 | 2.5 | 10 |
| CL-170FG | Fresh green | 20 | 2.2 | 2.6 | 560 | 26 | 20 | 2.2 | 6.5 |
| CL-170PG | Pure green | 20 | 2.2 | 2.6 | 557 | 24 | 20 | 1 | 3 |
| CL-170SR | Super brightness red | 20 | 2 | 2.6 | 650 | 40 | 20 | 1.5 | 4.3 |
| CL-170SD | Super brightness orange | 20 | 2 | 2.6 | 630 | 40 | 20 | 2 | 6.2 |
| CL-170UR | Ultra brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 3.5 | 13 |
| CL-170HR | High brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 5 | 23 |

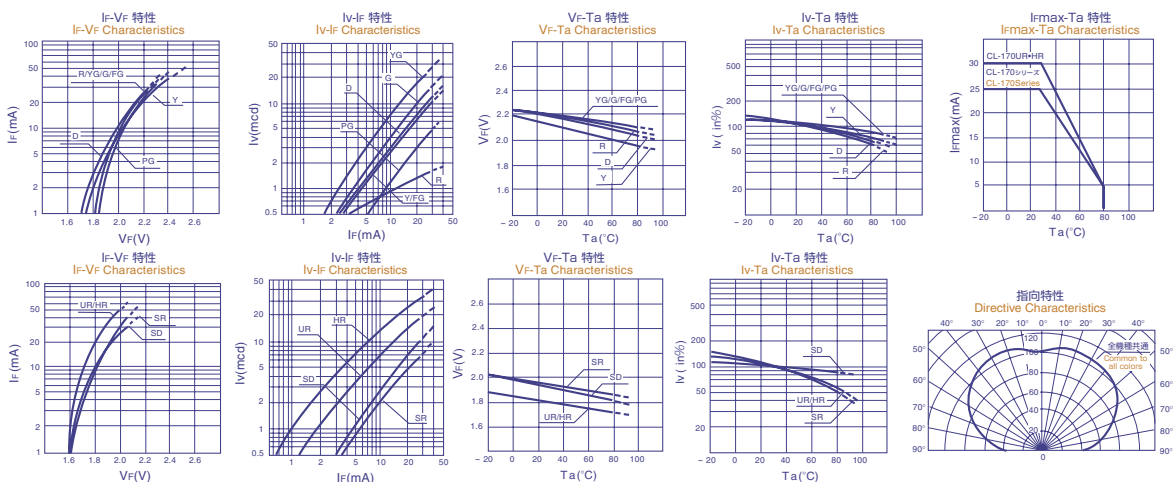
*NIST規格に準拠

*Per NIST standards

●外形寸法図 Outline drawing

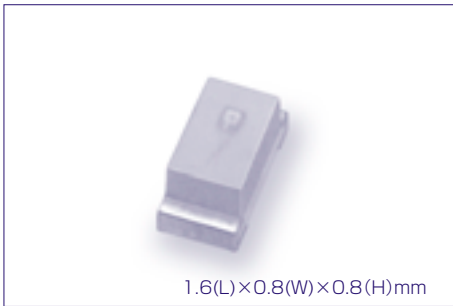


■ 諸特性 Characteristics



CL-190 Series

Mono-Color Upward-Lighting Type **CL-190 Series**



1.6(L)×0.8(W)×0.8(H)mm

● 小型のチップLEDです。

● Compact chip LED

発光色のラインアップにつきましては、発注時にお問い合わせの上、ご確認ください。

Please contact us at the time of order for the lineup of luminescent colors.

●絶対最大定格 Absolute Maximum Rating (Ta 25°C)

| Product code | Pd (mW) | I _F (mA) | I _{FP} (mA) | V _R (V) | Top (°C) | Tst (°C) |
|---------------------------------------|---------|---------------------|----------------------|--------------------|----------|----------|
| CL-190 (UR,HRを除く) Except UR and HR | 50 | 20 | 100*1 | 5 | -25~+80 | -30~+85 |
| CL-190UR/HR | 78 | 30 | | | | |

*1 I_{FP}の条件はduty 1/10、パルス巾30msecです。

*1 Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

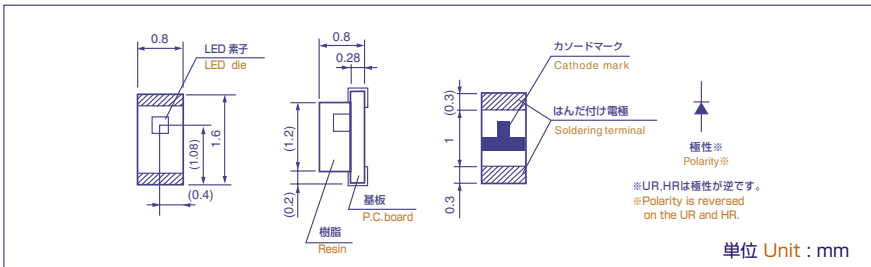
●電気的光学的特性 Electro-optical Characteristics (Ta 25°C)

| Product code | Lighting color | V _F | | | λ _p typ (nm) | Δλ typ (nm) | I _v * (mcd) | | |
|--------------|-------------------------|---------------------|---------|---------|-------------------------|-------------|------------------------|-----------|-----------|
| | | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) |
| CL-190R | Red | 20 | 2.2 | 2.6 | 700 | 100 | 20 | 0.5 | 1.3 |
| CL-190D | Orange | 20 | 2.2 | 2.6 | 605 | 40 | 20 | 2.4 | 7.1 |
| CL-190Y | Yellow | 20 | 2.1 | 2.6 | 589 | 40 | 20 | 2.6 | 6.4 |
| CL-190YG | Yellow green | 20 | 2.2 | 2.6 | 570 | 30 | 20 | 5 | 18 |
| CL-190G | Green | 20 | 2.2 | 2.6 | 567 | 26 | 20 | 2.5 | 10 |
| CL-190FG | Fresh green | 20 | 2.2 | 2.6 | 560 | 26 | 20 | 2.2 | 6.5 |
| CL-190PG | Pure green | 20 | 2.2 | 2.6 | 557 | 24 | 20 | 1 | 3 |
| CL-190SR | Super brightness red | 20 | 2 | 2.6 | 650 | 40 | 20 | 1.5 | 4.3 |
| CL-190SD | Super brightness orange | 20 | 2 | 2.6 | 630 | 40 | 20 | 2 | 6.2 |
| CL-190UR | Ultra brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 3.5 | 13 |
| CL-190HR | High brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 5 | 23 |

*NIST規格に準拠

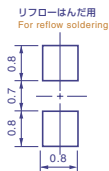
*Per NIST standards

●外形寸法図 Outline drawing

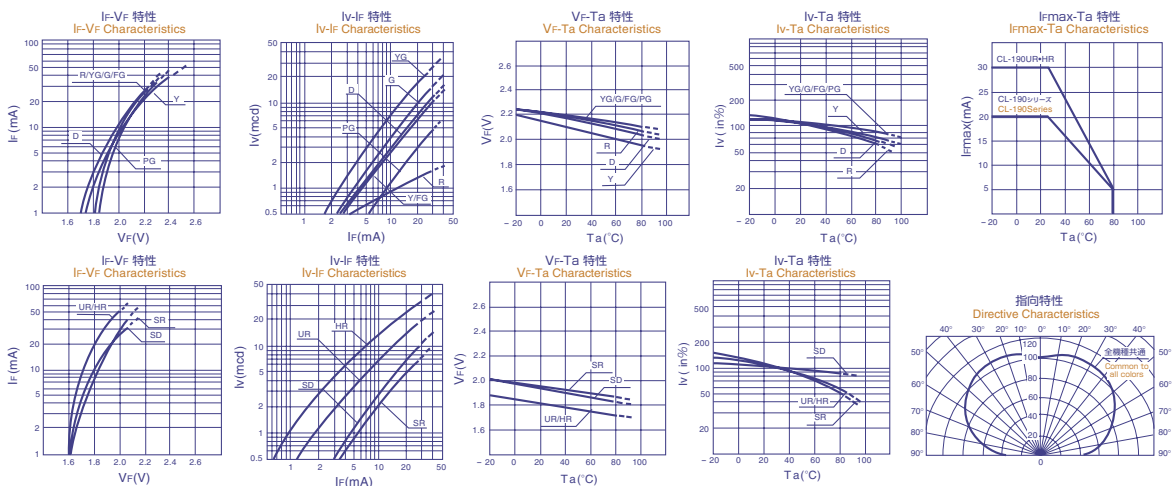


推奨はんだ付けパターン

The following soldering patterns are recommended for reflow-soldering:

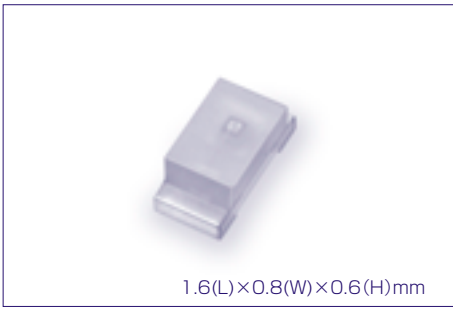


■ 諸特性 Characteristics



CL-191 Series

Mono-Color Upward-Lighting Type **CL-191 Series**



1.6(L)×0.8(W)×0.6(H)mm

● CL-190の厚み(0.8mm)をさらに薄くした小型チップLEDです。

● Small-sized chip LED even thinner than CL-190(0.8mm thick).

発光色のラインアップにつきましては、発注時にお問い合わせの上、ご確認ください。

Please contact us at the time of order for the lineup of luminescent colors.

●絶対最大定格 Absolute Maximum Rating

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP (mA) | VR (V) | Top (°C) | Tst (°C) |
|---------------------------------------|---------|---------|----------|--------|----------|----------|
| CL-191 (UR,HRを除く Except UR and HR) | 50 | 20 | 100*1 | 5 | -25~+80 | -30~+85 |
| CL-191UR/HR | 78 | 30 | | | | |

※1 IFPの条件はduty 1/10、パルス巾30msecです。

※1 Condition for IFP is pulse of 1/10 duty and 30msec width.

●電光的学的特性 Electro-optical Characteristics

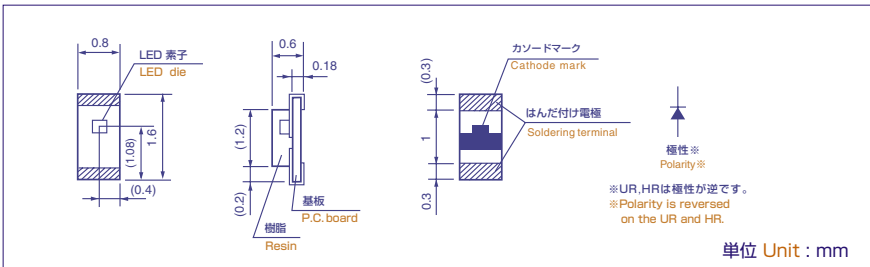
(Ta 25°C)

| Product code | Lighting color | VF | | | λp typ (nm) | Δλ typ (nm) | IV* | | |
|--------------|-------------------------|---------|---------|---------|-------------|-------------|---------|-----------|-----------|
| | | IF (mA) | typ (V) | max (V) | | | IF (mA) | min (mcd) | typ (mcd) |
| CL-191R | Red | 20 | 2.2 | 2.6 | 700 | 100 | 20 | 0.5 | 1.3 |
| CL-191D | Orange | 20 | 2.2 | 2.6 | 605 | 40 | 20 | 2.4 | 7.1 |
| CL-191Y | Yellow | 20 | 2.1 | 2.6 | 589 | 40 | 20 | 2.6 | 6.4 |
| CL-191YG | Yellow green | 20 | 2.2 | 2.6 | 570 | 30 | 20 | 5 | 18 |
| CL-191G | Green | 20 | 2.2 | 2.6 | 567 | 26 | 20 | 2.5 | 10 |
| CL-191FG | Fresh green | 20 | 2.2 | 2.6 | 560 | 26 | 20 | 2.2 | 6.5 |
| CL-191PG | Pure green | 20 | 2.2 | 2.6 | 557 | 24 | 20 | 1 | 3 |
| CL-191SR | Super brightness red | 20 | 2 | 2.6 | 650 | 40 | 20 | 1.5 | 4.3 |
| CL-191SD | Super brightness orange | 20 | 2 | 2.6 | 630 | 40 | 20 | 2 | 6.2 |
| CL-191UR | Ultra brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 3.5 | 13 |
| CL-191HR | High brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 5 | 23 |

※NIST規格に準拠

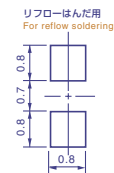
※Per NIST standards

●外形寸法図 Outline drawing

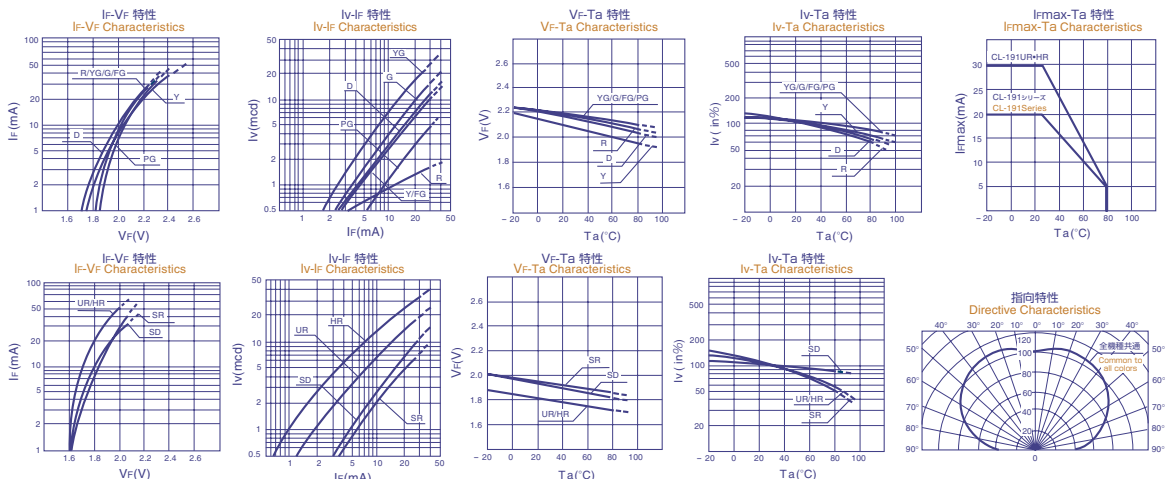


推奨はんだ付けパターン

The following soldering patterns are recommended for reflow soldering:

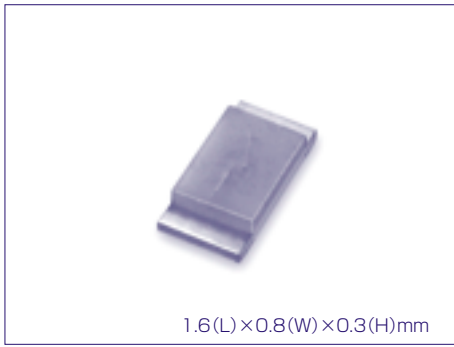


■ 諸特性 Characteristics



CL-194S Series

Mono-Color Upward-Lighting Type **CL-194S Series**



1.6(L)×0.8(W)×0.3(H)mm

● 小型・薄型の白色LEDです。

● Compact and thin white LED

●絶対最大定格 Absolute Maximum Rating*1

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP*2 (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------|--------|----------|----------|
| CL-194S-WS | 76 | 20 | 50 | 5 | -25~+80 | -30~+85 |

*1 1素子当たりの値です。The values are based on 1-die performance.

*2 IFPの条件はduty 1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|------------------------------------|--------|------------|-----|---------------|---------------|---------|
| 順電圧 Forward Voltage*1 | V_F | $I_F=5mA$ | — | 2.9 | 3.15 | V |
| 逆電流 Reverse Current*1 | I_R | $V_R=5V$ | — | — | 2 | μA |
| 光度 Luminous Intensity*2 | I_v | $I_F=5mA$ | 140 | 260 | — | mcd |
| 色度座標 Chromaticity coordinates*3 | x, y | $I_F=5mA$ | | $x(\pm 0.02)$ | $y(\pm 0.02)$ | |
| | | | a | 0.28 | 0.236 | |
| | | | b | 0.28 | 0.301 | |
| | | | c | 0.34 | 0.386 | |
| d | 0.34 | 0.321 | | | | |

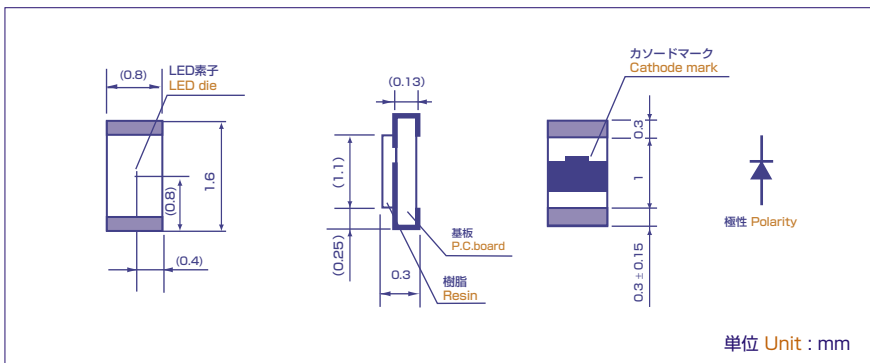
*1 1素子当たりの値です。The values are based on 1-die performance.

*2 NIST規格に準拠、各素子同時点灯の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

*3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

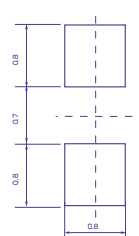
●外形寸法図 Outline drawing



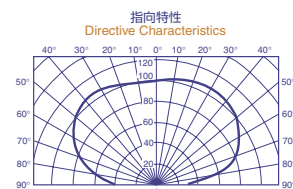
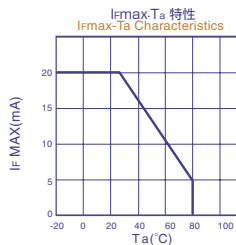
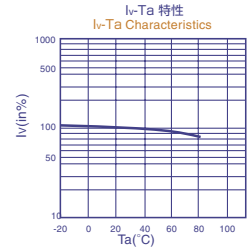
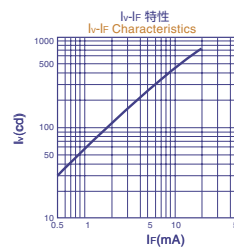
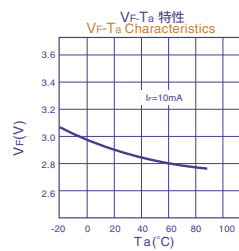
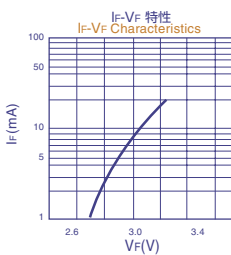
推奨はんだ付けパターン

The following soldering patterns are recommended for reflow soldering:

リフローはんだ用
For reflow soldering

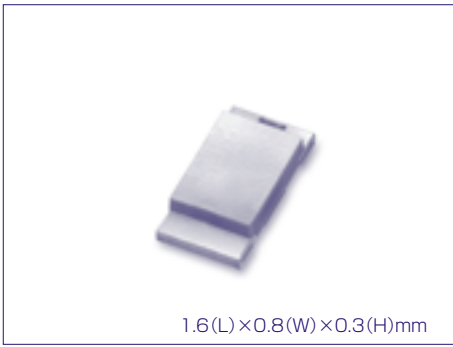


■ 諸特性 Characteristics



CL-194S (R type) Series

Mono-Color Upward-Lighting Type **CL-194S(R type) Series**



● 小型・薄型の広指向性青色LEDです。

● Compact, thin, and wide-directivity blue LED

●絶対最大定格 Absolute Maximum Rating

(Ta 25°C)

| Series | Pd (mW) | I _F (mA) | I _{FP} (mA) | V _R (V) | T _{op} (°C) | T _{st} (°C) |
|------------------|---------|---------------------|----------------------|--------------------|----------------------|----------------------|
| CL-194S (R type) | 35 | 10 | 100*1 | 4 | -25~+80 | -30~+85 |

※1 I_{FP}の条件はduty 1/10、パルス巾30msecです。

※1 Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

●電氣的光学的特性 Electro-optical Characteristics

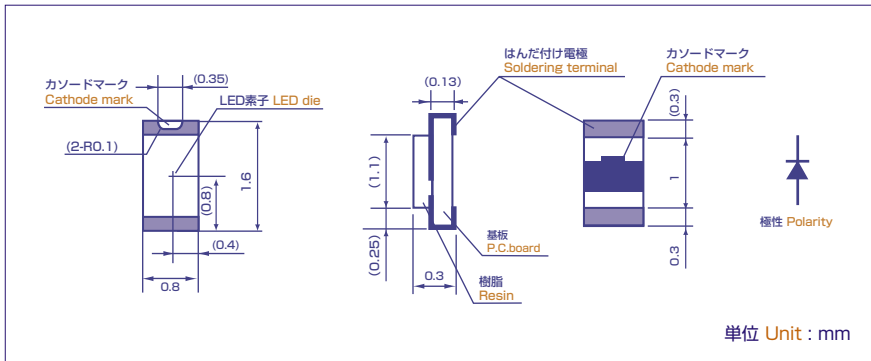
(Ta 25°C)

| Product code | Lighting color | V _F | | | λ _p typ (nm) | Δλ typ (nm) | I _v * | | |
|-----------------------|----------------|---------------------|---------|---------|-------------------------|-------------|---------------------|-----------|-----------|
| | | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) |
| CL-194S(R type)-HB8-R | Blue | 5 | 2.9 | 3.15 | 470 | 26 | 5 | 45 | 65 |

※NIST規格に準拠

※Per NIST standards

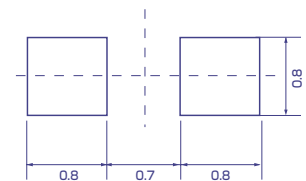
●外形寸法図 Outline drawing



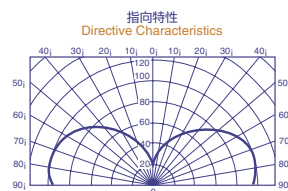
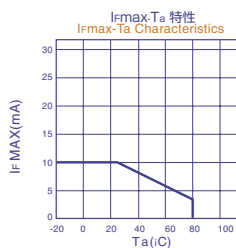
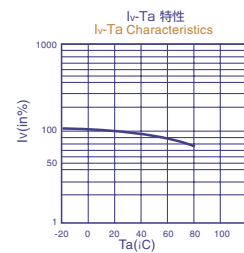
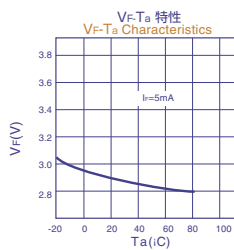
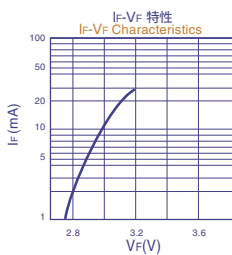
推奨はんだ付けパターン

The following soldering patterns are recommended for reflow-soldering:

リフローはんだ用
For reflow soldering



■ 諸特性 Characteristics



CL-Z194S Series

Mono-Color Upward-Lighting Type **CL-Z194S Series**



1.6(L)×0.8(W)×0.3(H)mm

- 小型・薄型の白色LEDです。
- ツェナーダイオードを搭載し、静電耐圧に優れています。
- Compact and thin white LED
- Zener diode LED, excellent in resistance to electrostatic potential.

●絶対最大定格 Absolute Maximum Rating^{※1} (Ta 25°C)

| Product code | Pd (mW) | If (mA) | Ifp ^{※2} (mA) | V _R (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------------------|--------------------|----------|----------|
| CL-Z194S-WS | 76 | 20 | 100 | 5 | -25~+80 | -30~+85 |

※1 1素子当たりの値です。The values are based on 1-die performance.

※2 Ifpの条件はduty 1/10、パルス巾30msecです。Condition for Ifp is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics (Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|---|----------------|------------|----------|------|----------|------|
| 順電圧 Forward Voltage ^{※1} | V _F | If=5mA | — | 2.9 | 3.15 | V |
| 光度 Luminous Intensity ^{※2} | I _v | If=5mA | — | 260 | — | mcd |
| 色度座標 Chromaticity coordinates ^{※3} | x, y | If=5mA | x(±0.02) | | y(±0.02) | |
| | | | a | 0.28 | 0.236 | |
| | | | b | 0.28 | 0.301 | |
| | | | c | 0.34 | 0.386 | |
| d | 0.34 | 0.321 | | | | |

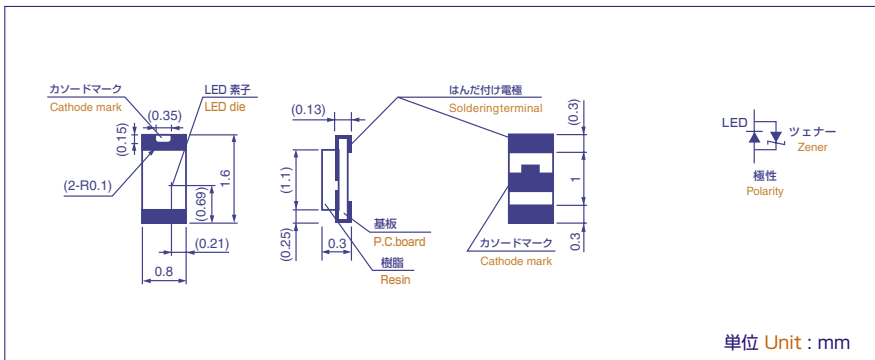
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

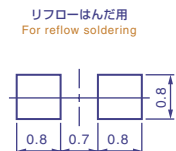
※3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

●外形寸法図 Outline drawing

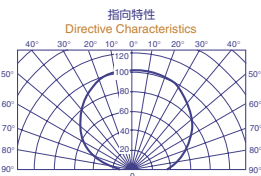
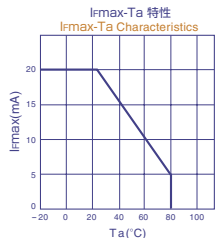
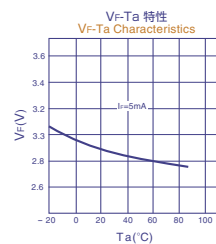
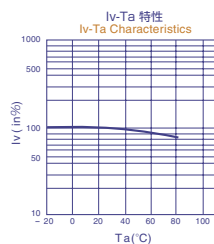
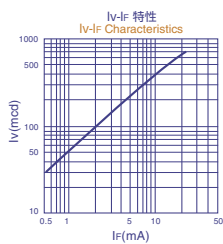
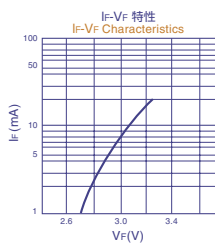


推奨はんだ付けパターン

The following soldering patterns are recommended for reflow soldering:



■ 諸特性 Characteristics



CL-195 Series

Mono-Color Upward-Lighting Type **CL-195 Series**



- 小型のチップLEDです。
- CL-190とコンパチです。

- Compact chip LED
- Compatible with the CL-190 series.

発光色のラインアップにつきましては、発注時にお問い合わせの上、ご確認ください。

Please contact us at the time of order for the lineup of luminescent colors.

●絶対最大定格 Absolute Maximum Rating

(Ta 25°C)

| Product code | Pd (mW) | I _F (mA) | I _{FP} (mA) | V _R (V) | Top (°C) | Tst (°C) |
|---------------------------------------|---------|---------------------|----------------------|--------------------|----------|----------|
| CL-195 (UR,HRを除く Except UR and HR) | 50 | 20 | 100*1 | 5 | -25~+80 | -30~+85 |
| CL-195UR/HR | 78 | 30 | | | | |

※1 I_{FP}の条件はduty 1/10、パルス巾30msecです。

※1 Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

●電光的学的特性 Electro-optical Characteristics

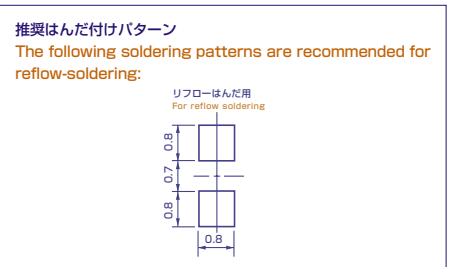
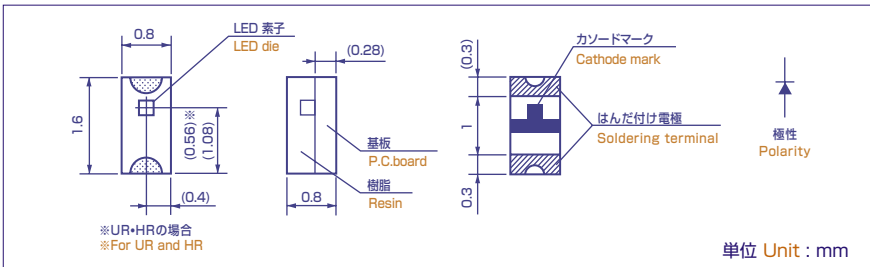
(Ta 25°C)

| Product code | Lighting color | V _F | | | λ _p typ (nm) | Δλ typ (nm) | I _v * (mcd) | | |
|--------------|-------------------------|---------------------|---------|---------|-------------------------|-------------|------------------------|-----------|-----------|
| | | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) |
| CL-195R | Red | 20 | 2.2 | 2.6 | 700 | 100 | 20 | 0.5 | 1.3 |
| CL-195D | Orange | 20 | 2.2 | 2.6 | 605 | 40 | 20 | 2.4 | 7.1 |
| CL-195Y | Yellow | 20 | 2.1 | 2.6 | 589 | 40 | 20 | 2.6 | 6.4 |
| CL-195YG | Yellow green | 20 | 2.2 | 2.6 | 570 | 30 | 20 | 5 | 18 |
| CL-195G | Green | 20 | 2.2 | 2.6 | 567 | 26 | 20 | 2.5 | 10 |
| CL-195FG | Fresh green | 20 | 2.2 | 2.6 | 560 | 26 | 20 | 2.2 | 6.5 |
| CL-195PG | Pure green | 20 | 2.2 | 2.6 | 557 | 24 | 20 | 1 | 3 |
| CL-195SR | Super brightness red | 20 | 2 | 2.6 | 650 | 40 | 20 | 1.5 | 4.3 |
| CL-195SD | Super brightness orange | 20 | 2 | 2.6 | 630 | 40 | 20 | 2 | 6.2 |
| CL-195UR | Ultra brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 3.5 | 13 |
| CL-195HR | High brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 5 | 23 |

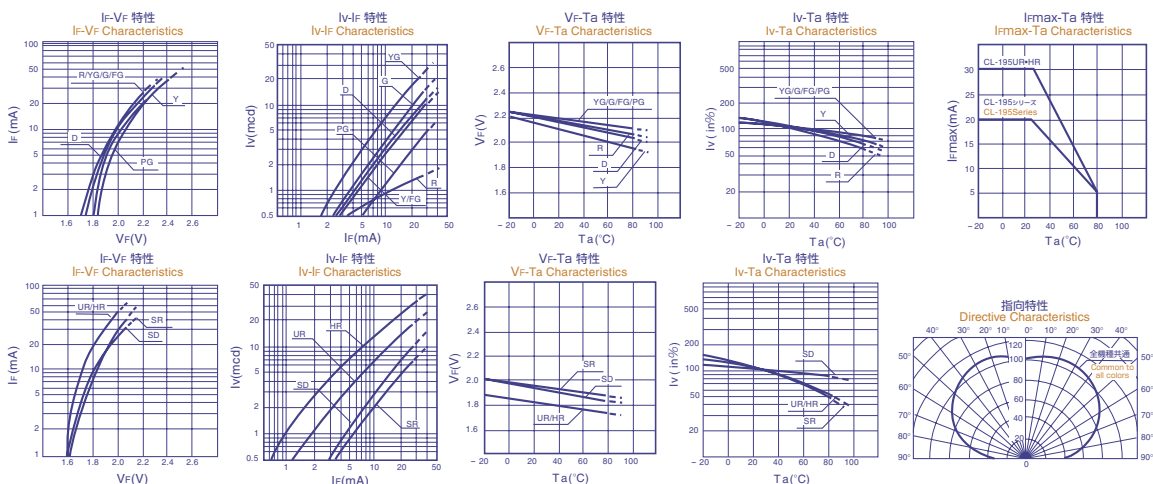
※NIST規格に準拠

※Per NIST standards

●外形寸法図 Outline drawing

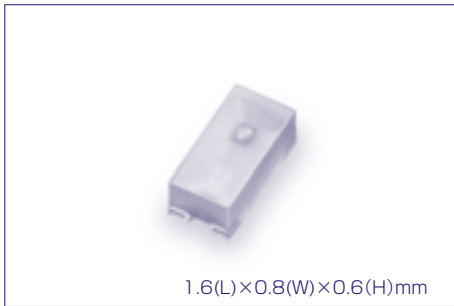


■諸特性 Characteristics



CL-196 Series

Mono-Color Upward-Lighting Type **CL-196 Series**



1.6(L)×0.8(W)×0.6(H)mm

● CL-190の厚み(0.8mm)をさらに薄くした小型チップLEDです。

● Small-sized chip LED even thinner than CL-190(0.8mm thick).

発光色のラインアップにつきましては、発注時にお問い合わせの上、ご確認ください。

Please contact us at the time of order for the lineup of luminescent colors.

●絶対最大定格 Absolute Maximum Rating (Ta 25°C)

| Product code | Pd (mW) | I _F (mA) | I _{FP} (mA) | V _R (V) | Top (°C) | Tst (°C) |
|---------------------------------------|---------|---------------------|----------------------|--------------------|----------|----------|
| CL-196 (UR,HRを除く) Except UR and HR | 50 | 20 | 100※1 | 5 | -25~+80 | -30~+85 |
| CL-196UR/HR | 78 | 30 | | | | |

※1 I_{FP}の条件はduty 1/10、パルス巾30msecです。

※1 Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

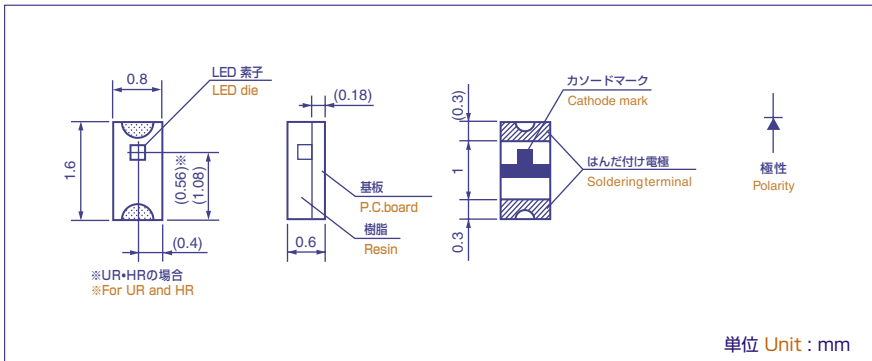
●電気的光学的特性 Electro-optical Characteristics (Ta 25°C)

| Product code | Lighting color | V _F | | | λ _p typ (nm) | Δλ typ (nm) | I _V * (mcd) | | |
|--------------|-------------------------|---------------------|---------|---------|-------------------------|-------------|------------------------|-----------|-----------|
| | | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) |
| CL-196R | Red | 20 | 2.2 | 2.6 | 700 | 100 | 20 | 0.5 | 1.3 |
| CL-196D | Orange | 20 | 2.2 | 2.6 | 605 | 40 | 20 | 2.4 | 7.1 |
| CL-196Y | Yellow | 20 | 2.1 | 2.6 | 589 | 40 | 20 | 2.6 | 6.4 |
| CL-196YG | Yellow green | 20 | 2.2 | 2.6 | 570 | 30 | 20 | 5 | 18 |
| CL-196G | Green | 20 | 2.2 | 2.6 | 567 | 26 | 20 | 2.5 | 10 |
| CL-196FG | Fresh green | 20 | 2.2 | 2.6 | 560 | 26 | 20 | 2.2 | 6.5 |
| CL-196PG | Pure green | 20 | 2.2 | 2.6 | 557 | 24 | 20 | 1 | 3 |
| CL-196SR | Super brightness red | 20 | 2 | 2.6 | 650 | 40 | 20 | 1.5 | 4.3 |
| CL-196SD | Super brightness orange | 20 | 2 | 2.6 | 630 | 40 | 20 | 2 | 6.2 |
| CL-196UR | Ultra brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 3.5 | 13 |
| CL-196HR | High brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 5 | 23 |

※NIST規格に準拠

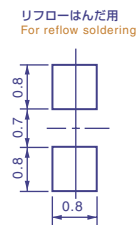
※Per NIST standards

●外形寸法図 Outline drawing

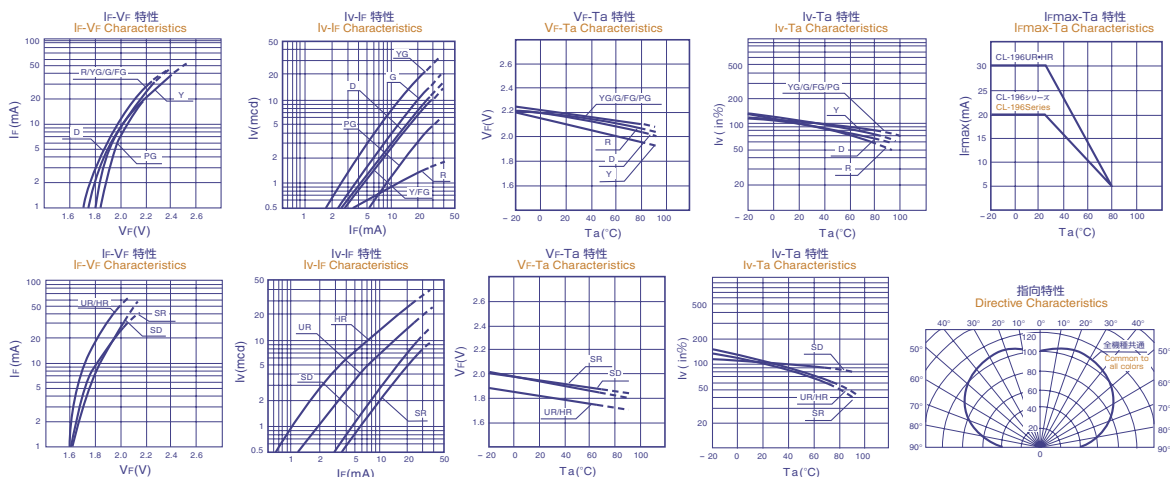


推奨はんだ付けパターン

The following soldering patterns are recommended for reflow soldering:



■諸特性 Characteristics



CL-197 Series

Mono-Color Upward-Lighting Type **CL-197 Series**



1.6(L)×0.8(W)×0.4(H)mm

● 小型・薄型のチップLEDです。

● Compact and thin chip LED

●絶対最大定格 Absolute Maximum Rating (Ta 25°C)

| Series | Pd (mW) | I _F (mA) | I _{FP} (mA) | V _R (V) | T _{op} (°C) | T _{st} (°C) |
|--------|---------|---------------------|----------------------|--------------------|----------------------|----------------------|
| CL-197 | 50 | 20 | 100*1 | 5 | -25~+80 | -30~+85 |

※1 I_{FP}の条件はduty 1/10、パルス巾30msecです。

※1 Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

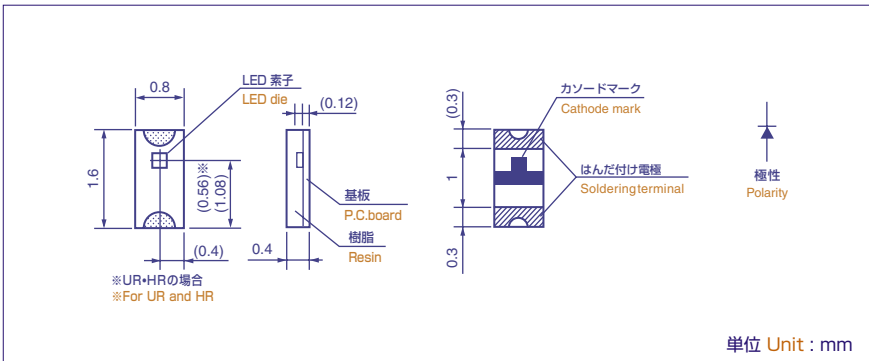
●電氣的光学的特性 Electro-optical Characteristics (Ta 25°C)

| Product code | Lighting color | V _F | | | λ _p typ (nm) | Δλ typ (nm) | I _v * | | |
|--------------|----------------|---------------------|---------|---------|-------------------------|-------------|---------------------|-----------|-----------|
| | | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) |
| CL-197YG | Yellow green | 20 | 2.2 | 2.6 | 570 | 30 | 20 | 5 | 18 |

※NIST規格に準拠

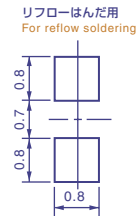
※Per NIST standards

●外形寸法図 Outline drawing

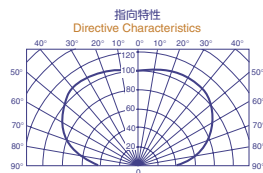
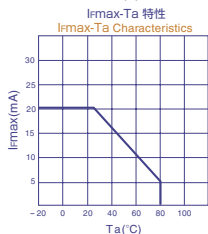
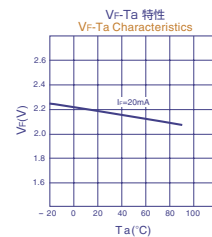
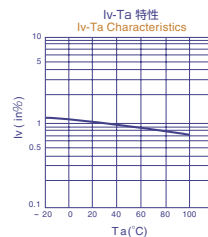
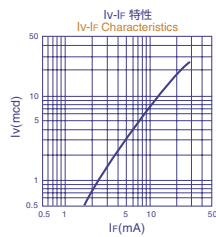
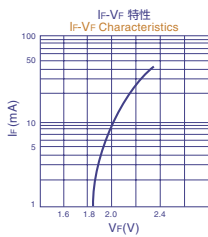


推奨はんだ付けパターン

The following soldering patterns are recommended for reflow-soldering:



■ 諸特性 Characteristics





● 小型・超薄型の白色LEDです。

● Compact and ultra-thin white LED

●絶対最大定格 Absolute Maximum Rating^{※1}

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP ^{※2} (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------------------|--------|----------|----------|
| CL-198N-WS | 38 | 10 | 50 | 5 | -25~+80 | -30~+85 |

※1 1素子当たりの値です。The values are based on 1-die performance.

※2 IFPの条件はduty 1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|--|----------------|---------------------|-----|----------|----------|------|
| 順電圧 Forward Voltage ^{※1} | V _F | I _F =5mA | — | 2.9 | 3.15 | V |
| 逆電流 Reverse Current ^{※1} | I _R | V _R =5V | — | — | 2 | μA |
| 光度 Luminous Intensity ^{※2} | I _v | I _F =5mA | 150 | 300 | — | mcd |
| 色度座標 Chromaticity coordinates ^{※3} | x, y | I _F =5mA | | x(±0.02) | y(±0.02) | |
| | | | a | 0.28 | 0.24 | |
| | | | b | 0.28 | 0.30 | |
| | | | c | 0.35 | 0.39 | |
| d | 0.35 | 0.29 | | | | |

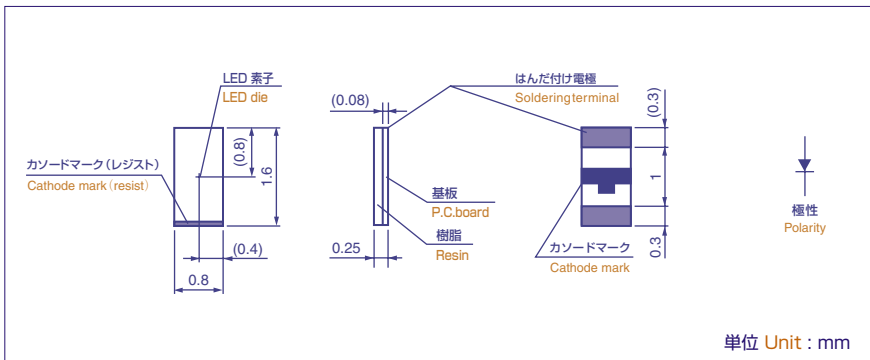
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

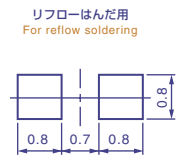
※3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

●外形寸法図 Outline drawing

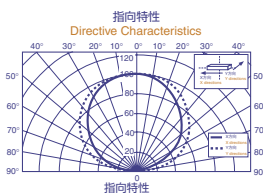
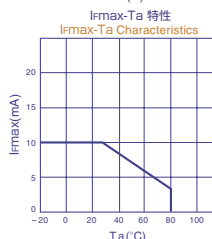
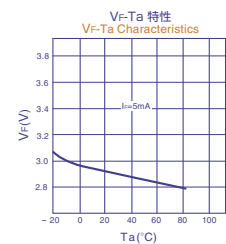
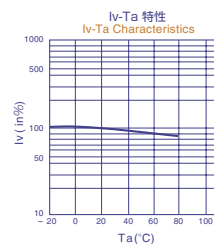
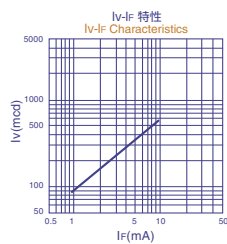
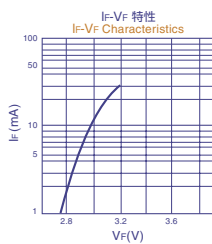


推奨はんだ付けパターン

The following soldering patterns are recommended for reflow soldering:



■ 諸特性 Characteristics



CL-198S Series

Mono-Color Upward-Lighting Type **CL-198S Series**



- 小型・超薄型の白色LEDです。
- Compact and ultra-thin white LED

●絶対最大定格 Absolute Maximum Rating^{※1}

(Ta 25°C)

| Product code | Pd (mW) | I _F (mA) | I _{FP} ^{※2} (mA) | V _R (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------------------|------------------------------------|--------------------|----------|----------|
| CL-198S-WS | 76 | 20 | 50 | 5 | -25~+80 | -30~+85 |

※1 1素子当たりの値です。The values are based on 1-die performance.

※2 I_{FP}の条件はduty 1/10、パルス巾30msecです。Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|---|----------------|---------------------|----------|------|----------|------|
| 順電圧 Forward Voltage ^{※1} | V _F | I _F =5mA | — | 2.9 | 3.15 | V |
| 逆電流 Reverse Current ^{※1} | I _R | V _R =5V | — | — | 2 | μA |
| 光度 Luminous Intensity ^{※2} | I _v | I _F =5mA | 180 | 260 | — | mcd |
| 色度座標 Chromaticity coordinates ^{※3} | x, y | I _F =5mA | x(±0.02) | | y(±0.02) | |
| | | | a | 0.28 | 0.24 | |
| | | | b | 0.28 | 0.30 | |
| | | | c | 0.35 | 0.39 | |
| d | 0.35 | 0.29 | | | | |

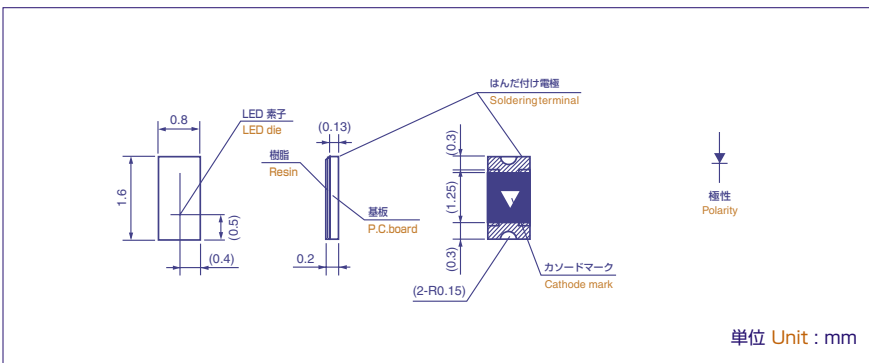
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

※3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

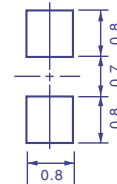
●外形寸法図 Outline drawing



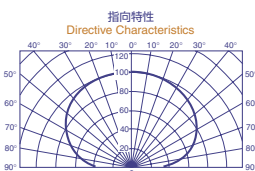
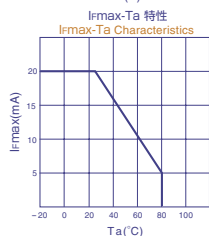
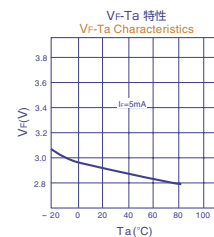
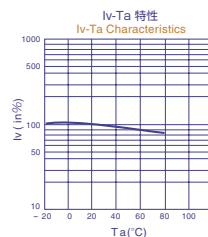
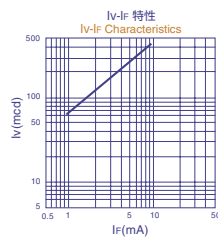
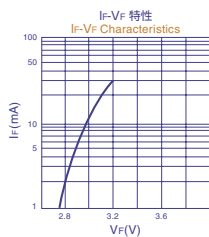
推奨はんだ付けパターン

The following soldering patterns are recommended for reflow soldering:

リフローはんだ用
For reflow soldering



■ 諸特性 Characteristics



CL-198T Series

Mono-Color Upward-Lighting Type **CL-198T Series**



1.6(L)×0.8(W)×0.2(H)mm

● 小型・超薄型の白色LEDです。

● Compact and ultra-thin white LED

●絶対最大定格 Absolute Maximum Rating^{*1}

(Ta 25°C)

| Product code | Pd (mW) | If (mA) | Ifp ^{*2} (mA) | V _R (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------------------|--------------------|----------|----------|
| CL-198T-WZ | 33 | 10 | 50 | 5 | -25~+80 | -30~+85 |

^{*1} 1素子当たりの値です。The values are based on 1-die performance.

^{*2} Ifpの条件はduty 1/10、パルス巾30msecです。Condition for Ifp is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|--|----------------|--------------------|-----|----------|----------|------|
| 順電圧 Forward Voltage ^{*1} | V _F | If=5mA | — | 2.9 | 3.15 | V |
| 逆電流 Reverse Current ^{*1} | I _R | V _R =5V | — | — | 2 | μA |
| 光度 Luminous Intensity ^{*2} | I _v | If=5mA | — | 250 | — | mcd |
| 色度座標 Chromaticity coordinates ^{*3} | x, y | If=5mA | | x(±0.02) | y(±0.02) | |
| | | | a | 0.28 | 0.236 | |
| | | | b | 0.28 | 0.301 | |
| | | | c | 0.34 | 0.386 | |
| d | 0.34 | 0.353 | | | | |

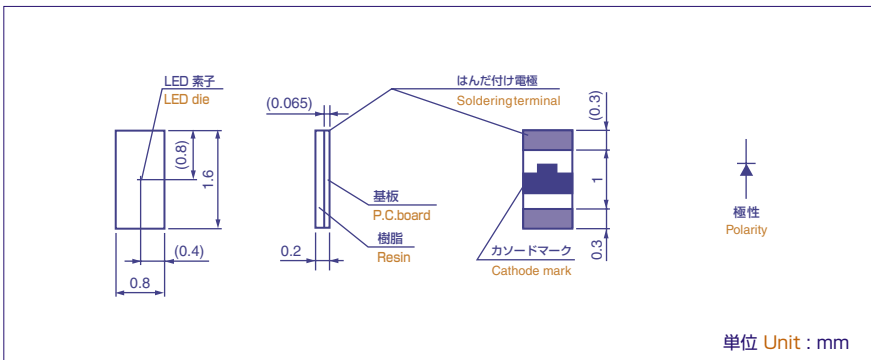
^{*1} 1素子当たりの値です。The values are based on 1-die performance.

^{*2} NIST規格に準拠、各素子同時点灯の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

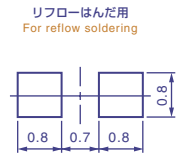
^{*3} 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

●外形寸法図 Outline drawing

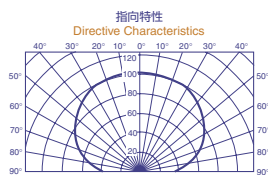
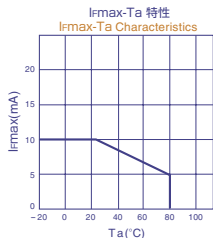
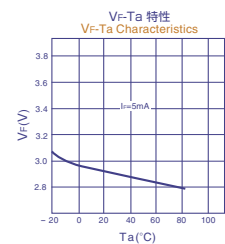
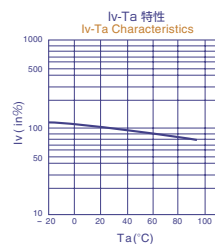
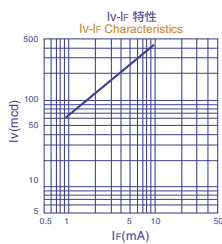
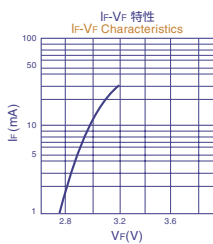


推奨はんだ付けパターン

The following soldering patterns are recommended for reflow soldering:

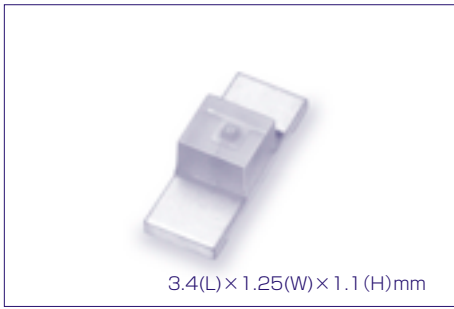


■ 諸特性 Characteristics



CL-260 Series

Mono-Color Upward-Lighting Type **CL-260 Series**



3.4(L)×1.25(W)×1.1(H)mm

- 小型のチップLEDです。
- チップマウンターにより、プリント基板背面からの自動実装が可能です。
- プリント基板穴に発光面を挿入することにより、トータルな薄型化が実現できます。
- プリント基板穴は、丸穴に対応しています。

- Compact chip LED
- Mountable from bottom surface of P.C. board by chip mounter.
- Thinner total height can be obtained by means of fitting lens portion into the cutout provided on the P.C. board.
- Designed for circular cutout on P.C. board.

発光色のラインアップにつきましては、発注時にお問い合わせの上、ご確認ください。

Please contact us at the time of order for the lineup of luminescent colors.

●絶対最大定格 Absolute Maximum Rating

(Ta 25°C)

| Product code | Pd (mW) | I _F (mA) | I _{FP} (mA) | V _R (V) | Top (°C) | Tst (°C) |
|---------------------------------------|---------|---------------------|----------------------|--------------------|----------|----------|
| CL-260 (UR,HRを除く Except UR and HR) | 65 | 25 | 100*1 | 5 | -25~+80 | -30~+85 |
| CL-260UR/HR | 78 | 30 | | | | |

※1 I_{FP}の条件はduty 1/10、パルス巾30msecです。

※1 Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

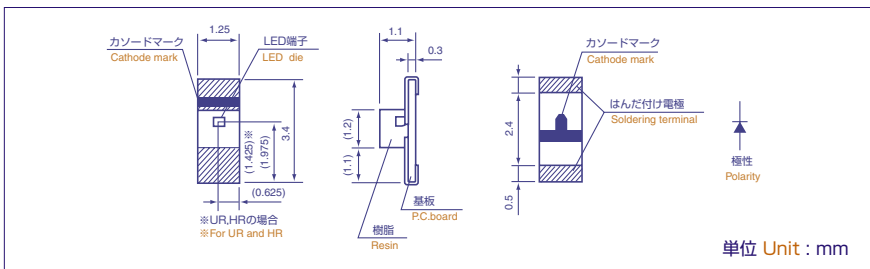
(Ta 25°C)

| Product code | Lighting color | V _F | | | λ _p typ (nm) | Δλ typ (nm) | I _V * (mcd) | | |
|--------------|-------------------------|---------------------|---------|---------|-------------------------|-------------|------------------------|-----------|-----------|
| | | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) |
| CL-260R | Red | 20 | 2.2 | 2.6 | 700 | 100 | 20 | 0.5 | 1.3 |
| CL-260D | Orange | 20 | 2.2 | 2.6 | 605 | 40 | 20 | 2.4 | 7.1 |
| CL-260Y | Yellow | 20 | 2.1 | 2.6 | 589 | 40 | 20 | 2.6 | 6.4 |
| CL-260YG | Yellow green | 20 | 2.2 | 2.6 | 570 | 30 | 20 | 5 | 18 |
| CL-260G | Green | 20 | 2.2 | 2.6 | 567 | 26 | 20 | 2.5 | 10 |
| CL-260FG | Fresh green | 20 | 2.2 | 2.6 | 560 | 26 | 20 | 2.2 | 6.5 |
| CL-260PG | Pure green | 20 | 2.2 | 2.6 | 557 | 24 | 20 | 1 | 3 |
| CL-260SR | Super brightness red | 20 | 2 | 2.6 | 650 | 40 | 20 | 1.5 | 4.3 |
| CL-260SD | Super brightness orange | 20 | 2 | 2.6 | 630 | 40 | 20 | 2 | 6.2 |
| CL-260UR | Ultra brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 3.5 | 13 |
| CL-260HR | High brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 5 | 23 |

※NIST規格に準拠

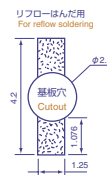
※Per NIST standards

●外形寸法図 Outline drawing

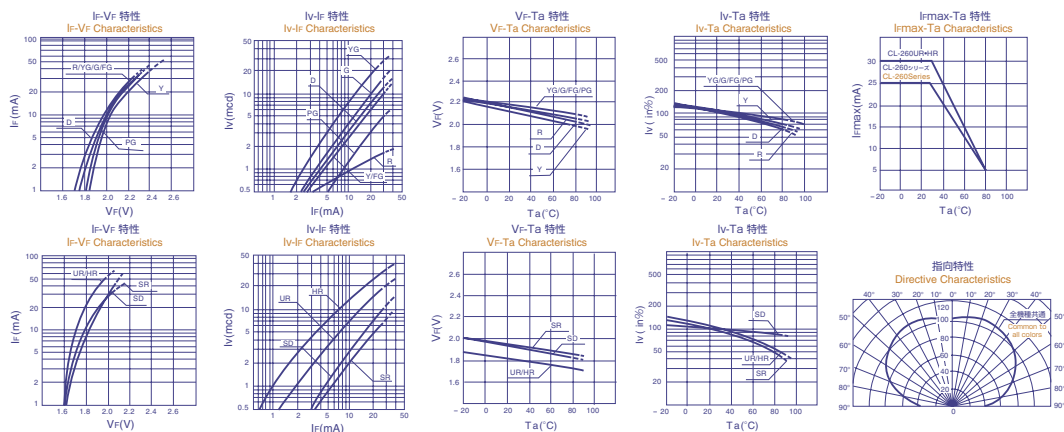


推奨はんだ付けパターン

The following soldering patterns are recommended for reflow-soldering:



■ 諸特性 Characteristics



CL-281 Series

Mono-Color Upward-Lighting Type **CL-281 Series**



- 超小型のチップLEDです。
- 光度は、弊社小型サイズ品と同様の特性を有しています。
- Compact chip LED
- Brightness and other properties are the same as those of our other compact products.

発光色のラインアップにつきましては、発注時にお問い合わせの上、ご確認ください。
Please contact us at the time of order for the lineup of luminescent colors.

●絶対最大定格 Absolute Maximum Rating (Ta 25°C)

| Product code | Pd (mW) | I _F (mA) | I _{FP} (mA) | V _R (V) | Top (°C) | Tst (°C) |
|---|---------|---------------------|----------------------|--------------------|----------|----------|
| CL-281 (UR,HRを除く) (Except UR and HR) | 50 | 20 | 100※1 | 5 | -25~+80 | -30~+85 |
| CL-281UR/HR | 78 | 30 | | | | |

※1 I_{FP}の条件はduty 1/10、パルス巾30msecです。

※1 Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

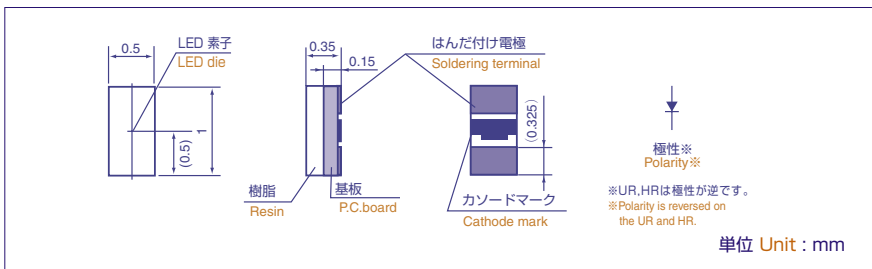
●電気的光学的特性 Electro-optical Characteristics (Ta 25°C)

| Product code | Lighting color | V _F | | | λ _p (nm) | Δλ (nm) | I _V * (mcd) | | |
|--------------|-------------------------|---------------------|---------|---------|---------------------|---------|------------------------|-----------|-----------|
| | | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) |
| CL-281R | Red | 20 | 2.2 | 2.6 | 700 | 100 | 20 | 0.5 | 1.3 |
| CL-281D | Orange | 20 | 2.2 | 2.6 | 605 | 40 | 20 | 2.4 | 7.1 |
| CL-281Y | Yellow | 20 | 2.1 | 2.6 | 589 | 40 | 20 | 2.6 | 6.4 |
| CL-281YG | Yellow green | 20 | 2.2 | 2.6 | 570 | 30 | 20 | 5 | 18 |
| CL-281G | Green | 20 | 2.2 | 2.6 | 567 | 26 | 20 | 2.5 | 10 |
| CL-281FG | Fresh green | 20 | 2.2 | 2.6 | 560 | 26 | 20 | 2.2 | 6.5 |
| CL-281PG | Pure green | 20 | 2.2 | 2.6 | 557 | 24 | 20 | 1 | 3 |
| CL-281SR | Super brightness red | 20 | 2 | 2.6 | 650 | 40 | 20 | 1.5 | 4.3 |
| CL-281SD | Super brightness orange | 20 | 2 | 2.6 | 630 | 40 | 20 | 2 | 6.2 |
| CL-281UR | Ultra brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 3.5 | 13 |
| CL-281HR | High brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 5 | 23 |

※NIST規格に準拠

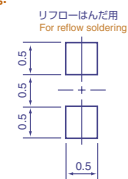
※Per NIST standards

●外形寸法図 Outline drawing

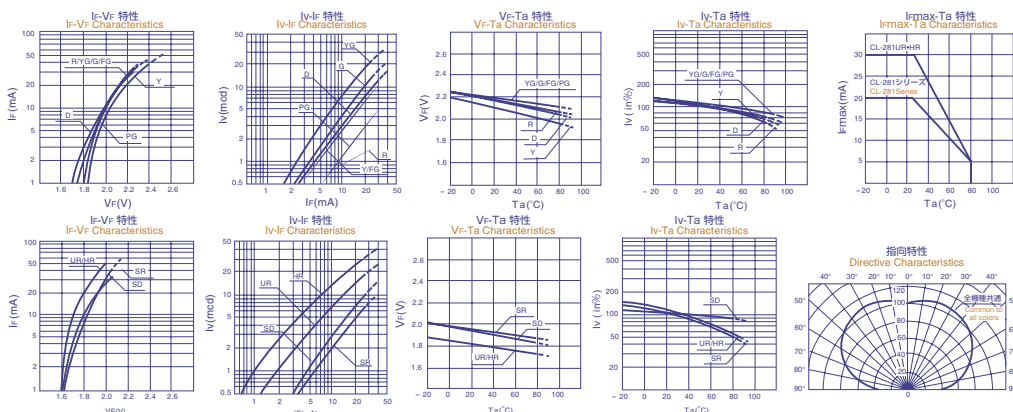


推奨はん付けパターン

The following soldering patterns are recommended for reflow-soldering:



■諸特性 Characteristics



CL-282S Series

Mono-Color Upward-Lighting Type **CL-282S Series**



1.0(L)×0.5(W)×0.2(H)mm

● 超小型・超薄型の白色LEDです。

● Ultra-compact and ultra-thin white LED

●絶対最大定格 Absolute Maximum Rating^{※1}

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP ^{※2} (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------------------|--------|----------|----------|
| CL-282S-WZ | 33 | 10 | 50 | 5 | -25~+80 | -30~+85 |

※1 1素子当たりの値です。The values are based on 1-die performance.

※2 IFPの条件はduty 1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|---|----------------|---------------------|----------|------|----------|------|
| 順電圧 Forward Voltage ^{※1} | V _F | I _F =5mA | — | 2.9 | 3.15 | V |
| 逆電流 Reverse Current ^{※1} | I _R | V _R =5V | — | — | 2 | μA |
| 光度 Luminous Intensity ^{※2} | I _v | I _F =5mA | — | 250 | — | mcd |
| 色度座標 Chromaticity coordinates ^{※3} | x, y | I _F =5mA | x(±0.02) | | y(±0.02) | |
| | | | a | 0.28 | 0.236 | |
| | | | b | 0.28 | 0.301 | |
| | | | c | 0.34 | 0.386 | |
| d | 0.34 | 0.353 | | | | |

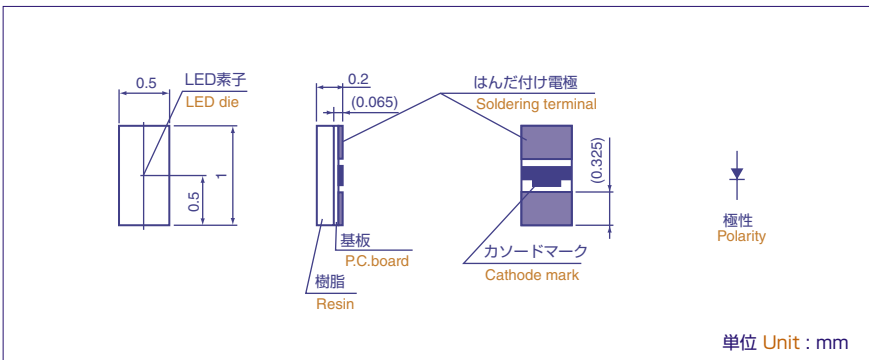
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

※3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

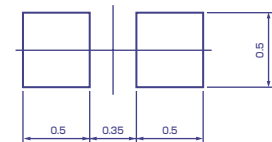
●外形寸法図 Outline drawing



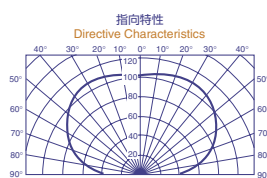
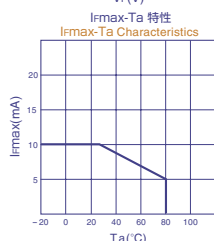
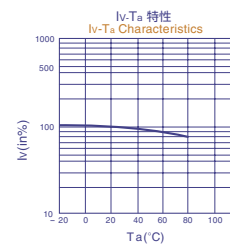
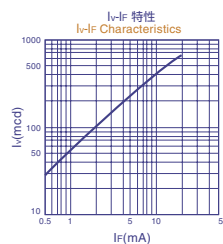
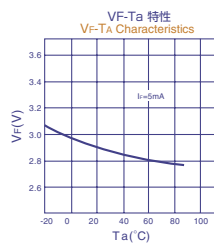
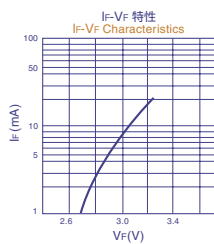
推奨はんだ付けパターン

The following soldering patterns are recommended for reflow soldering:

リフローはんだ用
For reflow soldering



■ 諸特性 Characteristics





1.0(L)×0.5(W)×0.25(H)mm

● 超小型の白色LEDです。

● Ultra-compact white LED

●絶対最大定格 Absolute Maximum Rating*1

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP*2 (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------|--------|----------|----------|
| CL-287S-WQ | 66 | 20 | 100 | 5 | -25~+80 | -30~+85 |
| CL-287S-WS | 33 | 10 | 50 | 5 | -25~+80 | -30~+85 |

*1 1素子当たりの値です。The values are based on 1-die performance.

*2 IFPの条件はduty 1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit | |
|------------------------------------|--------|----------------------|-------------------|------|-------|------|--|
| 順電圧 Forward Voltage*1 | VF | CL-287S-WQ IF=5mA | — | 2.7 | 3.05 | V | |
| | | CL-287S-WS IF=5mA | — | 2.9 | 3.15 | | |
| 逆電流 Reverse Current*1 | IR | VR=5V | — | — | 2 | μA | |
| 光度 Luminous Intensity*2 | Iv | CL-287S-WQ IF=5mA | 165 | 350 | — | mcd | |
| | | CL-287S-WS IF=5mA | 150 | 250 | — | | |
| 色度座標 Chromaticity coordinates*3 | x, y | IF=5mA | x(±0.02) y(±0.02) | | | | |
| | | | a | 0.28 | 0.236 | | |
| | | | b | 0.28 | 0.301 | | |
| | | | c | 0.34 | 0.386 | | |
| | | | d | 0.34 | 0.353 | | |

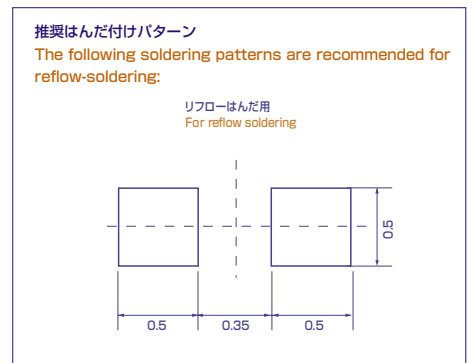
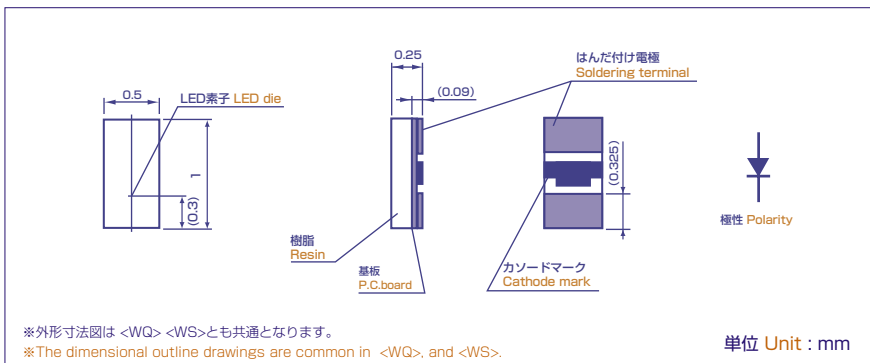
*1 1素子当たりの値です。The values are based on 1-die performance.

*2 NIST規格に準拠、各素子同時点灯の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

*3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d

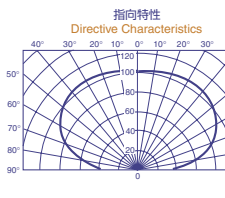
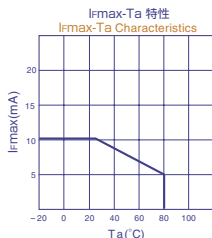
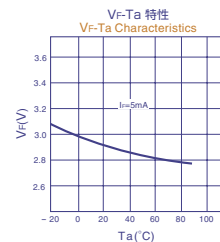
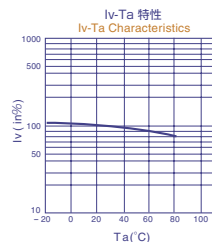
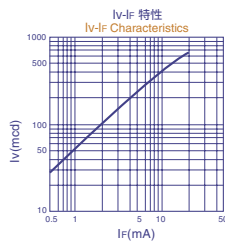
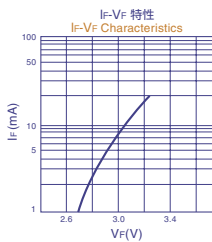
●外形寸法図 Outline drawing



■ 諸特性 Characteristics

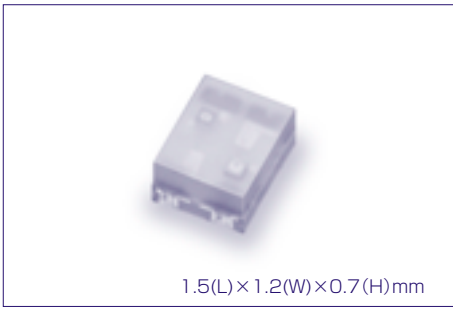
* <WQ>につきましてはカタログ不掲載のため、詳細につきましてはお問い合わせください。

* <WS> are not listed in this catalog. Please consult with us for details.



CL-165 Series

Multi-Color Upward-Lighting Type **CL-165 Series**



●絶対最大定格 Absolute Maximum Rating (Ta 25°C)

| Series | Lighting color | P ^{※1} (mW) | Pd (mW) | I _F (mA) | I _{FP} (mA) | V _R (V) | Top (°C) | Tst (°C) |
|--------|----------------|----------------------|---------|---------------------|----------------------|--------------------|----------|----------|
| CL-165 | YG | 90 | 65 | 25 | 100 ^{※2} | 5 | -25~+80 | -30~+85 |
| | HR | | 78 | 30 | | | | |

- ※1 Pは同時点灯時の全許容損失を示します。
- ※1 P means total value of power dissipation when both colors are on.
- ※2 I_{FP}の条件はduty 1/10、パルス巾30msecです。
- ※2 Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

● 2色発光タイプの小型チップLEDです。

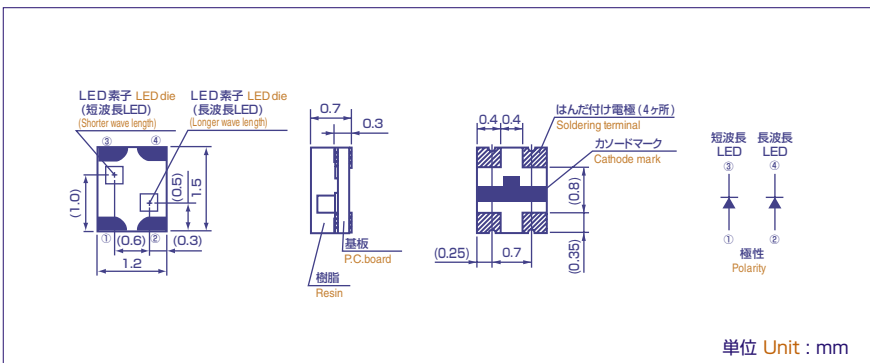
● 2-colored illuminated type compact chip LED

●電気的光学的特性 Electro-optical Characteristics (Ta 25°C)

| Product code | Lighting color | V _F | | | λ _p typ (nm) | Δλ typ (nm) | I _v [*] | | |
|--------------|---------------------|---------------------|---------|---------|-------------------------|-------------|-----------------------------|-----------|-----------|
| | | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) |
| CL-165HR/YG | Yellow green | 20 | 2.2 | 2.6 | 570 | 30 | 20 | 5.0 | 18 |
| | High brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 5.0 | 23 |

- ※NIST規格に準拠
- ※Per NIST standards

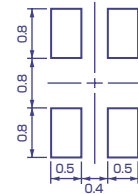
●外形寸法図 Outline drawing



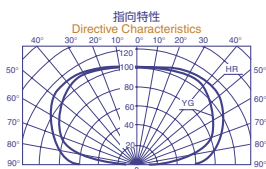
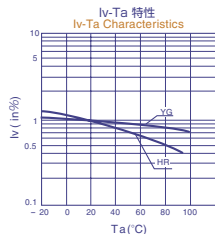
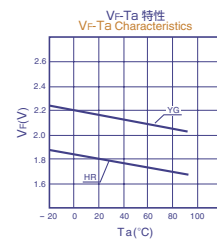
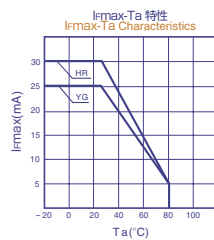
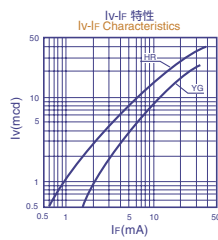
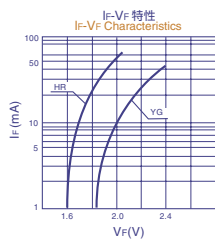
推奨はんだ付けパターン

The following soldering patterns are recommended for reflow soldering:

リフローはんだ用
For reflow soldering



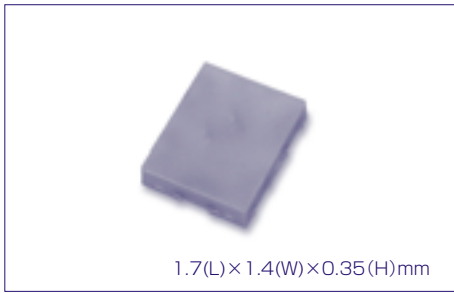
■ 諸特性 Characteristics



CL-340 Series

NEW

Multi-Color Upward-Lighting Type **CL-340 Series**



1.7(L)×1.4(W)×0.35(H)mm

● 同一パッケージで赤、青、緑の3色に発光する小型・薄型チップLEDです。

● 3 colors of red, blue, and green compact and thin chip LEDs in one package

●絶対最大定格 Absolute Maximum Rating (Ta 25°C)

| Series | Lighting color | P*1 (mW) | Pd (mW) | If (mA) | IFP (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------|----------------|----------|---------|---------|----------|--------|----------|----------|
| CL-340 | TR1 | 125 | 78 | 30 | 100*2 | 5 | -25~+80 | -30~+85 |
| | HGC | | 76 | 20 | | | | |
| | HBC | | 72 | 20 | | | | |

※1 Pは同時点灯時の全許容損失を示します。

※1 P means total value of power dissipation when both colors are on.

※2 IFPの条件はduty 1/10、パルス巾0.1msecです。

※2 Condition for IFP is pulse of 1/10 duty and 0.1 msec width.

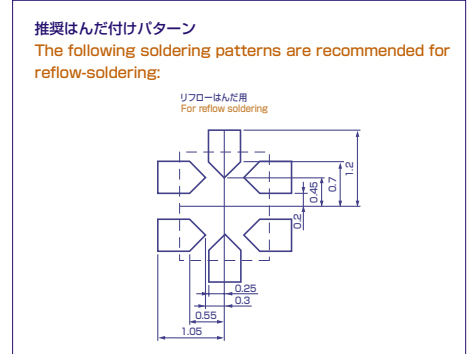
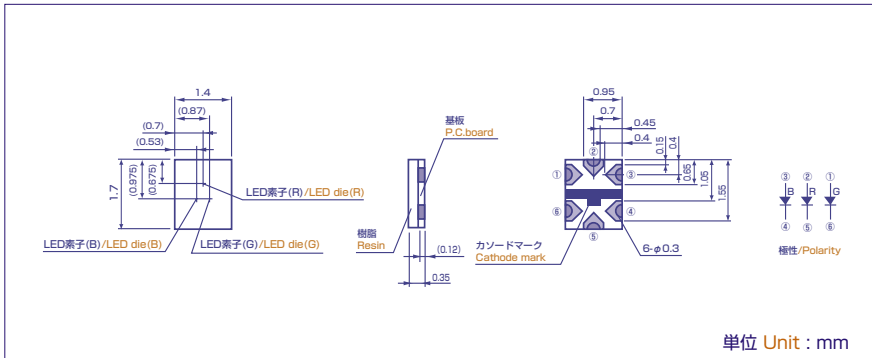
●電氣的光学的特性 Electro-optical Characteristics (Ta 25°C)

| Product code | Lighting color | VF | | | λp typ (nm) | IV* | | |
|--------------|----------------|---------|---------|---------|-------------|---------|-----------|-----------|
| | | If (mA) | typ (V) | max (V) | | If (mA) | min (mcd) | typ (mcd) |
| CL-340 | TR1 | 5 | 1.85 | 2.4 | 618 | 5 | 18 | 36 |
| | HGC | 5 | 2.7 | 3.1 | 530 | 5 | 60 | 180 |
| | HBC | 5 | 2.75 | 3.1 | 470 | 5 | 12 | 40 |

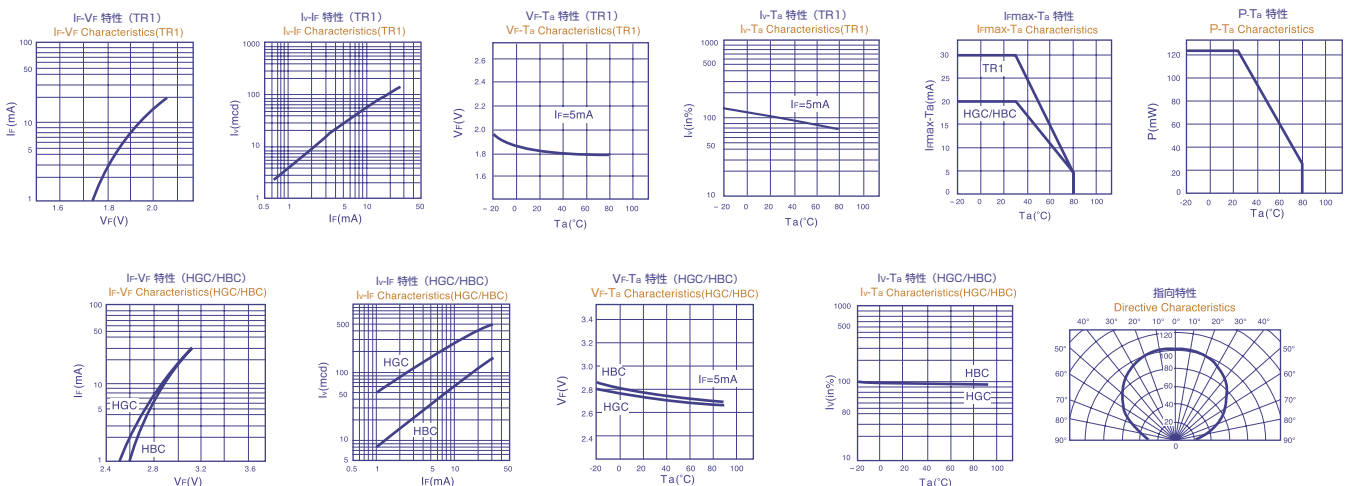
※NIST規格に準拠

※Per NIST standards

●外形寸法図 Outline drawing



■諸特性 Characteristics



CL-501 Series

Multi-Color Upward-Lighting Type **CL-501 Series**



● 同一パッケージで赤、青、緑の3色に発光する小型チップLEDです。

● 3 colors of red, blue, and green compact chip LEDs in one package

●絶対最大定格 Absolute Maximum Rating

(Ta 25°C)

| Series | Lighting color | P ^{※1} (mW) | Pd (mW) | If (mA) | Ifp (mA) | Vr (V) | Top (°C) | Tst (°C) |
|--------|----------------|----------------------|---------|---------|-------------------|--------|----------|----------|
| CL-501 | TR1 | 125 | 78 | 30 | 100 ^{※2} | 5 | -25~+80 | -30~+85 |
| | HGC | | 76 | 20 | | | | |
| | HBC | | 72 | 20 | | | | |

※1 Pは同時点灯時の全許容損失を示します。

※1 P means total value of power dissipation when both colors are on.

※2 Ifpの条件はduty 1/10、パルス巾0.1msecです。

※2 Condition for Ifp is pulse of 1/10 duty and 0.1 msec width.

●電氣的光学的特性 Electro-optical Characteristics

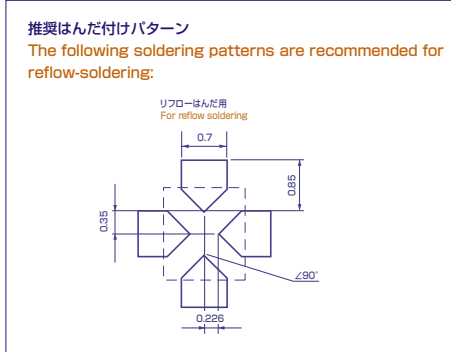
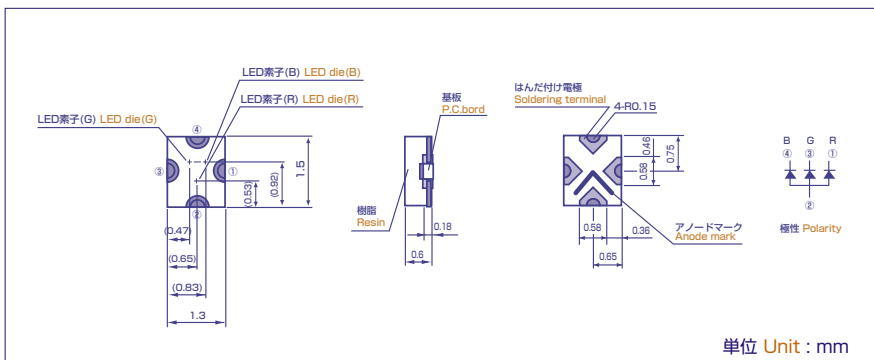
(Ta 25°C)

| Product code | Lighting color | VF | | | λp typ (nm) | Iv [*] | | |
|--------------|----------------|---------|---------|---------|-------------|-----------------|-----------|-----------|
| | | If (mA) | typ (V) | max (V) | | If (mA) | min (mcd) | typ (mcd) |
| CL-501G | TR1 | 5 | 1.85 | 2.4 | 618 | 5 | 18 | 36 |
| | HGC | 5 | 2.7 | 3.1 | 530 | 5 | 60 | 180 |
| | HBC | 5 | 2.75 | 3.1 | 470 | 5 | 12 | 40 |

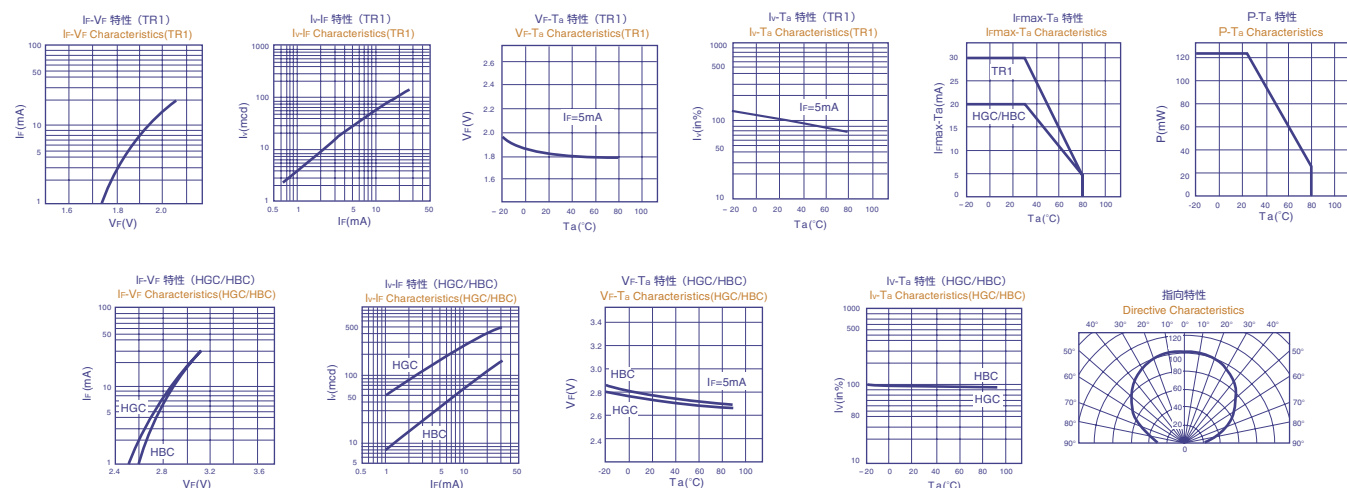
※NIST規格に準拠

※Per NIST standards

●外形寸法図 Outline drawing

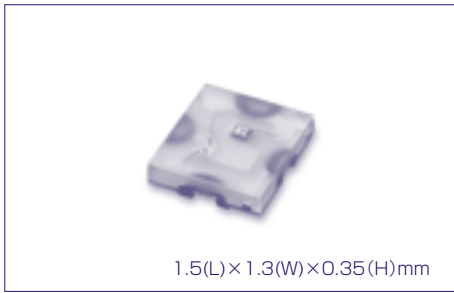


■ 諸特性 Characteristics



CL-503 Series

Multi-Color Upward-Lighting Type **CL-503 Series**



● 同一パッケージで赤、青、緑の3色に発光する小型・薄型チップLEDです。

● 3 colors of red, blue, and green compact and thin chip LEDs in one package

●絶対最大定格 Absolute Maximum Rating (Ta 25°C)

| Series | Lighting color | P*1 (mW) | Pd (mW) | If (mA) | IFP (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------|----------------|----------|---------|---------|----------|--------|----------|----------|
| CL-503 | TR1 | 125 | 78 | 30 | 100*2 | 5 | -25~+80 | -30~+85 |
| | HGC | | 76 | 20 | | | | |
| | HBC | | 72 | 20 | | | | |

※1 Pは同時点灯時の全許容損失を示します。

※1 P means total value of power dissipation when both colors are on.

※2 IFPの条件はduty 1/10、パルス巾0.1msecです。

※2 Condition for IFP is pulse of 1/10 duty and 0.1msec width.

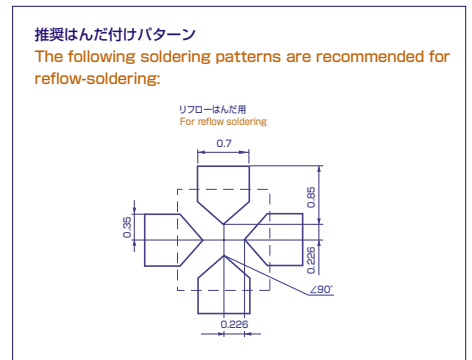
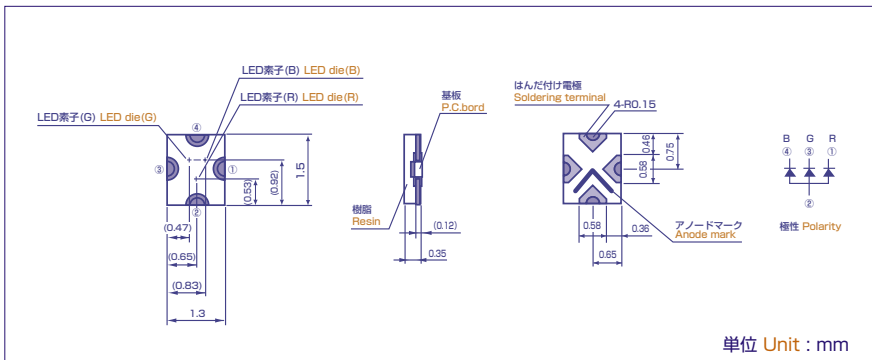
●電氣的光学的特性 Electro-optical Characteristics (Ta 25°C)

| Product code | Lighting color | VF | | | λp typ (nm) | IV* | | |
|--------------|----------------|---------|---------|---------|-------------|---------|-----------|-----------|
| | | If (mA) | typ (V) | max (V) | | If (mA) | min (mcd) | typ (mcd) |
| CL-503 | TR1 | 5 | 1.85 | 2.4 | 618 | 5 | 18 | 36 |
| | HGC | 5 | 2.7 | 3.1 | 530 | 5 | 60 | 180 |
| | HBC | 5 | 2.75 | 3.1 | 470 | 5 | 12 | 40 |

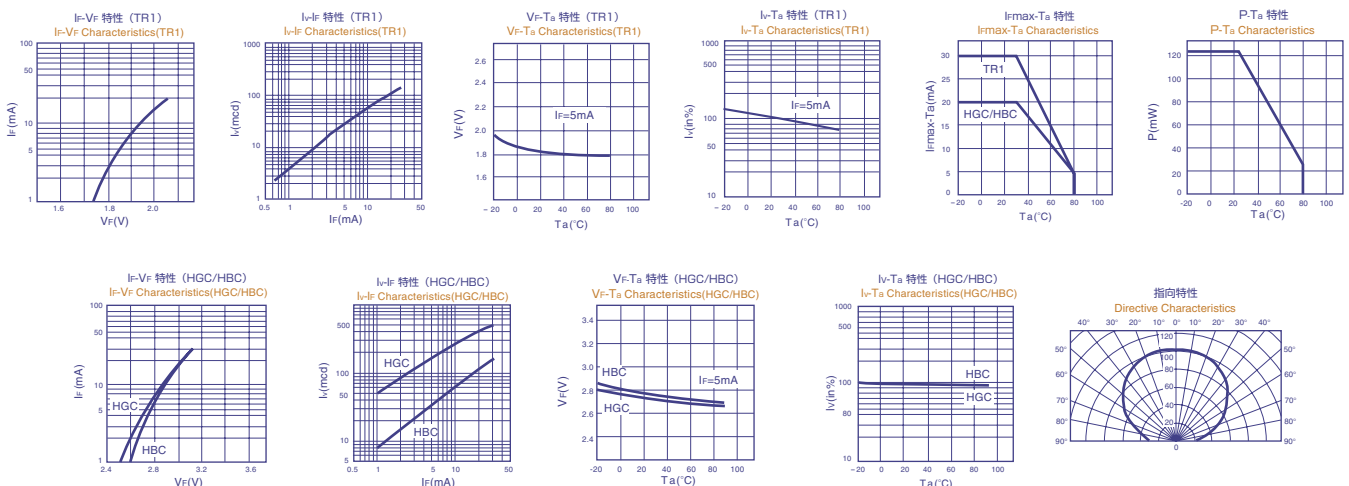
※NIST規格に準拠

※Per NIST standards

●外形寸法図 Outline drawing

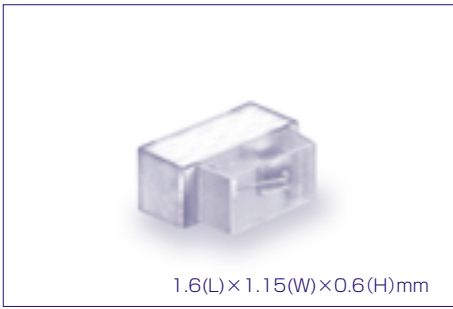


■諸特性 Characteristics



CL-270 Series

Mono-Color Side-Lighting Type **CL-270 Series**



1.6(L)×1.15(W)×0.6(H)mm

● 小型のチップLEDです。

● Compact chip LED

発光色のラインアップにつきましては、発注時にお問い合わせの上、ご確認ください。

Please contact us at the time of order for the lineup of luminescent colors.

●絶対最大定格 Absolute Maximum Rating

(Ta 25°C)

| Product code | Pd (mW) | If (mA) | Ifp (mA) | Vr (V) | Top (°C) | Tst (°C) |
|---------------------------------------|---------|---------|----------|--------|----------|----------|
| CL-270 (UR,HRを除く Except UR and HR) | 50 | 20 | 100*1 | 5 | -25~+80 | -30~+85 |
| CL-270UR/HR | 78 | 30 | | | | |

*1 Ifpの条件はduty 1/10、パルス巾30msecです。

*1 Condition for Ifp is pulse of 1/10 duty and 30msec width.

●電氣的光学的特性 Electro-optical Characteristics

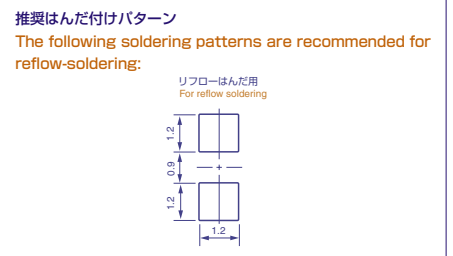
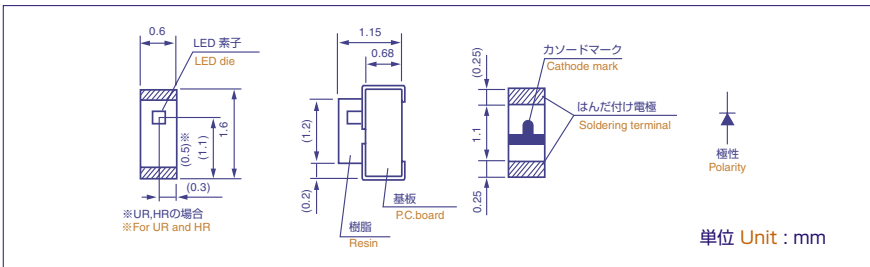
(Ta 25°C)

| Product code | Lighting color | VF | | | λp typ (nm) | Δλ typ (nm) | Iv* | | |
|--------------|-------------------------|---------|---------|---------|-------------|-------------|---------|-----------|-----------|
| | | If (mA) | typ (V) | max (V) | | | If (mA) | min (mcd) | typ (mcd) |
| CL-270R | Red | 20 | 2.2 | 2.6 | 700 | 100 | 20 | 0.5 | 1.3 |
| CL-270D | Orange | 20 | 2.2 | 2.6 | 605 | 40 | 20 | 2.4 | 7.1 |
| CL-270Y | Yellow | 20 | 2.1 | 2.6 | 589 | 40 | 20 | 2.6 | 6.4 |
| CL-270YG | Yellow green | 20 | 2.2 | 2.6 | 570 | 30 | 20 | 5 | 18 |
| CL-270G | Green | 20 | 2.2 | 2.6 | 567 | 26 | 20 | 2.5 | 10 |
| CL-270FG | Fresh green | 20 | 2.2 | 2.6 | 560 | 26 | 20 | 2.2 | 6.5 |
| CL-270PG | Pure green | 20 | 2.2 | 2.6 | 557 | 24 | 20 | 1 | 3 |
| CL-270SR | Super brightness red | 20 | 2 | 2.6 | 650 | 40 | 20 | 1.5 | 4.3 |
| CL-270SD | Super brightness orange | 20 | 2 | 2.6 | 630 | 40 | 20 | 2 | 6.2 |
| CL-270UR | Ultra brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 3.5 | 13 |
| CL-270HR | High brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 5 | 23 |

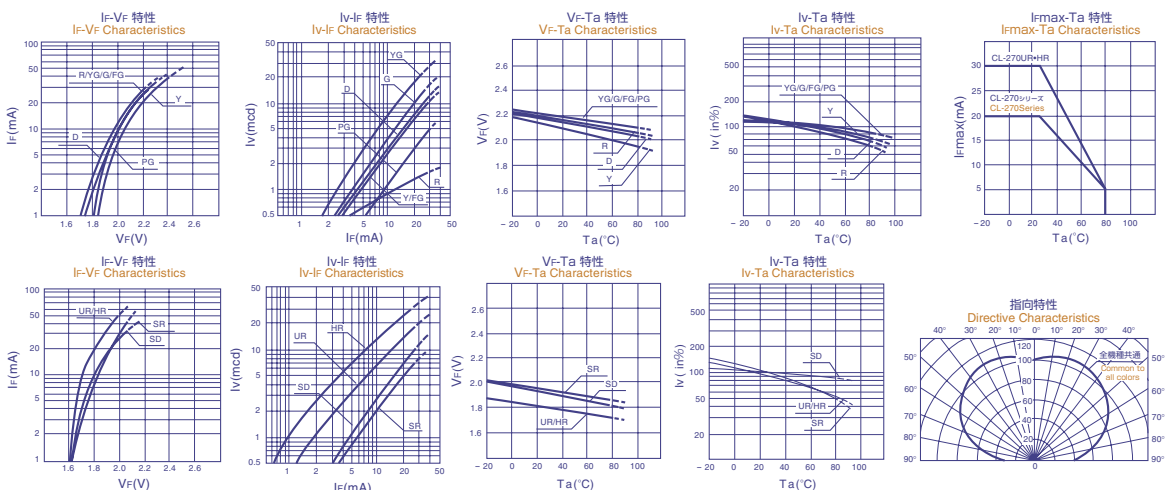
*NIST規格に準拠

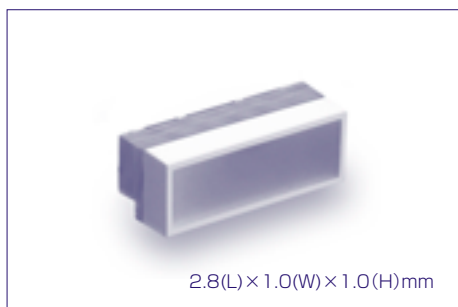
*Per NIST standards

●外形寸法図 Outline drawing



■ 諸特性 Characteristics





2.8(L)×1.0(W)×1.0(H)mm

● 薄型バックライト用の白色LEDです。推奨導光板は1.0mm厚です。

● White LED for thin-shaped backlight. Recommended thickness of optical waveguide is 1.0 mm.

● 絶対最大定格 Absolute Maximum Rating^{※1}

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP ^{※2} (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------------------|--------|----------|----------|
| CL-430F-WQ | 114 | 30 | 100 | 5 | -25~+80 | -30~+85 |

※1 1素子当たりの値です。The values are based on 1-die performance.

※2 IFPの条件はduty1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

● 電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|---|----------------|----------------------|------|----------|----------|------|
| 順電圧 Forward Voltage ^{※1} | V _F | I _F =20mA | — | 3.3 | 3.6 | V |
| 逆電流 Reverse Current ^{※1} | I _R | V _R =5V | — | — | 2 | μA |
| 光度 Luminous Intensity ^{※2} | I _v | I _F =20mA | 1400 | 2000 | — | mcd |
| 色度座標 Chromaticity coordinates ^{※3} | x, y | I _F =20mA | | x(±0.02) | y(±0.02) | |
| | | | a | 0.268 | 0.228 | |
| | | | b | 0.284 | 0.256 | |
| | | | c | 0.309 | 0.286 | |
| | | | d | 0.307 | 0.308 | |
| | | | e | 0.275 | 0.275 | |
| f | 0.252 | 0.247 | | | | |

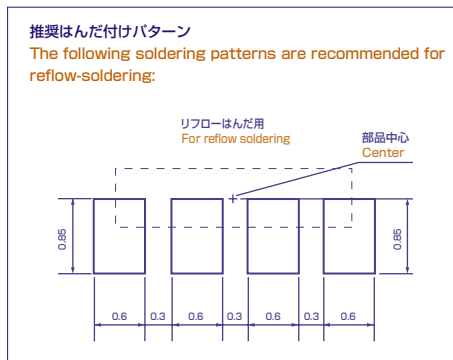
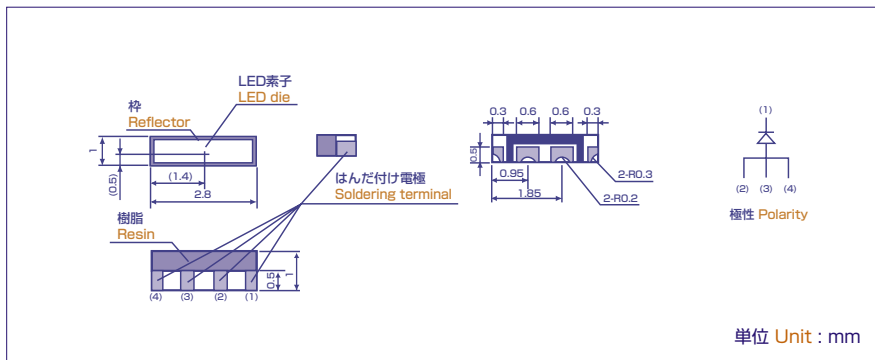
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯の値です。

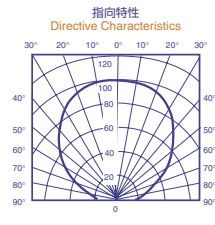
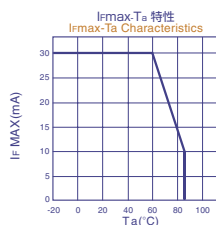
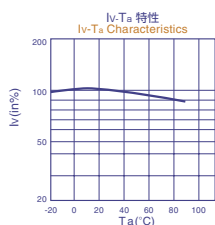
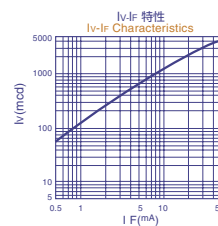
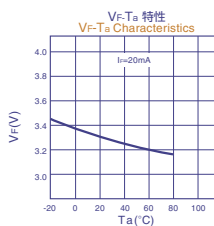
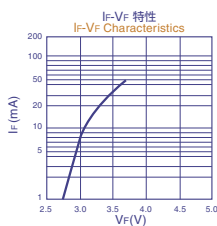
Compliant with NIST. The values are based on the condition that each die lights simultaneously.

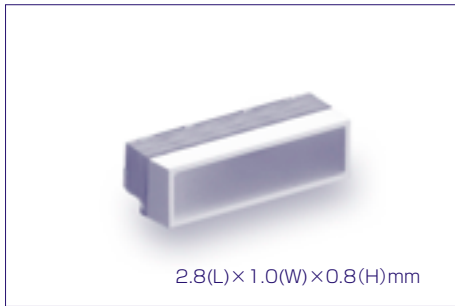
※3 色度座標は、a, b, c, d, e, fに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d,e,f.

● 外形寸法図 Outline drawing



■ 諸特性 Characteristics





● 薄型バックライト用の白色LEDです。推奨導光板は0.8mm厚です。

● White LED for thin-shaped backlight. Recommended thickness of optical waveguide is 0.8 mm.

●絶対最大定格 Absolute Maximum Rating^{※1}

(Ta 25°C)

| Product code | Pd (mW) | I _F (mA) | I _{FP} ^{※2} (mA) | V _R (V) | T _{op} (°C) | T _{st} (°C) |
|--------------|---------|---------------------|------------------------------------|--------------------|----------------------|----------------------|
| CL-431F-WQ | 114 | 30 | 100 | 5 | -25~+80 | -30~+85 |

※1 1素子当たりの値です。The values are based on 1-die performance.

※2 I_{FP}の条件はduty 1/10、パルス巾30msecです。Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|--|----------------|----------------------|----------|-------|----------|------|
| 順電圧 Forward Voltage ^{※1} | V _F | I _F =20mA | — | 3.3 | 3.6 | V |
| 逆電流 Reverse Current ^{※1} | I _R | V _R =5V | — | — | 2 | μA |
| 光度 Luminous Intensity ^{※2} | I _v | I _F =20mA | 1440 | 1800 | — | mcd |
| 色度座標 Chromaticity coordinates ^{※3} | x, y | I _F =20mA | x(±0.02) | | y(±0.02) | |
| | | | a | 0.268 | 0.228 | |
| | | | b | 0.284 | 0.256 | |
| | | | c | 0.309 | 0.286 | |
| | | | d | 0.307 | 0.308 | |
| | | | e | 0.275 | 0.275 | |
| f | 0.252 | 0.247 | | | | |

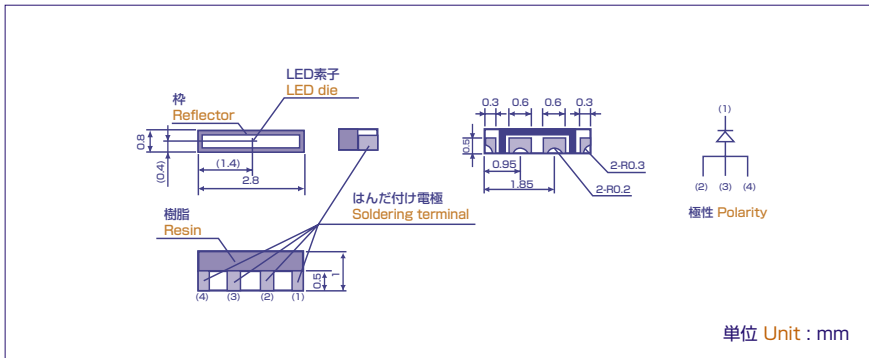
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

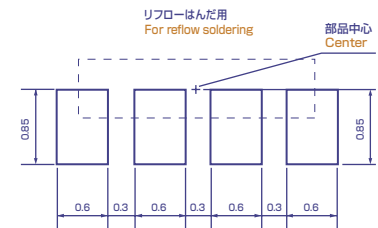
※3 色度座標は、a, b, c, d, e, fに囲まれた範囲です。Chromaticity coordinates is surrounded with a, b, c, d, e, f.

●外形寸法図 Outline drawing

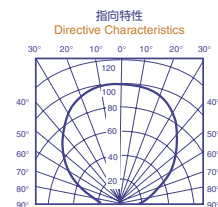
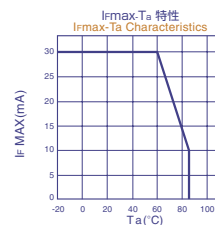
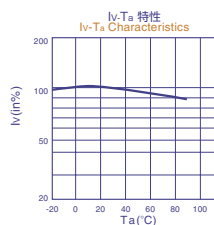
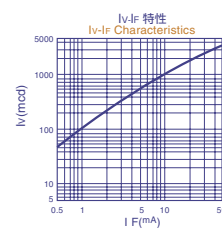
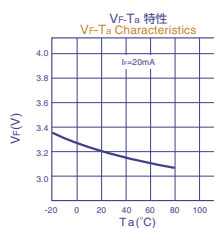
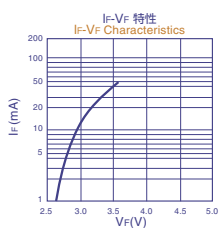


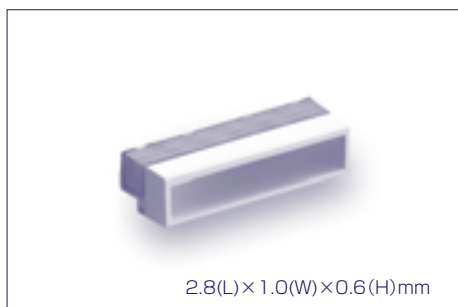
推奨はんだ付けパターン

The following soldering patterns are recommended for reflow soldering:



■ 諸特性 Characteristics





2.8(L)×1.0(W)×0.6(H)mm

● 薄型バックライト用の白色LEDです。推奨導光板は0.6mm厚です。

● White LED for thin-shaped backlight. Recommended thickness of optical waveguide is 0.6 mm.

● 絶対最大定格 Absolute Maximum Rating*1

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP*2 (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------|--------|----------|----------|
| CL-432F-WQ | 114 | 30 | 100 | 5 | -25~+80 | -30~+85 |

*1 1素子当たりの値です。The values are based on 1-die performance.

*2 IFPの条件はduty1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

● 電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|---------------------------------|--------|-------------------|------|----------|----------|---------------|
| 順電圧 Forward Voltage*1 | V_F | $I_F=20\text{mA}$ | — | 3.3 | 3.6 | V |
| 逆電流 Reverse Current*1 | I_R | $V_R=5\text{V}$ | — | — | 2 | μA |
| 光度 Luminous Intensity*2 | I_v | $I_F=20\text{mA}$ | 1200 | 1680 | — | mcd |
| 色度座標 Chromaticity coordinates*3 | x, y | $I_F=20\text{mA}$ | | x(±0.02) | y(±0.02) | |
| | | | a | 0.268 | 0.228 | |
| | | | b | 0.284 | 0.256 | |
| | | | c | 0.309 | 0.286 | |
| | | | d | 0.307 | 0.308 | |
| | | | e | 0.275 | 0.275 | |
| f | 0.252 | 0.247 | | | | |

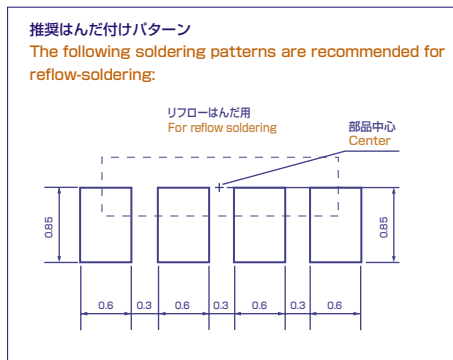
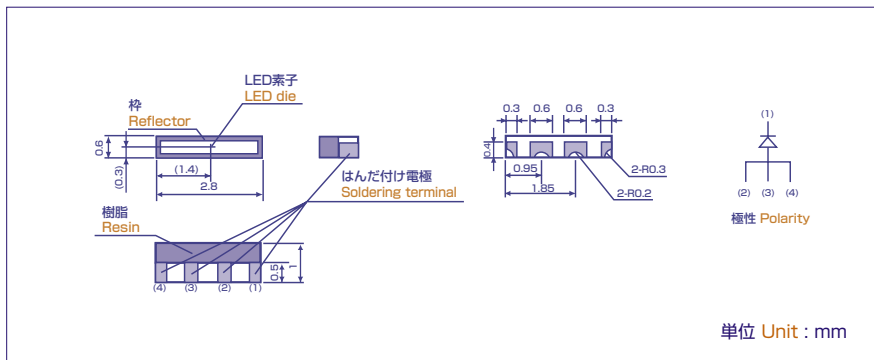
*1 1素子当たりの値です。The values are based on 1-die performance.

*2 NIST規格に準拠、各素子同時点灯の値です。

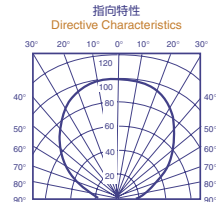
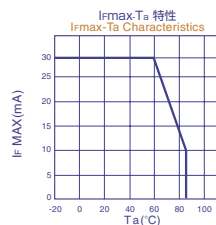
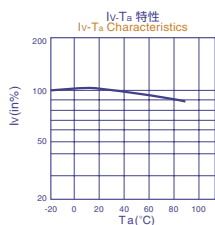
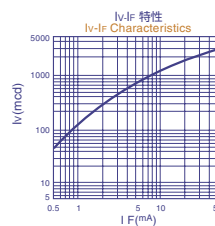
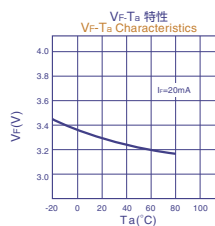
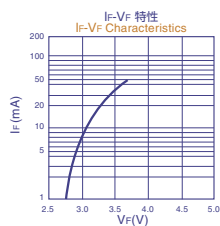
Compliant with NIST. The values are based on the condition that each die lights simultaneously.

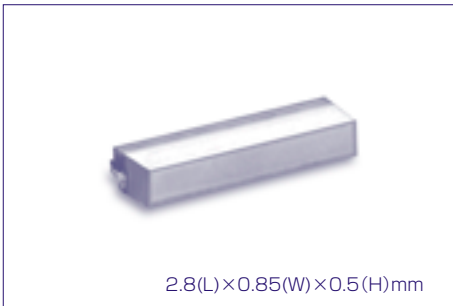
*3 色度座標は、a, b, c, d, e, fに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d,e,f.

● 外形寸法図 Outline drawing



■ 諸特性 Characteristics





● 薄型バックライト用の白色LEDです。推奨導光板は0.5mm厚です。

● White LED for thin-shaped backlight. Recommended thickness of optical waveguide is 0.5 mm.

●絶対最大定格 Absolute Maximum Rating^{※1}

(Ta 25°C)

| Product code | Pd (mW) | I _F (mA) | I _{FP} ^{※2} (mA) | V _R (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------------------|------------------------------------|--------------------|----------|----------|
| CL-434F-WX | 114 | 30 | 100 | 5 | -25~+80 | -30~+85 |

※1 1素子当たりの値です。The values are based on 1-die performance.

※2 I_{FP}の条件はduty 1/10、パルス巾30msecです。Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|---|----------------|----------------------|------|----------|----------|------|
| 順電圧 Forward Voltage ^{※1} | V _F | I _F =20mA | — | 3.3 | 3.6 | V |
| 逆電流 Reverse Current ^{※1} | I _R | V _R =5V | — | — | 2 | μA |
| 光度 Luminous Intensity ^{※2} | I _v | I _F =20mA | 1400 | 1850 | — | mcd |
| 色度座標 Chromaticity coordinates ^{※3} | x, y | I _F =20mA | | x(±0.02) | y(±0.02) | |
| | | | a | 0.268 | 0.228 | |
| | | | b | 0.284 | 0.256 | |
| | | | c | 0.309 | 0.286 | |
| | | | d | 0.307 | 0.308 | |
| | | | e | 0.275 | 0.275 | |
| f | 0.252 | 0.247 | | | | |

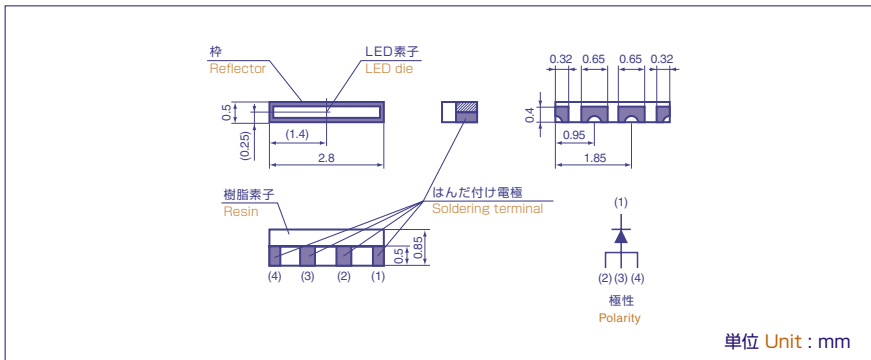
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

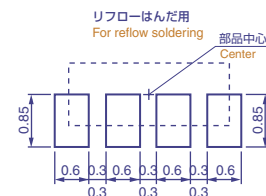
※3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

●外形寸法図 Outline drawing

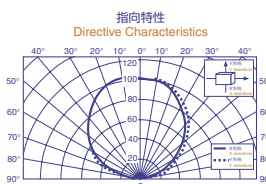
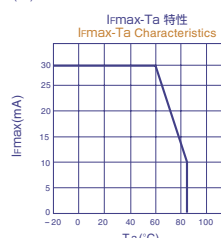
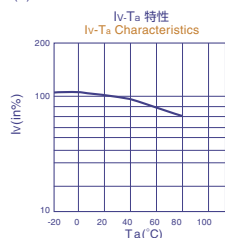
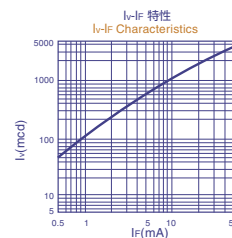
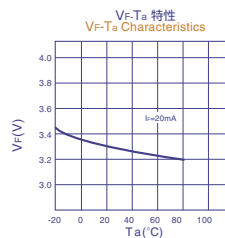
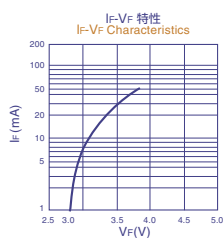


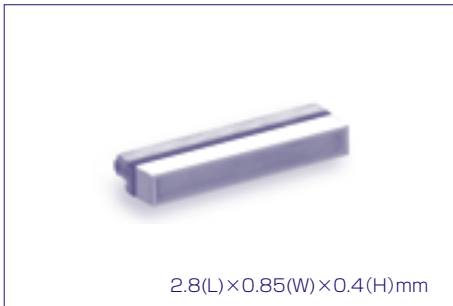
推奨はんだ付けパターン

The following soldering patterns are recommended for reflow-soldering:



■ 諸特性 Characteristics





2.8(L)×0.85(W)×0.4(H)mm

- 薄型バックライト用の白色LEDです。推奨導光板は0.4mm厚です。
- 超薄型タイプです。
- White LED for thin-shaped backlight. Recommended thickness of optical waveguide is 0.4 mm.
- Ultra thin type.

●絶対最大定格 Absolute Maximum Rating^{※1}

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP ^{※2} (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------------------|--------|----------|----------|
| CL-435F-WQ | 114 | 30 | 100 | 5 | -25~+80 | -30~+85 |

※1 1素子当たりの値です。The values are based on 1-die performance.

※2 IFPの条件はduty1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|--|----------------|----------------------|------|----------|----------|------|
| 順電圧 Forward Voltage ^{※1} | V _F | I _F =20mA | — | 3.3 | 3.6 | V |
| 逆電流 Reverse Current ^{※1} | I _R | V _R =5V | — | — | 2 | μA |
| 光度 Luminous Intensity ^{※2} | I _v | I _F =20mA | 1000 | 1380 | — | mcd |
| 色度座標 Chromaticity coordinates ^{※3} | x, y | I _F =20mA | | x(±0.02) | y(±0.02) | |
| | | | a | 0.268 | 0.228 | |
| | | | b | 0.284 | 0.256 | |
| | | | c | 0.309 | 0.286 | |
| | | | d | 0.307 | 0.308 | |
| | | | e | 0.275 | 0.275 | |
| f | 0.252 | 0.247 | | | | |

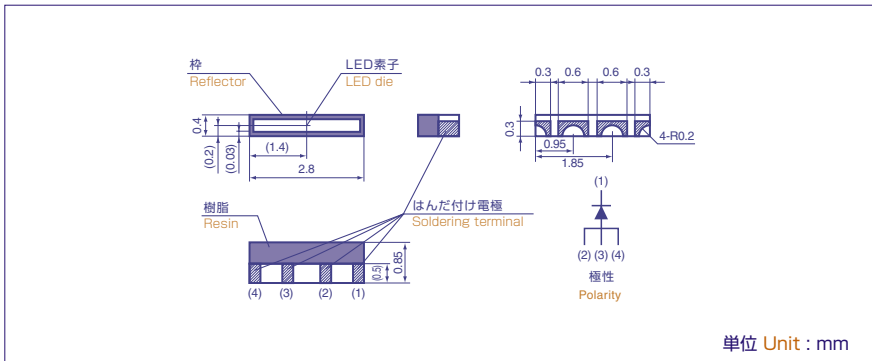
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

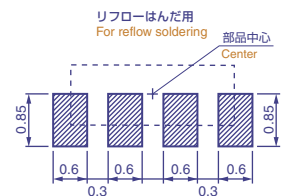
※3 色度座標は、a, b, c, d, e, fに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d,e,f.

●外形寸法図 Outline drawing

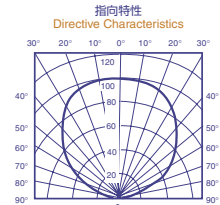
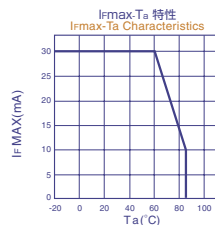
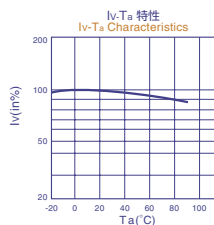
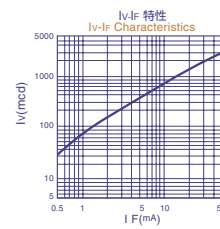
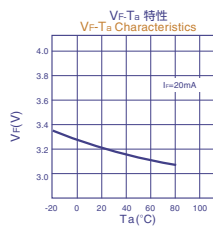
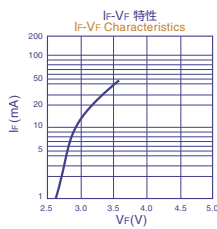


推奨はんだ付けパターン

The following soldering patterns are recommended for reflow-soldering:

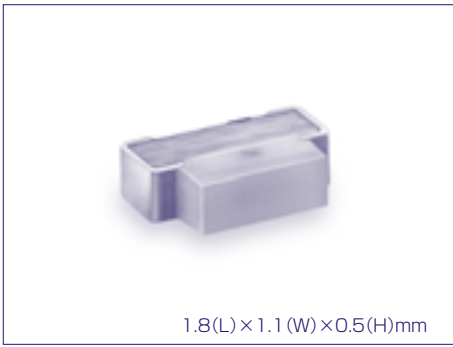


■ 諸特性 Characteristics



CL-480S Series

Mono-Color Side-Lighting Type **CL-480S Series**



● 小型の白色LEDです。

● Compact white LED

●絶対最大定格 Absolute Maximum Rating^{※1}

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP ^{※2} (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------------------|--------|----------|----------|
| CL-480S-WS | 76 | 20 | 50 | 5 | -25~+80 | -30~+85 |

※1 1素子当たりの値です。The values are based on 1-die performance.

※2 IFPの条件はduty 1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|--|----------------|---------------------|----------|------|----------|------|
| 順電圧 Forward Voltage ^{※1} | V _F | I _F =5mA | — | 2.9 | 3.15 | V |
| 逆電流 Reverse Current ^{※1} | I _R | V _R =5V | — | — | 100 | μA |
| 光度 Luminous Intensity ^{※2} | I _v | I _F =5mA | — | 150 | — | mcd |
| 色度座標 Chromaticity coordinates ^{※3} | x, y | I _F =5mA | x(±0.02) | | y(±0.02) | |
| | | | a | 0.28 | 0.236 | |
| | | | b | 0.28 | 0.301 | |
| | | | c | 0.34 | 0.386 | |
| d | 0.34 | 0.321 | | | | |

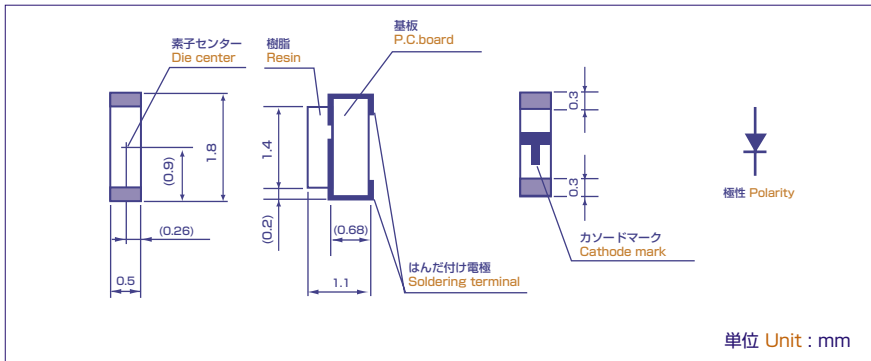
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

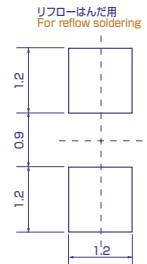
※3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

●外形寸法図 Outline drawing



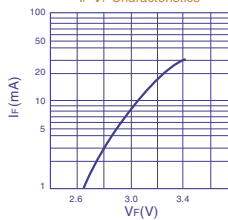
推奨はんだ付けパターン

The following soldering patterns are recommended for reflow soldering:

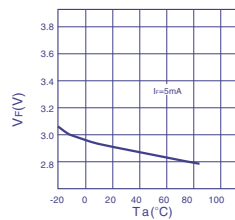


■ 諸特性 Characteristics

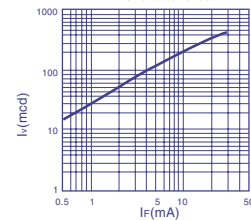
I_F-V_F 特性
I_F-V_F Characteristics



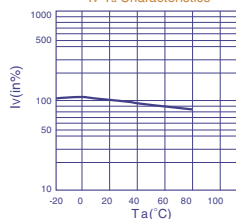
V_F-T_a 特性
V_F-T_a Characteristics



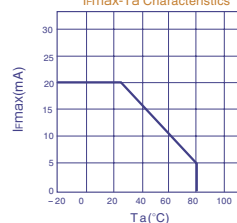
I_v-I_F 特性
I_v-I_F Characteristics



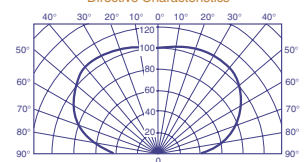
I_v-T_a 特性
I_v-T_a Characteristics



I_{Fmax}-T_a 特性
I_{Fmax}-T_a Characteristics

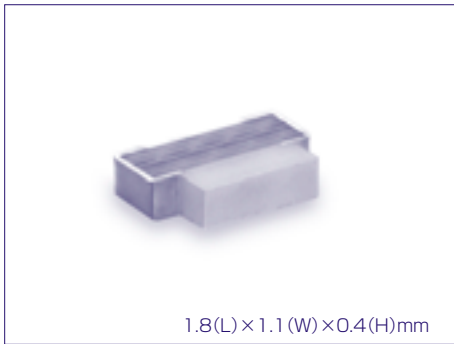


指向特性
Directive Characteristics



CL-481S Series

Mono-Color Side-Lighting Type **CL-481S Series**



● 小型の白色LEDです。

● Compact white LED

●絶対最大定格 Absolute Maximum Rating*1

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP*2 (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------|--------|----------|----------|
| CL-481S-WS | 76 | 20 | 50 | 5 | -25~+80 | -30~+85 |

*1 1素子当たりの値です。The values are based on 1-die performance.

*2 IFPの条件はduty1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|------------------------------------|--------|------------|-----|---------------|---------------|---------|
| 順電圧 Forward Voltage*1 | V_F | $I_F=5mA$ | — | 2.9 | 3.15 | V |
| 逆電流 Reverse Current*1 | I_R | $V_R=5V$ | — | — | 100 | μA |
| 光度 Luminous Intensity*2 | I_v | $I_F=5mA$ | — | 150 | — | mcd |
| 色度座標 Chromaticity coordinates*3 | x, y | $I_F=5mA$ | | $x(\pm 0.02)$ | $y(\pm 0.02)$ | |
| | | | a | 0.28 | 0.236 | |
| | | | b | 0.28 | 0.301 | |
| | | | c | 0.34 | 0.386 | |
| d | 0.34 | 0.321 | | | | |

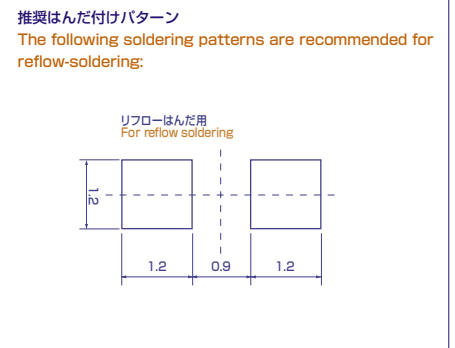
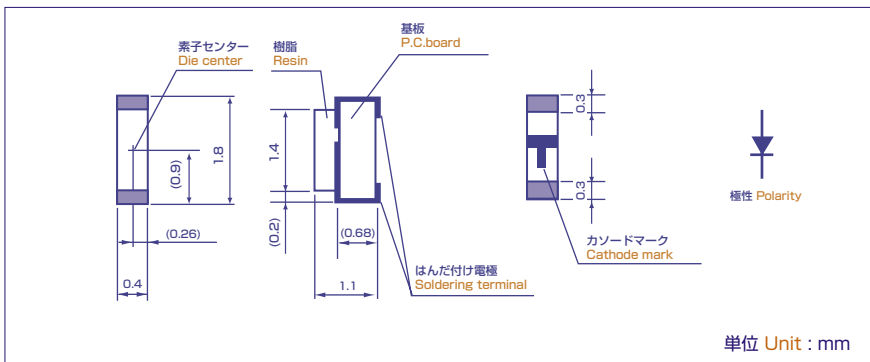
*1 1素子当たりの値です。The values are based on 1-die performance.

*2 NIST規格に準拠、各素子同時点灯の値です。

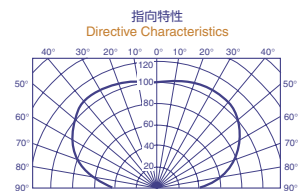
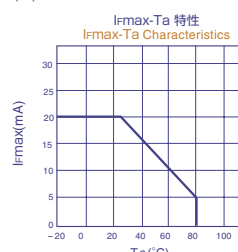
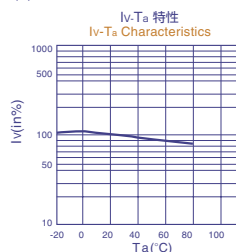
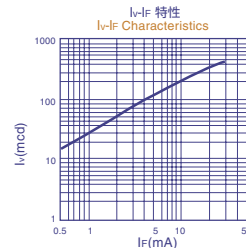
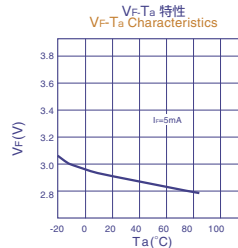
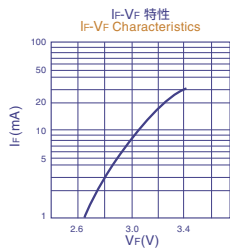
Compliant with NIST. The values are based on the condition that each die lights simultaneously.

*3 色度座標はa、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

●外形寸法図 Outline drawing

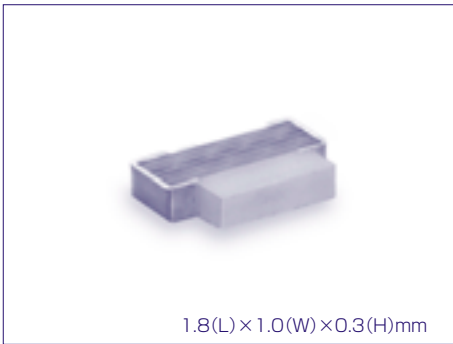


■ 諸特性 Characteristics



CL-482T Series

Mono-Color Side-Lighting Type **CL-482T Series**



● 小型・薄型の白色LEDです。

● Compact and thin white LED

●絶対最大定格 Absolute Maximum Rating^{※1}

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP ^{※2} (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------------------|--------|----------|----------|
| CL-482T-WS | 76 | 20 | 50 | 5 | -25~+80 | -30~+85 |

※1 1素子当たりの値です。The values are based on 1-die performance.

※2 IFPの条件はduty 1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit | |
|---|--------|------------|-------------------|------|-------|------|--|
| 順電圧 Forward Voltage ^{※1} | VF | IF=5mA | — | 2.9 | 3.15 | V | |
| 逆電流 Reverse Current ^{※1} | IR | VR=5V | — | — | 2 | μA | |
| 光度 Luminous Intensity ^{※2} | Iv | IF=5mA | — | 115 | — | mcd | |
| 色度座標 Chromaticity coordinates ^{※3} | x, y | IF=5mA | x(±0.02) y(±0.02) | | | | |
| | | | a | 0.28 | 0.236 | | |
| | | | b | 0.28 | 0.301 | | |
| | | | c | 0.34 | 0.386 | | |
| d | 0.34 | 0.321 | | | | | |

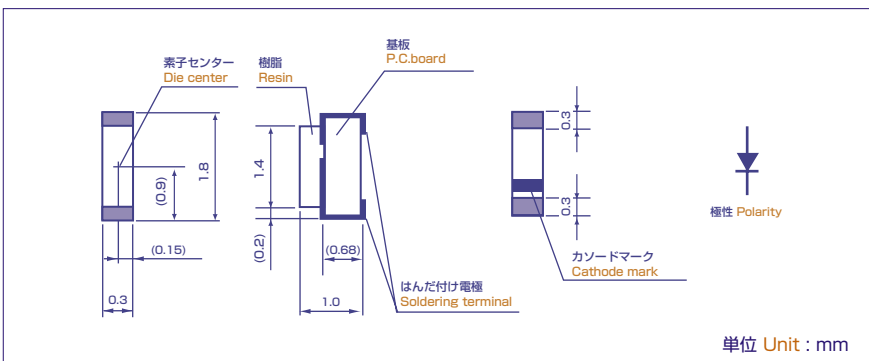
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

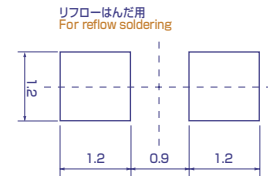
※3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d

●外形寸法図 Outline drawing

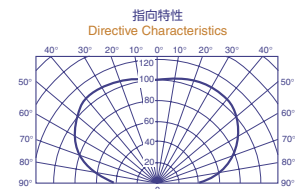
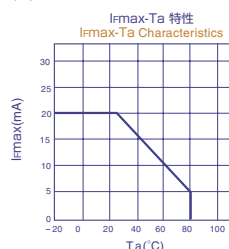
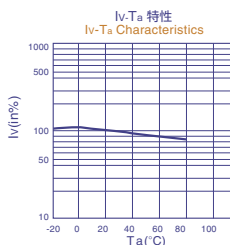
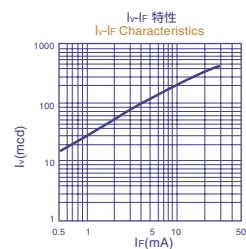
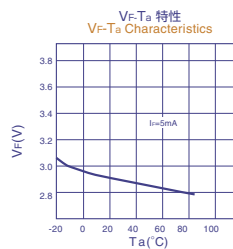
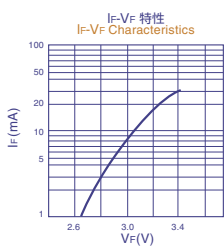


推奨はんだ付けパターン

The following soldering patterns are recommended for reflow soldering:



■ 諸特性 Characteristics



CL-Z482T Series

Mono-Color Side-Lighting Type **CL-Z482T Series**



- 小型・薄型の白色LEDです。
- ツェナーダイオードを搭載し、静電耐圧に優れています。
- Compact and thin white LED
- Zener diode LED, excellent in resistance to electrostatic potential.

●絶対最大定格 Absolute Maximum Rating*1 (Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP*2 (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------|--------|----------|----------|
| CL-Z482T-WS | 76 | 20 | 50 | 5 | -25~+80 | -30~+85 |

*1 1素子当たりの値です。The values are based on 1-die performance.

*2 IFPの条件はduty 1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics (Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|---------------------------------|--------|------------|-------------------|------|-------|------|
| 順電圧 Forward Voltage*1 | VF | IF=5mA | — | 2.9 | 3.15 | V |
| 逆電流 Reverse Current*1 | IR | VR=5V | — | — | 2 | μA |
| 光度 Luminous Intensity*2 | Iv | IF=5mA | — | 115 | — | mcd |
| 色度座標 Chromaticity coordinates*3 | x, y | IF=5mA | x(±0.02) y(±0.02) | | | |
| | | | a | 0.28 | 0.236 | |
| | | | b | 0.28 | 0.301 | |
| | | | c | 0.34 | 0.386 | |
| d | 0.34 | 0.321 | | | | |

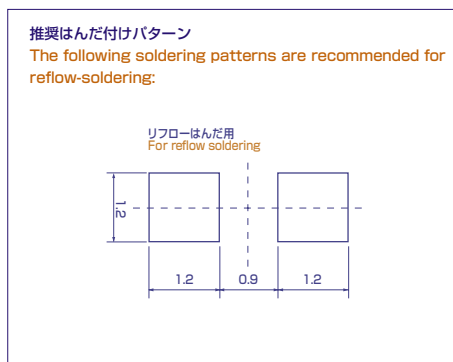
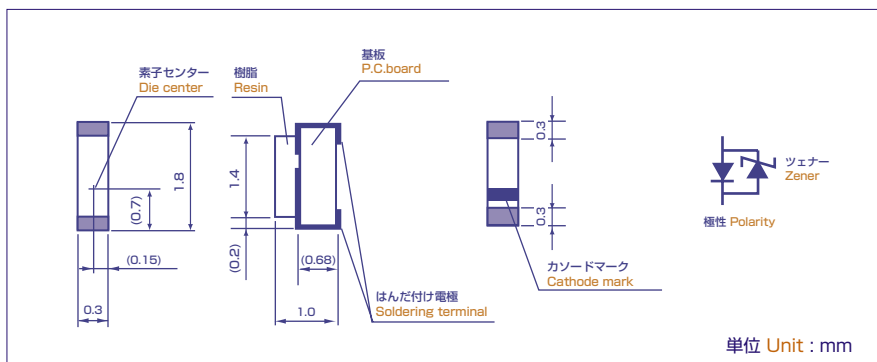
*1 1素子当たりの値です。The values are based on 1-die performance.

*2 NIST規格に準拠、各素子同時点灯の値です。

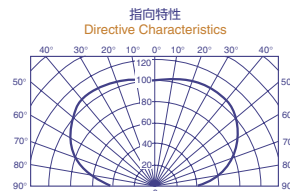
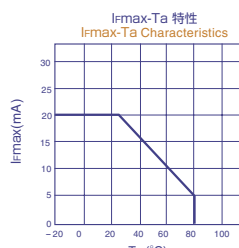
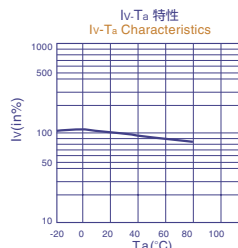
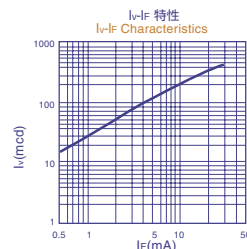
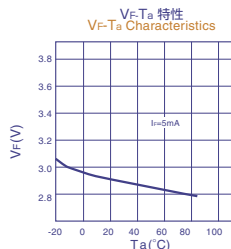
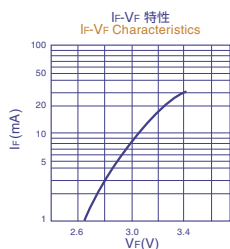
Compliant with NIST. The values are based on the condition that each die lights simultaneously.

*3 色度座標は、a, b, c, dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d

●外形寸法図 Outline drawing

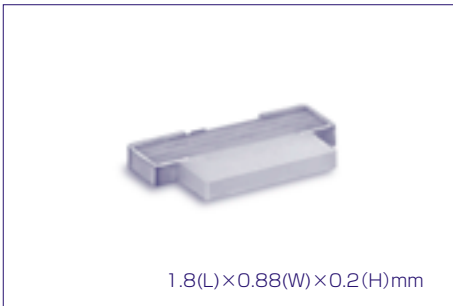


■ 諸特性 Characteristics



CL-483S Series

Mono-Color Side-Lighting Type **CL-483S Series**



● 小型・薄型の白色LEDです。

● Compact and thin white LED

右記以外の発光色につきましてはお問い合わせください。
Please contact us for luminescent colors other than those described at right.

●絶対最大定格 Absolute Maximum Rating^{※1}

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP ^{※2} (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------------------|--------|----------|----------|
| CL-483S-WT | 76 | 20 | 100 | 4 | -25~+80 | -30~+85 |

※1 1素子当たりの値です。The values are based on 1-die performance.

※2 IFPの条件はduty 1/10、パルス巾30msecです。Condition for IFP is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|---|--------|------------|----------|--------|----------|------|
| 順電圧 Forward Voltage ^{※1} | VF | IF=5mA | — | 2.9 | 3.15 | V |
| 逆電流 Reverse Current ^{※1} | IR | VR=4V | — | — | 2 | μA |
| 光度 Luminous Intensity ^{※2} | IV | IF=5mA | — | 100 | — | mcd |
| 色度座標 Chromaticity coordinates ^{※3} | x, y | IF=5mA | x(±0.02) | | y(±0.02) | |
| | | | a | 0.2800 | 0.2339 | |
| | | | b | 0.2800 | 0.2989 | |
| | | | c | 0.3400 | 0.3721 | |
| d | 0.3400 | 0.3396 | | | | |

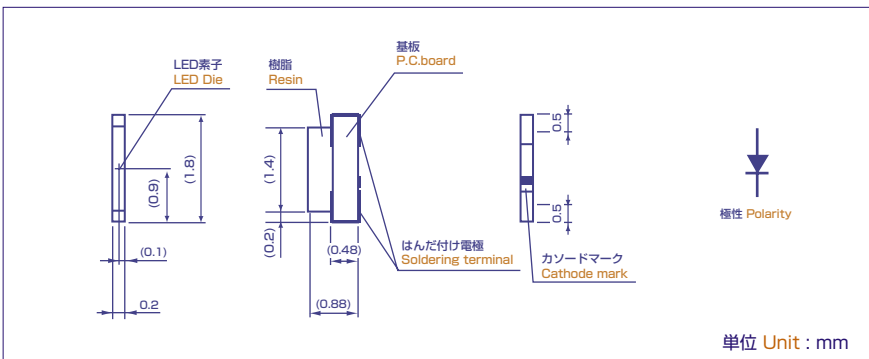
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

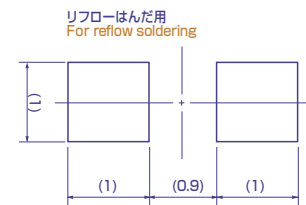
※3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

●外形寸法図 Outline drawing

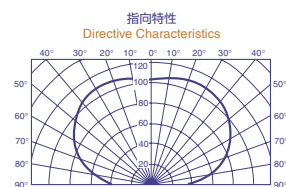
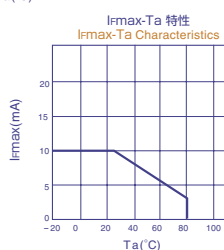
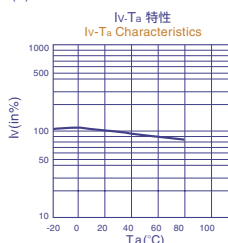
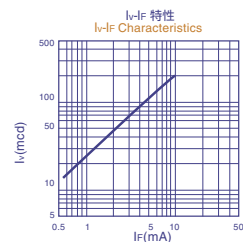
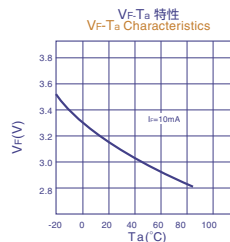
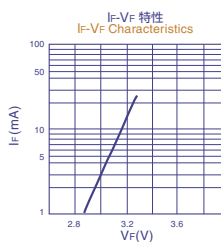


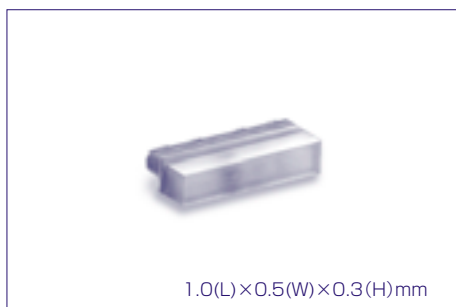
推奨はんだ付けパターン

The following soldering patterns are recommended for reflow soldering:



■ 諸特性 Characteristics





● 超小型・薄型の白色LEDです。

● Ultra-compact and thin white LED

● 絶対最大定格 Absolute Maximum Rating^{*1}

(Ta 25°C)

| Product code | Pd (mW) | If (mA) | Ifp ^{*2} (mA) | V _R (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------------------|--------------------|----------|----------|
| CL-830S-WS | 76 | 20 | 50 | 5 | -25~+80 | -30~+85 |

^{*1} 1素子当たりの値です。The values are based on 1-die performance.

^{*2} Ifpの条件はduty 1/10、パルス巾30msecです。Condition for Ifp is pulse of 1/10 duty and 30msec width.

● 電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|--|----------------|--------------------|-----|----------|----------|------|
| 順電圧 Forward Voltage ^{*1} | V _F | If=5mA | — | 2.9 | 3.15 | V |
| 逆電流 Reverse Current ^{*1} | I _R | V _R =5V | — | — | 2 | μA |
| 光度 Luminous Intensity ^{*2} | I _v | If=5mA | — | 170 | — | mcd |
| 色度座標 Chromaticity coordinates ^{*3} | x, y | If=5mA | | x(±0.02) | y(±0.02) | |
| | | | a | 0.28 | 0.236 | |
| | | | b | 0.28 | 0.301 | |
| | | | c | 0.34 | 0.386 | |
| d | 0.34 | 0.353 | | | | |

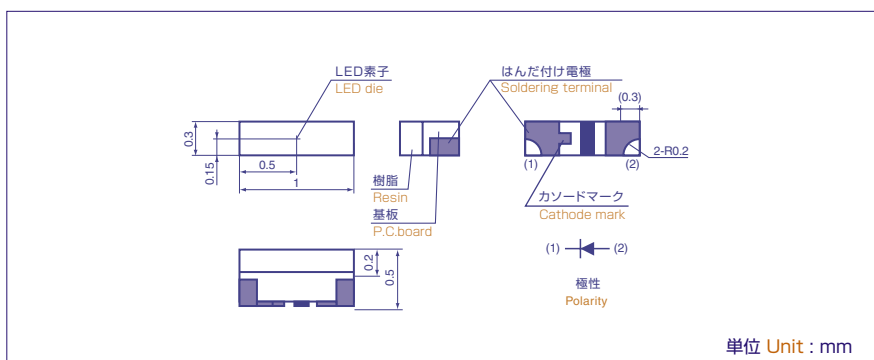
^{*1} 1素子当たりの値です。The values are based on 1-die performance.

^{*2} NIST規格に準拠、各素子同時点灯の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

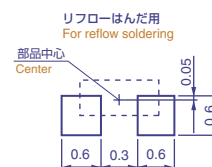
^{*3} 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

● 外形寸法図 Outline drawing

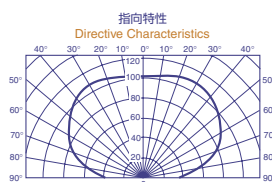
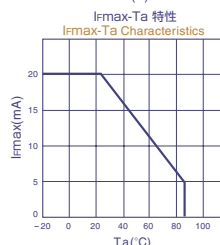
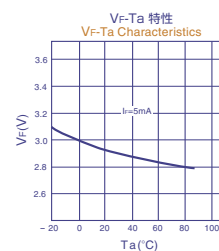
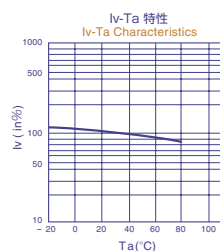
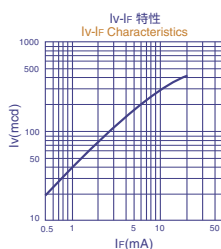
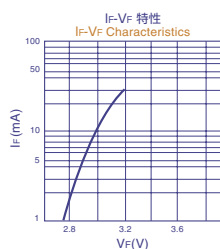


推奨はんだ付けパターン

The following soldering patterns are recommended for reflow soldering:

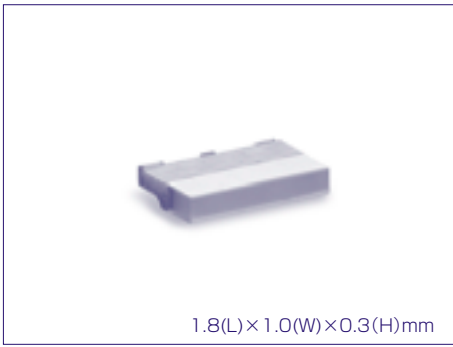


■ 諸特性 Characteristics



CL-840S Series

Mono-Color Side-Lighting Type **CL-840S Series**



- 薄型の白色LEDです。
- リフレクター付きです。
- Thin white LED
- Reflector equipped

●絶対最大定格 Absolute Maximum Rating^{※1}

(Ta 25°C)

| Product code | Pd (mW) | IF (mA) | IFP ^{※2} (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------------|---------|---------|------------------------|--------|----------|----------|
| CL-840S-WT | 35 | 10 | 50 | 4 | -40~+85 | -40~+85 |

※1 1素子当たりの値です。/The values are based on 1-die performance.

※2 IFPの条件はduty 1/10、パルス巾30msecです。/Condition for IFP is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics

(Ta 25°C)

| Parameter | Symbol | Conditions | MIN | TYP | MAX | Unit |
|---|----------------|---------------------|-------------------|------|-------|------|
| 順電圧 Forward Voltage ^{※1} | V _F | I _F =5mA | — | 2.9 | 3.15 | V |
| 逆電流 Reverse Current ^{※1} | I _R | V _R =4V | — | — | 2 | μA |
| 光度 Luminous Intensity ^{※2} | I _v | I _F =5mA | — | 200 | — | mcd |
| 色度座標 Chromaticity coordinates ^{※3} | x, y | I _F =5mA | x(±0.02) y(±0.02) | | | |
| | | | a | 0.28 | 0.236 | |
| | | | b | 0.28 | 0.301 | |
| | | | c | 0.34 | 0.386 | |
| d | 0.34 | 0.321 | | | | |

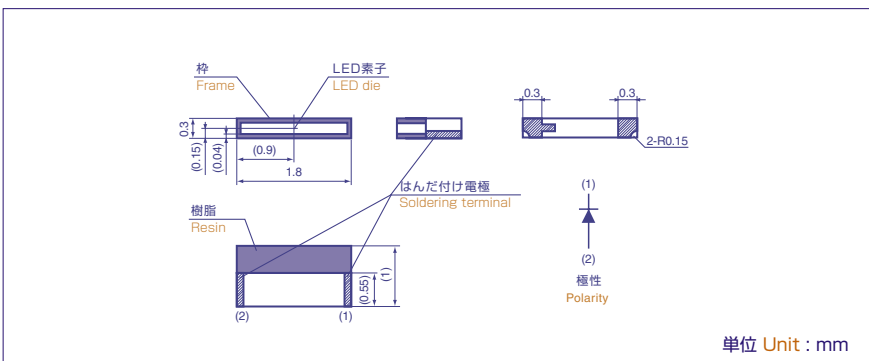
※1 1素子当たりの値です。The values are based on 1-die performance.

※2 NIST規格に準拠、各素子同時点灯時の値です。

Compliant with NIST. The values are based on the condition that each die lights simultaneously.

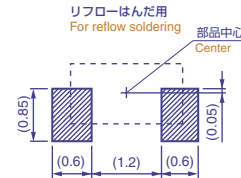
※3 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

●外形寸法図 Outline drawing

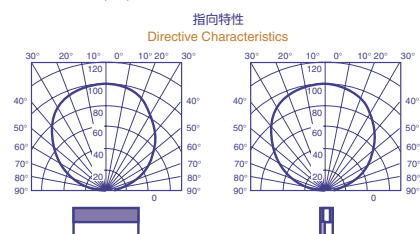
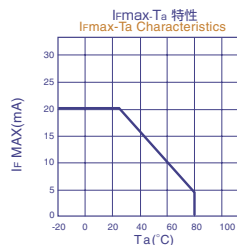
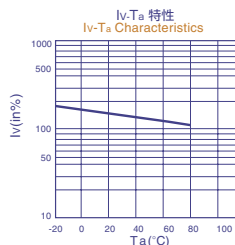
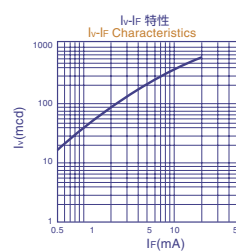
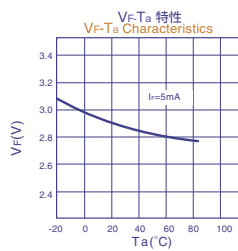
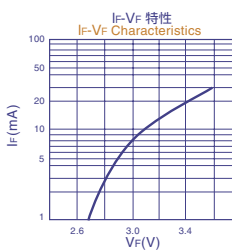


推奨はんだ付けパターン

The following soldering patterns are recommended for reflow-soldering:

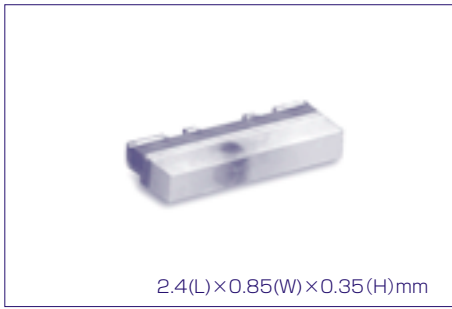


■ 諸特性 Characteristics



CL-365 Series

Multi-Color Side-Lighting Type **CL-365 Series**



● 2色発光タイプのチップLEDです。

● 2-colored illuminated type chip LED

右記以外の発光色につきましてはお問い合わせください。
Please contact us for luminescent colors other than those described at right.

●絶対最大定格 Absolute Maximum Rating (Ta 25°C)

| Series | Lighting color | P*1 (mW) | Pd (mW) | If (mA) | I _{FP} (mA) | V _R (V) | Top (°C) | Tst (°C) |
|--------|----------------|----------|---------|---------|----------------------|--------------------|----------|----------|
| CL-365 | TR2 | — | 48 | 20 | 100*2 | 5 | -25~+80 | -30~+85 |
| | WS | | 76 | | | | | |

※1 Pは同時点灯時の全許容損失を示します。

※1 P means total value of power dissipation when both colors are on.

※2 I_{FP}の条件はduty 1/10、パルス巾30msecです。

※2 Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

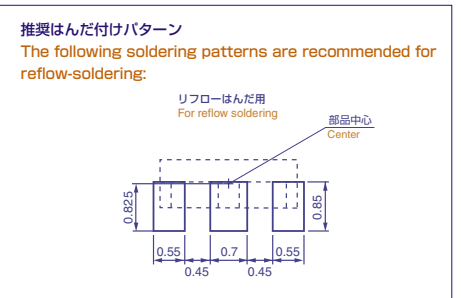
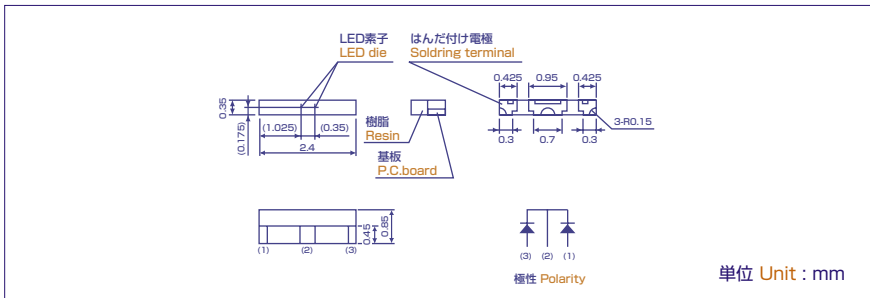
●電気的光学的特性 Electro-optical Characteristics (Ta 25°C)

| Parameter | Lighting color | Symbol | Conditions | MIN | TYP | MAX | Unit | |
|------------------------------------|----------------|----------------|---------------------|-------------------|-------|-------|------|--|
| 順電圧 Forward Voltage | TR2 | V _F | I _F =5mA | — | 1.85 | 2.4 | V | |
| | WS | | | — | 2.9 | 3.15 | | |
| 逆電流 Reverse Current | TR2 | I _R | V _R =5V | — | — | 100 | μA | |
| | WS | | | — | — | 2 | | |
| 光度 Luminous Intensity*1 | TR2 | I _v | I _F =5mA | 7 | 12 | — | mcd | |
| | WS | | | 75 | 105 | — | | |
| ドミナント波長 Dominant Wavelength | TR2 | λ _d | I _F =5mA | — | 630 | — | nm | |
| 色度座標 Chromaticity coordinates*2 | | x, y | I _F =5mA | x(±0.02) y(±0.02) | | | | |
| | | | | a | 0.255 | 0.195 | | |
| | | | | b | 0.255 | 0.235 | | |
| | | | | c | 0.295 | 0.324 | | |
| | | | | d | 0.315 | 0.304 | | |

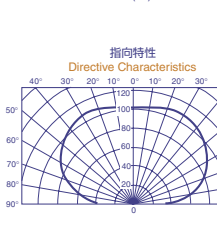
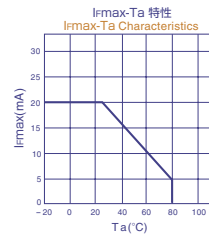
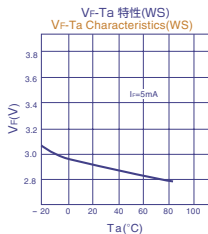
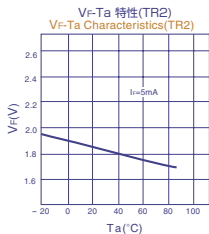
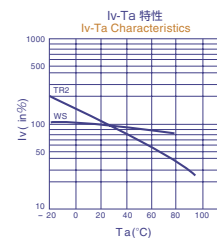
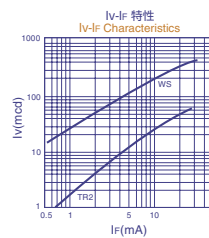
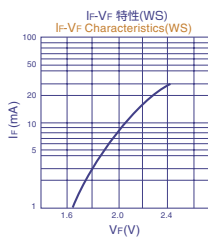
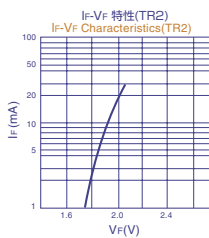
※1 NIST規格に準拠。Compliant with NIST.

※2 色度座標は、a、b、c、dに囲まれた範囲です。Chromaticity coordinates is surrounded with a,b,c,d.

●外形寸法図 Outline drawing

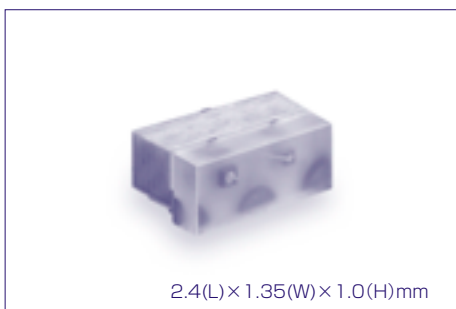


■ 諸特性 Characteristics



CL-375 Series

Multi-Color Side-Lighting Type **CL-375 Series**



- 2色発光タイプのチップLEDです。
- 2-colored illuminated type chip LED

●絶対最大定格 Absolute Maximum Rating (Ta 25°C)

| Series | Lighting color | P ^{※1} (mW) | Pd (mW) | I _F (mA) | I _{FP} (mA) | V _R (V) | T _{op} (°C) | T _{st} (°C) |
|--------|----------------|----------------------|---------|---------------------|----------------------|--------------------|----------------------|----------------------|
| CL-375 | YG | 90 | 65 | 25 | 100 ^{※2} | 5 | -25~+80 | -30~+85 |
| | HR | | 78 | 30 | | | | |

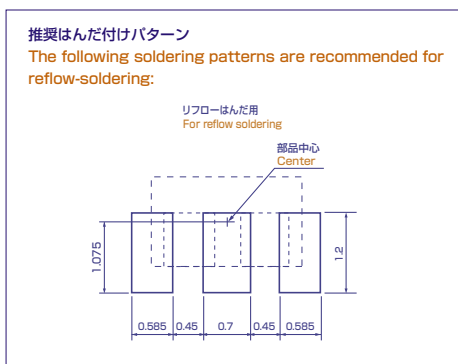
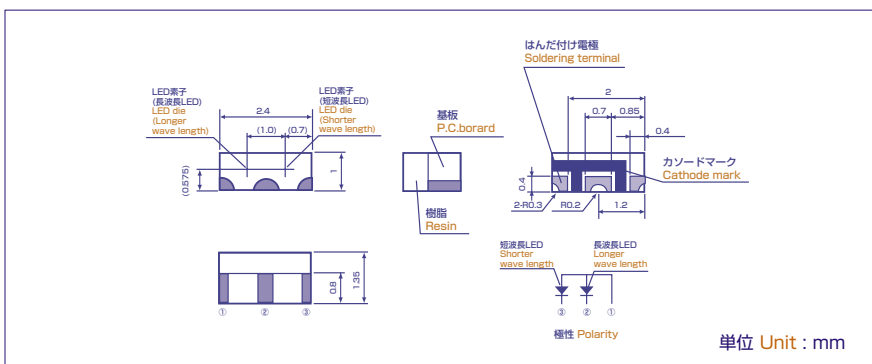
- ※1 Pは同時点灯時の全許容損失を示します。
- ※1 P means total value of power dissipation when both colors are on.
- ※2 I_{FP}の条件はduty 1/10、パルス巾30msecです。
- ※2 Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics (Ta 25°C)

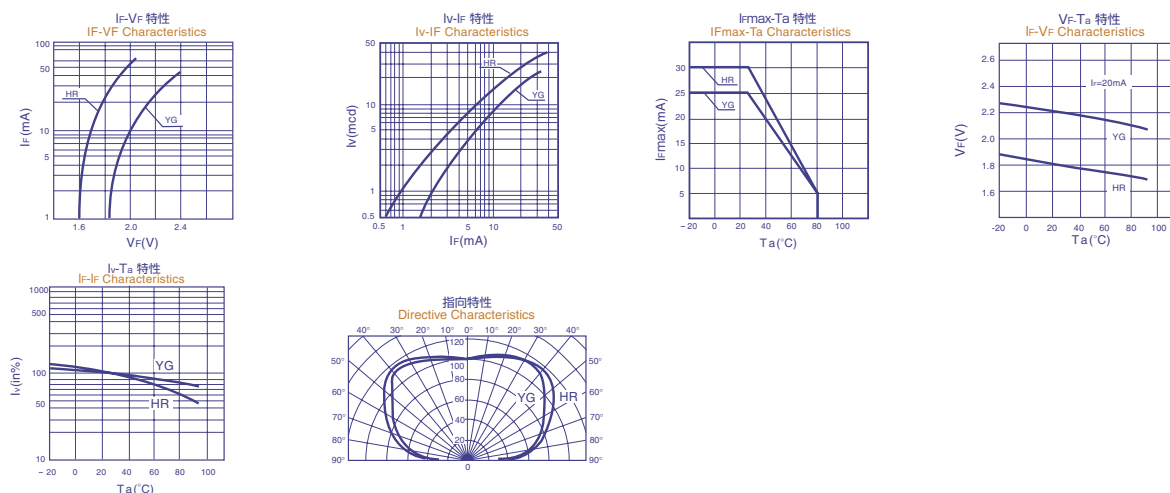
| Product code | Lighting color | V _F | | | λ _p typ (nm) | Δλ typ (nm) | I _v [*] | | |
|--------------|---------------------|---------------------|---------|---------|-------------------------|-------------|-----------------------------|-----------|-----------|
| | | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) |
| CL-375HR/YG | Yellow green | 20 | 2.2 | 2.6 | 570 | 30 | 20 | 5.0 | 18 |
| | High brightness red | 20 | 1.8 | 2.6 | 660 | 20 | 20 | 5.0 | 23 |

- ※NIST規格に準拠
- ※Per NIST standards

●外形寸法図 Outline drawing



■諸特性 Characteristics



CL-385 Series

Multi-Color Side-Lighting Type **CL-385 Series**



- 2色発光タイプのチップLEDです。
- 2-colored illuminated type chip LED

●絶対最大定格 Absolute Maximum Rating (Ta 25°C)

| Series | Lighting color | P*1 (mW) | Pd (mW) | IF (mA) | IFP (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------|----------------|----------|---------|---------|----------|--------|----------|----------|
| CL-385 | TD2 | 90 | 80 | 30 | 100*2 | 4 | -25~+80 | -30~+85 |
| | HG5 | | 76 | 20 | | | | |

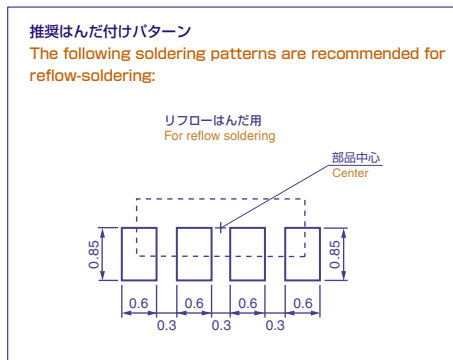
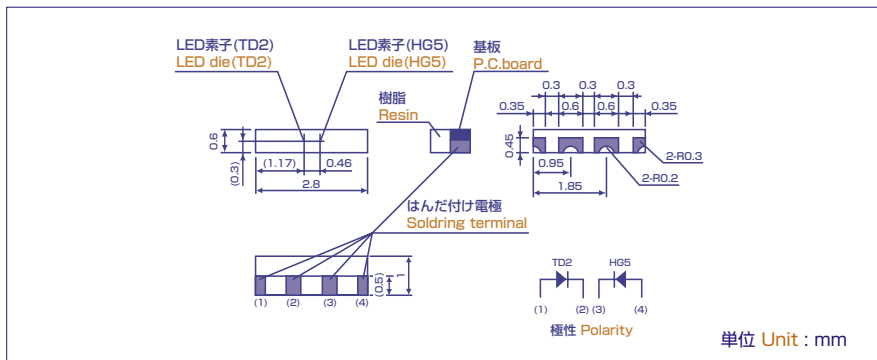
- *1 Pは同時点灯時の全許容損失を示します。
- *1 P means total value of power dissipation when both colors are on.
- *2 IFPの条件はduty 1/10、パルス巾30msecです。
- *2 Condition for IFP is pulse of 1/10 duty and 30msec width.

●電気的光学的特性 Electro-optical Characteristics (Ta 25°C)

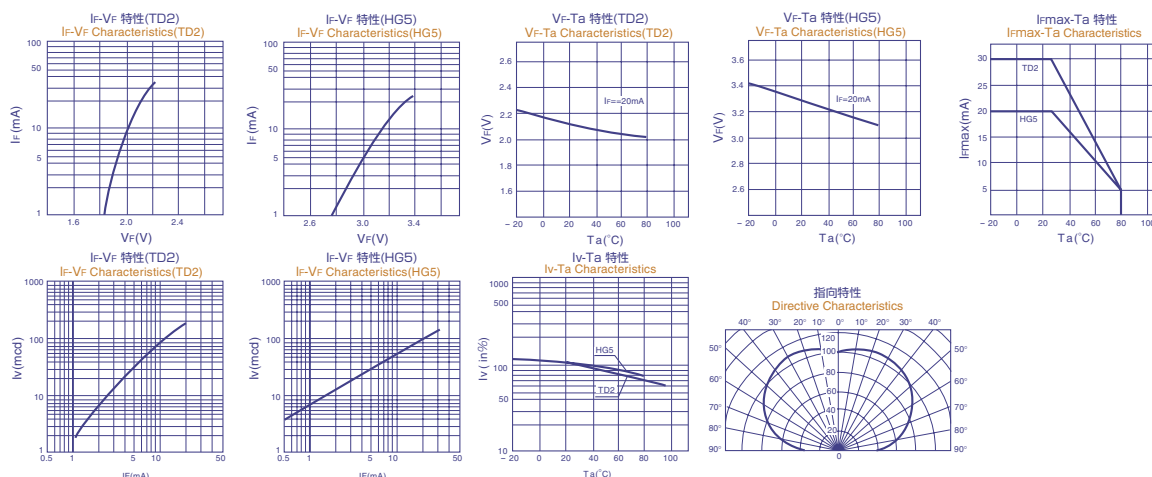
| Product code | Lighting color | VF | | | λp typ (nm) | IV* | | |
|---------------|----------------------------|---------|---------|---------|-------------|---------|-----------|-----------|
| | | IF (mA) | typ (V) | max (V) | | IF (mA) | min (mcd) | typ (mcd) |
| CL-385TD2/HG5 | Top high brightness orange | 20 | 2.1 | 2.6 | 605 | 20 | 70 | 180 |
| | High brightness green | 20 | 3.3 | 3.8 | 530 | 20 | 40 | 100 |

- *NIST規格に準拠
- *Per NIST standards

●外形寸法図 Outline drawing

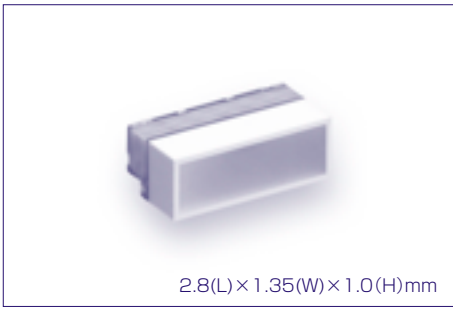


■ 諸特性 Characteristics



CL-421 Series

Multi-Color Side-Lighting Type **CL-421 Series**



2.8(L)×1.35(W)×1.0(H)mm

● 同一パッケージで赤、青、緑の3色に発光するチップLEDです。

● 3 colors of red, blue, and green chip LEDs in one package

●絶対最大定格 Absolute Maximum Rating

(Ta 25°C)

| Series | Lighting color | P ^{※1} (mW) | Pd (mW) | I _F (mA) | I _{FP} (mA) | V _R (V) | T _{op} (°C) | T _{st} (°C) |
|--------|----------------|----------------------|---------|---------------------|----------------------|--------------------|----------------------|----------------------|
| CL-421 | TR1 | 125 | 78 | 30 | 100 ^{※2} | 4 | -25~+80 | -30~+85 |
| | MG/MB | | 76 | 20 | | | | |

※1 Pは同時点灯時の全許容損失を示します。

※1 P means total value of power dissipation when both colors are on.

※2 I_{FP}の条件はduty 1/10、パルス巾30msecです。

※2 Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

●電氣的光学的特性 Electro-optical Characteristics

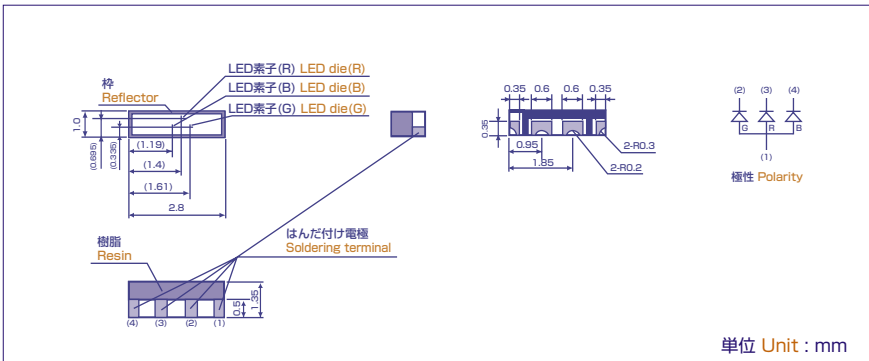
(Ta 25°C)

| Product code | Lighting color | V _F | | | λ _p typ (nm) | Δλ typ (nm) | I _v [*] | | |
|--------------|----------------|---------------------|---------|---------|-------------------------|-------------|-----------------------------|-----------|-----------|
| | | I _F (mA) | typ (V) | max (V) | | | I _F (mA) | min (mcd) | typ (mcd) |
| CL-421S-G | TR1 | — | 2.0 | 2.6 | 624 | 15 | 20 | 79 | 120 |
| | MG | — | 3.3 | 3.8 | 515 | 35 | 20 | 110 | 300 |
| | MB | — | 3.4 | 3.8 | 470 | 35 | 20 | 30 | 95 |

※NIST規格に準拠

※Per NIST standards

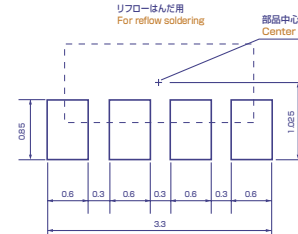
●外形寸法図 Outline drawing



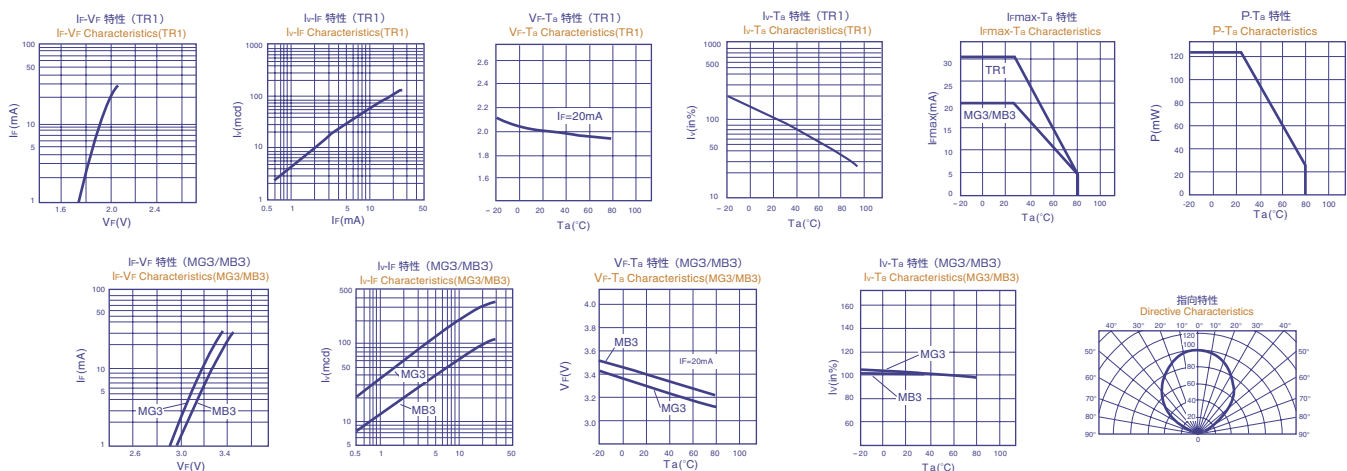
単位 Unit : mm

推奨はんだ付けパターン

The following soldering patterns are recommended for reflow-soldering:

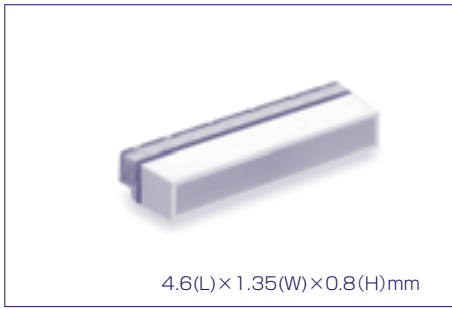


■諸特性 Characteristics



CL-422 Series

Multi-Color Side-Lighting Type **CL-422 Series**



● 同一パッケージで赤、青、緑の3色に発光するチップLEDです。

● 3 colors of red, blue, and green chip LEDs in one package

●絶対最大定格 Absolute Maximum Rating (Ta 25°C)

| Series | Lighting color | P*1 (mW) | Pd (mW) | IF (mA) | IFP (mA) | VR (V) | Top (°C) | Tst (°C) |
|--------|----------------|----------|---------|---------|----------|--------|----------|----------|
| CL-422 | TR1 | 125 | 78 | 30 | 100*2 | 4 | -25~+80 | -30~+85 |
| | MG3 | | 80 | 20 | | | | |
| | MB3 | | 76 | 20 | | | | |

*1 Pは同時点灯時の全許容損失を示します。

*1 P means total value of power dissipation when both colors are on.

*2 IFPの条件はduty 1/10、パルス巾30msecです。

*2 Condition for IFP is pulse of 1/10 duty and 30msec width.

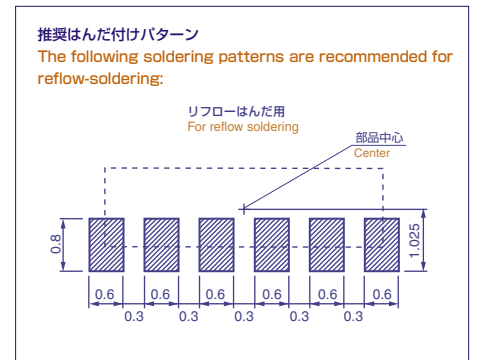
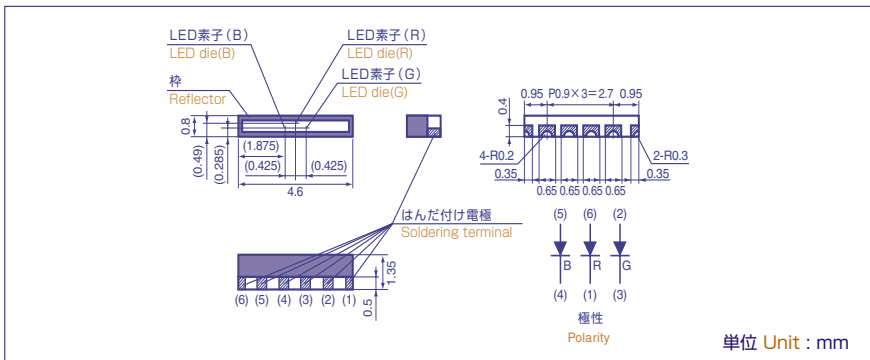
●電氣的光学的特性 Electro-optical Characteristics (Ta 25°C)

| Product code | Lighting color | VF | | | λp typ (nm) | IV* | | |
|--------------|----------------|---------|---------|---------|-------------|---------|-----------|-----------|
| | | IF (mA) | typ (V) | max (V) | | IF (mA) | min (mcd) | typ (mcd) |
| CL-422S-P | TR1 | 20 | 2.0 | 2.6 | 624 | 20 | 70 | 110 |
| | MG3 | 20 | 3.3 | 4.0 | 523 | 20 | 135 | 360 |
| | MB3 | 20 | 3.3 | 3.8 | 465 | 20 | 50 | 135 |

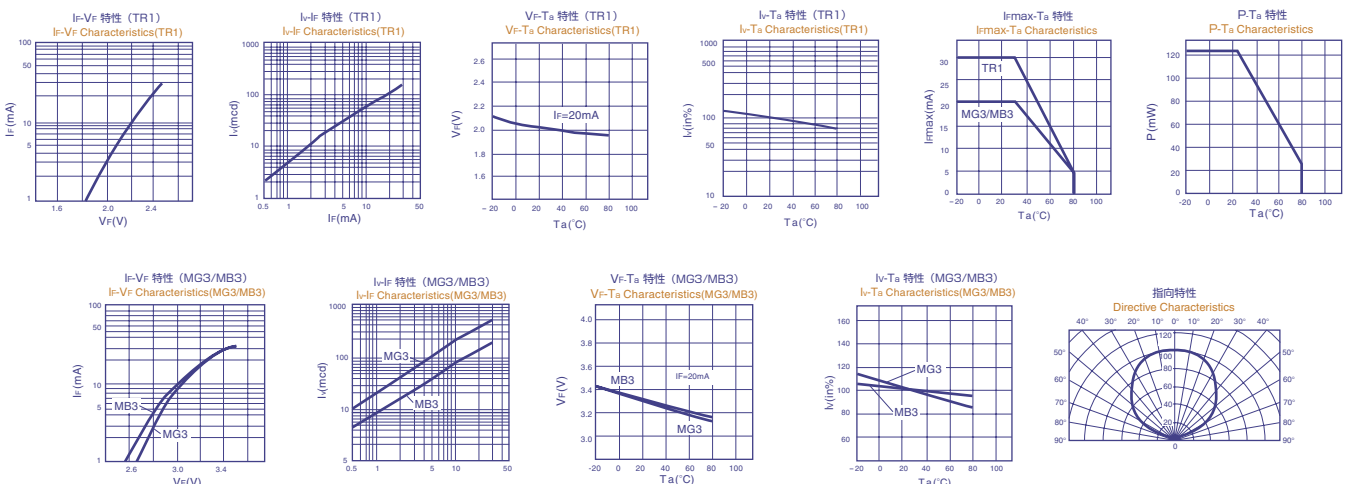
*NIST規格に準拠

*Per NIST standards

●外形寸法図 Outline drawing

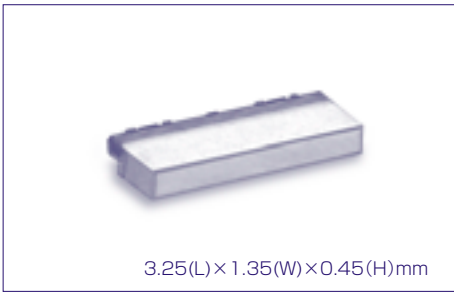


■ 諸特性 Characteristics



CL-425 Series

Multi-Color Side-Lighting Type **CL-425 Series**



● 同一パッケージで赤、青、緑の3色に発光するチップLEDです。

● 3 colors of red, blue, and green chip LEDs in one package

●絶対最大定格 Absolute Maximum Rating

(Ta 25°C)

| Series | Lighting color | P ^{※1} (mW) | Pd (mW) | I _F (mA) | I _{FP} (mA) | V _R (V) | T _{op} (°C) | T _{st} (°C) |
|--------|----------------|----------------------|---------|---------------------|----------------------|--------------------|----------------------|----------------------|
| CL-425 | TR2 | 125 | 78 | 30 | 100 ^{※2} | 4 | -25~+80 | -30~+85 |
| | HG8 | | 76 | 20 | | | | |
| | HB8 | | 71 | 20 | | | | |

※1 Pは同時点灯時の全許容損失を示します。

※1 P means total value of power dissipation when both colors are on.

※2 I_{FP}の条件はduty 1/10、パルス巾30msecです。

※2 Condition for I_{FP} is pulse of 1/10 duty and 30msec width.

●電氣的光学的特性 Electro-optical Characteristics

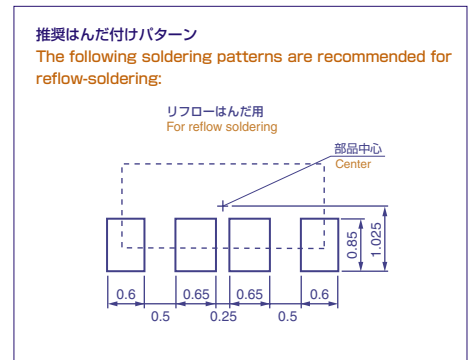
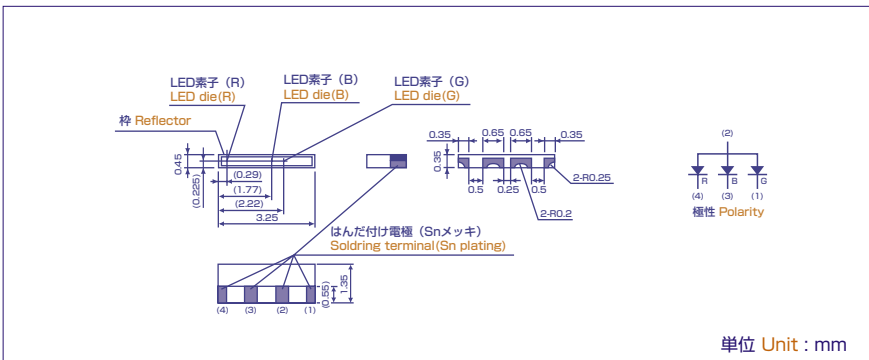
(Ta 25°C)

| Product code | Lighting color | V _F | | | λ _p typ (nm) | I _v [*] | | |
|--------------|----------------|---------------------|---------|---------|----------------------------|-----------------------------|-----------|-----------|
| | | I _F (mA) | typ (V) | max (V) | | I _F (mA) | min (mcd) | typ (mcd) |
| CL-425F | TR2 | 5 | 1.85 | 2.4 | 625 | 5 | 10 | 20 |
| | HG8 | 5 | 3.1 | 3.4 | 530 | 5 | 90 | 180 |
| | HB8 | 5 | 2.9 | 3.2 | 470 | 5 | 18 | 45 |

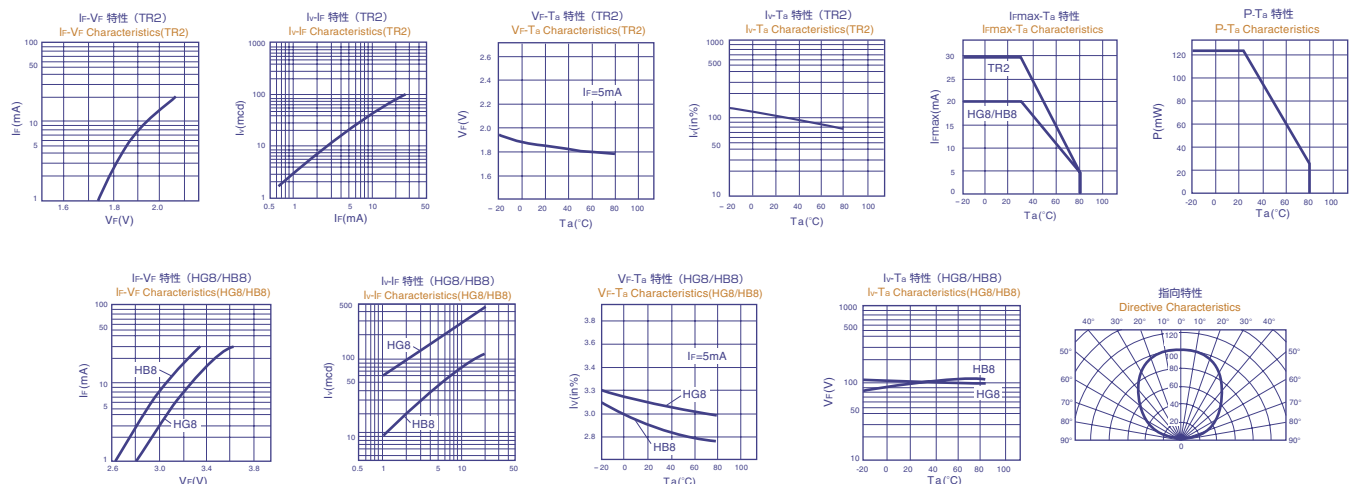
※NIST規格に準拠

※Per NIST standards

●外形寸法図 Outline drawing



■ 諸特性 Characteristics



使用上の注意

Precaution to be taken on mounting CITILEDs

■ 納入形態 Shipping Modes

■ テーピング

CITILEDをテーピングして納入いたします。尚、テーピング仕様はCITILEDの機種により異なりますが、本カタログのテーピング仕様頁に、機種別詳細を掲載してありますのでご参照下さい。

■ Taping

CITILEDs are packed on a tape. The taping specifications depend on the CITILED type. For details on each type, please refer to the taping specifications page in this catalog.

■ はんだ付け推奨条件 Recommended Soldering Conditions

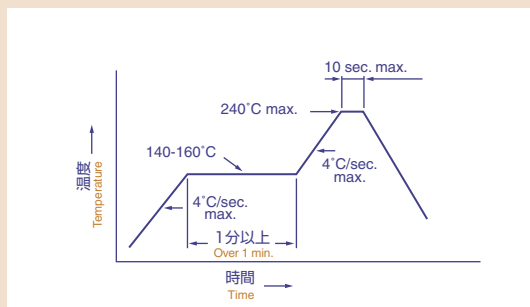
(ご使用の際には事前打ち合わせをお奨めいたします。)

(Consultation with us prior to soldering recommended)

■ リフローはんだ

● 推奨リフローはんだ付け温度プロファイル

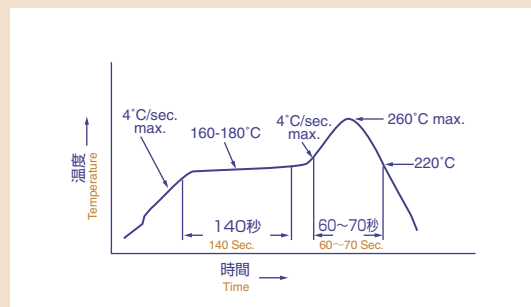
Recommended reflow soldering temperature profile.



■ Reflow soldering

● 推奨鉛フリーリフローはんだ付け温度プロファイル

Recommended lead free reflow soldering temperature profile.



■ 手はんだ

コテ先温度は350℃以下に抑えて、各ランド3秒以内で行ってください。

■ Manual soldering

The temperature of the iron tip should be no higher than 350°C (572°F) and soldering within 3 seconds per solder-land is to be observed.

■ 取扱について Handling

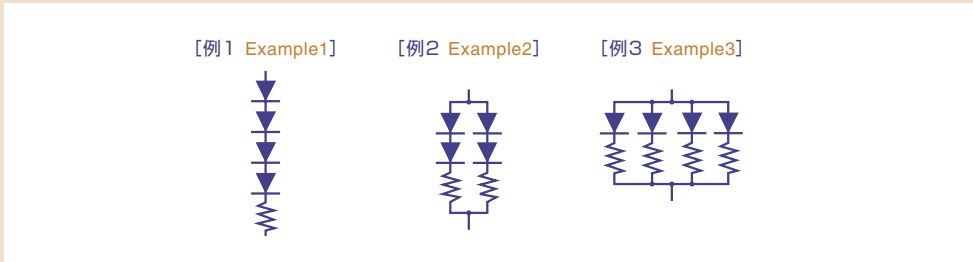
- 1) 樹脂部に高温の状態では応力がかかるようなことは避けてください。
- 2) 樹脂部は鋭い金属爪、あるいはサンドブラストなどでの摩擦は避けてください。

- 1) Care must be taken not to cause stress to the epoxy resin portion of CITILEDs while it is exposed to high temperature.
- 2) Care must be taken not to rub the epoxy resin portion of CITILEDs with hard or sharp article such as the sand blast and the metal hook.

■ 設計上の注意 Notes for designing

- 1) 回路内には必ず電流制限抵抗を接続し、定格内で駆動するよう設計してください。
- 2) パルス駆動にて使用される場合は、平均電流値が定格内になるよう設計してください。また、LED消灯時に逆電圧がかからないよう設計してください。
- 3) LEDを複数個ご使用になる際は、各LED間に電流差を生じさせない為に、LEDに流れる電流の経路毎に電流制限抵抗を設けて下さい。

- 1) Care must be taken to provide the current limiting resistor in the circuit so as to drive the CITILEDs within the rated figures. Also, caution should be taken not to overload CITILEDs with instantaneous voltage at the turning ON and OFF of the circuit.
- 2) When using the pulse drive, care must be taken to keep the average current within the rated figures. Also, the circuit should be designed so as not to be subjected to reverse voltage when turning off the CITILEDs.
- 3) When two or more LEDs are used, provide each circuit on which an LED is mounted with current-controlled resistance to prevent current difference between or among LEDs.



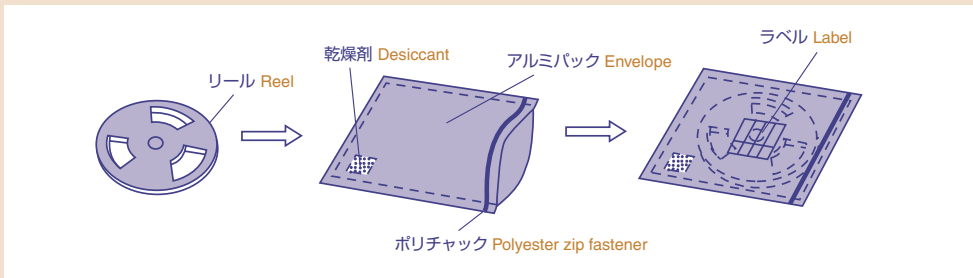
■ 梱包仕様 Packing specifications

■防湿梱包

製品の輸送中及び保管中の吸湿を避けるため、アルミパックによる防湿包装を行っています。この包装袋内には乾燥剤(シリカゲル)が入っております。

■Moisture-proof packing:

In order to avoid the absorption of moisture during transportation and storage, CITILEDs are packed in the aluminum envelope. A desiccant is included in the aluminum envelope.



■保管

樹脂部の吸湿を避けるため、保管環境としてはドライボックス保管が最も望ましいですが、ドライボックス保管が出来ない場合は以下の条件を推奨します。

温度:5~30℃

湿度:60%RH以下

防湿包装されておりますので、開封後は速やかに実装されることが望まれますが、開封後保管される場合はドライボックス保管、またはポリチャックによる再シールをお願いします。

■ベーキング

防湿梱包開封後から一定時間以上経過した製品は吸湿が進みますので、ご使用前にベーキングを行って下さい。(詳細は個別仕様書を御請求ください。)

■Storage:

In order to avoid the absorption of moisture, it is recommended to store CITILEDs (in bulk or taped) in the dry box (or the desiccator) with a desiccant. Otherwise, to store them in the following environment is recommended.

Temperature:5℃~30℃(41°F~86°F)

Humidity:60%HR max.

It is recommended to solder CITILEDs as soon as possible after unpacking the aluminum envelope, but in case that CITILEDs have to be left unused after unpacking, to store them in the dry box or to seal the aluminum envelope again is requested.

■Baking:

The packing is moisture-proof, but products unpacked for more than a certain time before use should be baked first. (For details apply for individual specification sheets.)

■ 注意事項 Precautions

使用上の注意については、個別仕様書を御参考願います。

Please see the individual specifications manual for precautions.