

SN3838F85CQ01 Datasheet

Infrared Emitter












3838 Series (850nm) - 135°/35° (OA55°)



Applications

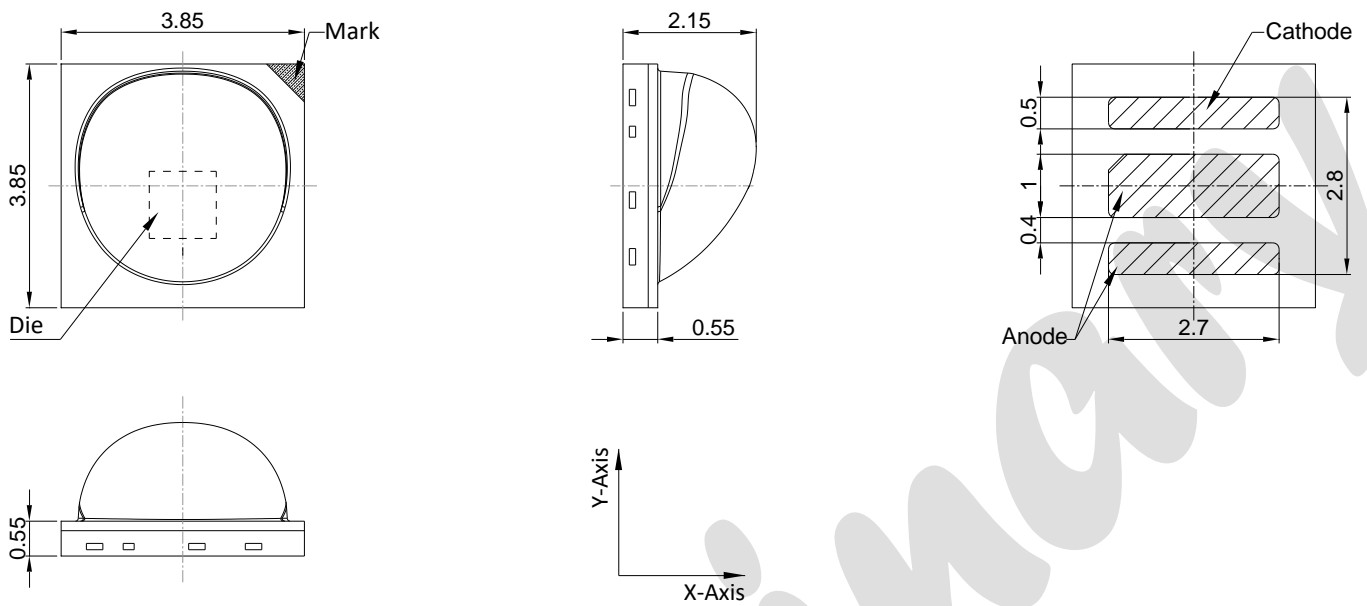
-  Security System
-  Automotive

Features

-  Package: clear silicone
-  Corrosion robustness class: 3B
-  ESD: 2KV (HBM : MIL STD 883 Class 2)
-  IR light source with high efficiency
-  Dual junction emitter
-  Qualifications: AEC-Q102 Qualified
-  Low thermal resistance (Max. 11 K/W)
-  Peak wavelength 850 nm
-  Optimized for high current pulse operation
-  RoHS 2.0 and REACH compliant
-  MSL 2 qualified according to J-STD 020E

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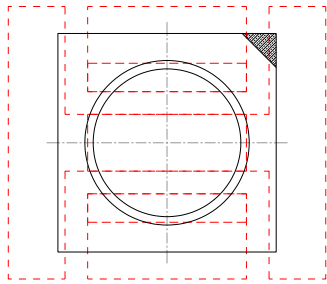
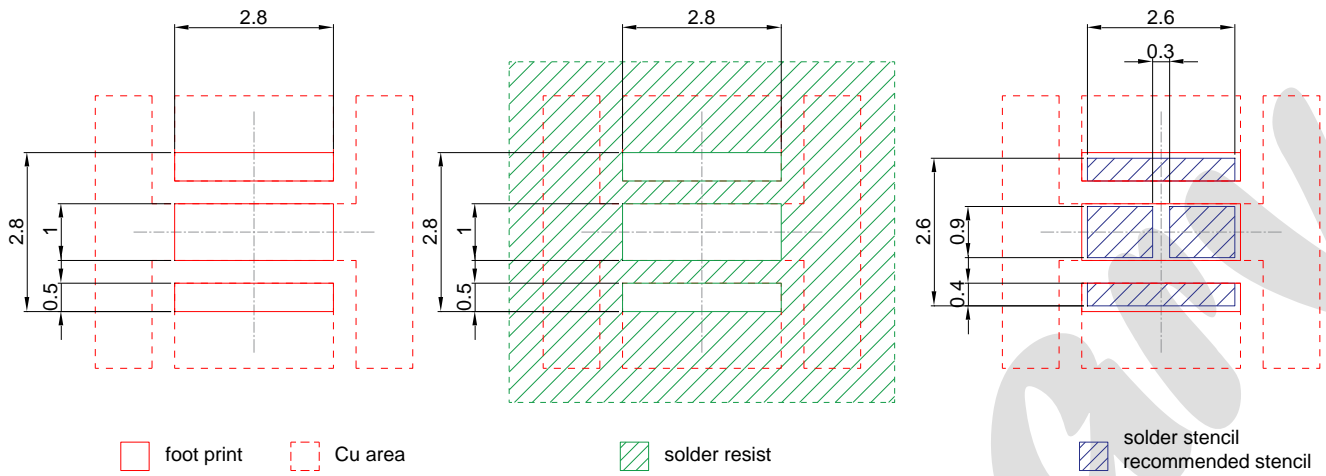
Dimensional Drawing



1. Dimensions are in millimeters.
2. General tolerance is $\pm 0.05\text{mm}$.

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Recommended Solder Pad



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Maximum Ratings

T_A : 25 °C

| Parameter | Symbol | Rating | |
|---|------------------|--------|---------|
| Forward current | I _F | max. | 1000 mA |
| Power consumption | P _{tot} | max. | 3.6 W |
| Pulse forward current | I _{PF} | max. | 3 A |
| Reverse voltage | V _R | max. | 5 V |
| Junction temperature | T _j | max. | 145 °C |
| Operating temperature | T _{op} | min. | -40 °C |
| | | max. | 105 °C |
| Storage temperature | T _{stg} | min. | -40 °C |
| | | max. | 105 °C |
| Soldering temperature | T _{sol} | max. | 260 °C |
| Thermal resistance junction | R _{th} | typ. | 6.5 K/W |
| | | max. | 11 K/W |
| ESD withstand voltage (HBM : MIL STD 883 Class 2) | V _{ESD} | max. | 2 kV |

1. For other ambient, limited setting of current will depend on de-rating curves.
2. When drive on maximum current, Junction temperature must be kept below 145°C.

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Characteristics

I_F : 1A | t_p : 10 ms | T_A : 25°C

| Parameter | Symbol | Values |
|---|-----------------|-----------------------|
| Peak wavelength | λ_p | typ. 850 nm |
| Spectral bandwidth | $\Delta\lambda$ | typ. 35 nm |
| View angle (X-axis) | $2\theta_{1/2}$ | 135 ° |
| (Y-axis) | | typ. 35 ° |
| Off-axis angle (Y-axis) | | typ. 55 ° |
| Total radiant power $I_F = 1\text{ A}; t_p = 100\ \mu\text{s}$ | Φ_e | min. 1200 mW |
| | | typ. 1400 mW |
| | | max. 1600 mW |
| Radiant intensity $I_F = 1\text{ A}; t_p = 100\ \mu\text{s}$ | I_E | min. 240 mW/sr |
| | | typ. 320 mW/sr |
| | | max. 400 mW/sr |
| Forward voltage $I_F = 1\text{ A}; t_p = 100\ \mu\text{s}$ | V_F | min. 2.8 V |
| | | typ. 3.25 V |
| | | max. 3.6 V |
| Reverse current ($V_R=5\text{V}$) | I_R | max. 10 μA |

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Brightness Groups

Total radiant power $I_F : 1A$ | $t_p : 100 \mu s$

| Group | min. Φ_e | max. Φ_e |
|-------|---------------|---------------|
| PB2A | 1200 mW | 1400 mW |
| PB4A | 1400 mW | 1600 mW |

Forward voltage $I_F : 1A$ | $t_p : 100 \mu s$

| Group | min. V_F | max. V_F |
|-------|------------|------------|
| KN | 2.8 V | 3.6 V |

Peak wavelength $I_F : 1A$ | $t_p : 100 \mu s$

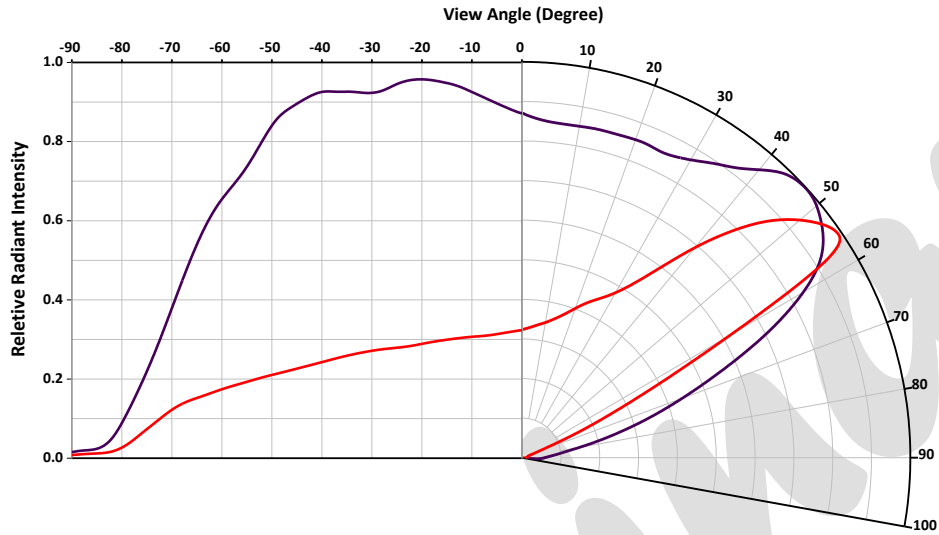
| Group | min. λ_p | max. λ_p |
|-------|------------------|------------------|
| F3 | 840 nm | 870 nm |

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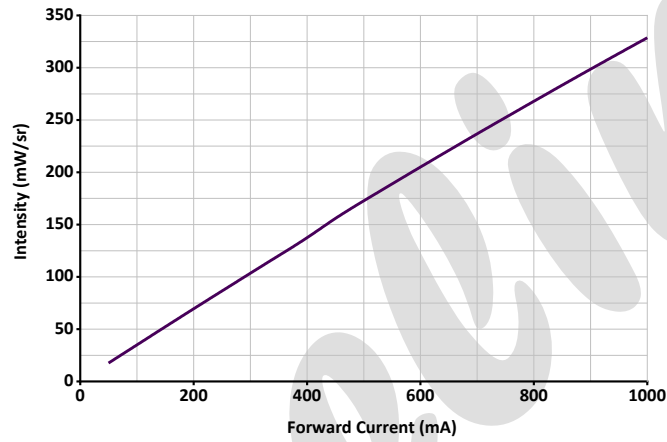
Typical Electrical Optical Characteristics Curves

Radiation Characteristics(L=0)

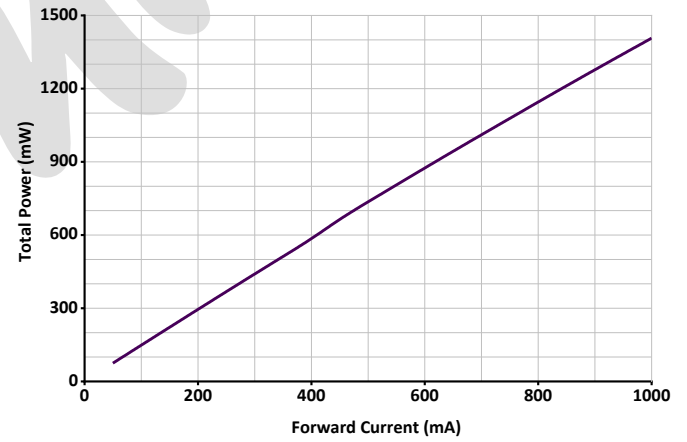
● X-axis ● Y-axis



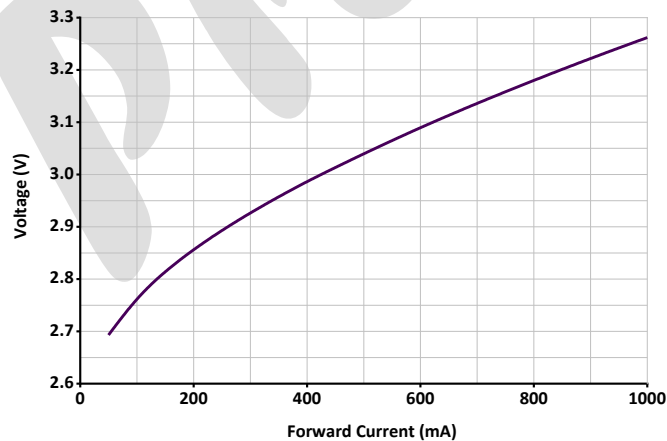
Radiant Intensity



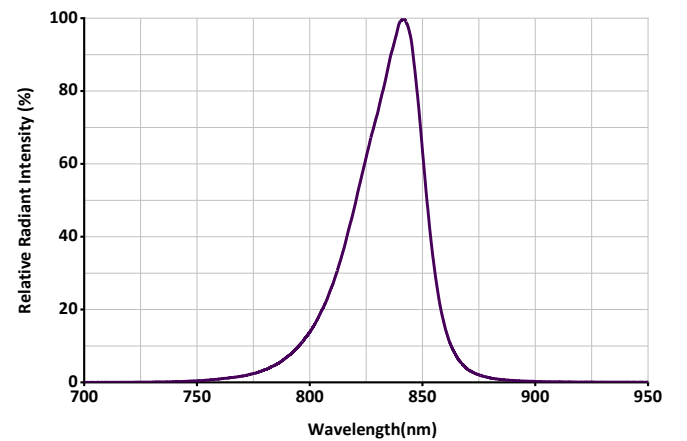
Total radiant power



Forward current



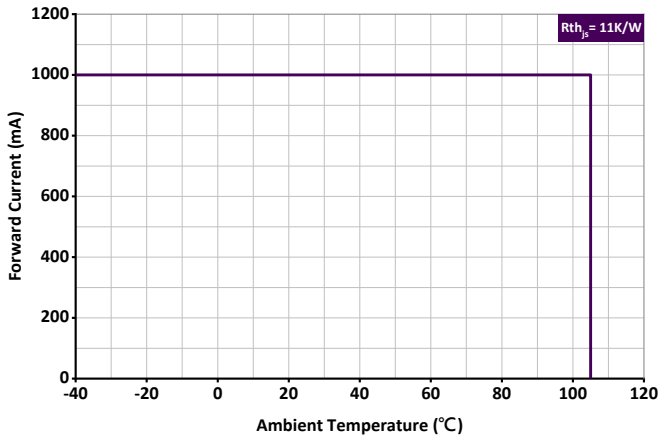
Relative Spectral Emission



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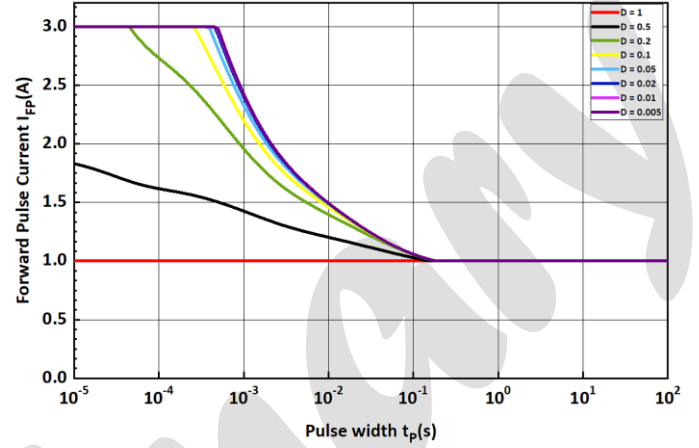
Permissible Forward Current

$$I_{F,max} = f(T_S); R_{th_{j_s}} = 11K/W$$



Permissible Pulse Handling Capability

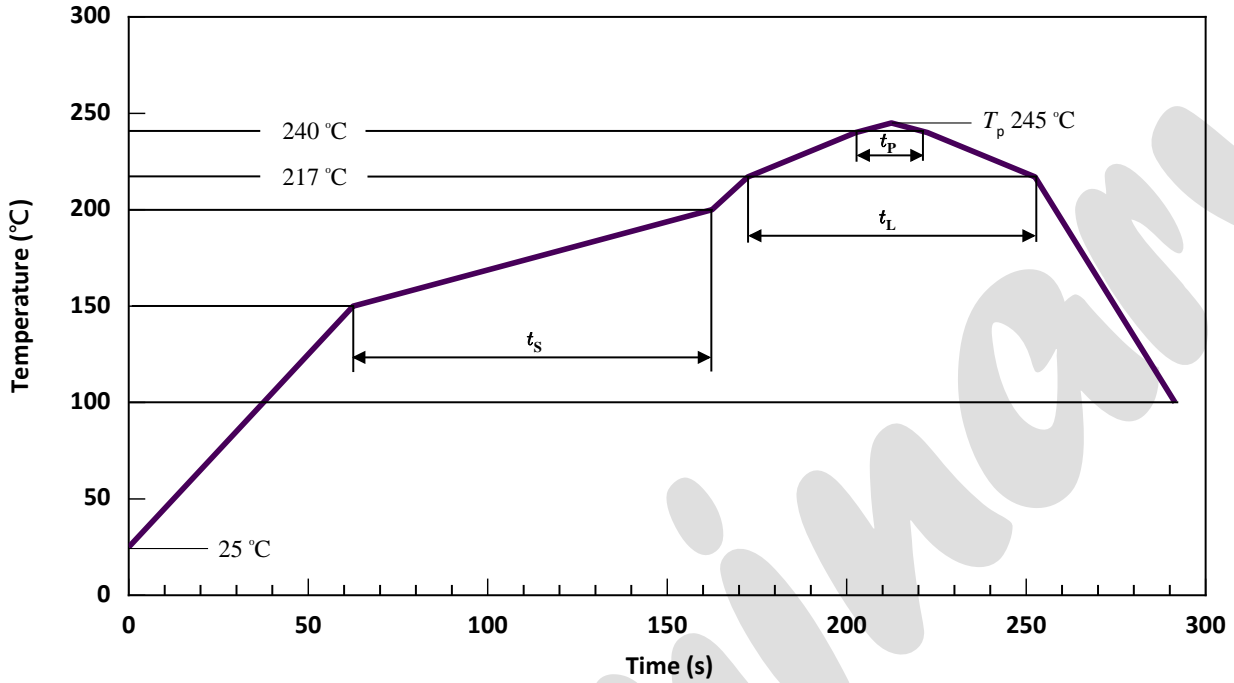
$$I_F = f(t_p); D = \text{Duty cycle}; T_S = 85^\circ\text{C}$$



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Reflow Soldering Profile

Product complies to MSL Level 2 acc. to JEDEC J-STD-020E

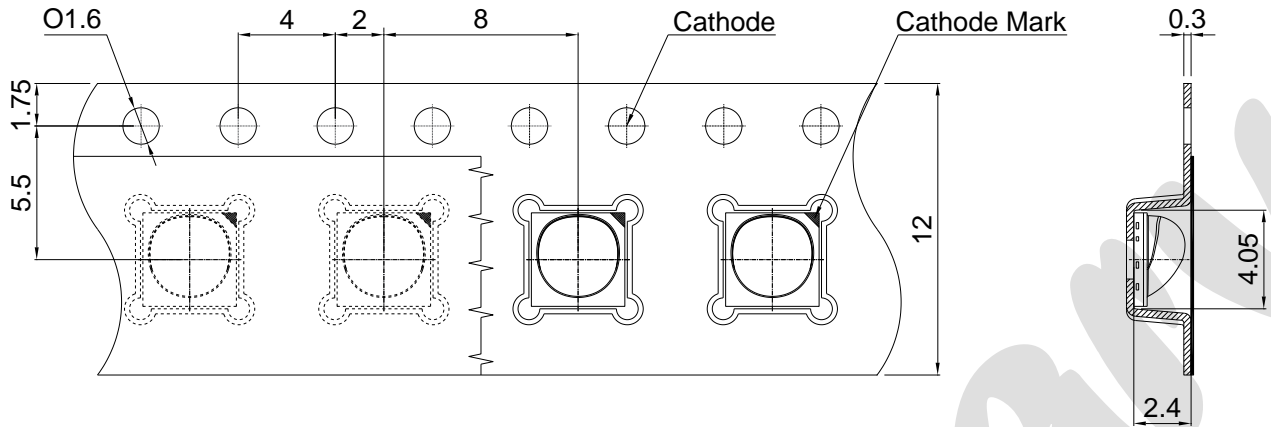


| Profile Feature | Symbol | Pb-Free (SnAgCu) Assembly | | | Unit |
|--|--------|---------------------------|----------------|---------|------|
| | | Minimum | Recommendation | Maximum | |
| Ramp-up rate to preheat 25 °C to 150 °C | | | 2 | 3 | K/s |
| Time t_s T_{Smin} to T_{Smax} | t_s | 60 | 100 | 120 | s |
| Ramp-up rate to peak T_{Smax} to T_p | | | 2 | 3 | K/s |
| Liquidus temperature | T_L | | 217 | | °C |
| Time above liquidus temperature | t_L | | 80 | 100 | s |
| Peak temperature | T_p | | 245 | 260 | °C |
| Time within 5 °C of the specified peak temperature $T_p - 5$ K | T_p | 10 | 20 | 30 | s |
| Ramp-down Rate T_p to 100 °C | | | 3 | 4 | K/s |
| Time 25 °C to T_p | | | | 480 | s |

1. Do not stress the silicone resin while it is exposed to high temperature.
2. The reflow process should not exceed 2 times.

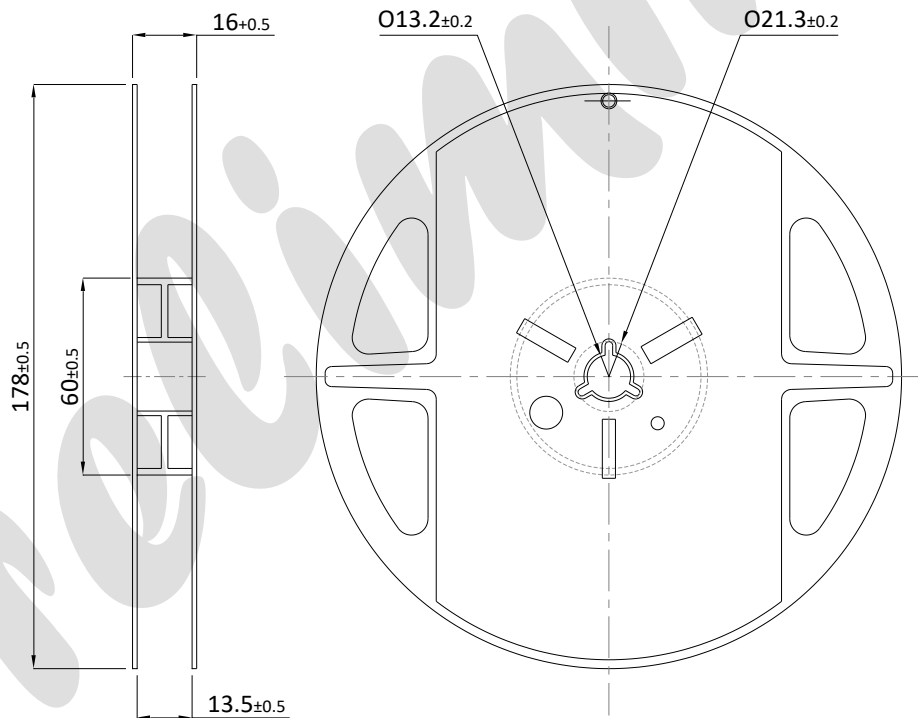
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Dimensions of Tape



1. Dimensions are in millimeters.
2. General tolerance is $\pm 0.1\text{mm}$.


Dimensions of Reel



1. Dimensions are in millimeters.
2. 800 pieces per reel.
3. Dimensions acc. to EIA 481-E.

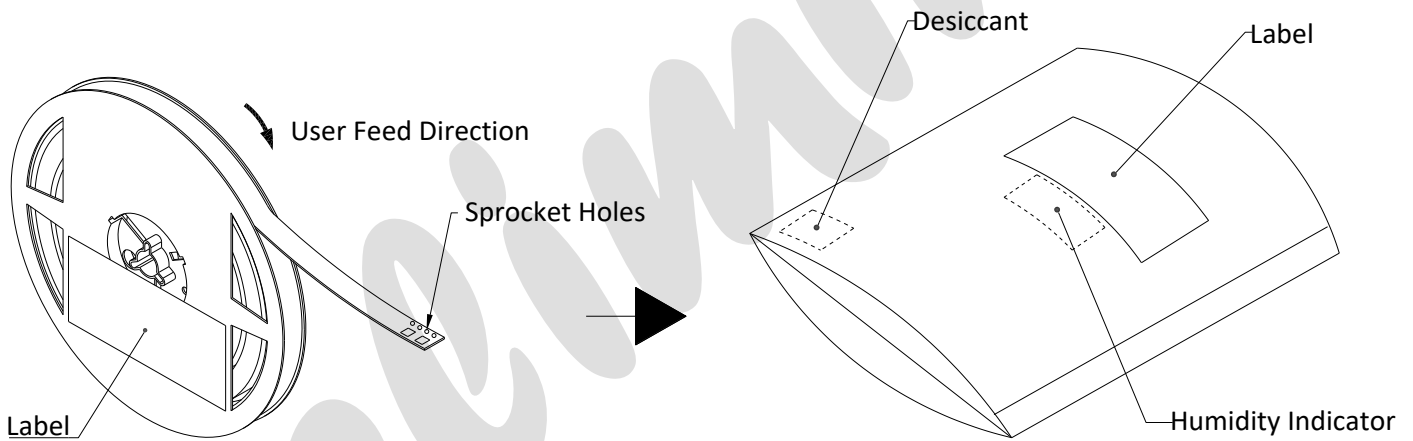
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Barcode-Product-Label (BPL)

| | | |
|---|---|-----------|
|  | | MSL |
| Part No: | | |
| O Item: | | |
| N Item: | | |
| Q'TY: | | |
| VF: | (| mA) |
| IV: | (| mA) |
| WL: | (| mA) |
| Lot No: | | |
| XXXX-XXXX XXXX / PLSTXXXX | | RoHS PASS |

- ☰ Part No : Product Number
- ☰ O Item : Customer's Product Number
- ☰ N Item : Product Name
- ☰ Q'TY : Packing Quantity
- ☰ VF : Voltage Rank
- ☰ IV : Luminous Intensity Rank
- ☰ WL : Wavelength Rank
- ☰ Lot No : Lot Number
- ☰ MSL : MSL Level
- ☰ XXXX-XXXX XXXX / PLSTXXXX : Identify Label Number

Dry Packing Process and Materials



1. Moisture-sensitive product is packed in a dry bag containing desiccant and a humidity card according JEDEC-STD-033.

Disclaimer

1. Brightek reserves the right(s) on the adjustment of product material mix for the specification.
2. The product meets Brightek published specification for a period of one year from date of shipment.
3. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
4. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. Brightek assumes no responsibility for any damage resulting from the use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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