

SF3838F94CQ01 Datasheet

Infrared Emitter

3838 Series (940nm) - 50°



Applications

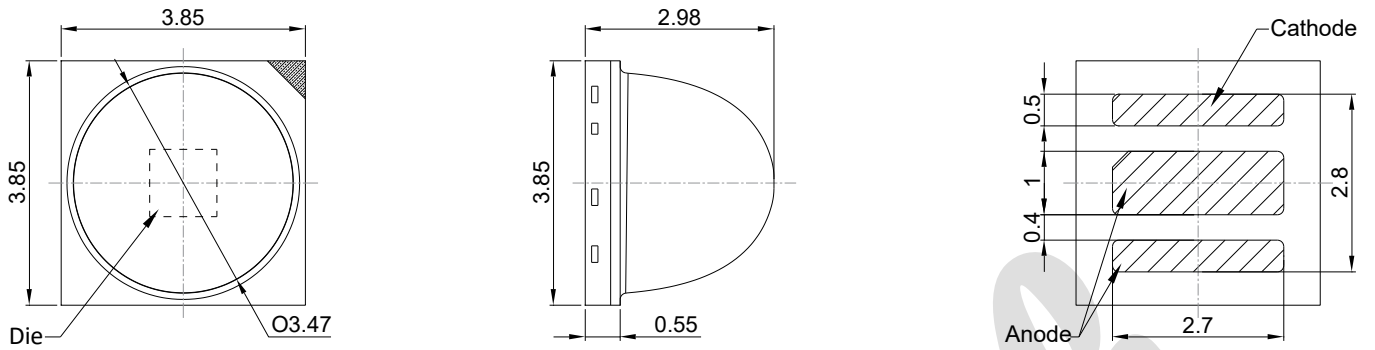
- Security System
- Automotive
- Facial Recognition
- Gesture Recognition

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. 9 K/W)
- Peak wavelength 940 nm
- Optimized for high current pulse operation
- RoHS 2.0 and REACH compliant
- MSL 2 qualified according to J-STD 020

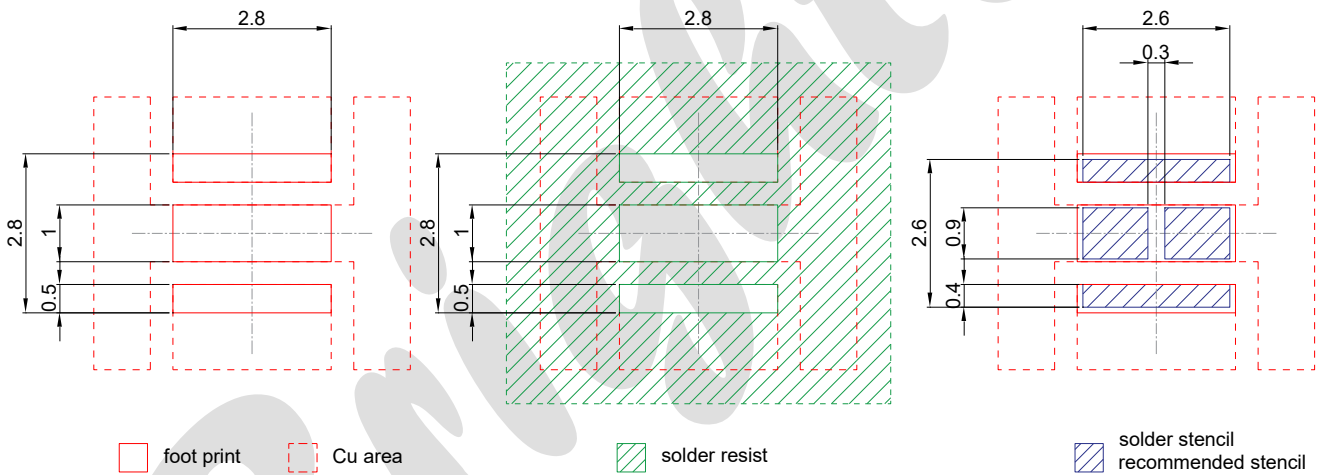
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Dimensional Drawing



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

Recommended Solder Pad



Component Location on Pad

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Maximum Ratings

T_A : 25 °C

Parameter	Symbol	Rating
Forward current	I _F	max. 1500 mA
Power consumption	P _{tot}	max. 5.5 W
Pulse forward current	I _{PF}	max. 5 A
Reverse voltage	V _R	max. 5 V
Junction temperature	T _j	max. 145 °C
Operating temperature	T _{op}	min. -40 °C
		max. 125 °C
Storage temperature	T _{stg}	min. -40 °C
		max. 125 °C
Soldering temperature	T _{sol}	max. 260 °C
Thermal resistance junction	R _{th}	typ. 4.5 K/W
		max. 9 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. 940 nm
Spectral bandwidth	$\Delta\lambda$	typ. 45 nm
View angle	$2\theta_{1/2}$	typ. 50 °
Total radiant power	Φ_e	min. 1200 mW
		typ. 1400 mW
		max. 1600 mW
Total radiant power $I_F = 1.5 \text{ A}; t_p = 10\text{ms}$	Φ_e	min. 1900 mW
		typ. 2100 mW
		max. 2300 mW
Radiant intensity	I_E	min. 1000 mW/sr
		typ. 1200 mW/sr
		max. 1400 mW/sr
Radiant intensity $I_F = 1.5 \text{ A}; t_p = 10\text{ms}$	I_E	min. 1550 mW/sr
		typ. 1750 mW/sr
		max. 1950 mW/sr
Forward voltage	V_F	min. 2.8 V
		typ. 3.1 V
		max. 3.6 V
Forward voltage $I_F = 1.5 \text{ A}; t_p = 10\text{ms}$	V_F	min. 2.85 V
		typ. 3.25 V
		max. 3.65 V
Forward voltage $I_F = 5 \text{ A}; t_p = 100 \mu\text{s}$	V_F	typ. 4.4 V
		max. 5.0 V
Reverse current ($V_R=5\text{V}$)	I_R	max. 10 μA

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Brightness Groups

Total radiant power $I_F : 1A$ | $t_p : 10$ ms

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

Forward voltage $I_F : 1A$ | $t_p : 10$ ms

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

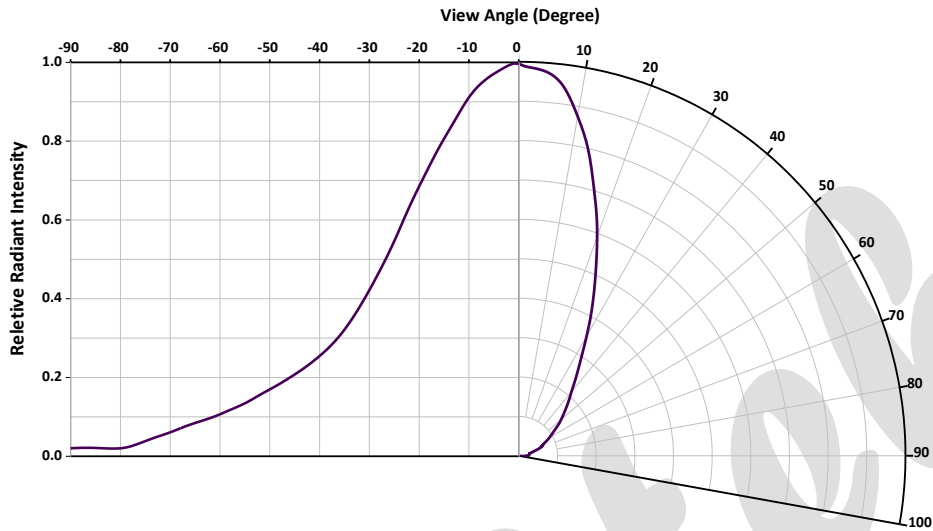
Peak wavelength $I_F : 1A$ | $t_p : 10$ ms

Group	min. λ_p	max. λ_p
F1	930 nm	950 nm

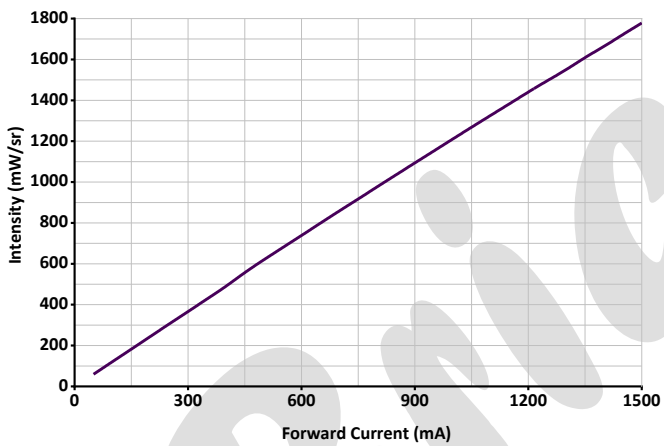
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Typical Electrical Optical Characteristics Curves

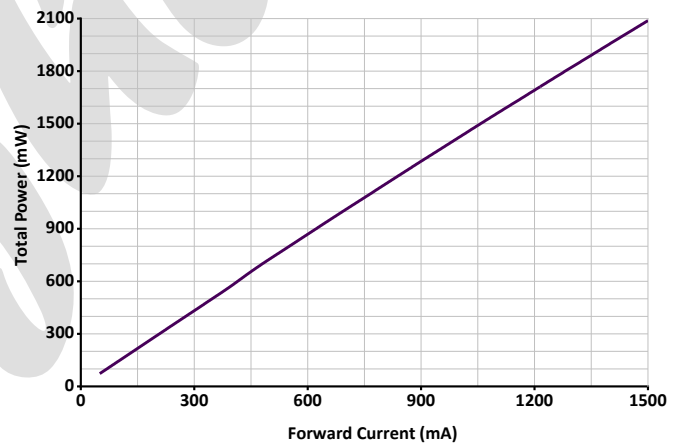
Radiation Characteristics(L=0)



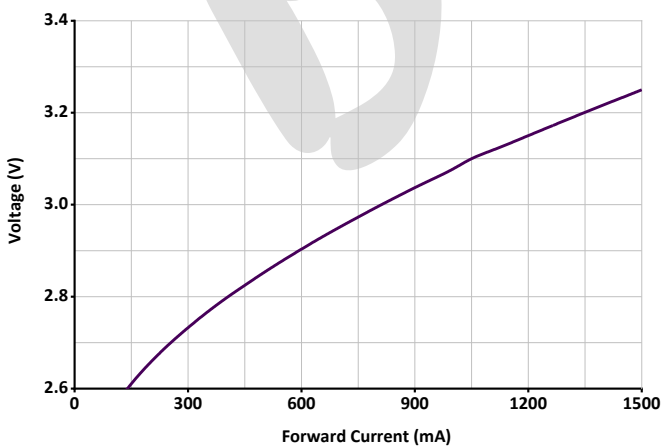
Radiant Intensity



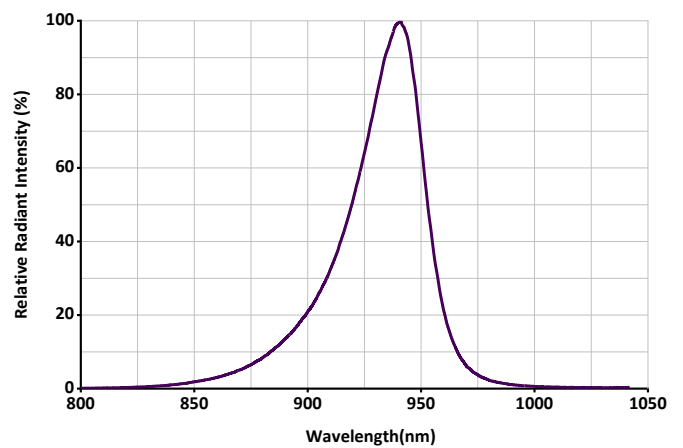
Total radiant power



Forward Voltage



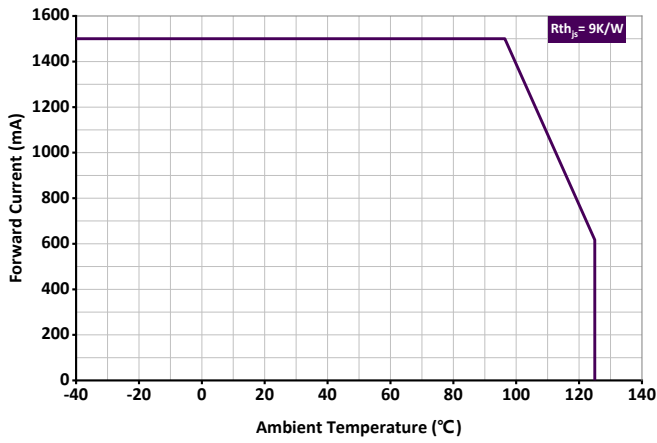
Relative Spectral Emission



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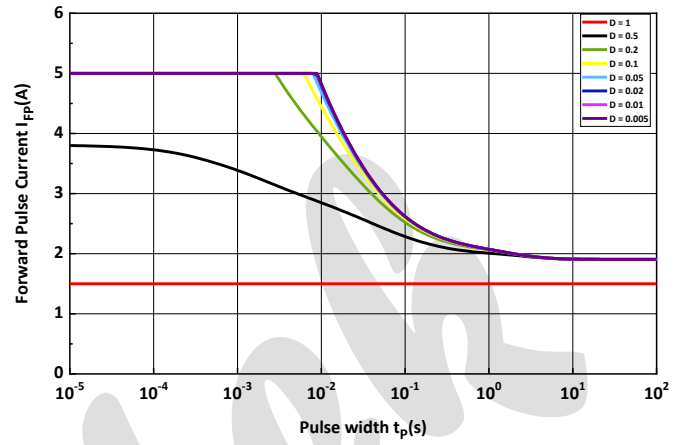
Permissible Forward Current

$$I_{F,max} = f(T_S); R_{th_{j_s}} = 9 \text{ K/W}$$



Permissible Pulse Handling Capability

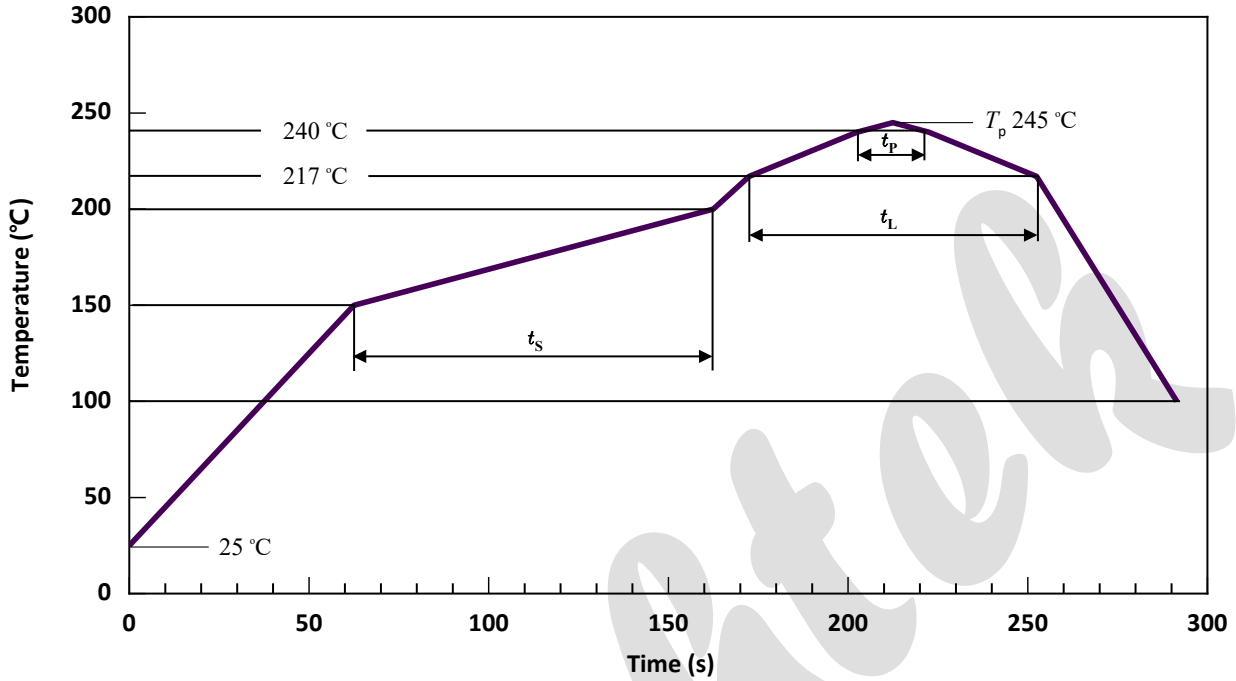
$$I_F = f(t_p); D = \text{Duty cycle}; T_S = 85^\circ\text{C}$$



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Reflow Soldering Profile

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

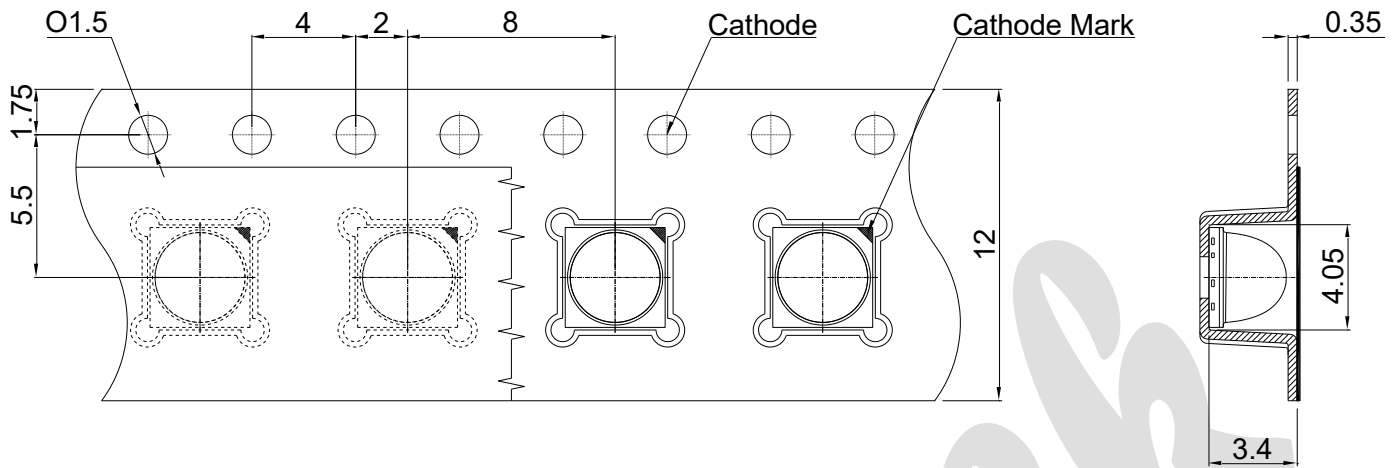


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat 25 °C to 150 °C			2	3	K/s
Time t_s T_{Smin} to T_{Smax}	t_s	60	100	120	s
Ramp-up rate to peak T_{Smax} to T_P			2	3	K/s
Liquidus temperature	T_L		217		°C
Time above liquidus temperature	t_L		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.

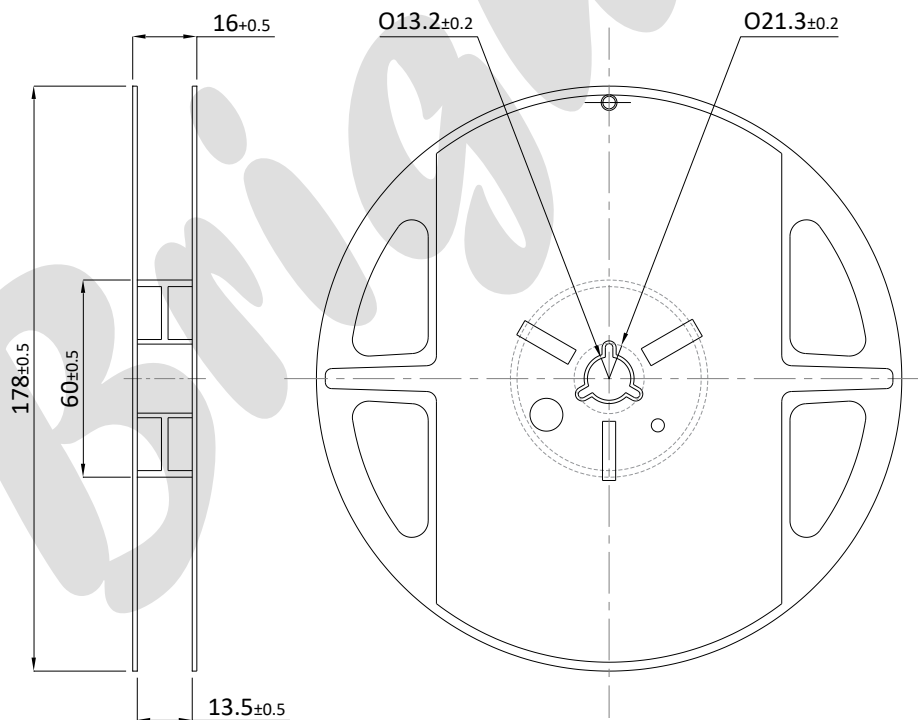
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Dimensions of Tape



1. Dimensions are in millimeters.
2. General tolerance is ± 0.1 mm.


Dimensions of Reel



1. Dimensions are in millimeters.
2. 600 pieces per reel.
3. Dimensions acc. to EIA 481-E

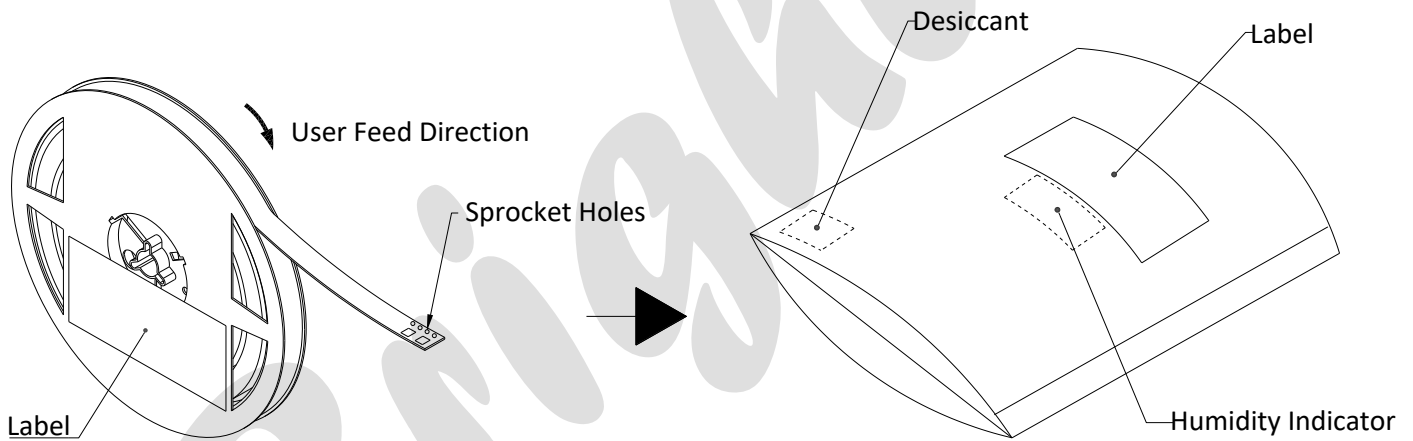
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Barcode-Product-Label (BPL)

		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.
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