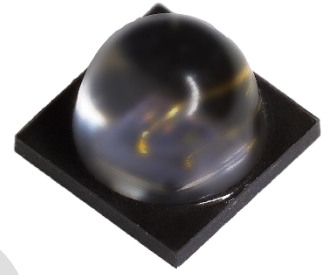


# SF3838F94CQ00 Datasheet

## Infrared Emitter

3838 Series (940nm) - 50°



### Applications

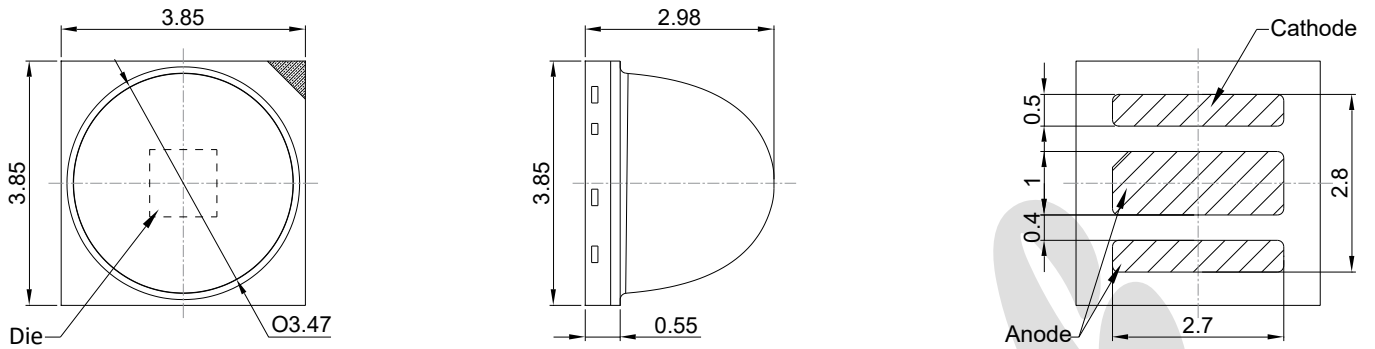
- Security System
- Automotive
- Facial Recognition
- Gesture Recognition

### Features

- Package: clear silicone
- Corrosion robustness class: 3B
- ESD: 2KV (HBM : MIL STD 883 Class 2)
- IR light source with high efficiency
- Single 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 020E

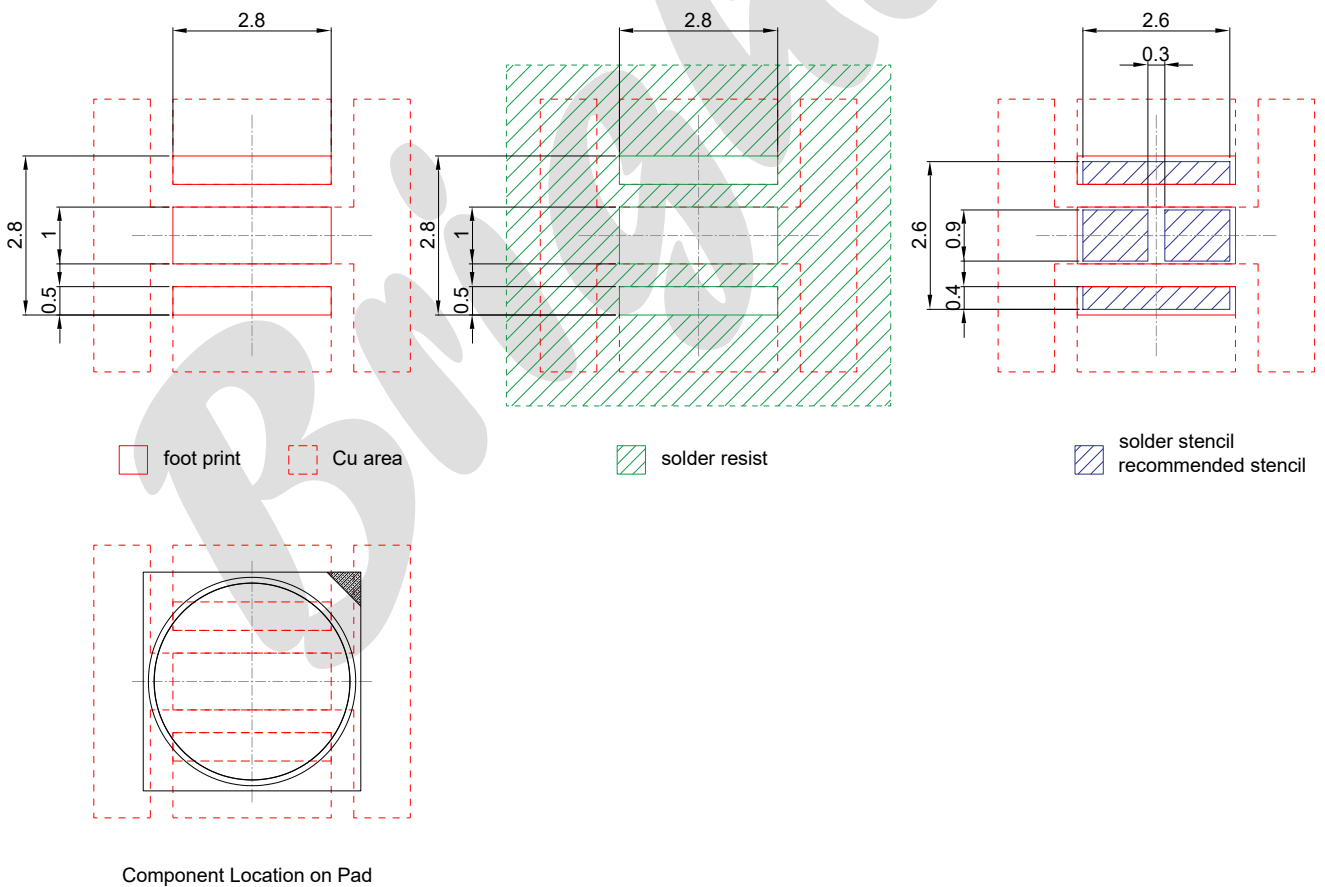
# SF3838F94CQ00

## Dimensional Drawing



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

## Recommended Solder Pad



# SF3838F94CQ00

## Maximum Ratings

T<sub>A</sub> : 25 °C

Parameter	Symbol		Rating
Forward current	I <sub>F</sub>	max.	1000 mA
Power consumption	P <sub>tot</sub>	max.	2 W
Pulse forward current	I <sub>PF</sub>	max.	3 A
Reverse voltage	V <sub>R</sub>	max.	5 V
Junction temperature	T <sub>j</sub>	max.	125 °C
Operating temperature	T <sub>op</sub>	min.	-40 °C
		max.	105 °C
Storage temperature	T <sub>stg</sub>	min.	-40 °C
		max.	105 °C
Soldering temperature	T <sub>sol</sub>	max.	260 °C
Thermal resistance junction	R <sub>th</sub>	typ.	4.5 K/W
		max.	9 K/W
ESD withstand voltage (HBM : MIL STD 883 Class 2)	V <sub>ESD</sub>	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 125°C.

# SF3838F94CQ00

## Characteristics

$I_F$ : 1A |  $t_p$ : 10 ms |  $T_A$ : 25°C

Parameter	Symbol		Values
Peak wavelength	$\lambda_p$	typ.	940 nm
Spectral bandwidth	$\Delta\lambda$	typ.	40 nm
View angle	$2\theta_{1/2}$	typ.	50 °
Total radiant power $I_F = 1A$ ; $t_p = 100 \mu s$	$\Phi_e$	min.	700 mW
		typ.	800 mW
		max.	1000 mW
Radiant intensity $I_F = 1A$ ; $t_p = 100 \mu s$	$I_E$	min.	640 mW/sr
		typ.	740 mW/sr
		max.	940 mW/sr
Forward voltage $I_F = 1 A$ ; $t_p = 100 \mu s$	$V_F$	min.	1.4 V
		typ.	1.6 V
		max.	2.0 V
Reverse current ( $V_R=5V$ )	$I_R$	max.	10 $\mu A$

# SF3838F94CQ00

## Brightness Groups

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

Group	min. $\Phi_e$	max. $\Phi_e$
PA7	700 mW	800 mW
PA8	800 mW	900 mW
PA9	900 mW	1000 mW

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

Group	min. $V_F$	max. $V_F$
DF	1.4 V	2.0 V

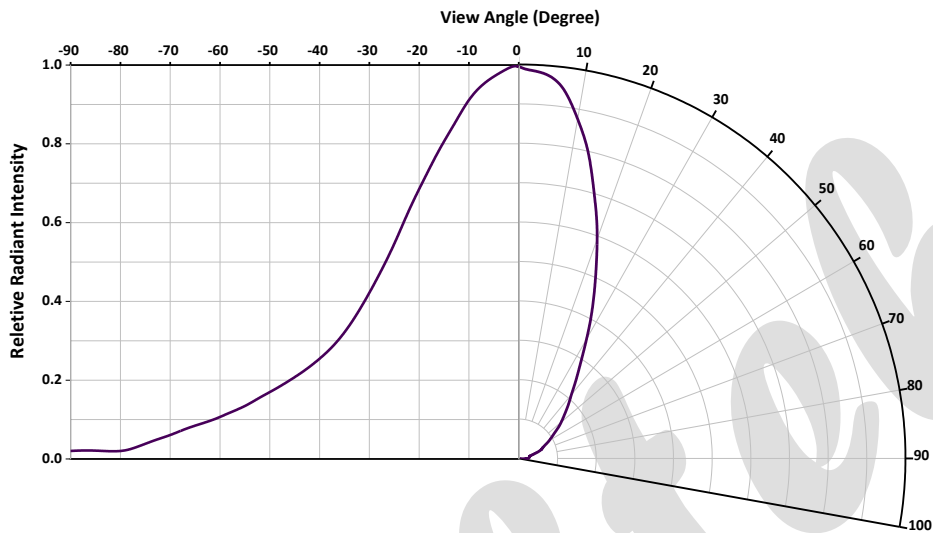
Peak wavelength  $I_F : 1A$  |  $t_p : 10$ ms

Group	min. $\lambda_p$	max. $\lambda_p$
F1	930 nm	950 nm

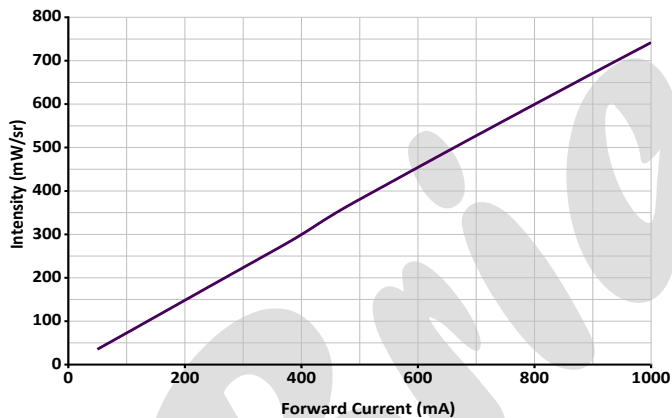
# SF3838F94CQ00

## Typical Electrical Optical Characteristics Curves

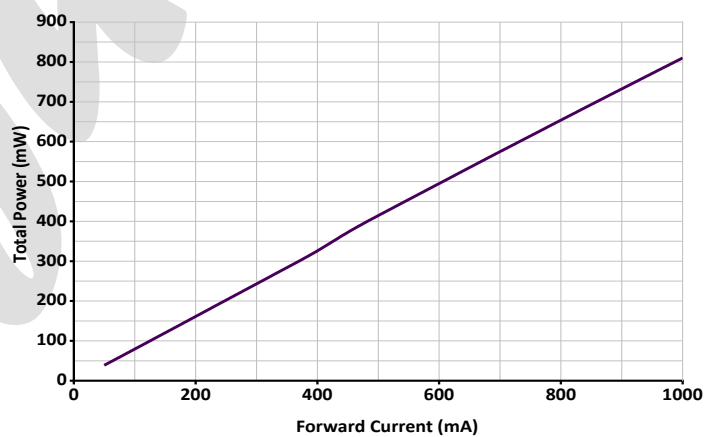
### Radiation Characteristics(L=0)



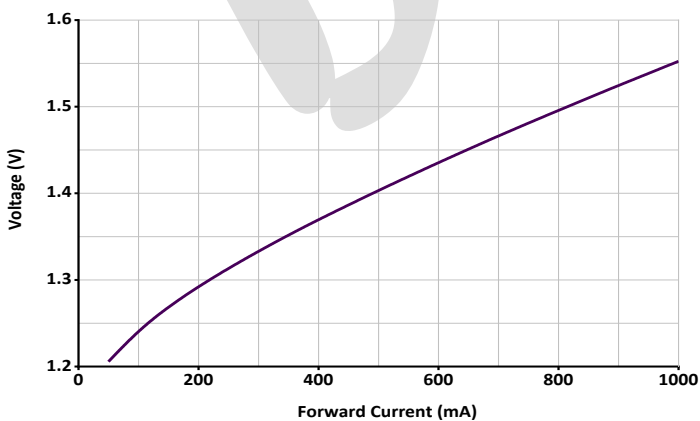
### Radiant Intensity



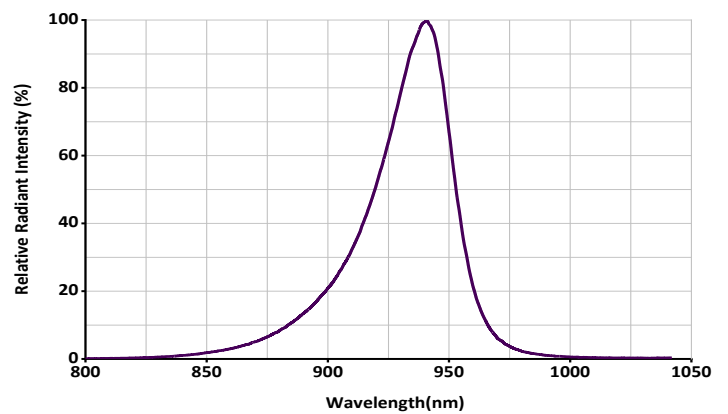
### Total radiant power



### Forward Voltage



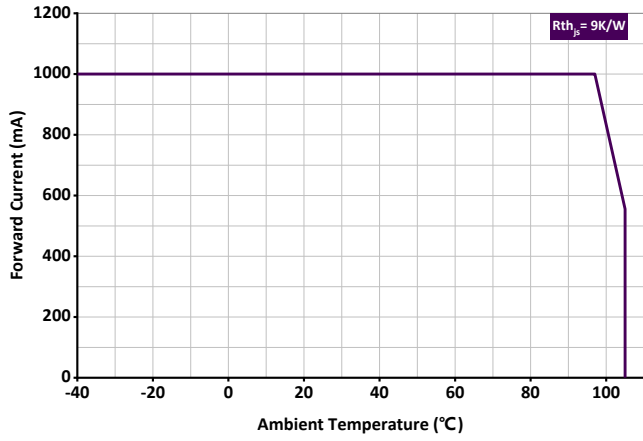
### Relative Spectral Emission



# SF3838F94CQ00

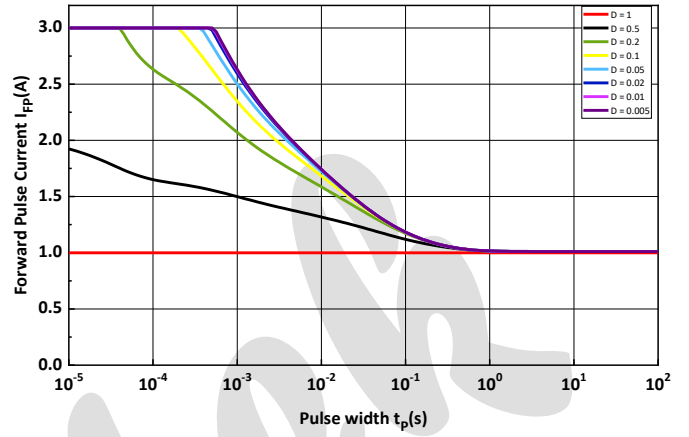
## Permissible Forward Current

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



## Permissible Pulse Handling Capability

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

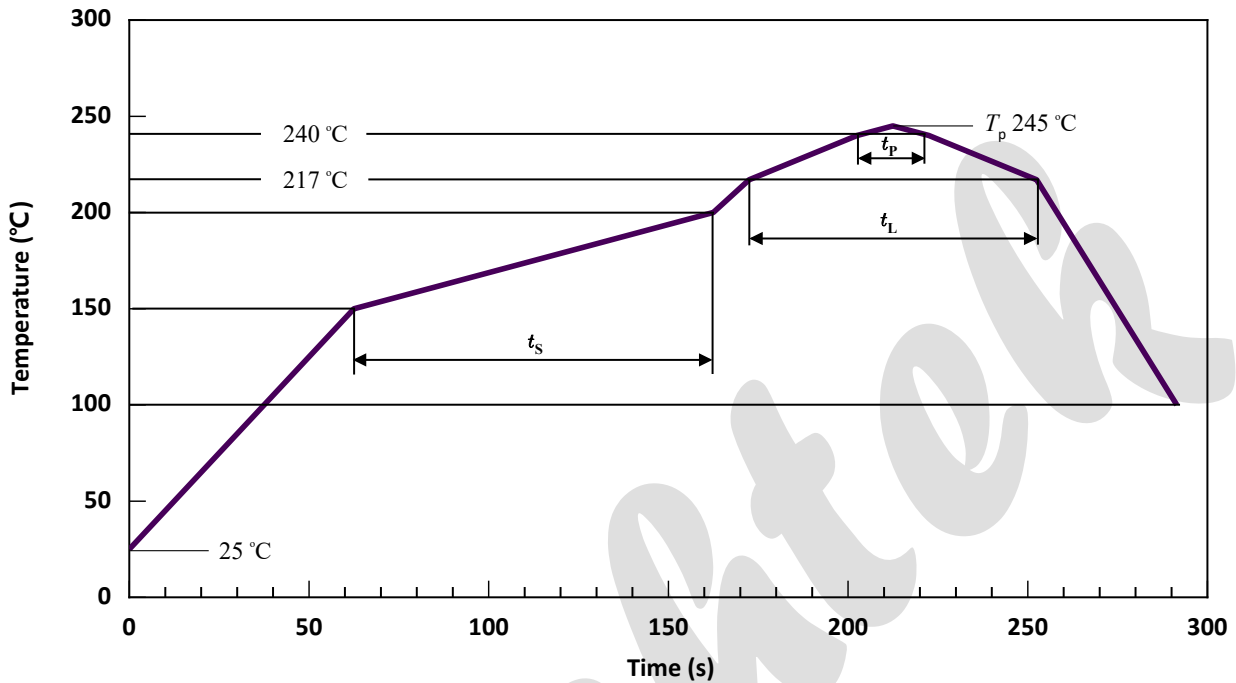


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# SF3838F94CQ00

## Reflow Soldering Profile

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



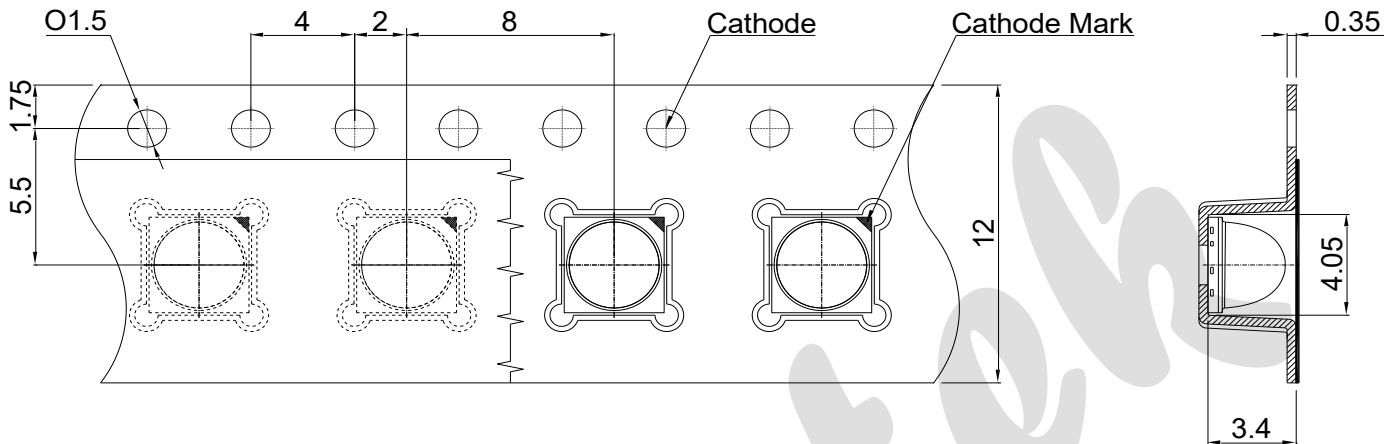
Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat 25°C to 150°C			2	3	K/s
Time $t_s$ $T_{Smin}$ to $T_{Smax}$	$t_s$	60	100	120	s
Ramp-up rate to peak $T_{Smax}$ to $T_P$			2	3	K/s
Liquidus temperature	$T_L$		217		°C
Time above liquidus temperature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



# SF3838F94CQ00

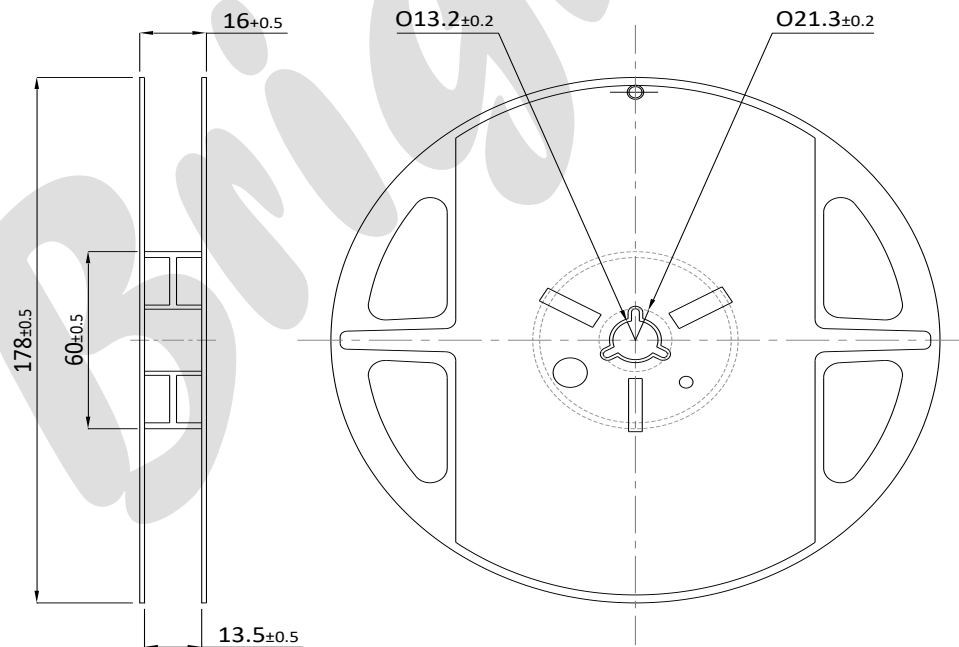
1. Do not stress the silicone resin while it is exposed to high temperature.
2. The reflow process should not exceed 2 times.

## 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. 600 pieces per reel.
3. Dimensions acc. to EIA 481-E

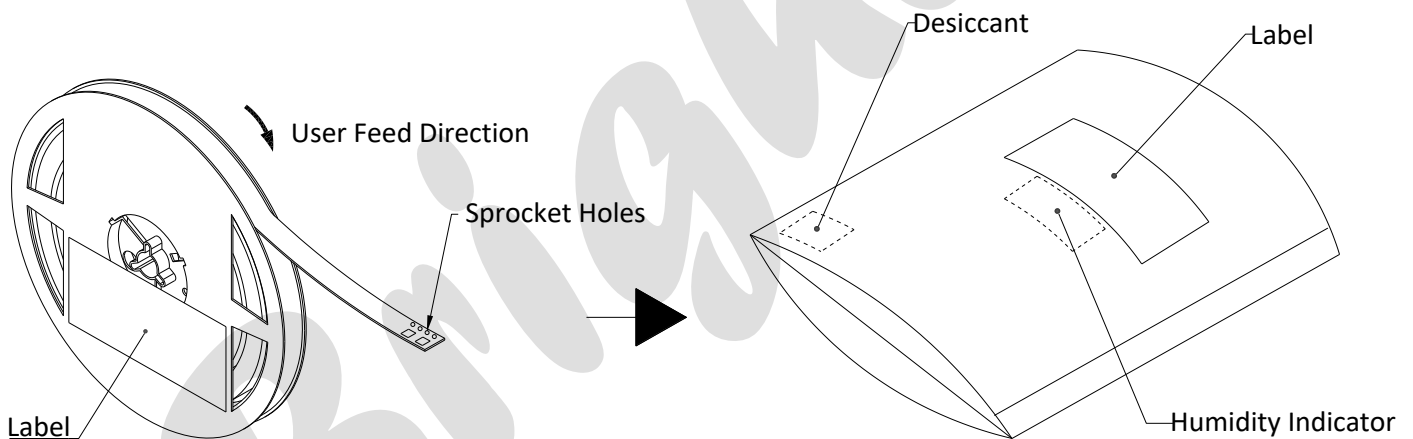
# SF3838F94CQ00

## 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



- 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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