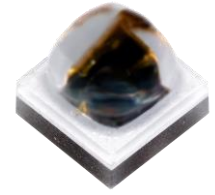


HE1616F94CQ01 Datasheet



Infrared Emitter

1616 Series (940nm) - 80°



Applications

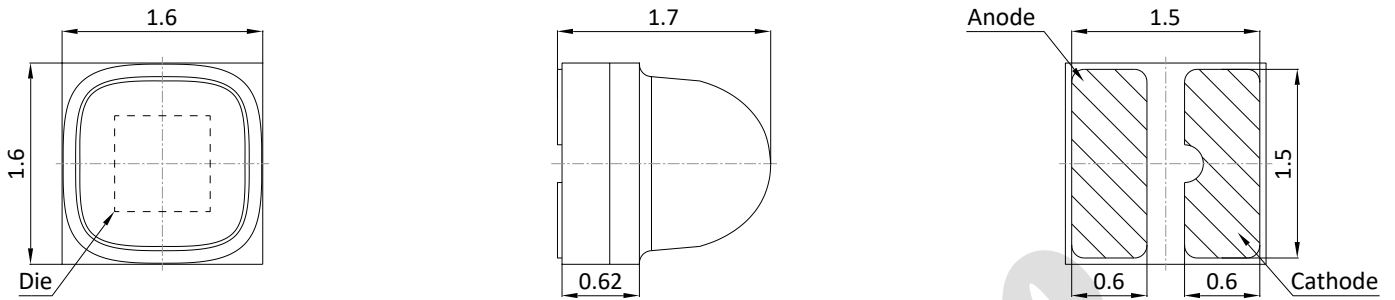
- Security System
- Automotive
- Facial Recognition
- Gesture Recognition

Features

- Package: clear silicone
- Corrosion robustness class : A
- ESD: 2KV (HBM)
- IR light source with high efficiency
- Dual junction emitter
- Qualifications: AEC-Q102 Qualified
- Low thermal resistance (Max. 12 K/W)
- Peak wavelength 940 nm
- Optimized for high current pulse operation
- RoHS 2.0 and REACH compliant
- MSL 1 qualified according to J-STD 020

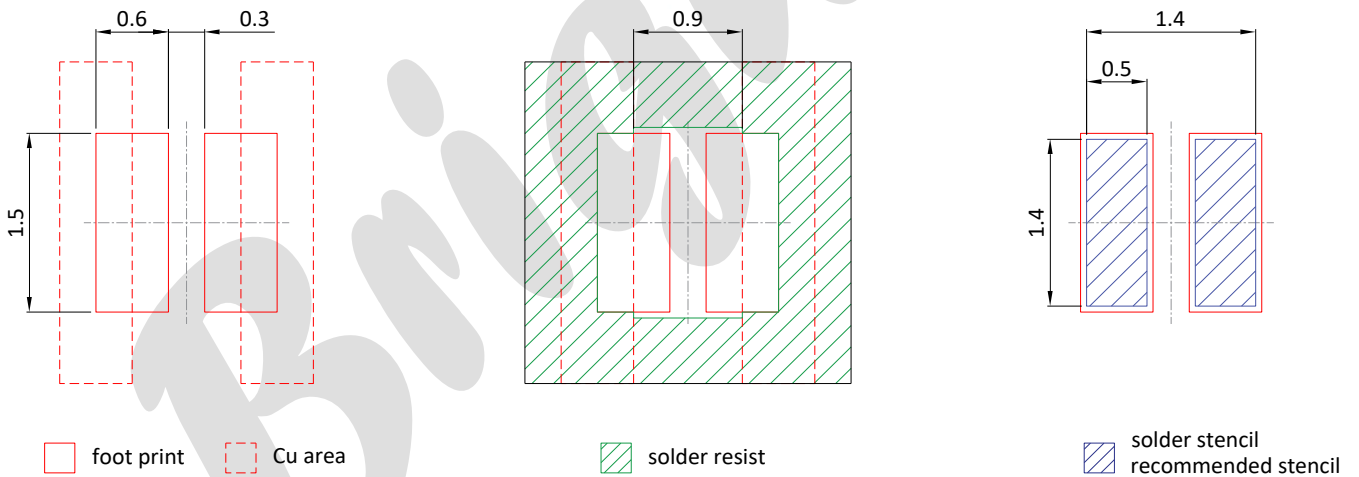
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Dimensional Drawing



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

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. 2 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. 9 K/W
		max. 12 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. 35 nm
View angle	$2\theta_{1/2}$	typ. 80 °
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. 720 mW/sr typ. 820 mW/sr max. 920 mW/sr
Forward voltage $I_F = 1\text{ A}; t_p = 100\ \mu\text{s}$	V_F	min. 2.8 V typ. 3.3 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 $I_F : 1A$ | $t_p : 10$ 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

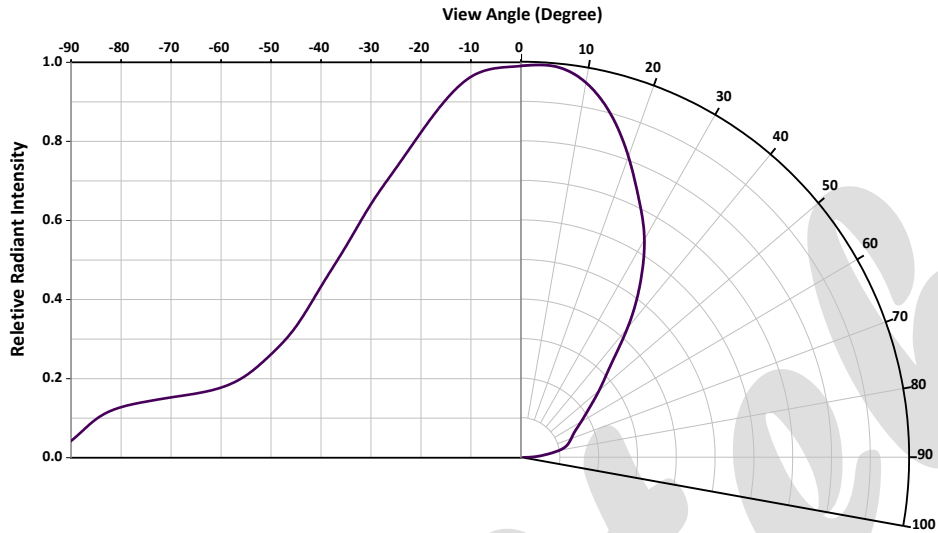
Peak wavelength $I_F : 1A$ | $t_p : 10$ ms

Group	min. λ_p	max. λ_p
F1	930 nm	960 nm

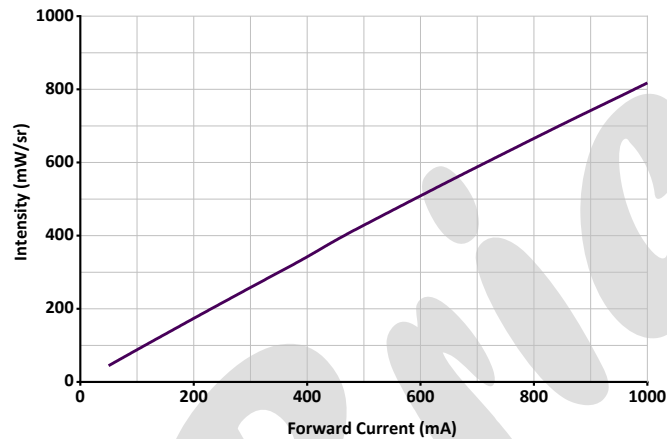
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Typical Electrical Optical Characteristics Curves

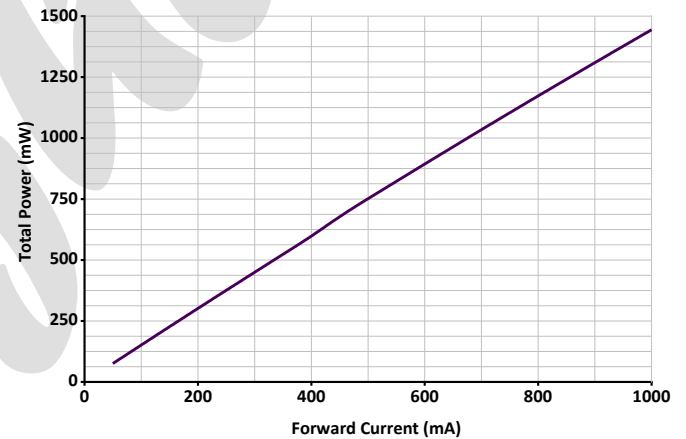
Radiation Characteristics



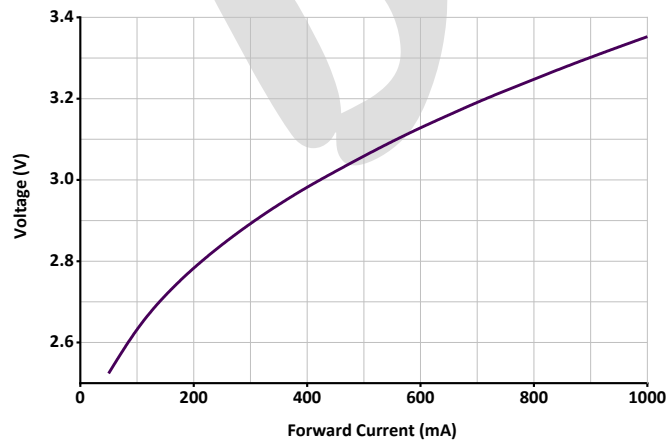
Radiant Intensity



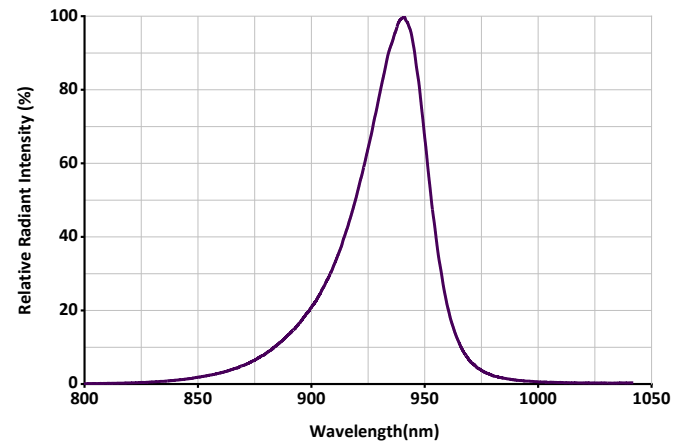
Total radiant power



Forward Voltage



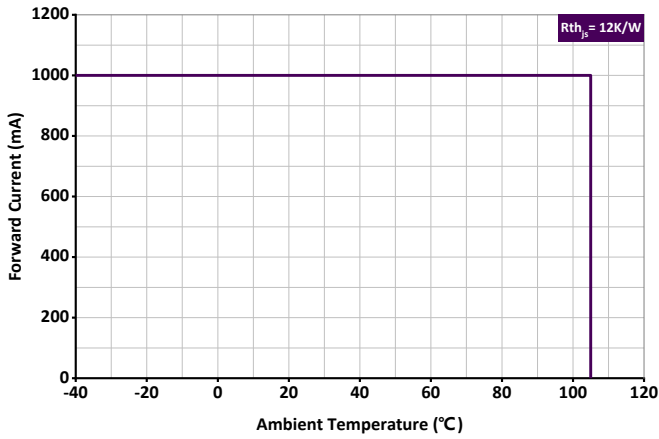
Relative Spectral Emission



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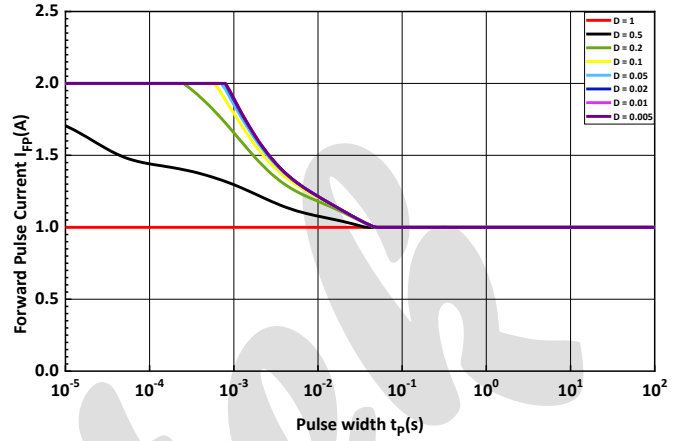
Permissible Forward Current

$$I_{F,max} = f(T_S); R_{th_{j_s}} = 12 \text{ K/W}$$



Permissible Pulse Handling Capability

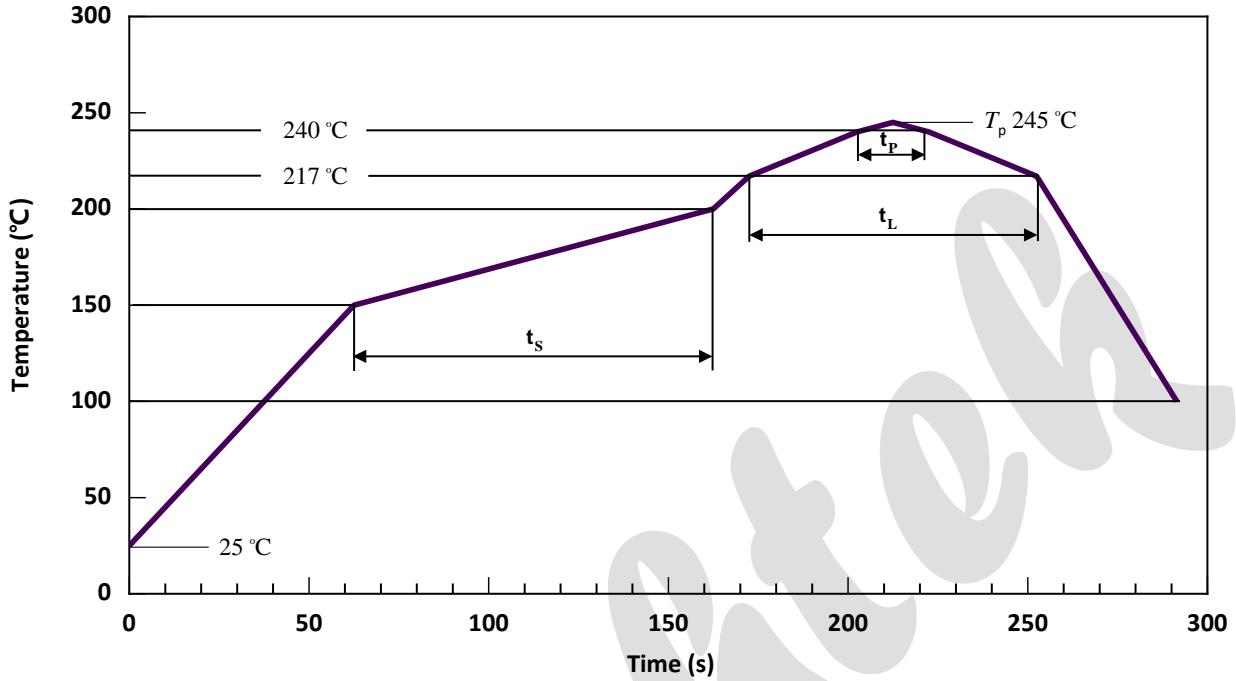
$$I_F = f(t_p); D = \text{Duty cycle}; T_a \text{ max} = 85^\circ\text{C}$$



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Reflow Soldering Profile

Product complies to MSL Level 1 acc. to JEDEC J-STD-020E

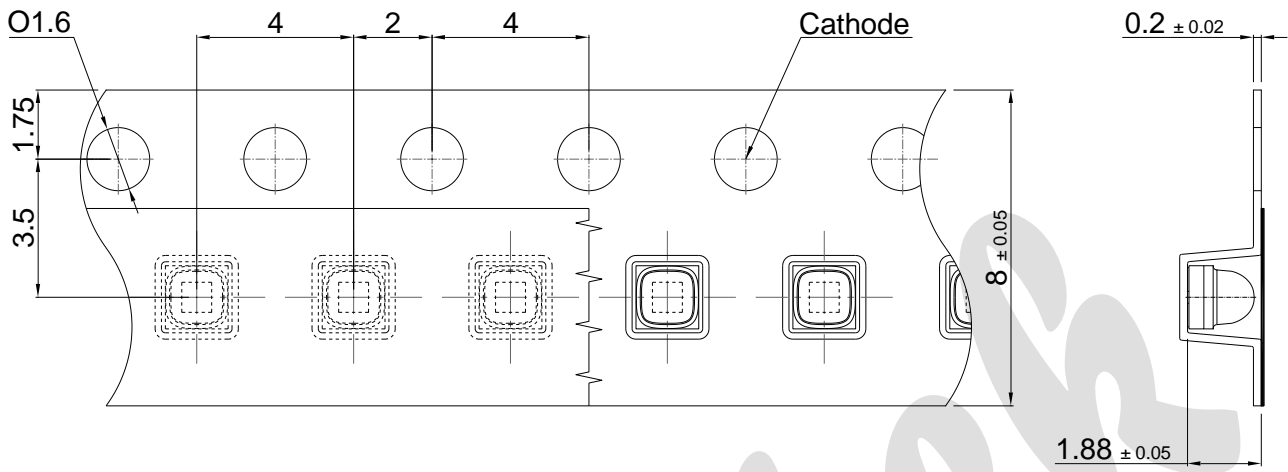


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat 25 °C to 150 °C			2	3	K/s
Time t_s T_{Smin} to T_{Smax}	t_s	60	100	120	s
Ramp-up rate to peak T_{Smax} to T_P			2	3	K/s
Liquidus temperature	T_L		217		°C
Time above liquidus temperature	t_L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

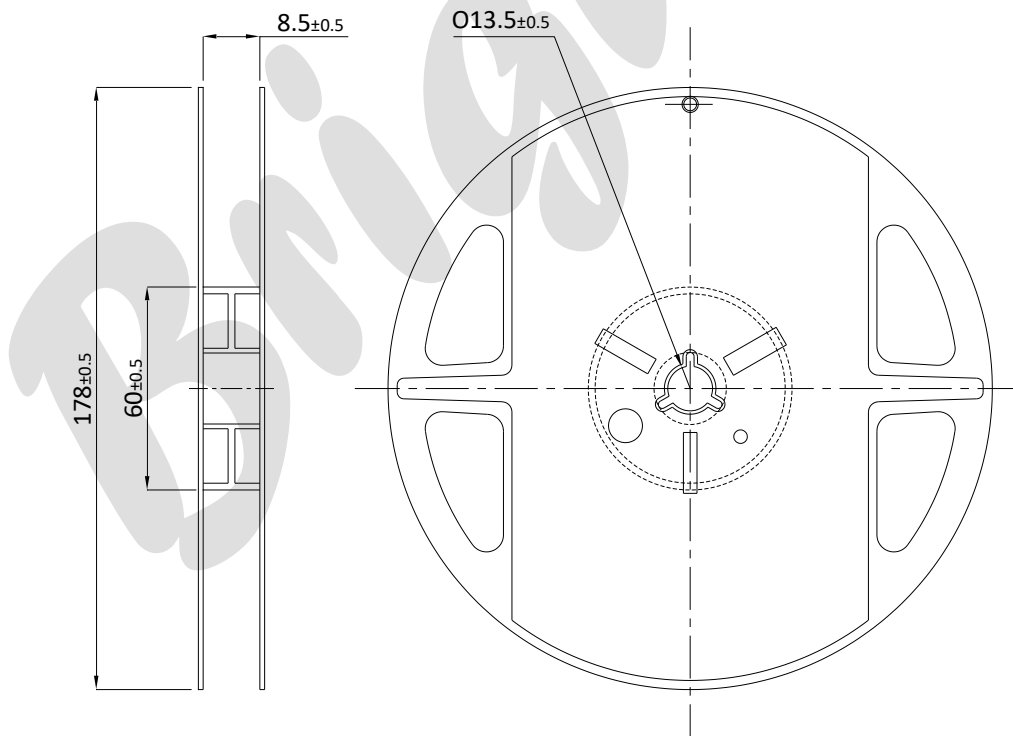
HE1616F94CQ01

Dimensions of Tape



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


Dimensions of Reel



1. Dimensions are in millimeters.
2. 2000 pieces per reel.
3. Dimensions acc. to EIA 481-E

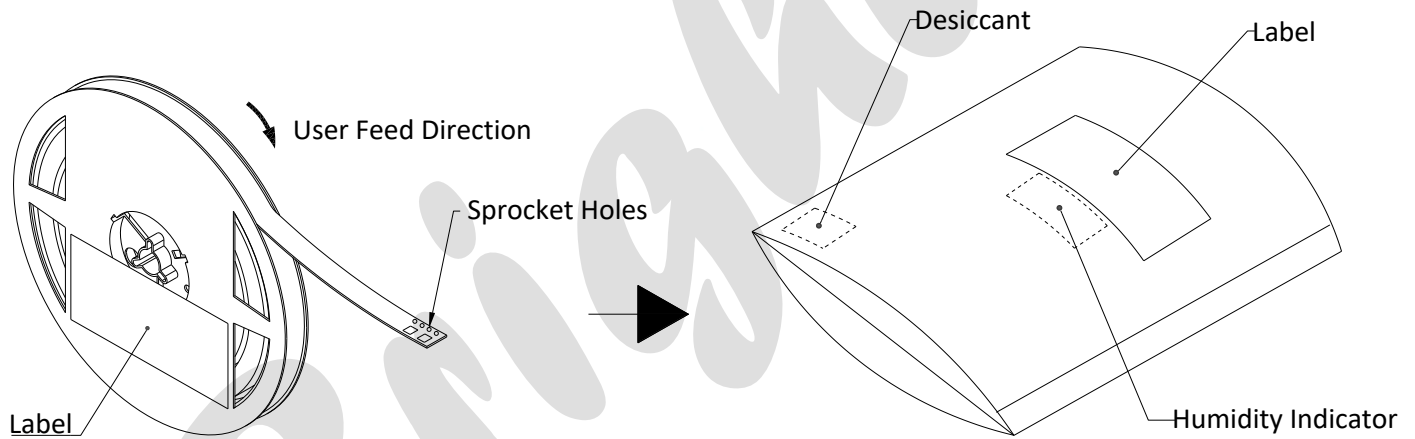
HE1616F94CQ01

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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