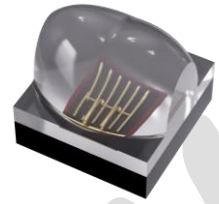


HF1616F94CQ01 Datasheet

Infrared Emitter

1616 Series (940nm) - 110°/130°



Applications

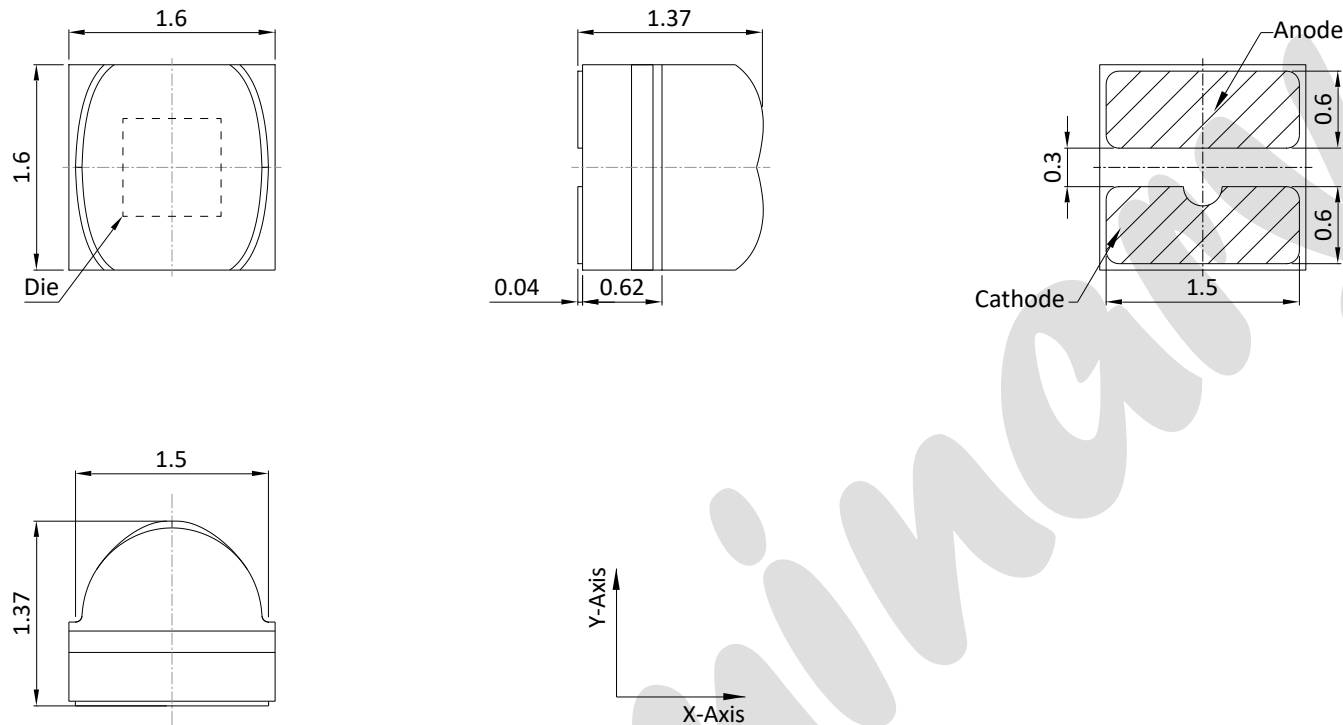
- Security System
- Automotive
- Facial Recognition
- Gesture Recognition

Features

- Package: clear silicone
- Corrosion robustness class: 3B
- 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

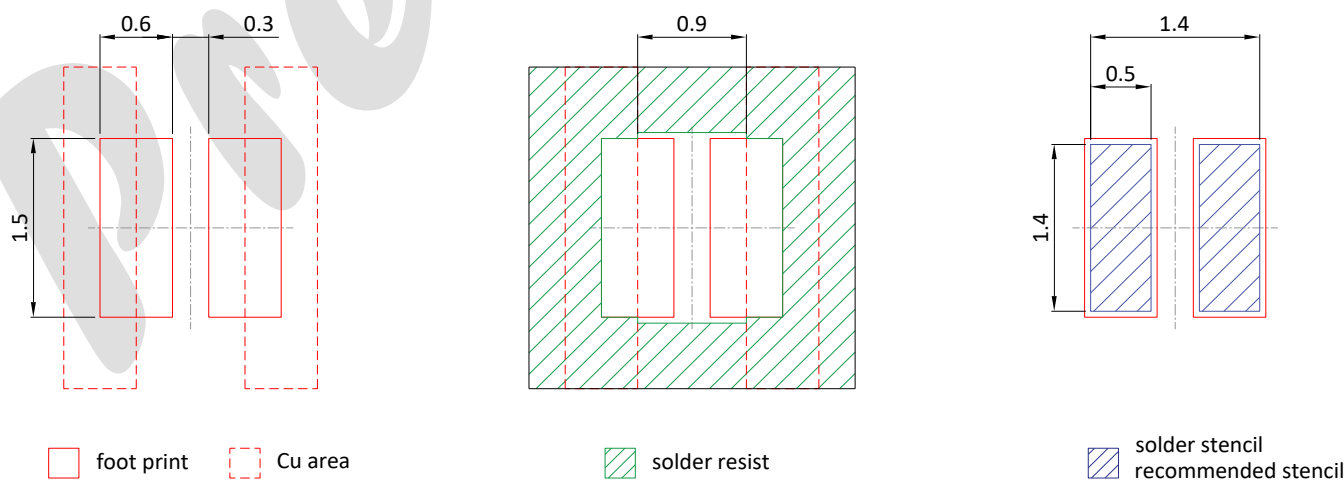
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Dimensional Drawing



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

Recommended Solder Pad



HF1616F94CQ01

Maximum Ratings

$T_A : 25\text{ }^{\circ}\text{C}$

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 $^{\circ}\text{C}$
Operating temperature	T_{op}	min.	-40 $^{\circ}\text{C}$
		max.	105 $^{\circ}\text{C}$
Storage temperature	T_{stg}	min.	-40 $^{\circ}\text{C}$
		max.	105 $^{\circ}\text{C}$
Soldering temperature	T_{sol}	max.	260 $^{\circ}\text{C}$
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 $^{\circ}\text{C}$.

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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 (X-axis)	$2\theta_{1/2}$	typ.	110 °
(Y-axis)			130 °
Total radiant power $I_F = 1\text{ A}; t_p = 100\text{ }\mu\text{s}$	Φ_e	min.	1000 mW
		typ.	1200 mW
		max.	1400 mW
Radiant intensity $I_F = 1\text{ A}; t_p = 100\text{ }\mu\text{s}$	I_E	min.	320 mW/sr
		typ.	420 mW/sr
		max.	510 mW/sr
Forward voltage $I_F = 1\text{ A}; t_p = 100\text{ }\mu\text{s}$	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 $I_F : 1A \mid t_p : 10 \text{ ms}$

Group	min. Φ_e	max. Φ_e
PB0A	1000 mW	1200 mW
PB2A	1200 mW	1400 mW

Forward voltage $I_F : 1A \mid t_p : 10 \text{ ms}$

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

Peak wavelength $I_F : 1A \mid t_p : 10 \text{ ms}$

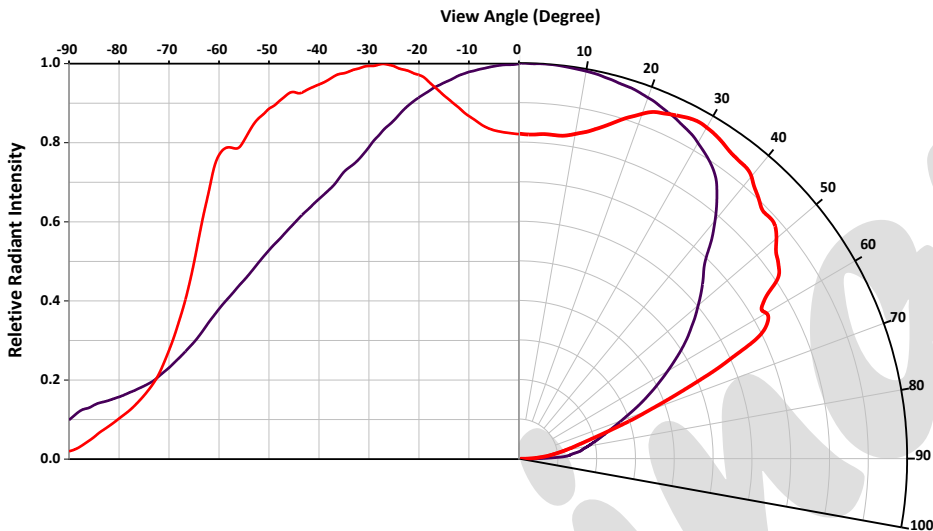
Group	min. λ_p	max. λ_p
F1	930 nm	950 nm

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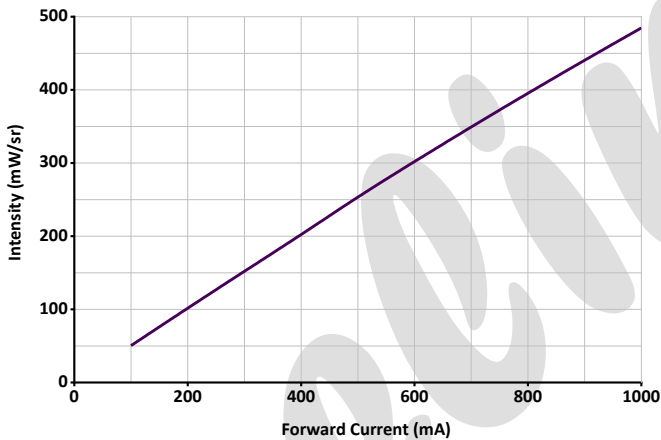
Typical Electrical Optical Characteristics Curves

Radiation Characteristics(L=0)

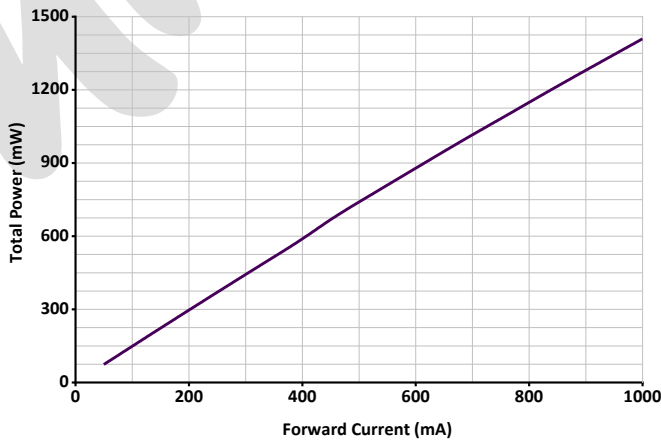
● X-axis ● Y-axis



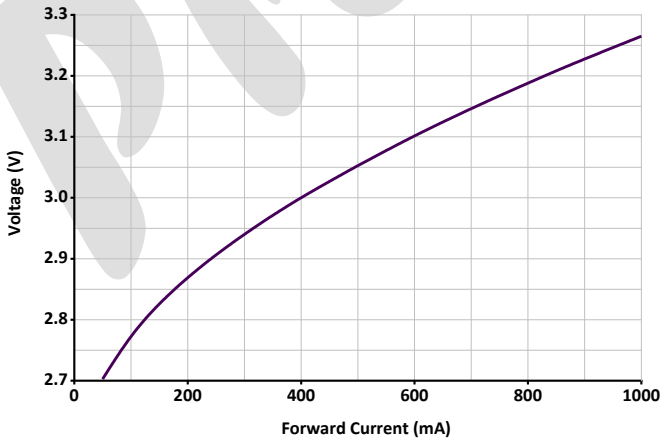
Radiant Intensity



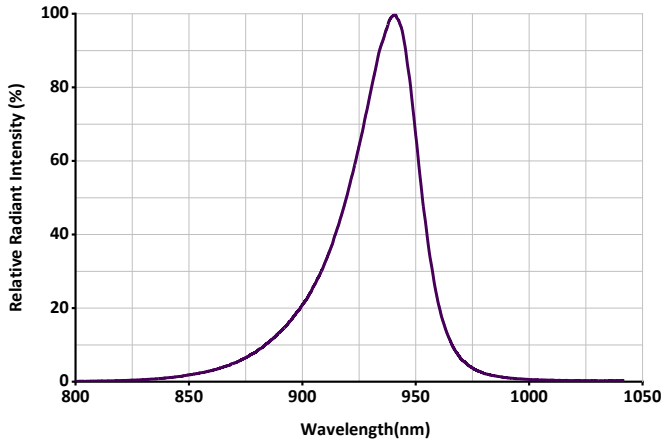
Total radiant power



Forward Voltage



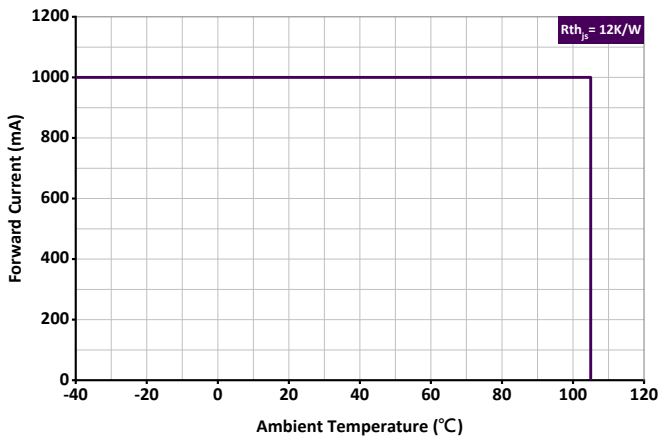
Relative Spectral Emission



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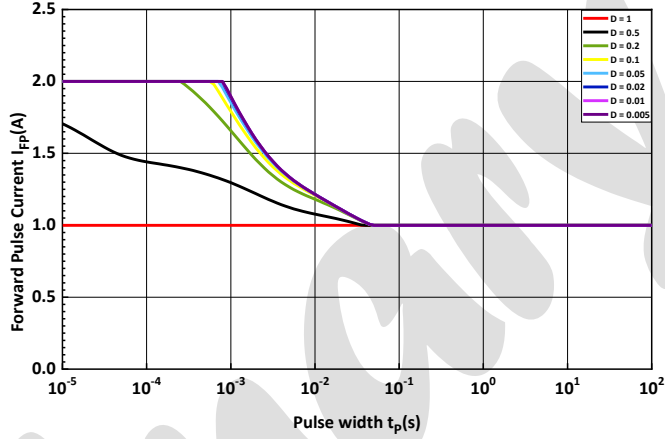
Permissible Forward Current

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



Permissible Pulse Handling Capability

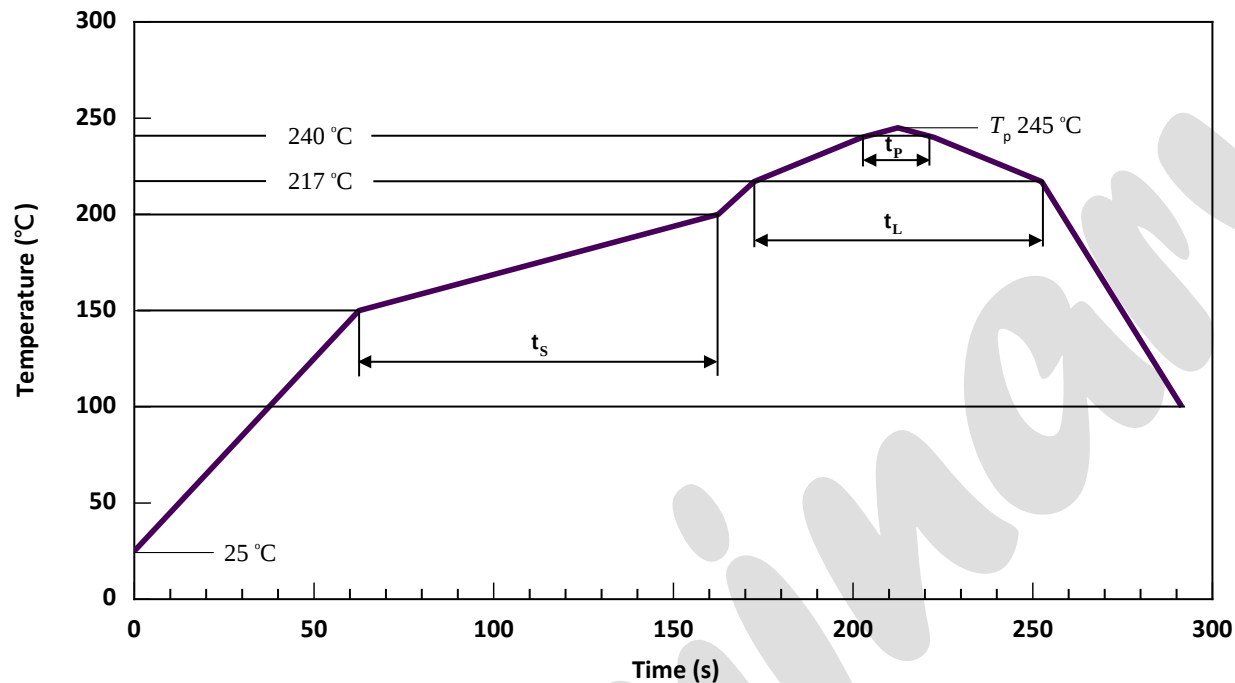
$I_F = f(t_p); D = \text{Duty cycle}; T_a \text{ max} = 85^{\circ}\text{C}$



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Reflow Soldering Profile

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

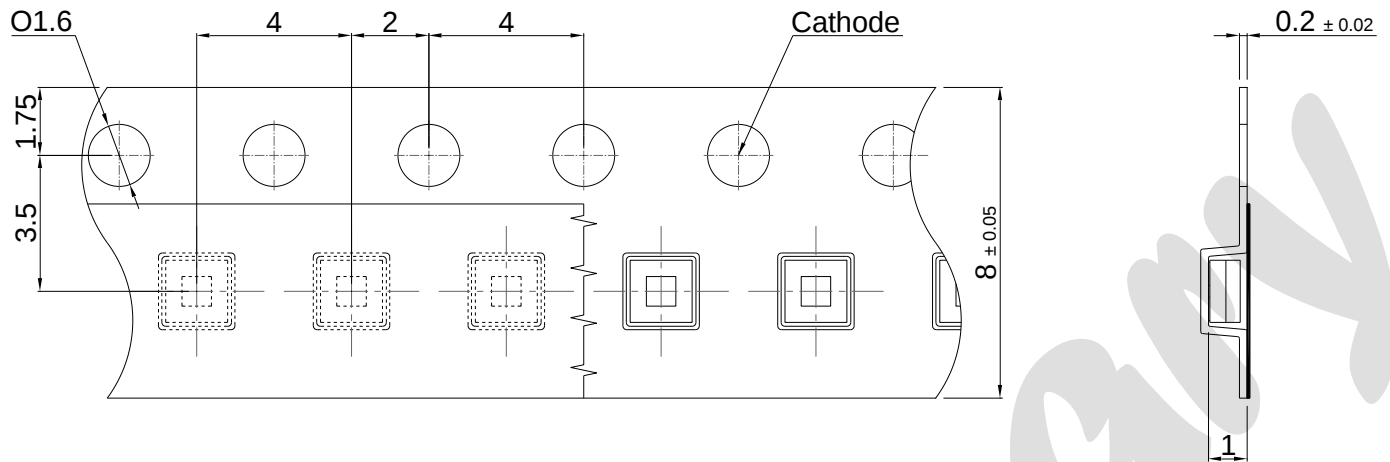


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat 25 °C to 150 °C			2	3	K/s
Time ts T _{Smin} to T _{Smax}	ts	60	100	120	s
Ramp-up rate to peak T _{Smax} to T _P			2	3	K/s
Liquidus temperature	T _L		217		°C
Time above liquidus temperature	t _L		80	100	s
Peak temperature	T _P		245	260	°C
Time within 5 °C of the specified peak temperature TP - 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

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

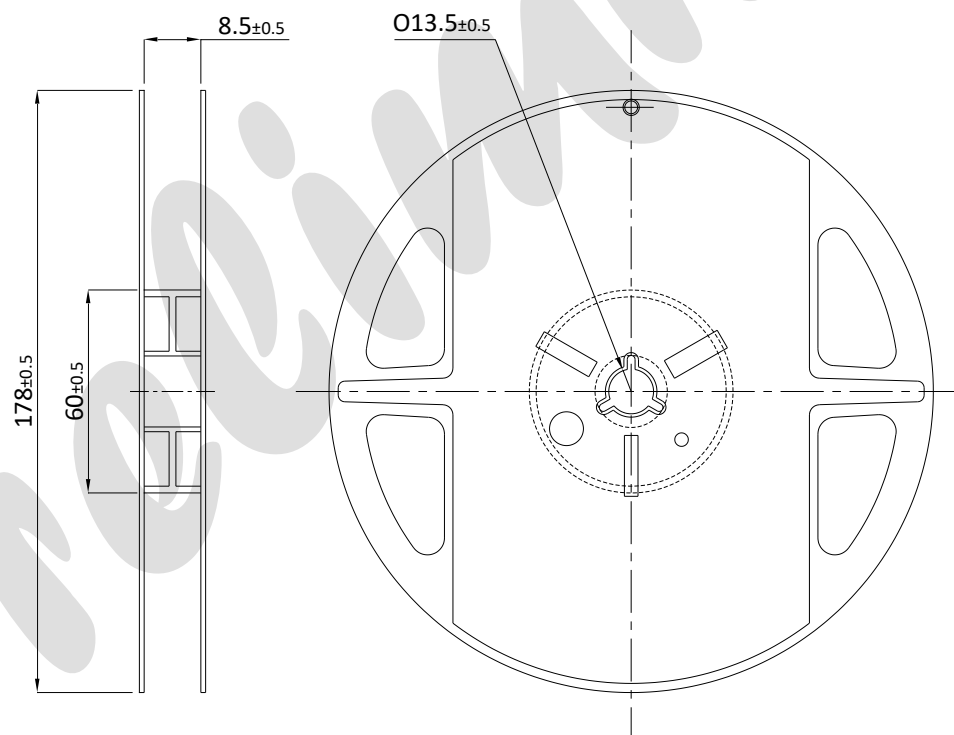
HF1616F94CQ01

Dimensions of Tape



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

Dimensions of Reel



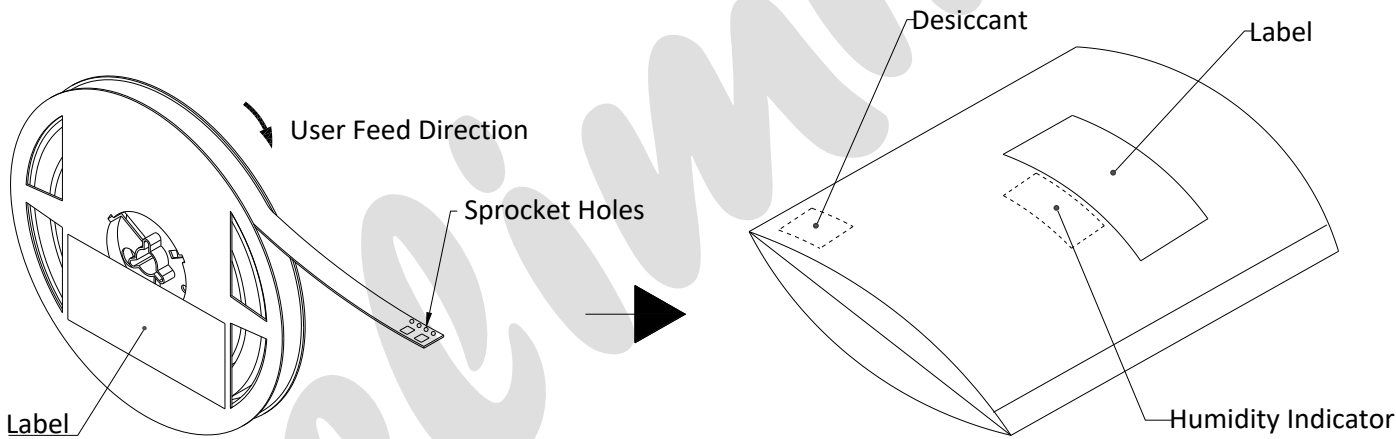
1. Dimensions are in millimeters.
2. 4000 pieces per reel.
3. Dimensions acc. to EIA 481-E

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 to 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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