Harvatek Surface Opto Interrupter Data Sheet
B4192PTIRM2B-000113
Preliminary

DISCLAIMER

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Life Support Policy

HARVATEK's products are not authorized for use as critical components in life support devices or systems without the express written approval of the President of HARVATEK or HARVATEK INTERNATIONAL. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

Product Specifications

Item	Specification	Material	Quantity
Detector Spectral Bandwidth λ_D	700nm~1100nm @ V_{CE}=5V / T_S = 25℃		
Emitter Peak Wavelength λ_P	Typ: 940nm @ 20mA / T_S = 25℃		
Collector Light Current I_C	Typ: 600uA @V_{CE}=2V, I_F=4mA,d=1mm		
Resin	Black	Epoxy	
Carrier tape	EIA 481-1A specs	Conductive black tape	
Reel	EIA 481-1A specs	Conductive black	
Label	HT standard	Paper	
Packing bag	220x240mm	Aluminum laminated bag/ no-zipper	One reel per bag
Carton	HT standard	Paper	Non-specified

Others:

Each immediate box consists of 5 reels. The 5 reels may not necessarily have the same lot number or the same bin combinations of Iv, CIE and Vf. Each reel has a label identifying its specification; the immediate box consists of a product label as well.

Note :This is shipped test conditions

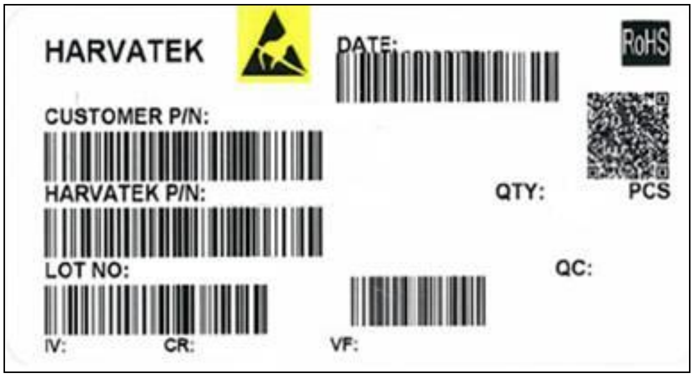
※Remarks: This product should be operated in forward bias. If a reverse voltage is continuously applied to the product, such operation can cause migration resulting in LED damage.

ATTENTION: Electrostatic Discharge (ESD) protection

The symbol to the left denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips and Silicon semiconductor is necessary even though they are relatively safe in the presence of low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are **STATIC SENSITIVE devices**. ESD precaution must be taken during design and assembly.

If manual work or processing is needed, please ensure the device is adequately protected from ESD during the process.

Label Specifications



HARVATEK

DATE:

RoHS

CUSTOMER P/N:

HARVATEK P/N:

QTY: PCS

LOT NO:

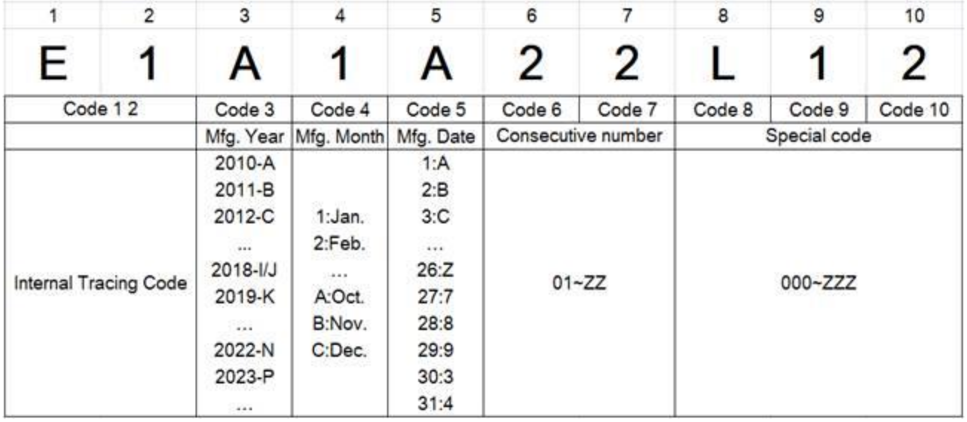
QC:

IV: CR: VF:

■Harvatek P/N:

B	419	2	PTIR	M2B-	0001	13
Product	**Package**	**Dice**	**Type**	**Voltage**	**Series Number**	**Taping**
PCB	**1.9(L)x1.4(W)x0.65(H) mm**	**2: Bi**	**PT: Phototransistor** **IR: Infrared**	**PT: 2V,** **IR: 4mA**	**0001~ZZZZ**	**1. Taping style** **2. Q'ty**

■ Lot No.:



1	2	3	4	5	6	7	8	9	10
E	1	A	1	A	2	2	L	1	2
Code 1 2		Code 3	Code 4	Code 5	Code 6	Code 7	Code 8	Code 9	Code 10
		Mfg. Year	Mfg. Month	Mfg. Date	Consecutive number		Special code		
Internal Tracing Code		2010-A 2011-B 2012-C ... 2018-I/J 2019-K ... 2022-N 2023-P ...	1:Jan. 2:Feb. ... A:Oct. B:Nov. C:Dec.	1:A 2:B 3:C ... 26:Z 27:7 28:8 29:9 30:3 31:4	01~ZZ		000~ZZZ		

Absolute Maximum Rating at 25℃

Symbol	Parameters	Ratings	Units	Notes
INPUT (Emitter)				
V_R	Reverse Voltage	5	V	
I_F	Forward Current	100	mA	
I_{FP}	Peak Forward Current	500	mA	1
P_d	Total Power Dissipation	150	mW	
OUTPUT (Detector)				
V_{CEO}	Collector-Emitter Voltage	30	V	
V_{ECO}	Emitter-Collector Voltage	5	V	
I_C	Collector Current	20	mA	
P_d	Total Power Dissipation	75	mW	
SENSOR				
T_{opr}	Operating Temperature	-40 ~ +85	℃	
T_{stg}	Storage Temperature	-40 ~ +100	℃	
T_{sol}	Soldering Temperature	260	℃	2

Notes:

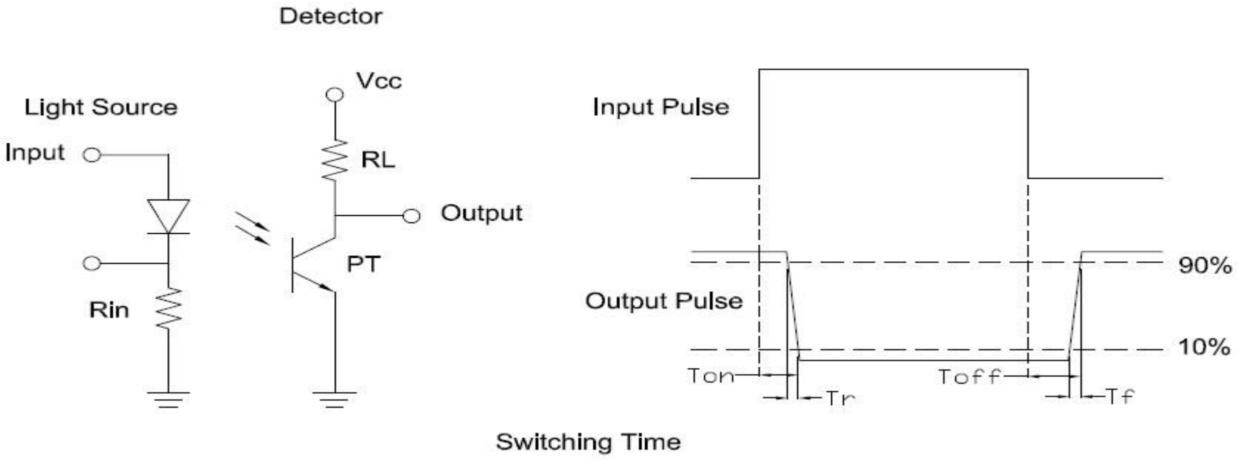
1. I_{FP} Conditions--Pulse Width≦100μs and Duty≦1%.
2. Soldering time≦5 seconds.

Electro-Optical Characteristics

Symbol	Parameters	Test conditions	Min	Typ	Max	Units	Notes
INPUT (Emitter)							
V_F	Forward Voltage	I_F=20mA	-	1.24	1.45	V	
λ_P	Peak Wavelength	I_F=20mA	-	940	-	nm	
I_R	Reverse Current	V_R=5V	-	-	10	μA	
OUTPUT (Detector)							
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=2mA Ee=1mW/cm²	-	-	0.4	V	
I_{CEO}	Collector Dark Current	V_{CE}=10V Ee=0mW/cm²	-	-	100	nA	
SENSOR							
$I_{C(ON)}$	Collector Light Current	V_{CE}=2V I_F=4mA d=1 mm	-	600	-	μA	
I_{LEAK}	Leakage Current	V_{CE}=2V I_F=4mA with no reflection	-	-	1	μA	
t_r	Rise Time	V_{CE}=2V, I_C=0.1mA R_L=1000Ω d=1 mm	-	15	-	μS	5
t_f	Fall Time		-	15	-	μS	

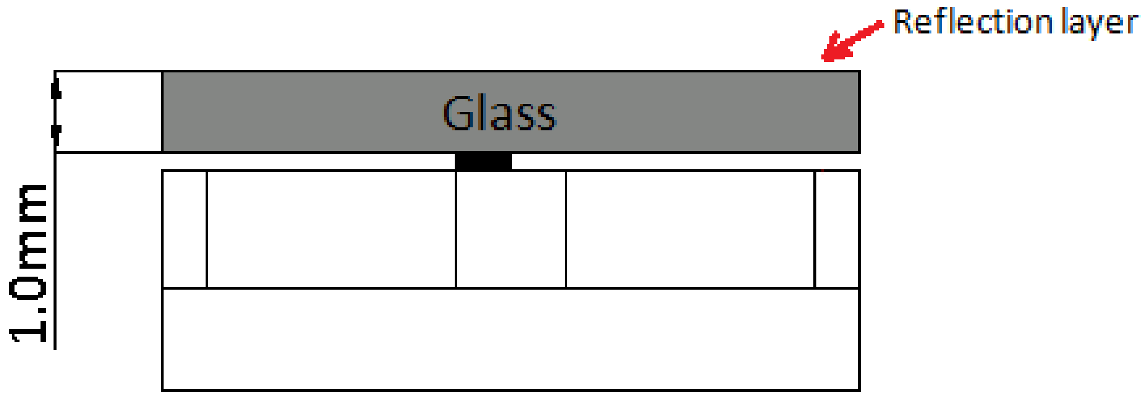
Notes:

3. Test circuit：:



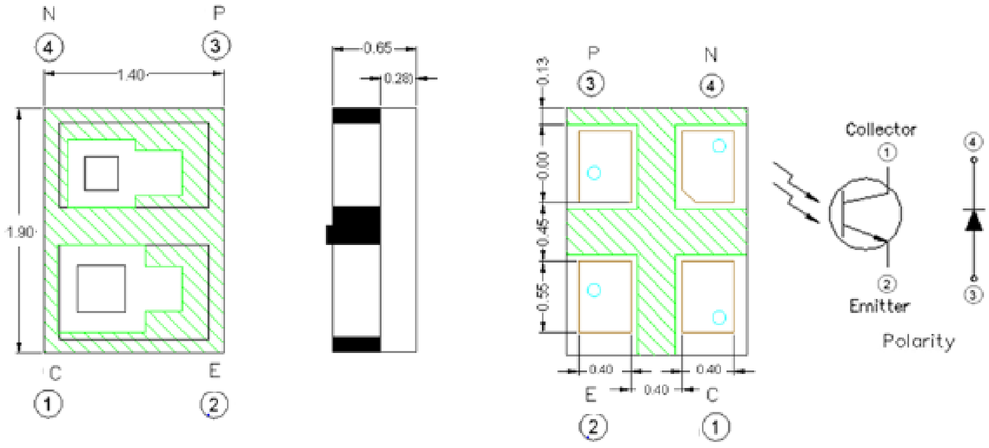
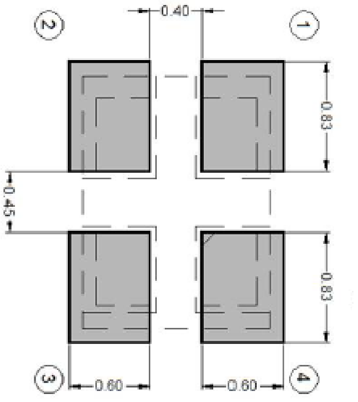
Switching Time

Light Current Measurement Setup Diagram

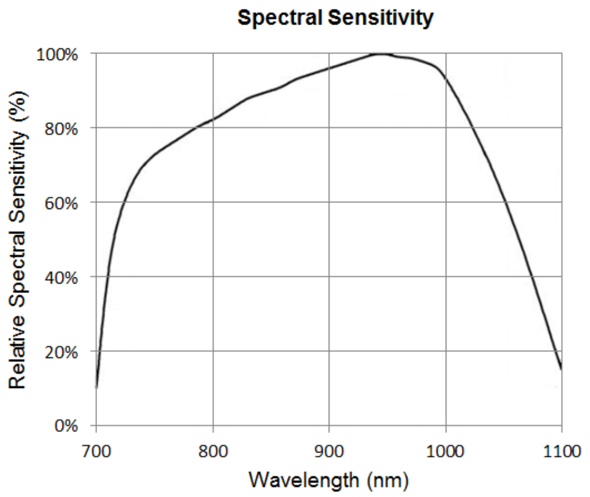


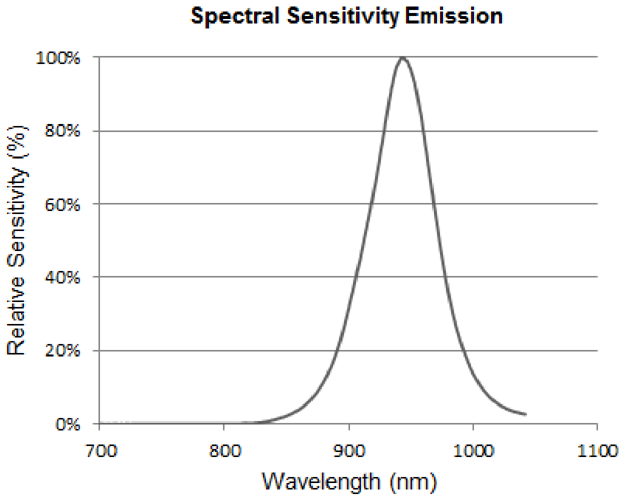
Package Outline Dimension and Recommended Soldering Pattern for Reflow Soldering

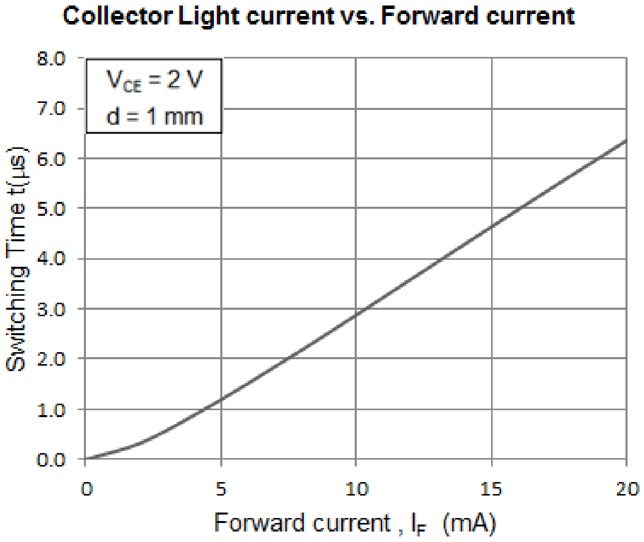
(Unit: mm Tolerance: +/-0.1)

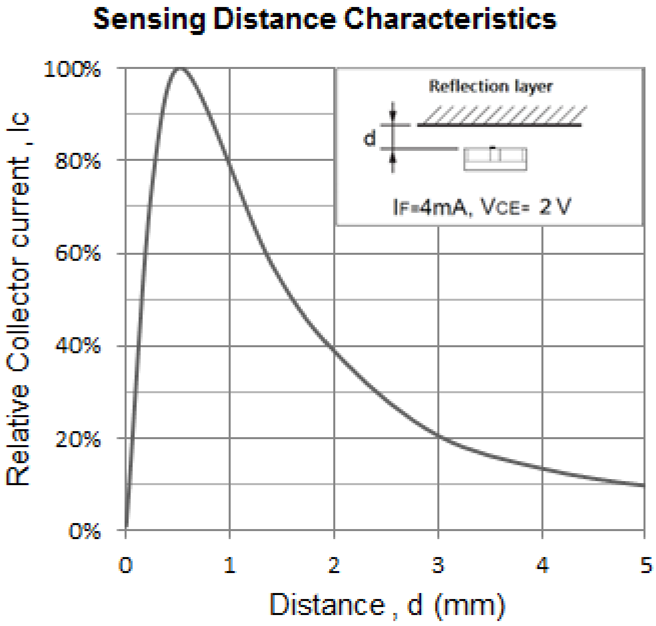
Outline Dim.	Soldering Pattern
	
Soldering terminals may shift in the x, y direction.	

Characteristics of B4192PTIR







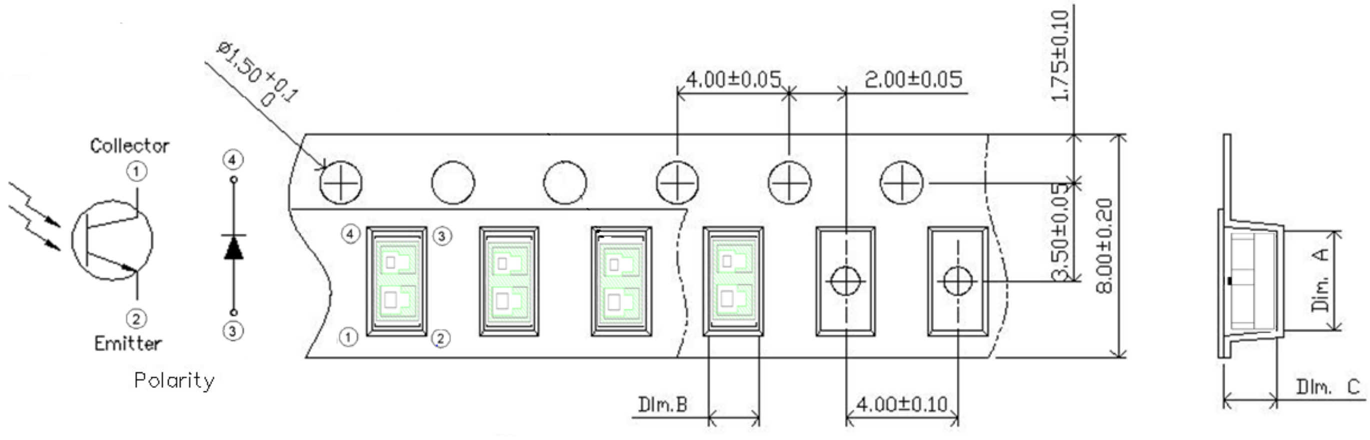


Precaution for Use

1. The chips should not be used directly in any type of fluid such as water, oil, organic solvent, etc.
2. When the LEDs are illuminating, the maximum ambient temperature should be first considered before operation.
3. LEDs must be stored in a clean environment. A sealed container with a nitrogen atmosphere is necessary if the storage period is over 3 months after shipping.
4. The LEDs must be used within 4 weeks after unpacked. Unused products must be repacked in an anti-electrostatic package, folded to close any opening and then stored in a dry and cool space.
5. The appearance and specifications of the products may be modified for improvement without further notice.
6. The LEDs are sensitive to the static electricity and surge. It is strongly recommended to use a grounded wrist band and anti-electrostatic glove when handling the LEDs.If a voltage over the absolute maximum rating is applied to LEDs, it will damage LEDs.Damaged LEDs will show some abnormal characteristics such as remarkable increase of leak current, lower turn-on voltage and getting unlit at low current.

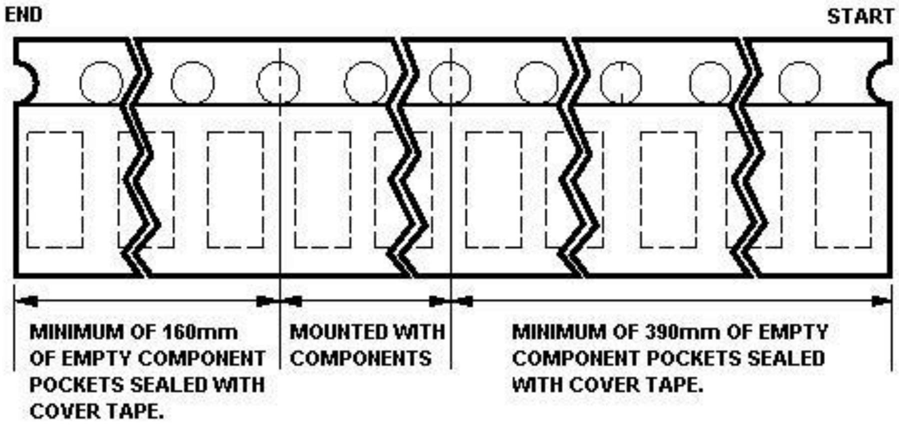
Packaging

Tape Dimension

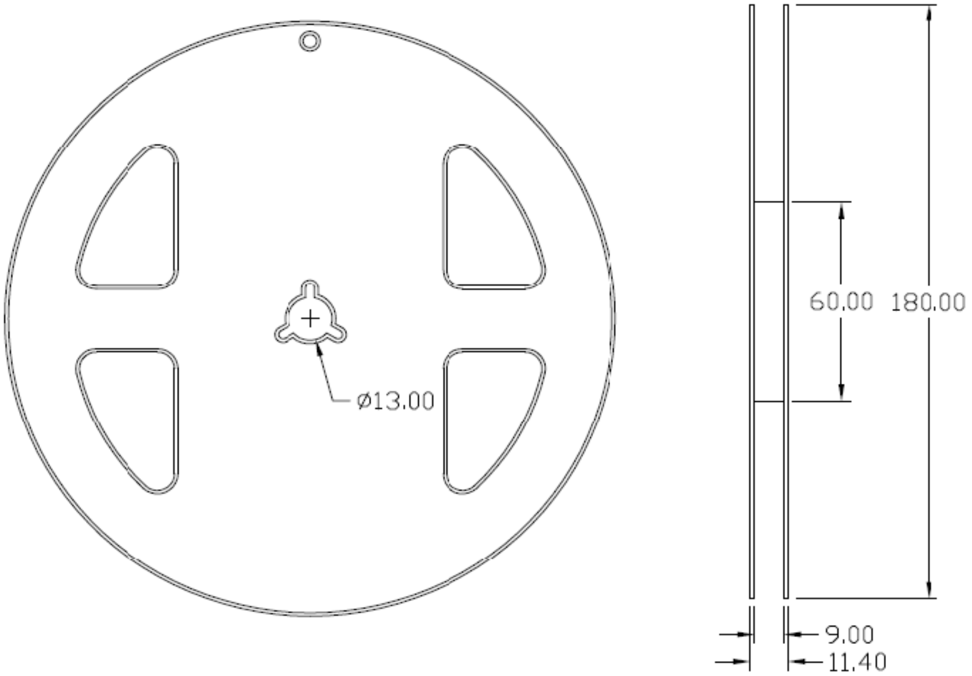


Dim. A	Dim. B	Dim. C	Q'ty/Reel
2.18±0.05	1.68±0.05	0.9±0.05	3K

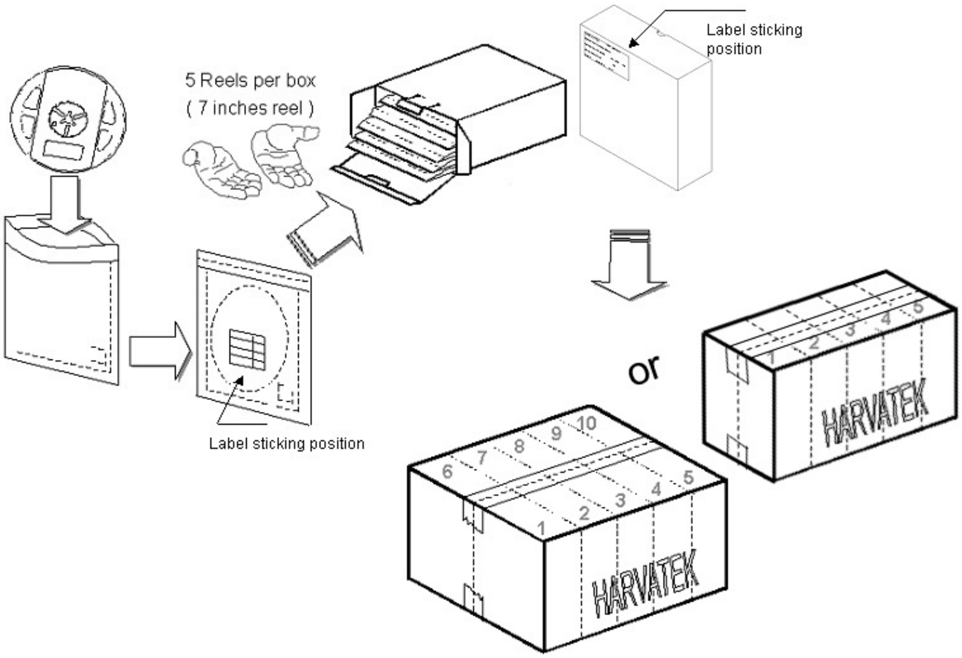
Unit: mm



Reel Dimension



Packing



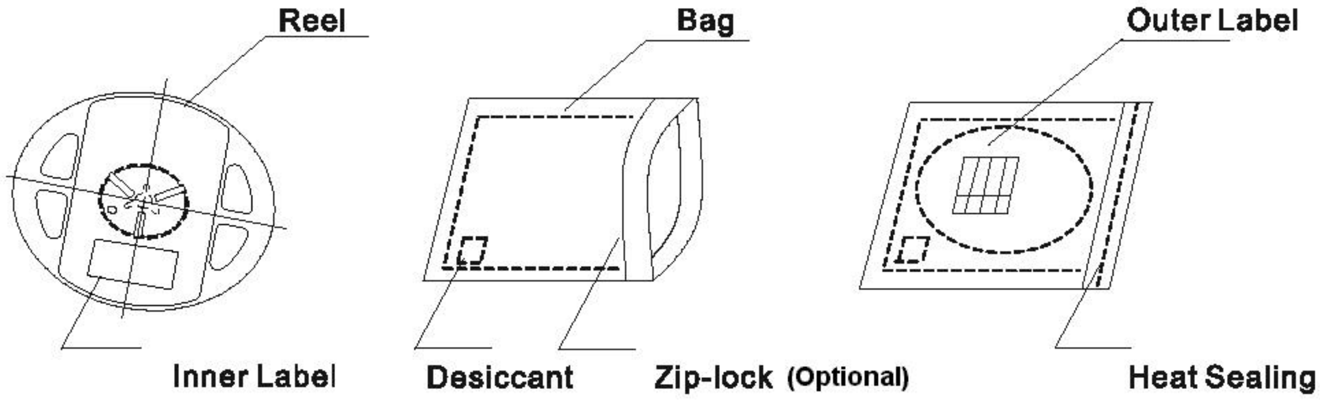
5 or 10 boxes per carton is available depending on shipment quantity.

Dry Pack

All SMD optical devices are **MOISTURE SENSITIVE**. Avoid exposure to moisture at all times during transportation or storage. Every reel is packaged in a moisture protected anti-static bag. Each bag is properly sealed prior to shipment.

A humidity indicator will be included in the moisture protected anti-static bag prior to shipment.

The packaging sequence is as follows:



Baking

Baking before soldering is recommended when the package has been unsealed for 4 weeks. The conditions are as followings:

1. 60±3℃×(12~24hrs)and<5%RH, taped reel type.
2. 100±3℃×(45min~1hr), bulk type.
3. 130±3℃×(15min~30min), bulk type.

Precautions

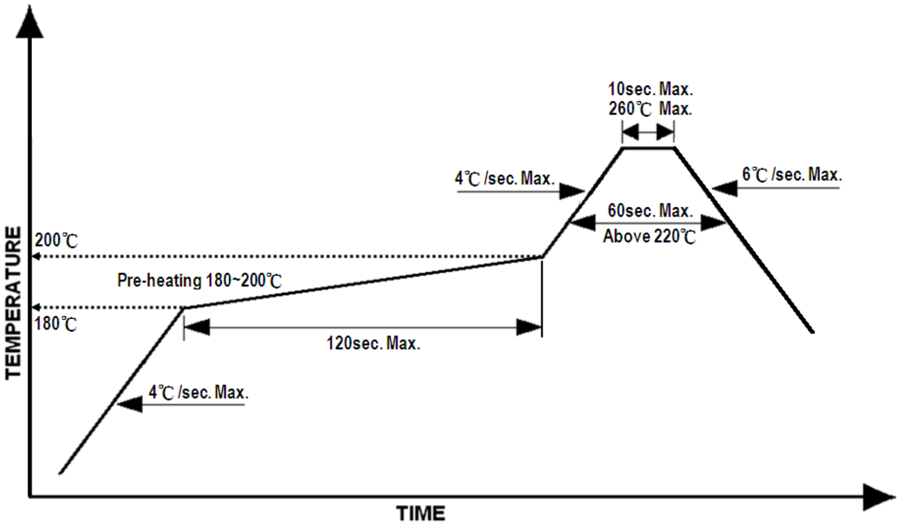
1. Avoid exposure to moisture at all times during transportation or storage.
2. Anti-Static precaution must be taken when handling GaN, InGaN, and AlInGaP products.
3. It is suggested to connect the unit with a current limiting resistor of the proper size. Avoid applying a reverse voltage beyond the specified limit.
4. Avoid operation beyond the limits as specified by the absolute maximum ratings.
5. Avoid direct contact with the surface through which the LED emits light.
6. If possible, assemble the unit in a clean room or dust-free environment.

Reflow Soldering

Recommend soldering paste specifications:

1. Operating temp.: Above 220℃ ,60sec
2. Peak temp.:260℃ Max.,10sec Max.
3. Reflow soldering should not be done more than two times.
4. Never take next process until the component is cooled down to room temperature after reflow.
5. The recommended reflow soldering profile (measuring on the surface of the LED terminal) is following:

Lead-free Solder Profile



Reworking

- Rework should be completed within 5 seconds under 260℃.
- The iron tip must not come in contact with the copper foil.
- Twin-head type is preferred.

Cleaning

Following are cleaning procedures after soldering:

- An alcohol-based solvent such as isopropyl alcohol (IPA) is recommended.
- Temperature x Time should be 50℃ x 30sec. or <30℃ x 3min
- Ultra sonic cleaning: < 15W/ bath; bath volume ≤ 1liter
- Curing: 100℃ max, <3min

Cautions of Pick and Place

- Avoid stress on the resin at elevated temperature.
- Avoid rubbing or scraping the resin by any object.
- Electric-static may cause damage to the component. Please ensure that the equipment is properly grounded. Use of an ionizer fan is recommended.

Revise History

Rev.	Descriptions	Date	Page
Preliminary	-	06/18/2019	