TDS Lighting Co.,LTD

Add: NO.148,Mingfa industrial park,Huishan district,Wuxi city,Jiangsu Province
E:xdlleds@gmail.com Website:www.tds-led.com Tel:0086-510-68380810

Table of Contents

General Information 2
Mechanical Dimensions 3
Characteristics 4
Luminous Flux Characteristic 4
Absolute Maximum Ratings 4
Characteristic Curve 5-6
Precautions For Use 7
Assembly process flow 8
Reflow Profile 9
Product Packaging Information 10

Revision History

Versions	Description	Release Date
1.1	1.Add the reflow profile 2.Add the packing details 3.Add the table of contents	2020/7/29

TDS Lighting Co.,LTD

Add: NO.148,Mingfa industrial park,Huishan district,Wuxi city,Jiangsu Province
E:xdlleds@gmail.com Website:www.tds-led.com Tel:0086-510-68380810

DESCRIPTION : High Power Infrared LED

Model No: TDS-P003IR-T3A-1

REVISION : 1.1

Material:

Heat resistant polymer / Heat resistant polymer
Encapsulating Resin / Silicone resin
Lens / Heat resistant clear polymer
Electrodes / Ag plating copper alloy
Die attach / Silver paste
Chip / AlGaAs

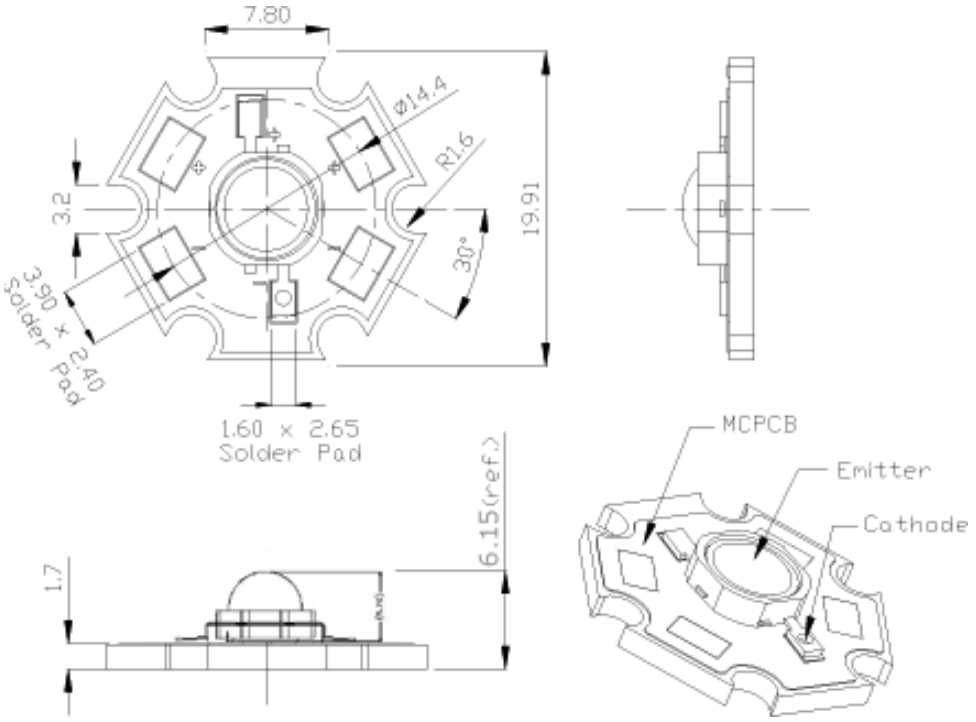
Applications:

- **CCD Camera**
- **Night Vision**
- **Infrared applied system**

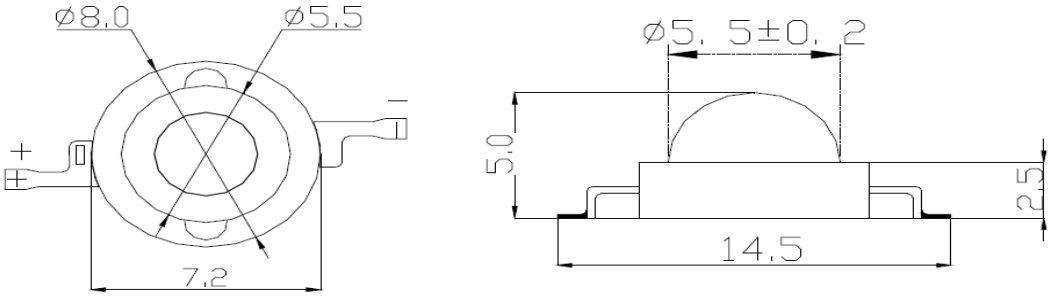
Add: NO.148,Mingfa industrial park,Huishan district,Wuxi city,Jiangsu Province
E:xdlleds@gmail.com Website:www.tds-led.com Tel:0086-510-68380810

Package Dimensions

Star Heatsink



TDS-P003IR-T3A-1



Notes: 1.All dimensions are in millimeters
2.Tolerances unless dimensions ±0.25mm

Add: NO.148,Mingfa industrial park,Huishan district,Wuxi city,Jiangsu Province
E:xdlleds@gmail.com Website:www.tds-led.com Tel:0086-510-68380810

Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Units
Forward Current	I_F	350	mA
Reverse Voltage	V_R	5	V
Operating Temperature	T_{opr}	-40 ~ +85	℃
Storage Temperature	T_{stg}	-40 ~ +85	℃
Junction temperature	T_j	125	ºC
Power Dissipation @I_F=700mA	P_d	1	W

Note: We suggest that customer should add the heat sink with IR to exclude the heat.

Electro-Optical Characteristics (Ta=25℃)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Units
Total Radiated Power	Po	I_F=350mA	200	300	--	mW
		I_F=700mA	280	400	--	
Radiant Intensity	I_E	I_F=350mA	10	20	--	mW/sr
		I_F=700mA	20	30	--	
Peak Wavelength	λp	I_F=20mA	805		810	nm
Spectral Bandwidth	Δλ	I_F=20mA	--	10	--	nm
Forward Voltage	V_F	I_F=350mA	1.6	-	2.2	V
		I_F=700mA	1.6	-	2.2	
Reverse Current	I_R	V_R=5V	--	--	10	μA
Optical Rise Time	Tr	I_F=20mA	--	11	--	ns
Optical Fall Time	Tf	I_F=20mA	--	7	--	ns
View Angle	$2\theta 1/2$	I_F=20mA	--	140	--	deg
Thermal resistance, junction to heat-sink	Rth j-L	I_F=700mA	--	45	--	℃/W

Note. 1. Radiometric measurement tolerance : ±10%

2 .$2\theta_{1/2}$ is the off axis angle from lamp centerline where the radiant intensity is 1/2 of the peak value.

3. Forward Voltage measurement tolerance : ±0.1V

Add: NO.148,Mingfa industrial park,Huishan district,Wuxi city,Jiangsu Province
E:xdlleds@gmail.com Website:www.tds-led.com Tel:0086-510-68380810

Typical Electro-Optical Characteristics Curves

Fig.1 Forward Current vs. Ambient Temperature

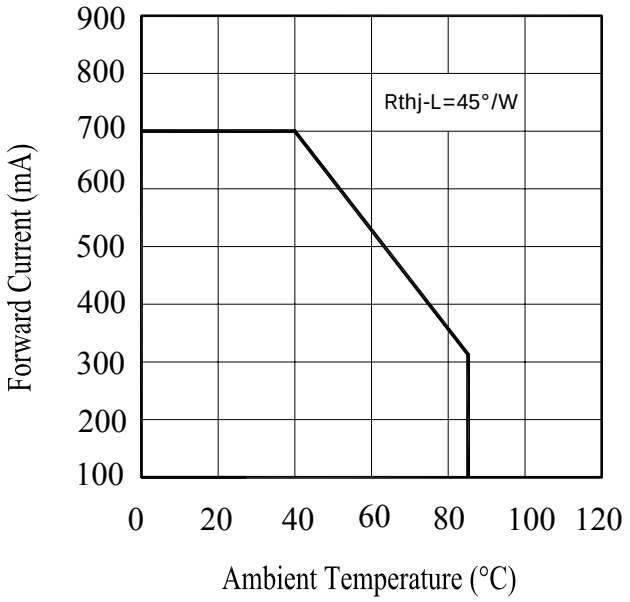


Fig.2 Spectral Distribution

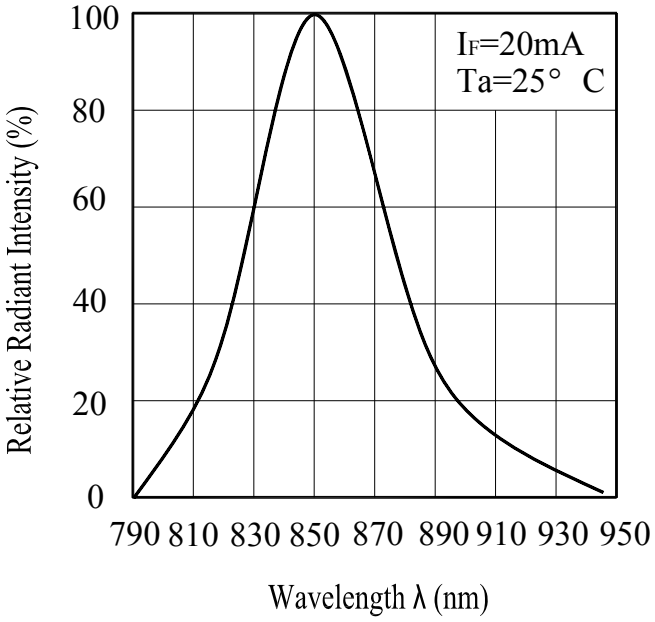


Fig.3 Peak Emission Wavelength Ambient Temperature

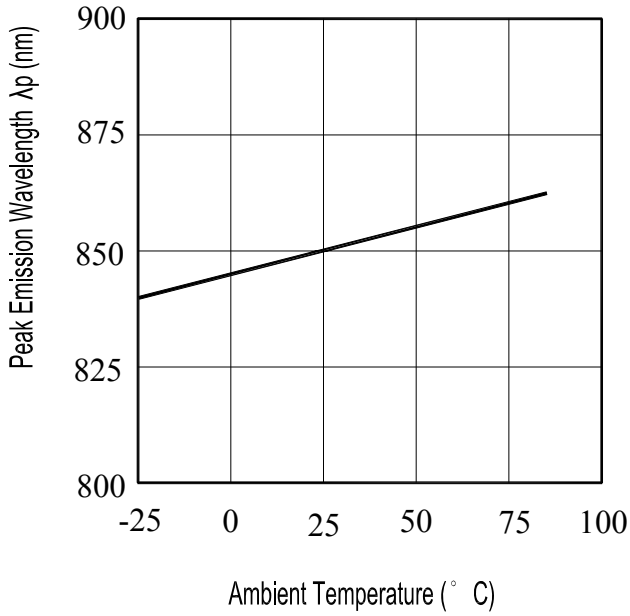
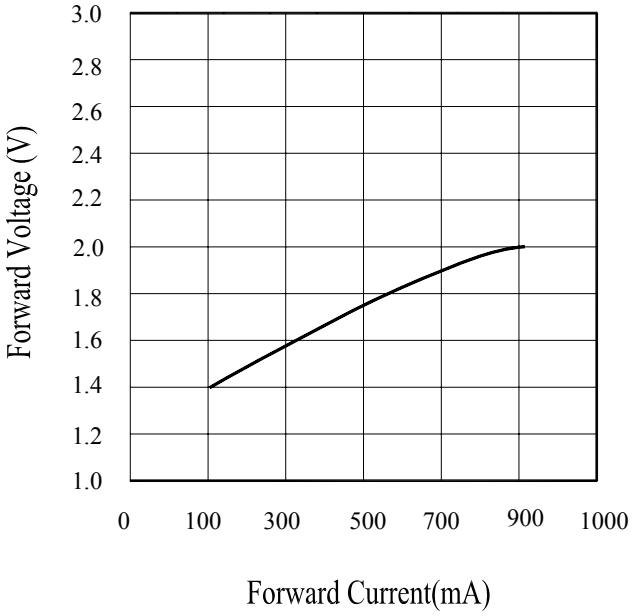


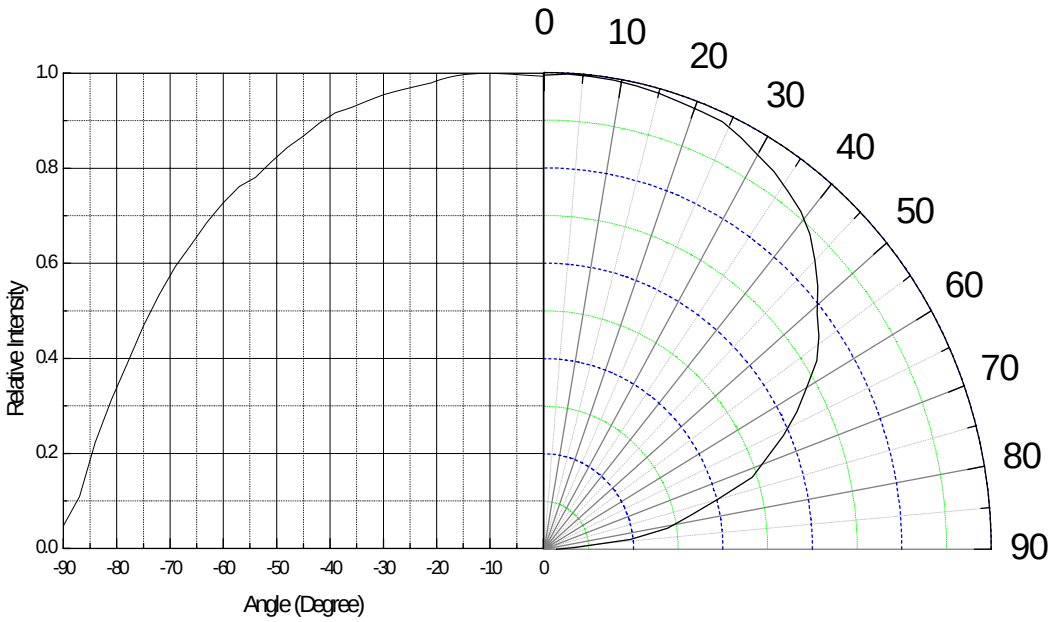
Fig.4 Forward Current vs. Forward Voltage



Add: NO.148,Mingfa industrial park,Huishan district,Wuxi city,Jiangsu Province
E:xdlleds@gmail.com Website:www.tds-led.com Tel:0086-510-68380810

Typical Electro-Optical Characteristics Curves

Fig.5 Relative Radiant Intensity vs. Angular Displacement



Add: NO.148,Mingfa industrial park,Huishan district,Wuxi city,Jiangsu Province
E:xdlleds@gmail.com Website:www.tds-led.com Tel:0086-510-68380810

Precautions For Use

1. Over-current-proof

Though IR-1W-850 has conducted ESD protection mechanism, customer must not use the device in reverse and should apply resistors for extra protection. Otherwise slight voltage shift may cause enormous current change and burn out failure would happen.

2. Thermal Management

1.For maintaining the high flux output and achieving reliability, IR-1W/3W-850 LED package should be mounted on a metal core printed circuit board (MCPCB) with proper thermal connection to dissipate approximately 1W of thermal energy under 350mA operation.

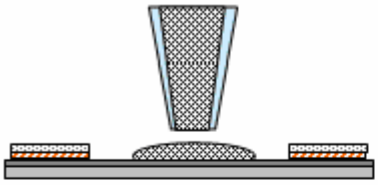
MCPCB structure

Recommended supplier:
- Kavano Industrial Co., Ltd
- TT Electronics

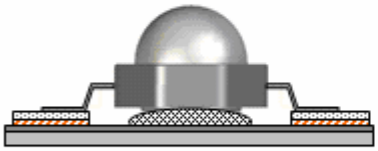
2.Special thermal designs are also recommended to take in outer heat sink design, such as FR4 PCB on Aluminum with thermal vias or FPC on Aluminum with thermal conductive adhesive, etc.

3.Sufficient thermal management must be conducted, or the die junction temperature will be over the limit under large electronic driving and LED lifetime will decrease critically.

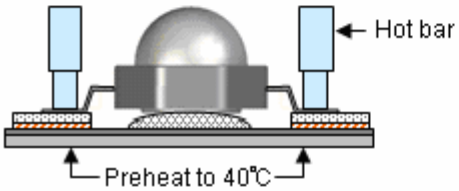
3. Assembly process flow



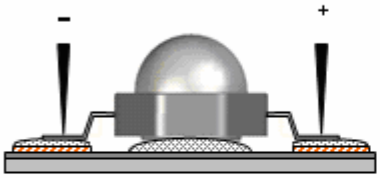
Thermal conductive glue dispensing
Recommended material and its supplier: EpoTek T7109 from Epoxy Technology



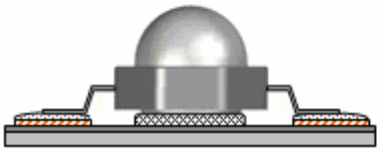
IR-placement **LED emitter**



Hot bar soldering of LED emitter
Note: The MCPCB should be preheated up to 40°C for increasing the solderability



Functional test of LED emitter



Curing of thermal conductive glue

Handling Indications：Do not handle the IR by the lens at any time during the assembly process. This can cause damage to the optical surfaces or may dislocate the lens if excessive force is applied.

4. Soldering Iron

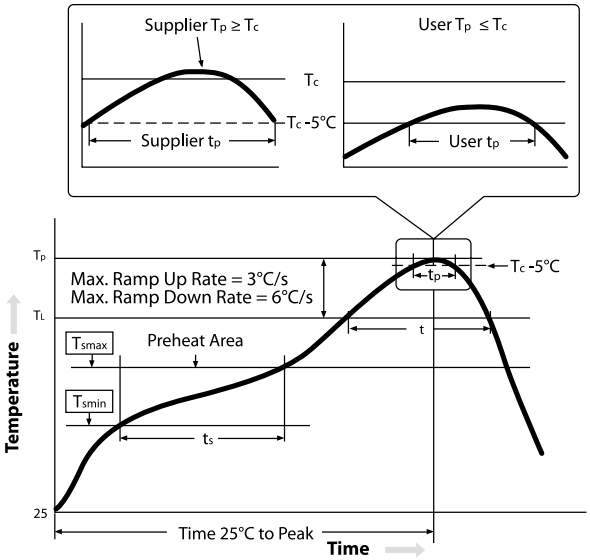
1.For prototype builds or small series production runs it is possible to place and solder the LED by hand.

2.Dispensing thermal conductive glue or grease on the substrates and follow its curing spec. Press LED housing to closely connect LED and substrate.

3.It is recommended to hand solder the leads with a solder tip temperature of 260°C for less than 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal.

4.Be careful because the damage of the product is often started at the time of the hand solder.

The following reflow profile is from IPC/JEDEC J-STD-020D which provided here for reference.



Classification Reflow Profiles

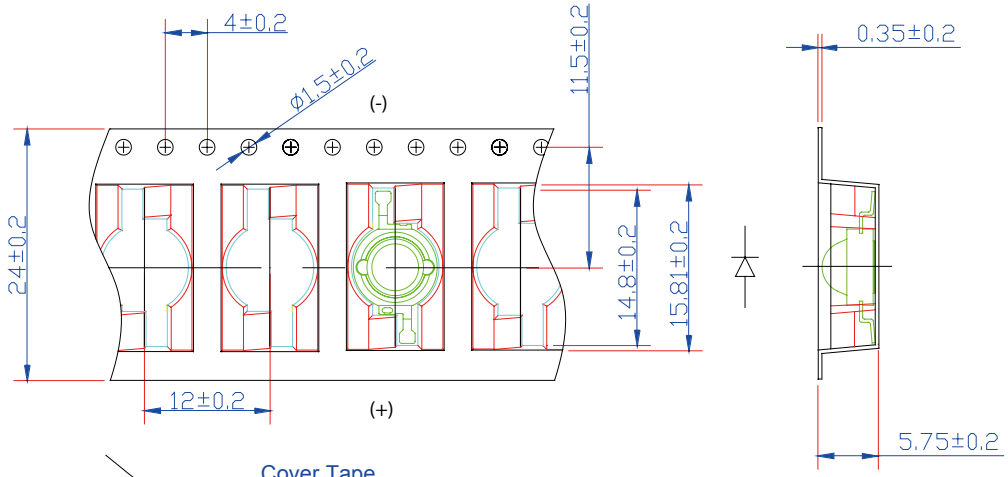
Profile Feature	Low-Temp,Pb-Free Assembl
Preheat/Soak Temperature Min (T_{smin}) Temperature Max (T_{smax}) Time (ts) from (T_{smin} to T_{smax})	 80° C 110° C 60-120 seconds
Ramp-up rate (TL to T_P)	2° C/ seconds max.
Liquidous temperature (TL) Time (tL) maintained above TL	138° C 20-50 seconds
Peak package body temperature (T_P) (1)	155° C~160° C
Classification temperature (T_C)	160° C
Time (tp) within 5° C of the specified classification temperature (Tc) (2)	30 seconds
Average ramp-down rate (T_p to T_{smax})	3° C/second max.
Time 25° C to peak temperature	6minutes max

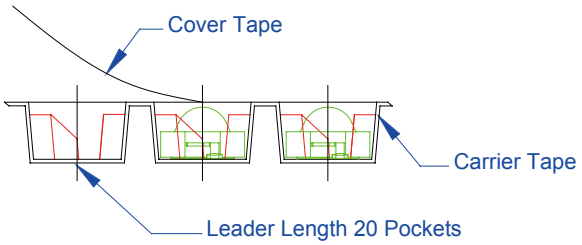
Notes:
1. Tolerance for peak profile temperature (Tp) is defined as a supplier minimum and a user maximum.
2. Tolerance for time at peak profile temperature (tp) is defined as a supplier minimum and a user maximum.

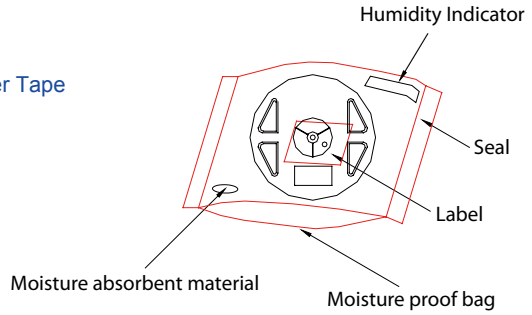
Add: NO.148,Mingfa industrial park,Huishan district,Wuxi city,Jiangsu Province
E:xdlleds@gmail.com Website:www.tds-led.com Tel:0086-510-68380810

Product Packaging Information

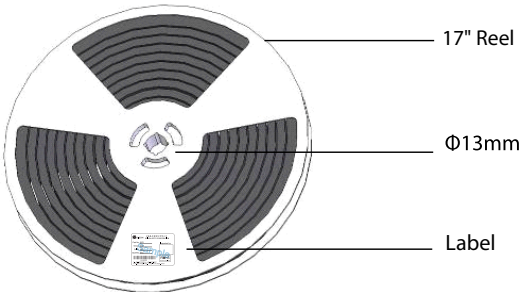
Tape and Reel Dimension



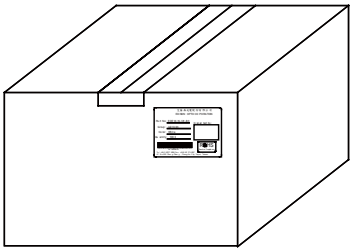




Edixeon Emitter



1000pcs LEDs inside



10 boxes in 1 carton