

Features

- 0402 package (1.0 x 0.5 x 0.4mm) top-mount SMD LED
- High brightness output
- AlInGaP and InGaN chip technology
- Compact package size
- High reliability performance
- Clear lens configuration

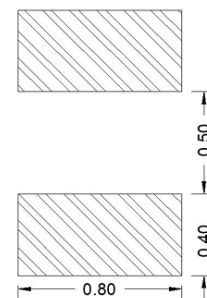
Applications

- Consumer electronics
- Wearables
- Automobile aftermarket
- Industrial equipment

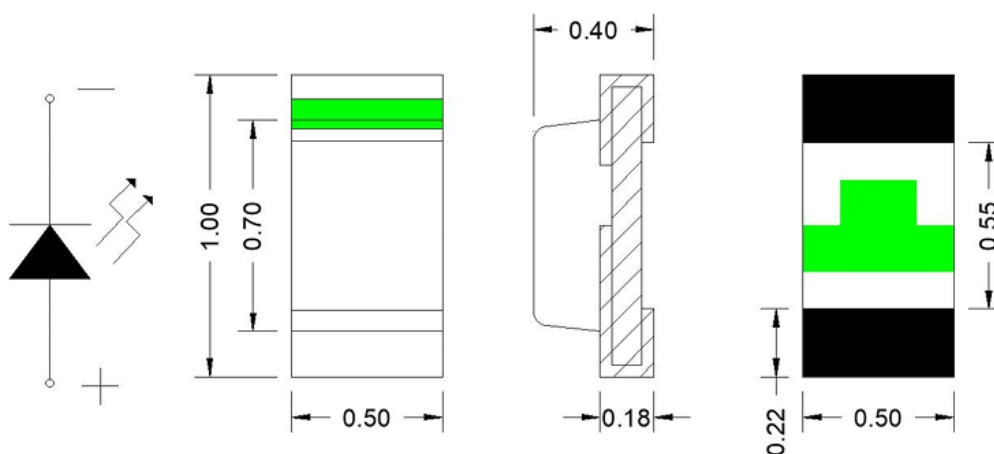
Description

The IN-S42BT series is a popular low profile 0402 package with versatile design capabilities. It is a PCB type molding style LED which can be used in various applications.

Recommended Solder Pattern



Package Dimensions in mm



Notes.

1. All dimensions are in millimeters.
2. Tolerance is ± 0.10 mm unless otherwise noted

Absolute Maximum Rating $T_A = 25^{\circ}\text{C}$ (Note)

Product	Emission Color	P_d (mW)	I_F (mA)	I_{FP}^* (mA)	V_R (V)	T_{OP} ($^{\circ}\text{C}$)	T_{ST} ($^{\circ}\text{C}$)
IN-S42BTR	Red	60	25	100	5	$-30^{\circ}\text{C} \sim +85^{\circ}\text{C}$	$-40^{\circ}\text{C} \sim +90^{\circ}\text{C}$
IN-S42BT5YG	Yellow Green	60	25	100	5	$-30^{\circ}\text{C} \sim +85^{\circ}\text{C}$	$-40^{\circ}\text{C} \sim +90^{\circ}\text{C}$
IN-S42BT5Y	Yellow	60	25	100	5	$-30^{\circ}\text{C} \sim +85^{\circ}\text{C}$	$-40^{\circ}\text{C} \sim +90^{\circ}\text{C}$
IN-S42BT5A	Amber	60	25	100	5	$-30^{\circ}\text{C} \sim +85^{\circ}\text{C}$	$-40^{\circ}\text{C} \sim +90^{\circ}\text{C}$
IN-S42BT5B	Blue	90	25	100	5	$-30^{\circ}\text{C} \sim +85^{\circ}\text{C}$	$-40^{\circ}\text{C} \sim +90^{\circ}\text{C}$
IN-S42BT5G	Green	90	25	100	5	$-30^{\circ}\text{C} \sim +85^{\circ}\text{C}$	$-40^{\circ}\text{C} \sim +90^{\circ}\text{C}$
IN-S42BT5UW	White	90	25	100	5	$-30^{\circ}\text{C} \sim +85^{\circ}\text{C}$	$-40^{\circ}\text{C} \sim +90^{\circ}\text{C}$

Note

1. Condition for IFP is pulse of 1/10 duty and 0.1msec width

ESD Precaution

ATTENTION: Electrostatic Discharge (ESD) protection



The symbol above denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips 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.

Please be advised that normal static precautions should be taken in the handling and assembly of this device to prevent damage or degradation which may be induced by electrostatic discharge (ESD).

Electrical Characteristics $T_A = 25^\circ\text{C}$ (Note)

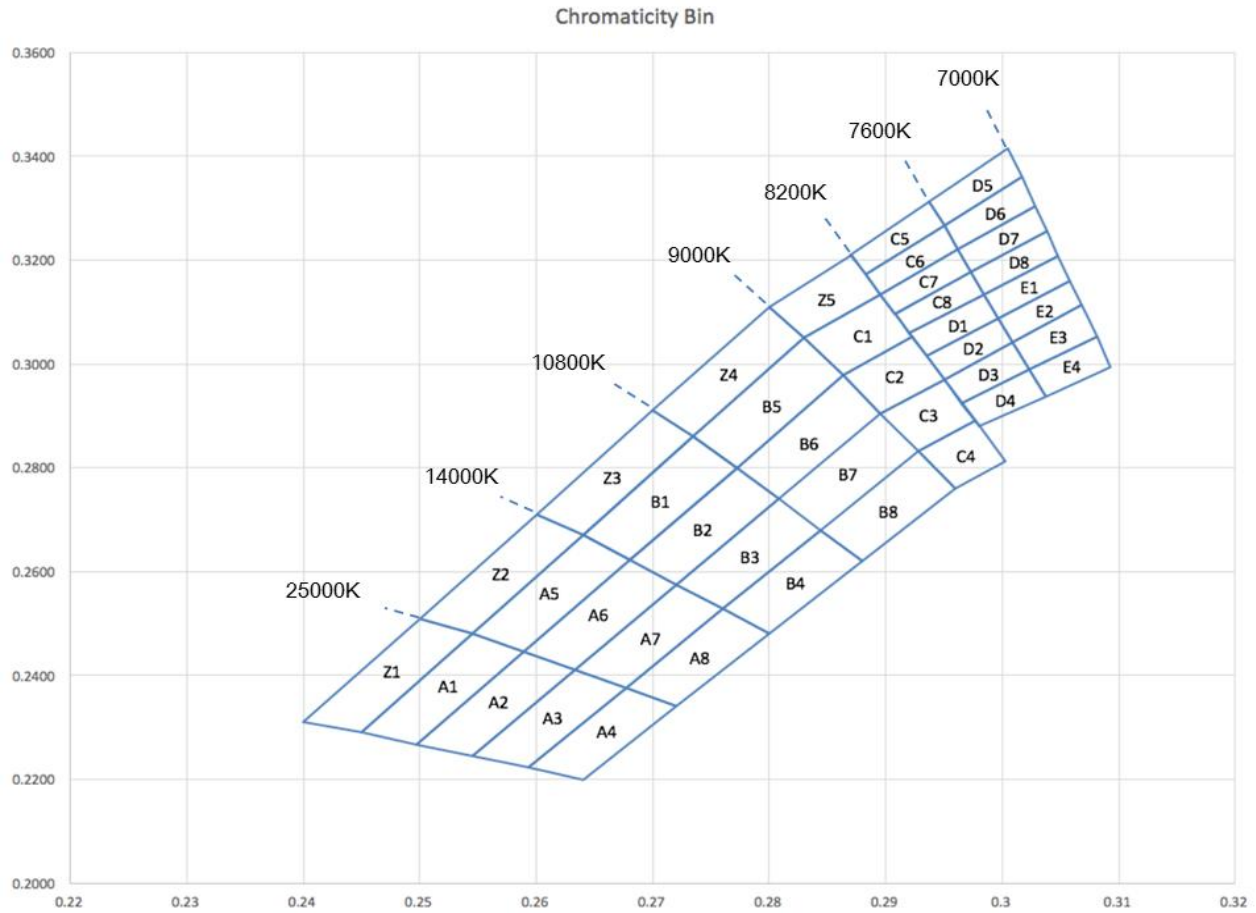
Product	Emission Color	$I_F(\text{mA})$	$V_F(\text{V})$		$\lambda(\text{nm})$			Viewing Angle ($^\circ$)	$IV(\text{mcd})$
			typ.	max	λ_D	λ_P	$\Delta\lambda$	2 θ 1/2	typ.
IN-S42BTR	Red	20	2.1	2.4	622	625	20	120	110
IN-S42BT5YG	Yellow Green	5	2.0	2.2	571	574	15	120	11.5
IN-S42BT5Y	Yellow	5	2.0	2.2	585	592	15	120	28.5
IN-S42BT5A	Amber	5	2.0	2.2	605	603	15	120	28.5
IN-S42BT5B	Blue	5	2.9	3.1	467	467	30	120	35
IN-S42BT5G	Green	5	2.7	3.0	525	524	35	120	300
IN-S42BT5UW	White	5	2.9	3.1	X=0.29 Y=0.29	-	-	120	230

Note

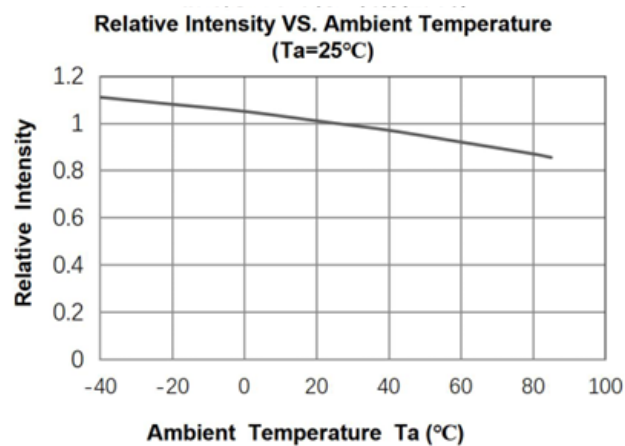
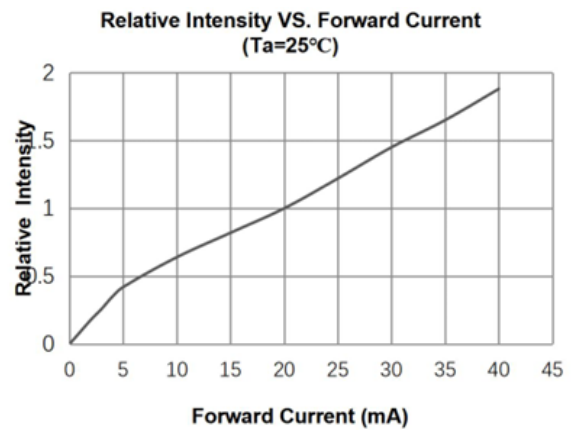
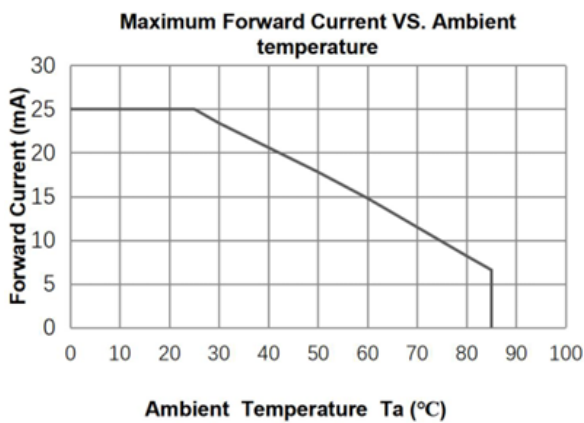
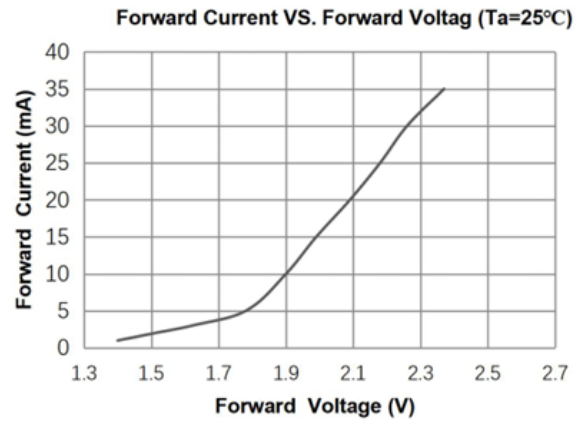
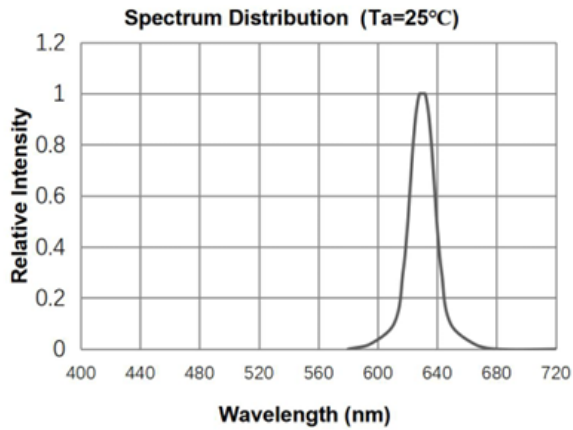
1. Performance guaranteed only under conditions listed in above tables.

Chromaticity Bin (for White only)

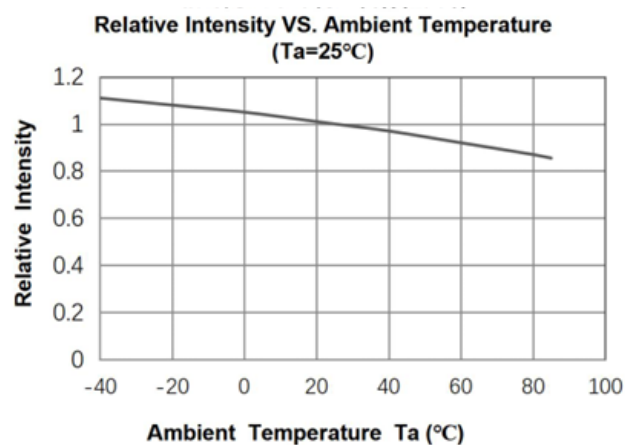
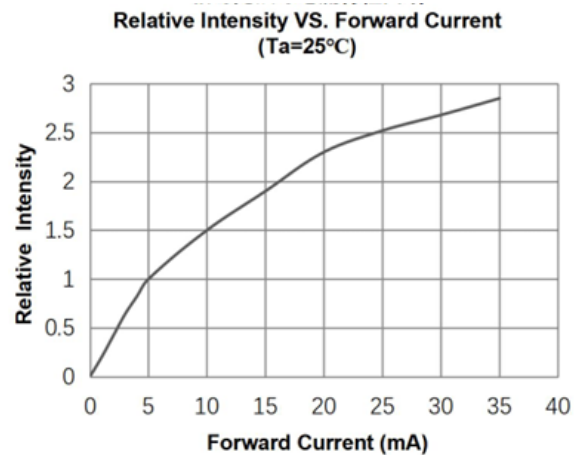
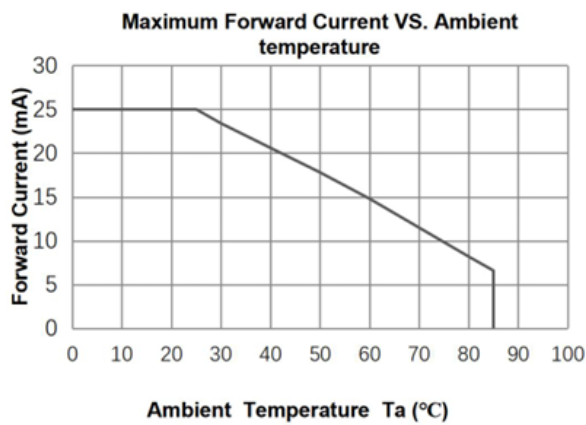
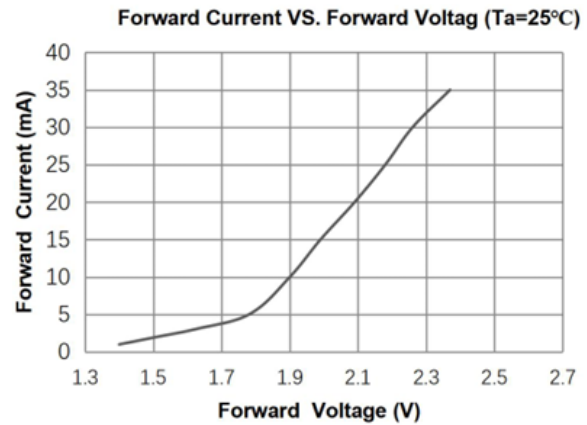
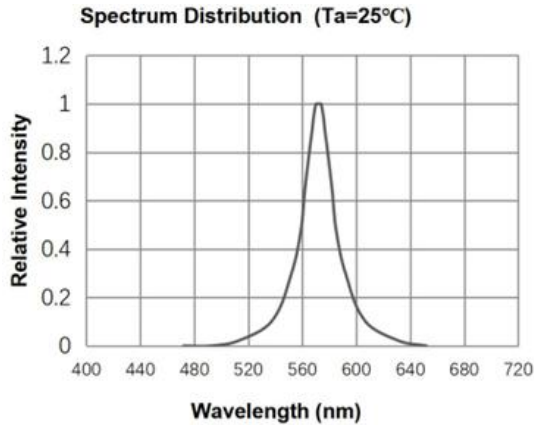
Bin Code	CIE-X	CIE-Y	Bin Code	CIE-X	CIE-Y	Bin Code	CIE-X	CIE-Y	Bin Code	CIE-X	CIE-Y
A5	0.2545	0.2480	B1	0.2640	0.2670	C1	0.2830	0.3050	D1	0.2920	0.3060
	0.2589	0.2445		0.2680	0.2623		0.2863	0.2978		0.2935	0.3015
	0.2680	0.2623		0.2772	0.2800		0.2923	0.3052		0.2997	0.3088
	0.2640	0.2670		0.2735	0.2860		0.2895	0.3134		0.2984	0.3133
A6	0.2589	0.2445	B2	0.2720	0.2575	C2	0.2863	0.2978	D2	0.2935	0.3015
	0.2633	0.2410		0.2680	0.2623		0.2895	0.2905		0.2950	0.2970
	0.2720	0.2575		0.2772	0.2800		0.2950	0.2970		0.3009	0.3042
	0.2680	0.2623		0.2808	0.2740		0.2923	0.3052		0.2997	0.3088
A7	0.2677	0.2375	B3	0.2720	0.2575	C3	0.2895	0.2905	D3	0.2950	0.2970
	0.2633	0.2410		0.2760	0.2528		0.2928	0.2833		0.2965	0.2925
	0.2720	0.2575		0.2844	0.2680		0.2977	0.2891		0.3023	0.2990
	0.2760	0.2528		0.2808	0.2740		0.2950	0.2970		0.3009	0.3042
A8	0.2720	0.2340	B4	0.2760	0.2528	C4	0.2928	0.2833	D4	0.2965	0.2925
	0.2677	0.2375		0.2844	0.2680		0.2977	0.2891		0.2980	0.2880
	0.2760	0.2528		0.2880	0.2620		0.3003	0.2812		0.3037	0.2937
	0.2800	0.2480		0.2800	0.2480		0.2960	0.2760		0.3023	0.2990
E1	0.2984	0.3133	B5	0.2735	0.2860	C5	0.2883	0.3172	D5	0.2937	0.3312
	0.2997	0.3088		0.2772	0.2800		0.2870	0.3210		0.2950	0.3266
	0.3058	0.3160		0.2863	0.2978		0.2937	0.3312		0.3017	0.3360
	0.3048	0.3207		0.2830	0.3050		0.2950	0.3266		0.3005	0.3415
E2	0.2997	0.3088	B6	0.2772	0.2800	C6	0.2883	0.3172	D6	0.2950	0.3266
	0.3009	0.3042		0.2808	0.2740		0.2950	0.3266		0.2962	0.3220
	0.3068	0.3113		0.2895	0.2905		0.2962	0.3220		0.3028	0.3304
	0.3058	0.3160		0.2863	0.2978		0.2895	0.3134		0.3017	0.3360
E3	0.3009	0.3042	B7	0.2808	0.2740	C7	0.2895	0.3134	D7	0.2962	0.3220
	0.3023	0.2990		0.2844	0.2680		0.2908	0.3097		0.2973	0.3177
	0.3081	0.3053		0.2928	0.2833		0.2973	0.3177		0.3038	0.3256
	0.3068	0.3113		0.2895	0.2905		0.2962	0.3220		0.3028	0.3304
E4	0.3023	0.2990	B8	0.2844	0.2680	C8	0.2908	0.3097	D8	0.2973	0.3177
	0.3037	0.2937		0.2928	0.2833		0.2920	0.3060		0.2984	0.3133
	0.3093	0.2993		0.2960	0.2760		0.2984	0.3133		0.3048	0.3207
	0.3081	0.3053		0.2880	0.2620		0.2973	0.3177		0.3038	0.3256
Z2	0.2500	0.2510	Z3	0.2600	0.2710	Z4	0.2700	0.2910	Z5	0.2800	0.3110
	0.2600	0.2710		0.2700	0.2910		0.2800	0.3110		0.2871	0.3210
	0.2640	0.2670		0.2735	0.2860		0.2830	0.3050		0.2895	0.3134
	0.2545	0.2480		0.2640	0.2670		0.2735	0.2860		0.2830	0.3050
A1	0.2497	0.2267	A2	0.2497	0.2267	A3	0.2593	0.2223	A4	0.2640	0.2200
	0.2450	0.2290		0.2589	0.2445		0.2677	0.2375		0.2593	0.2223
	0.2545	0.2480		0.2633	0.2410		0.2633	0.2410		0.2677	0.2375
	0.2589	0.2445		0.2545	0.2245		0.2545	0.2245		0.2720	0.2340
Z1	0.2400	0.2310									
	0.2500	0.2510									
	0.2545	0.2480									
	0.2450	0.2291									



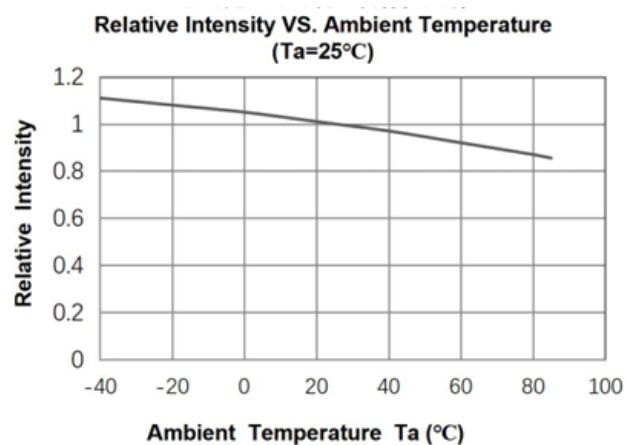
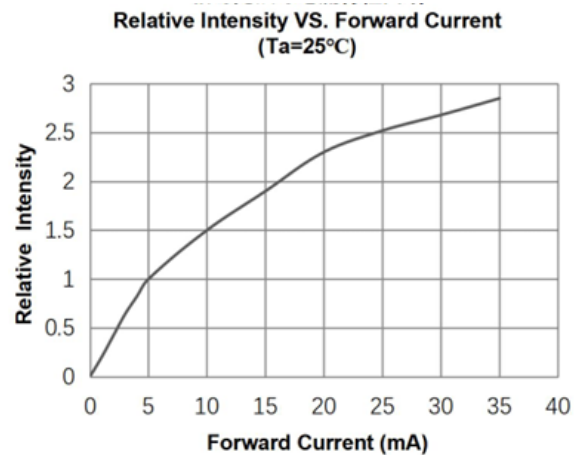
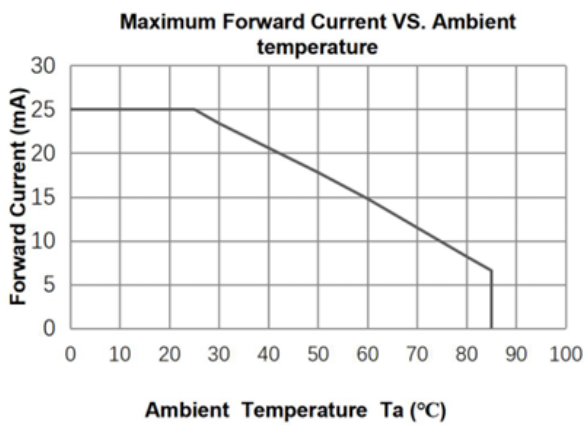
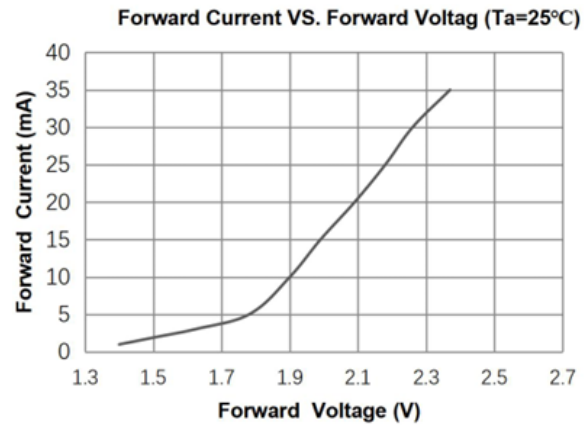
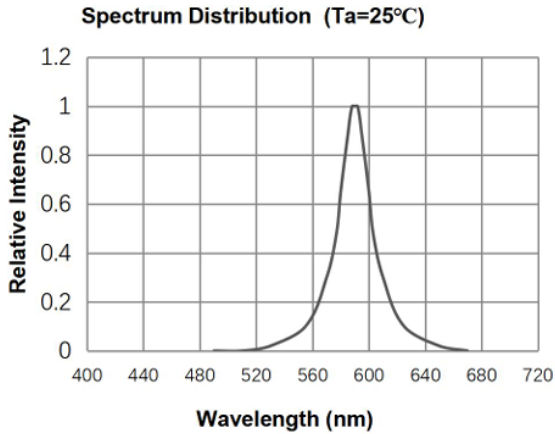
Typical Characteristic Curves – R



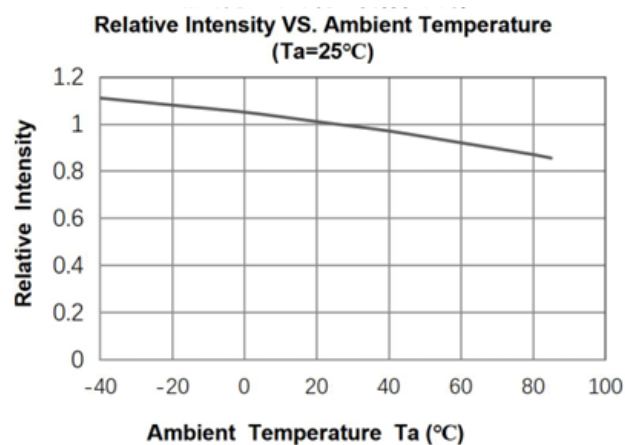
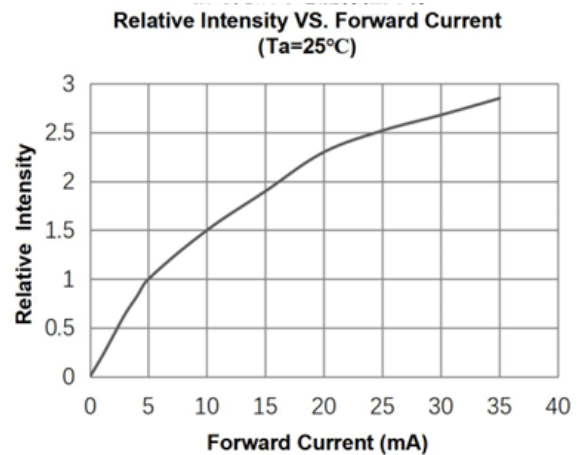
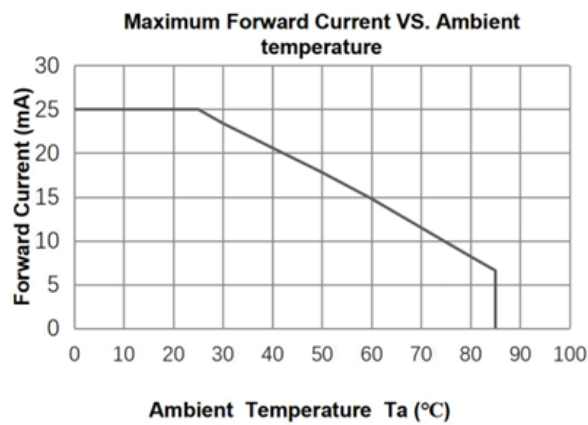
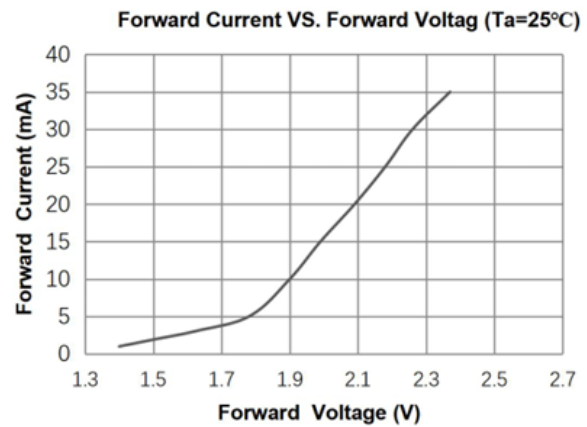
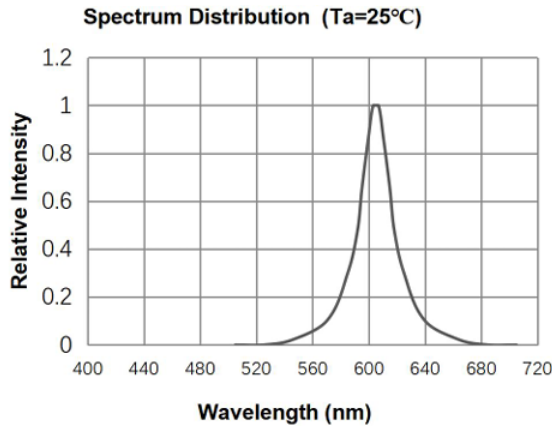
Typical Characteristic Curves – YG



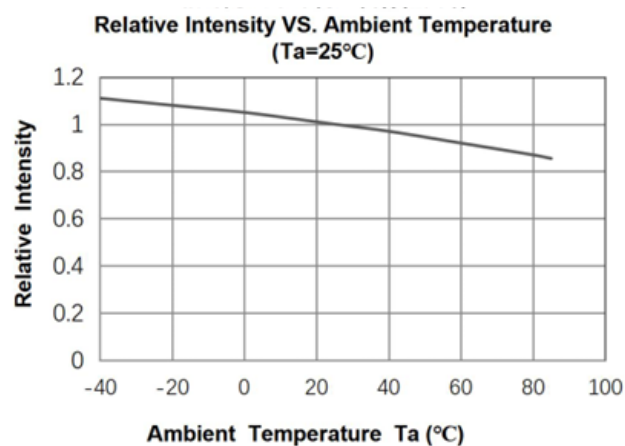
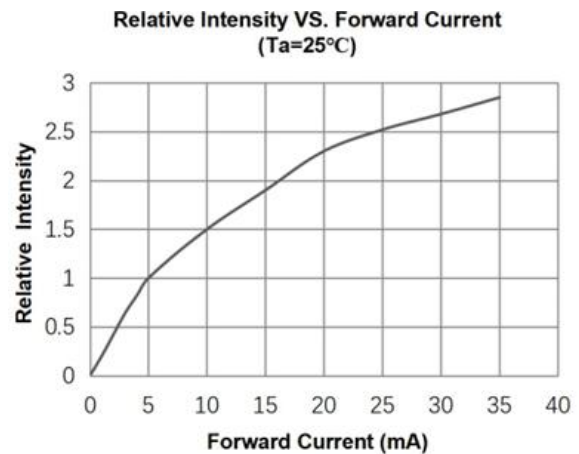
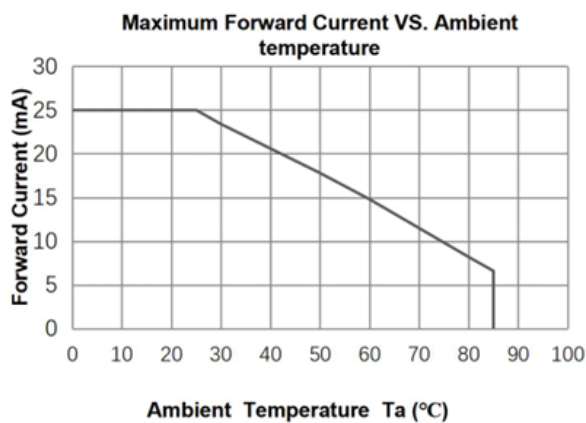
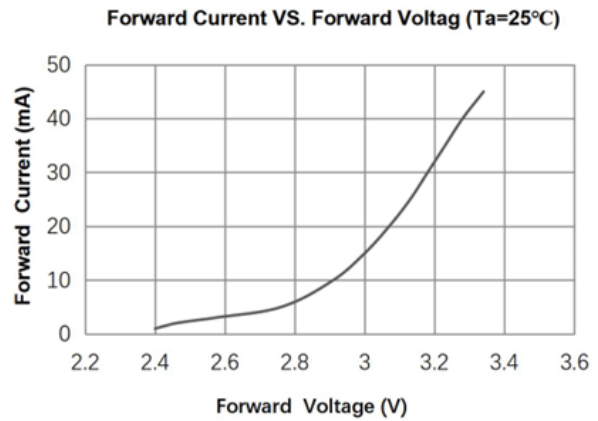
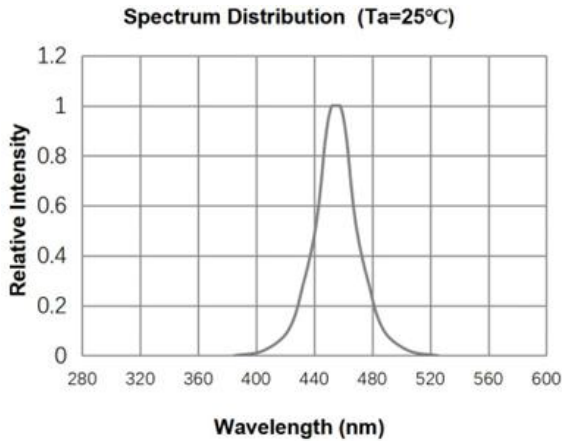
Typical Characteristic Curves – Y



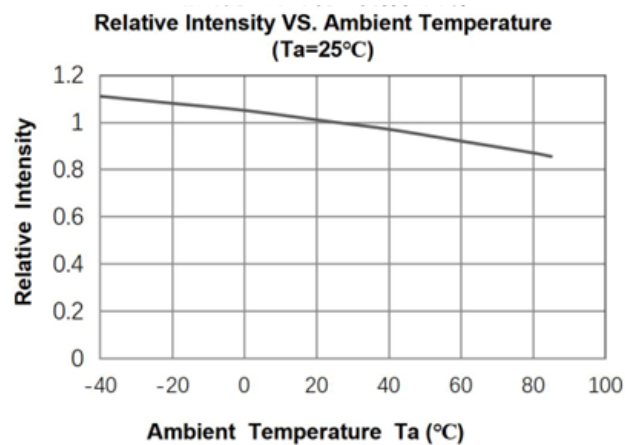
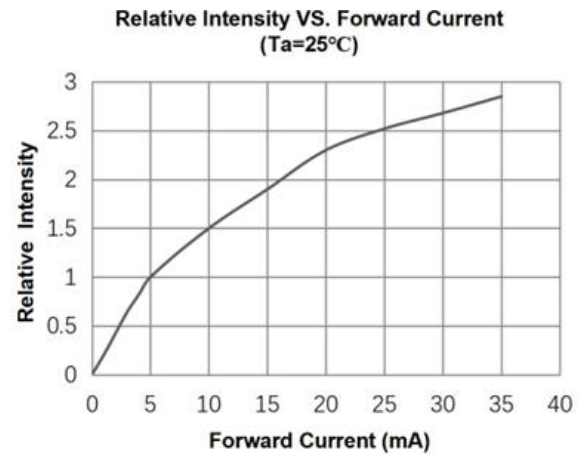
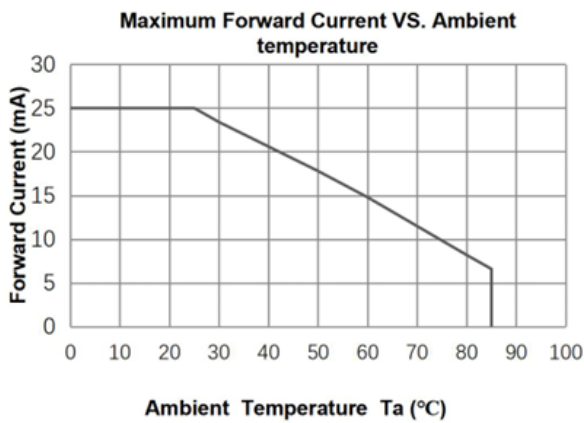
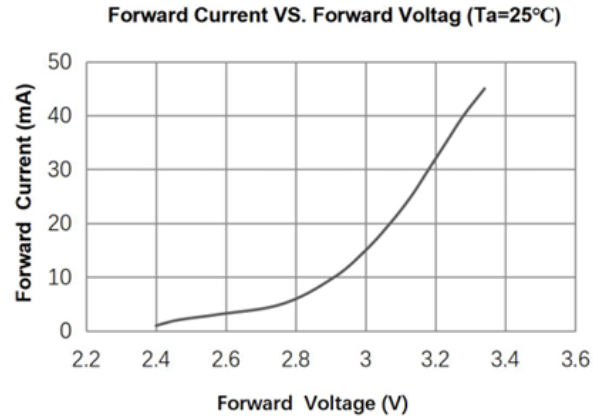
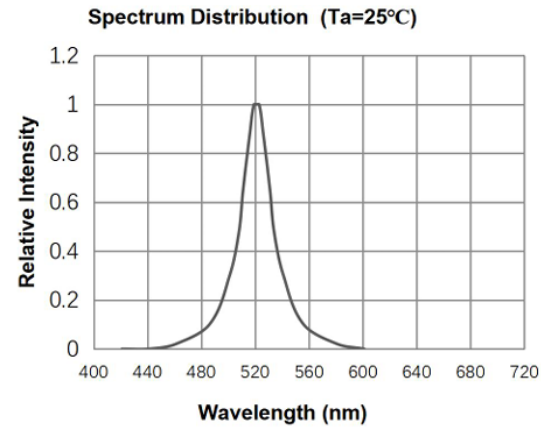
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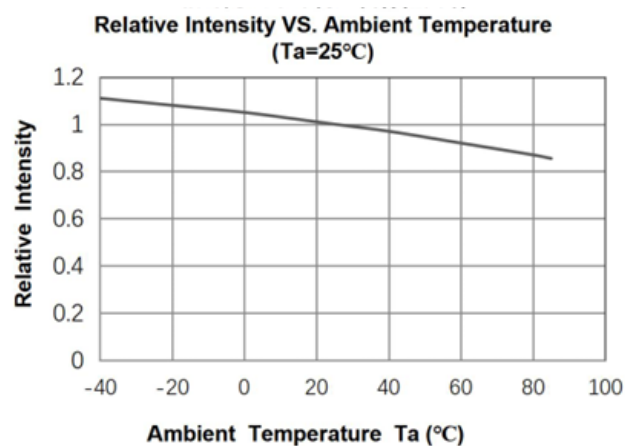
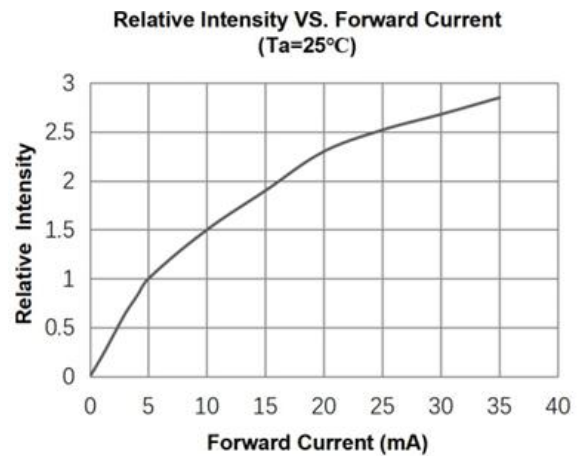
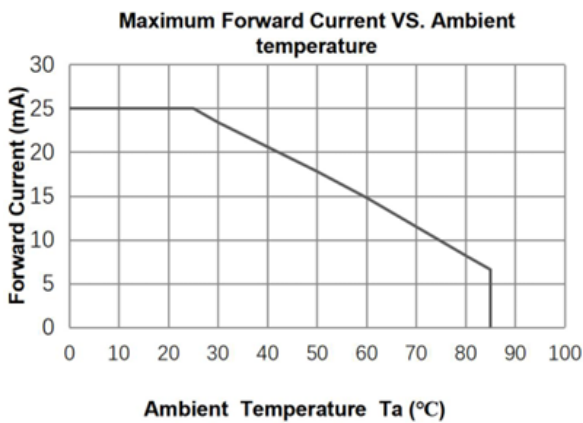
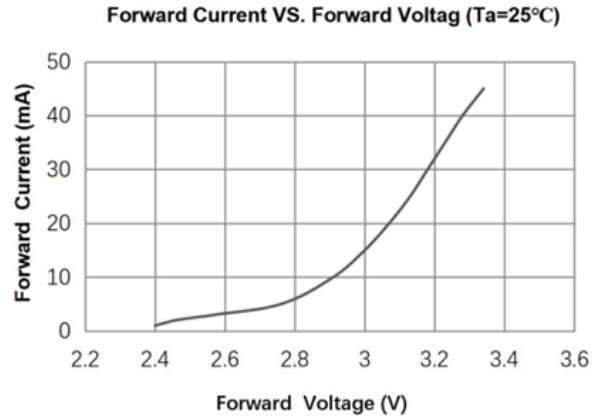
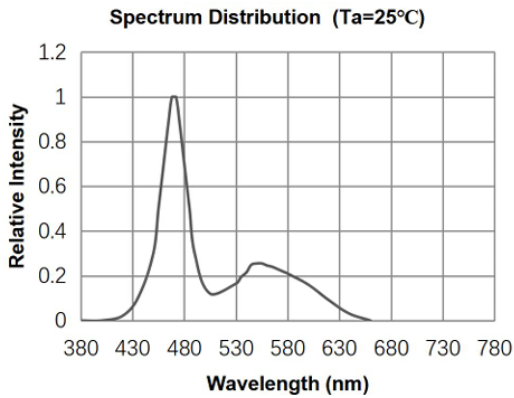
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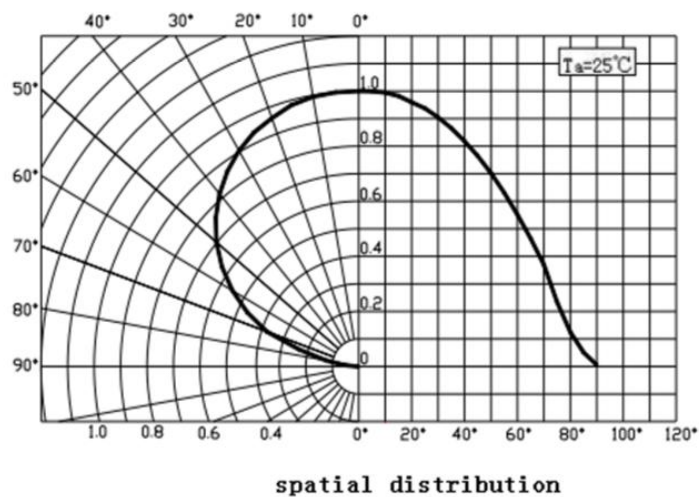
Typical Characteristic Curves – G



Typical Characteristic Curves – W



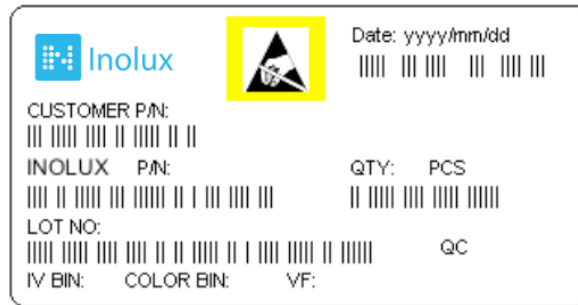
Typical Characteristic Curves – Radiation Pattern



Ordering Information

Orderable Part Number	Emission Color	Technology	Test Current I_F (mA)	Luminous Intensity I_V (mcd) (Typ.)	Forward Voltage V_F (V) (Typ.)
IN-S42BTR	Red	AlInGaP	20	110	2.1
IN-S42BT5YG	Yellow Green	AlInGaP	5	11.5	2.0
IN-S42BT5Y	Yellow	AlInGaP	5	28.5	2.0
IN-S42BT5A	Amber	AlInGaP	5	28.5	2.0
IN-S42BT5B	Blue	InGaN	5	35	2.9
IN-S42BT5G	Green	InGaN	5	300	2.7
IN-S42BT5UW	White	InGaN	5	230	2.9

Label Specifications

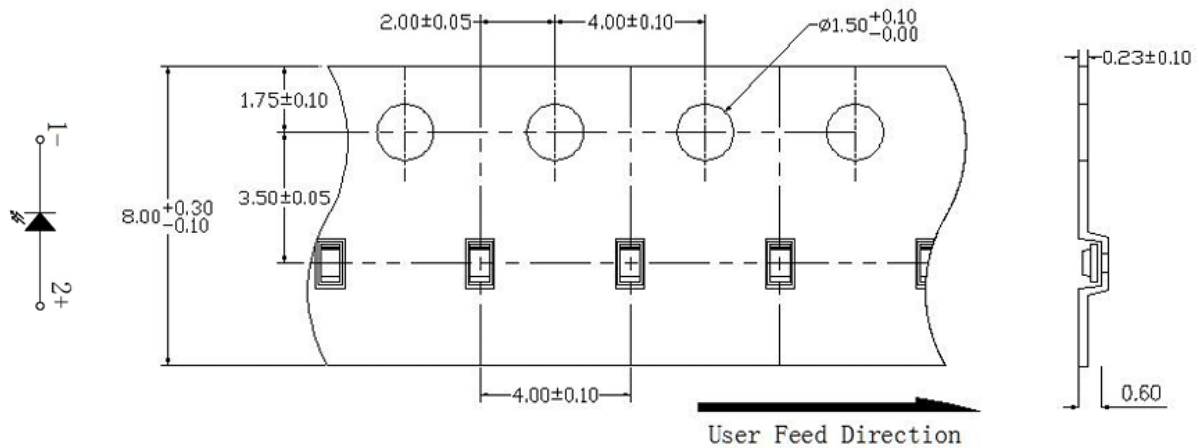
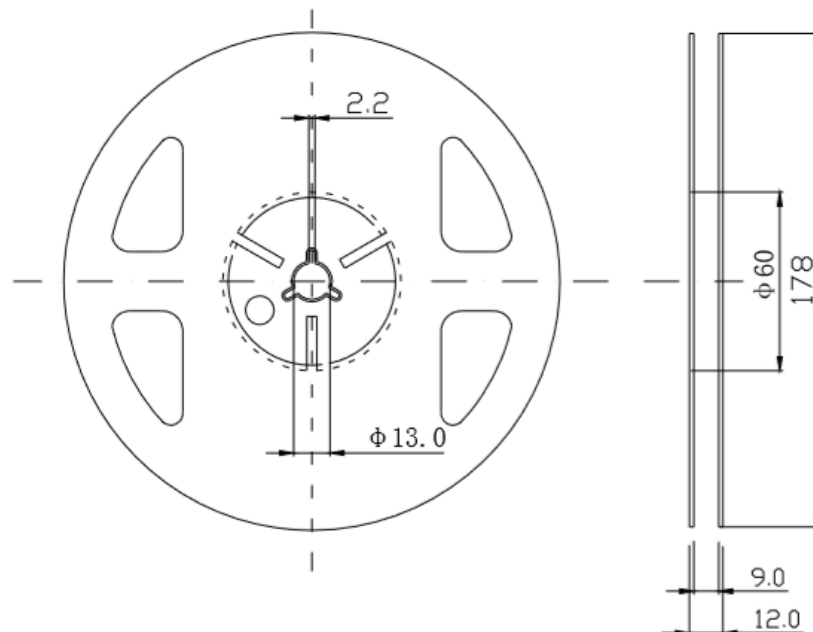


Inolux P/N:

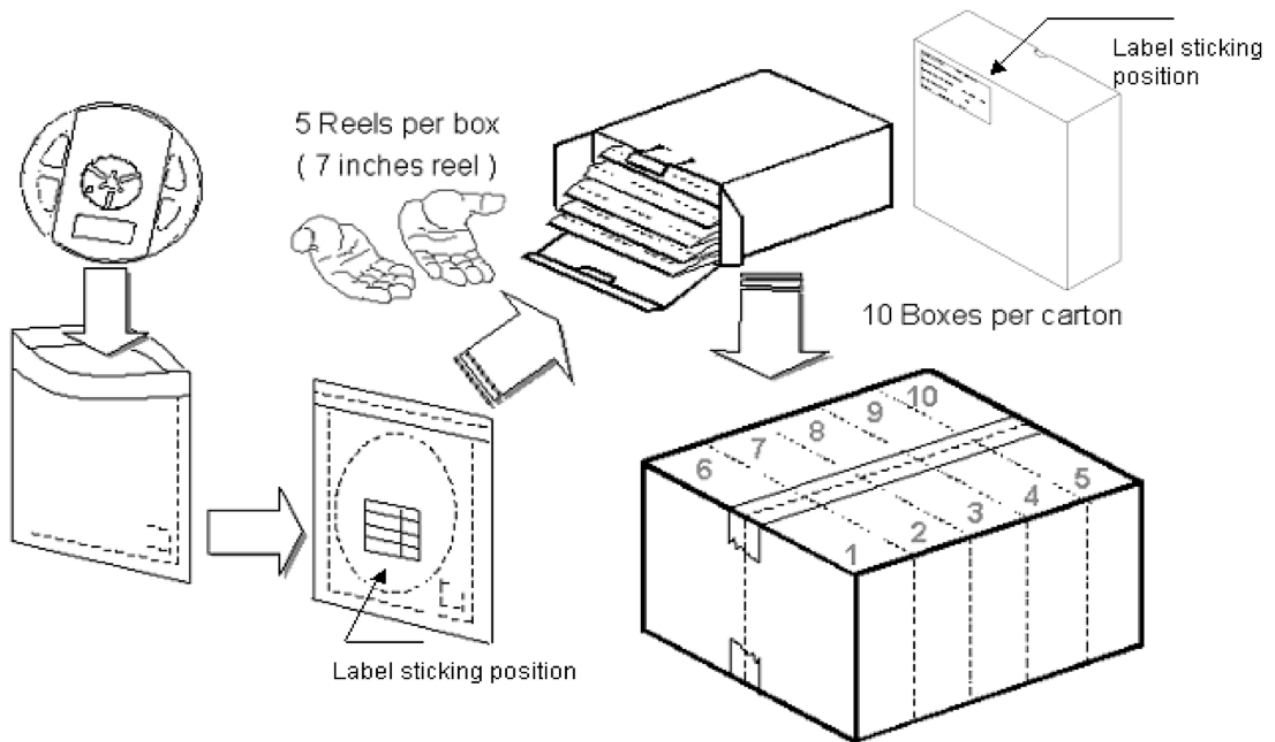
I	N	-	S	4	2	B	T				-	X	X	X	X
Inolux SMD			Material	Package		Variation	Orientation	Current	Lens	Color	Customized Stamp-off				
			S = PCB Type	42B = 1.0 x 0.5 x 0.4mm			T = Top Mount	(Blank) = 20mA 5=5mA	(Blank) = Clear U = Diffused	R=624m A=605nm Y=590nm YG=570nm G=520nm B=470nm W=White					

Lot No.:

Z	2	0	1	7	01	24	001
Internal Tracker	Year (2017, 2018,)				Month	Date	Serial

Packaging Information: 3000pcs Per Reel
Tape Dimension

Reel Dimension


Packing Dimension



5 boxes per carton are available depending on shipment quantity.

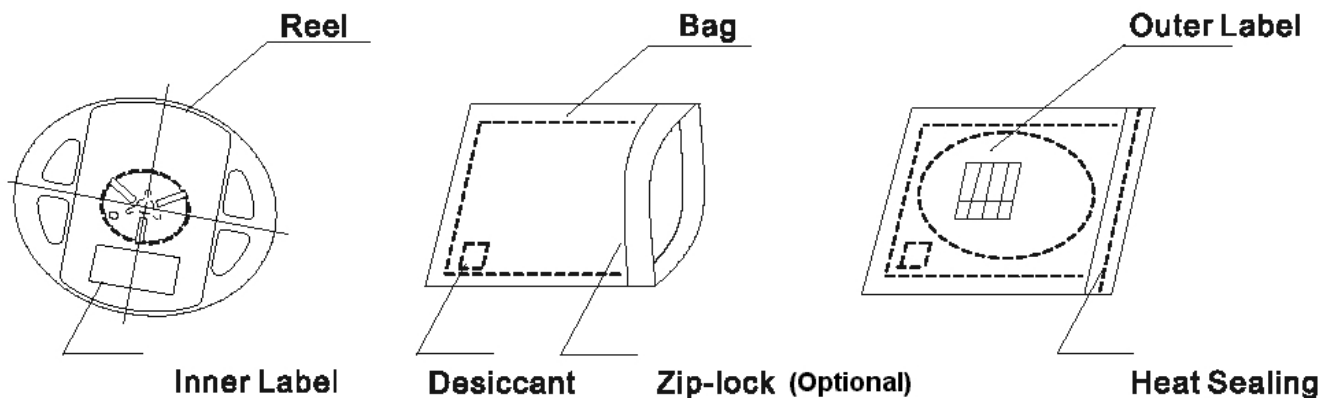
	Specification	Material	Quantity
Carrier tape	Per EIA 481-1A specs	Conductive black tape	3000pcs per reel
Reel	Per EIA 481-1A specs	Conductive black	
Label	Standard	Paper	
Packing bag	220x240mm	Aluminum laminated bag/ no-zipper	One reel per bag
Carton	Standard	Paper	Non-specified
Others: Each immediate box consists of 5 reels. The 5 reels may not necessarily have the same lot number or the same bin combinations of Iv, λ_D and Vf. Each reel has a label identifying its specification; the immediate box consists of a product label as well.			

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.

Upon request, a humidity indicator will be included in the moisture protected anti-static bag prior to shipment.

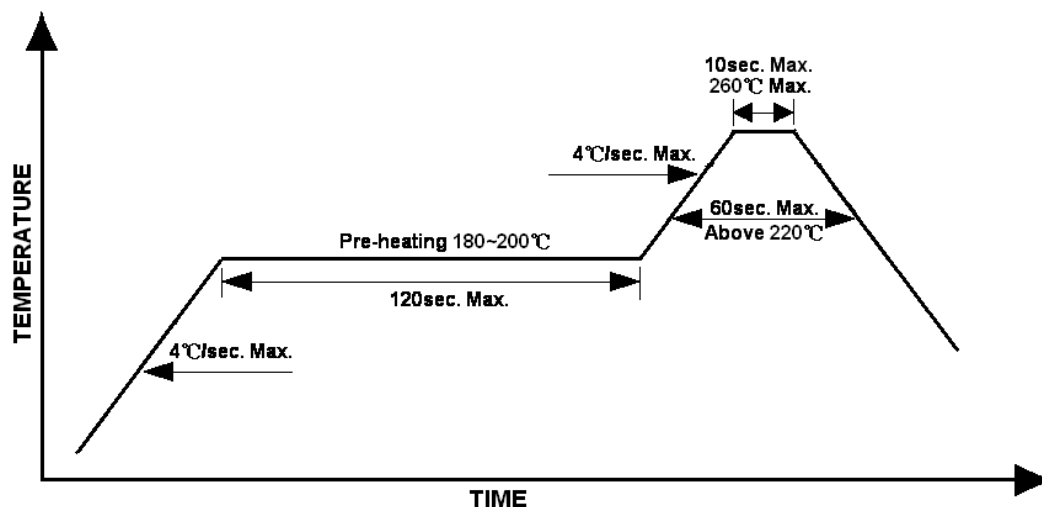
The packaging sequence is as follows:



Reflow Soldering

- Recommended tin glue specifications: melting temperature in the range of 178~192 °C
- The recommended reflow soldering profile is as follows (temperatures indicated are as measured on the surface of the LED resin):

Lead-free Solder Profile



Precautions

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

Reworking

- Rework should be completed within 5 seconds under 260 °C.
- 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°C x 30sec. or <30°C x 3min
- Ultra sonic cleaning: < 15W/ bath; bath volume ≤ 1liter
- Curing: 100 °C max, <3min

Cautions of Pick and Place

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

Revision History

Changes since last revision	Page	Version No.	Revision Date
Initial Release		1.0	10-04-2018
Updated	P3/P8	1.1	04-24-2020
Updated		1.2	06-09-2026

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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.

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