Features

- 0402 0.4mm SMD LED
- High Brightness
- AlInGaP Technology
- Small package
- High reliability
- Clear Lens

Applications

- Consumer Electronics
- Wearables
- Automobile After Market
- Industrial Equipment

Description

The IN-S42BT5UW.80.45 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

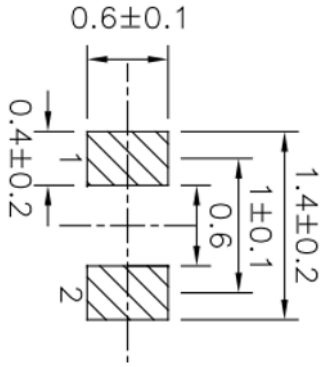
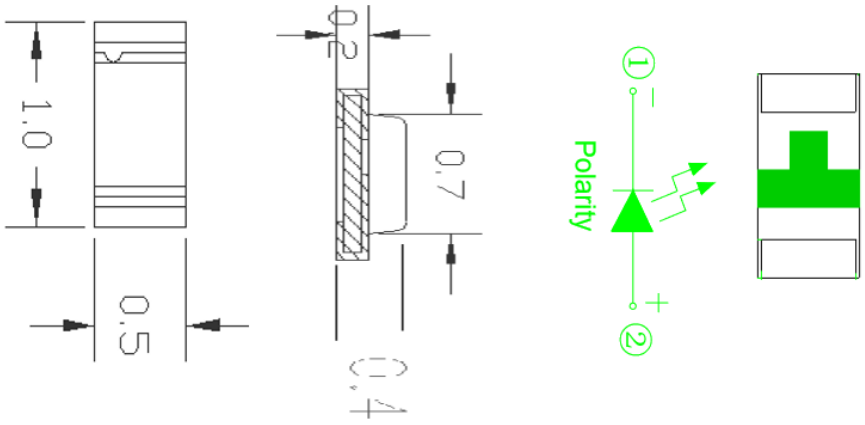


Figure 1. IN-S42BT5UW.80.45 Solder Pattern

Package Dimensions in mm



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

Figure 2. IN-S42BT5UW.80.45 Package Dimensions

Absolute Maximum Rating at 25°C (Note 1)

Product	Emission Color	P_d (mW)	I_F (mA)	I_{FP}* (mA)	V_R (V)	T_{OP} (°C)	T_{ST} (°C)
IN-S42BT5UW.80.45	White	90	25	100	5	-30°C~+85°C	-40°C~+90°C

Notes
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).

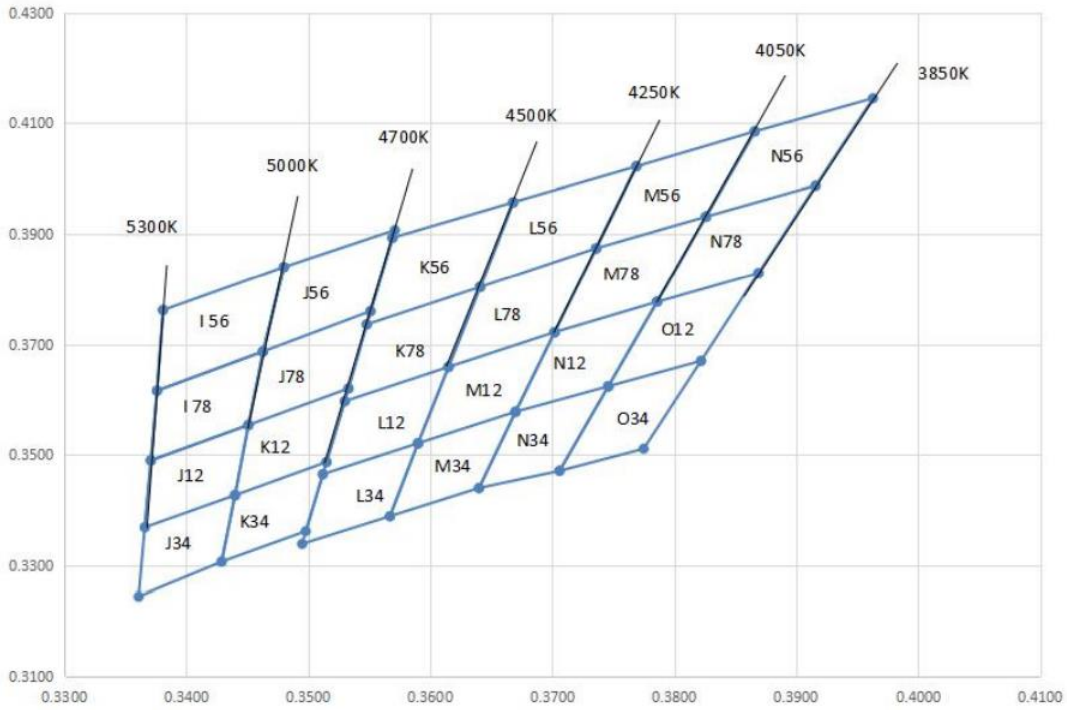
Electrical Characteristics T_A = 25℃ (Note 1)

Product	Emission Color	I_F(mA)	V_F(V)		λ(nm)			CRI	Viewing Angle	I^*_V(mcd)
			typ.	max	λ_D	λ_P	△λ	min.	2θ1/2	typ.
IN-S42BT5UW.80.45	White	5	2.8	3.2	X=0.365 Y=0.370	-	-	80	120	230

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

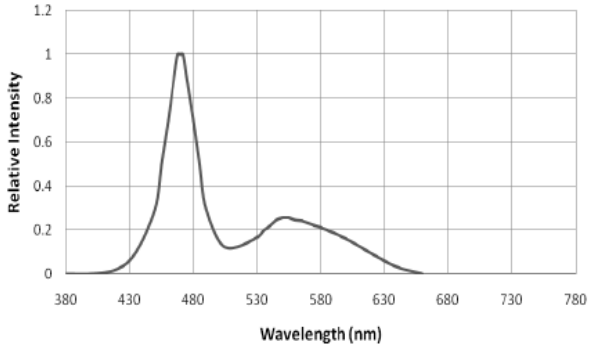
Chromaticity Bin (for White only)

Bin Code	CIE-X	CIE-Y	Bin Code	CIE-X	CIE-Y	Bin Code	CIE-X	CIE-Y	Bin Code	CIE-X	CIE-Y
I56	0.3381	0.3762	I78	0.3376	0.3616	J12	0.3371	0.3490	J34	0.3366	0.3369
	0.3376	0.3616		0.3371	0.3490		0.3366	0.3369		0.3361	0.3245
	0.3463	0.3687		0.3451	0.3554		0.3440	0.3427		0.3429	0.3307
	0.3480	0.3840		0.3463	0.3687		0.3451	0.3554		0.3440	0.3427
J56	0.3480	0.3840	J78	0.3463	0.3687	K12	0.3451	0.3554	K34	0.3440	0.3427
	0.3463	0.3687		0.3451	0.3554		0.3440	0.3427		0.3429	0.3307
	0.3551	0.3760		0.3533	0.3620		0.3515	0.3487		0.3498	0.3362
	0.3571	0.3907		0.3551	0.3760		0.3533	0.3620		0.3515	0.3487
K56	0.3569	0.3893	K78	0.3548	0.3736	L12	0.3530	0.3597	L34	0.3512	0.3465
	0.3548	0.3736		0.3530	0.3597		0.3512	0.3465		0.3495	0.3339
	0.3641	0.3804		0.3615	0.3659		0.3590	0.3521		0.3567	0.3389
	0.3668	0.3957		0.3641	0.3804		0.3615	0.3659		0.3590	0.3521
L56	0.3668	0.3957	L78	0.3641	0.3804	M12	0.3615	0.3659	M34	0.3590	0.3521
	0.3641	0.3804		0.3615	0.3659		0.3590	0.3521		0.3567	0.3389
	0.3736	0.3874		0.3702	0.3722		0.3670	0.3578		0.3640	0.3440
	0.3769	0.4022		0.3736	0.3874		0.3702	0.3722		0.3670	0.3578
M56	0.3769	0.4022	M78	0.3736	0.3874	N12	0.3702	0.3722	N34	0.3670	0.3578
	0.3736	0.3874		0.3702	0.3722		0.3670	0.3578		0.3640	0.3440
	0.3826	0.3931		0.3786	0.3777		0.3746	0.3624		0.3706	0.3471
	0.3866	0.4085		0.3826	0.3931		0.3786	0.3777		0.3746	0.3624
N56	0.3866	0.4085	N78	0.3826	0.3931	O12	0.3786	0.3777	O34	0.3746	0.3624
	0.3826	0.3931		0.3786	0.3777		0.3746	0.3624		0.3706	0.3471
	0.3916	0.3987		0.3869	0.3829		0.3822	0.3670		0.3775	0.3511
	0.3963	0.4145		0.3916	0.3987		0.3869	0.3829		0.3822	0.3670

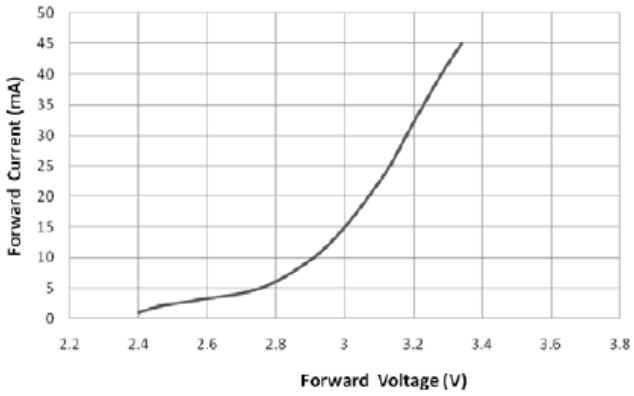


Typical Characteristic Curves

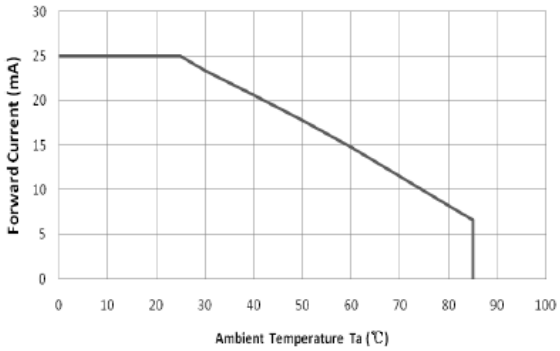
光谱分布特性曲线
Spectrum Distribution (Ta=25℃)



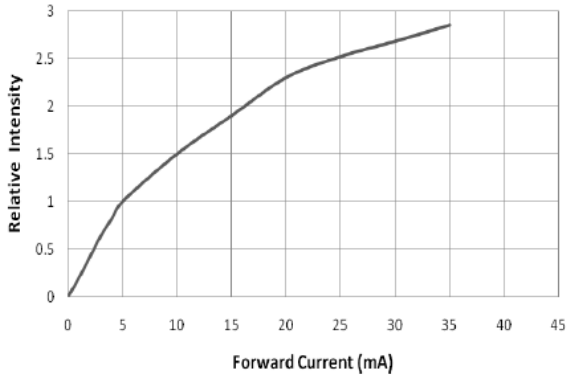
伏安特性曲线
Forward Current VS. Forward Voltag (Ta=25℃)



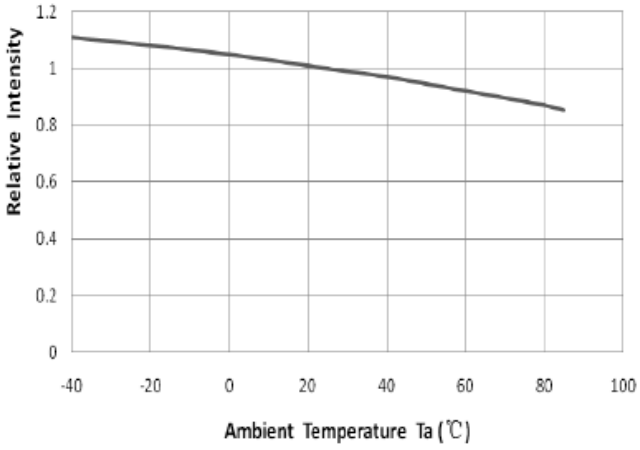
最大正向电流与环境温度特性曲线
Maximum Forward Current VS. Ambient temperature



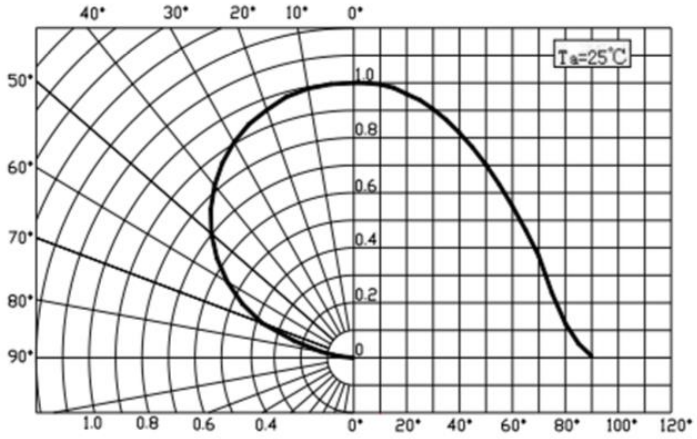
相对光强与电流特性曲线
Relative Intensity VS. Forward Current (Ta=25℃)



相对光强与环境温度特性曲线
Relative Intensity VS. Ambient Temperature (Ta=25℃)



Typical Characteristic Curves – Radiation Pattern

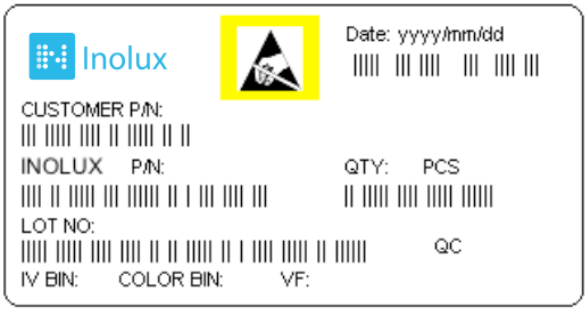


spatial distribution

Ordering Information

Product	Emission Color	Technology	Test Current I_F (mA)	Luminous Intensity I_V (mcd) (Typ.)	Forward Voltage V_F (V) (Typ.)	Orderable Part Number
IN-S42BT5UW.80.45	White	InGaN	5	230	2.8	IN-S42BT5UW.80.45

Label Specifications



Inolux P/N:

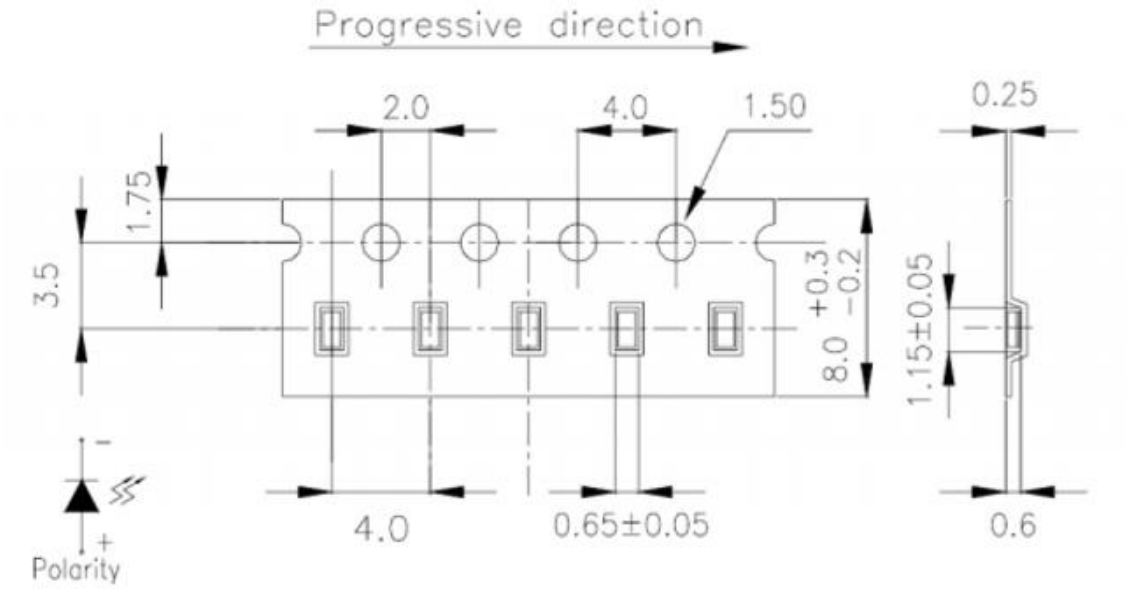
I	N	-	S	4	2	B	T	5	U	W	.	80	.	45	-	X	X	X	X
			Material	Package		Variation	Orientation	Current	Lens	Color		CRI	.	CCT		Customized Stamp-off			
Inolux SMD			S = PCB Type	42B = 1.0 x 0.5 x 0.4mm			T = Top Mount	5=5mA	(Blank) = Clear U = Diffused	W= White		80= CRI80		45= 4500K					

Lot No.:

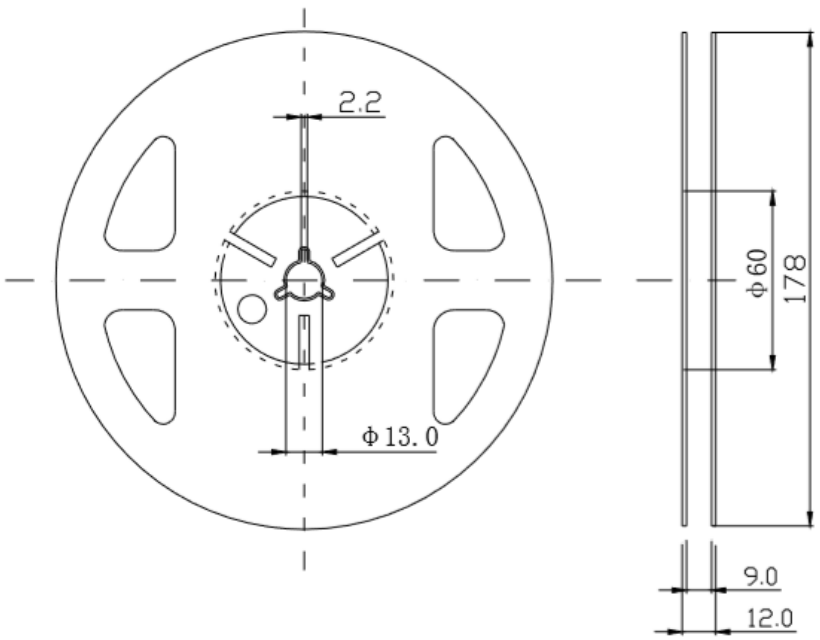
Z	2	0	1	7	01	24	001
Internal Tracker	Year (2017, 2018, …..)				Month	Date	Serial

Packaging Information: 3000pcs Per Reel

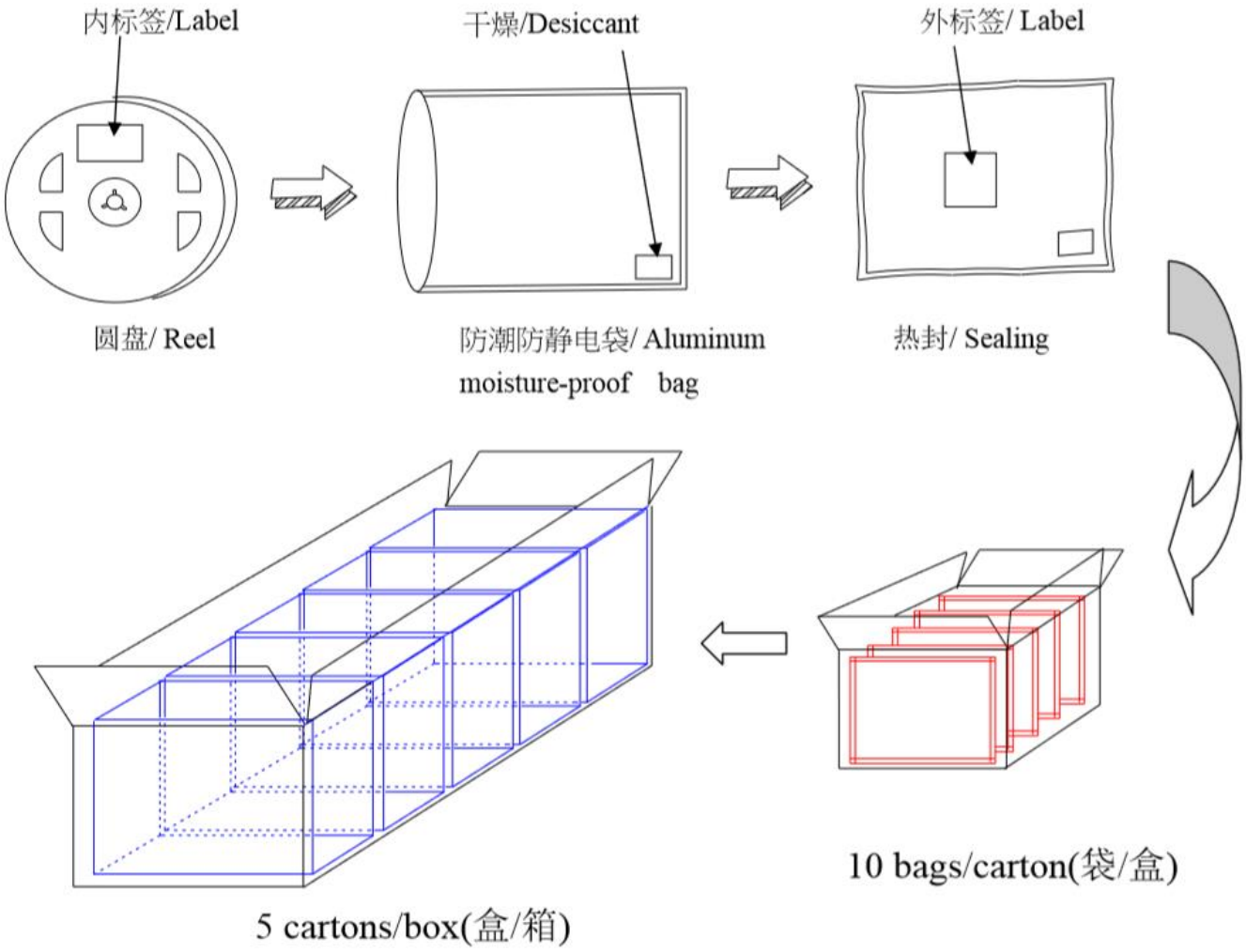
Tape Dimension



Reel Dimension



Packing Dimension

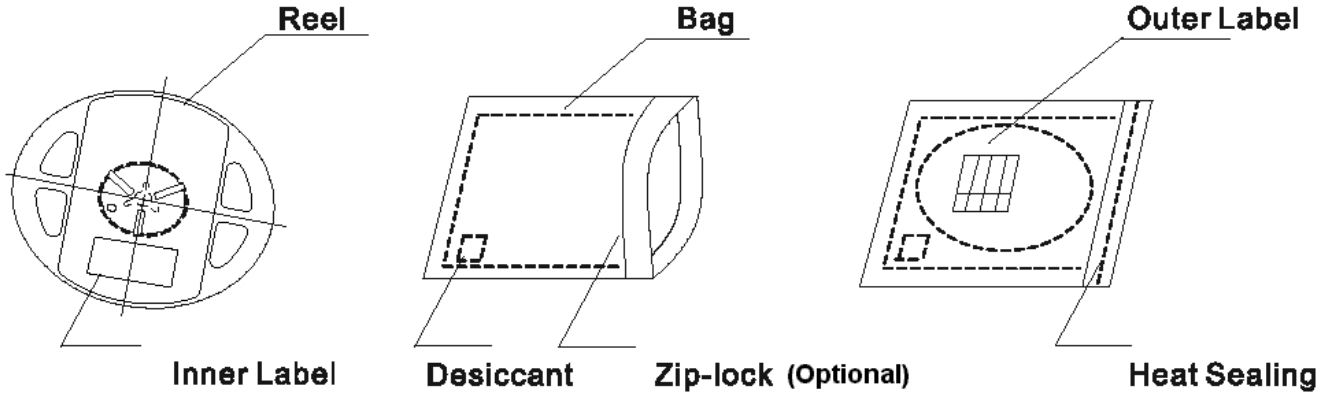


Dry Pack

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.

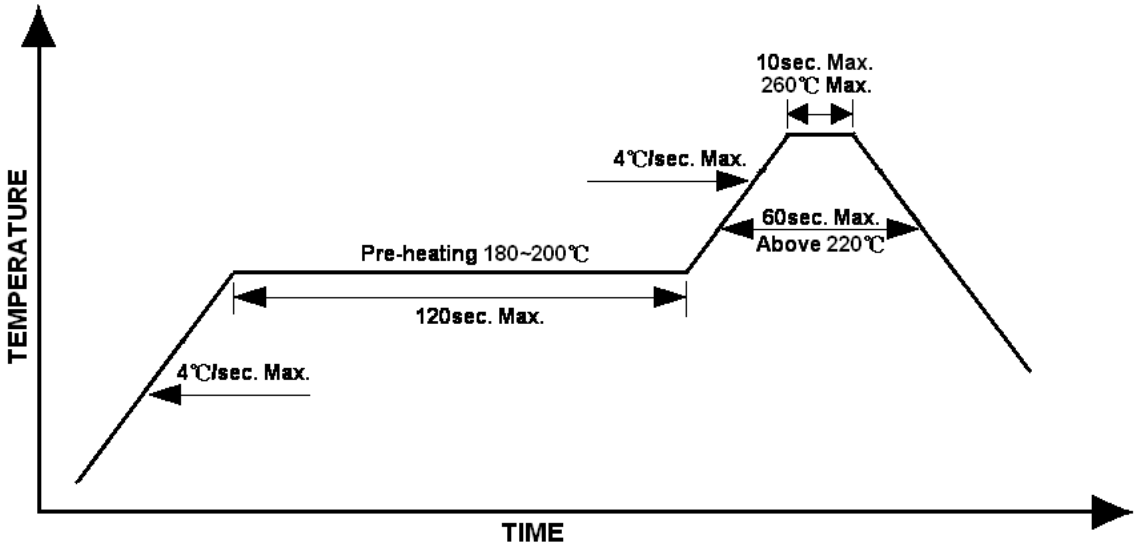
The packaging sequence is as follows:



Reflow Soldering

- Recommended tin glue specifications: melting temperature in the range of 178~192 ^{O}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 ^{O}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^{o}C x 30sec. or <30^{o}C x 3min
- Ultra sonic cleaning: < 15W/ bath; bath volume ≤ 1liter
- Curing: 100 ^{O}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.

Reliability

Item	Frequency/ lots/ samples/ failures	Standards Reference	Conditions
Precondition	For all reliability monitoring tests according to JEDEC Level 2	J-STD-020	1.) Baking at 85°C for 24hrs 2.) Moisture storage at 85°C/ 60% R.H. for 168hrs
Solderability	1Q/ 1/ 22/ 0	JESD22-B102-B And CNS-5068	Accelerated aging 155°C/ 24hrs Tinning speed: 2.5+0.5cm/s Tinning: A: 215°C/ 3+1s or B: 260°C/ 10+1s
Resistance to soldering heat		CNS-5067	Dipping soldering terminal only Soldering bath temperature A: 260+/-5°C; 10+/-1s B: 350+/-10°C; 3+/-0.5s
Operating life test	1Q/ 1/ 40/ 0	CNS-11829	1.) Precondition: 85°C baking for 24hrs 85°C/ 60%R.H. for 168hrs 2.) Tamb25°C; IF=20mA; duration 1000hrs
High humidity, high temperature bias	1Q/ 1/ 45/ 0	JESD-A101-B	Tamb: 85°C Humidity: 85% R.H., IF=5mA Duration: 1000hrs
High temperature bias	1Q/ 1/ 20	IN specs.	Tamb: 55°C IF=20mA Duration: 1000hrs
Pulse life test	1Q/ 1/ 40/ 0		Tamb25°C, If=20mA,, Ip=100mA, Duty cycle=0.125 (tp=125 μs,T=1sec) Duration 500hrs)
Temperature cycle	1Q/ 1/ 76/ 0	JESD-A104-A IEC 68-2-14, Nb	A cycle: -40 degree C 15min; +85 degree C 15min Thermal steady within 5 min.. 300 cycles 2 chamber/ Air-to-air type
High humidity storage test	1Q/ 1/ 40/ 0	CNS-6117	60+3°C 90+5/-10% R.H. for 500hrs
High temperature storage test	1Q/ 1/ 40/ 0	CNS-554	100+10°C for 500hrs
Low temperature storage test	1Q/ 1/ 40/ 0	CNS-6118	-40+5°C for 500hrs

Revision History

Changes since last revision	Page	Version No.	Revision Date
Initial Release		1.0	09-23-2021

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