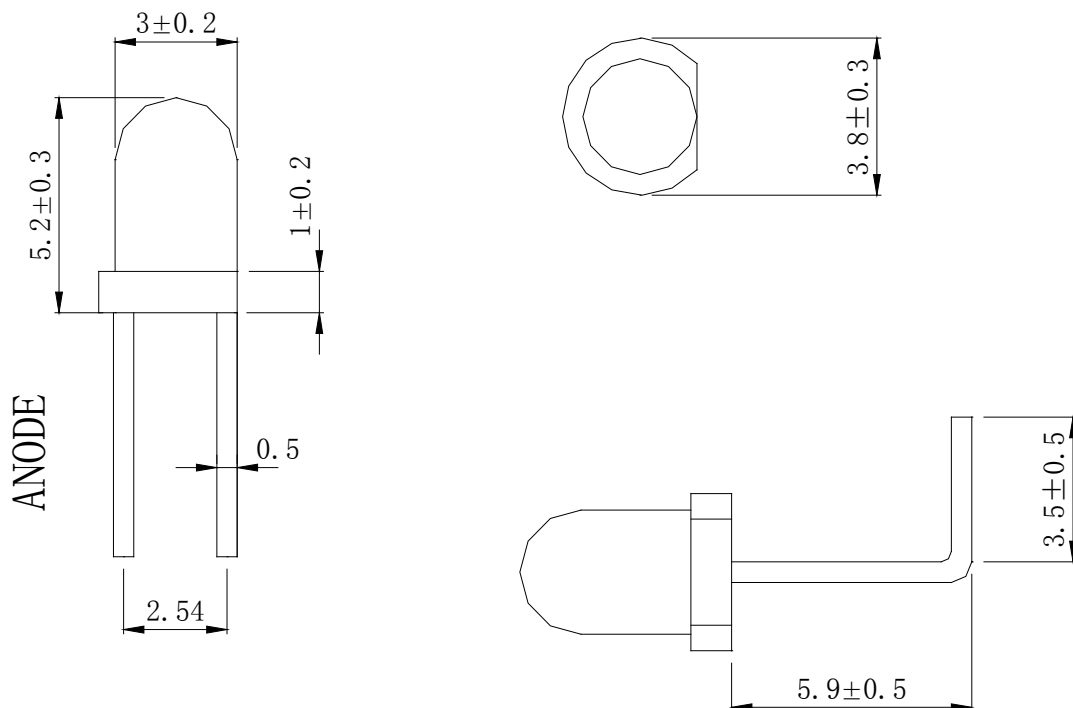


Features

- 3mm DIA LED Lamp
- Low Power Consumption
- High Efficiency
- Various Colors and Viewing Angle
- Long Solid State Reliability
- Package: 1000pcs/Packing

Applications

- Indicator

Package Dimensions**Notes:**

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 mm (.01") unless otherwise noted.
3. Protruded Resin under flange is 1.0mm(0.04") max.
4. Specifications are subject to change without notice.



Selection Guide

Part No	Lens Type	Dice	Emitted Color
FDL-3521B-TWD1-D5.9/3.5MC	White Diffused	InGaN	Blue

Electrical / Optical Characteristics At Ta=25 °C

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Condition
Iv	Luminous Intensity	28	90	180	mcd	IF=5mA
2θ1/2	Viewing Angle		30		deg	IF=5mA
λ Peak	Peak Emission Wavelength		453		nm	IF=5mA
λ d	Dominant Wavelength	452.5	457.0	467.5	nm	IF=5mA
Δλ	Spectral Line Half-Width		20		nm	IF=5mA
VF	Forward Voltage		3.1	3.7	V	IF=5mA
IR	Reverse Current			10	uA	VR =5V

Note:

- 1. θ1/2 is the angle from optical centerline where the luminous intensity is 1/2 optical centerline value

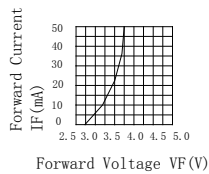
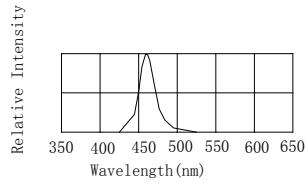
Absolute Maximum Ratings At Ta=25°C

Parameter	Blue	Unit
Power Dissipation	76	mW
Peak Forward Current[1]	60	mA
Continuous Forward Current	10	mA
Dreading Linear From 25°C	0.25	mA/°C
Reverse Voltage	5	V
Electrostatic Discharge Threshold	300	V
Operating Temperature Range	-45°C to + 85°C	
Storage Temperature Range	-55°C to + 105°C	
Soldering Condition	260°C For 10 Seconds	

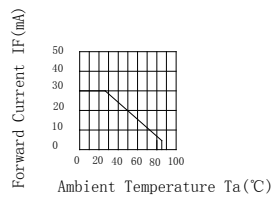
Note:

- 1. 1/10DutyCycle, 0.1msPulseWidth

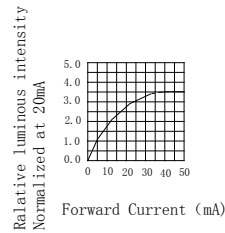
Electrical Optical Characteristics Curves At Ta=25 °C



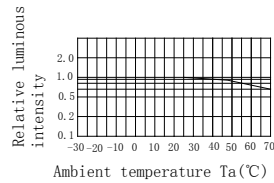
Forward Current vs. Forward Voltage



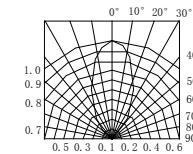
Forward Current Derating Curve



Forward luminous intensity vs. Forward Current

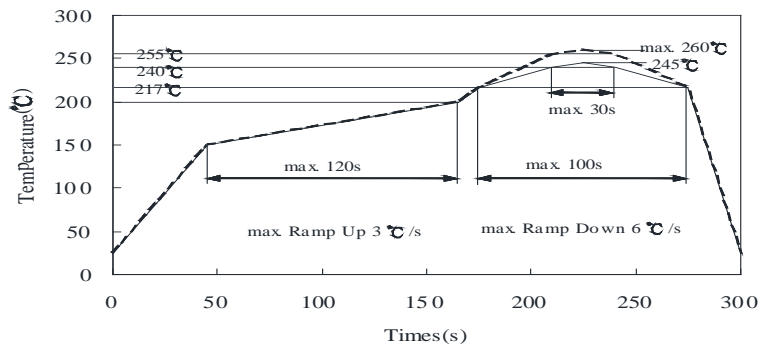


Relative Luminous Intensity vs. Ambient temperature



Spatial Distribution

Reflow Soldering Instructions



Notes:

1. The LEDs should be used within a year.
2. The LEDs should be kept in 5~30°C and 60% RH for less.
3. The LEDs should be used within 24 hours, or else should be kept a 5~30°C and 30% RH or less. And LEDs should be used within 7 days after opening the package.

Bin Range Of Luminous Intensity

Symbol	Bin Code	Min.	Max.	Unit	Condition
Iv	N	28	45	mcd	IF=5mA
	P	45	72		
	Q	72	112		
	R	112	180		

Bin Range Of Forward Voltage

Symbol	Bin Code	Min.	Max.	Unit	Condition
VF	V27	2.70	2.90	V	IF=5mA
	V29	2.90	3.10		
	V31	3.10	3.30		
	V33	3.30	3.50		
	V35	3.50	3.70		

Bin Range Of Dominate Wavelength

Symbol	Bin Code	Min.	Max.	Unit	Condition
λd	B1	452.5	457.5	nm	IF=5mA
	B2	457.5	462.5		
	B3	462.5	467.5		

Notes:

1. Tolerance of Luminous Intensity +/-20%
2. Tolerance of Forward Voltage +/-0.15V
3. Tolerance of the Dominate Wavelength +/- 2nm

Reliability Test Items Conditions

Classification	Test Item	Test Conditions	Test hours	Result
Endurance Test	Opertion Life	Connect with a power $I_F=5mA$ T_a =Under room temperature	1000Hrs	0/20
	Hige Temperature High Humidity	$T_a=+65 \text{ } ^\circ C \pm 5^\circ C$ RH=90%-95%	240Hrs	0/20
	Hige Temperature Storage	High $T_a=+85 \text{ } ^\circ C \pm 5^\circ C$	1000Hrs	0/20
	Low Temperature Storage	Low $T_a=-35 \text{ } ^\circ C \pm 5^\circ C$ Test time=1000hrs	1000Hrs	0/20
Environmental Test	Temperature Cycling	$-45 \text{ } ^\circ C$ to $+105 \text{ } ^\circ C$ 15min 5min 15min	300 Cycles	0/20
	Thermal Shock	$-35 \text{ } ^\circ C \pm 5^\circ C$ to $+85 \text{ } ^\circ C \pm 5^\circ C$ 5min 10sec 5min	300 Cycles	0/20
	Solder Resistance	Preheating: $120 \text{ } ^\circ C \pm 5^\circ C$ Operation heating : $260 \text{ } ^\circ C$ (Max.), within 5 seconds(Max.)	5Cycles	0/20

Judgment criteria of failure for the reliability

Measuring items	Symbol	Measuring conditions	Judgment criteria for failure
Forward voltage	$V_F(V)$	$I_F=5mA$	Over $U \times 1.2$
Rvevrse current	$I_R(\mu A)$	$V_R=5V$	Over $U \times 2$
Luminous intensity	$I_v(mcd)$	$I_F=5mA$	Below $S \times 0.5$

Note: 1.U means the upper limit of specified characteristics. S means initial value.

2.Meansurment shall be taken between 2 hours after the test pieces have been returned to normal ambient conditions after completion of each test.