

White specification

KT1-2013RN-AN



Features

- ◆ Technology core: High energy laser excited white light in fluorescent crystal
- ◆ Typical view angle: 2.5°
- ◆ Typical light flux output: 350lm @ 2.2A.
- ◆ Soldering methods: spot welding
- ◆ Grouping parameter: Brightness, Forward Voltage and Chromaticity.
- ◆ The product itself will remain within RoHS compliant version.

Applications

- ◆ Special flashlight
- ◆ automotive lighting
- ◆ Stage lights full of stars
- ◆ Optical fiber lighting

Materials

Items	Description
Housing	Pure coppe
Fluorescent film	Ceramic glass fluorescent plate
Die attach	Welding
Lens	NICHIA Blue laser diode
Chip	Blue laser lamp bead



Chip specification

(1) Features

Forward Current : 3.0A(CW Operation), $T_m = 70\text{ }^{\circ}\text{C}$, ACC(Auto Current Control) Operation

(2) LD-Bank Absolute Maximum Ratings

Item	Symbol	Absolute Maximum Ratings	Unit
Forward Current ($T_m = 25^{\circ}\text{C}$) *1)	I_f	3.5	A
Allowable Reverse Current ($T_m = 25^{\circ}\text{C}$) *1)	$I_{r(LD)}$	85	mA
Storage Temperature	T_{stg}	-40 ~ 85	$^{\circ}\text{C}$
Operating Temperature *2)	T_m	0 ~ 70	$^{\circ}\text{C}$

*1) Individual LD

*2) Refer to Fig.1

(3) Lifetime Characteristics of LD-Bank

Item	Symbol	Test Condition	Min	Typ.	Max	Unit
Estimated Lifetime *6) *7)	Life	Cumulative Failure Rate 50%	10000	-20000	-	Hr
		Cumulative Failure Rate 1%	1000	-	-	Hr

() are reference figures.

*3) Condition: $T_m = 70\text{ }^{\circ}\text{C}$, ACC, $I_f = 3.0\text{A}$ (CW)

*4) Calculation Method: Estimated in the linear extrapolation by degradation rate at tested duration 1000 hrs.

Criteria for Judging the Defect of Lifetime: $P_o \times 0.5$

Cumulative failure rate is calculated by the parameter greater than 500pcs.

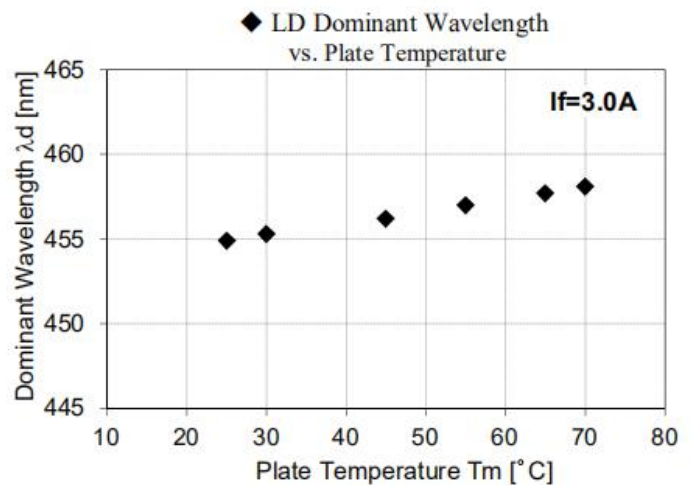
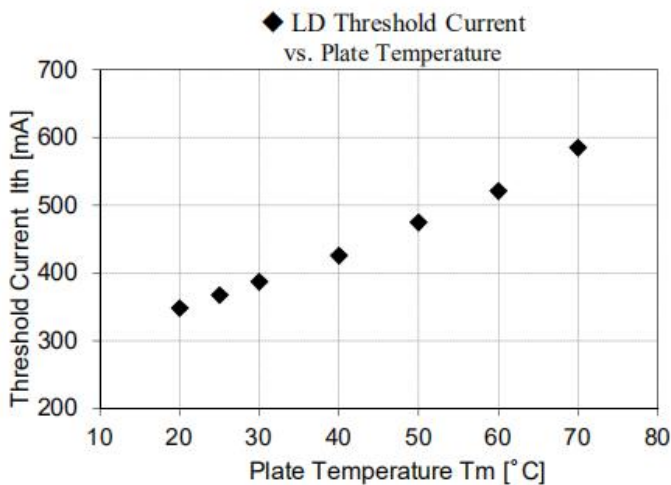
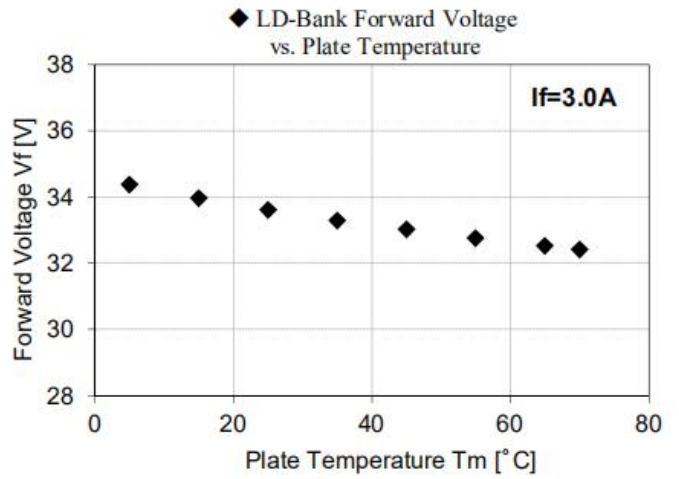
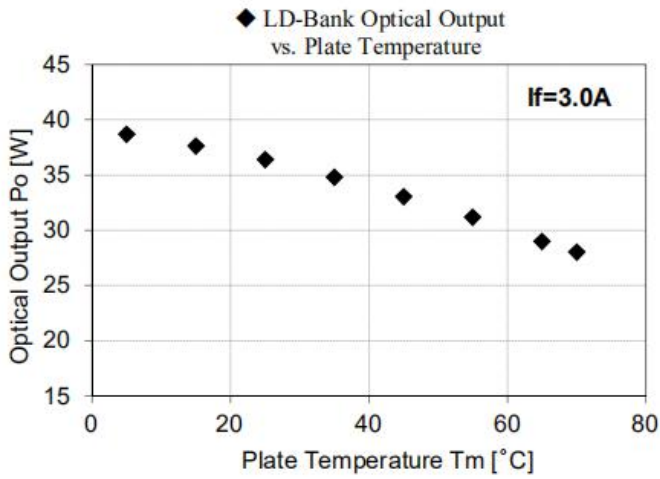
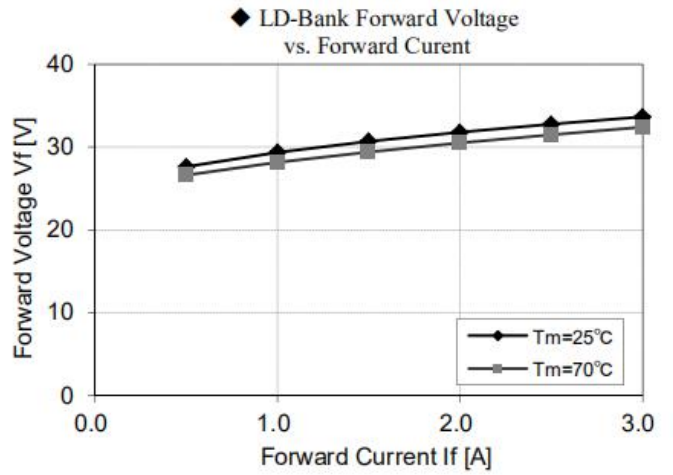
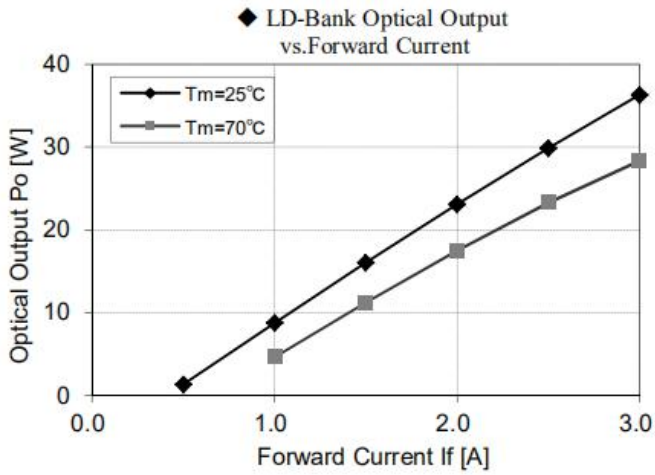
(4) Initial Electrical/Optical Characteristics of LD

Item	Symbol	Test Condition	Min	Typ.	Max	Unit	
Optical Output Power	P_o	$I_f = 3.0\text{A}$	-	-4.35	-	W	
Threshold Current	I_{th}	CW Operation	280	-	480	mA	
Operating Voltage	V_{op}	$I_f = 3.0\text{A}$	3.6	-	4.8	V	
Beam Divergence *9	Parallel	$\theta//$	$I_f = 3.0\text{A}$	0.65	-0.85	1.05	
	Perpendicular	θ	$I_f = 3.0\text{A}$	-1	-0.1	1	

All figures in this specification are measured by Nichia's method and may contain measurement deviations.



Typical Initial Optical/Electrical Characteristics





Reliability

(1) Test Items and Test Conditions

Test Item	Test Conditions	Note	Compliant Standard	Criteria for Judging
Resistance to Soldering Heat (Hand Soldering)	Tsld = 350 °C±10 °C, 5 sec. (4mm from the base of the lead)	2 times		A
Solderability	Tsld = 245 °C ±5 °C, 5 sec. Lead-free solder (Sn-3.0Ag-0.5Cu)	1 time	JEITA ED-4701 300 303A	B
Temperature Cycle	-40°C (30min.) ~ 85°C (30min.)	100 cycles	JEITA ED-4701 100 105	A
Vibration	200 m/s ² , 100 ~ 2000 ~ 100Hz (4min.) 4 cycles of each X,Y,Z	48 min.	JEITA ED-4701 400 403	A
Shock	15000 m/s ² , 0.5ms X,Y,Z	3 times	JEITA ED-4701 400 404	A
High Temperature Storage	Ta = 85 °C	1000hrs.	JEITA ED-4701 200 201	A
Temperature Humidity Storage	Ta = 85 °C, RH = 85 %	1000hrs.	JEITA ED-4701 100 103	A
Low Temperature Storage	Ta = -40 °C	1000hrs.	JEITA ED-4701 200 202	A
Life Test	Tm=70°C, If=3.0A(CW), ACC Operation	1000hrs.		C

(2) Criteria for Judging the Failure

	Item	Symbol	Test Conditions	Criteria for Judgment
A	Operating Voltage	Vop	If=3.0A (series)	±10% from the initial
	Optical Output Power	Po	If=3.0A	±10% from the initial
	Beam Tilt Angle	Δθ	If=3.0A	±0.5deg. from the initial
B	Appearance	–	Solderability	Over 95% (except for the 0.5mm from the lead tip)
C	Optical Output Power	Po	Life Test Condition	±10% from the initial

Cautions

Semiconductor devices, including Nichia laser diode Bank (the LD-Bank), can be damaged or fail in certain probability. The probability can be largely affected by the circuit used and/or environmental conditions. The following precautions should be carefully reviewed and followed to avoid the risk of any damage or failure. When incorporating the modules, equipment, systems, etc., Purchaser must acknowledge that any LD-Bank can be failed statically and must design its equipments fail safe design to avoid consequential bodily and/or property damage.

1. LASER BEAM CAN DAMAGE EYES:

Laser Light can damage the human eyes and skin. Do not expose the eye or skin to laser light directly. This Laser product has an optical lens and emits a collimated laser beam. The light from this product, both direct and reflected, is very harmful as it can propagate a long distance while maintaining high optical density. When handling the product, wear appropriate safety glasses to protect eyes from laser light including reflected and stray light. The reflected and stray light spilling into an unintended area should be attenuated and/or absorbed.

When handling the LD-Bank, wear appropriate safety glasses to prevent laser light, even any reflections from entering to the eyes.

Use of the LD-Bank should conform to Class 4 of the IEC60825-1 and 21 CFR Part 1040.10 Safety Standards.

2. Static Electricity and Electrical Surges:

Static electricity or electrical surges will reduce and degrade the reliability of the LD-Bank. When working with the LD-Banks take countermeasures to avoid the generation of static electricity, including the following:

Use or wear appropriate work clothes, gloves, shoes, grounded wrist straps and other tools to avoid static electricity.

Wrist band must be grounded by high resistance (1M Ohm) wire.

Use anti-static case for transport and storage of the LD-Bank.

Use fully grounded workbenches, soldering tools, equipment and circuits. Especially, soldering iron must be leak-free type. Ground the equipment and the circuit to be connected, and surge current must be blocked at the power supply.

Insulating materials will not release static electricity. Use ion blower to neutralize the electrostatic.

To prevent electrostatic generation, maintain environmental humidity more than 40%.

Do not connect or disconnect oscilloscope probes or voltage meter cables when the LD-Bank is operated. That may cause surge.

Do not use the LD-Bank near a Glow Electric Discharge Tube or similar equipment, due to the chance of inducing an electrical surge by high frequency noise.



Outline Dimension

