REFERENCE

ZIGEN LED DATASHEET

Series Part Number

ZG1ExXxxC00

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1. Product Description

ZIGEN is targeting to professional lighting market from innovative concepts and quality driven development.
ZG1ExExxC00 is under ZIGEN I series (ZG1) with features below

- Mechanical Dimensions : 13.5 x 13.5 x 1.6 (mm)
- Substrate : Aluminum

ZG1	E	x	X	xx	C	0	0
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]

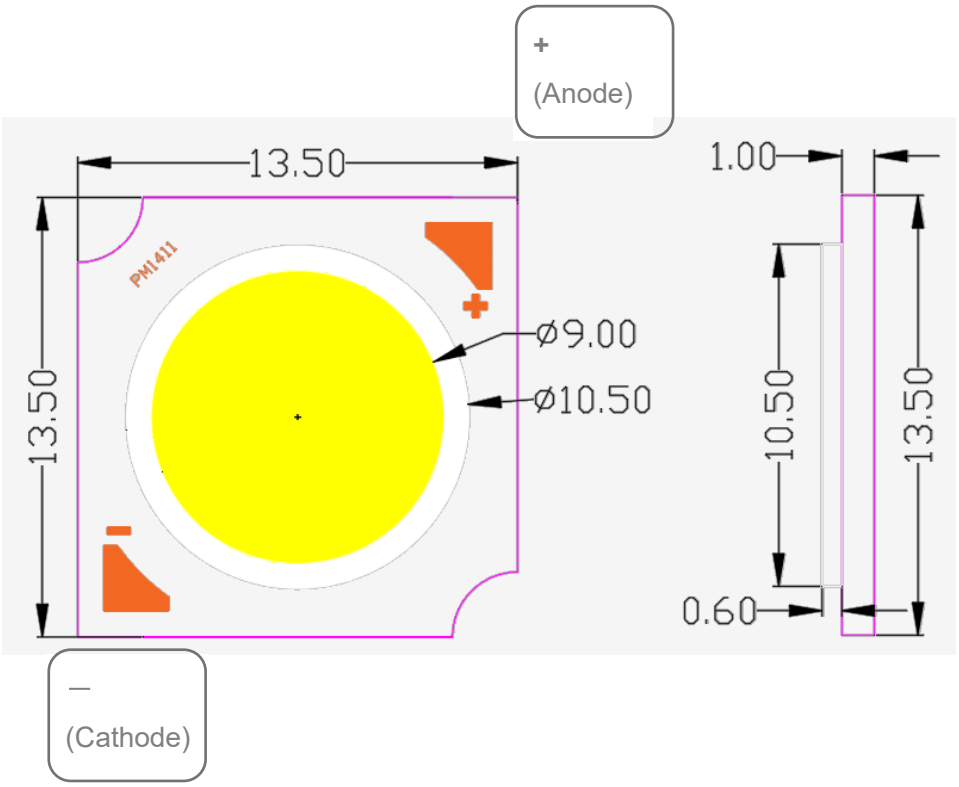
[1]	Series code	ZG1
[2]	Version	E (13x13mm)
[3]	CRI	M (>80)
		G (>90)
[4]	Chip Layout	X (6s5p)
[5]	Color code	27 (2700K)
		30 (3000K)
		40 (4000K)
		50 (5000K)
[6]	Substrate type	C (1313)
[7]	Test Condition	0 (cold)
[8]	Custom code	0 (standard)

2. External Dimension & Circuit Diagram

- External Dimension

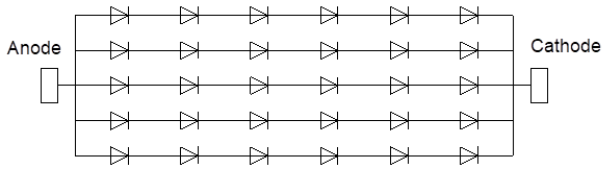
Unit : mm

Tolerances unless specified : +/-0.2



Notes: Values inside parentheses are reference values.
External sizes of are determined by maximum dimensions,
that include salient areas on the edges of respective sides.

- Internal circuit



3. Ratings and Characteristics

3-1) Absolute maximum ratings

Parameter	Symbol	Ratings	Unit
Max. DC Forward Current (mA) ※1,4	I_F	850	mA
Power Dissipation ※1,4	Pd	15.0	W
Reverse Voltage ※2,4	VR	-15	V
Max. Junction Temperature	Tj	145	°C
Operating Temperature ※3	T_{Opr}	-30 ~ +100	°C
Storage Temperature	T_{Stg}	-40 ~ +100	°C

Notes:

※1. Power dissipation and forward current are the values when the module temperature is set lower than the rating by using an adequate heat sink.

※2. The maximum rating of reverse voltage is assumed to happen in short time by the initial connection error. (Not dealing with the possibility of always-on reverse voltage.)

※3. Operating temperature is the Case temperature Tc
(Refer to measuring point for case temperature in the next page.)
Refer "Derating curve" in the 3-4) for Operating temperature at operating current.

※4. Tc=25℃ or within derating curve temperature at operating current.

3-2) Electro-Optical Characteristics

(Measured at 500mA, Tj=90℃)

Product Code	Nominal CCT	CRI		Luminous Flux			Voltage		
		Ra Min.	Ra Typ	Min.	Typ.	Typ. (Tj25℃)	Min.	Typ.	Max.
MX27	2700	80	82	1,050	1,180	(1,290)	15.4	17.2 (17.6)	19.4
MX30	3000	80	82	1,100	1,230	(1,340)			
MX40	4000	80	82	1,150	1,280	(1,390)			
GX27	2700	90	92	880	980	(1,070)			
GX30	3000	90	92	940	1,040	(1,130)			
GX40	4000	90	92	980	1,080	(1,170)			

Notes:

※5. Measurement tolerance: Voltage ± 5 %, Luminous Flux ±7%, Ra ±3

※6. Parenthesis shows reference value at Tj=25℃

3-3) Chromaticity Characteristics

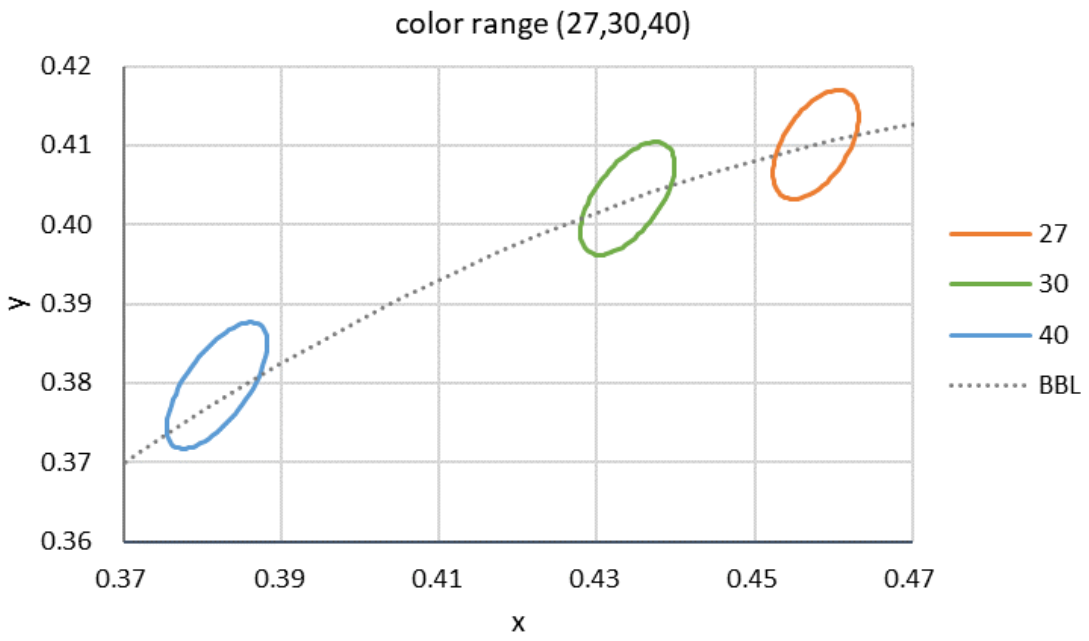
(Measured at 500mA, Tj=90℃)

x,y tolerance : +/- 0.005

Tj=90degree

Color Temperature (Code)	Center Color Point	Oval parameter		
		Major Axis a	Minor Axis b	Ellipse Rotation Angle θ
2700 (27)	(0.4578, 0.4101)	0.00774	0.00411	57.3
3000 (30)	(0.4339, 0.4033)	0.00834	0.00408	53.2
4000 (40)	(0.3818, 0.3797)	0.00939	0.00402	54.0

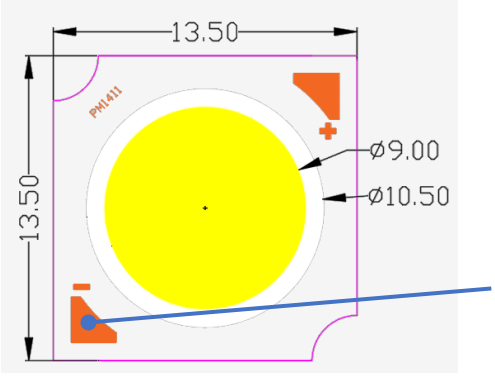
* Each color area stay within Mac Adam 3-step ellipse from the chromaticity center.
* The chromaticity center refers to ANSI C78.377:2017
* θ is the angle between the major axis of the ellipse and the x-axis, and a and b are the major and minor semi-axes of an ellipse. (ref. IEC 60081:1997 AnnexD)



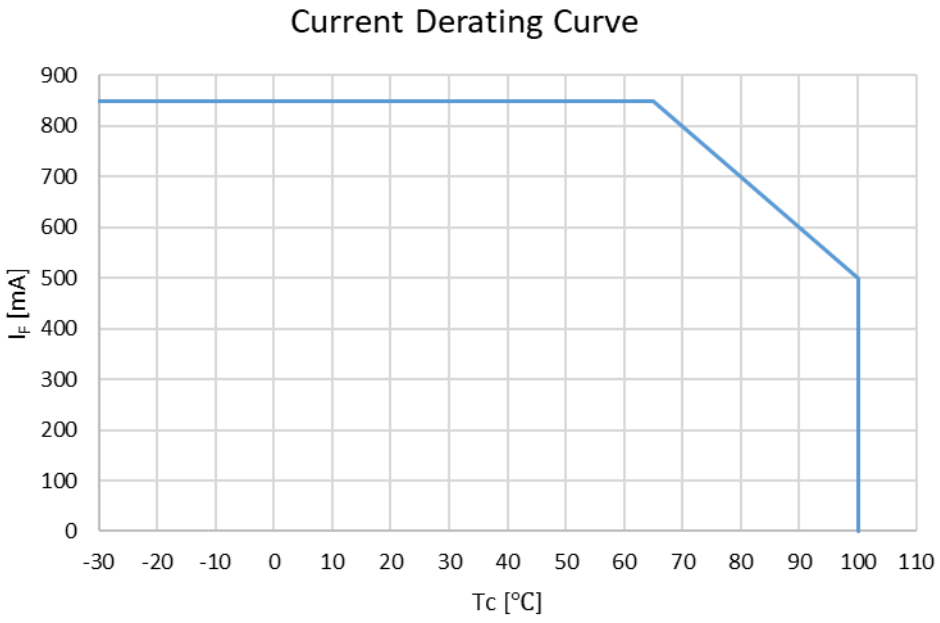
3-4) Derating Curve

To keep the LED in good reliability use, Case temperature (Tc) of COB must below the rating curve by attaching an adequate heat sink.
Please measure Tc in actual usage condition.
Below Tc derating curve is only applicable to right condition of installation written in precautions.
Especially heat sink surface must be flat on backside of COB and well thermally conducted.
If heatsink under Tc point of COB is not flat, please use the different point on COB with same distance from center of LES as Tc point.
Please ensure that Tc does not exceed derating curve even after installation and operation as final product.

(Measuring point for case temperature)



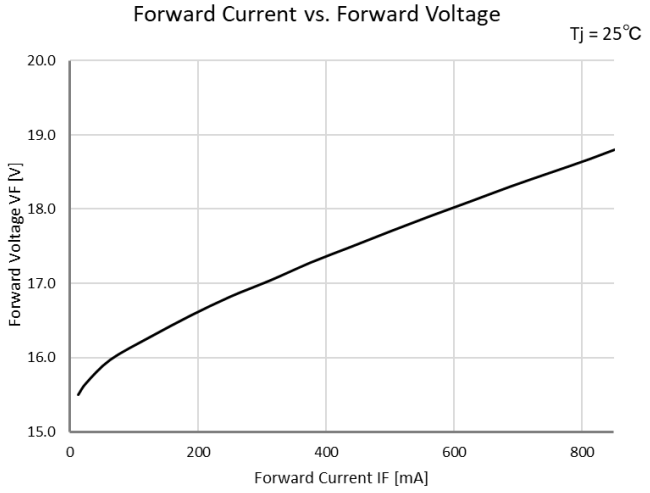
- COB mounting surface should be flat and plain.
- Substrate surface temperature should be uniform when measuring case temperature.



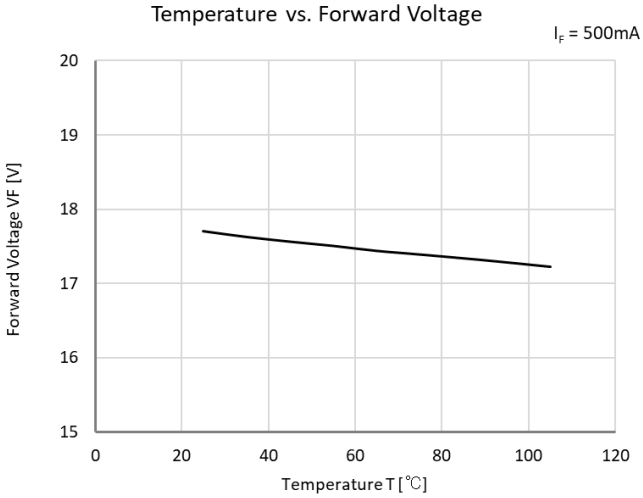
※ Designed to be L70 >40,000hrs

3-5) Characteristics Diagram (TYP.)

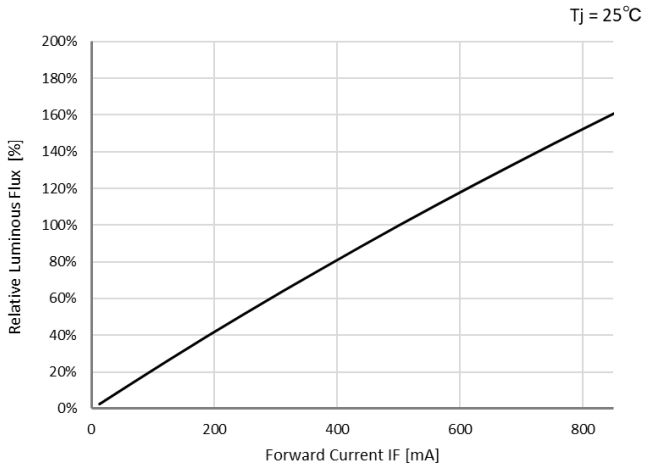
Forward Current vs. Forward Voltage



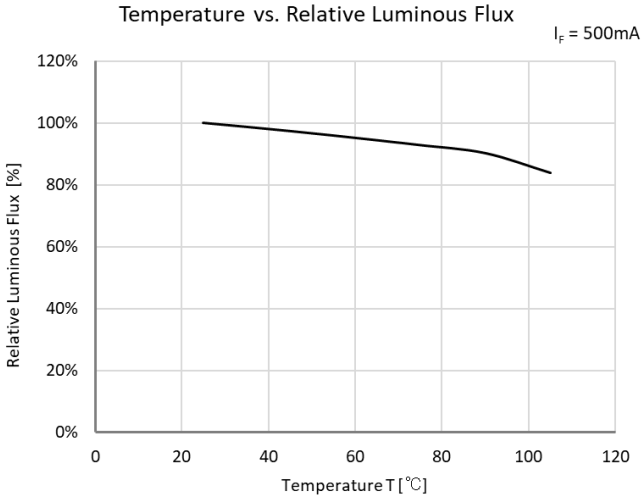
Temperature vs. Forward Voltage



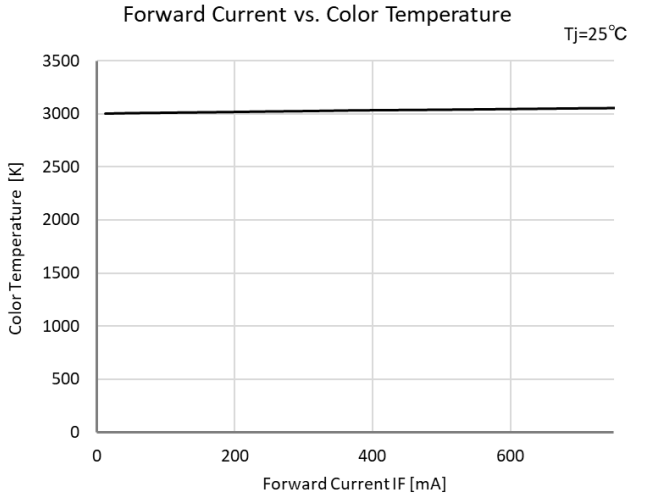
Forward Current vs. Relative Lunimous Flux



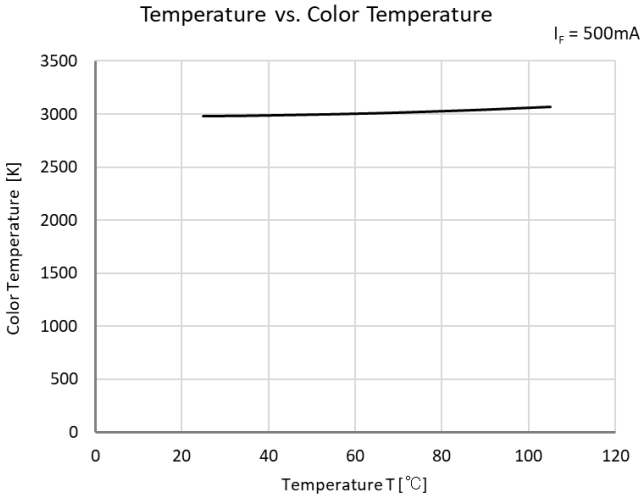
Temperature vs. Relative Luminous Flux



Forward Current vs. Color Temperature



Temperature vs. Color Temperature



Notes:

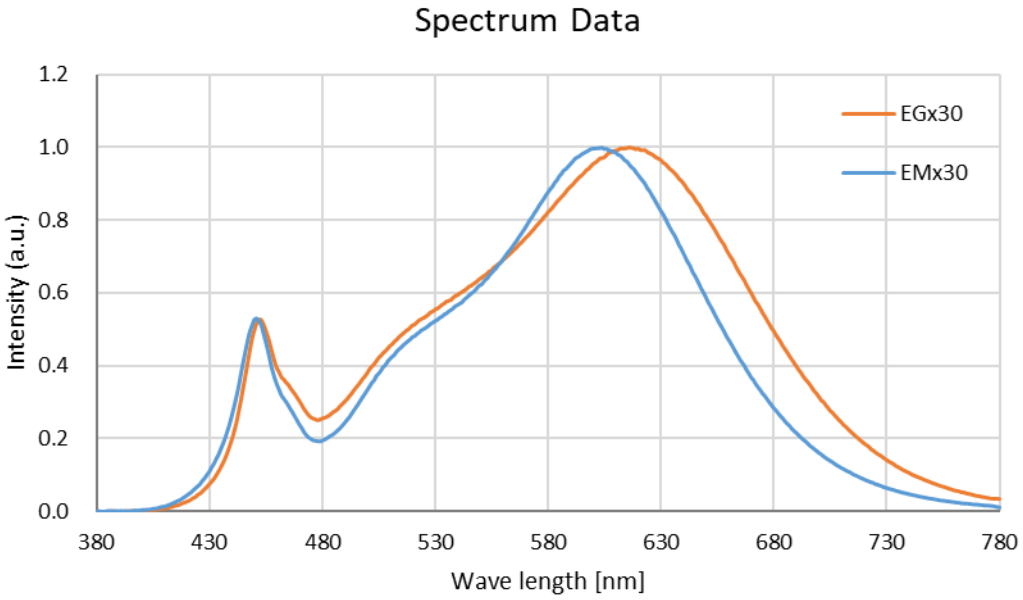
※1 . Temperature shown in above for Tc temperature at instantaneous operation, and Tj is equal to Tc for such operation. Please refer above chart as reference of temperature dependency of LED characteristics.

※2. Characteristics data shown here are for reference purpose only. (3000K Ra80 model, Not guaranteed data)

3-6) Spectrum and Color (Reference)

Spectrum data for 3000K G type (CRI > 90) and for M type (CRI > 80)

(Measured at 500mA, Tj=90℃)



3-7) Radiation Beam Angle (Reference)

FWHM (full width at half maximum) : 118 degree

4. Reliability

The reliability of products shall be satisfied with items listed below.

NO	Test Item	Condition	Samples n	Defective C
1	Temperature Cycle	-40°C~100°C / Dwell time 30min / 200 Cycles	8	0
2	High Temperature / Humidity Storage	85°C/85%RH / 1000 H	8	0
3	Low Temperature Storage	-40°C / 1000 H	8	0
4	High Temperature Storage	100°C / 1000 H	8	0
5	High Temperature Life	Tc 85°C / 1000 H / @IF=500mA	8	0

Failure Criteria

(Measured at 500mA, Tj=25℃)

	Item	Symbol	Criteria
1	Forward Voltage	V_F	V_F > Initial value x 1.1
2	Luminous Flux	Φ	Φ < Initial value x 0.8
3	CIE-x / CIE-y	⊿x, ⊿y	⊿x, ⊿y < 0.02

5. Packing and Labels

Packaging

- ■ One tray composed of 50 pieces
- ■ 15 trays (750 pieces) and one upper lid-tray in one moisture-proof bag
- ■ bags number depending on order in one carton

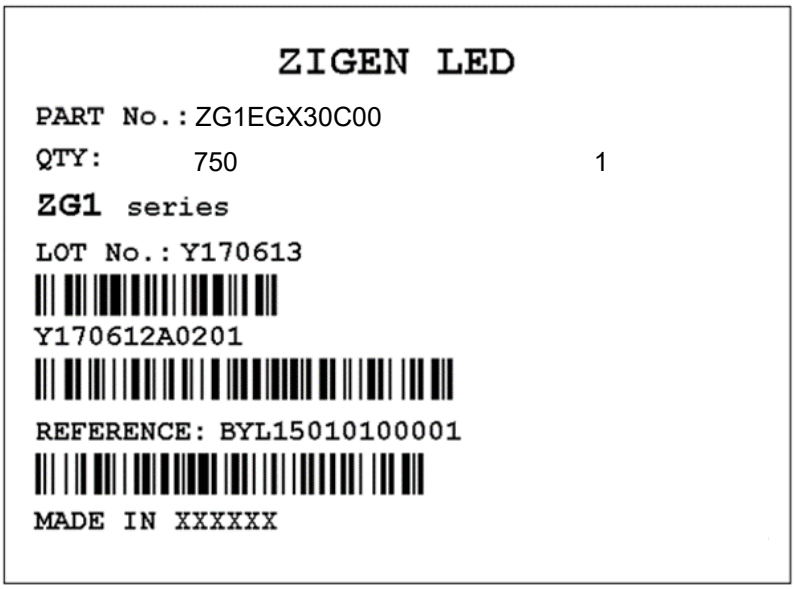
(Note 1) There are cases of one carton composed of one tray. (50 pieces~)

(Note 2) State of packing is subject to change.

< One bag >
50 pieces × 15 trays =750 pieces

< One Tray >
50 pieces / tray

Labels



Indication printed on product

Model No. and control No. are indicated on backside of substrate.

Control No.

Indicated as follows ;

ZG	1	E	GX		
①	②	③	④		
30	C	00			
⑤	⑥	⑦			
RW	20	23	xx	yy	yy
⑧	⑨		⑩	⑪	

①~⑦ : Model Number

⑧ : Internal control code

⑨ : Production year

⑩ : Production month

⑪ : Batch number

6. Precautions

1. Storage conditions

- Before the package is opened: The LEDs should be stored at 30°C or less and 50%RH or less after being delivered and the storage life limit is 6 months. If the LEDs are stored for 6 months or more, they should be stored in a sealed container with a nitrogen atmosphere and moisture absorbent material.
- After opening the package: The LED should be stored under 30°C or less and 30%RH or less. The LED should be used within 7days after opening the package. If unused LEDs remain, it should be stored in moisture proof packages with absorbent.
- Please avoid exposing air with corrosive gas.

2. Handling of COB

- Do not put mechanical stress on the LED, and Do not bend substrate.
- Never touch the optical surface with finger or sharp object. The LED surface could be soiled or damaged, which could affect the optical performance of the LED.
- Avoid any contact with the LES including DAM resin during handling and after assembly.
- Please keep handling the LEDs with appropriate ESD grounding, especially in low-humidity work environment. Every manufacturing facility in regard to the product (plant, equipment, machine, carrier machine and conveyance unit) should be connected to ground and please avoid the product to be electric-charged.
- It is recommended to handle the LED with powder-less latex gloves.
- Do not touch the resin with tweezers to avoid scratching or other damage.
- Please use IPA when cleaning COB

3. Assembly conditions

- Please use appropriate heatsink to control Tc temperature
- Thermal conductor (heat conductive glue/adhesive/sheet etc) must be used for mounting COB to heat sink
- Please do not use convex or rough surface or not clean heatsink.
- Please make sure COB will not detach from heatsink through life of finish product.
- When using holder please avoid to use harmful outgas (Cl, Br etc) contain material (Br contain PBT etc) and make sure it's reliability is enough in temperature and light from COB.
- Please make sure thermal conductor on back side of LED will not reduce performance through life of finish product.
- Please avoid keep convex stress during and after installation, which may cause bending and affect thermal conductivity in long use.
- Please do not touch or hold by resin area and handle by Aluminum substrate part only.

4. Connecting method

- Connection by solder wire with 380 degree tip-temperature tool within 3-5 seconds.
- Please solder whole solder pad area.
- Please avoid to touch resin part by soldering tool.
- This product is not designed for reflow and flow soldering.
- Please prevent to pull lead connected to solder pad and pulling stress after installation.
- Please prevent to use flux.
- Please verify solder wire contented flux is no more activated after soldering.
- In case using holder connector, please verify electric connectivity for long use.

5. Usage conditions
   - Please check reliability well enough under finish product condition before using for mass production.
   - Please avoid use or verify reliability in a place with high moisture and corrosive gas (halogen, H2S, NH3, SO2, NOX etc)
   - Please avoid use or verify reliability under direct sun right condition, exposure in outdoor and dusty place.
   - Please avoid use or verify reliability to use in liquid like water, oil and solvent.
   - Please avoid use under strong acidic or alkali atmosphere condition.

6. Operation
   - Any reverse voltage cannot be applied after installation.
   - Please use appropriate protective device to avoid surge or high voltage.

7. Safety
   - Please be care to LED light from injuring eyes.
   - Please avoid flammable goods from strong light intensity area.
   - Please follow appropriate regulations and lows for usage as lighting product.

8. Others
   - Any uncertain or necessity of suggestion in usage, please consult with sales representative.
   - Please follow the latest assemble guide, available in the website of ZIGEN.
   - All information in this document is subject to be updated without prior notice.
   - Please confirm the latest datasheet with sales representative and exchange formal specification before starting purchase for mass production

Revision History

Current version: **2507a**

Previous version: **2504a**

Page	Subjects (major change in previous version)	Date of change
4	Amend to Tj90 performance	2024.6.4
4,8	Added Tj25 characteristics and update spectrum	2025.4.5
4.6	Amend temperature characteristics	2025.7.4