

ZIGEN LED DATASHEET

Series Part Number

ZG6EGCxxC0S

ZG6EGExxC0S

ZG6EGXxxC0S

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1. Product Description

ZIGEN is targeting to professional lighting market from innovative concepts and quality driven development.

ZG6ExxxC0x is under ZIGEN VI series (ZG6) with features below

- Mechanical Dimensions : 13.5 x 13.5 x 1.5 (mm)
- High Efficiency Color Switch COB in good color control
- Diagonal connection : lower CCT
- All connection : higher CCT
- No disconnection for color switch, avoiding hot plug
- Substrate : Aluminum

ZG6 E G x xx C 0 S
[1] [2] [3] [4] [5] [6] [7] [8]

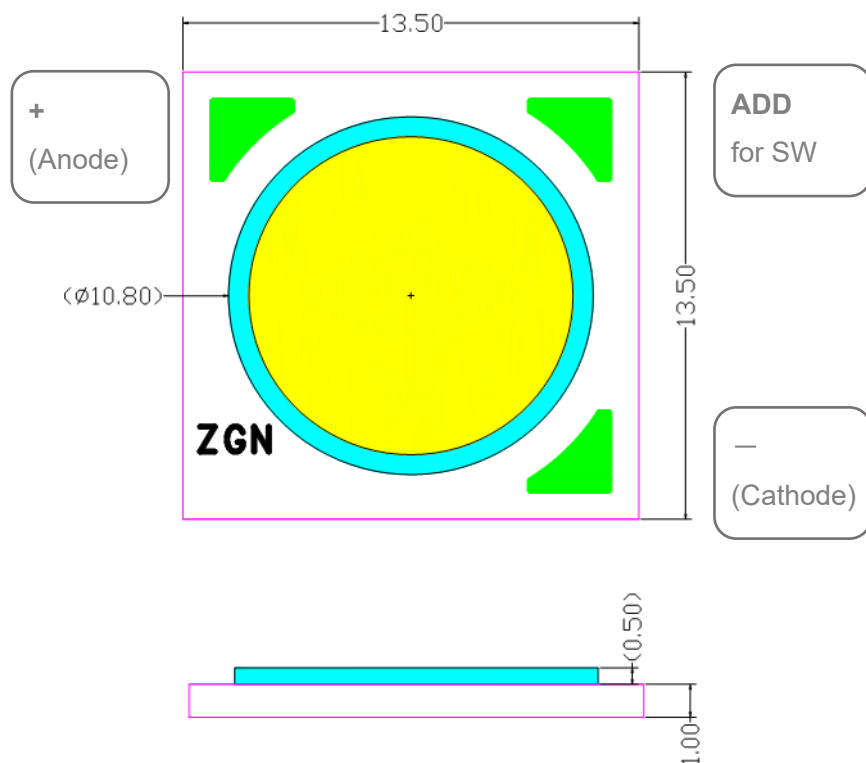
[1]	Series code	ZG6
[2]	Series code	E
[3]	CRI	G (>90)
[4]	Chip Layout	C (3s6p) E (5s6p) X (6s6p)
[5]	Color code	W3 (2700K-3000K) 34 (3000K-4000K) 3M (3000K-3500K)
[6]	Substrate size	C (13.5x13.5mm)
[7]	Custom code	0
[8]	Custom code	S (color switch by single and by both channel)

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.

3. Ratings and Characteristics

3-1) Absolute maximum ratings

Parameter	Symbol	Ratings	Unit
Max. DC Forward Current (mA) ※1,4	I_F	730	mA
Power Dissipation ※1,4	P_d	6.7 for BGC 11.0 for BGE 13.2 for BGX	W
Reverse Voltage ※2,4	V_R	-15	V
Max. Junction Temperature	T_j	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 T_c
(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 . $T_c=25^{\circ}\text{C}$ or within derating curve temperature at operating current.

3-2) Electro-Optical Characteristics

(Measured at 500mA, Tj=25°C)

Product Code	Wire Connection	Nominal CCT	CRI (Ra)		Luminous Flux		Voltage			
			Min.	Typ	Min.	Typ.	Min.	Typ.	Max.	Max.ref (Tj90)
ZG6EGC W3C0S	▲	2700	90	92	480	530	8.0	8.9	9.5	9.3
	▲+ADD	3000	90	92	515	565	7.7	8.6	9.3	9.1
ZG6EGC 34C0S	▲	3000	90	92	495	545	8.0	8.9	9.5	9.3
	▲+ADD	4000	90	92	545	590	7.7	8.6	9.3	9.1
ZG6EGC 3MC0S	▲	3000	90	92	485	535	8.0	8.9	9.5	9.3
	▲+ADD	3500	90	92	515	565	7.7	8.6	9.3	9.1
ZG6EGE W3C0S	▲	2700	90	92	780	870	13.5	14.9	15.8	15.6
	▲+ADD	3000	90	92	840	930	13.1	14.4	15.4	15.2
ZG6EGE 34C0S	▲	3000	90	92	830	920	13.5	14.9	15.8	15.6
	▲+ADD	4000	90	92	900	990	13.1	14.4	15.4	15.2
ZG6EGE 3MC0S	▲	3000	90	92	800	890	13.5	14.9	15.8	15.6
	▲+ADD	3500	90	92	850	940	13.1	14.4	15.4	15.2
ZG6EGX W3C0S	▲	2700	90	92	930	1030	16.0	17.8	18.8	18.4
	▲+ADD	3000	90	92	1000	1100	15.5	17.3	18.5	18.1
ZG6EGX 34C0S	▲	3000	90	92	990	1090	16.0	17.8	18.8	18.4
	▲+ADD	4000	90	92	1090	1190	15.5	17.3	18.5	18.1
ZG6EGX 3MC0S	▲	3000	90	92	950	1050	16.0	17.8	18.8	18.4
	▲+ADD	3500	90	92	1020	1120	15.5	17.3	18.5	18.1

Notes:

※ 5 . Measurement tolerance: Voltage $\pm 3 \%$, Luminous Flux $\pm 7\%$, Ra ± 2

3-3) Chromaticity Characteristics

(Measured at 500mA)

x,y tolerance : +/- 0.005

Tj=25 degree

center

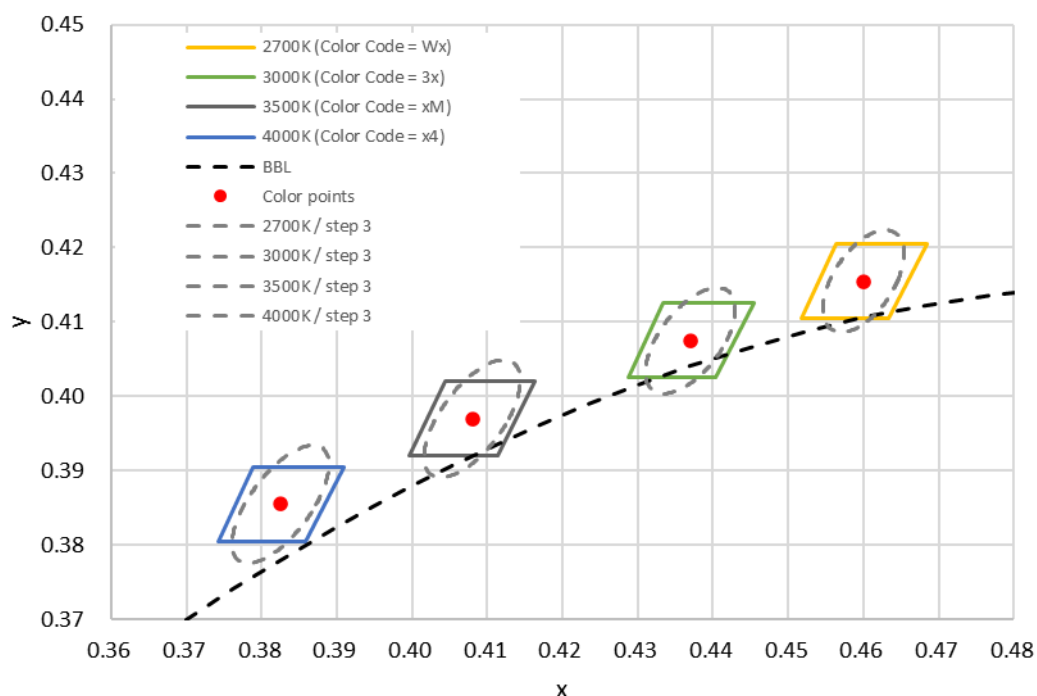
2700K	x	0.4600	0.4517	0.4634	0.4684	0.4564
(Color Code = Wx)	y	0.4155	0.4105	0.4105	0.4205	0.4205

3000K	x	0.4370	0.4287	0.4404	0.4454	0.4334
(Color Code = 3x)	y	0.4075	0.4025	0.4025	0.4125	0.4125

3500K	x	0.4080	0.3997	0.4114	0.4164	0.4044
(Color Code = xM)	y	0.3970	0.3920	0.3920	0.4020	0.4020

4000K	x	0.3825	0.3742	0.3859	0.3909	0.3789
(Color Code = x4)	y	0.3855	0.3805	0.3805	0.3905	0.3905

Color range 27(W)-30(3)-35(M)-40(4)



3-4) Derating Curve

To keep the LED in good reliability use, Case temperature (T_c) of COB must below the rating curve by attaching an adequate heat sink.

Please measure T_c in actual usage condition.

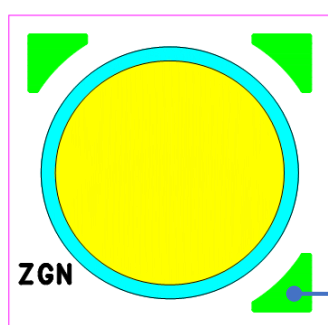
Below T_c derating curve is only applicable to right condition of installation written in precautions.

Especially heat sink surface must be flat on backside of COB and well thermally conducted.

If heatsink under T_c point of COB is not flat, please use the different point on COB with same distance from center of LES as T_c point.

Please ensure that T_c does not exceed derating curve even after installation and operation as final product.

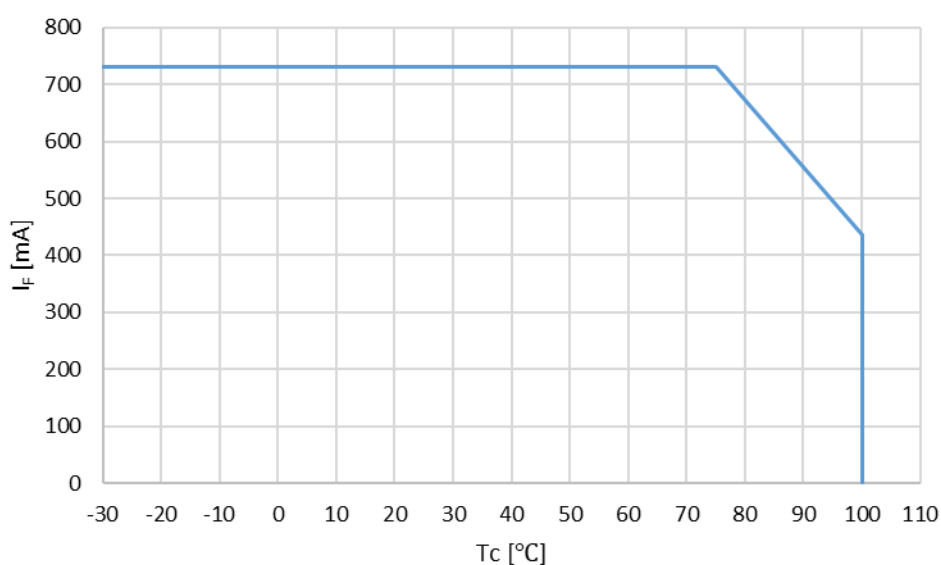
(Measuring point for case temperature)



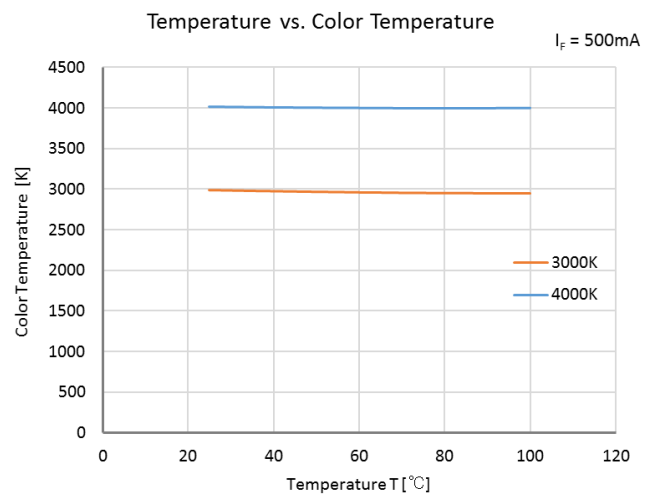
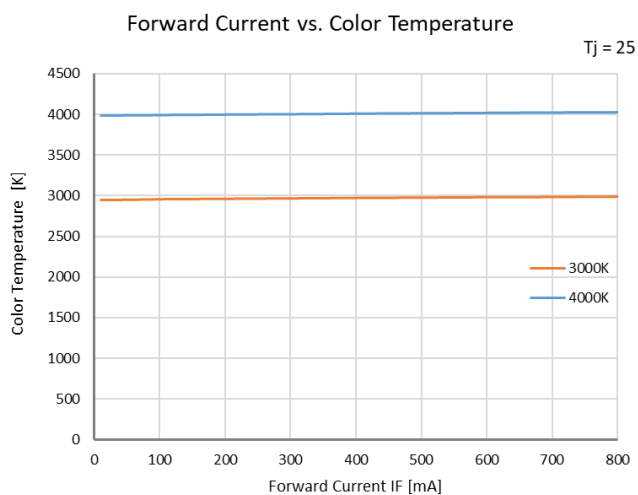
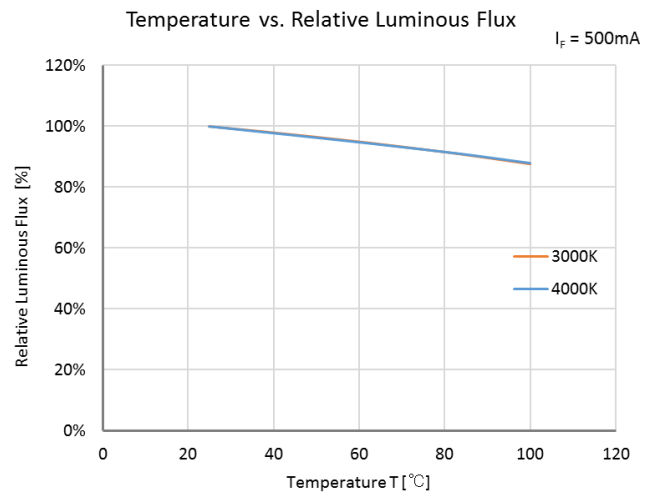
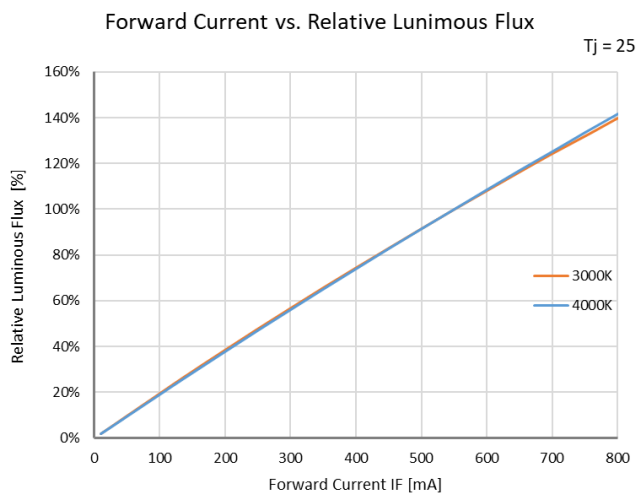
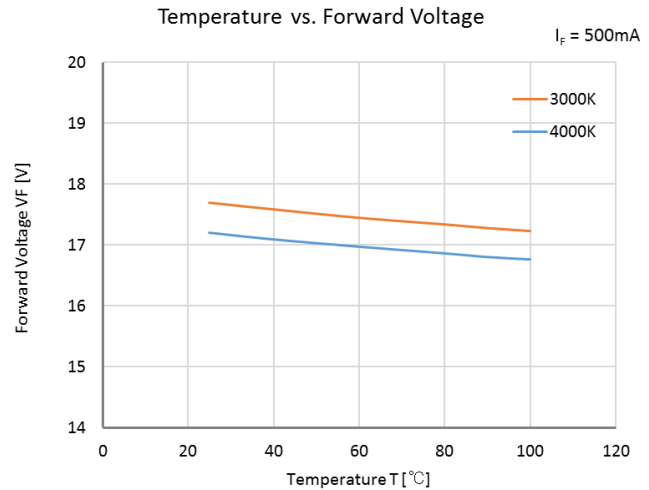
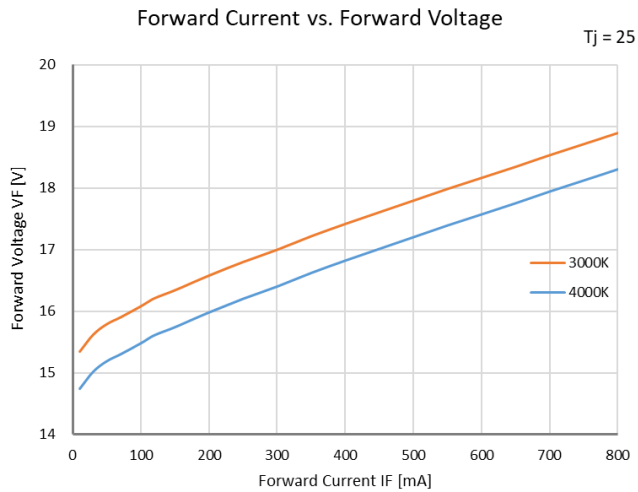
- COB mounting surface should be flat and plain.
- Substrate surface temperature should be uniform when measuring case temperature.

Thermal Resistance ($^{\circ}\text{C}/\text{W}$)

Current Derating Curve



3-5) Characteristics Diagram (TYP.)



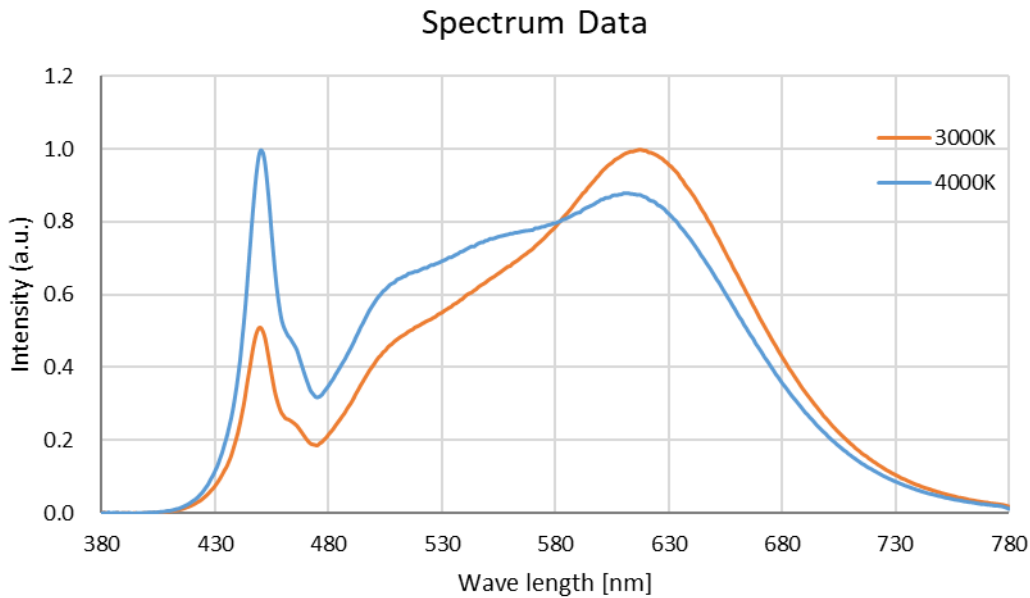
Notes:

- ※ 1. Temperature shown in above for T_c temperature at instantaneous operation, and T_j is equal to T_c 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. (Not guaranteed data)

3-6) Spectrum and Color Rendering Index (Reference)

Spectrum data for 3000K, 4000K (Ra>90)

(Measured at 500mA, Tj=25°C)



※ Spectrum data shown here are for reference purpose only. (Not guaranteed data)

Color Rendering Index 3000K (for BGx34 type)

Ra	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
92	92	94	97	93	92	95	92	79	51	89	94	82	92	98	86
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Color Rendering Index 4000K (for BGx34 type)

Ra	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
92	92	95	97	93	91	93	94	83	54	88	93	74	92	98	88
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※ Color Rendering Index data shown above are for reference purpose only. (Not guaranteed data)

3-7) Radiation Beam Angle (Reference)

FWHM (full width at half maximum) : 114 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 / 100 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

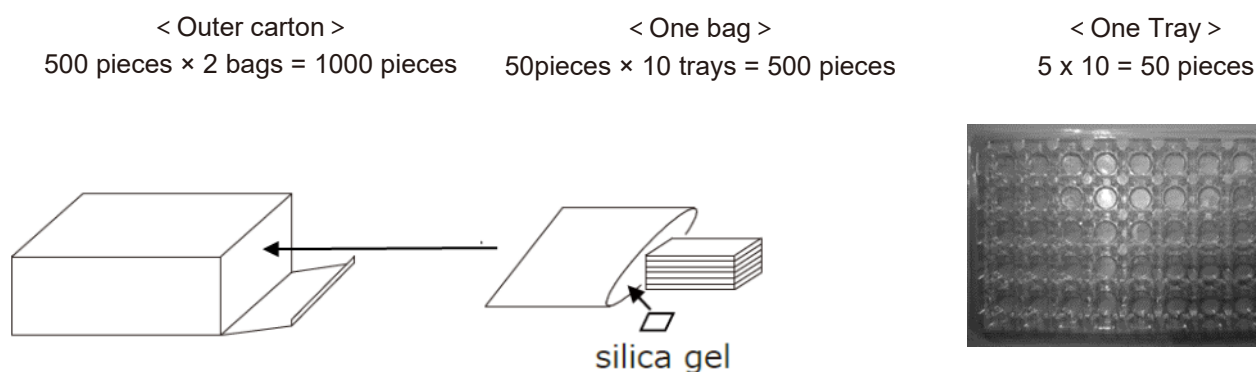
(Measured at 500mA, Tj=25°C)

	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	Δx, Δy	Δx, Δy < 0.02

5. Packing and Labels

Packaging

- One tray composed of 80 pieces
 - 10 trays (500 pieces) and one upper lid-tray in one moisture-proof bag
 - 2 bags (1000 pieces) in one carton
 - Dimensions of outer carton : 235 × 220 × 90 mm (Reference value)
- (Note 1) There are cases of one carton composed of one bag. (50 pieces~)
- (Note 2) State of tray and packing is subject to change without notice.



Indication printed on product

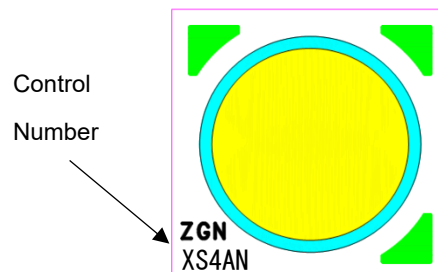
Model No. and control No. are indicated on backside of substrate.

Control No.

Indicated as follows ;

<u>X</u>	<u>S</u>	<u>9</u>	<u>G</u>	<u>4</u>
①	②	③	④	⑤

- ① X : Chip layout
(X: 6x6, E: 5x6, C: 3x6)
- ② S : Ra/Color code / rank
(S: 3000-4000K Ra90, W: 2700-3000K Ra90,
M: 3000-3500K Ra90)
- ③ 4 : Year
- ④ A : Month
- ⑤ N : Date (1~9,A~V)



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.
- 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.
- Please keep handling the LEDs with appropriate ESD grounding, especially in low-humidity work environment.
- 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 and thermal conductor (heat conductive glue/adhesive/sheet etc) for mounting COB to control Tc temperature.
- 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 crack in long use.
- Please do not touch or hold by resin area and handle by ceramic substrate part only.

4. Connecting method

- Connection by solder wire with 380 degree tip-temperature tool under 5seconds is recommended.
- 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 laws 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 from previous version)	Date of change
6	Add center point	2024.10.22
5	Adjustment of Electro-Optical Characteristics	2025.04.29
5,7	Updating thermal characteristics	2025.07.07