REFERENCE

ZIGEN LED DATASHEET

Series Part Number

ZG2BxMxxL00

1. Product Description

ZIGEN is targeting to professional lighting market from innovative concepts and quality driven development.
ZG2BxMxxL00 is under ZIGEN I series (ZG2) with features below

- Mechanical Dimensions : 12.0 x 15.0 x 1.4 (mm)
- Dim to change color function
- Substrate : Alumina Ceramic

ZG2 B x M xx L 0 0
[1] [2] [3] [4] [5] [6] [7] [8]

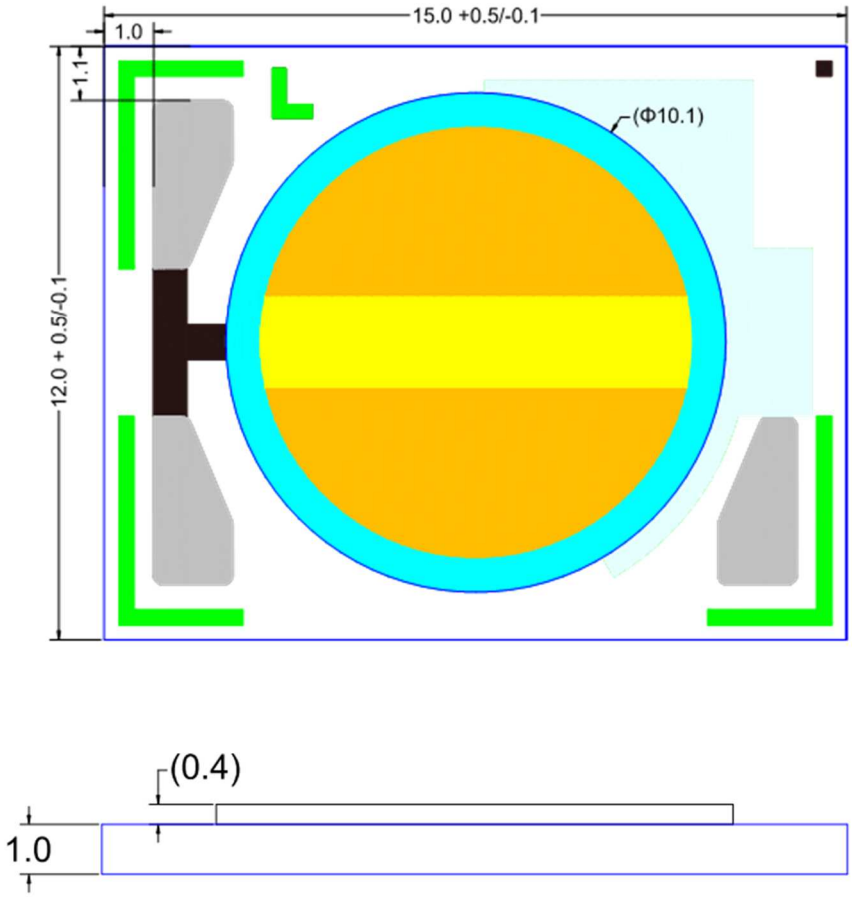
[1]	Series code	ZG2
[2]	Substrate size	B (15x12mm)
[3]	CRI	M (>80)
		R (>90)
[4]	Chip Layout	M (6s2p)
[5]	Color code	23 (2000K-3000K)
		2H (2000K-2800K)
		A3 (Amber-3000K)
[6]	LES	L (8.7mm, ZG2)
[7]	Test Condition	0 (cold)
[8]	Custom code	0 (standard)

2. External Dimension & Circuit Diagram

- External Dimension

Unit : mm

Tolerances unless specified : +/-0.1



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.

Distance from bottom of substrate to electrode is typical 2.0mm (reference)

Inner edge of green line is designed to have distance >1.2mm from bottom of substrate.

3. Ratings and Characteristics

3-1) Absolute maximum ratings

Parameter	Symbol	Ratings	Unit
Max. DC Forward Current (mA) ※1,4	I_F	380	mA
Power Dissipation ※1,4	Pd	7	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 50mA, Tj=25℃)

Product Code	Nomical CCT	CRI (Ra)		Luminous Flux		Voltage		
		Min.	Typ	Min.	Typ.	Min.	Typ.	Max.
MM2H	2000	80	82	40	50	12.0	14.3	15.5
RM23	2000	92	95	30	40			
RMA3	Amber	92	95	25	35			

(Measured at 350mA, Tj=25℃)

Product Code	Nomical CCT	CRI (Ra)		Luminous Flux		Voltage		
		Min.	Typ	Min.	Typ.	Min.	Typ.	Max.
MM2H	2840	80	85	620	680	16.4	18.2	21.0
RM23	3000	90	92	565	625			
RMA3	3000	94	96	490	550			

Notes:

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

3-3) Chromaticity Characteristics

(Measured at 50mA and 350mA)

x,y tolerance : +/- 0.005

Tj=25 degree

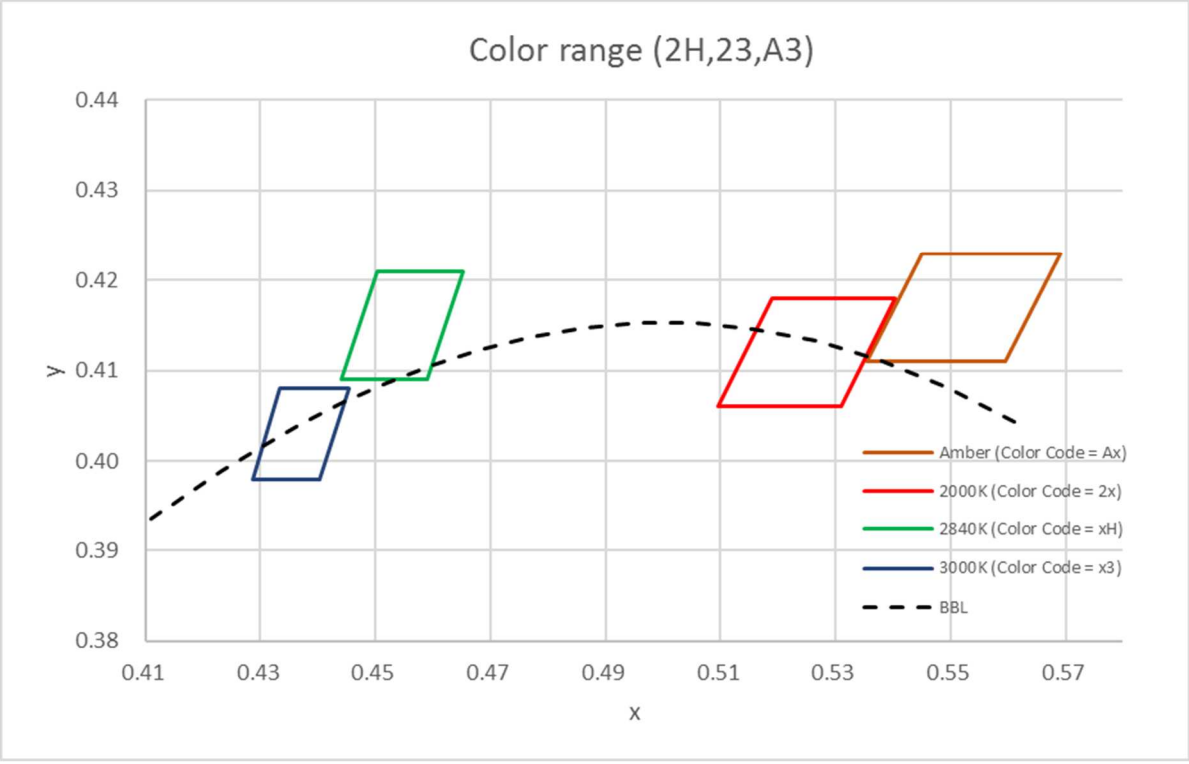
IF=50mA

Amber	x	0.5595	0.5690	0.5450	0.5355
(Color Code = Ax)	y	0.4110	0.4230	0.4230	0.4110

2000K	x	0.5097	0.5311	0.5404	0.5190
(Color Code = 2x)	y	0.4060	0.4060	0.4180	0.4180

IF=350mA

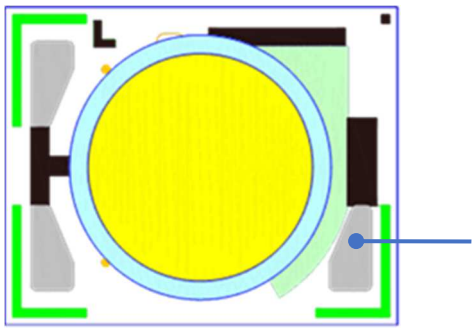
3000K	x	0.4287	0.4404	0.4454	0.4334
(Color Code = x3)	y	0.3980	0.3980	0.4080	0.4080
2840K	x	0.4504	0.4440	0.4590	0.4653
(Color Code = xH)	y	0.4210	0.4090	0.4090	0.4210



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.

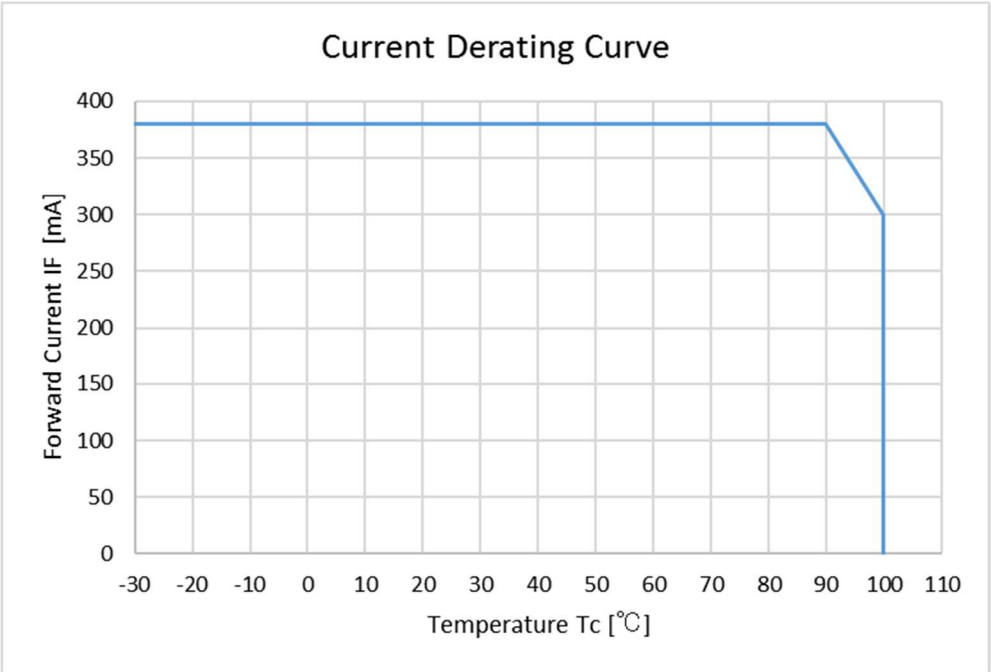
(Measuring point for case temperature)



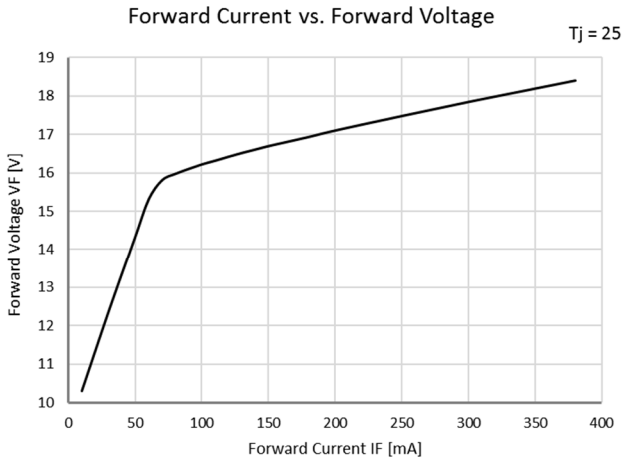
- COB mounting surface should be flat and plain.
- Substrate surface temperature should be uniform when measuring case temperature.

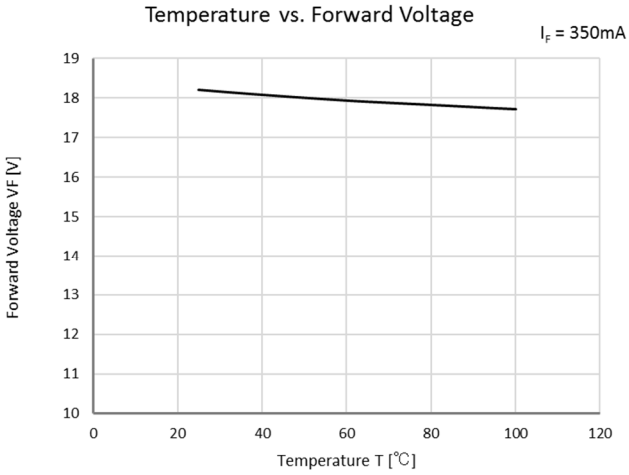
Thermal Resistance (℃/W)

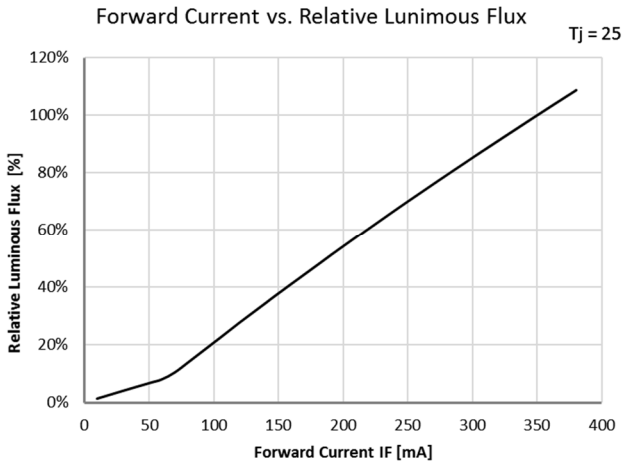
5.5

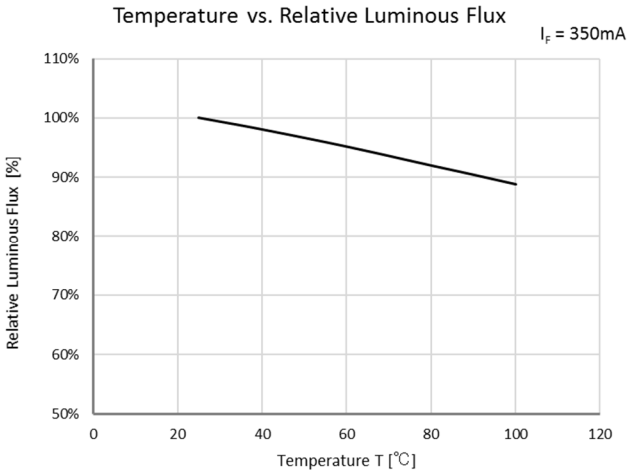


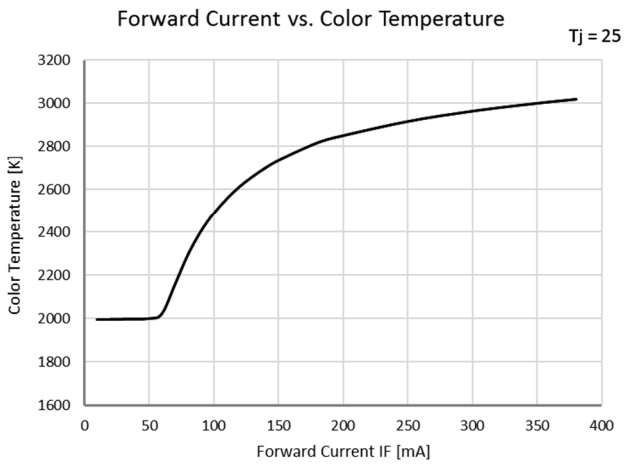
3-5) Characteristics Diagram (TYP.)

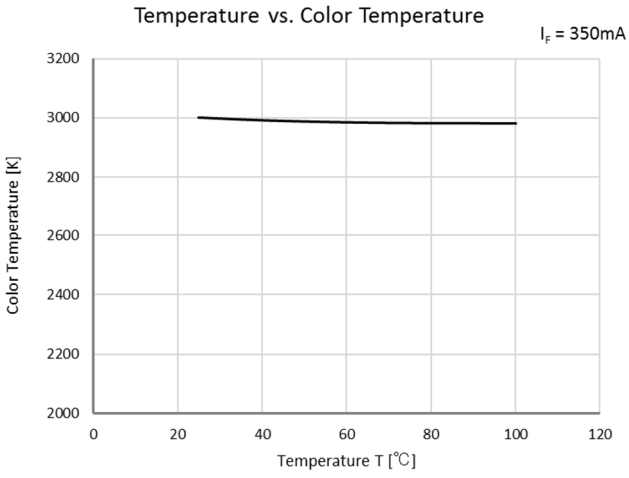












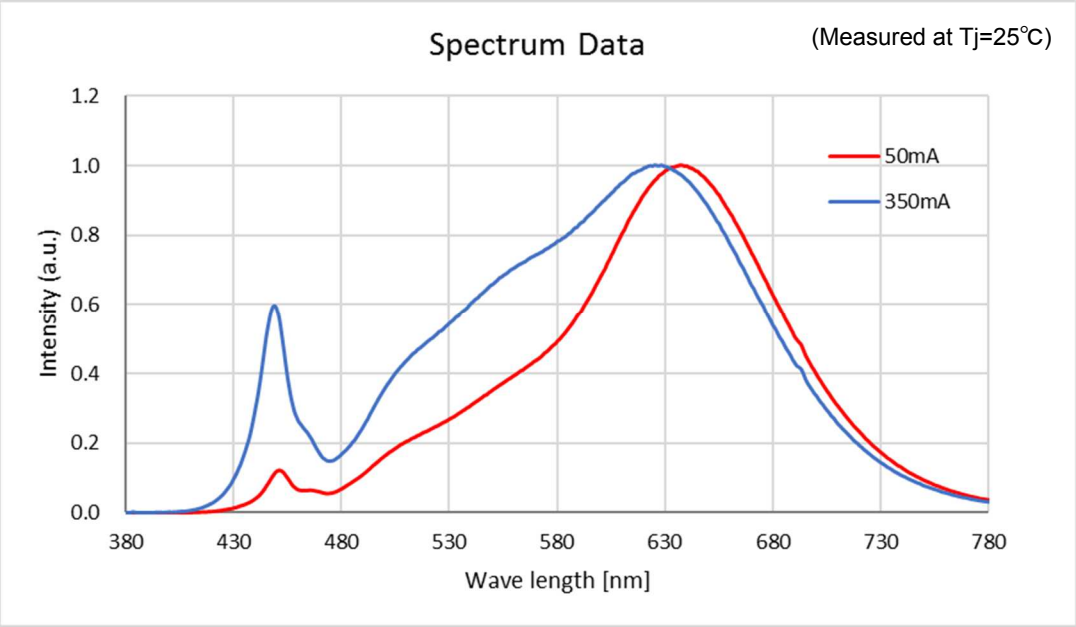
Notes:

※ 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. (Not guaranteed data)

3-6) Spectrum and Color Index (Reference)

Spectrum data for R23 type (CRI > 90 2000-3000K)



Color Index 50mA 2000K

CRI	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
97	99	100	98	99	100	96	94	89	77	98	94	96	100	97	94
CQS	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
96	94	98	95	96	97	100	98	95	97	99	99	99	93	98	96

Color Index 350mA 3000K

CRI	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
92	92	94	94	92	91	92	93	85	65	85	93	79	92	96	90
CQS	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
91	89	94	93	93	98	93	89	89	91	89	85	93	90	94	91

3-7) Radiation Beam Angle (Reference

FWHM (full width at half maximum) : 120 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 / 300 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=350mA	8	0

Failure Criteria

(Measured at 350mA, 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 80 pieces
- ■ 5 trays (400 pieces) and one upper lid-tray in one moisture-proof bag
- ■ 2 bags (800 pieces) in one carton
- ■ Dimensions of outer carton : 235 × 220 × 90 mm (Reference value)

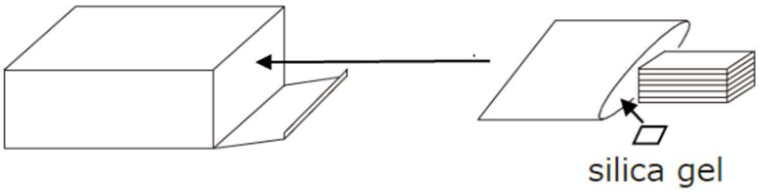
(Note 1) There are cases of one carton composed of one bag. (80 pieces~)

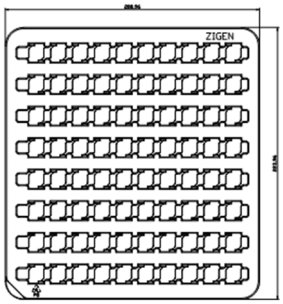
(Note 2) State of packing is subject to change.

< Outer carton >
400 pieces × 2 bags = 800 pieces

< One bag >
80 pieces × 5 trays = 400 pieces

< One Tray >
10 x 8 = 80 pieces





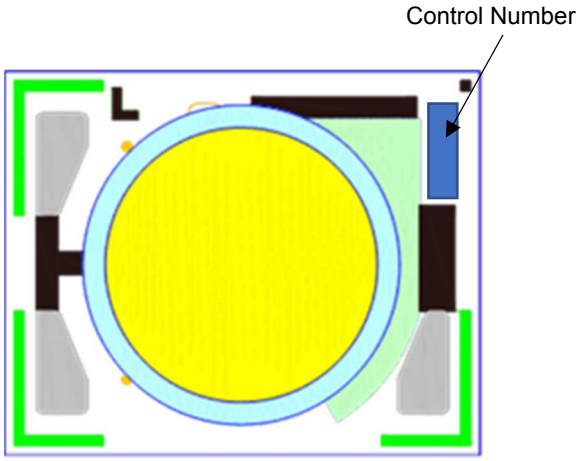
Indication printed on product

Model No. and control No. are indicated on substrate surface.

Control No.

Indicated as follows ;

M	H	7	H	T
①	②	③	④	⑤



① M : Chip layout

② H : Ra/Color code / rank
(H: M*2H, 2: R*23, A: R*A3)

③ 7 : Year

④ H : Month

⑤ T : 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 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: **19010501**

Previous version: **18040301**

Page	Subjects (major change in previous version)	Date of change
4	Electro Optical Characteristic updated	2017.10.20
6	Derating Curve updated	2017.10.20
10	Packing	2017.10.20
-	Add ZG2BRMA3L00	2018.2.7
5	Add Amber color range	2018.4.3
4	Electro-Optical Characteristics	2019.1.5
6	Derating curve	2019.1.5
7	Characteristics Diagram	2019.1.5
8	Spectrum and Color Index	2019.1.5