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ZnSe WHITE LED

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MODEL: RLZS-2012 (top LED, 2.0 mm x 1.2 mm x 1.0 mm)

1. SPECIFICATION:

1.1 Absolute maximum ratings at Ta=25℃

Parameter	Symbol	Value	Unit
Power dissipation	P_d	60	mW
DC forward current	I_f	20	mA
Peak forward current	I_{fpm}	20	mA
Reverse voltage	V_r	10	V
Operating temperature range	T_{opt}	-20～+75	℃
Storage temperature range	T_{stg}	-40～+100	℃

Notes)

- The half-life of the optical output at 25℃ is over 3,000hrs at the above If condition.
- Recommended If at 75℃ is 5mA. The half-life under such condition is over 1,000hrs.
- The half-life of the LED is inversely proportional to the square of the operating current. (The If-Ta curve is also shown in sheet 1.)

1.2 Typical electrical/optical properties at Ta=25℃

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Forward voltage		Vf	If=20mA	2.45	2.65	2.90	V
			If=1mA	2.34	2.37	2.40	
Reverse voltage		Vr	Ir=1μA	5	>30	>30	V
ESD threshold		V_{ESD}	100pF/1.5kΩ	2	8		kV
Peak wavelength 1		λ_{p1}	If=20mA	481	484	487	nm
Peak wavelength 2		λ_{p2}		595	605	615	
Luminous intensity	Rank A	Iv	If=20mA	450	500	550	mcd
	Rank N			350	400	450	
	Rank S			250	300	350	
Viewing angle		$2\theta_{1/2}$	If=20mA	105	120	135	degree

Notes)

- Peak wavelength 1 and 2 refers to emissions from the active layer and the substrate, respectively. White color is obtained by mixing these two light emissions.
- Rank S type employs optical diffuser inside epoxy lens.
- If-Vf, Po-If, and Po-Ta characteristics of a typical white LED is shown in sheet 2.
- A typical Viewing Angle data is shown in Sheet 3.

1.3 White color Rank classification of chromaticity at Ta=25℃

(If=20mA)

	Rank B			
X	0.20	0.08	0.23	0.285
Y	0.20	0.28	0.33	0.25

	Rank P			
x	0.285	0.23	0.345	0.34
y	0.25	0.33	0.37	0.28

	Rank Y			
X	0.34	0.345	0.43	0.39
Y	0.28	0.37	0.395	0.31

	Rank O			
x	0.39	0.43	0.56	0.58
y	0.31	0.395	0.44	0.42

Notes)

- (x,y) is chromatic coordinates in CIE color diagram. Rank areas are shown in Sheet 4.
- Tolerance of chromaticity is +/-0.02.
- The correlated color temperature for Rank B varies from 12,000K to infinity. For Rank P, it varies from 5,000K to 12,000K. For Rank Y, it varies from 3,000K to 5,000K. For Rank O, it varies from 1,600K to 3,000K.
- The narrower color ranks which the customer requires can be offered by a special contract between the two parties.
- The color of White LED is changed a little by an operating current
- A typical light emission spectrum of the white LED (Rank P) is shown in sheet 1.

2 OUTLINE DIMENSIONS AND MATERIALS

Please refer to Sheet 5.

Material as follows; Chip: Zinc Selenide (ZnSe) and ZnSe-related compound
Resin: Epoxy Resin
Substrate: Fiber-reinforced Epoxy

3 PRODUCT NAME INDICATION

- Product Number

The first seven characters show model number. Followings are representative of ranks.

RLZS-2012▲■

▲ - Ranking by Luminous Intensity

■ - Ranking by Color

- Lot Number

The first five characters show model number. Followings are representative of ranks.

YYMM-◯XXX□

YY - Year (02 for 2002, 03 for 2003,….)

MM - Month (01 for Jan., 02 for Feb., ….)

◯ - Epitaxial Chamber suffix (L,….)

XXX - Product Number (representative lot number of epitaxial growth)

□ - Substrate dopant suffix (P for Aluminum, C for Iodine)

4 RELIABILITY

4.1 Test Item and Result

Test Item	Test Condition	Result
Consecutive operating lifetime test	If=20mA / DC, Ta=25℃, t=1,000hours	0/18
High temperature storage lifetime test	Ta=85℃, t=1,000hours	0/18
Temperature humidity storage lifetime test	Ta=60℃, RH=90%, t=1,000hours	0/18
Reflow heat test	T=240℃(Max), t=10sec. Reflow soldering	0/18

Note)

• The reliability guarantee criterion is defined by MIL-S-19500H. The data shows LTPD is 15%.

4.2 Criteria For Judging The Damage

Item	Symbol	Test Conditions	Criteria for Judgement	
			Min.	Max.
Forward Voltage	Vf	If=20mA	-	U.S.L.x1.1
Luminous Intensity	Iv	If=20mA	L.S.L.x0.5	-

Note)

• U.S.L.: Upper Standard Level., L.S.L: Lower Standard Level.

5 CAUTIONS

Care should be taken after due consideration when using LEDs.

5.1 Storage

- Store at room temperature (25±3℃) and under low humidity (RH lower than 50%).

5.2 Static Electricity

- Static electricity or surge voltage damages the LEDs. It is recommended to use a wristband or an anti-electrostatic glove when handling the LEDs.

5.3 Soldering Conditions

- Reflow soldering should be performed at the peak temperature under 240℃ and less than 10 seconds.
- Hand repair soldering should be performed at temperatures under 300℃ and less than 3 seconds. (one time only)

5.4 Cleaning

- It is recommended to use isopropyl alcohol as a solvent for cleaning the LEDs. When using other solvents, it should be confirmed before hand whether the solvents dissolve the resin or not. Freon solvent should not be used to clean the LEDs because of worldwide regulations.
- Do not clean the LEDs by the ultrasonic. When it is absolutely necessary, the influence of ultrasonic cleaning on the LEDs depends on the factors such as ultrasonic power and the assembled condition. Before cleaning pre-test should be done to confirm will not cause any damage to the LEDs.

5.5 Others

- Care must be taken to ensure that the reverse voltage will not exceed the absolute maximum rating when using the LEDs with matrix drive.
- These LEDs described in this spec. sheets are intended to be used for ordinary electronic equipment. Potential applications of these LEDs include displays or backlighting for in-door instruments or mobile gear.
- Any conditions for pulse operation for LED over I_{fpm} are not recommended.
- The formal specifications must be exchanged and signed by both parties before large volume purchase begins.
- The appearance and specifications of the product may be modified for improvement without notice.