

# SANKEN

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LIGHT EMITTING DIODES

## T-1 Special Configuration Type (Diffused)

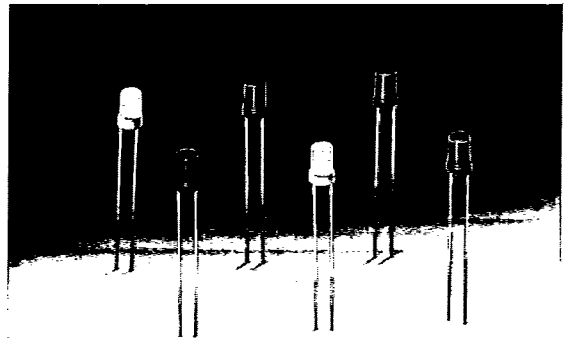
|            |            |
|------------|------------|
| SEL 2111 R | SEL 2711 Y |
| SEL 2111 W | SEL 2811 D |
| SEL 2311 G | SEL 2911 D |

### FEATURES

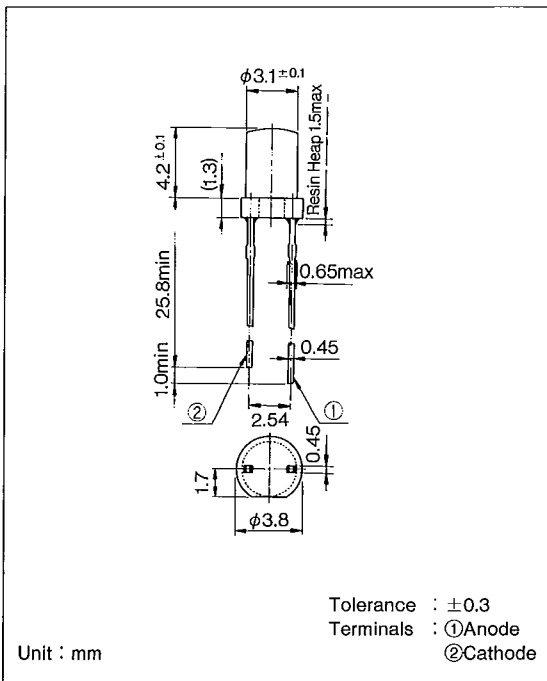
- Wide Viewing Angle of 75°
- Long-life/High Reliability
- Selection of 5 Colors/Intensities
- Pulse-Drivable
- CMOS/MOS, TTL Compatible

### APPLICATIONS

- Pilot Lamp
- Portable Device
- General Use
- Display of Battery and Communication Devices



### Package Dimensions



### Intensity Ranks

| Type No.   | Intensity<br>Min.<br>(mcd) | Condition<br>I <sub>F</sub><br>(mA) | Color |      |
|------------|----------------------------|-------------------------------------|-------|------|
|            |                            |                                     | Lens  | Chip |
| SEL 2111 R | A                          | 10                                  | R     | R    |
|            | B                          |                                     |       |      |
|            | C                          |                                     |       |      |
|            | D                          |                                     |       |      |
| SEL 2111 W | A                          | 10                                  | W     | R    |
|            | B                          |                                     |       |      |
|            | C                          |                                     |       |      |
|            | D                          |                                     |       |      |
| SEL 2311 G | A                          | 10                                  | G     | G    |
|            | B                          |                                     |       |      |
|            | C                          |                                     |       |      |
|            | D                          |                                     |       |      |
| SEL 2711 Y | A                          | 10                                  | Y     | Y    |
|            | B                          |                                     |       |      |
|            | C                          |                                     |       |      |
|            | D                          |                                     |       |      |
| SEL 2811 D | A                          | 10                                  | O     | A    |
|            | B                          |                                     |       |      |
|            | C                          |                                     |       |      |
|            | D                          |                                     |       |      |
| SEL 2911 D | A                          | 10                                  | O     | O    |
|            | B                          |                                     |       |      |
|            | C                          |                                     |       |      |
|            | D                          |                                     |       |      |

R=Red G=Green O=Orange Y=Yellow W=Opaline A=Amber

| Electro-Optical Characteristics (Ta=25°C) |   |  |                                 |                                 |      |      |                             |
|---|---|--|---------------------------------|---------------------------------|------|------|-----------------------------|
| Symbol                                    | Description                                   | Type No.   | Min.                            | Typ.                            | Max. | Unit | Test Condition              |
| $I_v$                                     | Intensity                                     | SEL 2111 R, SEL 2111 W<br>SEL 2311 G<br>SEL 2711 Y<br>SEL 2811 D<br>SEL 2911 D | 0.2<br>1.5<br>1.5<br>1.5<br>1.5 | 1.0<br>4.0<br>4.0<br>4.0<br>4.0 |      | mcd  | $I_F=10$ (mA)               |
| $2\theta_{1/2}$                           | Including Angle Between Half Intensity Points | SEL 2111 R, SEL 2111 W<br>SEL 2311 G<br>SEL 2711 Y<br>SEL 2811 D<br>SEL 2911 D |                                 | 75°                             |      | Deg  | $I_F=10$ (mA)<br>See Note 1 |
| $\lambda_P$                               | Peak Wavelength                               | SEL 2111 R, SEL 2111 W<br>SEL 2311 G<br>SEL 2711 Y<br>SEL 2811 D<br>SEL 2911 D |                                 | 700<br>560<br>570<br>612<br>583 |      | nm   | $I_F=10$ (mA)               |
| $\Delta\lambda$                           | Spectral Line Halfwidth                       | SEL 2111 R, SEL 2111 W<br>SEL 2311 G<br>SEL 2711 Y<br>SEL 2811 D<br>SEL 2911 D |                                 | 100<br>28<br>40<br>40<br>36     |      | nm   |                             |
| $\lambda_d$                               | Dominant Wavelength                           | SEL 2111 R, SEL 2111 W<br>SEL 2311 G<br>SEL 2711 Y<br>SEL 2811 D<br>SEL 2911 D |                                 | 650<br>562<br>566<br>608<br>585 |      | nm   | See Note 2                  |
| C   | Capacitance                                   | SEL 2111 R, SEL 2111 W<br>SEL 2311 G<br>SEL 2711 Y<br>SEL 2811 D<br>SEL 2911 D |                                 | 38<br>15<br>15<br>15<br>10      |      | pF   | $V_F=0$<br>$f=1$ (MHz)      |
| $V_F$                                     | DC Forward Voltage                            | SEL 2111 R, SEL 2111 W<br>SEL 2311 G<br>SEL 2711 Y<br>SEL 2811 D<br>SEL 2911 D | 1.5                             | 2.0                             | 3.0  | V    | $I_F=10$ (mA)               |
| $V_R$                                     | DC Reverse Voltage                            | SEL 2111 R, SEL 2111 W<br>SEL 2311 G<br>SEL 2711 Y<br>SEL 2811 D<br>SEL 2911 D | 5.0                             |                                 |      | V    | $I_R=100$ ( $\mu$ A)        |

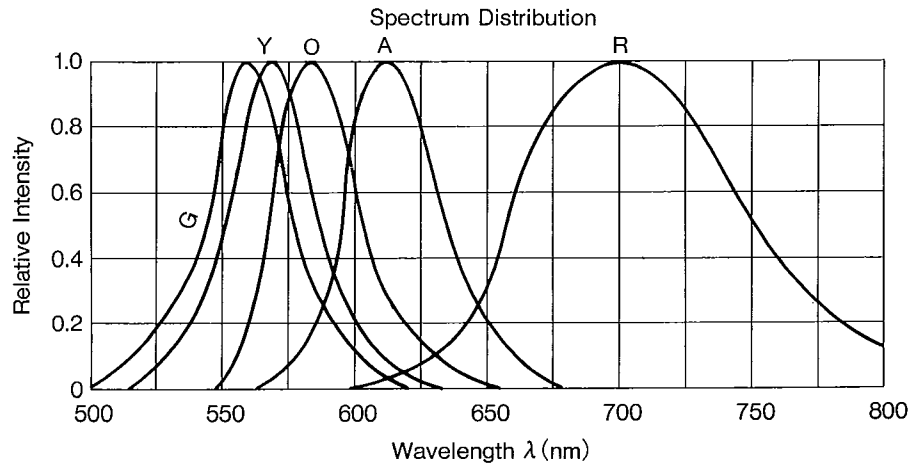
Notes : 1.  $\theta_{1/2}$  is the off-axis angle at which the intensity is half the axial intensity.

2. The dominant wavelength,  $\lambda_d$ , is derived from the CIE chromaticity diagram and it represents the single wavelength which defines the color of the device.

## Absolute Maximum Ratings (Ta = 25°C)

| Symbol            | Description  | Ratings             | Unit |
|-------------------|--|---------------------|------|
| I <sub>P</sub>    | Peak Forward Current* <sup>1</sup>                               | 100                 | mA   |
| I <sub>F</sub>    | Max. DC Forward Current* <sup>2</sup>                            | 30                  | mA   |
| V <sub>R</sub>    | DC Reverse Voltage (I <sub>R</sub> = 100μA)                      | 5                   | V    |
| I <sub>FP</sub>   | Transient Max. Peak Forward Current* <sup>3</sup> (10μsec Pulse) | 500                 | mA   |
| T <sub>op</sub>   | Operating Temp. Range  | -55 to +100         | °C   |
| T <sub>stg</sub>  | Storage Temp. Range  | -55 to +100         |      |
| T <sub>slid</sub> | Lead Soldering Temp. (more than 4.0 mm from body)                | 260°C for 5 seconds |      |

- Notes : 1. See Figure 4  
 2. This current derates linearly from 25°C at 0.33 mA/°C  
 3. Only for one pulse



**Fig. 1 : Relative Intensity vs. Wavelength**

### Individual Specifications

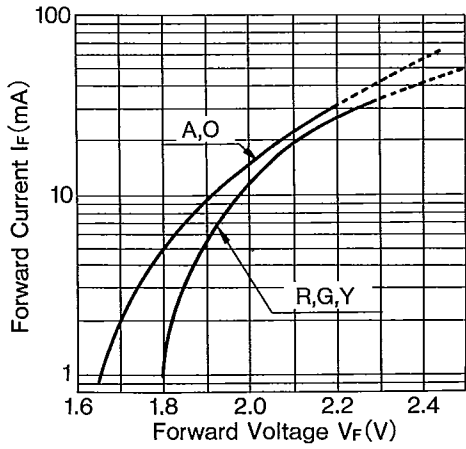


Fig.2 : Forward Current vs. Forward Voltage

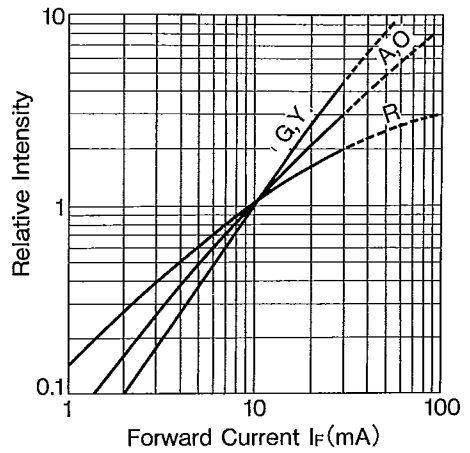


Fig.3 : Relative Intensity vs. Forward Current

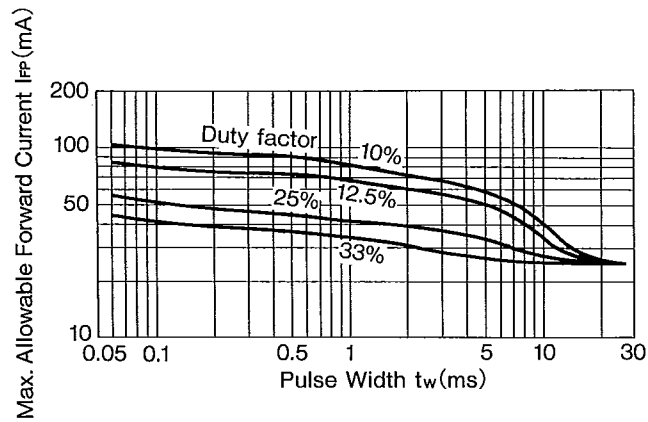


Fig.4 : Max. Allowable Forward Current vs. Pulse Width

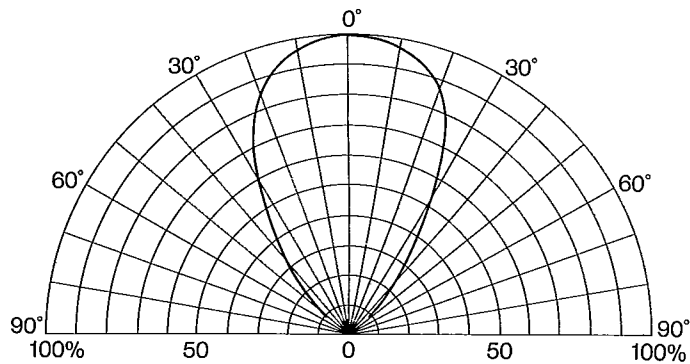


Fig.5 : Viewing Angle