

# SANKEN

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LIGHT EMITTING DIODES

## T-1 3/4 High Intensity Type (Diffused)

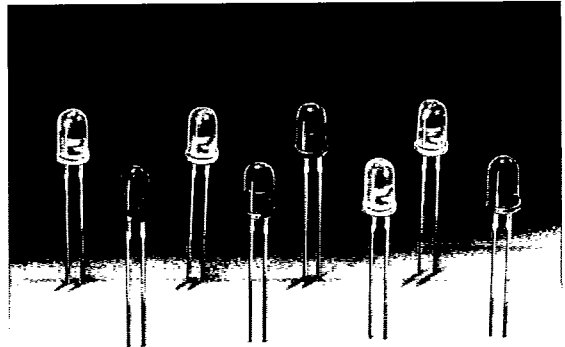
SEL 1210 R	SEL 1410 W	SEL 1910 D
SEL 1210 W	SEL 1810 D	SEL 1910 W
SEL 1410 G	SEL 1810 W	

### FEATURES

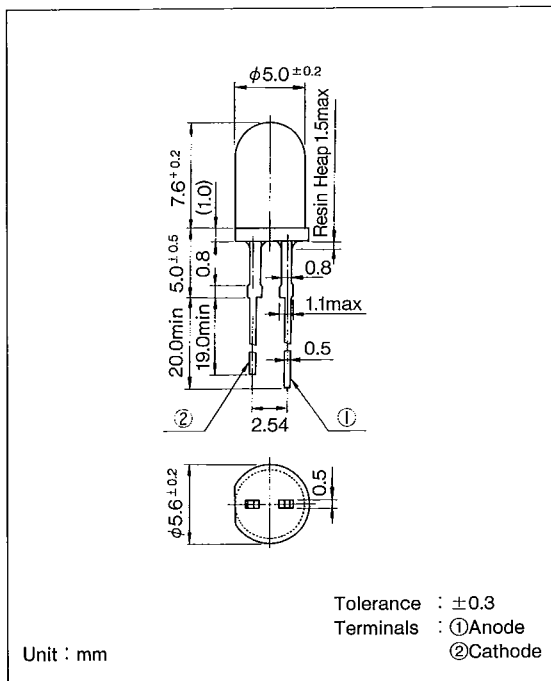
- High Intensity Type
- For Display and Other General Uses
- Long-life/High Reliability
- Wide Viewing Angle/Diffused Type
- Selection of 4 Colors/Intensities
- Pulse-Drivable
- CMOS/MOS, TTL Compatible

### APPLICATIONS

- General Use
- Panel Backlight, Keyboard Display
- Portable Device
- Electric Sign Board
- Display of Battery and Communication Devices



### Package Dimensions



### Intensity Ranks

Type No.	Intensity Min. (mcd)	Condition I <sub>F</sub> (mA)	Color	
			Lens	Chip
SEL 1210 R	A	7.0	R	HIR
	B	14.0		
SEL 1210 W	C	16.0	W	
	D	24.0		
SEL 1410 G	A	7.0	G	HIG
	B	15.0		
SEL 1410 W	C	20.0	W	
	D	27.0		
SEL 1810 D	A	4.5	O	A
	B	6.4		
SEL 1810 W	C	8.8	W	
	D	12.0		
SEL 1910 D	A	0.9	O	O
	B	2.5		
SEL 1910 W	C	4.3	W	
	D	7.1		

A=Amber R=Red G=Green O=Orange W=Opaline HIR=High Intensity Red HIG=High Intensity Green

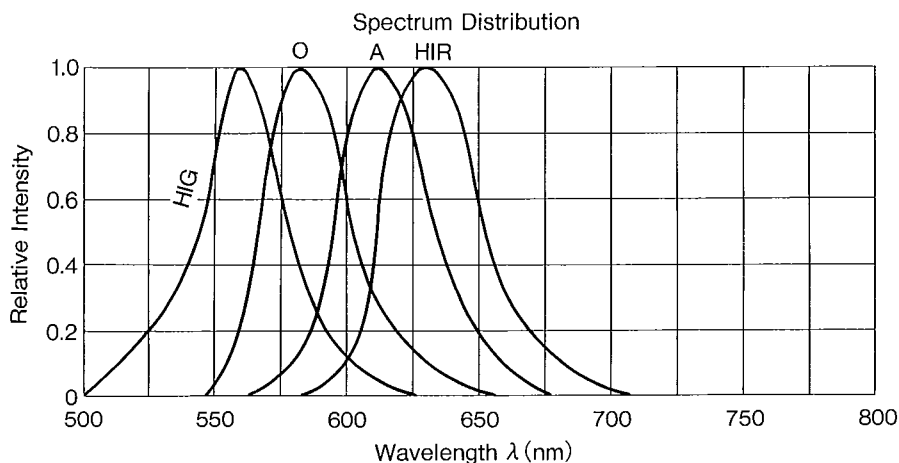
Electro-Optical Characteristics (Ta = 25°C)							
Symbol	Description	Type No.	Min.	Typ.	Max.	Unit	Test Condition
I <sub>v</sub>	Intensity	SEL 1210 R, 1210 W	7.0	24.0		mcd	I <sub>F</sub> = 20 (mA)
		SEL 1410 G, 1410 W	7.0	27.0			
		SEL 1810 D, 1810 W	4.5	12.0			I <sub>F</sub> = 10 (mA)
		SEL 1910 D, 1910 W	0.9	7.1			
2θ <sub>1/2</sub>	Including Angle Between Half Intensity Points	SEL 1210 R, 1210 W SEL 1410 G, 1410 W SEL 1810 D, 1810 W SEL 1910 D, 1910 W		60°		Deg	I <sub>F</sub> = 10 (mA) See Note 1
λ <sub>p</sub>	Peak Wavelength	SEL 1210 R, 1210 W SEL 1410 G, 1410 W SEL 1810 D, 1810 W SEL 1910 D, 1910 W		635 560 612 583		nm	I <sub>F</sub> = 10 (mA)
Δλ	Spectral Line Halfwidth	SEL 1210 R, 1210 W SEL 1410 G, 1410 W SEL 1810 D, 1810 W SEL 1910 D, 1910 W		40 28 40 36		nm	
λ <sub>d</sub>	Dominant Wavelength	SEL 1210 R, 1210 W SEL 1410 G, 1410 W SEL 1810 D, 1810 W SEL 1910 D, 1910 W		626 562 608 585		nm	See Note 2
C	Capacitance	SEL 1210 R, 1210 W SEL 1410 G, 1410 W SEL 1810 D, 1810 W SEL 1910 D, 1910 W		15 15 15 10		pF	V <sub>F</sub> = 0 f = 1 (MHz)
V <sub>F</sub>	DC Forward Voltage	SEL 1210 R, 1210 W SEL 1410 G, 1410 W SEL 1810 D, 1810 W SEL 1910 D, 1910 W	1.5	2.0	3.0	V	I <sub>F</sub> = 10 (mA)
V <sub>R</sub>	DC Reverse Voltage	SEL 1210 R, 1210 W SEL 1410 G, 1410 W SEL 1810 D, 1810 W SEL 1910 D, 1910 W	5.0			V	I <sub>R</sub> = 100 (μA)

- Notes : 1. θ<sub>1/2</sub> is the off-axis angle at which the intensity is half the axial intensity.  
 2. The dominant wavelength, λ<sub>d</sub>, 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 4.0mm 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

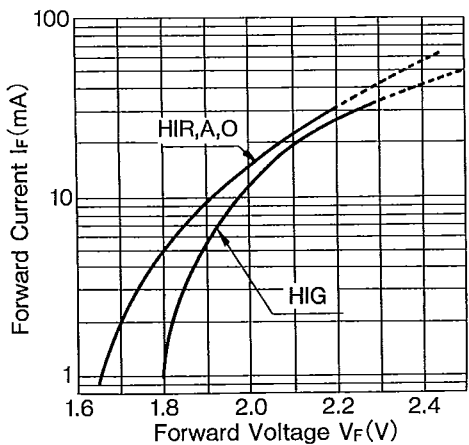


Fig.2 : Forward Current vs. Forward Voltage

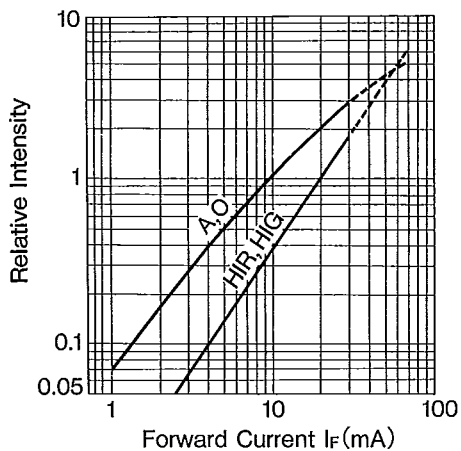


Fig.3 : Relative Intensity vs. Forward Current

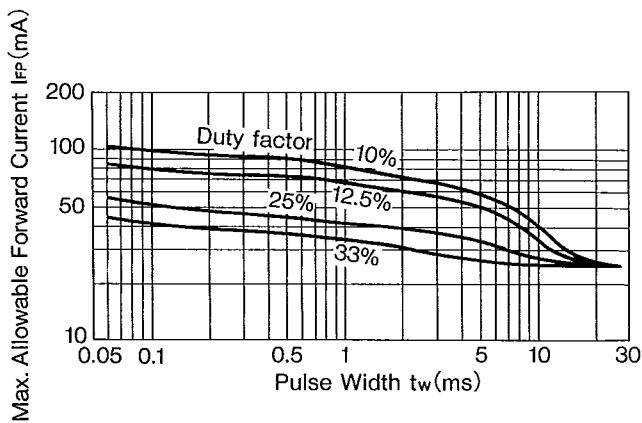


Fig.4 : Max. Allowable Forward Current vs. Pulse Width

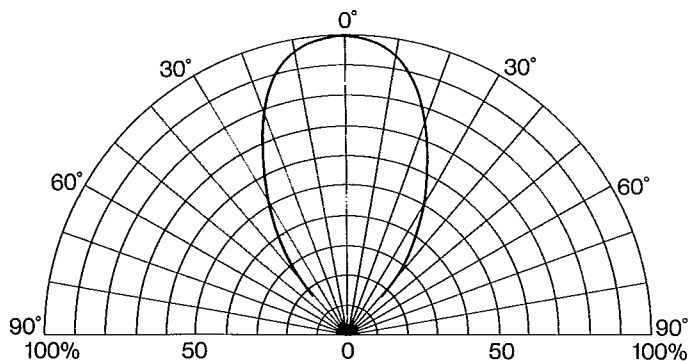


Fig.5 : Viewing Angle