

## WP934MD/2GD

T-1 (3mm) Bi-Level Circuit Board Indicator

### DESCRIPTION

- The Green source color devices are made with Gallium Phosphide Green Light Emitting Diode

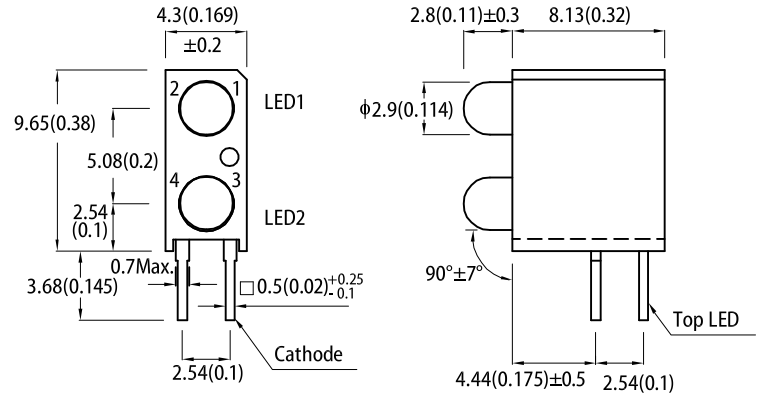
### FEATURES

- Pre-trimmed leads for pc mounting
- Black case enhances contrast ratio
- High reliability life measured in years
- Housing UL rating: 94V-0
- Housing material: Type 66 nylon
- RoHS compliant

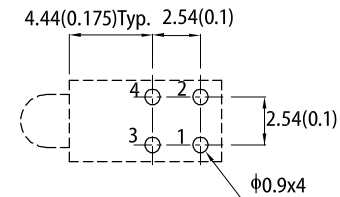
### APPLICATIONS

- Status indicator
- Illuminator
- Signage applications
- Decorative and entertainment lighting
- Commercial and residential architectural lighting

### PACKAGE DIMENSIONS



Recommended PCB Layout



**Notes:**

- All dimensions are in millimeters (inches).
- Tolerance is  $\pm 0.25(0.01)$  unless otherwise noted.
- Lead spacing is measured where the leads emerge from the package.
- The specifications, characteristics and technical data described in the datasheet are subject to change without prior notice.

### SELECTION GUIDE

Part Number	Emitting Color (Material)	Lens Type	Iv (mcd) @ 10mA <sup>[2]</sup>		Viewing Angle <sup>[1]</sup>
			Min.	Typ.	2θ1/2
WP934MD/2GD	<span style="color: green;">■</span> Green (GaP)	Green Diffused	10	25	50°

Notes:  
 1.  $\theta_{1/2}$  is the angle from optical centerline where the luminous intensity is 1/2 of the optical peak value.  
 2. Luminous intensity / luminous flux: +/-15%.  
 3. Luminous intensity value is traceable to CIE127-2007 standards.

ELECTRICAL / OPTICAL CHARACTERISTICS at  $T_A=25^\circ\text{C}$ 

Parameter	Symbol	Emitting Color	Value		Unit
			Typ.	Max.	
Wavelength at Peak Emission $I_F = 10\text{mA}$	$\lambda_{\text{peak}}$	Green	565	-	nm
Dominant Wavelength $I_F = 10\text{mA}$	$\lambda_{\text{dom}}^{[1]}$	Green	568	-	nm
Spectral Bandwidth at 50% $\Phi$ REL MAX $I_F = 10\text{mA}$	$\Delta\lambda$	Green	30	-	nm
Capacitance	C	Green	15	-	pF
Forward Voltage $I_F = 10\text{mA}$	$V_F^{[2]}$	Green	2	2.4	V
Reverse Current ( $V_R = 5\text{V}$ )	$I_R$	Green	-	10	$\mu\text{A}$
Temperature Coefficient of $\lambda_{\text{peak}}$ $I_F = 10\text{mA}$ , $-10^\circ\text{C} \leq T \leq 85^\circ\text{C}$	$\text{TC}_{\lambda_{\text{peak}}}$	Green	0.1	-	$\text{nm}/^\circ\text{C}$
Temperature Coefficient of $\lambda_{\text{dom}}$ $I_F = 10\text{mA}$ , $-10^\circ\text{C} \leq T \leq 85^\circ\text{C}$	$\text{TC}_{\lambda_{\text{dom}}}$	Green	0.06	-	$\text{nm}/^\circ\text{C}$
Temperature Coefficient of $V_F$ $I_F = 10\text{mA}$ , $-10^\circ\text{C} \leq T \leq 85^\circ\text{C}$	$\text{TC}_V$	Green	-2	-	$\text{mV}/^\circ\text{C}$

## Notes:

1. The dominant wavelength ( $\lambda_d$ ) above is the setup value of the sorting machine. (Tolerance  $\lambda_d : \pm 1\text{nm}$ .)
2. Forward voltage:  $\pm 0.1\text{V}$ .
3. Wavelength value is traceable to CIE127-2007 standards.
4. Excess driving current and / or operating temperature higher than recommended conditions may result in severe light degradation or premature failure.

ABSOLUTE MAXIMUM RATINGS at  $T_A=25^\circ\text{C}$ 

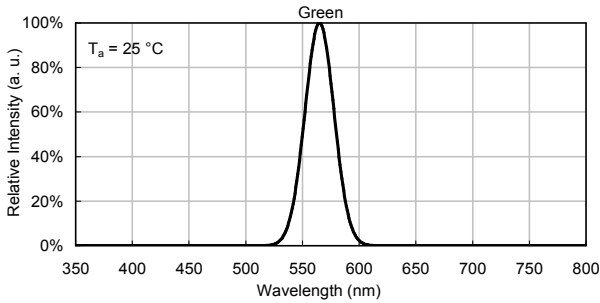
Parameter	Symbol	Value	Unit
Power Dissipation	$P_D$	62.5	mW
Reverse Voltage	$V_R$	5	V
Junction Temperature	$T_j$	110	$^\circ\text{C}$
Operating Temperature	$T_{\text{op}}$	-40 to +85	$^\circ\text{C}$
Storage Temperature	$T_{\text{stg}}$	-40 to +85	$^\circ\text{C}$
DC Forward Current	$I_F$	25	mA
Peak Forward Current	$I_{\text{FM}}^{[1]}$	140	mA
Electrostatic Discharge Threshold (HBM)	-	8000	V
Thermal Resistance (Junction / Ambient)	$R_{\text{th JA}}^{[2]}$	680	$^\circ\text{C}/\text{W}$
Thermal Resistance (Junction / Solder point)	$R_{\text{th JS}}^{[2]}$	460	$^\circ\text{C}/\text{W}$
Lead Solder Temperature <sup>[3]</sup>		260 $^\circ\text{C}$ For 3 Seconds	
Lead Solder Temperature <sup>[4]</sup>		260 $^\circ\text{C}$ For 5 Seconds	

## Notes:

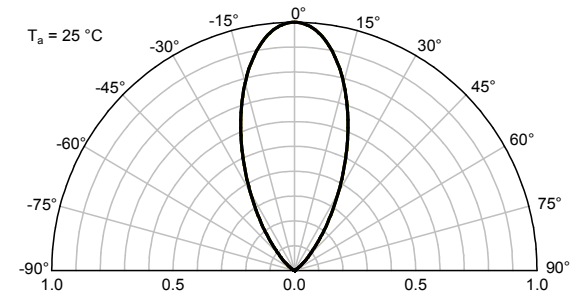
1. 1/10 Duty Cycle, 0.1ms Pulse Width.
2.  $R_{\text{th JA}}$ ,  $R_{\text{th JS}}$  Results from mounting on PC board FR4 (pad size  $\geq 16\text{ mm}^2$  per pad).
3. 2mm below package base.
4. 5mm below package base.
5. Relative humidity levels maintained between 40% and 60% in production area are recommended to avoid the build-up of static electricity – Ref JEDEC/JESD625-A and JEDEC/J-STD-033.

## TECHNICAL DATA

### RELATIVE INTENSITY vs. WAVELENGTH

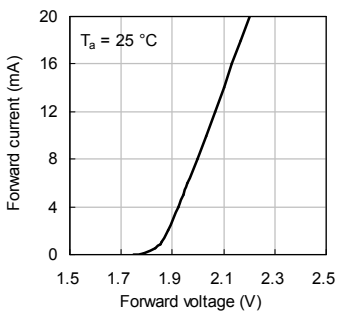


### SPATIAL DISTRIBUTION

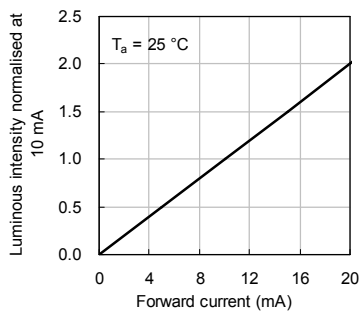


## GREEN

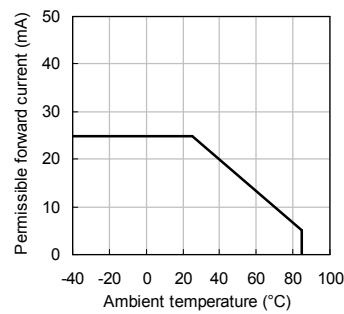
Forward Current vs. Forward Voltage



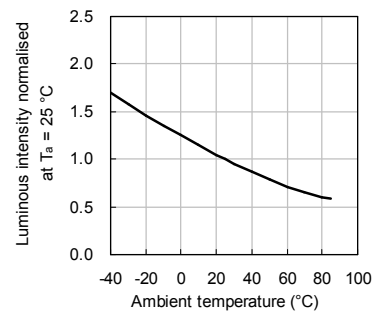
Luminous Intensity vs. Forward Current



Forward Current Derating Curve



Luminous Intensity vs. Ambient Temperature



### RECOMMENDED WAVE SOLDERING PROFILE



**Notes:**

1. Recommend pre-heat temperature of 105°C or less (as measured with a thermocouple attached to the LED pins) prior to immersion in the solder wave with a maximum solder bath temperature of 260°C
2. Peak wave soldering temperature between 245°C ~ 255°C for 3 sec (5 sec max).
3. Do not apply stress to the epoxy resin while the temperature is above 85°C.
4. Fixtures should not incur stress on the component when mounting and during soldering process.
5. SAC 305 solder alloy is recommended.
6. No more than one wave soldering pass.

### PACKING & LABEL SPECIFICATIONS

