

# 651 series



## features



- Ø12.7mm mounting
- Black anodised aluminium housing
- Colour diffused lens with a wide viewing angle
- Sealed to IP67
- Suitable for high vibration applications
- Internal reverse protection diode fitted as standard in all voltage models
- Pack Quantity = 10 Pieces

## specifications

Typical characteristics (Ta = 25°C)

Part Number	Colour	Voltage Vac/dc	Current DC (mA)	Luminous Intensity (mcd)	Wave Length (nm)	Operating Temp. (°C)	Storage Temp. (°C)	De-rating Graphs
651-105-21	Red	12 Vdc	20	95	625	-40 - +85	-40 - +85	B
651-111-21	Yellow	12 Vdc	20	45	590	-40 - +85	-40 - +85	B
651-114-21	Green	12 Vdc	20	45	565	-40 - +85	-40 - +85	C
651-105-23	Red	24-28 Vdc	20	95	625	-40 - +85	-40 - +85	B
651-111-23	Yellow	24-28 Vdc	20	45	590	-40 - +85	-40 - +85	B
651-102-21	Red	12 Vdc	19	500	660	-40 - +85	-40 - +85	B

^ = Voltage for 20mA product is Vf at 20mA, not Vopr

- Products must be de-rated according to the de-rating information. Each de-rating graph refers to specific LEDs. Please refer to graphs on page 3.

- Luminous intensity is measured at 20mA on a discrete LED unless otherwise stated.

## to order

**to order please contact us on: t: +44 (0)1229 582 430**

**f: +44 (0)1229 585 155 e: sales@marl.co.uk w: www.leds.co.uk**

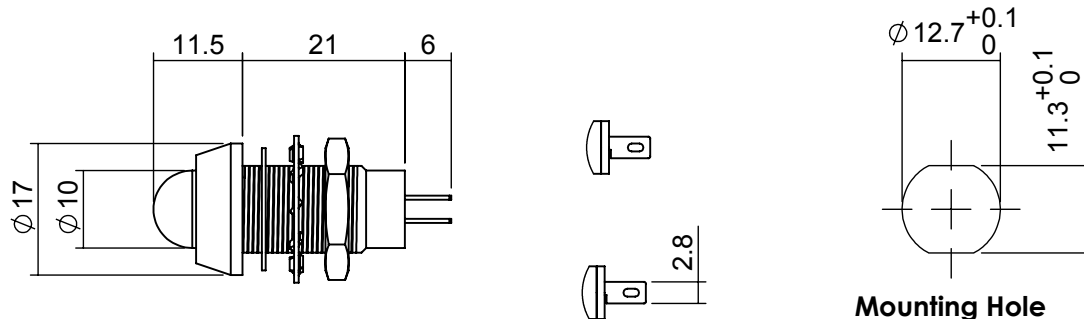
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## technical data



Mounting Hole

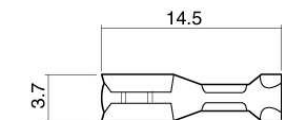
Dimensions in mm (typical)  
Not to scale

Anode termination denoted by red indicator  
Mounting hole to be clean and burr free

## housing material

## push on connectors

Body	Black Anodised Aluminium
Nut	Bright Nickel Plated Brass
Panel Seal	Viton
Fresnel Lens	Epoxy
Encapsulation	PC5430 Resin
Lock Washer	Spring Steel
Termination	-
Header	-



925-000-00 should be used with the 651 series lamp and in brass tin plated  
Dimensions in mm (typical). Not to scale.

## technical characteristics

Series	Max. Power Dissipation	Max. Reverse Voltage	Panel Cutout	Nut Mounting Torque	Min. Mounting Centres	Max. Panel Thickness
651	1000	3*/1000^	12.7	1.0	19.5	1.5 - 8.0
units	mW	Vdc	mm	Nm	mm	mm

\* = Current Version      ^ = Voltage Version

## optional flying lead terminations

Order Code Suffix	Supply Voltage	Wire Colour	Wire Length	No/Diameter of Conductor	Diameter Insulation	Comments
19	DC products	Red-anode/ Black-cathode	1000mm	19/0.15mm	1.2mm	Customised lengths available

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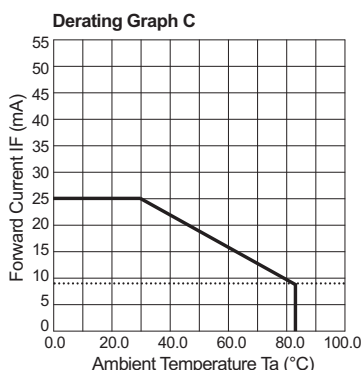
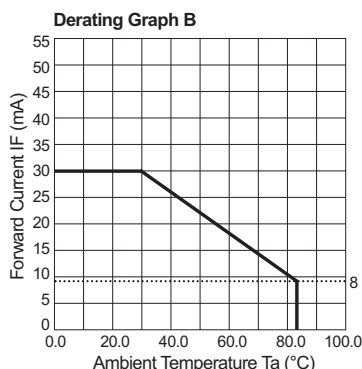
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## de-rating information



## also available

### Part numbers also available in the 651 series:

Part Number	Colour	Voltage Vopr	Part Number	Colour	Voltage Vopr	Part Number	Colour	Voltage Vopr
651-102-04	Red	20 mA dc	651-105-24	Red	48 Vdc	651-114-22-08	Green	24 Vdc
651-102-20	Red	5/6 Vdc	651-105-75	Red	110 Vac 50 Hz	651-114-23	Green	28 Vdc
651-102-22	Red	24 Vdc	651-105-75-07	Red	110 Vac 50 Hz	651-114-75	Green	110 Vac 50 Hz
651-102-22-07	Red	24 Vdc	651-105-75-08	Red	110 Vac 50 Hz	651-114-75-08	Green	110 Vac 50 Hz
651-102-22-08	Red	24 Vdc	651-105-76	Red	230 Vac 50 Hz			
651-102-23	Red	28 Vdc	651-105-76-08	Red	230 Vac 50 Hz			
651-102-24	Red	48 Vdc	651-111-04	Yellow	20 mA dc			
651-102-75	Red	110 Vac 50 Hz	651-111-20	Yellow	5/6 Vdc			
651-102-76	Red	230 Vac 50 Hz	651-111-22	Yellow	24 Vdc			
651-102-76-08	Red	230 Vac 50 Hz	651-111-22-08	Yellow	24 Vdc			
651-105-04	Red	20 mA dc	651-111-48	Yellow	60 Vdc			
651-105-20	Red	5/6 Vdc	651-111-75	Yellow	110 Vac 50 Hz			
651-105-22	Red	24 Vdc	651-111-76	Yellow	230 Vac 50 Hz			
651-105-22-08	Red	24 Vdc	651-114-04	Green	20 mA dc			
651-105-22-15	Red	24 Vdc	651-114-20	Green	5/6 Vdc			
651-105-23-15	Red	28 Vdc	651-114-22	Green	24 Vdc			

The products listed here illustrate all of the options available to order. These products may have custom modifications that alter their operation beyond the generic information contained within this datasheet. Please contact sales for further information.

\* = These products do not contain integral resistors

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# 651 series



also available continued

Part Number	Colour	Voltage Vopr
651-114-75-15	Green	110 Vac 50 Hz
651-114-76	Green	230 Vac 50 Hz
651-114-76-08	Green	230 Vac 50 Hz
651-135-22	Red/Green	24 Vdc

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## design considerations

### Electro-Static Discharge (ESD)

Build up of electro-static discharge occurs in many situations involving people moving and handling products. The range of possible situations is very diverse but voltage levels as high as several thousand volts can and do arise in many individual situations. When an operator charged up to these levels handles a static sensitive device, there is a very probable likelihood that the device will be irreversibly damaged. It is essential that precautions are taken at all stages during manufacture and assembly of these products. Although LEDs were never considered to be static sensitive devices, changes in manufacturing technology and materials used to produce higher intensity products over a large range of the wavelength spectrum have changed this. Marl has an approved system of ESD control from goods in, through production and into final packing and despatch. Marl recommend all users of LED based products follow the guidelines of BS 100015.

### Power De-Rating

The forward voltage/ current value of an LED is dependant upon the ambient temperature of the environment in which it is operated. Therefore, care must be taken to operate the LED at the correct voltage/ current values, depending upon the ambient temperature. Consequently, a recommendation regarding operating voltages and currents is given in order to address these temperature effects. This recommendation is termed 'de-rating'. It is usual for forward voltages and currents to be specified for ambient temperature of 25°C. However, because the values of these qualities vary with temperature, please refer to the de-rating graphs for correct operation. Marl accept no liability for any product that is operated higher than the stated voltage.

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