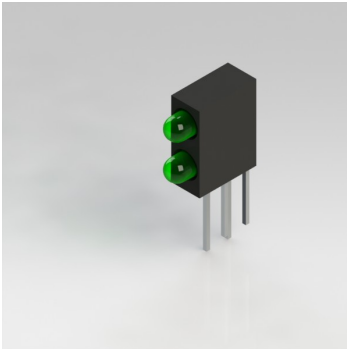


# 109 series



## features



- Ø3.0mm LED
- Saves board space and assembly time
- Material conforms to UL94 V-O flammability ratings
- Colour diffused lens
- Reverse polarity and low current options available
- Custom built multi-colour permutations available
- Typically available ex stock
- Pack Quantity = 250 Pieces

## specifications

Ordering information and 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
109-305-04	Red	2.0 Vdc	20	20	627	-40 - +85	-40 - +85	A
109-311-04	Yellow	2.1 Vdc	20	30	590	-40 - +85	-40 - +85	A2
109-314-04	Green	2.2 Vdc	20	28	565	-40 - +85	-40 - +85	F
109-330-04	Red/Green	2.0/2.2 Vdc	20	20/20	627/565	-40 - +85	-40 - +85	E
109-381-20	Red	5/6 Vdc	13	20@13mA	627	-40 - +70	-40 - +85	-
109-382-20	Yellow	5/6 Vdc	13	15@13mA	590	-40 - +70	-40 - +85	-
109-383-20	Green	5/6 Vdc	11.5	20@13mA	565	-40 - +70	-40 - +85	-

^ = 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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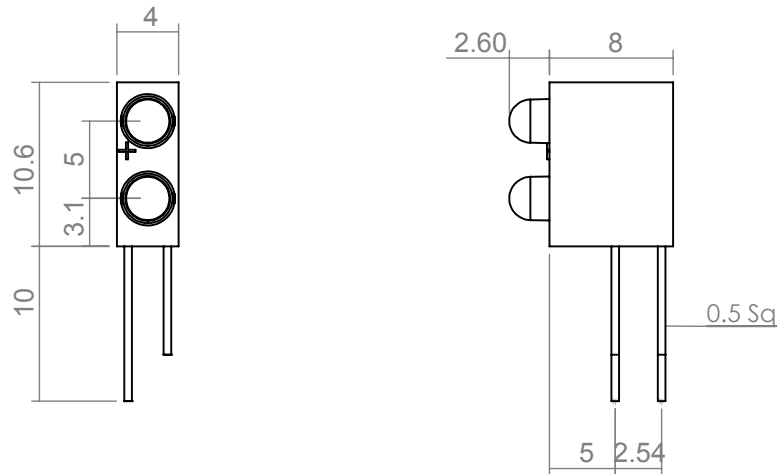


# 109 series



## technical data

Dimensions in mm (typical)  
Not to scale



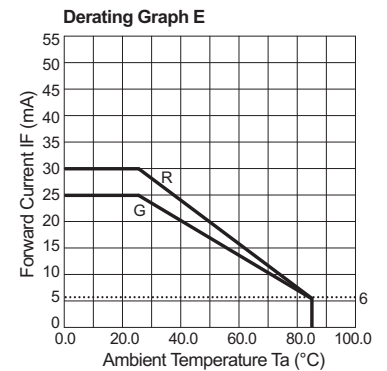
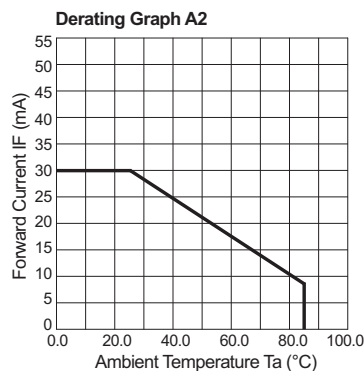
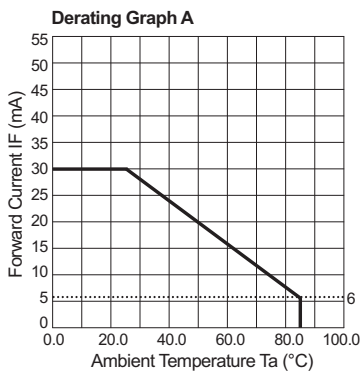
## housing material

### Polycarbonate

This material offers UL94 V-O flame retardancy\* and a high impact strength. This material has a melting point of 290-340°C and is suitable for use in the majority of automatic soldering processes

\*Material test thickness of 1.6mm

## de-rating information



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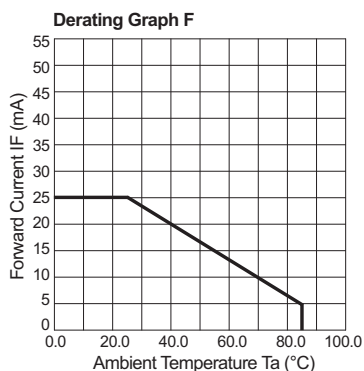
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# 109 series



## de-rating information continued



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# 109 series



also available

Part numbers also available in the 109 series:

Part Number	Colour	Voltage Vopr
109-000-01-50	Red/Green	2 mA dc
109-000-01-51	Green/Red	2 mA dc
109-000-01-53	Red/Yellow	2 mA dc
109-000-01-54	Green/Yellow	2 mA dc
109-000-01-57	Red/Green	2 mA dc
109-000-02-50	Red/Green	10 mA dc
109-000-04-50	Red/Green	20 mA dc
109-000-04-51	Yellow/Red	20 mA dc
109-000-04-52	Green/Yellow	20 mA dc
109-000-04-52-6	Green/Yellow	20 mA dc
109-000-04-53	Yellow/Green	20 mA dc
109-000-04-54	Green/Red	20 mA dc
109-000-13-50	Yellow/Green	20 mA dc RP
109-000-13-51	-	20 mA dc RP
109-000-20-51	Green/Red	5/6 Vdc
109-000-20-52	Red/Green	5/6 Vdc
109-305-01	Red	2 mA dc
109-305-04-7	Red	20 mA dc
109-305-13-7	Red	20 mA dc RP
109-311-01	Yellow	2 mA dc
109-311-01-24	Yellow	2 mA dc
109-311-01-6	Yellow	2 mA dc
109-311-04-24	Yellow	20 mA dc
109-314-01	Green	2 mA dc
109-330-01	Red/Green	2 mA dc
109-330-04-24	Red/Green	20 mA dc
109-332-13	Green/Yellow	20 mA dc RP
109-383-20-24	Green	5/6 Vdc
109-383-20-26	Green	5/6 Vdc
109-383-20-6	Green	5/6 Vdc

The products listed above 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.

to order

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# 109 series



## design considerations

### LED Polarity

Anode identification is shown in the dimensional diagram. The long lead of a non cropped unit can also be used to help identify the anode. For the 2 pin bi-colour units the standard colour configuration is red anode to the '+' sign.

### Reverse Polarity

This is offered on all PCB units, with the exception of the 125 series, if requested to help overcome the problem of systems with reverse polarity connections. Multiple units can also be supplied in reverse polarity but not with mixed polarities. The 2 pin and 3 pin bi-colours can be supplied in reverse colour configuration.

### Lead Cropping

Should lead cropping be required, Marl offer two standard lengths, either by request or by adding one of the following codes to the end of the part number:-

-24 = 3mm.

-26 = 5mm (e.g 101-205-02-26)

Other non standard lead lengths are available on request.

### Bi-Colour

2 pin operation. To achieve the second colour for a 2 pin bi-colour unit, the supply must be reversed, standard colour configuration for these units is red anode to the '+' sign.

### 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, marl should be contacted if the device is to be operated at a temperature significantly higher than 25°C. Marl accept no liability for any product that is operated higher than the stated voltage.

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