NORTH AMERICA
LED INDICATOR CATALOG
**2015**

MARL

# CONTENTS

# INTRODUCTION

## HISTORY

It is now more than 100 years since Henry Round first published a brief report after observing electroluminescence from a SiC (Silicon Carbide) diode. Whilst working for the Marconi company, he experimented using a variety of substances, he passed current through them and noticed that some gave off light - the first known report of the effect of the light-emitting diode. Then in the 1920s Oleg Losev, a radio technician in St Petersburg, noticed that crystal diodes, (zinc oxide and silicon carbide crystal rectifier diodes), used in radio receivers emitted light when current flowed through them.

During the 1960's, Robert Hall and Nick Holonyak of General Electric Company, were responsible for the development of LEDs as semiconductor devices as production of the standardized models based on 3mm and 5mm through hole LEDs as we know them today. Marshall Nathan of IMB and Robert Rediker of MIT were also crucial contributors to development of the LED as we know it today, overall it is fair to conclude that the LED has been a product which has been research, developed and manufactured by many different countries around the world.

In the 1970's, Marl was one of the first companies to identify the demand for solutions led applications, led by innovating packaging technologies to allow the end user to maximize the potential benefits from this new lighting technology.

## COMPANY AND ETHOS

Marl has now been adapting leading LED technology to provide innovative, attractive, functional, and cost effective solutions for more than 40 years. Customers keep on returning to take advantage of a world class in-house design and manufacturing facility, which produce high quality, high performance products. These are supported by an equally impressive range of expertise and disciplines which combine agility, speed and flexibility in order to consistently provide first class levels of service and support.

The Marl DNA is all about speed of innovation and timing, with a willingness to respond to both needs and expectations as projects evolve and mature through the entire product life cycle. Customers know when working with Marl that quality, cost and delivery are givens. The true business relationship is about offering truly creative input with a focus on innovation, a proactive approach to seeking out new initiatives through a cohesive program of continuous improvement for mutual benefit. Consequently, the Marl brand is recognized internationally as one of the pioneers of the Optoelectronics and LED Lighting industry, and locally as one of the leading companies in the Cumbrian economy.

## TECHNOLOGY AND PRODUCTS

This steered Marl to create a core product range comprising of PCB mounting, panel mounting and the bulb replacements, all utilizing the best LED technology available at any given point in time. Marl has unique access to some of the best Optoelectronics and LED Lighting technology in the world and as the LED revolution evolved, the product offer has expanded to include LED modules, chip on board, LEDs on board and complementary components. To the best of our knowledge Marl is currently manufacturing the only UL approved, sealed LED panel indicator lamp in the world! Marl also offers custom design and manufacturing services including electro-mechanical assembly and comprehensive electrical and environmental test. This skill set is particularly well suited to providing ruggedized electronic equipment and systems.

## QUALITY

Marl has all appropriate accreditation, including BSEN ISO 9001:2008 (Certificate Number: Q05480), in addition to ROHS and WEEE compliance.

## DEFENSE ACCREDITATION

Defense manufacturers code: (Cage code) U3054

NATO stock number listings available

ECCN No: EAR-99

HTS Code No: 8541402000

## LOCATION

Marl is based in Ulverston, Cumbria, in the UK. From this historic market town located on the fringe of the English Lake District, Marl operates its own business park, which houses an impressive and comprehensive design and manufacturing facility and includes the new Marl Business Hub, which has been especially designed for high-tech start-up companies and SMEs.

## SALES CHANNELS, DISTRIBUTORS AND TERRITORIES

All Marl Optoelectronic and LED Lighting technology products, systems and build to print services for ruggedized electronic sub-assemblies and systems are made available through a global network of electronic component distributors, electrical wholesalers, appointed agents and speciality distributors and from a highly qualified and experienced field sales force. Marl welcomes visitors to the factory to see the products being manufactured and also see the full range of design, demonstration and test facilities. Alternatively, Marl are always prepared to arrange on site technical support visits and demonstrations.

# CAPABILITIES

## TEAM

The most important element of quality is the Marl team, who between them have more than 750 years of LED experience and a millennium of engineering know-how. When this is combined with an impressive array of capability, (including rapid prototyping and high speed surface mount technology for boards up to 600mm), the result is a potent, competitive force which explains why an eclectic mix of blue chip customers keep on returning to Marl year-on-year.

## MARKETS

Marl has access to the best high performance LED and Solid State Lighting technologies available in the world, which has allowed the company to innovate design solutions which are right for the moment and are transferable across a number of demanding market sectors including transportation, defense, telecoms, photo science and a wide range of industrial applications.

As LED devices became more efficient, brighter and with a wider color spectrum, including white, the Marl product range evolved from indication, to task lighting and is now ready to tackle general illumination. The product ranges include LED and SSL componentry and accessories for the lighting industry, optoelectronic components and indicator lamps, ruggedized lighting systems.

# CAPABILITIES CONTINUED

### DESIGN, MANUFACTURE AND TEST

Services:

• PCB Assembly including surface mount and hand assembly

• Environmental testing facilities

• Fully equipped precision tool room

• Environmental test chamber

• PCB wave soldering

• Thermal imaging and modeling

• High voltage testing

• Dark room optical measurement facilities

• Global supply chain network for electromechanical and electronics including LED and SSL components and accessories

• Technology demonstration areas

Equipment List:

• Pacer Flat Bed CNC Router; materials up to 2.5m long and 1.25m wide; used for rapid prototyping

• Hurco VM20 CNC Milling Machine; 20 tools; bed size 1m x 0.5m

• Hurco TM6 CNC Lathe; 12 tools

• Citizen Sliding Head CNC Lathes; auto bar feed; diameter up to 25mm

### EMA (ELECTRO-MECHANICAL ASSEMBLY)

In addition Marl also delivers a number of electro-mechanical assembly solutions which are especially suited to meet Urgent Operational Requirements or to provide small and medium volume requirements for niche applications often demanding high standards of performance, ingress protection, reliability and overall ruggedization. This capability includes full turnkey solutions with testing to client specification, packaging and global distribution network.
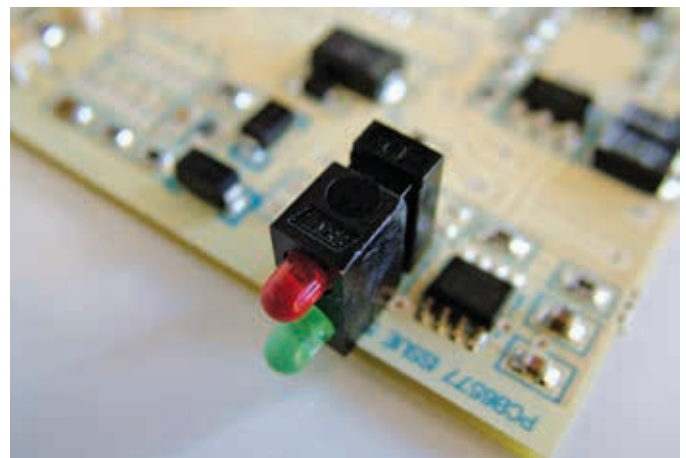
# PCB MOUNTED LEDS

The first product that Marl manufactured in the UK, in the 1970's, improving millions of Circuit Boards around the world, with better status indication.

These products are still very popular with through-hole technology, because they improve quality and reliability. They are particularly suitable for applications which require accurate indicator alignment, either for end or vertical stacking and are very useful for applications were the LED interfaces directly with the front-of-panel viewing aperture.

Over the decades we have seen Marl PCB Mounting LEDs used as status indicators in a wide range of applications including telecoms equipment, computer IT systems and process control.
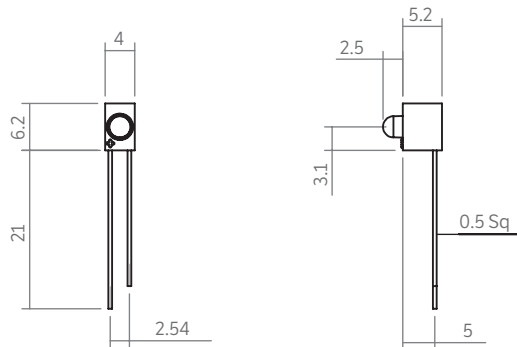
HOLDER

LED

# 103 SERIES

## SPECIFICATIONS

- Ø3.0mm LED
- Material conforms to UL94 V-O flammability ratings
- Color diffused lens
- Low current versions available
- Reverse polarity options available
- Customized lead lengths available
- Typically available ex stock
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/103series.pdf

## DIMENSIONS



Actual size.
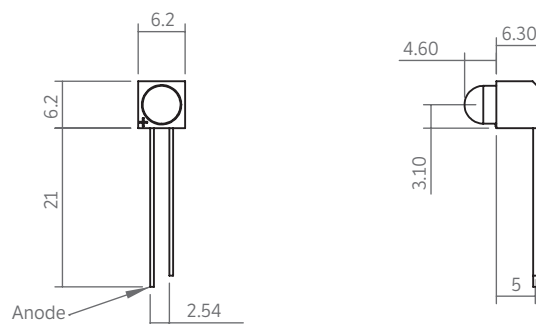All dimensions measured in mm.

---

# 104 SERIES

## SPECIFICATIONS

- Ø5.0mm LED
- Material conforms to UL94 V-O flammability ratings
- Color diffused lens
- Bi-color options available
- Reverse polarity options available
- Typically available ex stock
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/104series.pdf

## DIMENSIONS



Actual size.
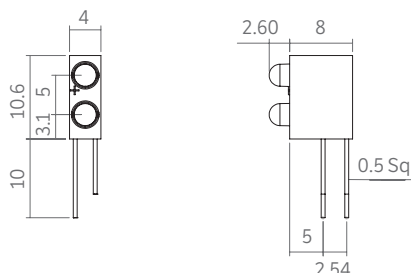All dimensions measured in mm.

# 109 SERIES

## SPECIFICATIONS

- Ø3.0mm LED
- Saves board space and assembly time
- Material conforms to UL94 V-O flammability ratings
- Color diffused lens
- Range of voltage options

- Reverse polarity and low current options available
- Custom built multi-color permutations available
- Typically available ex stock
- Range of LED colors

Complete online datasheet: http://ds.leds.co.uk/ds/109series.pdf

## DIMENSIONS

4
10.6
5
3.1
10
2.60   8
0.5 Sq
5
2.54

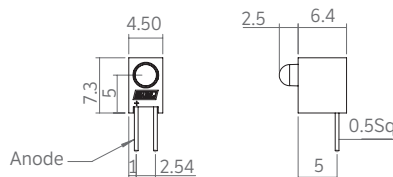Actual size.
All dimensions measured in mm.

# 113 SERIES

## SPECIFICATIONS

- Ø3.0mm LED
- Material conforms to UL94 V-O flammability ratings
- Color diffused lens
- Reverse polarity options available

- Typically available ex stock
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/113-120series.pdf

## DIMENSIONS

4.50
7.3
5
Anode
1   2.54
2.5   6.4
0.5Sq
5

Actual size.
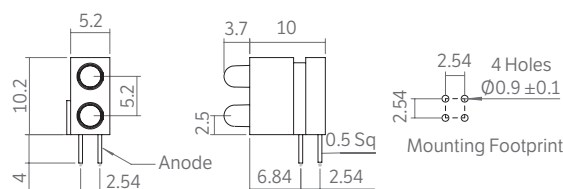All dimensions measured in mm.

# 122 SERIES

## SPECIFICATIONS

- PCB Mounting Ø3mm LED
- Material conforms to UL94 V-O flammability ratings
- Color diffused lens, white diffused for bi-color options
- Reverse polarity options available

- Custom built multi-color permutations available
- Typically available ex stock
- Designed for auto-insertion onto printed circuit board
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/122series.pdf

## DIMENSIONS

5.2
10.2
5.2
4
2.54
Anode
3.7  10
2.5
6.84  2.54
0.5 Sq
2.54  4 Holes
Ø0.9 ±0.1
2.54
Mounting Footprint

Actual size.
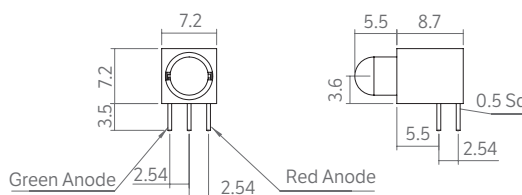All dimensions measured in mm.

---

# 151 SERIES

## SPECIFICATIONS

- Ø5.0mm LED
- Material conforms to UL94 V-O flammability ratings
- Diffused lens

- Typically available ex stock
- Red, amber and green tri-color
- Red and green bi-color

Complete online datasheet: http://ds.leds.co.uk/ds/151series.pdf

## DIMENSIONS

7.2
7.2
3.5
Green Anode  2.54  2.54  Red Anode
5.5  8.7
3.6
5.5  2.54
0.5 Sq

Actual size.
All dimensions measured in mm.

# BULB REPLACEMENT LEDS

This range has been manufactured in the UK since the early 1980s and justifies Marl's claim to be one of the first designers of Electronic Light Bulbs in the world! As the product range has evolved, the capability to directly replace bulbs utilizing conventional light source technology has grown enormously, beginning from a fairly modest position of only offering low intensity red, amber and green, to the position today were the EDE and MRO engineering community can be confident that a Marl Bulb Replacement LED will be available as a standard or semi-custom part to suit virtually any application demanded.

Designed to allow "Fit and Forget" replacement of the less reliable filament bulb, both for new equipment and retro-fit applications. Available with single chip "Flat Topped" LEDs which provide high intensity, effective illumination of most types of lens assemblies in illuminated push button switches and lamp holders. LED Bulb replacements are manufactured in all the popular lamp base styles and can be operated from a wide range of voltage options with true Bi-Polar termination for low voltage DC applications.

Outstanding reliability, improved optical matching and color perception translates into tangible customer benefits in terms of saving in maintenance time and replacement costs. Typical applications include control instrumentation, professional (military, aerospace and industrial) illuminated switches, and display illumination.
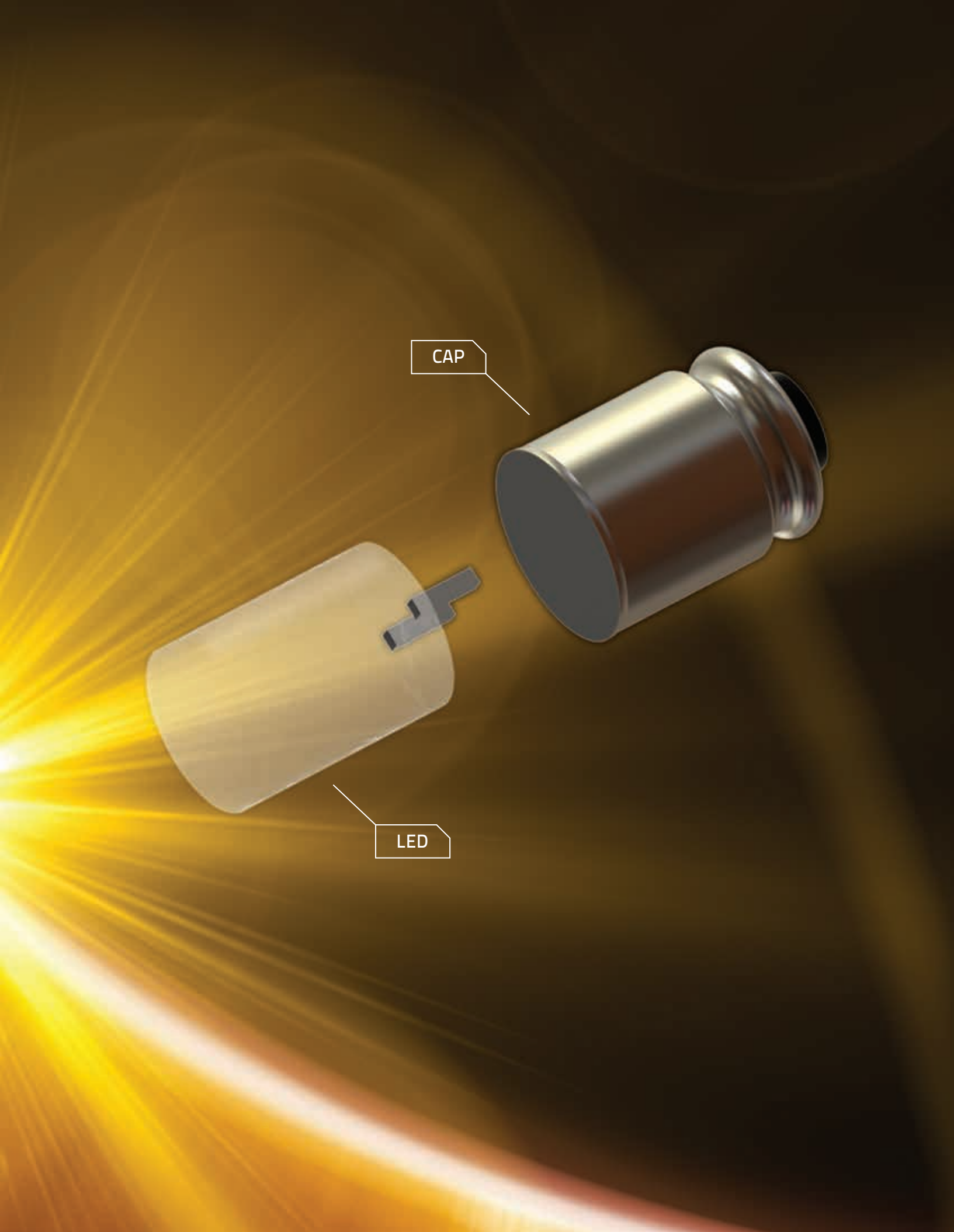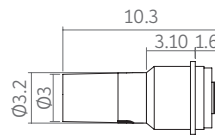
CAP

LED

# 202 SERIES

## SPECIFICATIONS

- Direct replacement for French Style T1 Midget Flange SX3s
- Water clear lens
- Flat topped LED for enhanced, even illumination of large lens areas

- Centre contact anode as standard
- Reverse polarity options available
- Internal resistor voltage options available
- Range of LED colors

Complete online datasheet: http://ds.leds.co.uk/ds/202series.pdf

## DIMENSIONS

10.3
3.10 1.6
Ø3.2
Ø3

Color sleeve on product denotes LED color.

Scale 2:1
All dimensions measured in mm.

---

# 204 SERIES

## SPECIFICATIONS

- Direct replacement for T1 ¾ Bi-Pin
- Flat topped LED for enhanced, even illumination of large lens areas
- Reduces maintenance costs
- 'Fit and Forget' reliability

- Warm white LED may be used behind colored lens as a true replacement for a filament lamp
- Internal resistor voltage options available
- Range of LED colors

Complete online datasheet: http://ds.leds.co.uk/ds/204series.pdf

## DIMENSIONS

15.3 6
Ø5.8
Ø5
0.50
2.54
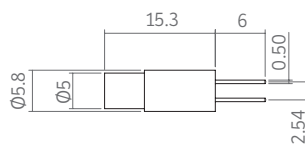
Color dot on product sleeve denotes LED color.
Green dot on base indicates cathode -ve termination.

Actual size.
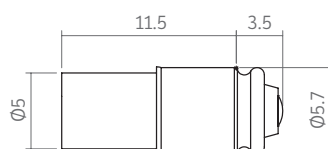All dimensions measured in mm.

# 205 SERIES

## SPECIFICATIONS



- Direct replacement for T1 ¾ Midget Groove S5.7s
- Centre contact anode as standard
- Reverse polarity options available
- Water clear lens
- Low current versions available

- Warm white LEDs may be used behind colored lens as a true replacement for a filament lamp
- Internal resistor voltage options available
- Range of LED colors

Complete online datasheet: http://ds.leds.co.uk/ds/205series.pdf

## DIMENSIONS



11.5  3.5  Ø5  Ø5.7

Color dot on LED denotes LED color.

Scale 2:1
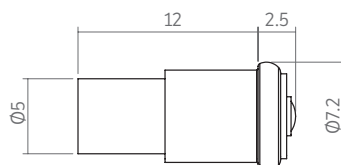All dimensions measured in mm.

---

# 206 SERIES

## SPECIFICATIONS



- Direct replacement for T1 ¾ Midget Flange SX6s
- Centre contact anode as standard
- Reverse polarity options available
- Water clear lens
- 'Fit and Forget' reliability

- Warm white LEDs may be used behind colored lens as a true replacement for a filament lamp
- Internal resistor voltage options available
- Range of LED colors

Complete online datasheet: http://ds.leds.co.uk/ds/206series.pdf

## DIMENSIONS



12  2.5  Ø5  Ø7.2

Color dot on LED denotes LED color.

Scale 2:1
All dimensions measured in mm.

# 208 SERIES

- Direct replacement for T6.8 Slide Base
- Flat topped LED for enhanced, even illumination of large lens areas
- Water clear lens
- Durable to shock and vibration

- Ideal for industrial pushbutton switches and annunciator panels
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/208series.pdf

## DIMENSIONS



42.60
Ø7
Ø5
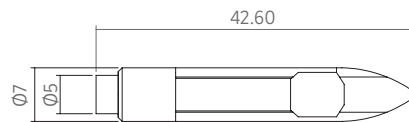
+ Printed on base denotes Anode.
Color dot on product denotes LED color.

Actual size.
All dimensions measured in mm.
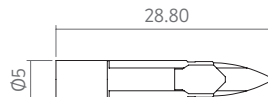
---

# 209 SERIES

SPECIFICATIONS



- Direct replacement for T5.5 Slide Base
- Ideal for industrial pushbutton switches and annunciator panels
- Durable to shock and vibration
- 'Fit and Forget' reliability

- Warm white LEDs may be used behind colored lens as a true replacement for a filament lamp
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/209series.pdf

## DIMENSIONS



28.80
Ø5

+ Printed on base denotes Anode.
Color dot on product denotes LED color.

Actual size.
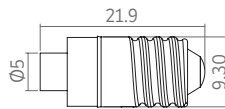All dimensions measured in mm.

22

# 210 SERIES

## SPECIFICATIONS

- Direct replacement for T3 ¼ Midget Edison Screw E10
- Centre contact anode as standard
- Ideal for industrial pushbutton switches and annunciator panels
- Durable to shock and vibration

- Warm white LEDs may be used behind colored lens as a true replacement for a filament lamp
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/210series.pdf

## DIMENSIONS

21.9

Ø5

9.30

Color dot on product denotes LED color.

Actual size.
All dimensions measured in mm.

---

# 215 SERIES

## SPECIFICATIONS

- Direct replacement for T3 ¼ Bayonet Automobile Cap BA9s
- Flat topped LED for enhanced, even illumination of large lens areas
- Centre contact anode as standard

- Reverse polarity options available
- Ideal for industrial pushbutton switches and annunciator panels
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/215series.pdf

## DIMENSIONS

20.50     5.50

Ø5

10.70
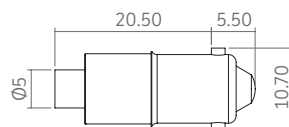
Color dot on sleeve denotes LED color.

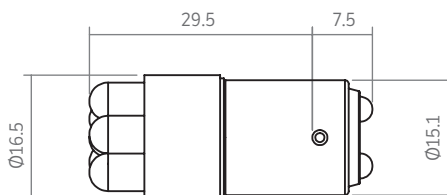Actual size.
All dimensions measured in mm.

# 225 SERIES

## SPECIFICATIONS

- Direct replacement for BA15d
- Bi-Polar termination
- Internal potting for increased reliability
- Ideal for high vibration applications
- 6 LED cluster

- Warm white LEDs may be used behind colored lens as a true replacement for a filament lamp
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/225series.pdf

## DIMENSIONS

29.5    7.5

Ø16.5    Ø15.1

Color dot on product denotes LED color.

Actual size.
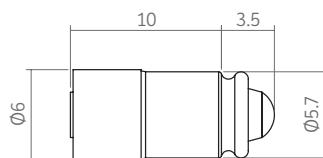All dimensions measured in mm.

---

# 235 SERIES

## SPECIFICATIONS

- Direct replacement for T1 ¾ Midget Groove S5.7s
- Surface mount LED
- Bi-polar termination
- High intensity, single chip LED technology

- Voltage ranges to suit both AC and DC operation
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/235series.pdf

## DIMENSIONS

10    3.5

Ø6    Ø5.7

Color dot on product denotes LED color.

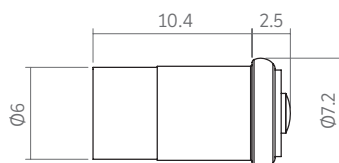Scale 2:1
All dimensions measured in mm.

# 236 SERIES

## SPECIFICATIONS



• Direct replacement for T1 ¾ Midget Flange SX6s
• Surface mount LED
• Bi-polar termination
• High intensity, single chip LED technology

• Voltage ranges to suit both AC and DC operation
• Range of LED colors
• Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/236series.pdf

## DIMENSIONS



10.4    2.5

Ø9    Ø7.2

Color dot on product denotes LED color.

Scale 2:1
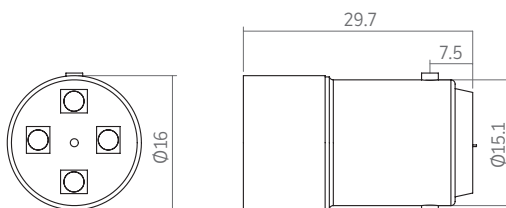All dimensions measured in mm.

---

# 240 SERIES

## SPECIFICATIONS



• Direct replacement for BA15d
• Bi-polar product
• Internally potted for increased reliability
• Ideal for high vibration applications

• 4 LED cluster
• Warm white LEDs can be used behind a colored lens as a true filament lamp replacement
• Range of LED colors
• Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/240series.pdf

## DIMENSIONS



29.7    7.5

Ø16    Ø15.1

Color dot on product denotes LED color.

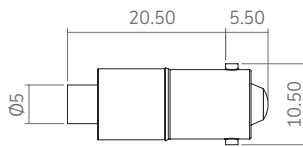Actual size.
All dimensions measured in mm.

# 255 SERIES

## SPECIFICATIONS

- Direct replacement for T3 ¼ BA9s Incandescent
- Unique SOLO technology - Single bi-polar product for multi voltage operating range 8 - 48 Vac/dc
- Flat topped LED for enhanced, even illumination of large lens areas

- Reduces stock and maintenance costs
- Durable to shock and vibration
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/255series.pdf

## DIMENSIONS

20.50    5.50

Ø5    10.50

Color dot on product denotes LED color.

Actual size.
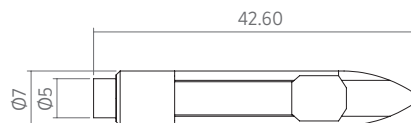All dimensions measured in mm.

# 258 SERIES

## SPECIFICATIONS

- Direct replacement for T6.8 Slide Base
- Unique SOLO technology - Single product for multi voltage operating range 8 - 48Vac/dc
- Flat topped LED for enhanced, even illumination of large lens areas

- Durable to shock and vibration
- Reduces stock and maintenance costs
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/258series.pdf

## DIMENSIONS

42.60

Ø7    Ø5

Color dot on product denotes LED color.

Actual size.
All dimensions measured in mm.

# PANEL INDICATOR LEDS

This product range has evolved significantly since Marl began designing and manufacturing high performance panel lamps in the early 1980s, to reach the point today were they are recognized as the leading global brand. This reputation has been earned from a product, which has consistently demonstrated very high orders of reliability, providing a positive indication at front of panel for a vast array of safety critical applications, including those exposed to the harshest of natural and man made environments, in an equally diverse array of professional and industrial markets around the world. At ground level, subterranean level, at depth under fresh and salt water, and 5m, 50m, 500m and 5km in the air above sea level, design engineers have been choosing Marl Panel Mounting LED Indicators to give end users clear visibility from the best single light source available.

The ultimate range of indicators which are available in a wide range of mounting diameters and combine features such as ingress protection (IP67), sunlight readability with outstanding orders of operational performance and reliability. Other options include internal limiting resistors, test facility, true low voltage DC Bi-Polar termination, burn-in and flame retardant flying leads. High performance Panel Indicator Lamps have been specifically designed for installation in all categories of climatic and hazardous environments and meet all the criteria expected of product capable of providing high intensity indication for long duration in the most demanding professional and military related applications.
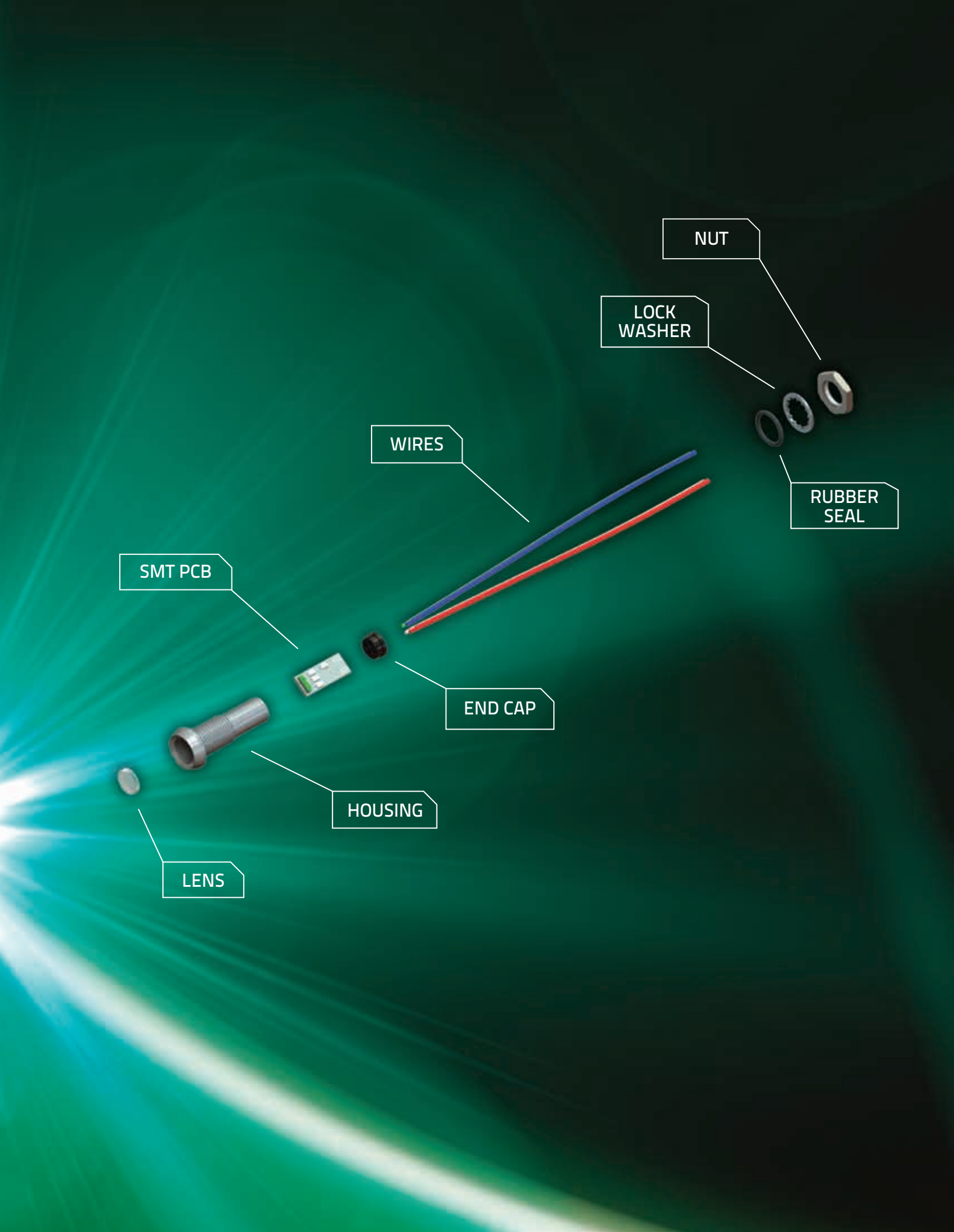
NUT

LOCK
WASHER

WIRES

RUBBER
SEAL

SMT PCB

END CAP

HOUSING

LENS

# 352 SERIES

• Ø6.35mm (0.250") mounting
• Black nylon housing
• Snap-In
• MLQ 20 pieces

• Range of LED colors
• Solder pins or wire terminations
• Range of voltage options: 20mA

Complete online datasheet: http://ds.leds.co.uk/ds/352series.pdf

## DIMENSIONS



0.1960 [4.8mm]
0.030 [0.8mm]
0.530 [13.5mm]
0.68 [17.3mm]
0.040 [1.0mm]
0.100 [2.5mm]
Ø.190 [Ø4.8mm] LED
0.117 [3.0mm]
0.020 [0.5mm] SQ. TYP.
Ø.245 [Ø6.2mm] Body
Ø.280 [Ø7.1mm] Flange
Single Color
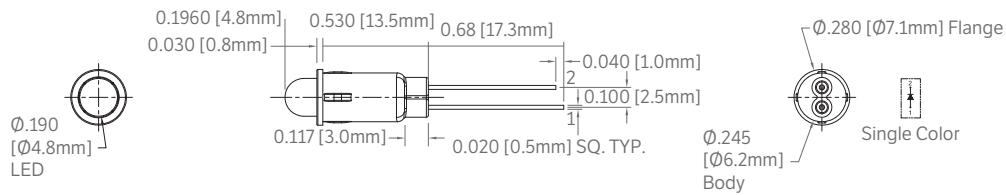
Actual size.
All dimensions measured in mm.

---

# 354 SERIES

• Ø4.1mm (0.161") mounting
• Black nylon housing
• Range of LED colors
• Diffused color LED/lens

• Standard intensity LEDs
• Solder pins or wire terminations
• Range of voltage options: 20mA

Complete online datasheet: http://ds.leds.co.uk/ds/354series.pdf

## DIMENSIONS



Ø4.8
Ø3
3.6   10.7
16.2
1
+0.1
Ø4.1 0
Mounting Hole
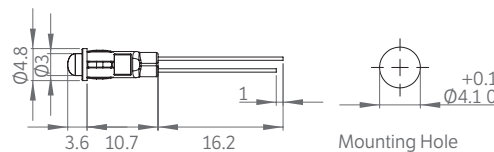
Actual size.
All dimensions measured in mm.

# 356 SERIES

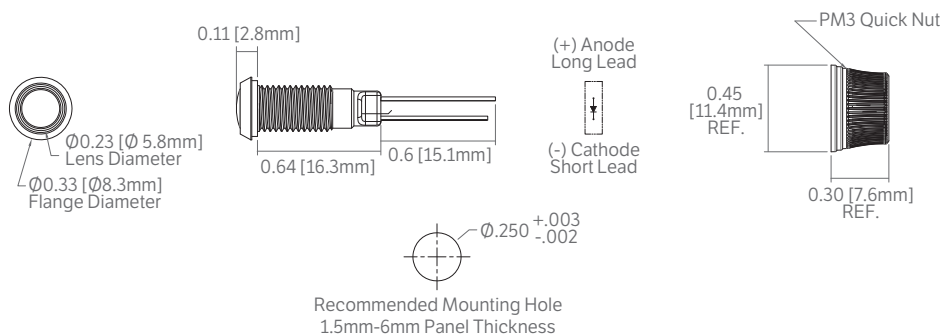## SPECIFICATIONS

- Ø6.35mm (0.250") mounting
- Quick-mount
- Plastic housing
- Range of LED Colors

- Diffused color LED/lens
- Standard Intensity LEDs
- Solder pins or wire terminations
- Range of voltage options: 20mA

Complete online datasheet: http://ds.leds.co.uk/ds/356series.pdf

## DIMENSIONS

0.11 [2.8mm]

Ø0.23 [Ø 5.8mm] Lens Diameter
Ø0.33 [Ø8.3mm] Flange Diameter

0.64 [16.3mm]
0.6 [15.1mm]

(+) Anode Long Lead
(-) Cathode Short Lead

PM3 Quick Nut
0.45 [11.4mm] REF.
0.30 [7.6mm] REF.

Ø.250 +.003 -.002

Recommended Mounting Hole
1.5mm-6mm Panel Thickness

Actual size.
All dimensions measured in mm.

# 357 SERIES

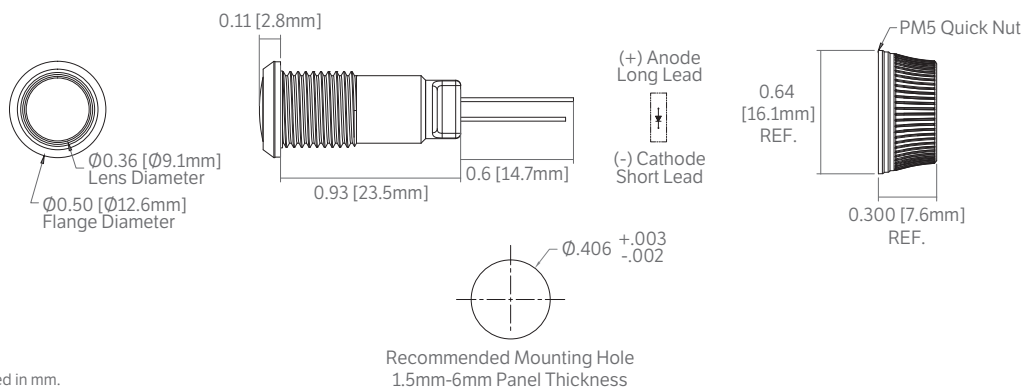## SPECIFICATIONS

- Ø10.3mm (0.406") mounting
- Quick-mount
- Plastic housing
- Range of LED Colors

- Diffused color LED/lens
- Standard intensity LEDs
- Solder pins or wire terminations
- Range of voltage options: 20mA

Complete online datasheet: http://ds.leds.co.uk/ds/357series.pdf

## DIMENSIONS

0.11 [2.8mm]

Ø0.36 [Ø9.1mm] Lens Diameter
Ø0.50 [Ø12.6mm] Flange Diameter

0.93 [23.5mm]
0.6 [14.7mm]

(+) Anode Long Lead
(-) Cathode Short Lead

PM5 Quick Nut
0.64 [16.1mm] REF.
0.300 [7.6mm] REF.

Ø.406 +.003 -.002

Recommended Mounting Hole
1.5mm-6mm Panel Thickness

Actual size.
All dimensions measured in mm.

# 508 SERIES

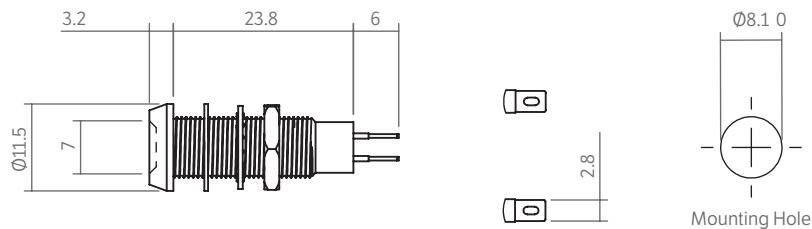## SPECIFICATIONS

- Ø8.1mm mounting (0.318")
- Robust bright nickel plated brass housing
- Low profile lens styling
- Smoked lens
- Sealed to IP67
- Suitable for high vibration applications

- Internal reverse protection diode fitted as standard in all voltage models
- Range of LED colors
- Range of voltage options
- Flying lead terminations available

Complete online datasheet: http://ds.leds.co.uk/ds/508series.pdf

## DIMENSIONS



Anode termination indicated by red sleeve.
Mounting hole to be clean and burr free.

Actual size.
All dimensions measured in mm.

---

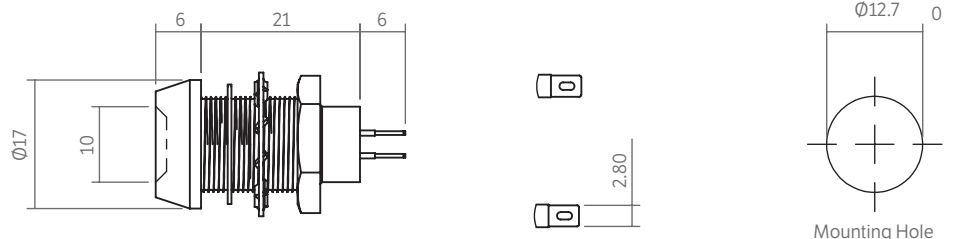# 512 SERIES

## SPECIFICATIONS

- Ø12.7mm mounting (0.500")
- Robust bright nickel plated brass housing
- Sealed to IP67, suitable for high vibration applications
- Smoked lens style

- Flying lead terminations available
- Internal reverse protection diode fitted as standard in all voltage models
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/512series.pdf

## DIMENSIONS



Anode termination indicated by red sleeve.
Mounting hole to be clean and burr free.

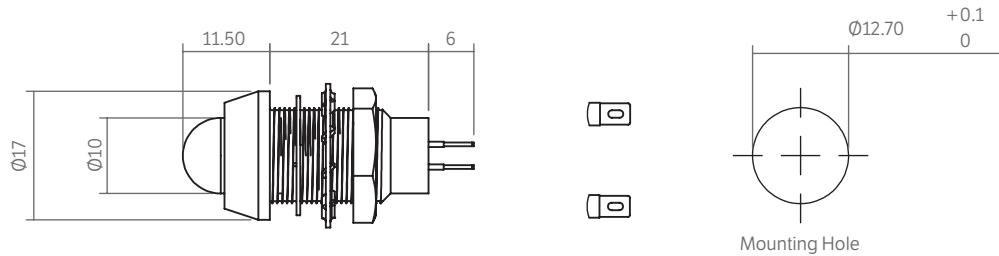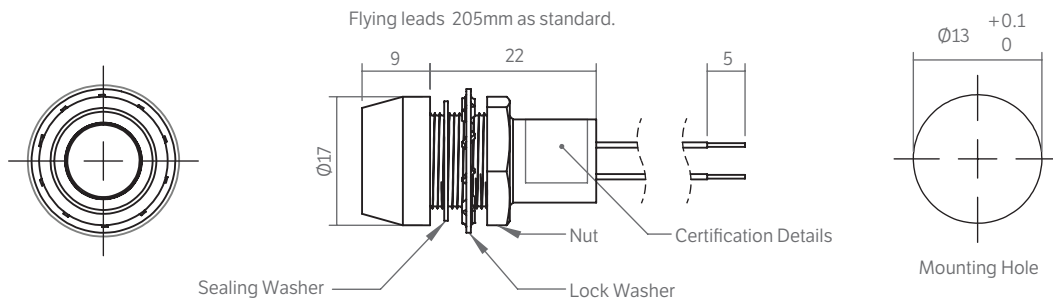Actual size.
All dimensions measured in mm.

# 514 SERIES

## SPECIFICATIONS

- Ø12.7mm mounting (0.500")
- Robust bright nickel plated brass housing
- Raised profile styling with a color diffused lens
- Sealed to IP67

- Suitable for high vibration applications
- Internal reverse protection diode fitted as standard in all voltage models
- Range of LED colors
- Range of voltage options
- Flying lead terminations available

Complete online datasheet: http://ds.leds.co.uk/ds/514series.pdf

## DIMENSIONS

11.50    21    6

Ø17

Ø10

Ø12.70    +0.1 0

Mounting Hole

Anode termination indicated by red sleeve.
Mounting hole to be clean and burr free.

Actual size.
All dimensions measured in mm.

---

# 515 SERIES

## SPECIFICATIONS

- Ø12.7mm mounting (0.500")
- Robust bright nickel plated brass housing
- Atex approved to EN50028 (EN50014)
- Sealed to IP67

- Color diffused lens
- Wide viewing angle
- Suitable for high vibration applications
- Range of LED colors

Complete online datasheet: http://ds.leds.co.uk/ds/515series.pdf

## DIMENSIONS

Flying leads  205mm as standard.

9    22    5

Ø17

Nut

Certification Details

Ø13    +0.1 0

Mounting Hole

Sealing Washer

Lock Washer

Actual size.
All dimensions measured in mm.

# 520 SERIES

- Ø6.1mm (0.240") mounting
- Robust stainless steel housing
- Counter sunk mounting for flush styling
- Sealed to IP67, vandal resistant
- Sunlight readable LEDs with a color diffused lens

- Internal reverse protection diode fitted as standard in all voltage models
- Range of LED colors
- Range of voltage options
- Flying lead terminations available

Complete online datasheet: http://ds.leds.co.uk/ds/520series.pdf
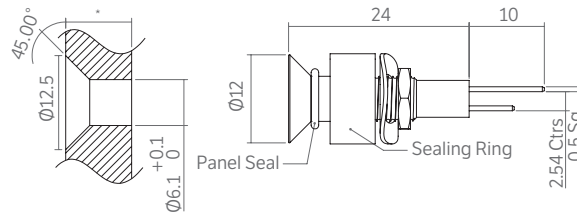
## DIMENSIONS



*Min/max panel thickness is 3mm / 6.5mm. Anode termination indicated by long pin.
Mounting hole to be clean and burr free.

Actual size.
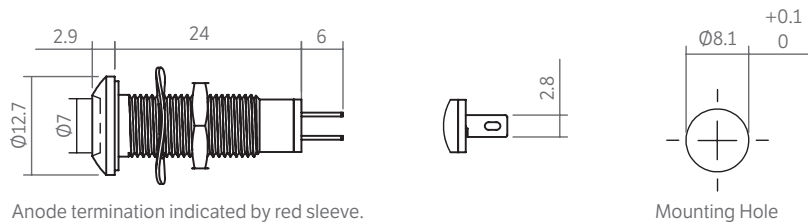All dimensions measured in mm.

---

# 524 SERIES

SPECIFICATIONS

- Ø8.1mm (0.318") mounting
- Robust stainless steel housing
- Sealed to IP67
- Suitable for high vibration applications
- Low profile lens styling with a wide viewing angle

- Sunlight readable LEDs
- Internal reverse protection diode fitted as standard in all voltage models
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/524series.pdf

## DIMENSIONS



Anode termination indicated by red sleeve.
Mounting hole to be clean and burr free.

Mounting Hole

Actual size.
All dimensions measured in mm.

# 525 SERIES

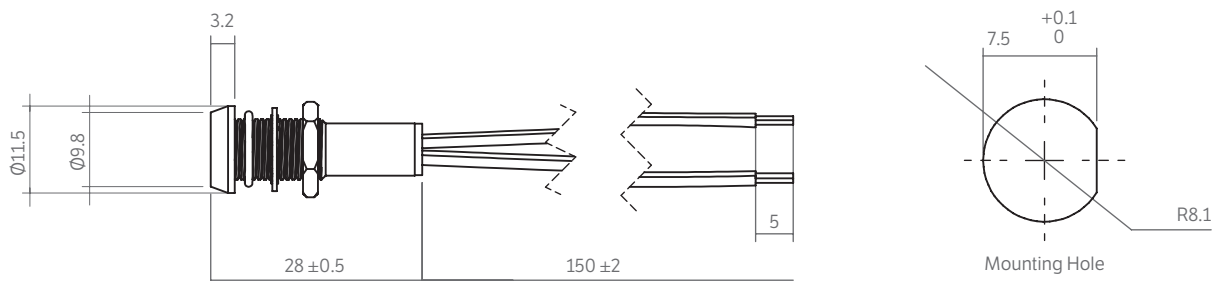## SPECIFICATIONS

- Ø8.1mm (0.318") mounting
- Sealed to IP67
- Suitable for high vibration applications
- Reverse voltage protection
- Wide viewing angle
- White lens for diffusion of color

- Nickel plated brass body with anti-rotation flat
- Range of multi LED colors from a single indicator

Complete online datasheet: http://ds.leds.co.uk/ds/525series.pdf

## DIMENSIONS



3.2

Ø11.5   Ø9.8

28 ±0.5    150 ±2

5

+0.1
7.5    0

R8.1

Mounting Hole

Actual size.
All dimensions measured in mm.

---

# 528 SERIES

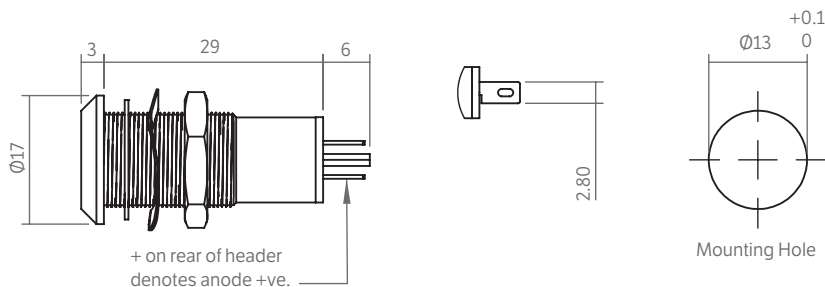## SPECIFICATIONS

- Ø13.0mm (0.500") mounting
- Robust stainless steel housing, sealed to IP67
- Low profile, color diffused lens styling
- Sunlight readable LEDs
- Suitable for high vibration applications

- Internal reverse protection diode fitted as standard in all voltage models
- Range of LED colors
- Range of voltage options
- Flying lead terminations available

Complete online datasheet: http://ds.leds.co.uk/ds/528series.pdf

## DIMENSIONS



3    29    6

Ø17

2.80

+ on rear of header
denotes anode +ve.

+0.1
Ø13    0

Mounting Hole

Actual size.
All dimensions measured in mm.

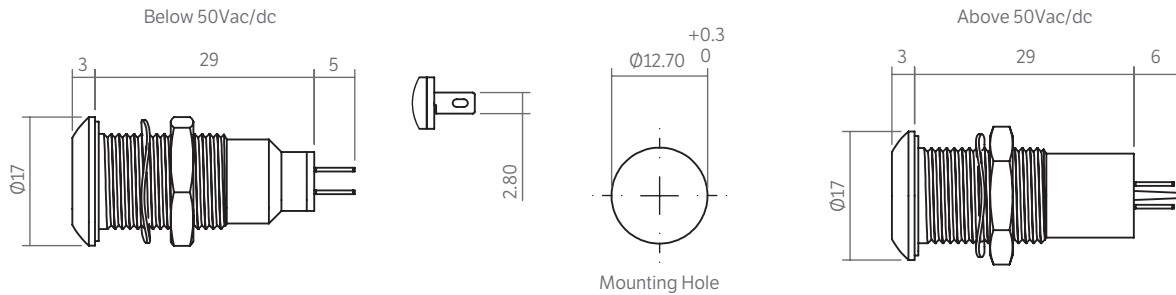# 531 SERIES

- Ø12.7mm mounting (0.500")
- Robust bright nickel plated brass housing
- Product will operate over a wide voltage range
- Full internal potting for use in high vibration applications
- Sealed to IP67

- True bi-polar product for low voltage DC applications
- Other voltages, including DC options are available
- Range of LED colors
- Range of voltage options
- Flying lead terminations available

Complete online datasheet: http://ds.leds.co.uk/ds/531series.pdf

## DIMENSIONS

Below 50Vac/dc

3    29    5

Ø17

+0.3
Ø12.70   0

2.80

Mounting Hole

Above 50Vac/dc

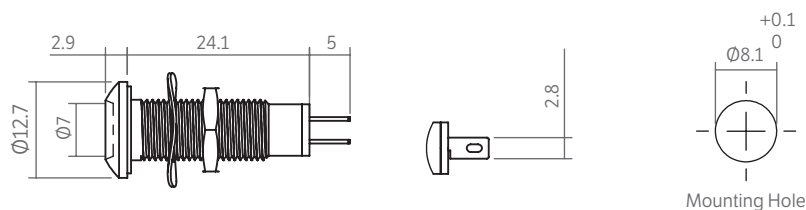3    29    6

Ø17

Actual size.
All dimensions measured in mm.

---

# 534 SERIES

SPECIFICATIONS

- Ø8.1mm (0.318") mounting
- Product will operate over a wide voltage range
- Robust stainless steel housing, sealed to IP67
- Color diffused lens
- Full internal potting to resist shock and vibration

- True bi-polar product for low voltage DC applications
- Other voltages, including DC options are available
- Range of LED colors
- Range of voltage options
- Flying lead terminations available

Complete online datasheet: http://ds.leds.co.uk/ds/534series.pdf

## DIMENSIONS

2.9    24.1    5

Ø12.7   Ø7

2.8

+0.1
Ø8.1   0

Mounting Hole

Actual size.
All dimensions measured in mm.

# 537 SERIES

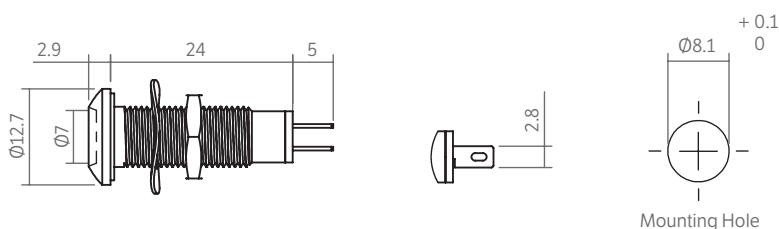## SPECIFICATIONS

- Ø8.1mm mounting (0.318")
- Product will operate over a wide input voltage range
- Bright nickel plated brass housing, sealed to IP67
- Fully internally potted to resist shock and vibration
- Color diffused lens

- True bi-polar product for low voltage DC applications
- Other voltages, including DC options are available
- Range of LED colors
- Range of voltage options
- Flying lead terminations available

Complete online datasheet: http://ds.leds.co.uk/ds/537series.pdf

## DIMENSIONS



2.9  24  5
Ø12.7  Ø7
2.8
Ø8.1  + 0.1 / 0
Mounting Hole

Actual size.
All dimensions measured in mm.

---

# 538 SERIES

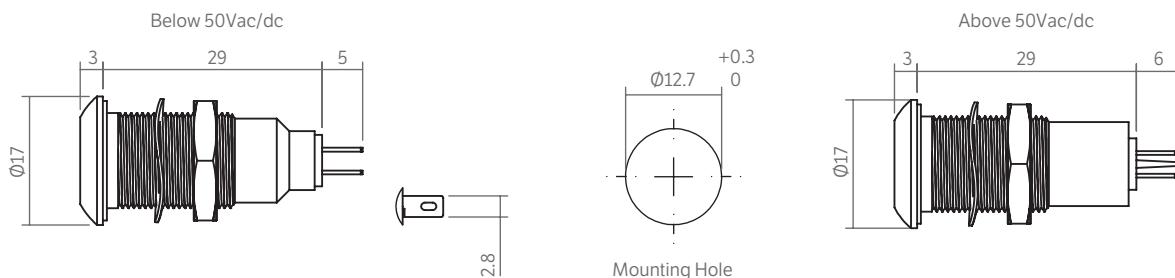## SPECIFICATIONS

- Ø12.7mm (0.500") mounting
- Product will operate over a wide input voltage range
- Robust stainless steel housing, sealed to IP67
- Fully internally potted to resist shock and vibration
- Color diffused lens

- True bi-polar product for low voltage DC applications
- Other voltages, including DC options, are available
- Range of LED colors
- Range of voltage options
- Flying lead terminations available

Complete online datasheet: http://ds.leds.co.uk/ds/538series.pdf

## DIMENSIONS

Below 50Vac/dc

3  29  5
Ø17
2.8

Ø12.7  +0.3 / 0
Mounting Hole
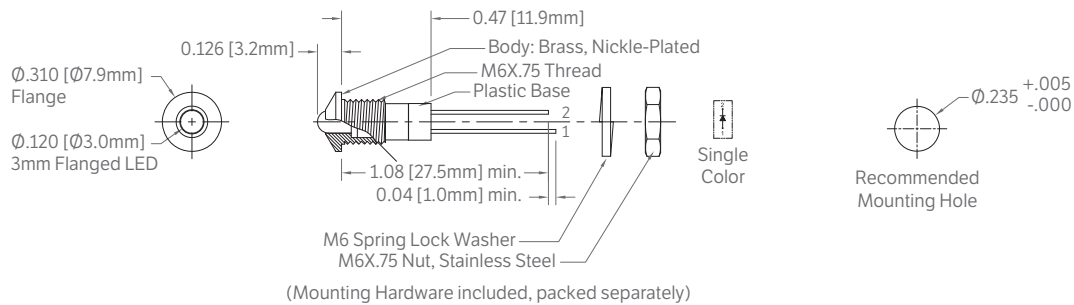
Above 50Vac/dc

3  29  6
Ø17

Actual size.
All dimensions measured in mm.

# 570 SERIES

- Ø6.0mm (0.240") mounting
- Nickel plated brass housing
- Range of LED colors
- Standard intensity LEDs

- Diffused color LED/lens
- Solder pins or wire terminations
- Range of voltage options: 20mA

Complete online datasheet: http://ds.leds.co.uk/ds/570series.pdf

## DIMENSIONS

Ø.310 [Ø7.9mm]
Flange

Ø.120 [Ø3.0mm]
3mm Flanged LED

0.126 [3.2mm]

0.47 [11.9mm]

Body: Brass, Nickle-Plated
M6X.75 Thread
Plastic Base

2
1

1.08 [27.5mm] min.
0.04 [1.0mm] min.

M6 Spring Lock Washer
M6X.75 Nut, Stainless Steel

Single
Color

Ø.235 +.005 -.000

Recommended
Mounting Hole

(Mounting Hardware included, packed separately)

Actual size.
All dimensions measured in mm.

# 571 SERIES

- Ø8.0mm (0.315") mounting
- Nickel plated brass housing
- Range of LED colors
- Standard intensity LEDs

- Diffused color LED/lens
- Solder pins or wire terminations
- Range of voltage options: 20mA
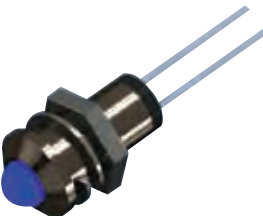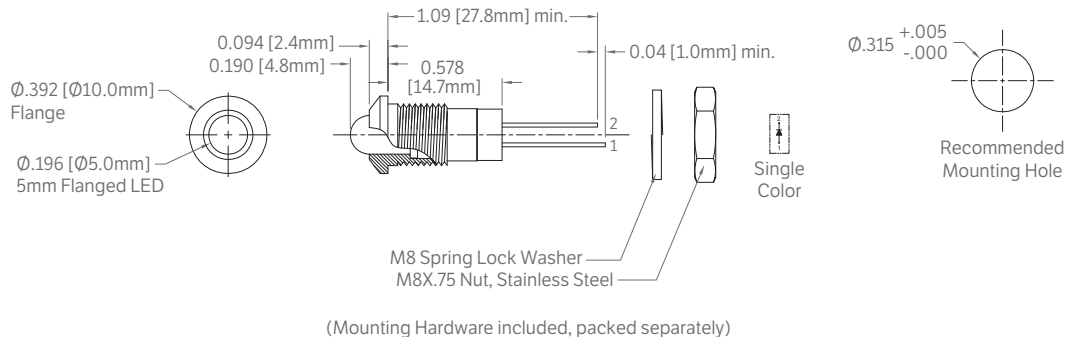
Complete online datasheet: http://ds.leds.co.uk/ds/571series.pdf

## DIMENSIONS

0.094 [2.4mm]
0.190 [4.8mm]

1.09 [27.8mm] min.

0.578
[14.7mm]

0.04 [1.0mm] min.

Ø.392 [Ø10.0mm]
Flange

Ø.196 [Ø5.0mm]
5mm Flanged LED

2
1

Single
Color

Ø.315 +.005 -.000

Recommended
Mounting Hole

M8 Spring Lock Washer
M8X.75 Nut, Stainless Steel

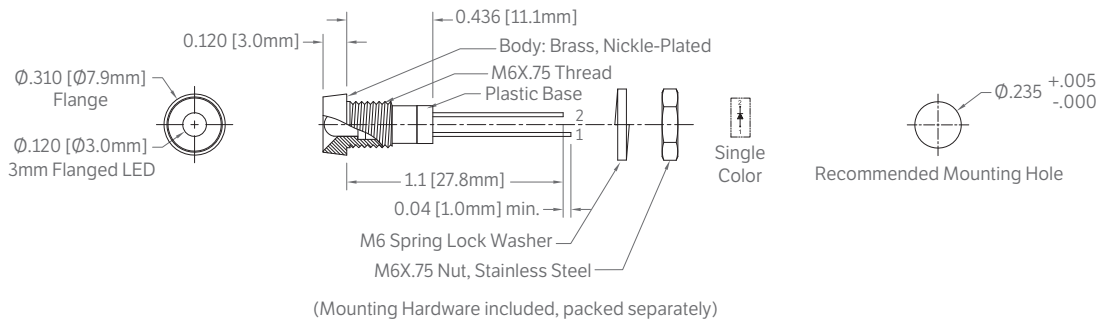(Mounting Hardware included, packed separately)

Actual size.
All dimensions measured in mm.

# 572 SERIES

- Ø6.0mm (0.235") mounting
- Nickel plated brass housing
- Range of LED colors
- Standard intensity LEDs

- Diffused color LED/lens
- Solder pins or wire terminations
- Range of voltage options: 20mA

Complete online datasheet: http://ds.leds.co.uk/ds/572series.pdf

## DIMENSIONS



0.120 [3.0mm]

0.436 [11.1mm]

Body: Brass, Nickle-Plated
M6X.75 Thread
Plastic Base

Ø.310 [Ø7.9mm]
Flange

Ø.120 [Ø3.0mm]
3mm Flanged LED

1.1 [27.8mm]
0.04 [1.0mm] min.
M6 Spring Lock Washer
M6X.75 Nut, Stainless Steel

Single
Color

Ø.235 +.005 -.000

Recommended Mounting Hole

(Mounting Hardware included, packed separately)

Actual size.
All dimensions measured in mm.

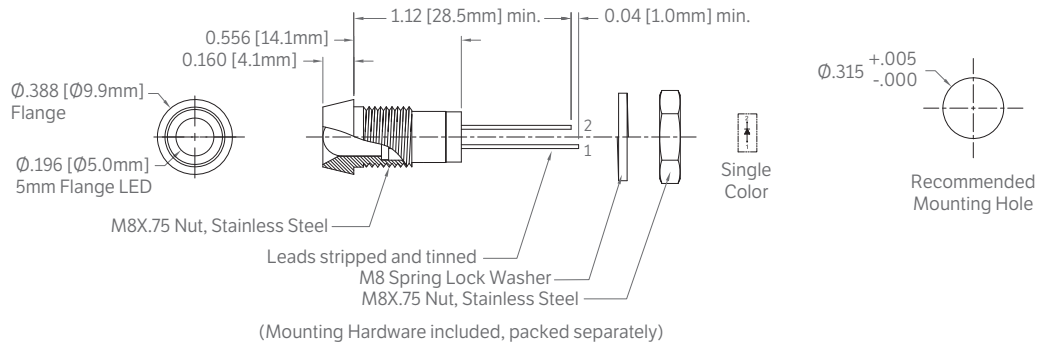# 573 SERIES

- Ø8.0mm (0.315") mounting
- Nickel plated brass housing
- Range of LED colors
- Standard intensity LEDs

- Diffused color LED/lens
- Solder pins or wire terminations
- Range of voltage options: 20mA

Complete online datasheet: http://ds.leds.co.uk/ds/573series.pdf

## DIMENSIONS



1.12 [28.5mm] min.
0.04 [1.0mm] min.

0.556 [14.1mm]
0.160 [4.1mm]

Ø.388 [Ø9.9mm]
Flange

Ø.196 [Ø5.0mm]
5mm Flange LED

M8X.75 Nut, Stainless Steel
Leads stripped and tinned
M8 Spring Lock Washer
M8X.75 Nut, Stainless Steel

Single
Color

Ø.315 +.005 -.000

Recommended
Mounting Hole

(Mounting Hardware included, packed separately)

Actual size.
All dimensions measured in mm.

# 604 SERIES

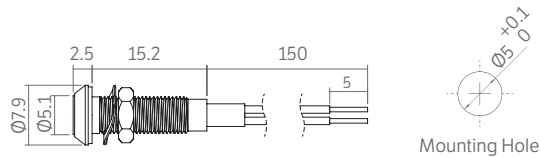## SPECIFICATIONS

- Ø5.0mm (0.197") mounting
- Robust bright nickel plated brass housing
- Sealed to IP67
- Smoked lens with a wide viewing angle
- Suitable for high vibration applications

- Internal reverse protection diode fitted as standard in all voltage models
- Range of LED colors
- Range of voltage options
- Flying lead terminations available

Complete online datasheet: http://ds.leds.co.uk/ds/604series.pdf

## DIMENSIONS

2.5   15.2   150

5

Ø7.9   Ø5.1

Ø5 +0.1/0

Mounting Hole

Actual size.
All dimensions measured in mm.

---

# 612 SERIES

## SPECIFICATIONS

- Ø6.35mm (0.250") mounting
- Black anodized aluminum housing, sealed to IP67
- Internal reverse protection diode fitted as standard in all voltage models
- Smoked lens

- Flying lead terminations available
- Ideal for high vibration applications
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/612series.pdf

## DIMENSIONS

2.5   15   10   0.65 Sq   2.54

Ø9   Ø5.1

Ø6.35 +0.1/0

Mounting Hole
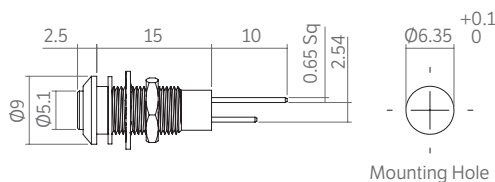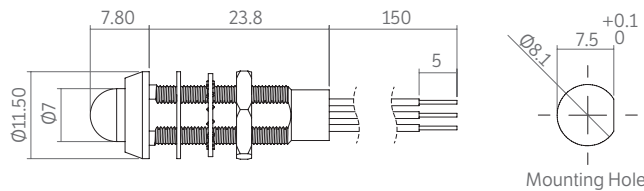
Actual size.
All dimensions measured in mm.

# 614 TRI COLOR SERIES

## SPECIFICATIONS

- Ø8.1mm (0.318") mounting
- Sealed to IP67
- Color coded flying lead terminations
- Internal reverse protection diode fitted as standard
- Configured to work as a tri-color indicator; red/amber/green

- Available with common anode +ve or common cathode -ve
- Range of voltage options
- Can be used as a bi-color or tri-color LED indicator

Complete online datasheet: http://ds.leds.co.uk/ds/614bicolourseries.pdf
http://ds.leds.co.uk/ds/614tricolourseries.pdf

## DIMENSIONS

7.80    23.8    150

5

Ø11.50    Ø7

Ø8.1    7.5    +0.1    0

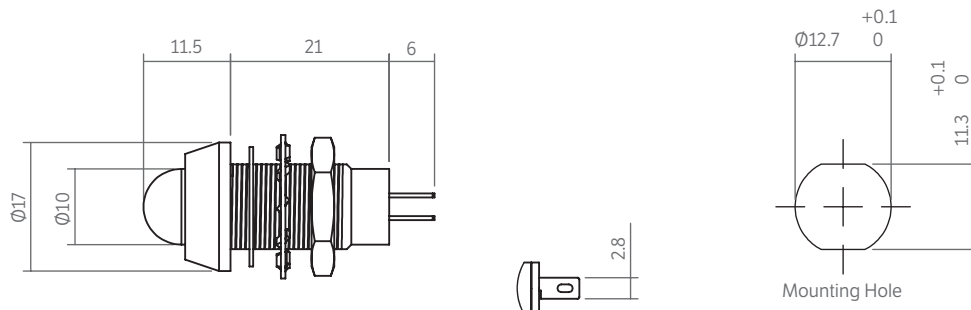Mounting Hole

Actual size.
All dimensions measured in mm.

---

# 651 SERIES

## SPECIFICATIONS

- Ø12.7mm (0.500") mounting
- Black anodized aluminum housing
- Color 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
- Range of LED colors
- Range of voltage options
- Flying lead terminations available

Complete online datasheet: http://ds.leds.co.uk/ds/651series.pdf

## DIMENSIONS

11.5    21    6

Ø17    Ø10

2.8

Ø12.7    +0.1    0

11.3    +0.1    0

Mounting Hole

Actual size.
All dimensions measured in mm.

# 660 SERIES

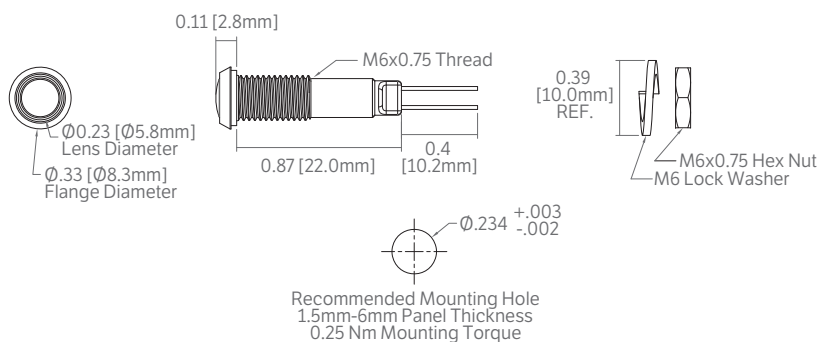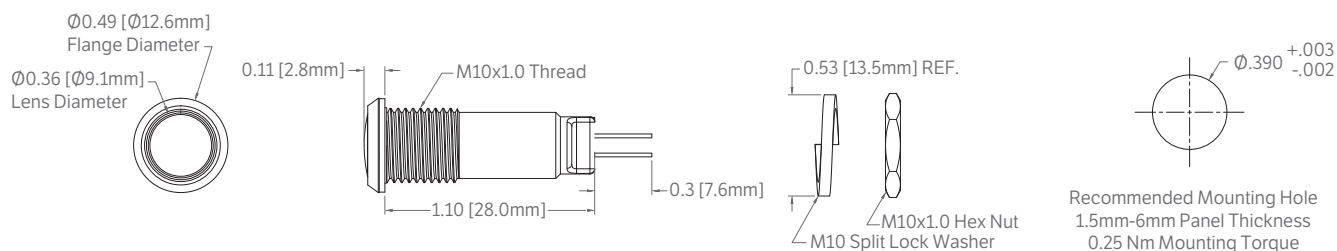## SPECIFICATIONS

- Ø6.0mm (0.234") mounting
- Plastic housing
- Range of LED colors
- Sealed to IP67
- Solder pins or wire terminations

- Diffused lens
- True bi-polar product for low voltage DC applications
- Voltage input: 8-48 Vac/dc

Complete online datasheet: http://ds.leds.co.uk/ds/660series.pdf

## DIMENSIONS

0.11 [2.8mm]

M6x0.75 Thread

Ø0.23 [Ø5.8mm] Lens Diameter
Ø.33 [Ø8.3mm] Flange Diameter

0.87 [22.0mm]

0.4 [10.2mm]

0.39 [10.0mm] REF.

M6x0.75 Hex Nut
M6 Lock Washer

Ø.234 +.003 -.002

Recommended Mounting Hole
1.5mm-6mm Panel Thickness
0.25 Nm Mounting Torque

Actual size.
All dimensions measured in mm.

# 661 SERIES

## SPECIFICATIONS

- Ø9.9mm (0.390") mounting
- Plastic housing
- Range of LED colors
- Sealed to IP67
- Solder pins or wire terminations

- Diffused lens
- Range of voltage options
- True bi-polar product for low voltage DC applications
- Voltage input: 8-48 Vac/dc

Complete online datasheet: http://ds.leds.co.uk/ds/661series.pdf

## DIMENSIONS

Ø0.49 [Ø12.6mm] Flange Diameter
Ø0.36 [Ø9.1mm] Lens Diameter

0.11 [2.8mm]

M10x1.0 Thread

0.53 [13.5mm] REF.

Ø.390 +.003 -.002

0.3 [7.6mm]

1.10 [28.0mm]

M10x1.0 Hex Nut
M10 Split Lock Washer

Recommended Mounting Hole
1.5mm-6mm Panel Thickness
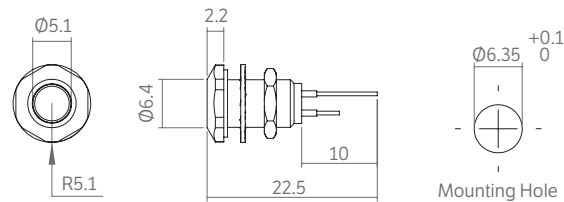0.25 Nm Mounting Torque

Actual size.
All dimensions measured in mm.

# 662 SERIES

- Ø6.35mm (0.250") mounting
- Black anodized aluminum housing
- Unique hexagonal bezel aids mounting
- Flying lead terminations available
- Sealed to IP67
- Range of LED colors

Complete online datasheet: http://ds.leds.co.uk/ds/662series.pdf

## DIMENSIONS



Ø5.1
R5.1
2.2
Ø6.4
10
22.5
Ø6.35 +0.1 / 0
Mounting Hole

Actual size.
All dimensions measured in mm.

---

# 665 SERIES

## SPECIFICATIONS

- Ø8.5mm (0.335") mounting
- Hard black anodized aluminum housing
- Short body length is ideal for portable equipment
- Unique hexagonal bezel to aid mounting to panel
- Unique PTFE mounting/panel seal
- Sealed to IP68 (10psi)to BS5420
- Ideal for marine and high vibration applications
- Range of LED colors
- Range of voltage options: 20mA

Complete online datasheet: http://ds.leds.co.uk/ds/665series.pdf

## DIMENSIONS



Hexagon to suit M6 socket (10mm a/f)
7.8
10.6
150
5
Ø11.5
Ø7
Ø8.5
Lens
Body
Panel Seal
Nut
Toothlock Washer
Flying Leads
Wire Support Boot
Red lead +ve
Black lead -ve
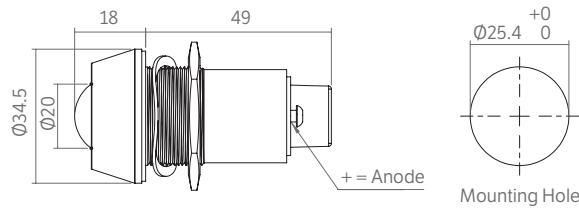Mounting hole
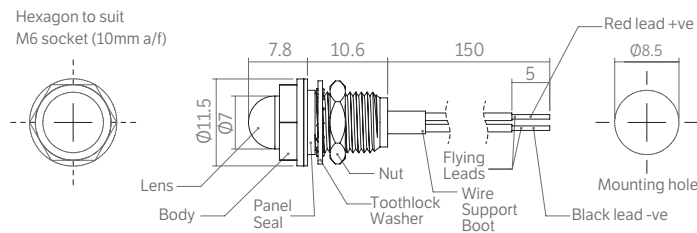
Actual size.
All dimensions measured in mm.

# 671 SERIES

## SPECIFICATIONS

- Ø25.4mm (1.000") mounting
- Black anodized aluminum housing
- RIA 12 approved versions available
- Color diffused lens
- Sealed to IP67

- Large LED indication
- AC versions available
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/671series.pdf

## DIMENSIONS

18    49

Ø34.5   Ø20

+ = Anode

Ø25.4  +0 0

Mounting Hole

Scale 1:2
All dimensions measured in mm.

---

# 677 SERIES

## SPECIFICATIONS

- Ø8.1mm (0.318") mounting
- Black anodized aluminum housing
- Sealed to IP67 - weatherproof
- Wide viewing angle - smoked lens
- Internal potting

- Internal reverse protection diode fitted as standard
- Range of LED color options
- Range of voltage options
- Flying lead terminations available

Complete online datasheet: http://ds.leds.co.uk/ds/677series.pdf

## DIMENSIONS

3.2    23.8    6

Ø11.5   Ø7

2.8

7.5  +0.1 0

Ø8.1  +0.1 0

Mounting Hole
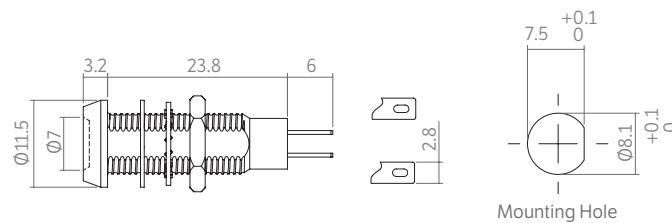
Actual size.
All dimensions measured in mm.

# 677 EMC SERIES

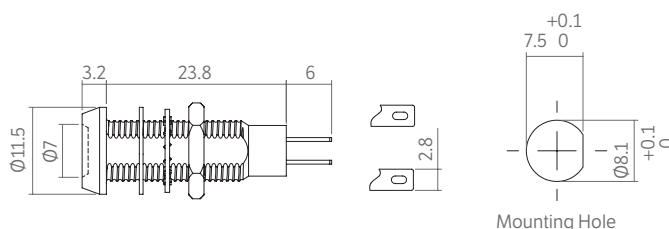## SPECIFICATIONS

- Ø8.1mm (0.318") mounting
- EMC version with internal stainless steel mesh
- Black chrome plated aluminum housing with a conductive rubber panel seal
- Sealed to IP67

- Internal reverse protection diode fitted as standard in all voltage models
- Range of LED colors
- Range of voltage options
- EMC version with internal stainless steel mesh on lens assembly
- Flying lead terminations available

Complete online datasheet: http://ds.leds.co.uk/ds/677emcseries.pdf

## DIMENSIONS



3.2    23.8    6

Ø11.5    Ø7

2.8

+0.1
7.5   0

Ø8.1   +0.1
0

Mounting Hole

Actual size.
All dimensions measured in mm.

# 690 SERIES

## SPECIFICATIONS

- Ø9.6mm (3.8") mounting
- UL Certified - certificate number E349017
- High intensity LED panel indicator
- Black anodized aluminum housing
- Wide viewing angle

- Internal potting aids vibration
- 8 – 48Vac/dc
- Bi-polar product
- Sealed to IP67 - weather proof
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/690series.pdf

## DIMENSIONS



2.6
(0.102")    24.4
(0.961")    5
(0.197")

2.80

Ø12 (0.472")    Ø7.5 (0.295")

3

+0.1
8.74   0
(0.344")

Ø9.6   +0.2
0
(0.375-0.378")

Ø9.6   +0.2
0
(0.375-0.378")

Mounting Hole
(Anti-rotation)

Mounting Hole
(Standard)
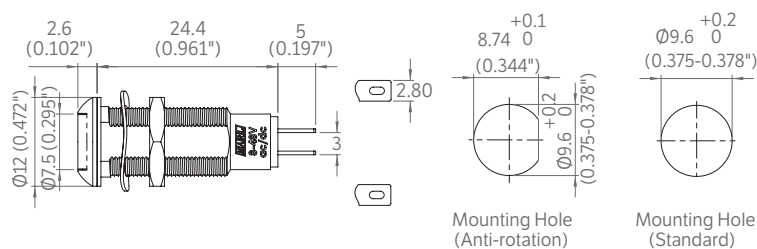
Actual size.
All dimensions measured in mm.

# 692 SERIES

- Ø12.7mm (0.500") mounting
- Black anodized aluminum housing
- Flame retardant flying lead options
- Sealed to IP67
- Color diffused lens

- Fully internally potted to resist shock and vibration
- Internal reverse protection diode fitted as standard
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/692series.pdf

## DIMENSIONS



Mounting Hole
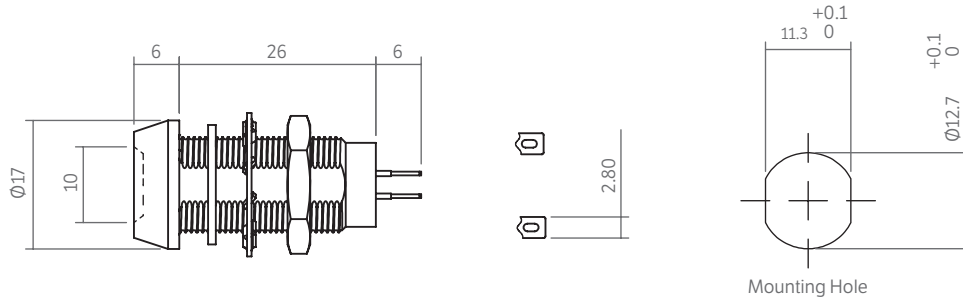
Actual size.
All dimensions measured in mm.

---

# 696 SERIES

SPECIFICATIONS

- Ø6.1mm (0.240") mounting
- Black anodized aluminum housing
- Counter sunk mounting for flush styling
- Sealed to IP67 and vandal resistant
- Flying lead terminations available

- Color diffused lens with a wide viewing angle
- Internal reverse protection diode fitted as standard in all voltage models
- Range of LED colors
- Range of voltage options

Complete online datasheet: http://ds.leds.co.uk/ds/696series.pdf

## DIMENSIONS



Panel and Mounting Hole        *Min/max panel thickness is 3mm/6.5mm.
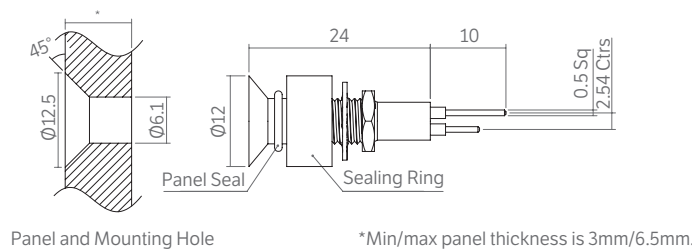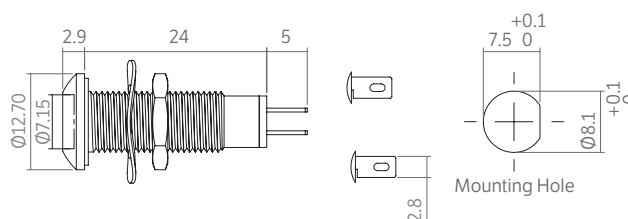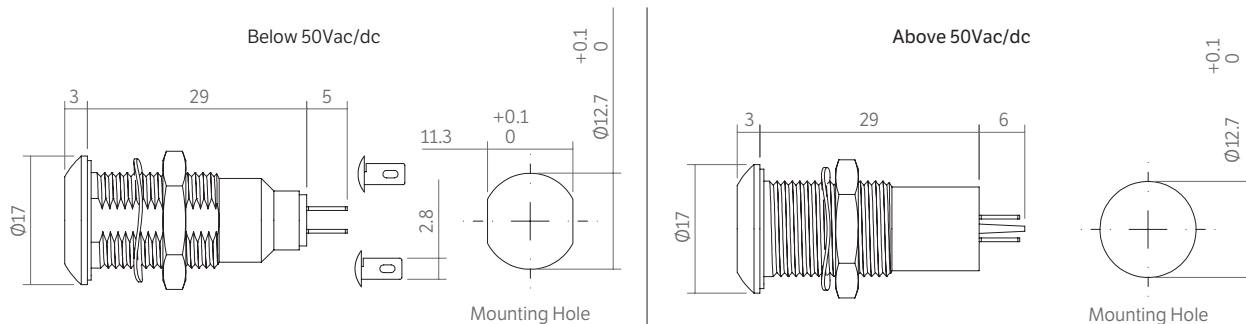
Actual size.
All dimensions measured in mm.

# 698 SERIES

## SPECIFICATIONS

- Ø8.1mm (0.318") mounting
- Product will operate over a wide input voltage range
- Black anodized aluminum housing, sealed to IP67
- Smoked lens style
- Fully internally potted to resist shock and vibration

- True bi-polar product for low voltage DC applications
- Other voltages, including DC options, are available
- Range of LED colors
- Flying lead terminations available

Complete online datasheet: http://ds.leds.co.uk/ds/698series.pdf

## DIMENSIONS



Mounting Hole

Actual size.
All dimensions measured in mm.

# 699 SERIES

## SPECIFICATIONS

- Ø12.7mm (0.500") mounting
- Product will operate over a wide input voltage range
- Black anodized aluminum housing, sealed to IP67
- Color diffused lens
- Fully internally potted to resist shock and vibration

- True bi-polar product for low voltage DC applications
- Other voltages including DC options are available
- Range of LED colors
- Flying lead terminations available

Complete online datasheet: http://ds.leds.co.uk/ds/699series.pdf

## DIMENSIONS



Below 50Vac/dc

Mounting Hole

Above 50Vac/dc

Mounting Hole

Actual size.
All dimensions measured in mm.

# IMPORTANT GENERAL INFORMATION

Whilst we try to ensure accurate LED color representation, please be aware that the photographic printing process may sometimes alter color of LEDs, lenses and component images.

All component specifications are believed to be valid at the time of going to press and are subject to change without notice. Errors and omissions excepted.

Components featured are from Marl's Core Product Ranges and suggestions or applications for use is left with the Customer to select the correct component for the application. Any modifications made by the customer to the component may invalidate the warranty. Any variations to specifications and full details of conditions of sale can be obtained by contacting us at:

Marl International Ltd Marl Business Park, Ulverston, Cumbria, LA12 9BN, UK

T +44 (0) 1229 582 430  |  F +44 (0) 1229 585 155
E sales@marl.co.uk  |  **www.leds.co.uk**

**MARL**

Marl International Ltd  Marl Business Park, Ulverston, Cumbria, LA12 9BN, UK
T +44 (0) 1229 582 430 | F +44 (0) 1229 585 155 | E sales@marl.co.uk

marlleds
marlinternationallimited
company/marl-international-limited
marlinternationalltd

**www.leds.co.uk**