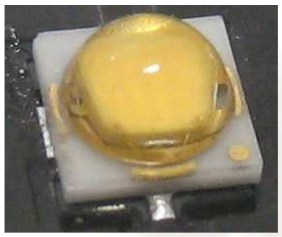
16mm : LLC02N LLC02M LLC02W LLC02X LLC02S LLC02E
16 mm: LLC12N LLC12M LLC12W
32 mm: LLC05N LLC05M LLC05W
35 mm: LLC07N LLC17N

Seoul Semiconductor Z5M monster Datasheet



LednLight, a high performance LED collimator series, for all your high power LEDs lighting applications

Benefits of the LednLight product range:

- Innovative and unique design, which allows you to use most existing LEDs references
- Homogeneous light distribution, resulting from software optimization and quality polymer
- Available with mechanical holder for ease of use and production
- Ready to use and easy integration into a cluster part

Characteristics of collimator LLC02E:

- Compatible with automotive standards (ECE and SAE)
- Compatible with traffic light standards (class M)

Characteristics of collimator LLC05N:

- Reduced divergence and high brightness light beam for all for long range lighting applications
- Compliant with surgical lighting applications

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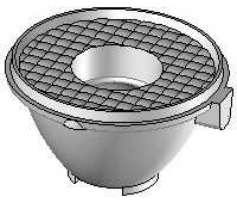
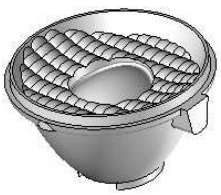
Seoul Semiconductor Z5 "monster" Datasheet

Optical Characteristics, overview table

Collimator	*LED*	*Half angle at 50% (°)*	*Half angle at 10% (°)*	*Efficicacity in cd / lm*	*Holder & options*
 LLC02N	Z5M - cool white	7.9	15.3	7.0	Mono Mono+ Adhesive Tri Quadri
 LLC02M	Z5M - cool white	13.2	22.5	3.3	Mono Mono+ Adhesive Tri Quadri
 LLC02W	Z5M - cool white	*16.6*	*28.4*	2.1	Mono Mono+ Adhesive Tri Quadri
 LLC02X	Z5M - cool white	*16.9*	*40.7*	1.2	Mono Mono+ Adhesive Tri Quadri
 LLC02S	Z5M - cool white	*21.2*	*39.7*	1.2	Mono Mono+ Adhesive Tri Quadri
 LLC02E	Z5M - cool white	10.6v / 16.4h	19.8v / 28.3h	2.8	Mono Mono+ Adhesive Tri Quadri

Measurement tolerances: angular +/- 5% efficiency +/- 10% . The values depend on your led bin

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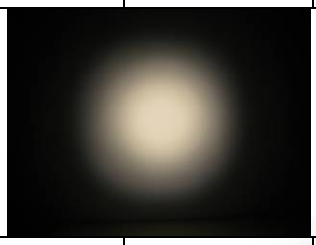
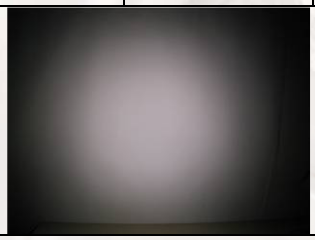
LednLight 16mm to be used with SEOUL SEMICONDUCTORS Z5M series

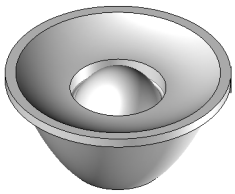
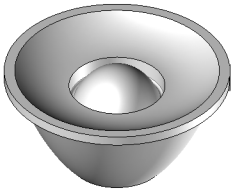
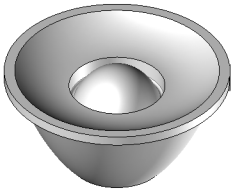
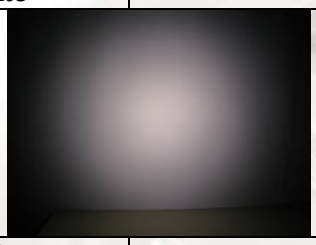
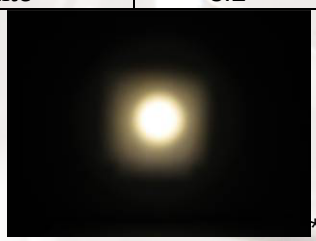
Collimator	LED	Half angle at 50%	Half angle at 10%	Efficacity cd / lm	Options & fastening
 LLC12N	Z5M - cool white	7.8	14.8	9.1	Mono Tri Quadri Mono+ adhesive
					
 LLC12M	Z5M - cool white	12.3	20.1	4.2	Mono Tri Quadri Mono+ adhesive
					
 LLC12W	Z5M - cool white	17.0	29.3	2.2	Mono Tri Quadri Mono+ adhesive
					

Measurement tolerances: angular +/- 5% efficiency +/- 10% . The values depend on your led bin

The LLC12 range is an update of LLC02 range with less light losses (90% LOR)

- *Mechanical compatibility with the 16 mm holders*
- Provide new beam angles
- Provide enhanced light output ratio
- *Up to 90% efficiency in +/- 15° solid angle for narrow & medium*
- *Little or no parasite light*
- Provide enhanced homogeneity
- *No chip image for narrow beam*
- *No ghost image of diffusing structure for medium & wide beams*

LednLight 32& 35mm to be used with SEOUL SEMICONDUCTORS Z5M series

 LLC05N	Z5M - cool white	*4.0*	*6.6*	40.2	Mono Mono+ adhsive
					
 LLC05M	Z5M - cool white	8.9	19.5	5.4	Mono Mono+ adhsive
					
 LLC05W	Z5M - cool white	12.2	24.3	3.4	Mono Mono+ adhsive
					
 LLC07N	Z5M - cool white	3.2	7.0	45	no
	 *				
 LLC17N	Z5M - cool white	3.7	7.9	31.2	no
					

Measurement tolerances: angular +/- 5% efficiency +/- 10% . The values depend on your led bin

* Ghost image of the die

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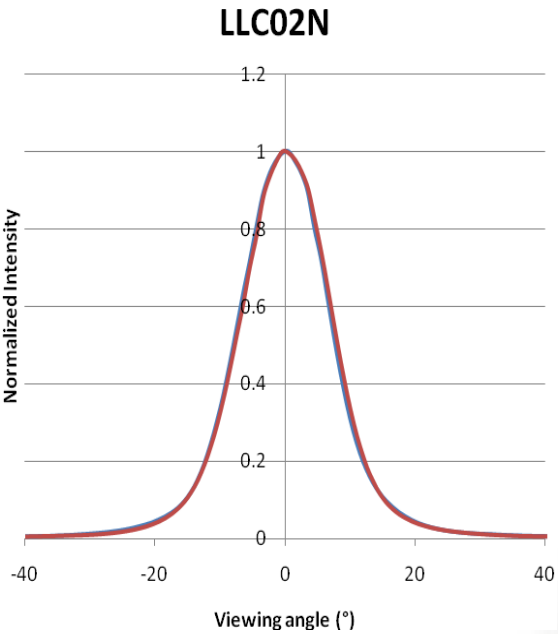
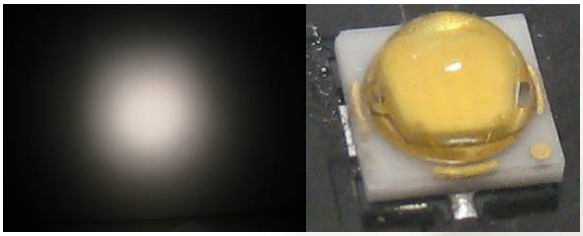
Optical characteristics and intensity distribution Collimator LLC02N – SEOUL Z5M

Measurements done with Ledgon 100 photogoniometer

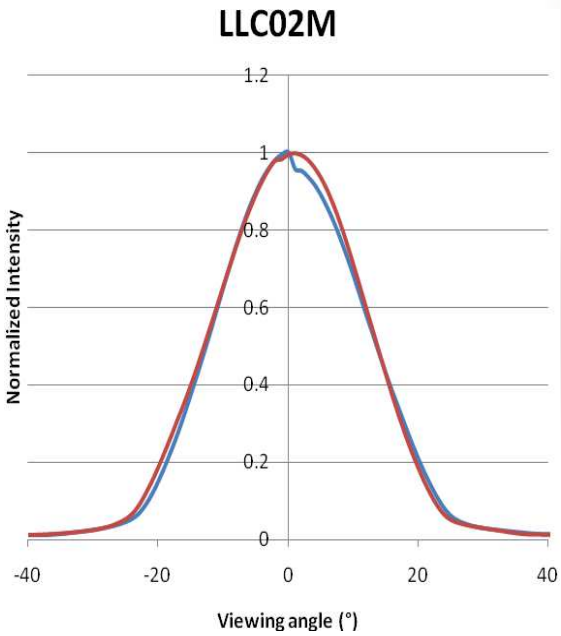




- SEOUL Z5M Cool white @350 mA reference SZW05A0A
- Narrow circular beam
- Efficacity 7.9 candelas per lumen
- Half-angle at 50% from maximum 7.9 °
- Half-angle at 10% from maximum 15.3 °
- Available with dedicated holder *for one LLH01AAA00) three (LH03XRR01) or four optics (LLH04XRR01).*

Optical characteristics and intensity distribution Collimator LLC02M – SEOUL Z5M

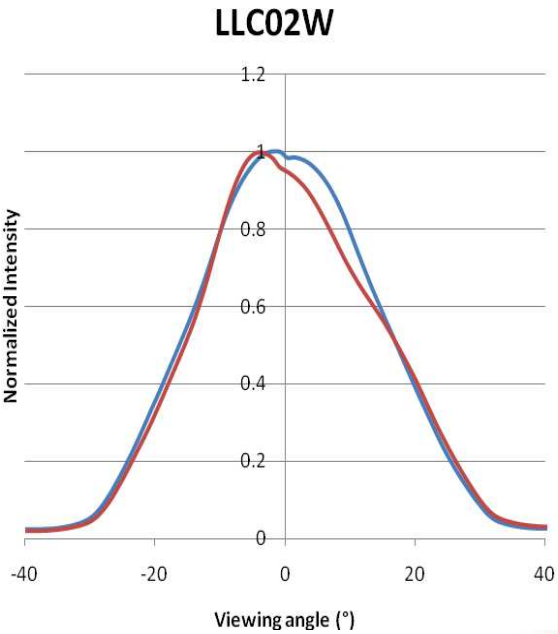
Measurements done with Ledgon 100 photogoniometer



- SEOUL Z5M Cool white @350 mA reference SZW05A0A
- Medium circular beam
- Efficacity 3.3candelas per lumen
- Half-angle at 50% from maximum 13.2°
- Half-angle at 10% from maximum 22.5°
- Available with dedicated holder *for one (LLH01AAA00) three (LH03XRR01) or four optics (LLH04XRR01).*

Optical characteristics and intensity distribution Collimator LLC02W - SEOUL Z5M

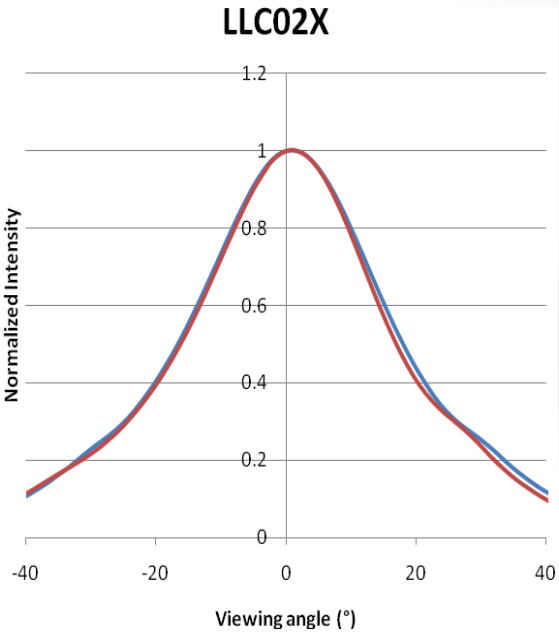
Measurements done with Ledgon 100 photogoniometer



- SEOUL Z5M Cool white @350 mA reference SZW05A0A
- Large circular beam
- Efficacity 2.1candelas per lumen
- Half-angle at 50% from maximum *16.6°*
- Half-angle at 10% from maximum *28.4°*
- Available with dedicated holder *for one (LLH01AAA00) three (LH03XRR01) or four optics (LLH04XRR01).*

Optical characteristics and intensity distribution Collimator LLC02X - SEOUL Z5M

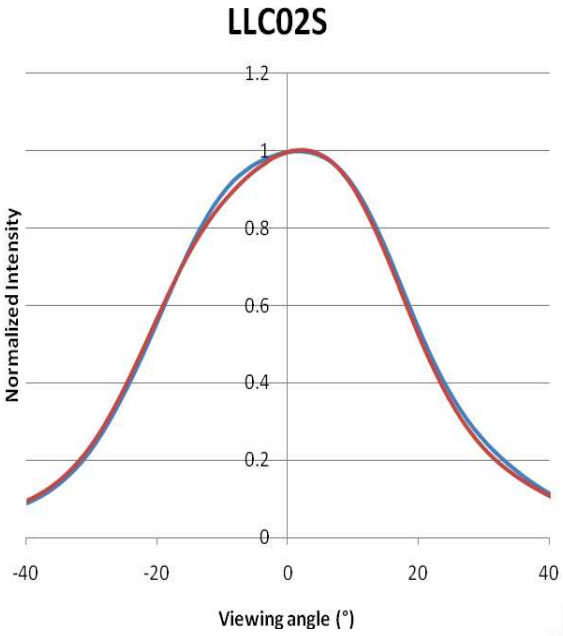
Measurements done with Ledgon 100 photogoniometer



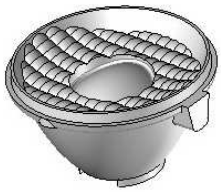
- SEOUL Z5M Cool white @350 mA reference SZW05A0A
- eXtra large circular beam
- Efficacity 1.2 candelas per lumen
- Half-angle at 50% from maximum *16.9°*
- Half-angle at 10% from maximum *40.7°*
- Available with dedicated holder *for one (LLH01AAA00) three (LH03XRR01) or four optics (LLH04XRR01).*

Optical characteristics and intensity distribution
Collimator LLC02S- SEOUL Z5M

Measurements done with
Ledgon 100 photogoniometer

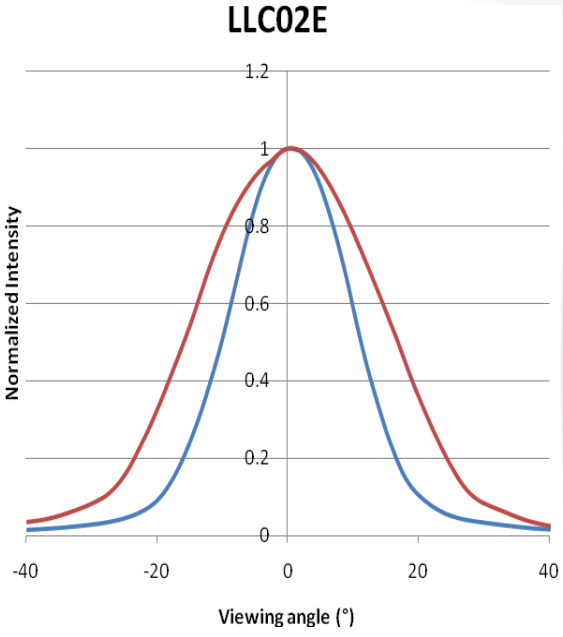


- SEOUL Z5M Cool white @350 mA reference SZW05A0A
- Super wide beam
- Efficacity 1.2 candelas per lumen
- Half-angle at 50% from maximum *21.2°*
- Half-angle at 10% from maximum *39.7°*
- Available with dedicated holder *for one (LLH01AAA00) three (LH03XRR01) or four optics (LLH04XRR01).*



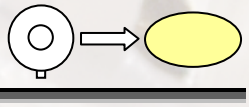
Optical characteristics and intensity distribution
Collimator LLC02E- SEOUL Z5MM

Measurements done with
Ledgon 100 photogoniometer



- SEOUL Z5M Cool white @350 mA
- Elliptical beam
- Efficacity 2.8 candelas per lumen
- Half-angle at 50% from maximum 10.6v°x16.4h°
- Half-angle at 10% from maximum 19.8v°x28.3h°
- Available with dedicated holder *for one (LLH01AAA00) three (LH03XRR01) or four optics (LLH04XRR01).*
- Designed to meet automotive and traffic light standards.

LLC02E: Beam orientation relative to the injection point



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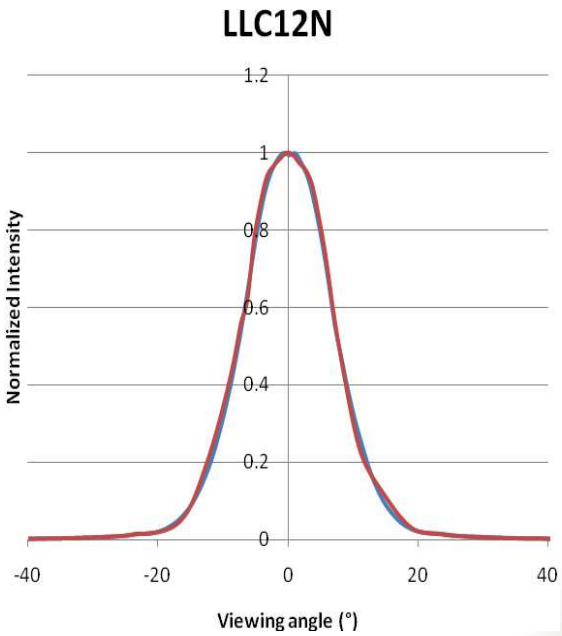
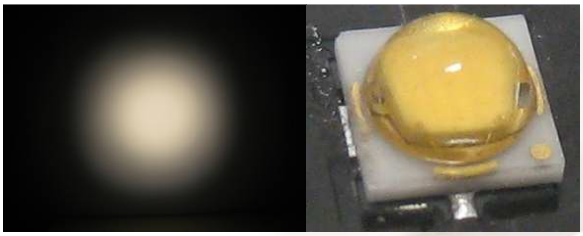
Optical characteristics and intensity distribution
Collimator LLC12N – SEOUL Z5M

Measurements done with
Ledgon 100 photogoniometer

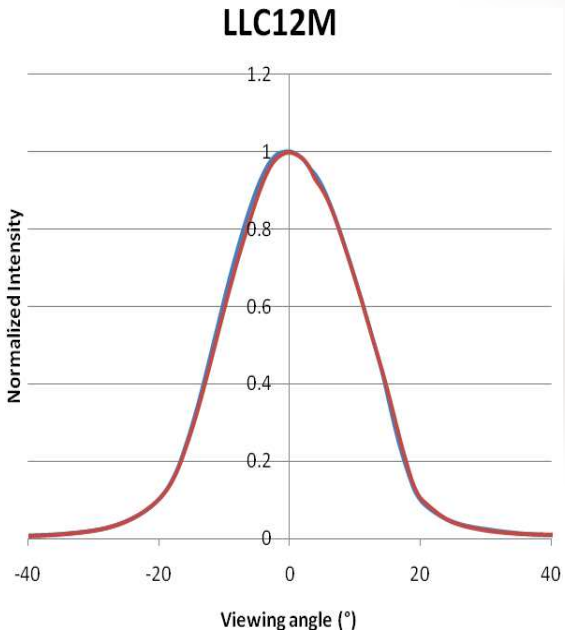




- SEOUL Z5M Cool white @350 mA reference SZW05A0A
- Narrow circular beam
- Efficacity 9.1 candelas per lumen
- Half-angle at 50% from maximum 7.8
- Half-angle at 10% from maximum 14.8
- Available with dedicated holder *for one LLH01AAA00) three (LH03XRR01) or four optics (LLH04XRR01).*

Optical characteristics and intensity distribution
Collimator LLC12M – SEOUL Z5MM

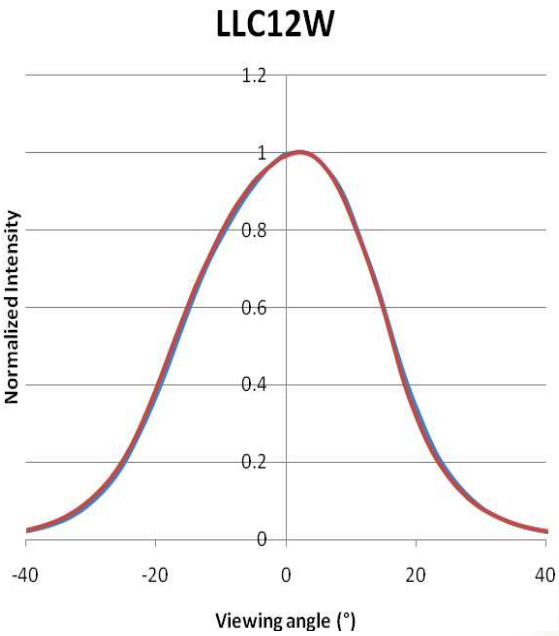
Measurements done with
Ledgon 100 photogoniometer



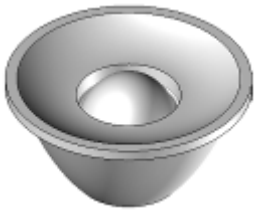
- SEOUL Z5M Cool white @350 mA reference SZW05A0A
- Medium circular beam
- Efficacity 4.2 candelas per lumen
- Half-angle at 50% from maximum 12.3°
- Half-angle at 10% from maximum 20.1°
- Available with dedicated holder *for one (LLH01AAA00) three (LH03XRR01) or four optics (LLH04XRR01).*

Optical characteristics and intensity distribution Collimator LLC12W - SEOUL Z5M

Measurements done with Ledgon 100 photogoniometer

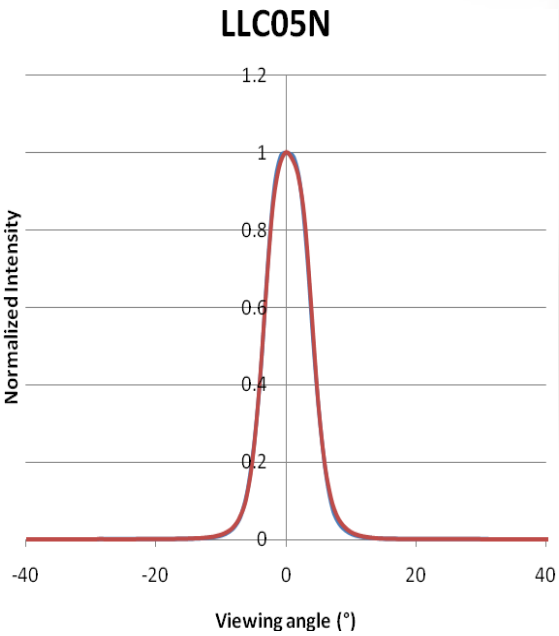


- SEOUL Z5M Cool white @350 mA reference SZW05A0A
- Large circular beam
- Efficacity 2.2 candelas per lumen
- Half-angle at 50% from maximum 17.0°
- Half-angle at 10% from maximum 29.3°
- Available with dedicated holder *for one (LLH01AAA00) three (LH03XRR01) or four optics (LLH04XRR01).*

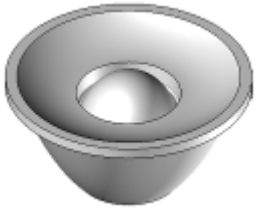


Optical characteristics and intensity distribution Collimator LLC05N - SEOUL SEMICONDUCTORS Z5M

Measurements done with Ledgon 100 photogoniometer

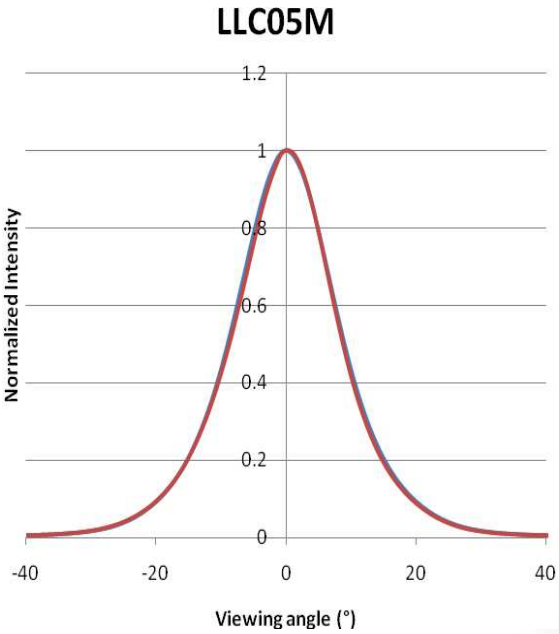


- SEOUL Z5M Cool white @350 mA reference SZW05A0A
- Super narrow circular beam
- Efficacity 40.2 candelas per lumen
- Half-angle at 50% from maximum *4.0*°
- Half-angle at 10% from maximum *6.6*°
- Available with dedicated *holder (LLH02XAL02) positioning holes needs to be created into the PCB.*

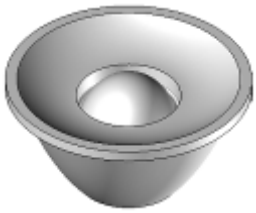


Optical characteristics and intensity distribution
Collimator LLC05M - SEOUL SEMICONDUCTORS Z5M

Measurements done with
Ledgon 100 photogoniometer



- SEOUL Z5M Cool white @350 mA reference SZW05A0A
- Medium circular beam
- Efficacity 5.4 candelas per lumen
- Half-angle at 50% from maximum 8.9°
- Half-angle at 10% from maximum 19.5°
- Available with dedicated *holder (LLH02XAL02) positioning holes needs to be created into the PCB.*



Optical characteristics and intensity distribution
Collimator LLC05W - SEOUL SEMICONDUCTORS Z5M

Measurements done with
Ledgon 100 photogoniometer

- SEOUL Z5M Cool white @350 mA reference SZW05A0A
- Wide circular beam
- Efficacity 3.4 candelas per lumen
- Half-angle at 50% from maximum 12.2°
- Half-angle at 10% from maximum 24.3°
- Available with dedicated *holder (LLH02XAL02) positioning holes needs to be created into the PCB.*

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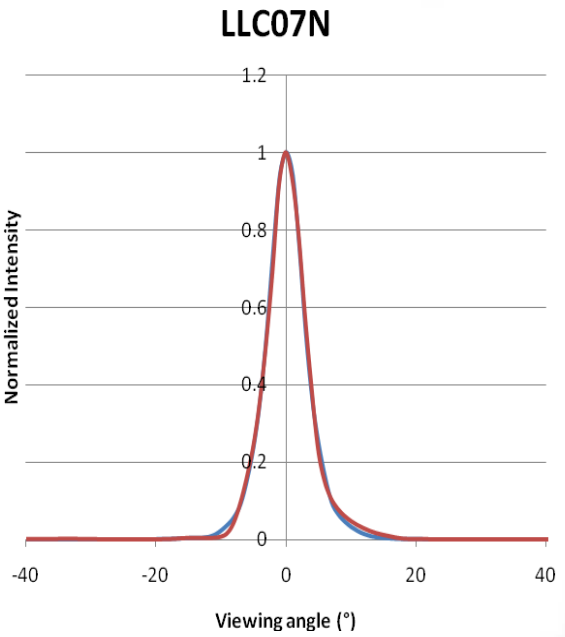
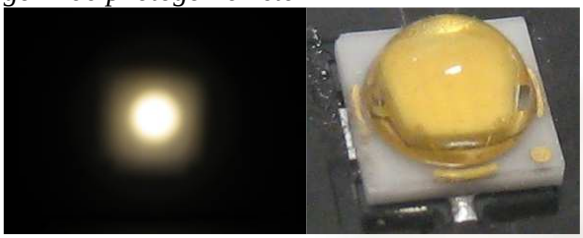
Optical characteristics and intensity distribution
Collimator LLC07N - SEOUL SEMICONDUCTORS Z5M

Measurements done with
Ledgon 100 photogoniometer

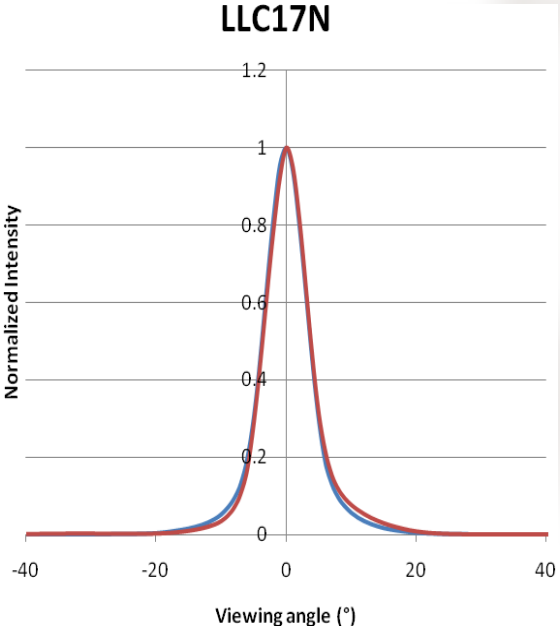


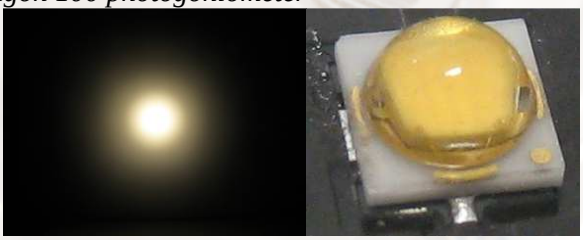


- SEOUL Z5M Cool white @350 mA reference SZW05A0A
- Super narrow circular beam
- Ghost image of the die
- Efficacity 45 candelas per lumen
- Half-angle at 50% from maximum 3.2°
- Half-angle at 10% from maximum 7.0°

Optical characteristics and intensity distribution
Collimator LLC17N - SEOUL SEMICONDUCTORS Z5M

Measurements done with
Ledgon 100 photogoniometer

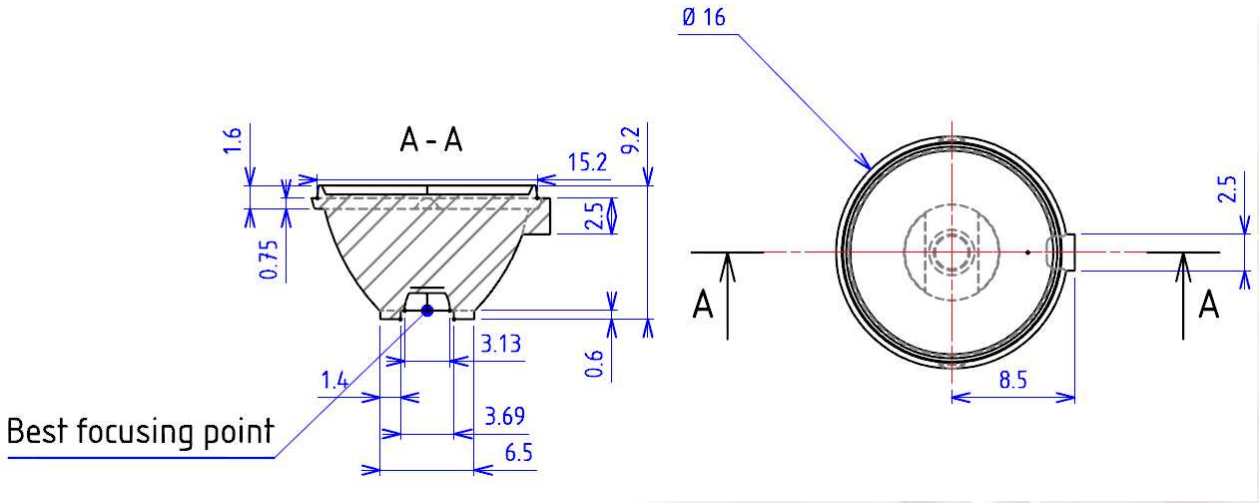




- SEOUL Z5M Cool white @350 mA reference SZW05A0A
- Super narrow circular beam
- Efficacity 31.2 candelas per lumen
- Half-angle at 50% from maximum 3.7°
- Half-angle at 10% from maximum 7.9°.

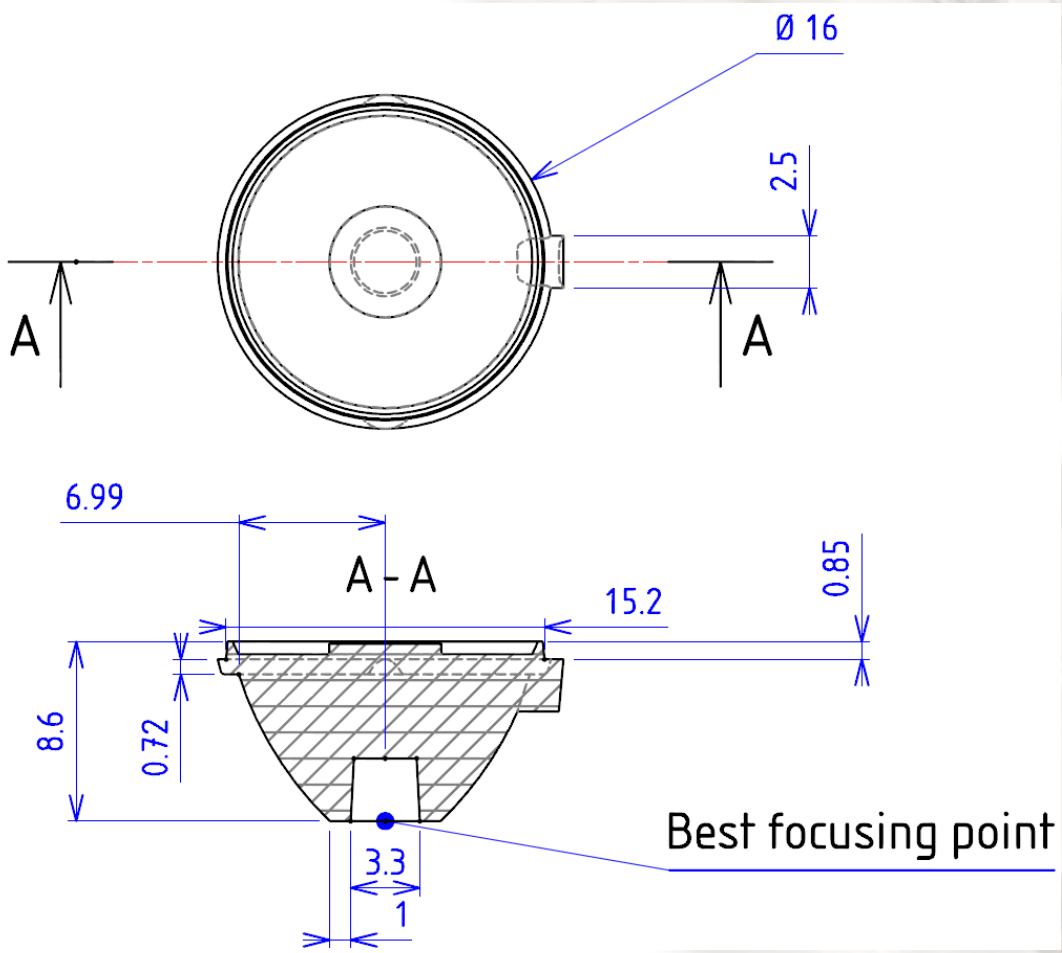
Mechanical characteristics LLC02N, LLC02M, LLC02W, LLC02E, LLC02X and LLC02S and LLC02E

Without holder, all dimensions are in millimeters
General tolerance +/-0.1 mm (standard NF T 58 -000 cat. 4, reduced class)



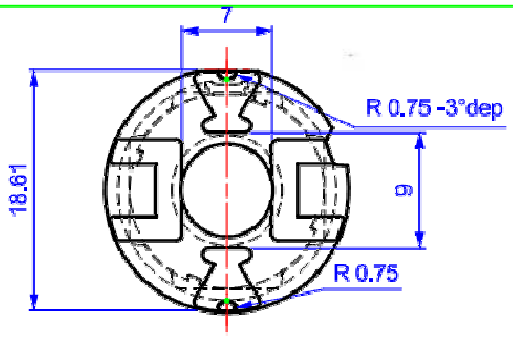
Mechanical characteristics LLC12N, LLC12M, LLC12W, LLC12E

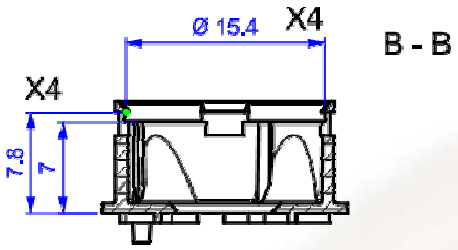
Without holder, all dimensions are in millimeters
General tolerance +/-0.1 mm (standard NF T 58 -000 cat. 4, reduced class)

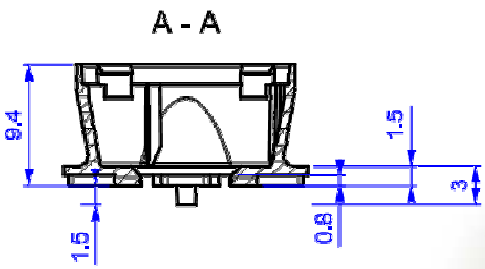


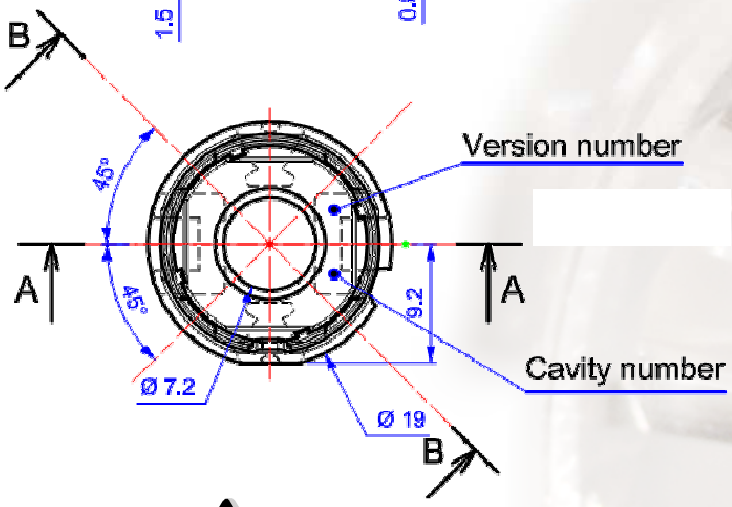
Mechanical characteristics Holder LLH01AAA

all dimensions are in millimetres
General tolerance +/-0.1 mm (standard NF T 58 -000 cat. 4, reduced class)









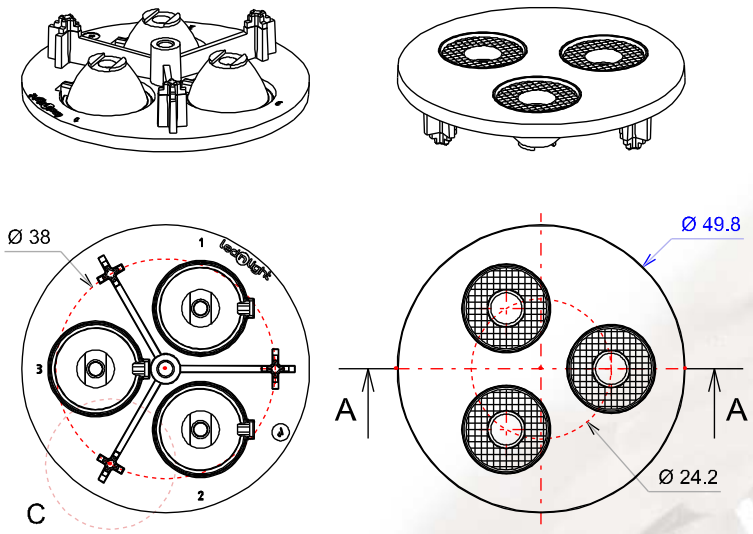
Ech : 1/1

Positioning holes needs to be created into the pcb

GAGGIONE SAS – 3, Rue de la Rolland – 01460 Montréal la Cluse – France
Tel : +33 (0)4 74 76 12 66 – Fax : +33 (0)4 74 76 76 77 – E-mail : lednlight@gaggione.com Web : www.lednlight.com

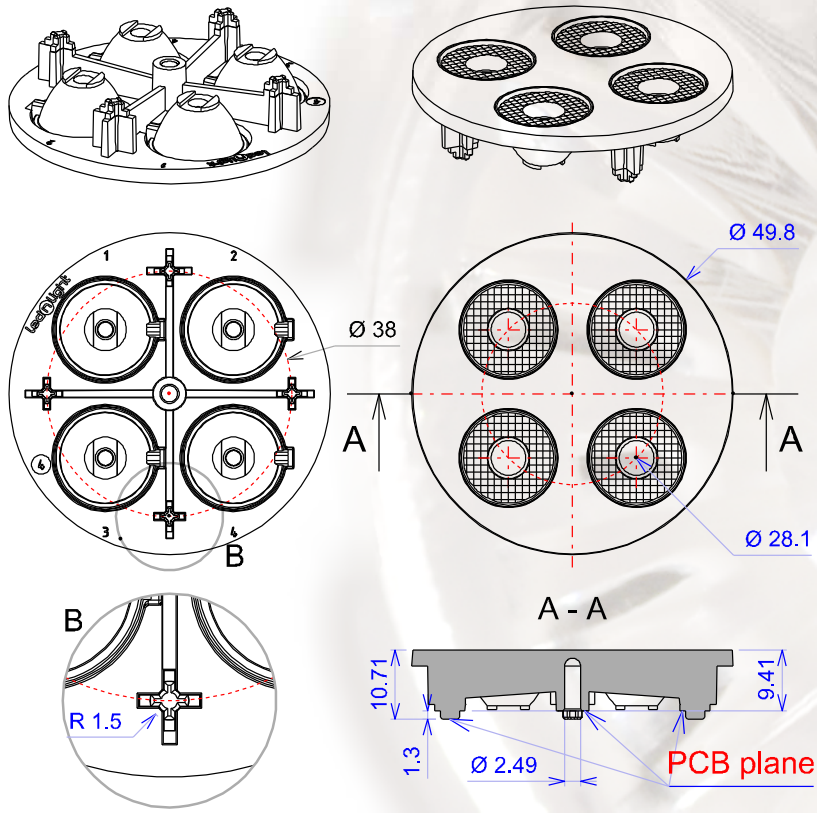
Mechanical characteristics holder TRI LLH03XRR

All dimensions are in millimeters
General tolerance +/-0.15 mm (standard NF T 58 -000 cat. 4, reduced class)



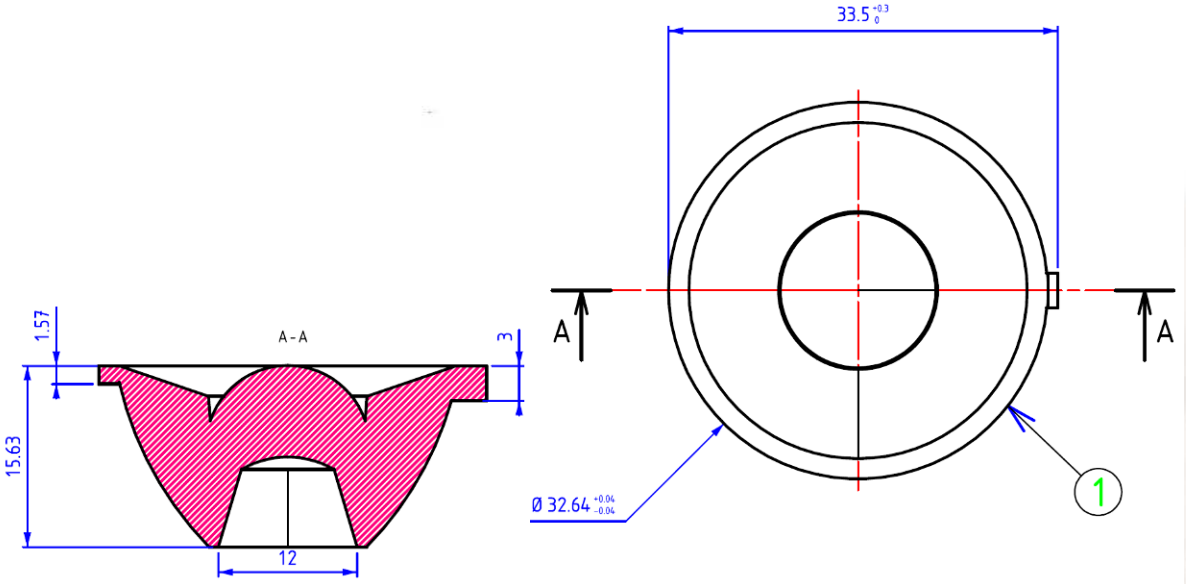
Mechanical characteristics holder QUADRI LLH04XRR

All dimensions are in millimeters
General tolerance +/-0.15 mm (standard NF T 58 -000 cat. 4, reduced class)



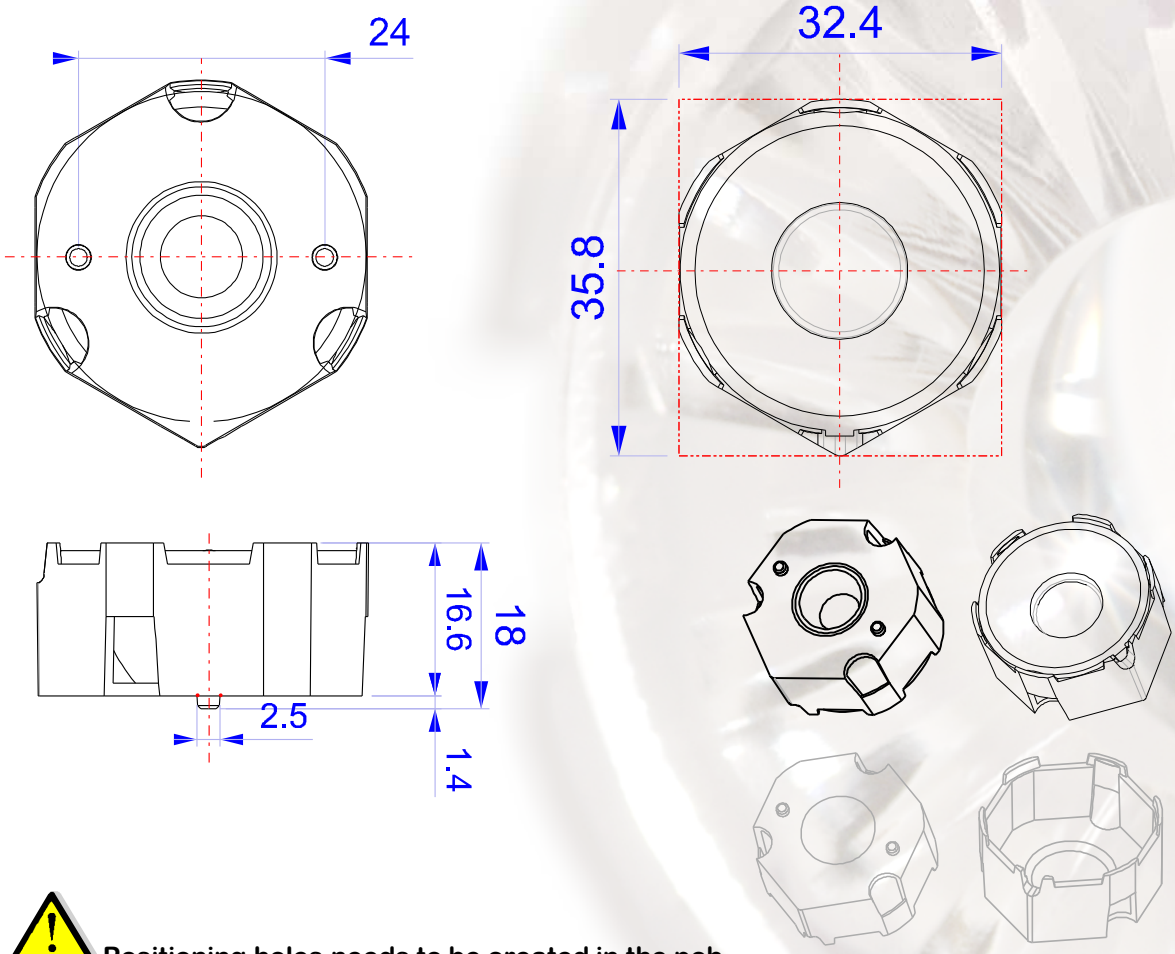
Mechanical characteristics LLC05N

Without holder, *dimension in millimetres General tolerance +/-0.15 mm (standard NF T 58 -000 cat. 4, reduced class)*



Mechanical characteristics LLH02XAL

dimension in millimetres General tolerance +/-0.15 mm (standard NF T 58 -000 cat. 4, reduced class)

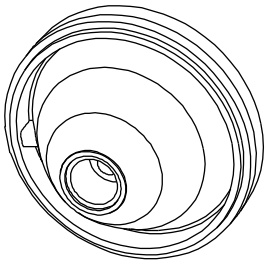


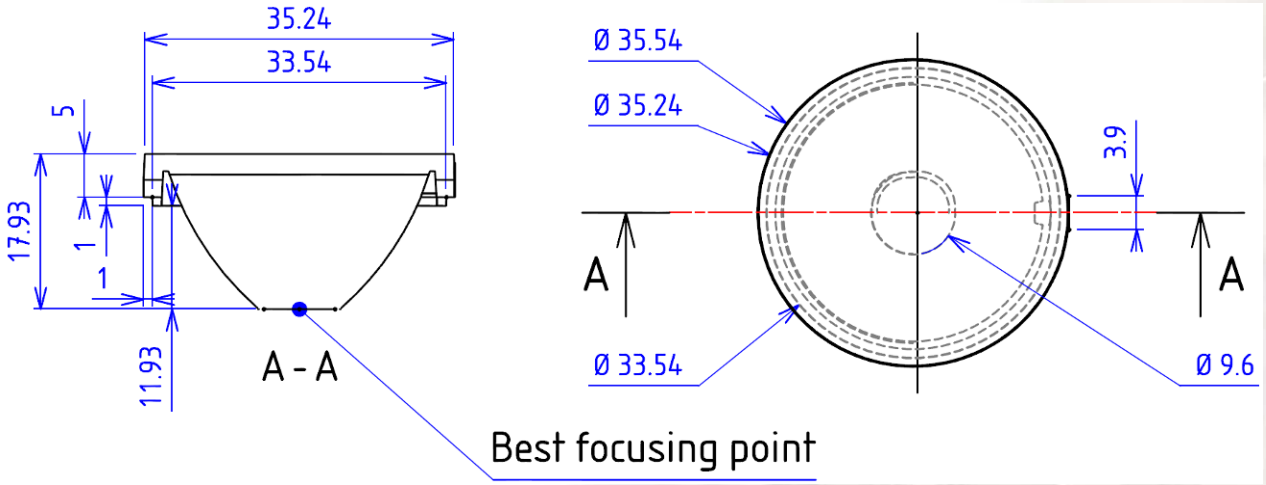
Positioning holes needs to be created in the pcb

Note: available with our adhesive (acrylate or epoxy glu can also be used see your supplier).

Mechanical characteristics LLC07N
Without holder, dimension is in millimeters

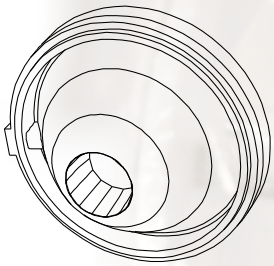
General tolerance +/-0.15 mm (standard NF T 58 -000 cat. 4, reduced class)

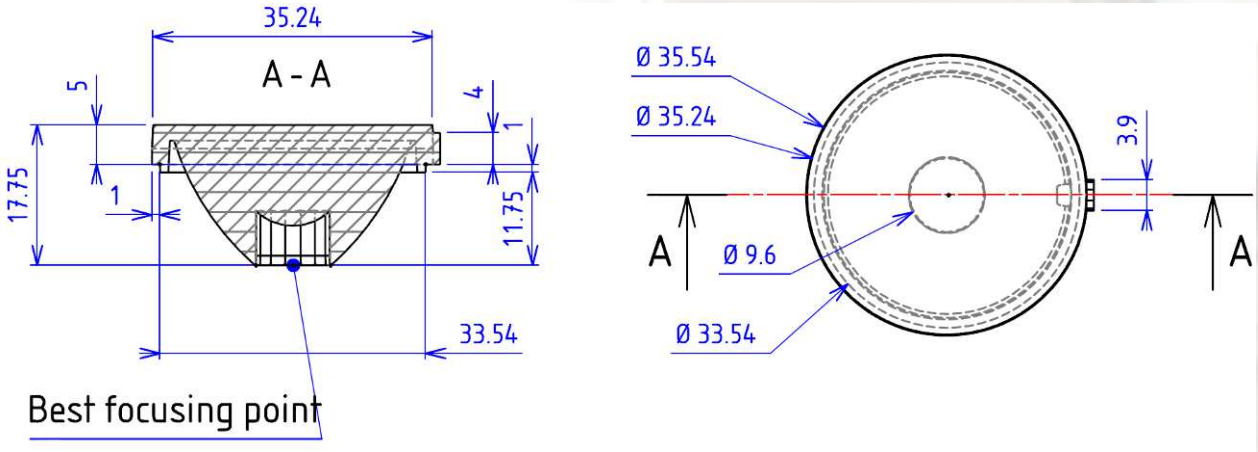




Mechanical characteristics LLC17N
without holder, dimensions are in millimeters

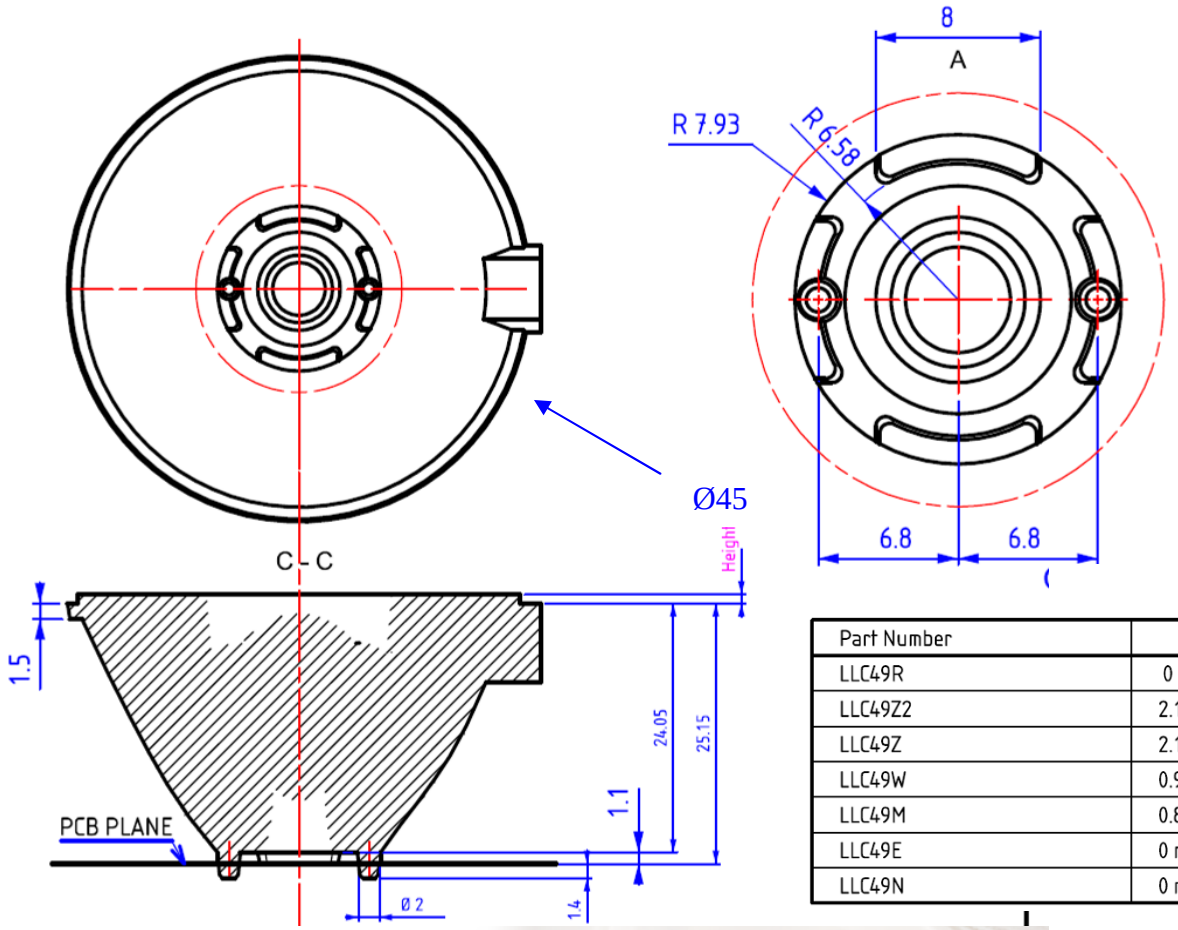
General tolerance +/-0.15 mm (standard NF T 58 -000 cat. 4, reduced class)





Mechanical characteristics LLC49R

Without holder, all dimensions are in millimetres, General tolerance +/-0.15 mm
(standard NF T 58 -000 cat. 4, reduced class)

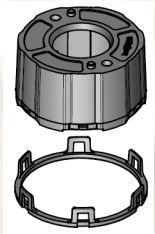


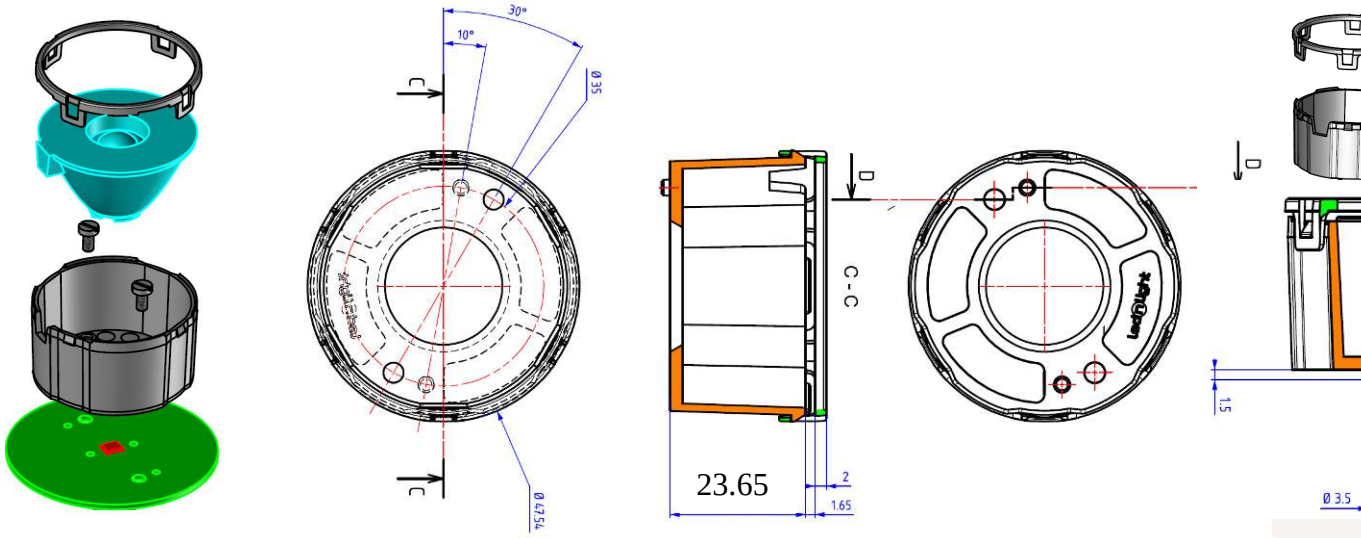
Part Number	Height
LLC49R	0 mm
LLC49Z2	2.1 mm
LLC49Z	2.1 mm
LLC49W	0.95 mm
LLC49M	0.8 mm
LLC49E	0 mm
LLC49N	0 mm

Nota: the LLC49R is drawn here.

Mechanical characteristics LLH09SPB00

holder, all dimensions are in millimetres, General tolerance +/-0.15 mm
(standard NF T 58 -000 cat. 4, reduced class)

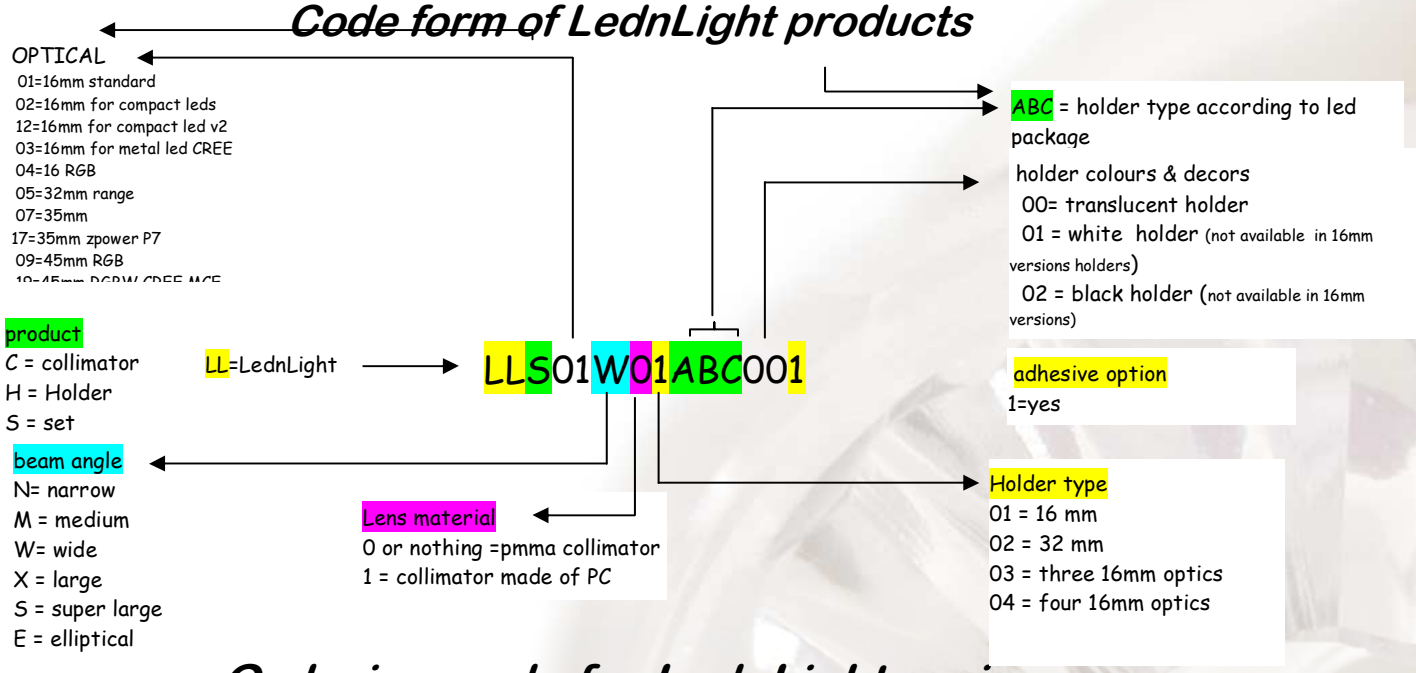




How to use te LLC49 collimator:

The holder is assembled on the PCB using screw or glue. The collimator has to be assembled inside the holder very precisely. The ring has to be snapped on the holder to lock the collimator into the holder.

Code form of LednLight products



Ordering code for LednLight series to be used with SEOUL SEMICONDUCTORS Z5M

Collimator + Holder	Ø 16mm – narrow - étroit	Ø 16mm – medium - intermédiaire	Ø 16mm –large	Ø 16mm – extra-large	Ø 16mm – super -large	Ø 16mm – elliptic -élliptique
No holder	LLC02N Or LLC12N	LLC02M Or LLC12M	LLC02W Or LLC12W	LLC02X	LLC02S	LLC02E
LLH01AAA Ø 16	LLS02N01AAA00 LLS12N01AAA00	LLS02M01AAA00 LLS12M01AAA00	LLS02W01AAA00 LLS12W01AAA00	LLS02X01AAA00	LLS02S01AAA00	LLS02E01AAA00
LLH01AAA Ø 16 + adhesive	LLS02N01AAA001 LLS12N01AAA001	LLS02M01AAA001 LLS12M01AAA001	LLS02W01AAA001 LLS12W01AAA001	LLS02X01AAA001	LLS02S01AAA001	LLS02E01AAA001
LLH03XRR (Three Ø 16 optics) HOLDER TRI	LLS02N03XRR01 LLS12N03XRR01	LLS02M03XRR01 LLS12M03XRR01	LLS02W03XRR01 LLS12W03XRR01	LLS02X03XRR01	LLS02S03XRR01	LLS02E03XRR01
LLH04XRR (Four Ø 16 optics) Holder QUADRI	LLS02N04XRR01 LLS12N04XRR01	LLS02M04XRR01 LLS12M04XRR01	LLS02W04XRR01 LLS12W04XRR01	LLS02X04XRR01	LLS02S04XRR01	LLS02E04XRR01

32 & 35 mm range

Collimateur / Holder	Ø 32mm – Narrow	Ø 32mm – Medium	Ø 32mm – Wide	Ø 35mm – narrow	Ø 35mm – narrow
No holder	LLC05N	LLC05M	LLC05W	LLC07N	LLC17N

LLH02XAL Ø 32	LLS05N02XAL02	LLS05M02XAL02	LLS05W02XAL02	-	-
LLH02XAL Ø 32 + adhesive	LLS05N02XAL021	LLS05M02XAL021	LLS05N02XAL02	-	-

Note: single holders are translucent; tri and quadri are available in different colours and decors ***SET=COLLIMATOR+HOLDER***

FAQ

Q – Of what material are Lednlight collimators made of ? Where are they manufactured ?
A – Lednlight collimators are made of a high purity grade PMMA, which guarantees a maximum luminous efficiency. Holders are made of PC. All our products are Made in France.

Q – What is Lednlight collimators luminous efficiency?
A – Luminous efficiency depends on the collimator itself and on the LED. It is between 85% and 93%.

Q – I would like to use a specific LED which is not mentioned in this datasheet. Is it possible?
A – LednLight collimators have a versatile design that can work with most LEDs references, allowing the user to choose the LED that best fits his needs. If your LED isn't mentioned in this datasheet, you can contact our engineering team which will give you more information.

Q – How can we position the LED compared to the collimator?
A – Mechanical drawings in pages 12~16 indicate the exact location of the focal point for each LednLight collimator. All you have to do is to put the LED chip at the focal point location.

Q – Can you provide CAD files of LednLight collimators?
A – The optical design is confidential, however CAD files of holder are available. You can upload them on our website. IES files and ray sets are also available on request.

Q – My project is very specific and custom. Lednlight collimator performances do not fit completely to my technical requirements.
A – Our engineers can design a custom version of the Lednlight collimators just for you, that will best fit your technical requirements, and at a very competitive price. Please do not hesitate to contact us to discuss your specifications.

Q – I would like to ask you a question which is not in the FAQ. How can I contact you?
A – Please visit our website : http://www.lednlight.com or contact us by phone :
+33 (0) 4 74 76 12 66 or by email : lednlight@gaggione.com