preliminary 29/06/2014

Lumoclip

MegaZeni Lumoclip

TigerZeni Lumoclip

Description:

The Lumoclip is a thermal and electrical interface module for ceramic chip on board (COB) LEDs. It comprises the LED ceramic with soldered power wires, and a white plastic holder to guide the wires and provide a flat top surface. It is supplied with a syringe of thermal compound. Two types and several powers of LED chip are offered as standard for the Lumoclip. The TigerZeni Lumoclip uses a 93 CRI Sharp TigerZeni LED with a total power of 25W. TigerZeni has two LEDs of different colours on the same ceramic. The MegaZeni Lumoclip uses a Sharp MegaZeni LED in powers of 35W and 50W. The range of colour temperatures available is 2700K, 3000K, 4000K, and 5000K in colour rendition index (CRI) 80+ and 90+. Many of these combinations will not be stock items. The full range of Sharp MegaZeni LEDs can be offered in Lumoclip packaging subject to lead time, minimum quantity and availability constraints.

Dimensions:

L x W x H 37.0 x 37.0 x 2.2mm

Standard cable length 80mm

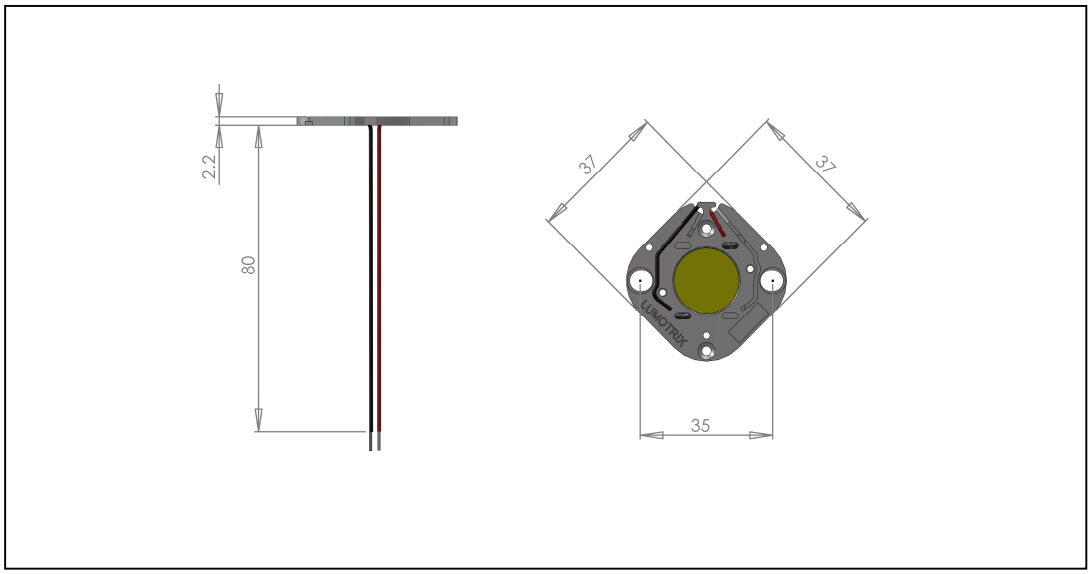

Fig.1 Lumoclip dimensions in mm

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preliminary 29/06/2014

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Features:

- Fully integrated LED with holder
- Same outline for TigerZeni and MegaZeni
- Uses world class Sharp LEDs.
- Low profile flat surface to fit most reflectors.
- High reliability Teflon wires pre-soldered to the LED.
- Integrated disposable dust cover for Light Emitting Surface
- Matching Optosource high temperature (180 ºC) reflectors available.
- Matching LEDengine active heat-sink available
- Available with matching LEDisk heat-spreader plate for ease of application

How to use:

These Lumoclips are available as part of the Lumotrix LEDengine (see separate datasheet), which incorporates thermal management and allows simple wiring. Alternatively, you must provide an adequate heat-sink and a constant current power supply (see Fig.2). Application of the Lumoclips directly to a heat-sink requires care and attention in order to avoid a field failure, so we also supply them assembled on a LEDisk heat-spreader plate, which makes them more robust and easy to use.

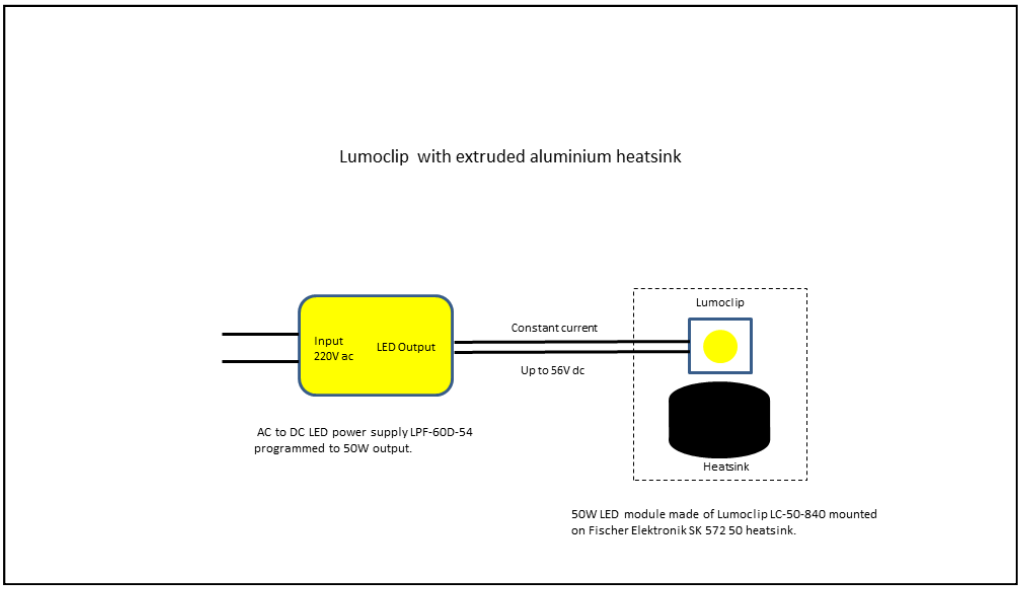

Fig.2 Lumoclip with constant current power supply and heat-sink

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The heat-sink must have a pair of mounting holes on 35mm centres for fixing the Lumoclip. Suitable screws are No.4 x 1/4" flanged pan-head self-tapping (S/T) screws to go in a 2.6mm diameter drilled hole. The equivalent metric 3 x 6mm S/T screw goes more easily into a 2.7mm diameter hole. If the holes are tapped M3 then flanged pan head or button head M3 x 6 screws should be used. If standard pan head screws (without flange) are used then an M3 washer should be placed under the head of the screws. The ceramic on the back of the Lumoclip should have 0.05 $cm^3$of heat-sink grease applied from the supplied calibrated syringe before loosely tightening the screws. The front of the Lumoclip has a dust cover over the light emitting surface of the LED. This dust cap should be pressed with a thumb to apply pressure to the ceramic around the light emitting surface. This will squeeze excess heat-sink grease from the gap between the ceramic and the heat-sink and give a very thin joint. The dust cap must now be discarded from the Lumoclip. Once the excess heat-sink compound has been squeezed out the screws can be fully tightened. The purpose of the screws is to locate the Lumoclip on the heat-sink surface. Over-tightening the screws will not press the LED harder onto the heat-sink surface but will easily break the plastic. Application of this product requires a trained operator, and accordingly it is recommended for mass production. For small quantities it is recommended that the Lumoclip is purchased assembled on to a LEDisk (see Fig.3) which acts as a heat spreader plate. LEDisk is a punched aluminium disk 2mm thick and 49.5mm diameter. Lumoclip can be factory fitted on to the LEDisk to make a robust LEDisk assembly. LEDisk can be tightened hard onto a heat-sink with holes at 34mm or 35mm mounting centres using pan head M3 or No.4 self-tapping screws. Ordinary heat-sink compound should be applied between the LEDisk and the heat-sink.

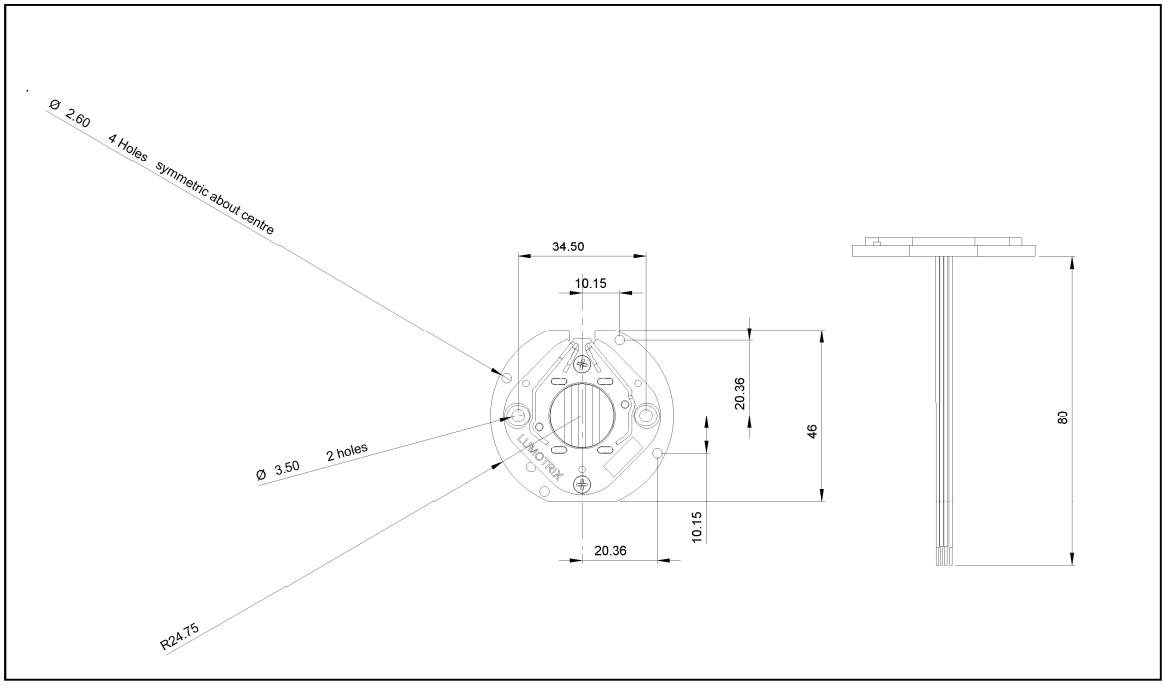

Fig.3 LEDisk Assembly dimensions in mm

A starting point for the heat-sink thermal coefficient specification is to divide 60 by the wattage of the Lumoclip. For example if you need a heat-sink for a 50W Lumoclip such as LC-50-840 which you intend to run at rated power i.e. 1.0 amps and approximately 49V then you need a thermal coefficient of 60/50 i.e. 1.2 ºC /W or better. This will give approximately a 50 ºC temperature rise over ambient. You must then verify the actual performance of the heat-sink in your own application, and modify its size to suit your particular requirements. You can measure the temperature under the Lumoclip using a thermocouple or thin film platinum resistance temperature sensor such as

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362-9799 from RS Components. There is a small tunnel designed into the plastic of the Lumoclip that allows the sensor to be placed against the top face of the heat-sink. This tunnel must be filled with heat-sink compound before inserting the sensor. The maximum temperature measured here should not be more than 95 ºC.

For a constant current power supply we offer LPF-40D-42 power supply for Lumoclips rated up to 35W and the LPF-60D-54 60W power supply for Lumoclips rated to 50W. These are from Mean Well and are IP67 rated. They are modified to have a current output programmable via a Lumotrix Softstart pcb (see http://www.lumotrix.com/led-power-supplies). If you wish to supply your own power supply, you will need one constant current power supply per Lumoclip and the maximum output voltage capability will need to be in the range of 40 to 60 Vdc according to the Lumoclip chosen (see Fig.4 below). In order to reduce cost it is possible to put two similar Lumoclips in series and run them from a single power supply with a capability in the region of 80 to 120 Vdc. This voltage is potentially dangerous and does not conform to SELV (Safety Extra Low Voltage) requirements. The wiring of the MegaZeni Lumoclip is red wire to the positive output of the supply and black wire to the negative output. The wiring of the TigerZeni Lumoclip is red wire to the positive output of the supply and black wire to the negative output for the 5700K LED and yellow wire to the positive output of the supply and white wire to the negative output for the 2700K LED. If the connections are reversed, the LED will be destroyed.

Often these LEDs will be used with a reflector to create a beam of light. The surface is flat which allows the use of many common reflectors. Lumotrix also offers a range of reflectors specially manufactured by Optosource in high temperature plastic to a Lumotrix specification (see separate datasheet). These conveniently have 2 pips which fit into the pair of holes on 24mm centres either side of the light emitting surface. This enables them to be accurately located in the centre of the LED and glued using a 2 part cyanoacrylate adhesive. These reflectors have the benefit of a clear polycarbonate cover to stop dust reaching the light emitting surface. They should be fitted immediately after the Lumoclip dust cover is removed. There is also a separate light cover which fits closely around these reflectors. Its purpose is to stop light leakage around the edge of the reflector where it touches the clip.

Warning: These LEDs are very bright. They can damage your sight if you look into them when you are too close.

Colour temperature, CRI and LES

Colour temperature is a way to describe the colour tint or hue of white light with reference to the appearance of an incandescent object. Our eyes are adjusted to sunlight which has a colour temperature of 5780 K and which we see as white. Cooler objects such as tungsten light bulbs or a candle flame will appear slightly orange, whereas hotter object will appear slightly blue. People tend to see lower colour temperatures as warm (psychologically) and higher colour temperatures as cold, so most domestic lighting, originally based on the incandescent tungsten bulb centres on a colour temperature of 3000K. Shops, offices and malls want a whiter light to give better colour contrast and more of an outdoor feel, and will generally prefer 4000K. For outdoor events (floodlighting) or where video or cameras are used the 5000K is best. http://en.wikipedia.org/wiki/Color_temperature

CRI stands for Colour Rendering Index and is based on a scale of 0 to 100. Incandescent light sources give a spread of light frequencies with a central maximum at a particular colour temperature. This gives a “natural looking” light and will have a CRI of 95 - 100. Light sources based on electronics (i.e. stimulated photon emission) tend to be monochromatic, and have holes in the natural light emission envelope. This will give odd rendition of certain colours and has a lower CRI. http://en.wikipedia.org/wiki/Color_rendering_index

Both the colour temperature and CRI deficiencies are amended using a mix of colour phosphors, but these tend to reduce the total light output and therefore the efficiency, and the bigger the change, the greater the loss of light. For example raw LEDs in this application have a blue-white light, and looking at the 50W Lumoclips in the chart below we see that the 80 CRI, 5000K LED has the most light output whereas the 90 CRI is less. Also looking at the LEDs at 80 CRI we see that the 3000K has a lower light output than the bluer 4000K unit.

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LES is the Light Emitting Surface of an LED. These LEDs are actually composed of lots of small LEDs under a phosphor cover. The more powerful models have more LEDs and tend to have a bigger LES. Optically a point source (small LES) is better because the light is more controllable. For example you can get a parallel beam by putting a parabolic reflector behind it. In the real world we cannot have a point source using this technology, but even so, a small LES is better for spot lights with narrow beam angles, and the larger LES is better for general illumination and gives more light.

Lumoclip selection chart

This chart shows order codes for some Lumoclips with technical data and the Sharp LED used inside. The complete range of Sharp LEDs is greater than this, see http://www.sharpleds.eu . They can all be packaged as Lumoclips. Lead time for non-stock items is 10-12 weeks and there may be a MOQ (minimum order quantity).

						Boost[1]	Boost[1]	Max			
	Lumoclip	**CRI**	**CCT (K)**	**Lumens**	**If (mA)**	**lumens**	**If (mA)**	**Vf (Vdc)**	**Luminous efficacy lm/W**	**Sharp LED inside**	**Typical Application**
25	LC-25-T	96 90	2700 5700	1840 2170	700 total	2050 2520	840 total	40.0	71 84	GW6TGCBG40C	Tiger – mood lighting
35	LC-35-827	83	2700	3310	950	3970	1200	40.0	98	GW6DME27XFC	Restaurant
35	LC-35-830	83	3000	3500	950	4200	1200	40.0	104	GW6DME30XFC	Downlight, hotel
35	LC-35-840	82	4000	3740	950	4490	1200	40.0	111	GW6DME40XFC	Shopping mall
35	LC-35-850	82	5000	3760	950	4510	1200	40.0	111	GW6DME40XFC	Outside lighting
35	LC-35-927	93	2700	2790	950	3350	1200	40.0	83	GW6DME27XFC	Restaurant
35	LC-35-930	93	3000	2950	950	3540	1200	40.0	87	GW6DME30XFC	Downlight, hotel
35	LC-35-940	92	4000	3090	950	3710	1200	40.0	92	GW6DME40XFC	Shopping mall
35	LC-35-950	90	5000	3130	950	3760	1200	40.0	93	GW6DME40XFC	Outside lighting
50	LC-50-827	83	2700	4240	950	5200	1200	55.0	94	GW6DME27XFC	Bar, stage lighting
50	LC-50-830	83	3000	4480	950	5490	1200	55.0	99	GW6DME30XFC	Shop
50	LC-50-840	82	4000	4790	950	5870	1200	55.0	106	GW6DME40XFC	Large Shopping Mall
50	LC-50-850	82	5000	4810	950	5890	1200	55.0	107	GW6DME50XFC	Floodlighting for TV cameras
50	LC-50-927	93	2700	3700	950	4530	1200	55.0	82	GW6DGE27XFC	Bar, stage lighting
50	LC-50-930	93	3000	3900	950	4780	1200	55.0	86	GW6DGE50XFC	Downlight, hotel
50	LC-50-940	92	4000	4090	950	5010	1200	55.0	91	GW6DGE40XFC	Large Shopping Mall
50	LC-50-950	92	5000	4140	950	5070	1200	55.0	92	GW6DGE50XFC	Floodlighting for TV cameras

Fig.4 Lumoclip selection chart

Note 1: Sharp Specifications allow increased LED current and Lumen output if the heat-sink is kept cool (less than 90C). We do not recommend this idea for inexperienced customers.

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Lumoclip Label information

Format:

LC-WW-CTT
41 /2013

LC = Lumoclip
WW = Power e.g. 50 Watt =50
CTT = **C**RI + Colour **T**emperature e.g. CRI 83 and CCT 4000 = 840
So Lumoclip detailed above has code LC-50-840

Week/Year

Packing information

In boxes, 10 pcs per box complete with calibrated syringe containing 10 portions of heat-sink compound.

Box size is 170 x 165 x 50mm. Small quantities will be packed as convenient.

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