



HELIO Optoelectronics Corp.

Helixeon – 3W Ultraviolet Series

Helixeon, a solid-state lighting device, provides high radiometric power output with high efficiency. Helixeon is encapsulated in silicone by molding technology. Also, Helixeon is capable of standard lead free solder reflow process. Helixeon UV series is applied for counterfeit currency, defect detection, medical treatment and etc.

Features

- | High luminous flux output
- | Long life operation
- | Compact package
- | RoHS certification
- | Superior ESD protection

Application

- | Counterfeit currency
- | Defect detection
- | Medical treatment
- | Party lighting



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Product Nomenclature

HM SC - E 3 L U
 X1 X2 X3 X4 X5 X6

X1		X2		X3		X4	
Item		Mode		Heat sink		Power	
Code	Type	Code	Type	Code	Type	Code	Type
HM	Molding	SC	Series Connection	E	Emitter	3	3W

X5		X6	
Pattern		Color	
Code	Type	Code	Type
L	Lambertian	U	Ultraviolet

Circuit Diagram of HELIXEON™- Emitter

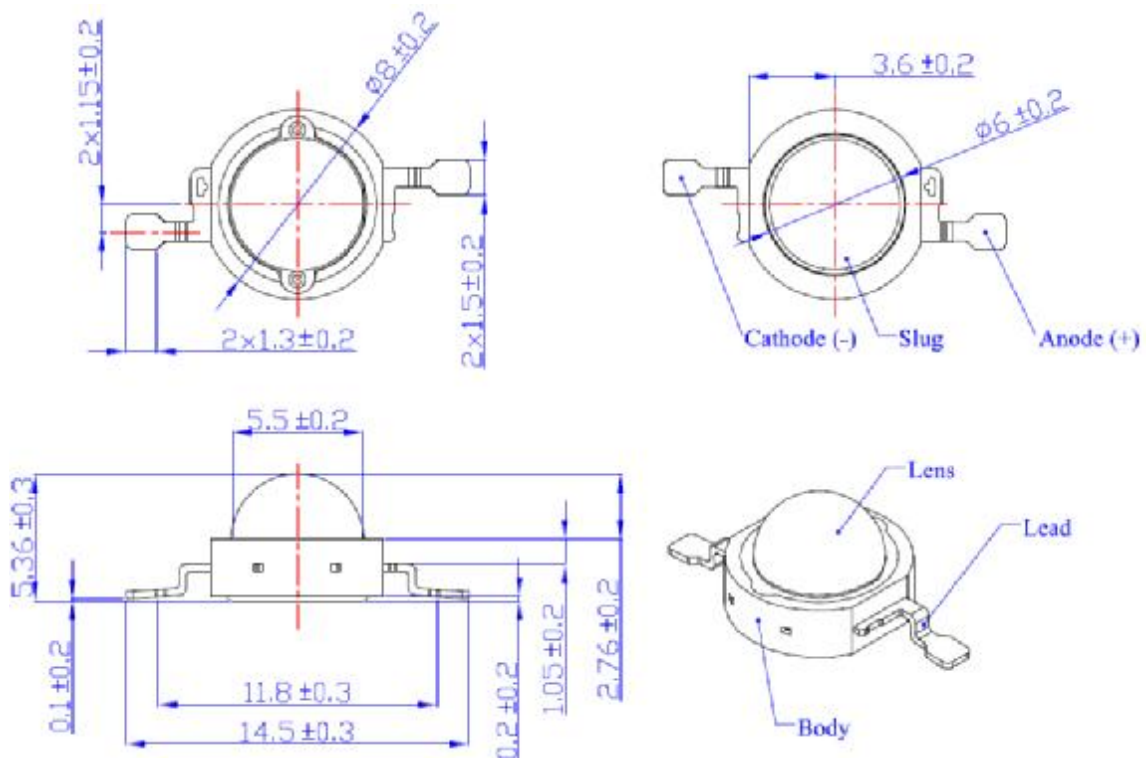
Color	Part number	Circuit diagram
Ultraviolet	HMSC-E3LU	

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Package Dimensions

Lead Form



Note:

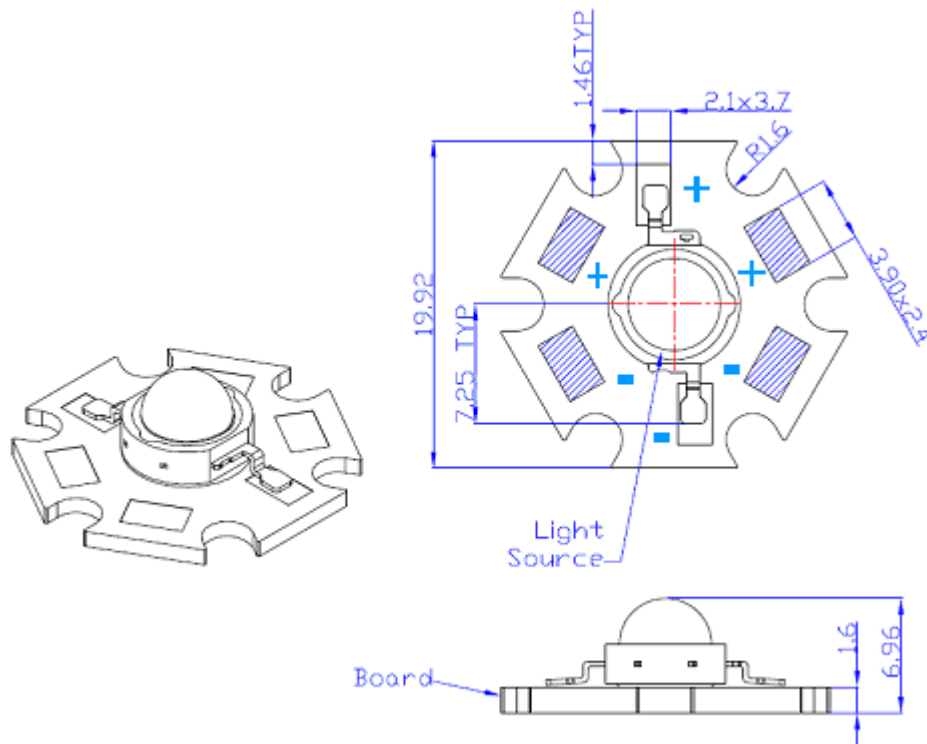
1. The anode side of the device is denoted by a hole in the lead frame.
2. Electrical insulation between the case and the board is required. The slug of the device is no electrically neutral.
3. Drawings are not to scale.
4. All dimensions are all in millimeter.
5. All dimensions without tolerance are for reference only.
6. Specifications are subject to change without notice.

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Package Dimensions

MCPCB Form



Note:

1. Slots in aluminum-core PCB for M3 mounting screw.
2. Electrical interconnection pads labeled on the aluminum-PCB with "+" and "-" to denote positive and negative, respectively.
3. Drawings are not to scale.
4. All dimensions are in millimeters.

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Characteristics for Helixeon UV emitter

HMSC-E3LU

Characteristics at $I_F = 350\text{mA}$ ($T_a = 25^\circ\text{C}$):

Parameter	Symbol	Value			Unit
		Min	Typical	Max	
Radiometric power ^{(1) (2)}	P_O	225	350	--	mW
Peak wavelength ⁽³⁾	λ_p	395	405	410	nm
View angle	$2\Theta_{1/2}$	--	150	--	degree
Forward voltage ⁽⁴⁾	V_F	6.4	--	8.4	V
Power dissipation	P_D	2.24	--	2.94	W
Junction temperature	T_J	--	--	120	Deg.
Operation temperature	T_{OP}	-40~+105			$^\circ\text{C}$
Storage temperature	T_{ST}	-40~+120			$^\circ\text{C}$

Bin code

Radiometric power (mW)	Rank (BIN)
225	M0
275	N0
355	P0
455	Q0
555	R0
655	S0

Note:

1. The typical radiometric power of Helixeon will be upgraded per season.
2. Minimum radiometric power performance guaranteed within published operating conditions. HELIO maintains a tolerance of $\pm 10\%$ on radiometric power measurements.
3. HELIO maintains a tolerance of $\pm 0.5\text{nm}$ for peak wavelength measurement.
4. HELIO maintains a tolerance of $\pm 0.06\text{V}$ on forward voltage measurement.

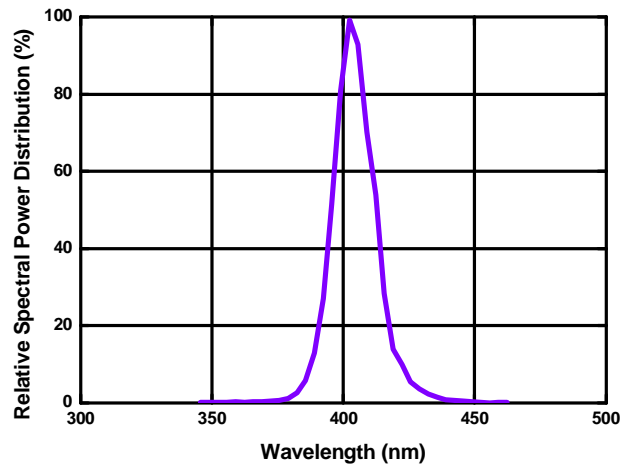
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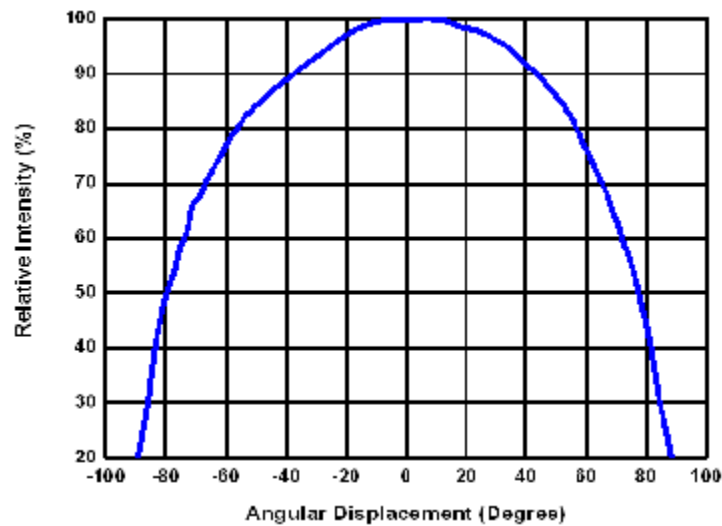
Optical characteristics

Emission spectrum

HMSC-E3LU



Radiation Pattern



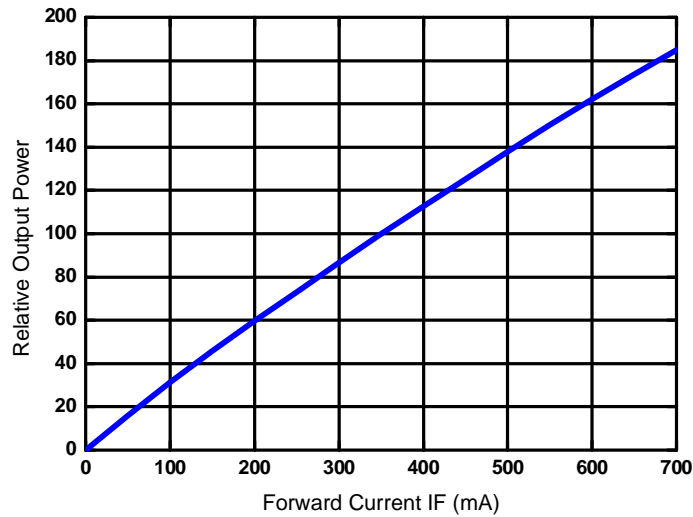
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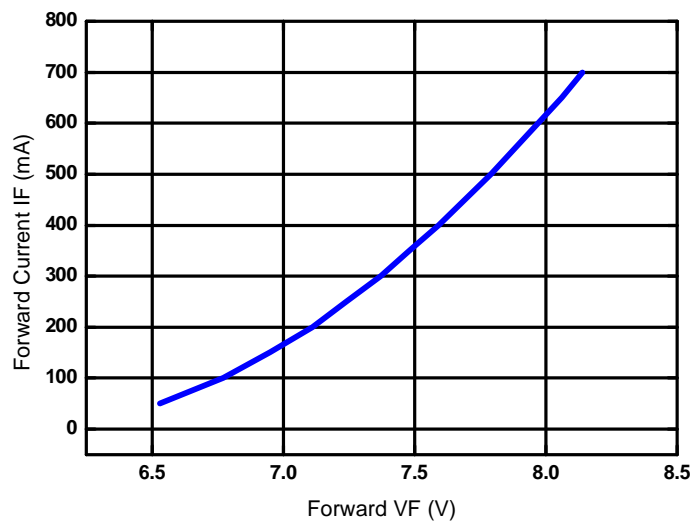
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Electrical characteristics

Typical Light Output Characteristics Over Forward Current



Typical Forward Current Characteristics



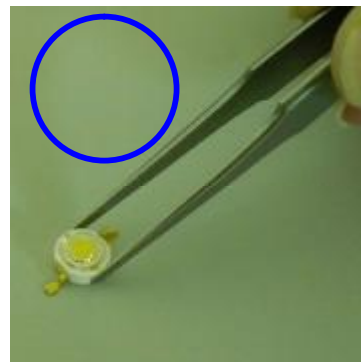
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Handling Precaution

The softness and dust affinity of silicone molding lens constrain the handling of LED. Thus, some handling indications of HELIXEON emitters are presented for possible damage prevention and excellent reliability.

- l Avoid leaving fingerprints or scratches (by sharp tools) on the silicone resin parts.
- l Do not force over 2000gf impact or pressure on the silicone molding lens.
- l The LEDs should only be picked up by making contact with the sides of the LED body.
- l When populating in SMT production, the pick-and-place nozzle must not place excessive pressure on the silicone molding lens.





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Reliability Test List

Test Item	Standard Test Method	Test Conditions	Note	Number of Damaged
Resistance to soldering heat (reflow soldering)	JEITA ED-4701 300 301	Ta=260°C, 10sec. (Pre treatment 25°C, 70%, 168hrs.)	2 times	0/10
Solderability (reflow soldering)	JEITA ED-4701 300 303	Tsld=215±5°C, 3sec. (Lead Solder)	1 time over 95%	0/10
Steady state operating life		Ta=25°C, I _F = 350mA Tested with Helio standard circuit board	1000 hrs.	0/10
Steady state operating life of high humidity heat		85°C, RH=85%, I _F = 350mA Tested with Helio standard circuit board	1000 hrs.	0/10
Temperature cycle	JEITA ED-4701 100 105	-40°C ~ 25°C ~ 100°C ~ 25°C 30min. 5min. 30min. 5min.	100 cycles	0/10
Thermal shock	JEITA ED-4701 300 307	0°C ~ 100°C 15sec. 15sec.	20 cycles	0/10
High temperature storage	JEITA ED-4701 200 201	Ta=100°C	1000 hrs.	0/10
Low temperature storage	JEITA ED-4701 200 202	Ta=-40°C	1000 hrs.	0/10
Vibration		2000 Hz, 2directions	60min.	0/10

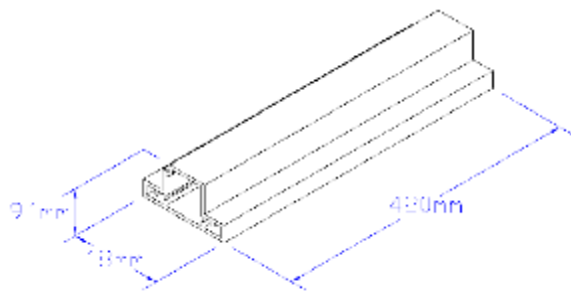
Failure Criteria :

- 1 Forward Voltage shift : > 200 mV
- 1 Radiometric Power degradation : > 10 %
- 1 Forward or Reverse Leakage : >10 μ A
- 1 Catastrophic failure

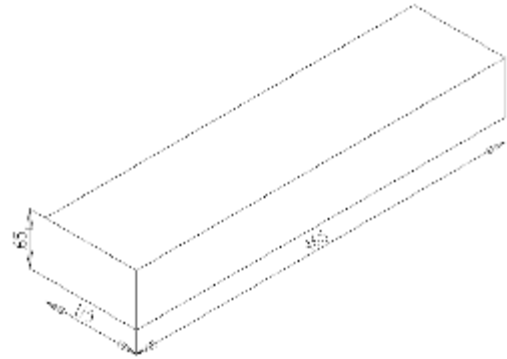
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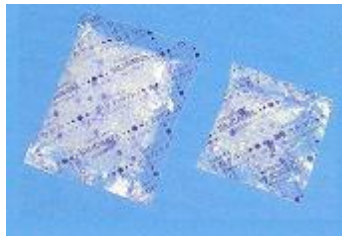
Tube Package Specifications



Tube



Inner carton



Dry agent

Note:

1. There are 50pcs emitters in a tube.
2. An antistatic bag contains 20 tubes and a drying agent.
3. There are 20 tubes in an inner carton.
4. All dimensions are all in millimeter.

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