HELIO Optoelectronics Corp.

Helixeon-Focusing

Helixeon-Focusing emitter is made by using molding technology. It is designed to achieve an uniform view angle and a better forward illumination. Higher luminous flux output is achieved at 1W/3W operation via the same collimated optic kit.

Features

- Higher forward luminous flux output
- Uniform view angle
- Long life operation
- Low power consumption

Application

- Torch lighting
- Down lighting
- Par lamp
- General lighting
- Brightness compensation

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Product Nomenclature

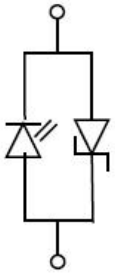
HM HP - E 1 F W

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	HP	High power	E	Emitter	1	1W

X5		X6	
Pattern		Color	
Code	Type	Code	Type
F	Focusing	W/V	White/Warm White
		R	Red
		G	Green
		B	Blue
		A	Amber

Circuit Diagram of HELIXEON- Emitter

Radiation Pattern	Part number	Circuit diagram
Focusing	HMHP-E1FW	
	HMHP-E1FV	
	HMHP-E1FR	
	HMHP-E1FG	
	HMHP-E1FB	
	HMHP-E1FA	

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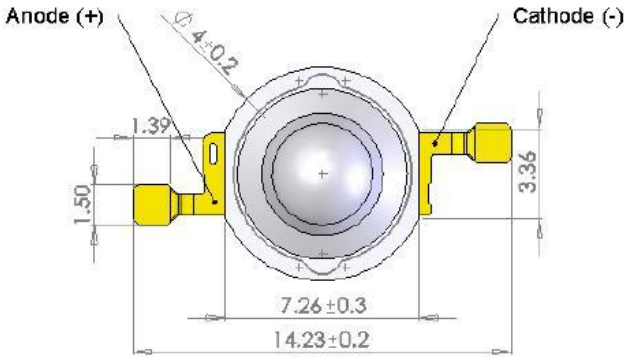
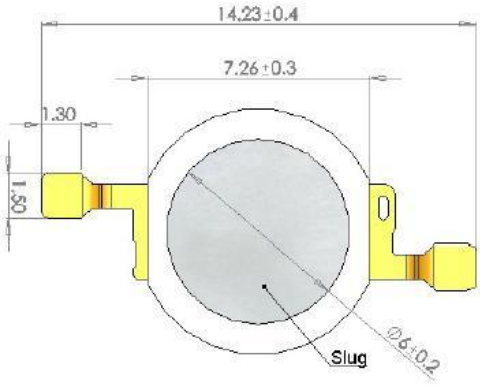
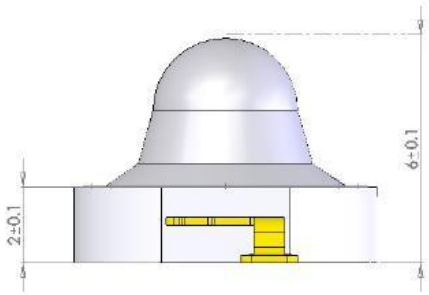
Package Dimensions

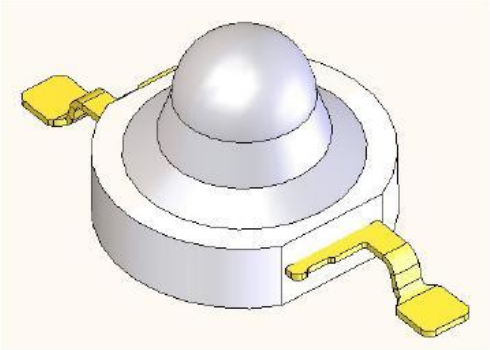
Lead Form

Focusing









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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Characteristics for Helixeon white emitter

HMHP-E1FW

Characteristics at I_F = 350mA (Ta=25℃):

Parameter	Symbol	Value			Unit
		Min	Typical	Max	
Luminous flux(1)	Φ_v(2)	67.2	80	--	lm
CRI	R_a	--	75	--	
View angle	$2\Theta_{1/2}$	--	60	--	degree
Correlated color temperature(3)	CCT	5650	--	10000	K
Forward voltage(4)	V_F	3.0	--	3.6	V
Power dissipation	P_D	1.05	--	1.26	W
Junction temperature	T_J	--	120	--	Deg.
Operation temperature	T_{OP}	-40~+120			℃
Storage temperature	T_{ST}	-40~+120			℃
ESD sensitivity		±2000 HBM			V

Bin code

Luminous Flux (lm)	Rank (BIN)		Correlated color temperature (K)	Rank (BIN)
67.2	T0		5000~5650	V
87.4	U0		5650~6300	W
113.6	V0		6300~7000	X
147.7	W0		7000~8000	Y
			8000~10000	Z

Note:

1. The typical luminous flux of Helixeon will be upgraded per season.
2. Φ_v, minimum luminous flux performance guaranteed within published operating conditions. HELIO maintains a tolerance of ±10% luminous flux measurements.
3. The correlated color temperature of Helixeon is divided into three main bins. In case of customized CCT, this detail information will be discussed in meeting.The tester tolerance of CCT is ±5%.
4. HELIO maintains a tolerance of±0.06V on forward voltage measurements.

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HMHP-E1FV

Characteristics at I_F = 350mA (Ta=25℃):

Parameter	Symbol	Value			Unit
		Min	Typical	Max	
Luminous flux(1)	Φ_v(2)	52	60	--	lm
CRI	R_a	--	67	--	
View angle	$2\Theta_{1/2}$	--	60	--	degree
Correlated color temperature(3)	CCT	2650	--	3250	K
Forward voltage(4)	V_F	3.0	--	3.6	V
Power dissipation	P_D	1.05	--	1.26	W
Junction temperature	T_J	--	120	--	Deg.
Operation temperature	T_{OP}	-40~+120			℃
Storage temperature	T_{ST}	-40~+120			℃
ESD sensitivity		±2000 HBM			V

Bin code

Luminous Flux (lm)	Rank (BIN)		Correlated color temperature (K)	Rank (BIN)
51.7	S0		2650~2850	M
67.2	T0		2850~3050	N
87.4	U0		3050~3250	P
113.6	V0			

Note:

1. The typical luminous flux of Helixeon will be upgraded per season.
2. Φ_v, minimum luminous flux performance guaranteed within published operating conditions. HELIO maintains a tolerance of ±10% luminous flux measurements.
3. The correlated color temperature of Helixeon is divided into three main bins. In case of customized CCT, this detail information will be discussed in meeting.The tester tolerance of CCT is ±5%.
4. HELIO maintains a tolerance of±0.06V on forward voltage measurements.

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HMHP-E1FR

Characteristics at I_F = 350mA (Ta=25℃):

Parameter	Symbol	Value			Unit
		Min	Typical	Max	
Luminous flux(1)	Φ_v(2)	30.6	43	--	lm
Dominant Wavelength (3)	Wd	610	--	630	nm
View angle	$2\Theta_{1/2}$	--	70	--	degree
Forward voltage(4)	V_F	2.0	--	2.6	V
Power dissipation	P_D	0.7	--	1.05	W
Junction temperature	T_J	--	120	--	Deg.
Operation temperature	T_{OP}	-40~+120			℃
Storage temperature	T_{ST}	-40~+120			℃
ESD sensitivity		±2000 HBM			V

Bin code

Luminous flux (lm)	Rank (BIN)		Wavelength (nm)	Rank (BIN)
30.6	Q0		610	A0
39.8	R0		620	B0
51.7	S0		630	C0

Note:

1. The typical luminous flux of Helixeon will be upgraded per season.
2. Φ_v, minimum luminous flux performance guaranteed within published operating conditions. HELIO maintains a tolerance of ±10% luminous flux measurements.
3. Dominant wavelength is derived from the CIE1931 chromaticity diagram and represents the perceived color. The tester tolerance of dominant wavelength is ±1nm.
4. HELIO maintains a tolerance of±0.06V on forward voltage measurements.

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HELIO Optoelectronics Corp.

HMHP-E1FG

Characteristics at I_F = 350mA (Ta=25℃):

Parameter	Symbol	Value			Unit
		Min	Typical	Max	
Luminous flux(1)	Φ_v(2)	51.7	60	--	lm
Dominant Wavelength (3)	Wd	515	--	535	nm
View angle	$2\Theta_{1/2}$	--	60	--	degree
Forward voltage(4)	V_F	3.0	--	3.6	V
Power dissipation	P_D	1.05	--	1.26	W
Junction temperature	T_J	--	120	--	Deg.
Operation temperature	T_{OP}	-40~+120			℃
Storage temperature	T_{ST}	-40~+120			℃
ESD sensitivity		±2000 HBM			V

Bin code

Luminous flux (lm)	Rank (BIN)		Wavelength (nm)	Rank (BIN)
51.7	S0		515	B0
67.2	T0		520	C0
87.4	U0		525	D0
			530	E0
			535	F0

Note:

1. The typical luminous flux of Helixeon will be upgraded per season.
2. Φ_v, minimum luminous flux performance guaranteed within published operating conditions. HELIO maintains a tolerance of ±10% luminous flux measurements.
3. Dominant wavelength is derived from the CIE1931 chromaticity diagram and represents the perceived color. The tester tolerance of dominant wavelength is ±1nm.
4. HELIO maintains a tolerance of±0.06V on forward voltage measurements.

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HELIO Optoelectronics Corp.

HMHP-E1FB

Characteristics at I_F = 350mA (Ta=25℃):

Parameter	Symbol	Value			Unit
		Min	Typical	Max	
Luminous flux(1)	Φ_v(2)	13.9	16	--	lm
Dominant Wavelength (3)	Wd	460	--	475	nm
View angle	$2\Theta_{1/2}$	--	60	--	degree
Forward voltage(4)	V_F	3.0	--	3.6	V
Power dissipation	P_D	1.05	--	1.26	W
Junction temperature	T_J	--	120	--	Deg.
Operation temperature	T_{OP}	-40~+120			℃
Storage temperature	T_{ST}	-40~+120			℃
ESD sensitivity		±2000 HBM			V

Bin code

Luminous flux (lm)	Rank (BIN)		Wavelength (nm)	Rank (BIN)
13.9	M0		460	E0
18.1	N0		465	F0
			470	G0

Note:

1. The typical luminous flux of Helixeon will be upgraded per season.
2. Φ_v, minimum luminous flux performance guaranteed within published operating conditions. HELIO maintains a tolerance of ±10% luminous flux measurements.
3. Dominant wavelength is derived from the CIE1931 chromaticity diagram and represents the perceived color. The tester tolerance of dominant wavelength is ±1nm.
4. HELIO maintains a tolerance of±0.06V on forward voltage measurements.

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HELIO Optoelectronics Corp.

HMHP-E1FA

Characteristics at I_F = 350mA (Ta=25℃):

Parameter	Symbol	Value			Unit
		Min	Typical	Max	
Luminous flux(1)	Φ_v(2)	30.6	45	--	lm
Dominant Wavelength (3)	Wd	585	--	595	nm
View angle	$2\Theta_{1/2}$	--	70	--	degree
Forward voltage(4)	V_F	2.0	--	2.6	V
Power dissipation	P_D	0.7	--	1.05	W
Junction temperature	T_J	--	120	--	Deg.
Operation temperature	T_{OP}	-40~+120			℃
Storage temperature	T_{ST}	-40~+120			℃
ESD sensitivity		±2000 HBM			V

Bin code

Luminous flux (lm)	Rank (BIN)		Wavelength (nm)	Rank (BIN)
30.6	Q0		585	A0
39.8	R0		587.5	B0
51.7	S0		590	C0
			592.5	D0

Note:

1. The typical luminous flux of Helixeon will be upgraded per season.
2. Φ_v, minimum luminous flux performance guaranteed within published operating conditions. HELIO maintains a tolerance of ±10% luminous flux measurements.
3. Dominant wavelength is derived from the CIE1931 chromaticity diagram and represents the perceived color. The tester tolerance of dominant wavelength is ±1nm.
4. HELIO maintains a tolerance of±0.06V on forward voltage measurements.

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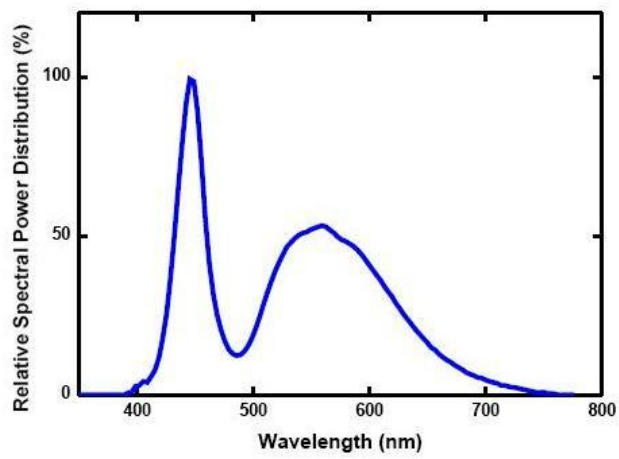
Optical characteristics

Emission spectrum

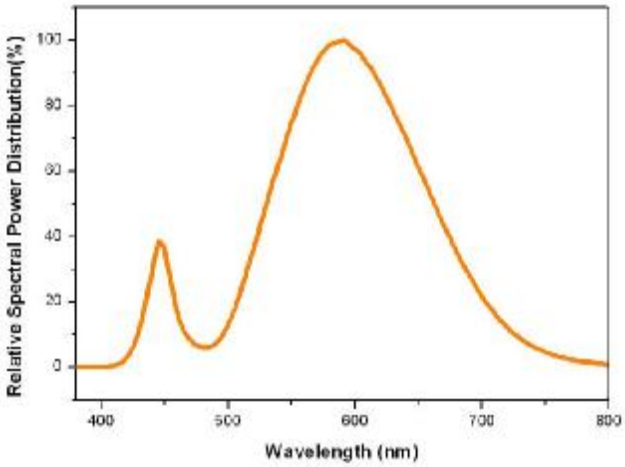
HMHP-E1FW

(White)



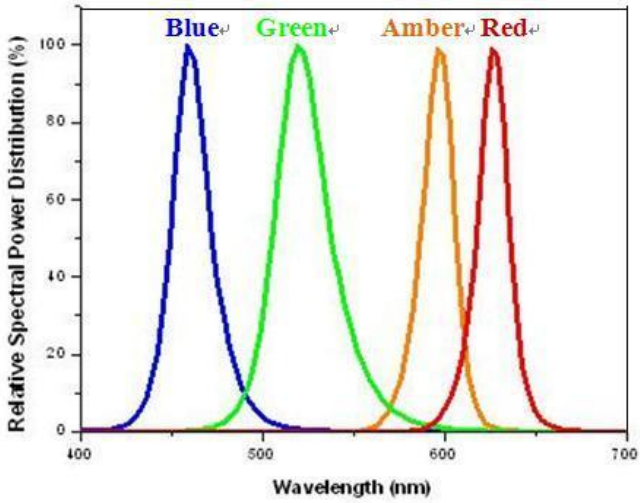
HMHP-E1FV

(Warm White)



HMHP-E1FR、HMHP-E1FG、HMHP-E1FB、HMHP-E1FA

(Red、Green、Blue、Amber)



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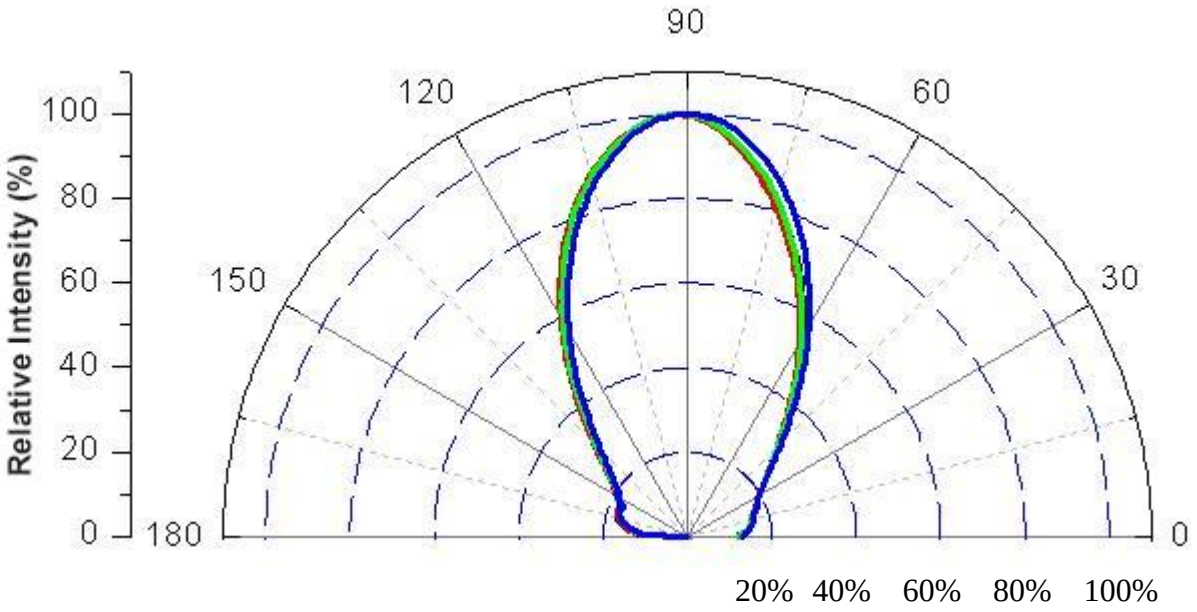
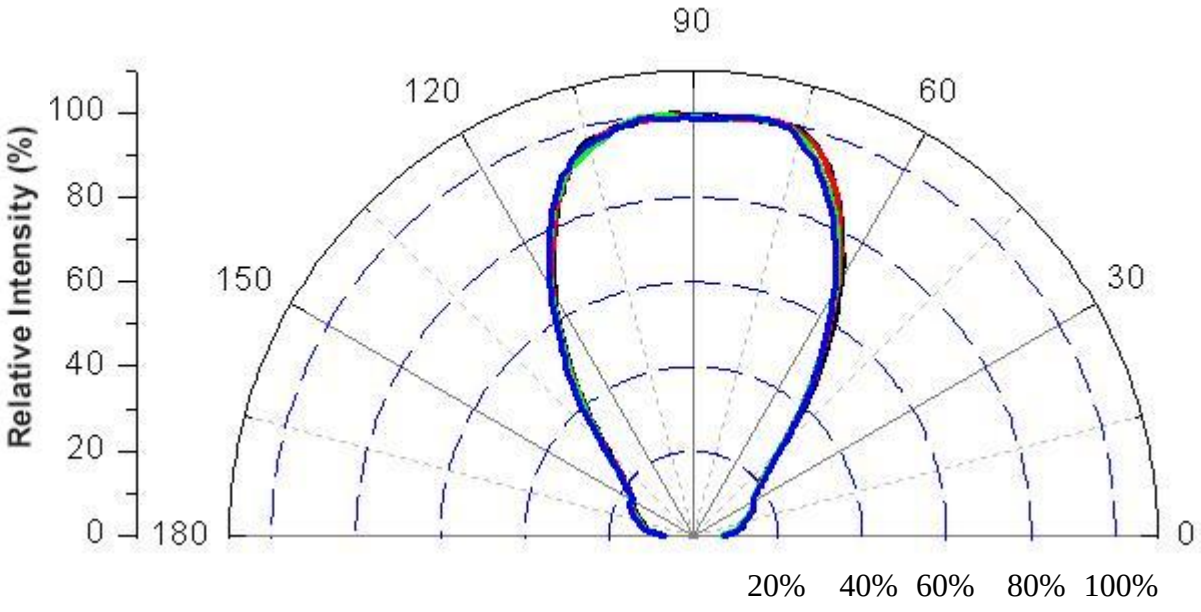
Polar Radiation Pattern

HMHP-E1FW (White)、HMHP-E1FV (Warm White) 、HMHP-E1FG (Green)、HMHP-E1FB (Blue)



HMHP-E1FR (Red)、HMHP-E1FA (Amber)



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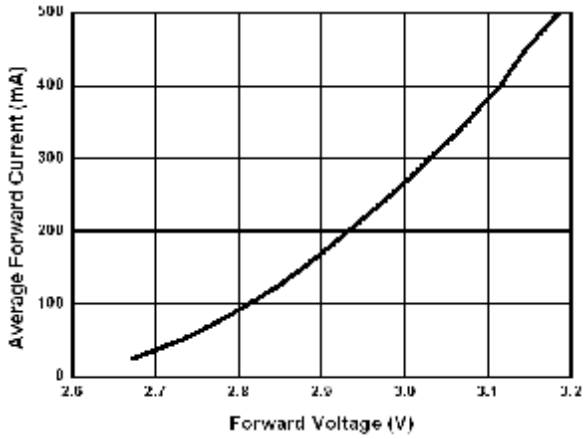
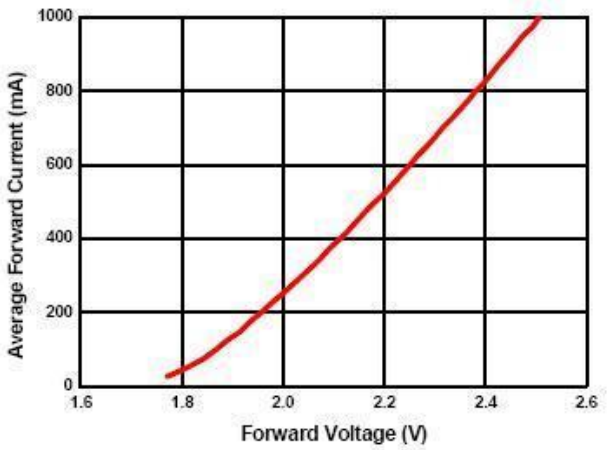
Electrical characteristics

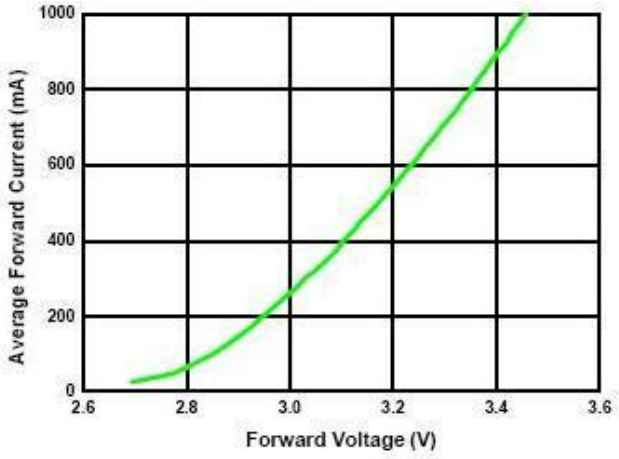
Typical Forward Current Characteristics



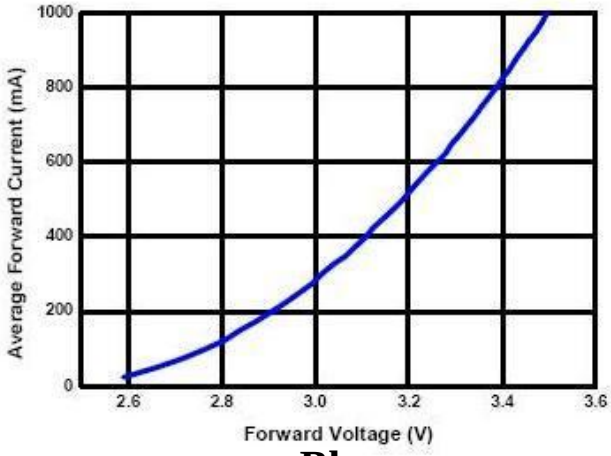
White/ Warm White



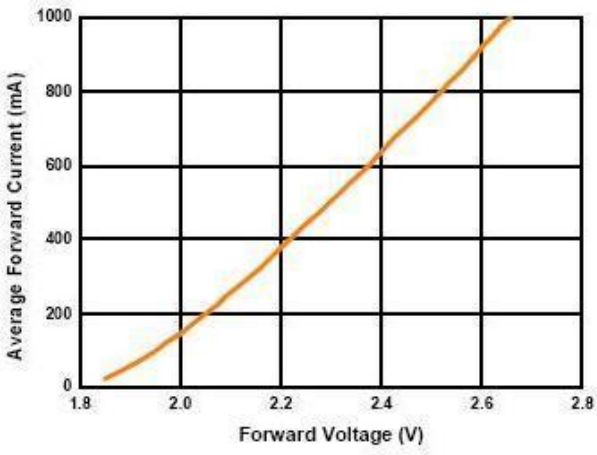
Red



Green



Blue



Amber

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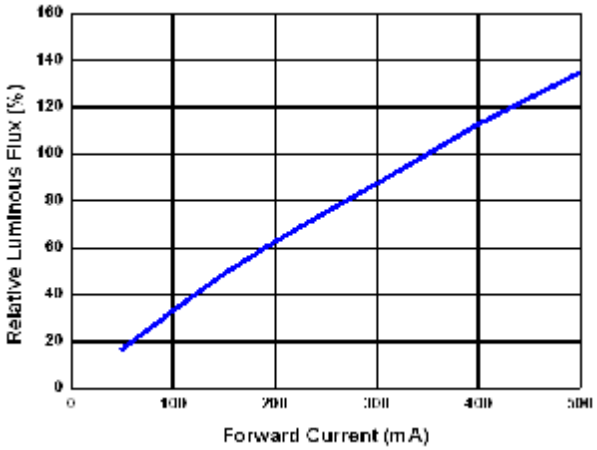
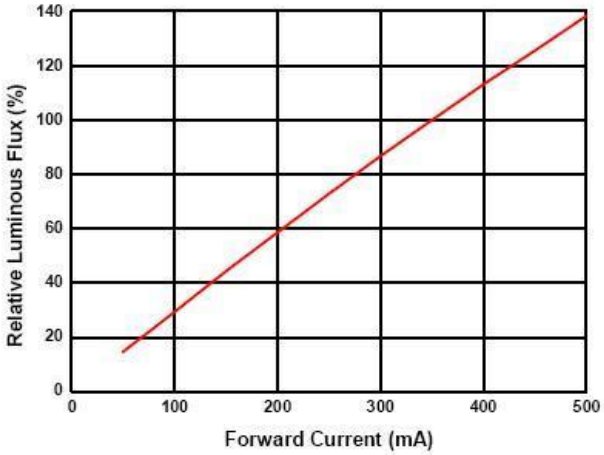
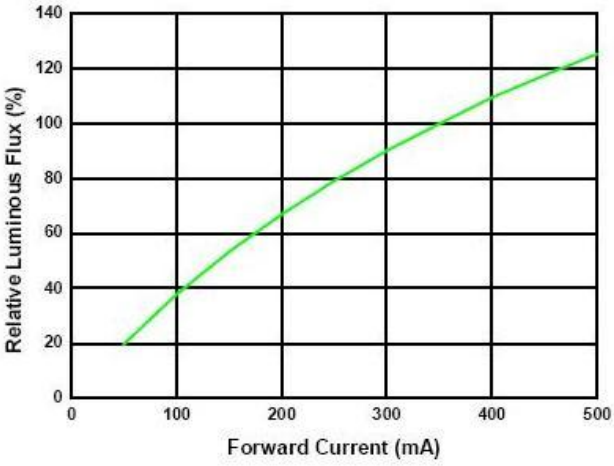
Typical Light Output Characteristics over. Forward Current



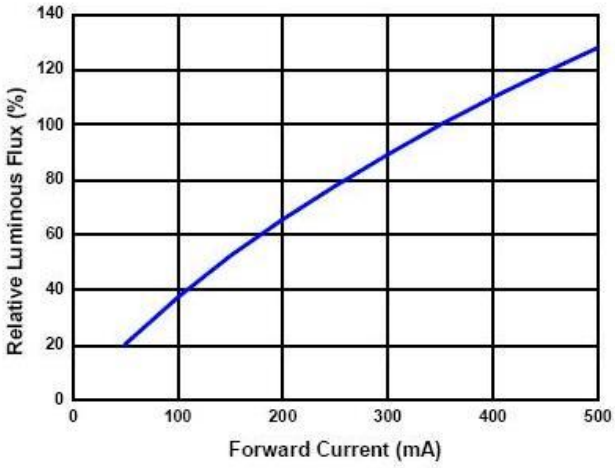
White/ Warm White



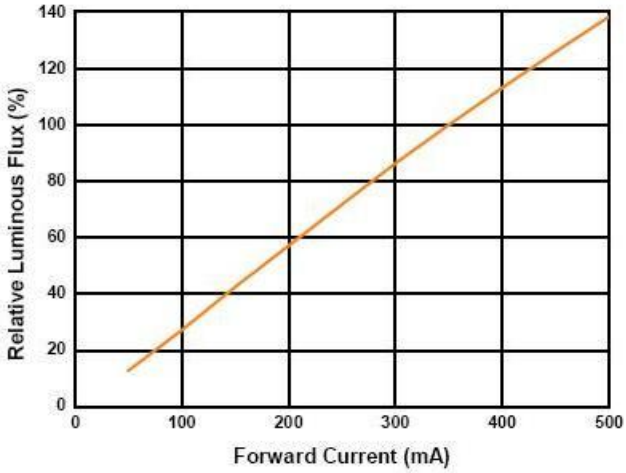
Red



Green



Blue



Amber

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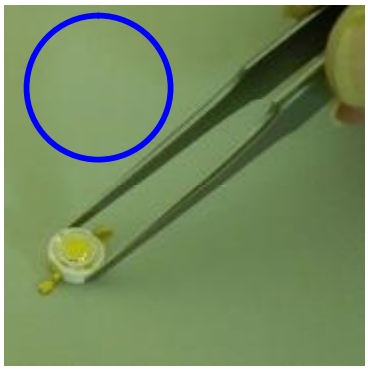
Handling Precaution

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.

- Avoid leaving fingerprints or scratches (by sharp tools) on the silicone resin parts.
- Do not force over 2000gf impact or pressure on the silicone molding lens.
- The LEDs should only be picked up by making contact with the sides of the LED body.
- 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℃, 10sec. (Pre treatment 25℃,70%,168hrs.)	2 times	0/10
Solderability (reflow soldering)	JEITA ED-4701 300 303	Tsld=215±5℃, 3sec. (Lead Solder)	1 time over 95%	0/10
Steady state operating life		Ta=25℃, I_F = 350mA Tested with Helio standard circuit board	1000 hrs.	0/10
Steady state operating life of high humidity heat		85℃, RH=85%, I_F = 350mA Tested with Helio standard circuit board	1000 hrs.	0/10
Temperature cycle	JEITA ED-4701 100 105	-40℃ ~ 25℃ ~ 100℃ ~ 25℃ 30min. 5min. 30min. 5min.	100 cycles	0/10
Thermal shock	JEITA ED-4701 300 307	0℃ ~ 100℃ 15sec. 15sec.	20 cycles	0/10
High temperature storage	JEITA ED-4701 200 201	Ta=100℃	1000 hrs.	0/10
Low temperature storage	JEITA ED-4701 200 202	Ta=-40℃	1000 hrs.	0/10
Vibration		2000 Hz, 2directions	60min.	0/10

Failure Criteria：

- Forward Voltage shift ：> 200 mV
- Luminous Flux degradation ：> 10 %
- Forward or Reverse Leakage：>10 μ A
- Catastrophic failure

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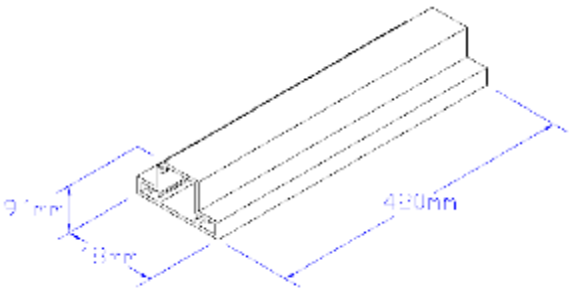
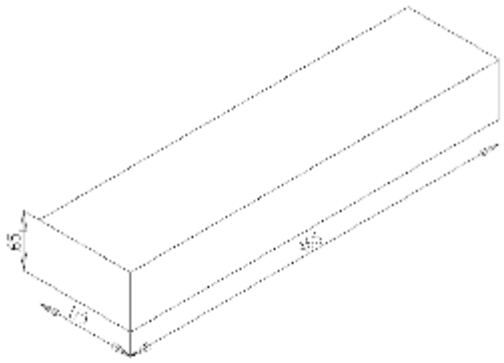
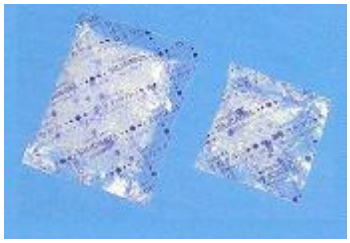
Tube Package Specifications



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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