



Spec. No.	PS-0810-031
Rev.	A

PRODUCT SPECIFICATION

Model No : CSHV-NL60WWG4-A6

Descriptions:
<ul style="list-style-type: none"> • LED Type : High Power VEGA • LED Package : Lambertian • Emitting Color : Warm White • Viewing Angle : 120° • Silicone LENS



CUSTOMER APPROVED SIGNATURES	APPROVED BY	CHECKED BY	PREPARED BY

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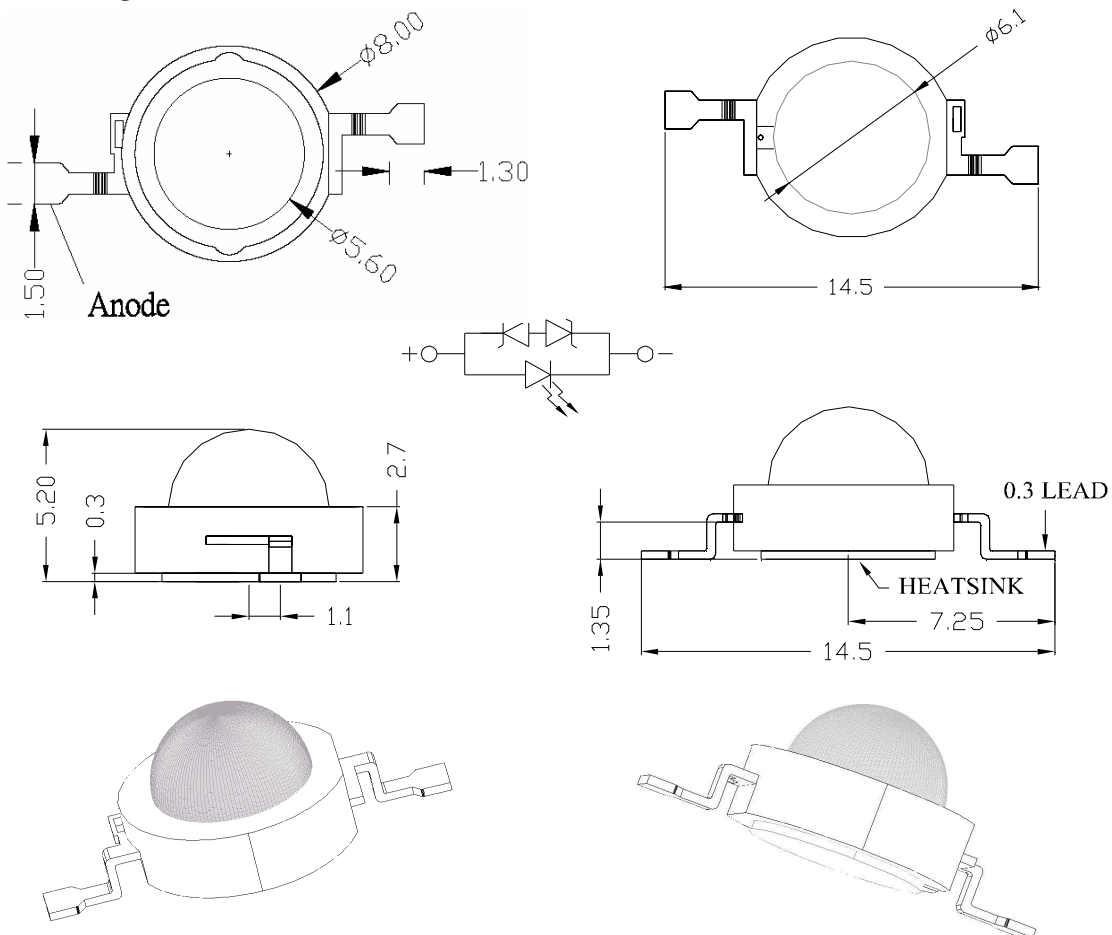
Features -

1. High Luminous Output : 55 lm
2. Silicone Encapsulation
3. RoHs Compliant
4. Compatible Lead-Free Reflow Solder
5. ESD>8KV(HBM)
5. Standard Collimator Compatible
6. Low thermal resistance (junction to Case) : 10 °C/W

Device Selection Guide -

Part No.			LED Lens
	Material	Emitted Color	
CSHV-NL60WWG4-A6	InGaN	Warm White	Water Transparent

Package Outline Dimensions -



Notes: Tolerance of measurement of Dimension: $\pm 0.25\text{mm}$



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■ Absolute Maximum Rating -

(Ta=25°C)

Parameter	Symbol	Rating	Unit
Power Dissipation	Pd	1.40	W
Forward Current (DC)	IF	350	mA
Peak Forward Current *	IFP	500	mA
Reverse Voltage	VR	5	V
Operating Temp.	Topr	-40 ~ +85	°C
Storage Temp.	Tstg	-40 ~ +100	°C

* Pulse width \leq 0.1 msec. duty \leq 1/10

■ Electro-optical Characteristics -

(Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Voltage	VF	-----	3.8	4.0	V	IF=350mA
Luminous Flux	Φ_v	35	55	-----	lm	
Viewing Angle	2 θ 1/2	-----	120	-----	deg	
Reverse Current	IR	-----	-----	50	μ A	VR=5V

■ Luminous Flux Rank Limits (IF = 350mA)

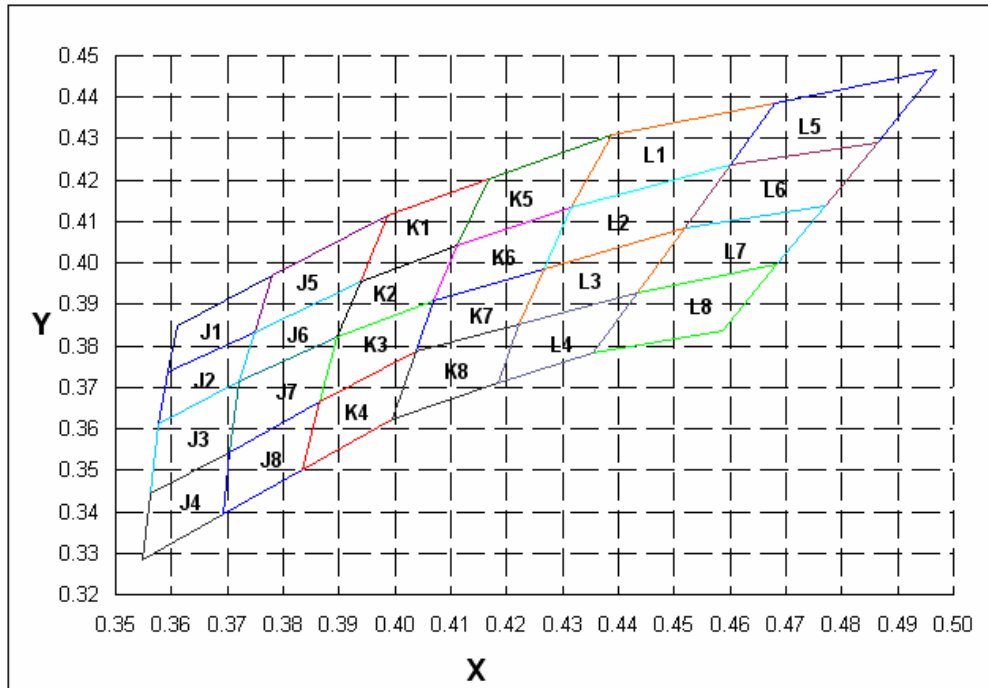
unit : lm

Part No. Code	CSHV-NL60WWG4-A6	
	min.	max.
H	35	45
J	45	58
K	58	70



Model No : CSHV-NL60WWG4-A6

■ Color Rank Limits ($I_f = 350\text{mA}$)



Rank J Color Temperature:3800~4600K									
J1					J5				
X	0.3593	0.3610	0.3780	0.3748	X	0.3748	0.3780	0.3988	0.3938
Y	0.3736	0.3850	0.3970	0.3834	Y	0.3834	0.3970	0.4116	0.3954
J2					J6				
X	0.3575	0.3593	0.3748	0.3720	X	0.3720	0.3748	0.3938	0.3897
Y	0.3612	0.3736	0.3834	0.3714	Y	0.3714	0.3834	0.3954	0.3823
J3					J7				
X	0.3561	0.3575	0.3720	0.3705	X	0.3705	0.3720	0.3897	0.3866
Y	0.3445	0.3612	0.3714	0.3544	Y	0.3544	0.3714	0.3823	0.3666
J4					J8				
X	0.3548	0.3561	0.3705	0.3692	X	0.3692	0.3705	0.3866	0.3834
Y	0.3285	0.3445	0.3544	0.3394	Y	0.3394	0.3544	0.3666	0.3501



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Color Rank Limits (I_f = 350mA)

Rank K Color Temperature:3175~3800K									
K1					K5				
X	0.3938	0.3988	0.4167	0.4112	X	0.4112	0.4167	0.4390	0.4314
Y	0.3954	0.4116	0.4203	0.4043	Y	0.4043	0.4203	0.4310	0.4135
K2					K6				
X	0.3897	0.3938	0.4112	0.4069	X	0.4069	0.4112	0.4314	0.4267
Y	0.3823	0.3954	0.4043	0.3908	Y	0.3908	0.4043	0.4135	0.3986
K3					K7				
X	0.3866	0.3897	0.4069	0.4037	X	0.4037	0.4069	0.4267	0.4222
Y	0.3666	0.3823	0.3908	0.3786	Y	0.3786	0.3908	0.3986	0.3853
K4					K8				
X	0.3834	0.3866	0.4037	0.3996	X	0.3996	0.4037	0.4222	0.4186
Y	0.3501	0.3666	0.3786	0.3624	Y	0.3624	0.3786	0.3853	0.3709

Rank L Color Temperature:2500~3175K									
L1					L5				
X	0.4314	0.4390	0.4680	0.4601	X	0.4601	0.4680	0.4970	0.4863
Y	0.4135	0.4310	0.4385	0.4238	Y	0.4238	0.4385	0.4466	0.4290
L2					L6				
X	0.4267	0.4314	0.4601	0.4519	X	0.4519	0.4601	0.4863	0.4770
Y	0.3986	0.4135	0.4238	0.4086	Y	0.4086	0.4238	0.4290	0.4137
L3					L7				
X	0.4222	0.4267	0.4519	0.4434	X	0.4434	0.4519	0.4770	0.4683
Y	0.3853	0.3986	0.4086	0.3930	Y	0.3930	0.4086	0.4137	0.3995
L4					L8				
X	0.4186	0.4222	0.4434	0.4355	X	0.4355	0.4434	0.4683	0.4588
Y	0.3709	0.3853	0.3930	0.3785	Y	0.3785	0.3930	0.3995	0.3838

Notes:

1. Tolerance of measurement of luminous Flux :±10%
2. Tolerance of measurement of Color Coordinates :±0.01
3. All data are measured by CSC's test equipment.
4. Please confirm with CSC salesman,if your request different from standard specification.



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Typical Electrical / Optical Characteristics Curves -

($T_a = 25^\circ\text{C}$ Unless Otherwise Noted)

Fig 1. Relative Luminous FLux vs. Forward Current

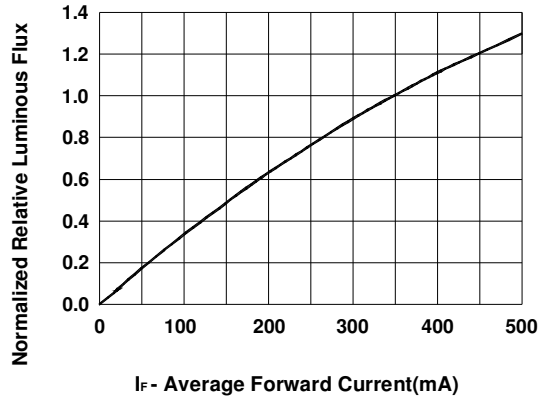


Fig 2. Forward Current vs. Forward Voltage

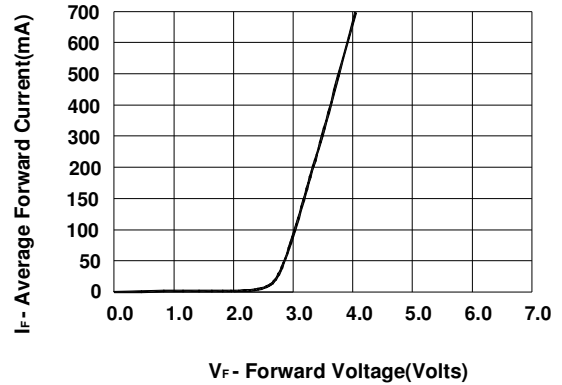


Fig 3. Maximum Forward Current vs. Ambient Temperature. Derating based on $T_{JMAX} = 120^\circ\text{C}$

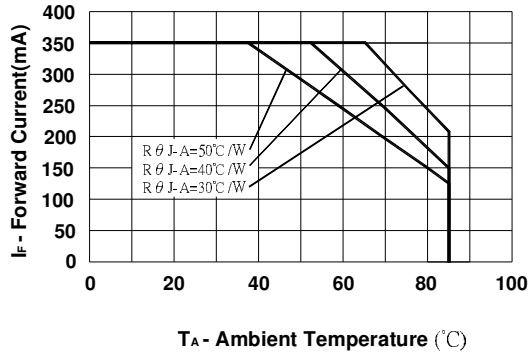


Fig 4. Relative Light Output vs. Junction Temperature

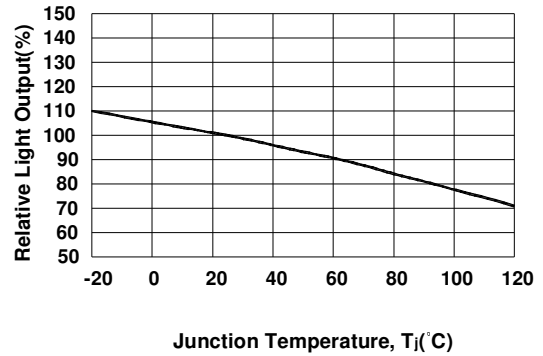


Fig 5. Relative Spectral Power Distribution vs. Wavelength

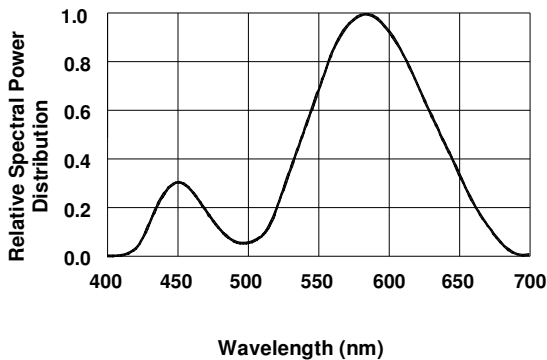
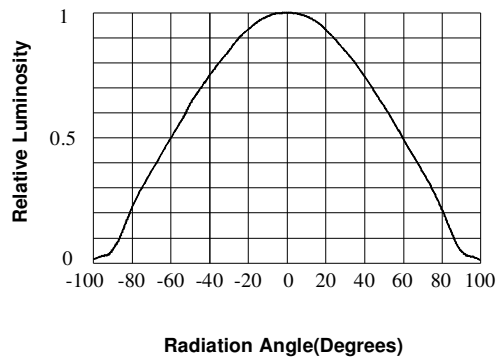


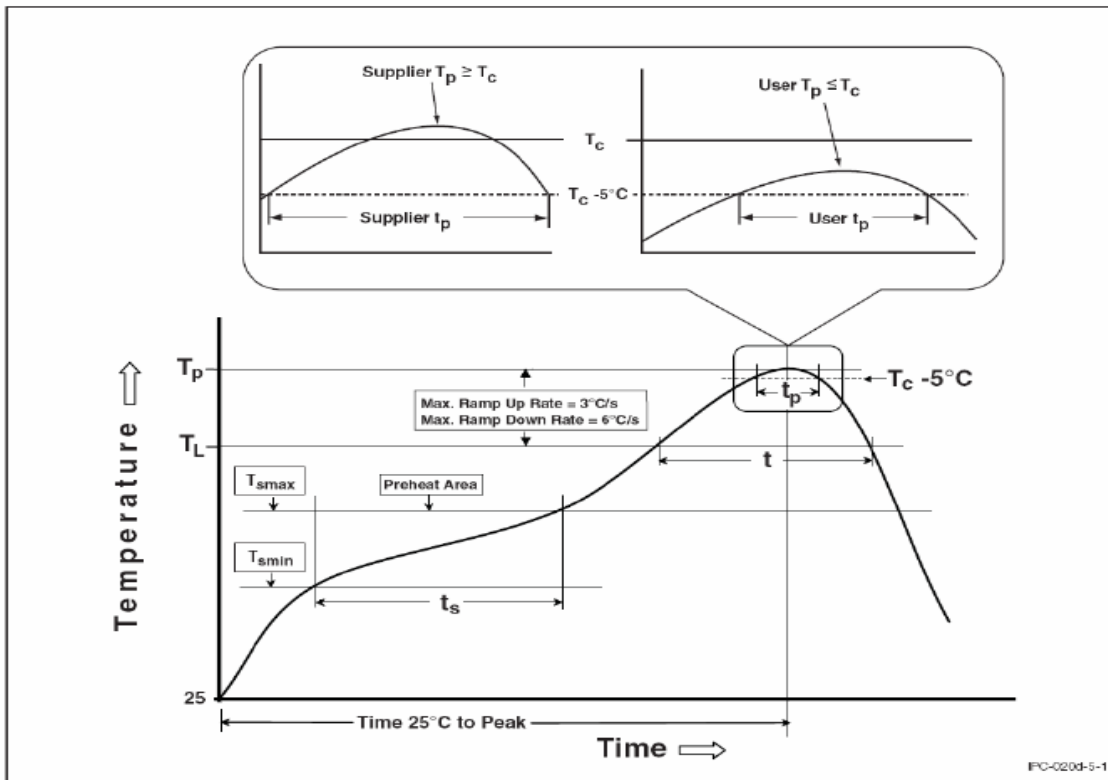
Fig 6. Relative Luminosity vs. Radiation Angle





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Reflow Soldering Characteristics



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat & Soak		
Temperature min (T_{smin})	100 °C	150 °C
Temperature max (T_{smax})	150 °C	200 °C
Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds	60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3 °C/second max.	3 °C/second max.
Liquidous temperature (T_L)	183 °C	217 °C
Time at liquidous (t_L)	60-150 seconds	60-150 seconds
Peak package body temperature (T_p)*	See classification temp in Table 4.1	See classification temp in Table 4.2
Time (t_p)** within 5 °C of the specified classification temperature (T_c)	20** seconds	30** seconds
Average ramp-down rate (T_p to T_{smax})	6 °C/second max.	6 °C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.
* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.		
** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.		

Hand Soldering Characteristics

Soldering temperature	260 °C
Soldering time	5 sec

Notes: All temperatures refer to Solder Pad

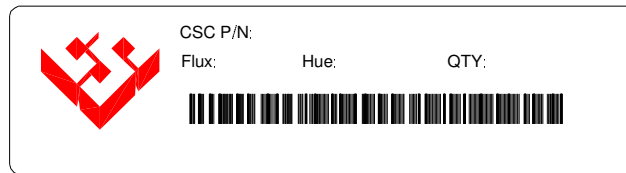
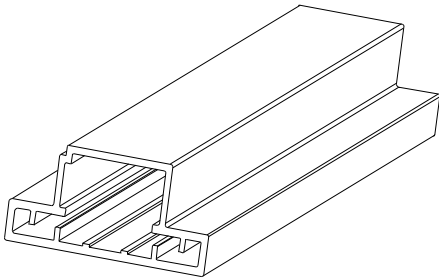


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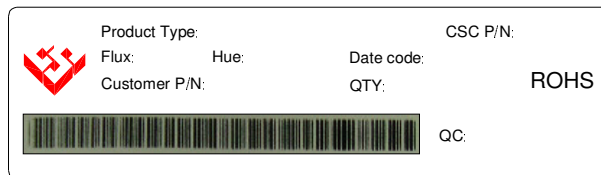
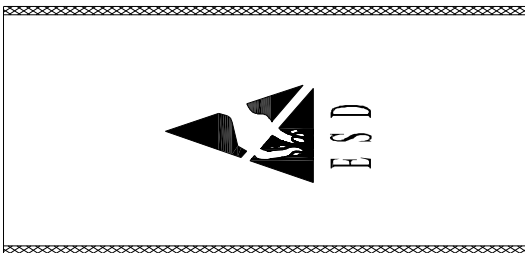
Package

1. Tube: 50pcs/tube
 CSC P/N: CSC Production number
 Flux: intensity grade
 Hue: wavelength grade
 Qty: quantity



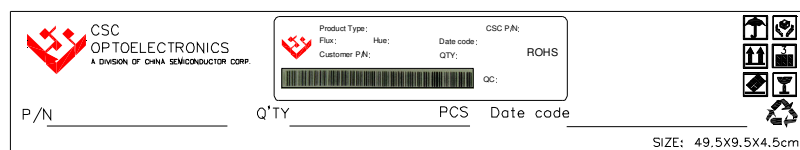
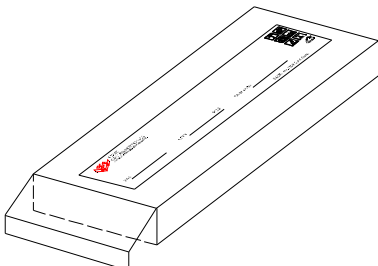
on tube

2. anti-electrostatic bag: 10 tubes/ bag
 Product type: Vega Power
 CSC P/N: CSC Production number
 Flux: intensity grade
 Hue: wavelength grade
 Date code: production time
 Customer P/N: customer production number
 Qty: quantity



on anti-electrostatic bag

3. carton: 2 anti-electrostatic bags/carton
 P/N: production number
 Qty: quantity
 Date code: production time



on carton



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■ Precautions for use

1. Please use LEDES refer to JEDEC 2a(Industry Best Moisture Sensitivity Level) as below:

Floor life		standard		accelerated Environment	
time	conditions	time	conditions	time	conditions
4	≤ 30°C/60%RH	(hours)	30°C/60%RH	(hours)	60°C/60%RH
weeks		696 ² +5/-0		120+1/-0	

Notes: The standard soak time includes a default value of 24 hours for semiconductor exposure time between bake and bag and includes the maximum time allowed out of bag at the distributor's facility.

2. Please confirm the moisture card in the anti-electrostatic bag after opening package.

If it shows 50%RH, LEDs should be performed baking treatment before used.

(bake condition: At 125°C +5/-0 for 24 hours)

3. Any mechanical force or any excess vibration on LENS should be avoided during operating.

4. LED should be stored below 60%RH after opening package.

5. Please refer to fig3 of page4 to choose current drive to use. Ambient temperature will affect current.

Note: The specifications are subject to change without notice. Please contact us for updated information.