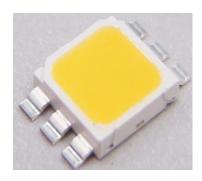




Cree® CLN6A-WKW/MKW



PRODUCT DESCRIPTION

The CLN6A LED delivers superior value with common voltage, current, size and optical properties. The Cree CLN6A is available in both cool and warm white to address a variety of lighting applications, including linear, portable, landscape and entertainment.

FEATURES

- Size (mm):5.0 x 5.0 x 1.3
- Color Temperatures(K):
 Cool White:
 Min. (4600) / Typical (5500)
 Warm White:
 Min. (2500) / Typical (3200)
- Luminous Flux (lm)
 CLN6A-WKW:(60.5 101.8)
 CLN6A-MKW:(51.0 101.8)
- CRI
 Typical CRI for Cool White is 72
 Typical CRI for Warm White is 80
- Lead-Free
- RoHS Compliant

APPLICATIONS

- Linear Lighting
- Channel Letter
- Portable Lighting
- Architectural & Landscaping Lighting
- Entertainment Lighting



ABSOLUTE MAXIMUM RATINGS $(T_A = 25^{\circ}C)$

Items	Symbol	Absolute Maximum Rating	Unit
		Cool/Warm	
Forward Current	$I_{\scriptscriptstyle \sf F}$	350	mA
Peak Forward Current Note1	$I_{_{FP}}$	600	mA
Reverse Voltage	$V_{_{\mathrm{R}}}$	5	V
Power Dissipation	$P_{_{D}}$	1200	mW
Operation Temperature	T_{opr}	-40 ~ +90	°C
Storage Temperature	T_{stg}	-40 ~ +100	°C
Junction Temperature	T _j	125	°C

Note: Pulse width ≤ 0.1 msec, duty $\leq 1/10$.

TYPICAL ELECTRICAL & OPTICAL CHARACTERISTICS ($T_A = 25$ °C)

Characteristics	Color	Symbol	Condition	Unit	Minimum	Typical	Maximum
Forward Voltage	Cool/Warm	$V_{_{\rm F}}$	I _F = 300 mA	V		3.8	4.4
Reverse Current	Cool/Warm	I_R	$V_R = 5 V$	μΑ			100
Luminous Elux	Cool	Φ_{V}	$I_F = 300 \text{ mA}$	lm	60.5	80	
Luminous Flux	Warm	Φ_{V}	$I_F = 300 \text{ mA}$	lm	51.0	72	
	Cool	Х	$I_F = 300 \text{ mA}$			0.3325	
Chromaticity	Cool	У	$I_F = 300 \text{ mA}$			0.3411	
Coordinates Warm	Marin	x	$I_F = 300 \text{ mA}$			0.4234	
	Walli	У	$I_F = 300 \text{ mA}$			0.3990	
Thermal Resistance, Junction to solder Point Note1	Cool/Warm	R _{THJS}	I _F = 300 mA	°C/W		15	

Note: Rth test condition: mounted on MCPCB (pad size \geq 40 mm²).



FLUX BIN LIMIT ($I_F = 300 \text{ mA}$)

Cool White(CLN6A-WKW)

Bin Code	Min.(lm)	Max.(lm)
J0	60.5	72.0
K0	72.0	85.6
L0	85.6	101.8

Warm White (CLN6A-MKW)

Bin Code	Min.(lm)	Max.(lm)
H0	51.0	60.5
J0	60.5	72.0
K0	72.0	85.6
L0	85.6	101.8

• Tolerance of measurement of luminous flux is $\pm 10\%$.

VF BIN LIMIT ($I_F = 300 \text{ mA}$)

Cool White (CLN6A-WKW)

Bin Code	Min.(V)	Max.(V)
44	2.8	3.2
45	3.2	3.6
46	3.6	4.0
47	4.0	4.4

Warm White (CLN6A-MKW)

Bin Code	Min.(V)	Max.(V)
44	2.8	3.2
45	3.2	3.6
46	3.6	4.0
47	4.0	4.4

Tolerance of measurement of VF is ± 0.05 V.



COLOR BIN LIMIT ($I_F = 300 \text{ mA}$)

Cool White

	iite		
Bin Code	Sub- bin	x	У
		0.2545	0.2480
	VA/-	0.2633	0.2410
	Wa	0.2545	0.2245
		0.2450	0.2290
		0.2633	0.2410
	VA/1-	0.2720	0.2340
	Wb	0.2640	0.2200
14/4		0.2545	0.2245
W1		0.2545	0.2480
	Wc	0.2640	0.2670
	VVC	0.2720	0.2575
		0.2633	0.2410
		0.2633	0.2410
	Wd	0.2720	0.2575
		0.2800	0.2480
		0.2720	0.2340
		0.2640	0.2670
	\\/o	0.2735	0.2860
	We	0.2808	0.2740
		0.2720	0.2575
		0.2720	0.2575
	Wf	0.2808	0.2740
	VVI	0.2880	0.2620
W2		0.2800	0.2480
VV Z		0.2735	0.2860
	\\/a	0.2830	0.3050
	Wg	0.2895	0.2905
		0.2808	0.2740
		0.2808	0.2740
	Wh	0.2895	0.2905
	vvn	0.2960	0.2760
		0.2880	0.2620

Bin Code	Sub- bin	х	у
	\A/=	0.2830	0.3050
		0.2950	0.3210
	Wj	0.2998	0.3028
		0.2895	0.2905
		0.2895	0.2905
	VA/1.	0.2998	0.3028
	Wk	0.3045	0.2865
Wa		0.2960	0.2760
W3		0.2950	0.3210
	14/100	0.3070	0.3370
	Wm	0.3100	0.3150
		0.2998	0.3028
		0.2998	0.3028
	Wn	0.3100	0.3150
	VVII	0.3130	0.2970
		0.3045	0.2865
		0.3070	0.3370
	Wp	0.3185	0.3485
	VVΡ	0.3200	0.3270
		0.3100	0.3150
		0.3100	0.3150
	Wa	0.3200	0.3270
	VVY	0.3215	0.3075
W4		0.3130	0.2970
VV- 1		0.3185	0.3485
	Wr	0.3300	0.3600
	VVI	0.3300	0.3390
		0.3200	0.3270
		0.3200	0.3270
	Ws	0.3300	0.3390
	WS	0.3300	0.3180
		0.3215	0.3075

Bin Code	Sub- bin	x	у
		0.3300	0.3600
	Wt	0.3455	0.3725
	VVC	0.3443	0.3535
		0.3300	0.3390
		0.3300	0.3390
	Wu	0.3443	0.3535
	vvu	0.3430	0.3345
W5		0.3300	0.3180
VVS		0.3455	0.3725
	Wy	0.3610	0.3850
	VVV	0.3585	0.3680
		0.3443	0.3535
		0.3443	0.3535
	Ww	0.3585	0.3680
	VVVV	0.3560	0.3510
		0.3430	0.3345

Tolerance of measurement of the color coordinates is ± 0.01 .



COLOR BIN LIMIT ($I_F = 300 \text{ mA}$)

Warm White

Bin Code	Sub- bin	x	у
		0.3610	0.3900
	Ma	0.3576	0.3651
	Ma	0.3751	0.3783
		0.3820	0.4075
		0.3576	0.3651
	Mb	0.3541	0.3401
	MD	0.3682	0.3491
M1		0.3749	0.3781
1417	Мс	0.3820	0.4075
		0.3751	0.3783
		0.3926	0.3915
		0.4030	0.4250
		0.3751	0.3783
	Md	0.3682	0.3491
	Ma	0.3822	0.3580
		0.3926	0.3915

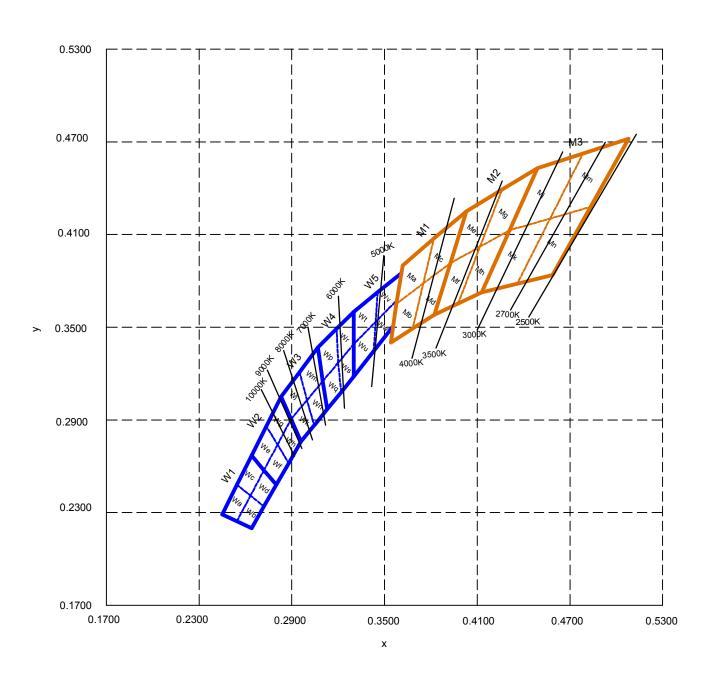
Bin Code	Sub- bin	х	у
		0.4030	0.4250
	Me	0.3926	0.3915
	Me	0.4118	0.4021
		0.4260	0.4390
		0.3926	0.3915
	Mf	0.3822	0.3580
	IMIT	0.3976	0.3653
M2		0.4118	0.4021
IVIZ	Mq	0.4260	0.4390
		0.4118	0.4021
	irig	0.4310	0.4128
		0.4490	0.4530
		0.4118	0.4021
	Mh	0.3976	0.3653
	14111	0.4129	0.3725
		0.4310	0.4128

Bin Code	Sub- bin	x	у
		0.4490	0.4530
	M÷	0.4310	0.4128
	Mj	0.4572	0.4203
		0.4785	0.4625
		0.4310	0.4128
	Mk	0.4129	0.3726
	IMK	0.4359	0.3782
M3		0.4572	0.4203
CIVI	Mm	0.4785	0.4625
		0.4572	0.4203
		0.4834	0.4279
		0.5080	0.4720
		0.4572	0.4203
	Mn	0.4359	0.3782
	14111	0.4588	0.3838
		0.4834	0.4279

Tolerance of measurement of the color coordinates is ± 0.01 .



CIE CHROMATICITY DIAGRAM





ORDER CODE TABLE*

Color	Kit Number	Luminous Flux (lm)		Color Bin Code
		Min.	Max.	Color Bill Code
Cool White	CLN6A-WKW-CJ0L0153	60.5	101.8	W1,W2,W3,W4,W5
Cool White	CLN6A-WKW-CJ0L0343	60.5	101.8	W3,W4
Cool White	CLN6A-WKW-CJ0L0453	60.5	101.8	W4,W5
Cool White	CLN6A-WKW-CK0L0343	72.0	101.8	W3,W4
Cool White	CLN6A-WKW-CK0L0453	72.0	101.8	W4,W5

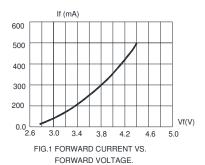
Color	Kit Number	Luminous Flux (lm)		Color Bin Code
		Min.	Max.	Color Bill Code
Warm White	CLN6A-MKW-CH0K0133	51.0	85.6	M1,M2,M3
Warm White	CLN6A-MKW-CH0K0233	51.0	85.6	M2,M3
Warm White	CLN6A-MKW-CH0K0513	51.0	85.6	W5,M1
Warm White	CLN6A-MKW-CJ0K0233	60.5	85.6	M2,M3
Warm White	CLN6A-MKW-CJ0K0513	60.5	85.6	W5,M1
Warm White	CLN6A-MKW-CH0L0513	51.0	101.8	W5,M1
Warm White	CLN6A-MKW-CJ0L0513	60.5	101.8	W5,M1

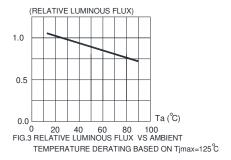
Notes:

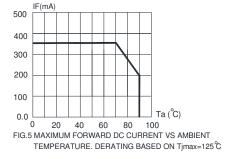
- 1. The above Kit numbers represent the order codes which include multiple flux-bin and color bin codes. Only one flux-bin code and one color bin code will be shipped on each reel. Single flux-bin codes and single color bin code will not be orderable.
- 2. Please refer to the "Cree LED Lamp Reliability Test Standards" document for reliability test conditions.
- 3. Please refer to the "Cree LED Lamp Soldering & Handling" document for information about how to use this LED product safely.

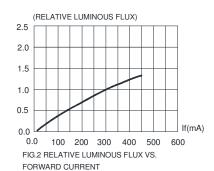


GRAPHS









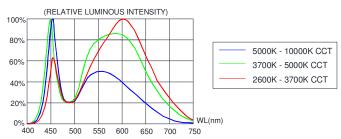
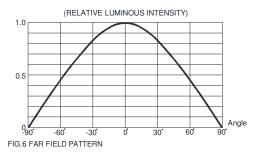


FIG.4 RELATIVE LUMINOUS INTENSITY VS. WAVELENGTH.

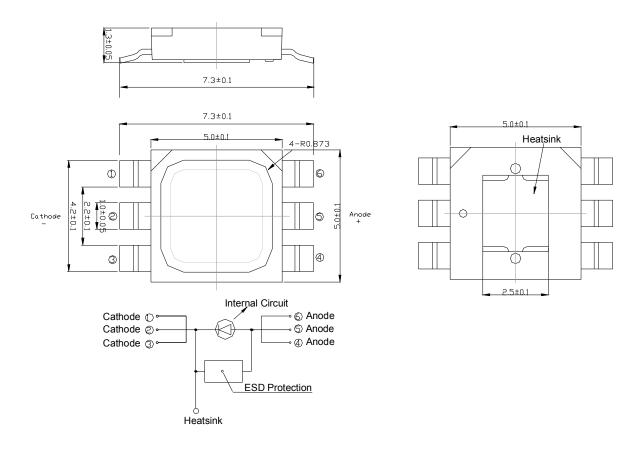


The above data are collected from statistical figures that do not necessarily correspond to the actual parameters of each single LED. Hence, these data will be changed without further notice.



MECHANICAL DIMENSIONS

All dimensions are in mm.



NOTES

RoHS Compliance

The levels of environmentally sensitive, persistent biologically toxic (PBT), persistent organic pollutants (POP), or otherwise restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS), as amended through April 21, 2006.

Vision Advisory Claim

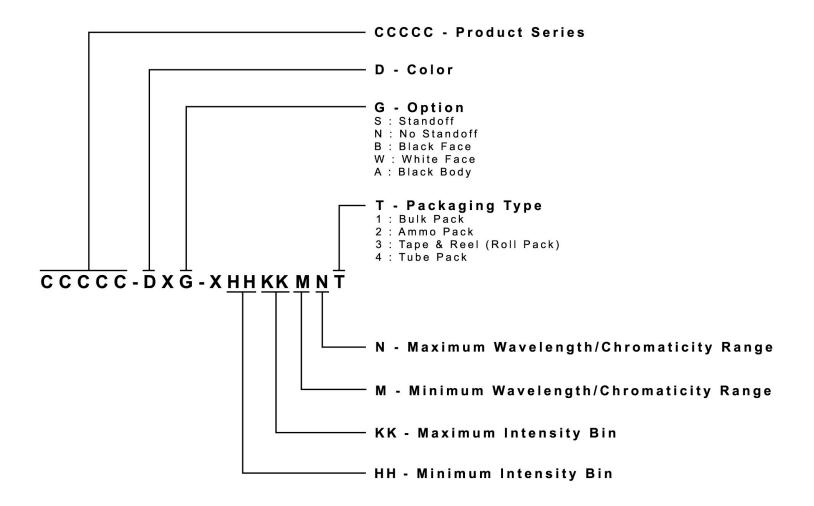
Users should be cautioned not to stare at the light of this LED product. The bright light can damage the eye.



KIT NUMBER SYSTEM

Cree LED lamps are tested and sorted into performance bins. A bin is specified by ranges of color, forward voltage, and brightness. Sorted LEDs are packaged for shipping in various convenient options. Please refer to the "Cree LED Lamp Packaging Standard" document for more information about shipping and packaging options.

Cree LEDs are sold by order codes in combinations of bins called kits. Order codes are configured in the following manner:





RELIABILITY

Tests and Results

Test	Applicable Standards	Test Condition	Note	Number of Damaged
Temperature Cycle* JEITA ED-4701 100 105		-40°C~25°C~100°C~25°C 30 mins, 5 mins, 30 mins, 5 mins	100 cycles	0/50
Thermal Shock*	MIL-STD-202G	-40°C~100°C 30 mins, 30 mins	100 cycles	0/50
Moisture Resistance	JEITA ED-4701 200 203	25°C~65°C~ 90%RH 24hrs/1cycle	10 cycles	0/25
High Temperature Storage	JEITA ED-4701 200 201	T _A =100°C	1000 hrs	0/25
Temperature Humidity Storage	JEITA ED-4701 100 103	T _A =60°C RH=90%	1000 hrs	0/25
Low Temperature Storage	JEITA ED-4701 200 202	T _A =-40°C	1000 hrs	0/25
High Temperature Life Test*	-	T _A =85°C I _F =160 mA	1000 hrs	0/25
Life Test*	-	T _A =25°C I _F =350 mA	1000 hrs	0/25
High Humidity Heat Life Test*	-	60°C RH=90% I _F =250 mA	500 hrs	0/25
Low Temperature Life Test	-	Ta=-30°C I _F =300 mA	1000 hrs	0/25
Resistance to Soldering Heat(Reflow Soldering)*	JEITA ED-4701 300 301	$T_{sol} = 260(\pm 5)^{\circ}\text{C}, 10\text{sec}$ (Pre treatment 30°C, 70%, 168hrs)	2 times	0/25
Solder ability (Reflow Soldering)	JEITA ED-4701 300 303	T _{SOL} =215±5°C, 3 sec (Lead Solder)	1 time (over 95%)	0/25
Vibration-variable Frequency	MIL-STE-883 Method 2007	20G min, 20 to 2000Hz, 4cycles, 4mins, Each x,y,z	16 mins	0/25
Substrate Bending	JEITA ED-4702	3mm, 5±1 sec	1 time	0/25
Adhesion Strength	JEITA ED-4702	5N, 10±1 sec	1 time	0/25
Electrostatic Discharge Test	MIL-STD-883 Method 2007	Human body model 1000 V	+/-1 time	0/25

Items marked with * are selective.

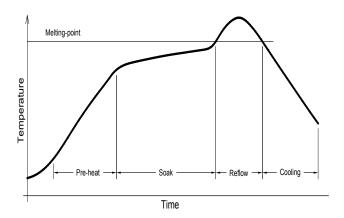
Failure Criteria

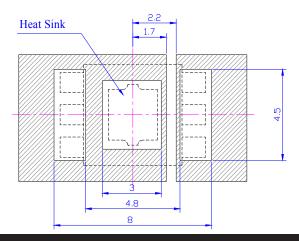
		Test	Criteria for Judgment		
Item	Item Symbol Condition		Min.	Max.	
Forward Voltage	V _F	I _F = 300 mA	-	Initial Data x 1.1	
Reverse Current	I_R	$V_R = 5 V$	-	100 μΑ	
Luminous Flux/Intensity	Φ _v	$I_F = 300 \text{ mA}$	Initial Data x 0.7	-	
Resistance to Soldering Heat	-	I _F = 300 mA	No dead lamps and visual damage		
Vibration-variable Frequency	-	I _F = 300 mA	No dead lamps and visual damage		



SOLDERING & HANDLING

- 1. Cleaning
- Don't use unspecified chemical liquids to clean the SMD LED; the chemical could harm the SMD LED. When washing is necessary, please immerse the SMD LED in alcohol at normal room temperature for less than 1 minute and dry at normal room temperature for 15 minutes before use.
- The influence of ultrasonic cleaning on the SMD LED depending on factors such as ultrasonic power and the way SMD LED are mounted. Ultrasonic cleaning shall be pre-qualified to ensure this will not cause damage to the SMD LED.
- 2. Moisture Proof Packing
- In order to prevent moisture absorption into SMD LED during the transportation and storage, SMD LED is packed in a moisture barrier bag. Desiccants and a humidity indicator are packed together with SMD LED as the secondary protection. The indication of humidity indicator card provides the information of humidity within SMD packing.
- 3. Storage
- Shelf life in original sealed bag at storage condition of <40°C and <90%RH is 12 months. Baking is required whenever shelf life is expired.
- Before openning the packaging , Please check whether bag leak air or not.
- After bag opening, the SMD LED must be stored under the condition < 30°C and < 60%RH. Under this condition, SMD LED must be used (subject to reflow) within 168 hours after bag opening, and re-baking is required when exceeding 168 hours.
- For baking, place SMD LED in oven at temperature 80°C±5°C and relative humidity <=10%RH, for 24 hours.
- Take out the material from packaging bag for re-bake. Do not open the door of oven frequently during the baking process.
- 4. Soldering
- Manual soldering by soldering iron
- The use of a soldering iron of less than 25W is recommended and the temperature of the iron must be kept at below 315°C, with soldering time within 2 seconds.
- The epoxy resin of SMD LED should not be in contact with tip of soldering iron.
- No mechanical stress should be exerted on the resin portion of SMD LED during soldering.
- Handling of SMD LED should be done when the package has been cooled down to below 40°C or less. This is to
 prevent the SMD LED failures due to thermal-mechanical stress during handling.
- Reflow Soldering
- The temperature (Top surface of SMD LED) profile is as below:





Solder	
Average ramp-up rate = 4°C/s max	Peak temperature = 250°C max.
Preheat temperature = 150°C ~200°C	Time within 5°C of actual Peak Temperature = 10s max.
Preheat time = 100s max.	Duration above 217°C is 80s max.
Ramp-down rate = 6°C/s max.	



PACKAGING

- The boxes are not water resistant and they must be kept away from water and moisture.
- The LEDs are packed in cardboard boxes after packaging in normal or anti-electrostatic bags.
- Cardboard boxes will be used to protect the LEDs from mechanical shocks during transportation.
- The reel pack is applied in SMD LED.
- Max 1100 pcs per reel.

