

Cree® Screen Master® 4-mm Oval LED C4SMG-RJS/GJS/BJS Data Sheet

The oval LED is specifically designed for variable-message signs and passengerinformation signs. The oval-shaped radiation pattern and high luminous intensity ensure that these devices are excellent for wide-field-of-view outdoor applications where a wide viewing angle and readability in sunlight are essential.

These lamps are made with an advanced optical-grade epoxy that offers superior high-temperature and high-moisture-resistance performance in outdoor signal and sign applications. The encapsulation resin contains anti-UV material in order to reduce the effects of long-term exposure to direct sunlight.



FEATURES

- Size (mm): 4
- Color and Typical Dominant Wavelength (nm):
 - » Red (621)
 - » Green (527)
 - » Blue (470)
- Luminous Intensity (mcd)
 - » Red (550-2130)
 - » Green (1100-4180)
 - » Blue (390-1520)
- Lead-Free
- RoHS-Compliant

APPLICATIONS

- Electronic Signs & Signals (ESS)
- Full-Color Video Screen
- Motorway Signs
- Variable-Message Sign (VMS)
- Advertising Signs
- Petrol Signs

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Absolute Maximum Ratings ($T_A = 25^{\circ}C$)

Items	Symbol	Absolute Max	cimum Rating	Unit
		Red	Blue and Green	
Forward Current	I _F	50 Note1	35	mA
Peak Forward Current Note2	I _{FP}	200	100	mA
Reverse Voltage	V _R	5	5	V
Power Dissipation	P _D	130	100	mW
Operation Temperature	T _{opr}	-40 ~	- +95	°C
Storage Temperature	T_{stg}	-40 ~	+100	°C
Lead Soldering Temperature	T _{sol}	(3	ec. max. he epoxy bulb)	
Electrostatic Discharge Classification (MIL-STD-883E)	ESD	Class 2		

Notes:

- 1. For long-term performance, the drive currents between 10 mA and 30 mA are recommended. Please contact Cree sales representative for more information on recommended drive conditions.
- 2. Pulse width ≤ 0.1 msec, duty $\leq 1/10$.

Typical Electrical & Optical Characteristics $(T_A = 25^{\circ}C)$

Characteristics	Color	Symbol	Condition	Unit	Minimum	Typical	Maximum
Forward Voltage	Red	V _F	I _F = 20 mA	V		2.1	2.6
	Blue/Green	V _F	$I_F = 20 \text{ mA}$	V		3.4	4.0
Reverse Current	Red	I _R	$V_{R} = 5 V$	μA			100
	Blue/Green	I _R	$V_{R} = 5 V$	μA			100
Dominant Wavelength	Red	$\lambda_{\rm D}$	$I_F = 20 \text{ mA}$	nm	619	621	624
	Green	$\lambda_{\rm D}$	$I_{F} = 20 \text{ mA}$	nm	520	527	535
	Blue	$\lambda_{_{D}}$	$I_{F} = 20 \text{ mA}$	nm	460	470	475
Luminous Intensity	Red	Iv	$I_{F} = 20 \text{ mA}$	mcd	550	1100	
	Green	I_v	$I_{F} = 20 \text{ mA}$	mcd	1100	2200	
	Blue	Iv	$I_{F} = 20 \text{ mA}$	mcd	390	900	



Intensity Bin Limit ($I_F = 20 \text{ mA}$)

Red					Green					Blue			
Bin Code	Sub- bin	Min. (mcd)	Max. (mcd)		Bin Code	Sub- bin	Min. (mcd)	Max. (mcd)		Bin Code	Sub- bin	Min. (mcd)	Max. (mcd)
	R1	550	605		то	T1	1100	1205			Q1	390	430
R0	R2	605	660			T2	1205	1310		Q0	Q2	430	470
ĸu	R3	660	715		10	Т3	1310	1415			Q3	470	510
	R4	715	770			T4	1415	1520			Q4	510	550
	S1	770	852		UO	U1	1520	1672		RO	R1	550	605
S0	S2	852	934			U2	1672	1824			R2	605	660
- 50	S3	934	1017			U3	1824	1976			R3	660	715
	S4	1017	1100			U4	1976	2130			R4	715	770
	T1	1100	1205			V1	2130	2347			S1	770	852
то	T2	1205	1310		VO	V2	2347	2564		<u> </u>	S2	852	934
10	Т3	1310	1415		VU	V3	2564	2781		S0	S3	934	1017
	T4	1415	1520			V4	2781	3000			S4	1017	1100
	U1	1520	1672			W1	3000	3295			T1	1100	1205
UO	U2	1672	1824		WO	W2	3295	3590		TO	T2	1205	1310
00	U3	1824	1976		**0	W3	3590	3885		Т0	Т3	1310	1415
	U4	1976	2130			W4	3885	4180			T4	1415	1520

Tolerance of measurement of luminous intensity is $\pm 15\%$

Color Bin Limit ($I_F = 20 \text{ mA}$)

Red			Green	Green				Blue			
Bin Code	Min. (nm)	Max. (nm)	Bin Code	Min. (nm)	Max. (nm)		Bin Code	Min. (nm)	Max. (
RB	619	624	G7	520	525		B3	460	465		
			G8	525	530		B4	465	470		
			G9	530	535		B5	470	475		

Tolerance of measurement of dominant wavelength is ± 1 nm

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Order Code Table*

	Kit Number	Luminous Int		Deck				
Color		Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)	Pack- age
Red	C4SMG-RJS-CR0U0BB1	550	2130	RB	619	RB	624	Bulk
Red	C4SMG-RJS-CR14QBB1	Any 4 consecutive sub-b	ins: R1 (550) - S2 (934)	RB	619	RB	624	Bulk
Red	C4SMG-RJS-CR34QBB1	Any 4 consecutive sub-bi	ns: R3 (660) - S4 (1100)	RB	619	RB	624	Bulk
Red	C4SMG-RJS-CS14QBB1	Any 4 consecutive sub-bi	ns: S1 (770) - T2 (1310)	RB	619	RB	624	Bulk
Red	C4SMG-RJS-CS34QBB1	Any 4 consecutive sub-bi	ns: S3 (934) - T4 (1520)	RB	619	RB	624	Bulk
Red	C4SMG-RJS-CT14QBB1	Any 4 consecutive sub-bir	ns: T1 (1100) - U2 (1824)	RB	619	RB	624	Bulk
Red	C4SMG-RJS-CR0U0BB2	550	2130	RB	619	RB	624	Ammo
Red	C4SMG-RJS-CR14QBB2	Any 4 consecutive sub-b	ins: R1 (550) - S2 (934)	RB	619	RB	624	Ammo
Red	C4SMG-RJS-CR34QBB2	Any 4 consecutive sub-bi	ns: R3 (660) - S4 (1100)	RB	619	RB	624	Ammo
Red	C4SMG-RJS-CS14QBB2	Any 4 consecutive sub-bi	ns: S1 (770) - T2 (1310)	RB	619	RB	624	Ammo
Red	C4SMG-RJS-CS34QBB2	Any 4 consecutive sub-bi	ns: S3 (934) - T4 (1520)	RB	619	RB	624	Ammo
Red	C4SMG-RJS-CT14QBB2	Any 4 consecutive sub-bir	ns: T1 (1100) - U2 (1824)	RB	619	RB	624	Ammo

		Luminous Int	ensity (mcd)		Pack-			
Color	Kit Number	Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)	age
Green	C4SMG-GJS-CT0W0791	1100	4180	G7	520	G9	535	Bulk
Green	C4SMG-GJS-CT14Q7T1	Any 4 consecutive sub-bir	ns: T1 (1100) - U2 (1824)	Any 1 color	bin from G7	(520 nm) to 0	G8 (530 nm)	Bulk
Green	C4SMG-GJS-CU14Q7T1	Any 4 consecutive sub-bir	ns: U1 (1520) - V2 (2564)	Any 1 color	bin from G7	(520 nm) to (G8 (530 nm)	Bulk
Green	C4SMG-GJS-CU34Q7T1	Any 4 consecutive sub-bin	ns: U3 (1824) - V4 (3000)	Any 1 color	bin from G7	(520 nm) to (G8 (530 nm)	Bulk
Green	C4SMG-GJS-CV14Q7T1	Any 4 consecutive sub-bin	s: V1 (2130) - W2 (3590)	Any 1 color	bin from G7	(520 nm) to (G8 (530 nm)	Bulk
Green	C4SMG-GJS-CT0W0792	1100	4180	G7	520	G9	535	Ammo
Green	C4SMG-GJS-CT14Q7T2	Any 4 consecutive sub-bir	ns: T1 (1100) - U2 (1824)	Any 1 color	bin from G7	(520 nm) to (G8 (530 nm)	Ammo
Green	C4SMG-GJS-CU14Q7T2	Any 4 consecutive sub-bir	ns: U1 (1520) - V2 (2564)	Any 1 color	bin from G7	(520 nm) to (G8 (530 nm)	Ammo
Green	C4SMG-GJS-CU34Q7T2	Any 4 consecutive sub-bir	ns: U3 (1824) - V4 (3000)	Any 1 color	bin from G7	(520 nm) to (G8 (530 nm)	Ammo
Green	C4SMG-GJS-CV14Q7T2	Any 4 consecutive sub-bin	s: V1 (2130) - W2 (3590)	Any 1 color	bin from G7	(520 nm) to (G8 (530 nm)	Ammo

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4 CLD-CT934.003



Order Code Table*

		Luminous In		Pack-				
Color	Kit Number	Min.	Max.	Color Bin	Min. (nm)	Color Bin	Max. (nm)	age
Blue	C4SMG-BJS-CQ0T0351	390	1520	B3	460	B5	475	Bulk
Blue	C4SMG-BJS-CQ0T0451	390	1520	B4	465	B5	475	Bulk
Blue	C4SMG-BJS-CQ14Q3T1	Any 4 consecutive sub-b	oins: Q1 (390) - R2 (660)	Any 1 color	bin from B3	(460 nm) to E	34 (470 nm)	Bulk
Blue	C4SMG-BJS-CQ14Q4T1	Any 4 consecutive sub-b	oins: Q1 (390) - R2 (660)	Any 1 color	bin from B4	(465 nm) to E	35 (475 nm)	Bulk
Blue	C4SMG-BJS-CR14Q3T1	Any 4 consecutive sub-t	oins: R1 (550) - S2 (934)	Any 1 color	bin from B3	(460 nm) to E	34 (470 nm)	Bulk
Blue	C4SMG-BJS-CR14Q4T1	Any 4 consecutive sub-b	oins: R1 (550) - S2 (934)	Any 1 color	bin from B4	(465 nm) to E	35 (475 nm)	Bulk
Blue	C4SMG-BJS-CR24Q4T1	Any 4 consecutive sub-b	ins: R2 (605) - S3 (1017)	Any 1 color	bin from B4	(465 nm) to E	35 (475 nm)	Bulk
Blue	C4SMG-BJS-CS24Q3T1	Any 4 consecutive sub-b	ins: S2 (852) - T3 (1415)	Any 1 color	bin from B3	(460 nm) to E	34 (470 nm)	Bulk
Blue	C4SMG-BJS-CS24Q4T1	Any 4 consecutive sub-b	ins: S2 (852) - T3 (1415)	Any 1 color	bin from B4	(465 nm) to E	35 (475 nm)	Bulk
Blue	C4SMG-BJS-CQ0T0352	390	1520	B3	460	B5	475	Ammo
Blue	C4SMG-BJS-CQ0T0452	390	1520	B4	465	B5	475	Ammo
Blue	C4SMG-BJS-CQ14Q3T2	Any 4 consecutive sub-b	oins: Q1 (390) - R2 (660)	Any 1 color	bin from B3	(460 nm) to E	34 (470 nm)	Ammo
Blue	C4SMG-BJS-CQ14Q4T2	Any 4 consecutive sub-b	oins: Q1 (390) - R2 (660)	Any 1 color	bin from B4	(465 nm) to E	35 (475 nm)	Ammo
Blue	C4SMG-BJS-CR14Q3T2	Any 4 consecutive sub-b	oins: R1 (550) - S2 (934)	Any 1 color	bin from B3	(460 nm) to E	34 (470 nm)	Ammo
Blue	C4SMG-BJS-CR14Q4T2	Any 4 consecutive sub-t	oins: R1 (550) - S2 (934)	Any 1 color	bin from B4	(465 nm) to E	35 (475 nm)	Ammo
Blue	C4SMG-BJS-CR24Q4T2	Any 4 consecutive sub-b	ins: R2 (605) - S3 (1017)	Any 1 color	bin from B4	(465 nm) to E	35 (475 nm)	Ammo
Blue	C4SMG-BJS-CS24Q3T2	Any 4 consecutive sub-b	ins: S2 (852) - T3 (1415)	Any 1 color	bin from B3	(460 nm) to E	34 (470 nm)	Ammo
Blue	C4SMG-BJS-CS24Q4T2	Any 4 consecutive sub-b	ins: S2 (852) - T3 (1415)	Any 1 color	bin from B4	(465 nm) to E	35 (475 nm)	Ammo

Notes:

- The above kit numbers represent order codes that include multiple intensity-bin and color-bin codes. Only one intensity-sub-bin code and one color-bin code will be shipped on each reel. Selected single intensity-bin, single color-bin codes will be orderable in certain quantities. For example, any four consecutive sub-bins from V1 to W2 mean only one intensity bin with four sub-bins of the following brightness ranges (V1-V4, V2-W1, V3-W2) will be shipped by Cree. For example, any one-color bin from G7 to G9 means only one color bin (G7 or G8 or G9) will be shipped by Cree.
- 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.

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Graphs





FIG.6 RED & BLUE&GREEN FAR FIELD PATTERN

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.

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60'

70°

80

_____90['] 1.0



Mechanical Dimensions

All dimensions are in mm. Tolerance is ± 0.25 mm unless otherwise noted.

An epoxy meniscus may extend about 1.5 mm down the leads.

Burr around bottom of epoxy may be 0.5 mm max.



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.

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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:



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Package

Features:

- 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 shock during transportation.
- The boxes are not water-resistant, and they must be kept away from water and moisture.
- There are two types of packaging: bulk pack and ammo pack.
- Max 500 pcs per bulk and max 3000 pcs per ammo.

Bulk Pack Packaging Type:

Ammo Pack Packaging Type:



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