

# Cree® PLCC4 SMD LED CLA1B-WKW/MKW



## PRODUCT DESCRIPTION

The CLA1B is packaged in an industry standard footprint. With an improved package to provide high reliability & performance, they are designed to work under a wide range of environmental conditions.

This high reliability feature makes them ideally suited to be used under illumination application conditions.

The wide viewing-angle makes these LEDs ideally suited for Linear Lighting, panel lighting and general illumination applications.

## FEATURES

- Size (mm): 3.2 x 2.8
- Color Temperatures(K):  
Cool White CLA1B-WKW : 4700 - 8300  
Warm White CLA1B-MKW : 2500 - 4700
- Luminous Flux (lm)  
CLA1B-WKW: (6.3 - 13.9)  
CLA1B-MKW: (6.3 - 13.9)
- CRI  
Typical CRI for Cool White is 75  
Typical CRI for Warm White is 80
- Viewing angle: 120 degree
- Lead-Free
- RoHS Compliant

## APPLICATIONS

- Linear Lighting
- Channel Letter
- Panel Lighting
- General Illumination

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

| Items                                | Symbol     | Absolute Maximum Rating | Unit               |
|--------------------------------------|------------|-------------------------|--------------------|
| Forward Current                      | $I_F$      | 80                      | mA                 |
| Peak Forward Current <sup>Note</sup> | $I_{FP}$   | 100                     | mA                 |
| Reverse Voltage                      | $V_R$      | 5                       | V                  |
| Power Dissipation                    | $P_D$      | 304                     | mW                 |
| Operation Temperature                | $T_{opr}$  | -40 ~ +100              | $^\circ\text{C}$   |
| Storage Temperature                  | $T_{stg}$  | -40 ~ +100              | $^\circ\text{C}$   |
| Junction Temperature                 | $T_J$      | 110                     | $^\circ\text{C}$   |
| Junction/Ambient                     | $R_{THJA}$ | 220                     | $^\circ\text{C/W}$ |
| Junction/Solder Point                | $R_{THJS}$ | 120                     | $^\circ\text{C/W}$ |

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

### TYPICAL ELECTRICAL & OPTICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

| Characteristics          | Color     | Symbol          | Condition     | Unit          | Minimum | Typical | Maximum |
|--------------------------|-----------|-----------------|---------------|---------------|---------|---------|---------|
| Forward Voltage          | Cool/Warm | $V_F$           | $I_F = 30$ mA | V             |         | 3.2     | 3.8     |
| Reverse Current          | Cool/Warm | $I_R$           | $V_R = 5$ V   | $\mu\text{A}$ |         |         | 10      |
| Luminous Flux            | Cool      | $\Phi_V$        | $I_F = 30$ mA | lm            | 6.3     | 9.6     |         |
|                          | Warm      | $\Phi_V$        | $I_F = 30$ mA | lm            | 6.3     | 8.6     |         |
| Luminous Intensity       | Cool      | $I_V$           | $I_F = 30$ mA | mcd           | 2800    | 3177    |         |
|                          | Warm      | $I_V$           | $I_F = 30$ mA | mcd           | 2520    | 3023    |         |
| Chromaticity Coordinates | Cool      | x               | $I_F = 30$ mA |               |         | 0.3452  |         |
|                          |           | y               | $I_F = 30$ mA |               |         | 0.3556  |         |
|                          | Warm      | x               | $I_F = 30$ mA |               |         | 0.4343  |         |
|                          |           | y               | $I_F = 30$ mA |               |         | 0.4043  |         |
| 50% Power Angle          | Cool/Warm | $2\theta_{1/2}$ | $I_F = 30$ mA | deg           |         | 120     |         |

### INTENSITY BIN LIMIT ( $I_f = 30 \text{ mA}$ )

#### Cool White(CLA1B-WKW)

| Bin Code | Sub-Bin Code | Min. (lm) | Max. (lm) |
|----------|--------------|-----------|-----------|
| D0       | -            | 6.3       | 8.2       |
| E0       | -            | 8.2       | 10.7      |
| F0       | F1           | 10.7      | 12.3      |
|          | F2           | 12.3      | 13.9      |

#### Warm White(CLA1B-MKW)

| Bin Code | Sub-Bin Code | Min. (lm) | Max. (lm) |
|----------|--------------|-----------|-----------|
| D0       | -            | 6.3       | 8.2       |
| E0       | -            | 8.2       | 10.7      |
| F0       | F1           | 10.7      | 12.3      |
|          | F2           | 12.3      | 13.9      |

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

### VF BIN LIMIT ( $I_f = 30 \text{ mA}$ )

#### Cool White (CLA1B-WKW)

| Bin Code | Min.(V) | Max.(V) |
|----------|---------|---------|
| 28       | 3.0     | 3.2     |
| 29       | 3.2     | 3.4     |
| 2a       | 3.4     | 3.6     |
| 2b       | 3.6     | 3.8     |

#### Warm White (CLA1B-MKW)

| Bin Code | Min.(V) | Max.(V) |
|----------|---------|---------|
| 28       | 3.0     | 3.2     |
| 29       | 3.2     | 3.4     |
| 2a       | 3.4     | 3.6     |
| 2b       | 3.6     | 3.8     |

Tolerance of measurement of VF is  $\pm 0.05\text{V}$ .

**COLOR BIN LIMIT ( $I_f = 30 \text{ mA}$ )**

| Region | x      | y      | Region | x      | y      | Region | x      | y      | Region | x      | y      |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0A     | 0.2950 | 0.2970 | 0B     | 0.2920 | 0.3060 | 0C     | 0.2984 | 0.3133 | 0D     | 0.2984 | 0.3133 |
|        | 0.2920 | 0.3060 |        | 0.2895 | 0.3135 |        | 0.2962 | 0.3220 |        | 0.3048 | 0.3207 |
|        | 0.2984 | 0.3133 |        | 0.2962 | 0.3220 |        | 0.3028 | 0.3304 |        | 0.3068 | 0.3113 |
|        | 0.3009 | 0.3042 |        | 0.2984 | 0.3133 |        | 0.3048 | 0.3207 |        | 0.3009 | 0.3042 |
| 0R     | 0.2980 | 0.2880 | 0S     | 0.2895 | 0.3135 | 0T     | 0.2962 | 0.3220 | 0U     | 0.3037 | 0.2937 |
|        | 0.2950 | 0.2970 |        | 0.2870 | 0.3210 |        | 0.2937 | 0.3312 |        | 0.3009 | 0.3042 |
|        | 0.3009 | 0.3042 |        | 0.2937 | 0.3312 |        | 0.3005 | 0.3415 |        | 0.3068 | 0.3113 |
|        | 0.3037 | 0.2937 |        | 0.2962 | 0.3220 |        | 0.3028 | 0.3304 |        | 0.3093 | 0.2993 |
| 1A     | 0.3048 | 0.3207 | 1B     | 0.3028 | 0.3304 | 1C     | 0.3115 | 0.3391 | 1D     | 0.3130 | 0.3290 |
|        | 0.3130 | 0.3290 |        | 0.3115 | 0.3391 |        | 0.3205 | 0.3481 |        | 0.3213 | 0.3373 |
|        | 0.3144 | 0.3186 |        | 0.3130 | 0.3290 |        | 0.3213 | 0.3373 |        | 0.3221 | 0.3261 |
|        | 0.3068 | 0.3113 |        | 0.3048 | 0.3207 |        | 0.3130 | 0.3290 |        | 0.3144 | 0.3186 |
| 1R     | 0.3068 | 0.3113 | 1S     | 0.3005 | 0.3415 | 1T     | 0.3099 | 0.3509 | 1U     | 0.3144 | 0.3186 |
|        | 0.3144 | 0.3186 |        | 0.3099 | 0.3509 |        | 0.3196 | 0.3602 |        | 0.3221 | 0.3261 |
|        | 0.3161 | 0.3059 |        | 0.3115 | 0.3391 |        | 0.3205 | 0.3481 |        | 0.3231 | 0.3120 |
|        | 0.3093 | 0.2993 |        | 0.3028 | 0.3304 |        | 0.3115 | 0.3391 |        | 0.3161 | 0.3059 |
| 2A     | 0.3215 | 0.3350 | 2B     | 0.3207 | 0.3462 | 2C     | 0.3290 | 0.3538 | 2D     | 0.3290 | 0.3417 |
|        | 0.3290 | 0.3417 |        | 0.3290 | 0.3538 |        | 0.3376 | 0.3616 |        | 0.3371 | 0.3490 |
|        | 0.3290 | 0.3300 |        | 0.3290 | 0.3417 |        | 0.3371 | 0.3490 |        | 0.3366 | 0.3369 |
|        | 0.3222 | 0.3243 |        | 0.3215 | 0.3350 |        | 0.3290 | 0.3417 |        | 0.3290 | 0.3300 |
| 2R     | 0.3222 | 0.3243 | 2S     | 0.3196 | 0.3602 | 2T     | 0.3290 | 0.3690 | 2U     | 0.3290 | 0.3300 |
|        | 0.3290 | 0.3300 |        | 0.3290 | 0.3690 |        | 0.3381 | 0.3762 |        | 0.3366 | 0.3369 |
|        | 0.3290 | 0.3180 |        | 0.3290 | 0.3538 |        | 0.3376 | 0.3616 |        | 0.3361 | 0.3245 |
|        | 0.3231 | 0.3120 |        | 0.3207 | 0.3462 |        | 0.3290 | 0.3538 |        | 0.3290 | 0.3180 |
| 3A     | 0.3371 | 0.3490 | 3B     | 0.3376 | 0.3616 | 3C     | 0.3463 | 0.3687 | 3D     | 0.3451 | 0.3554 |
|        | 0.3451 | 0.3554 |        | 0.3463 | 0.3687 |        | 0.3551 | 0.3760 |        | 0.3533 | 0.3620 |
|        | 0.3440 | 0.3427 |        | 0.3451 | 0.3554 |        | 0.3533 | 0.3620 |        | 0.3515 | 0.3487 |
|        | 0.3366 | 0.3369 |        | 0.3371 | 0.3490 |        | 0.3451 | 0.3554 |        | 0.3440 | 0.3427 |
| 3R     | 0.3366 | 0.3369 | 3S     | 0.3381 | 0.3762 | 3T     | 0.3480 | 0.3840 | 3U     | 0.3440 | 0.3428 |
|        | 0.3440 | 0.3428 |        | 0.3480 | 0.3840 |        | 0.3571 | 0.3907 |        | 0.3515 | 0.3487 |
|        | 0.3429 | 0.3307 |        | 0.3463 | 0.3687 |        | 0.3551 | 0.3760 |        | 0.3495 | 0.3339 |
|        | 0.3361 | 0.3245 |        | 0.3376 | 0.3616 |        | 0.3463 | 0.3687 |        | 0.3429 | 0.3307 |
| 4A     | 0.3530 | 0.3597 | 4B     | 0.3548 | 0.3736 | 4C     | 0.3641 | 0.3804 | 4D     | 0.3615 | 0.3659 |
|        | 0.3615 | 0.3659 |        | 0.3641 | 0.3804 |        | 0.3736 | 0.3874 |        | 0.3702 | 0.3722 |
|        | 0.3590 | 0.3521 |        | 0.3615 | 0.3659 |        | 0.3702 | 0.3722 |        | 0.3670 | 0.3578 |
|        | 0.3512 | 0.3465 |        | 0.3530 | 0.3597 |        | 0.3615 | 0.3659 |        | 0.3590 | 0.3521 |
| 4R     | 0.3512 | 0.3465 | 4S     | 0.3571 | 0.3907 | 4T     | 0.3668 | 0.3957 | 4U     | 0.3590 | 0.3521 |
|        | 0.3590 | 0.3521 |        | 0.3668 | 0.3957 |        | 0.3771 | 0.4034 |        | 0.3670 | 0.3578 |
|        | 0.3567 | 0.3389 |        | 0.3641 | 0.3804 |        | 0.3736 | 0.3874 |        | 0.3640 | 0.3440 |
|        | 0.3495 | 0.3339 |        | 0.3548 | 0.3736 |        | 0.3641 | 0.3804 |        | 0.3567 | 0.3389 |

● Tolerance of measurement of the color coordinates is  $\pm 0.01$ .

**COLOR BIN LIMIT ( $I_f = 30 \text{ mA}$ )**

| Region | x      | y      | Region | x      | y      | Region | x      | y      | Region | x      | y      |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 5A1    | 0.3670 | 0.3578 | 5A2    | 0.3686 | 0.3649 | 5A3    | 0.3744 | 0.3685 | 5A4    | 0.3726 | 0.3612 |
|        | 0.3686 | 0.3649 |        | 0.3702 | 0.3722 |        | 0.3763 | 0.3760 |        | 0.3744 | 0.3685 |
|        | 0.3744 | 0.3685 |        | 0.3763 | 0.3760 |        | 0.3825 | 0.3798 |        | 0.3804 | 0.3721 |
|        | 0.3726 | 0.3612 |        | 0.3744 | 0.3685 |        | 0.3804 | 0.3721 |        | 0.3783 | 0.3646 |
| 5B1    | 0.3702 | 0.3722 | 5B2    | 0.3719 | 0.3797 | 5B3    | 0.3782 | 0.3837 | 5B4    | 0.3763 | 0.3760 |
|        | 0.3719 | 0.3797 |        | 0.3736 | 0.3874 |        | 0.3802 | 0.3916 |        | 0.3782 | 0.3837 |
|        | 0.3782 | 0.3837 |        | 0.3802 | 0.3916 |        | 0.3869 | 0.3958 |        | 0.3847 | 0.3877 |
|        | 0.3763 | 0.3760 |        | 0.3782 | 0.3837 |        | 0.3847 | 0.3877 |        | 0.3825 | 0.3798 |
| 5C1    | 0.3825 | 0.3798 | 5C2    | 0.3847 | 0.3877 | 5C3    | 0.3912 | 0.3917 | 5C4    | 0.3887 | 0.3836 |
|        | 0.3847 | 0.3877 |        | 0.3869 | 0.3958 |        | 0.3937 | 0.4001 |        | 0.3912 | 0.3917 |
|        | 0.3912 | 0.3917 |        | 0.3937 | 0.4001 |        | 0.4006 | 0.4044 |        | 0.3978 | 0.3958 |
|        | 0.3887 | 0.3836 |        | 0.3912 | 0.3917 |        | 0.3978 | 0.3958 |        | 0.3950 | 0.3875 |
| 5D1    | 0.3783 | 0.3646 | 5D2    | 0.3804 | 0.3721 | 5D3    | 0.3863 | 0.3758 | 5D4    | 0.3840 | 0.3681 |
|        | 0.3804 | 0.3721 |        | 0.3825 | 0.3798 |        | 0.3887 | 0.3836 |        | 0.3863 | 0.3758 |
|        | 0.3863 | 0.3758 |        | 0.3887 | 0.3836 |        | 0.3950 | 0.3875 |        | 0.3924 | 0.3794 |
|        | 0.3840 | 0.3681 |        | 0.3863 | 0.3758 |        | 0.3924 | 0.3794 |        | 0.3898 | 0.3716 |
| 6A1    | 0.3889 | 0.3690 | 6A2    | 0.3915 | 0.3768 | 6A3    | 0.3981 | 0.3800 | 6A4    | 0.3953 | 0.3720 |
|        | 0.3915 | 0.3768 |        | 0.3941 | 0.3848 |        | 0.4010 | 0.3882 |        | 0.3981 | 0.3800 |
|        | 0.3981 | 0.3800 |        | 0.4010 | 0.3882 |        | 0.4080 | 0.3916 |        | 0.4048 | 0.3832 |
|        | 0.3953 | 0.3720 |        | 0.3981 | 0.3800 |        | 0.4048 | 0.3832 |        | 0.4017 | 0.3751 |
| 6B1    | 0.3941 | 0.3848 | 6B2    | 0.3968 | 0.3930 | 6B3    | 0.4040 | 0.3966 | 6B4    | 0.4010 | 0.3882 |
|        | 0.3968 | 0.3930 |        | 0.3996 | 0.4015 |        | 0.4071 | 0.4052 |        | 0.4040 | 0.3966 |
|        | 0.4040 | 0.3966 |        | 0.4071 | 0.4052 |        | 0.4146 | 0.4089 |        | 0.4113 | 0.4001 |
|        | 0.4010 | 0.3882 |        | 0.4040 | 0.3966 |        | 0.4113 | 0.4001 |        | 0.4080 | 0.3916 |
| 6C1    | 0.4080 | 0.3916 | 6C2    | 0.4113 | 0.4001 | 6C3    | 0.4186 | 0.4037 | 6C4    | 0.4150 | 0.3950 |
|        | 0.4113 | 0.4001 |        | 0.4146 | 0.4089 |        | 0.4222 | 0.4127 |        | 0.4186 | 0.4037 |
|        | 0.4186 | 0.4037 |        | 0.4222 | 0.4127 |        | 0.4299 | 0.4165 |        | 0.4259 | 0.4073 |
|        | 0.4150 | 0.3950 |        | 0.4186 | 0.4037 |        | 0.4259 | 0.4073 |        | 0.4221 | 0.3984 |
| 6D1    | 0.4017 | 0.3751 | 6D2    | 0.4048 | 0.3832 | 6D3    | 0.4116 | 0.3865 | 6D4    | 0.4082 | 0.3782 |
|        | 0.4048 | 0.3832 |        | 0.4080 | 0.3916 |        | 0.4150 | 0.3950 |        | 0.4116 | 0.3865 |
|        | 0.4116 | 0.3865 |        | 0.4150 | 0.3950 |        | 0.4221 | 0.3984 |        | 0.4183 | 0.3898 |
|        | 0.4082 | 0.3782 |        | 0.4116 | 0.3865 |        | 0.4183 | 0.3898 |        | 0.4147 | 0.3814 |
| 7A1    | 0.4147 | 0.3814 | 7A2    | 0.4183 | 0.3898 | 7A3    | 0.4242 | 0.3919 | 7A4    | 0.4203 | 0.3833 |
|        | 0.4183 | 0.3898 |        | 0.4221 | 0.3984 |        | 0.4281 | 0.4006 |        | 0.4242 | 0.3919 |
|        | 0.4242 | 0.3919 |        | 0.4281 | 0.4006 |        | 0.4342 | 0.4028 |        | 0.4300 | 0.3939 |
|        | 0.4203 | 0.3833 |        | 0.4242 | 0.3919 |        | 0.4300 | 0.3939 |        | 0.4259 | 0.3853 |

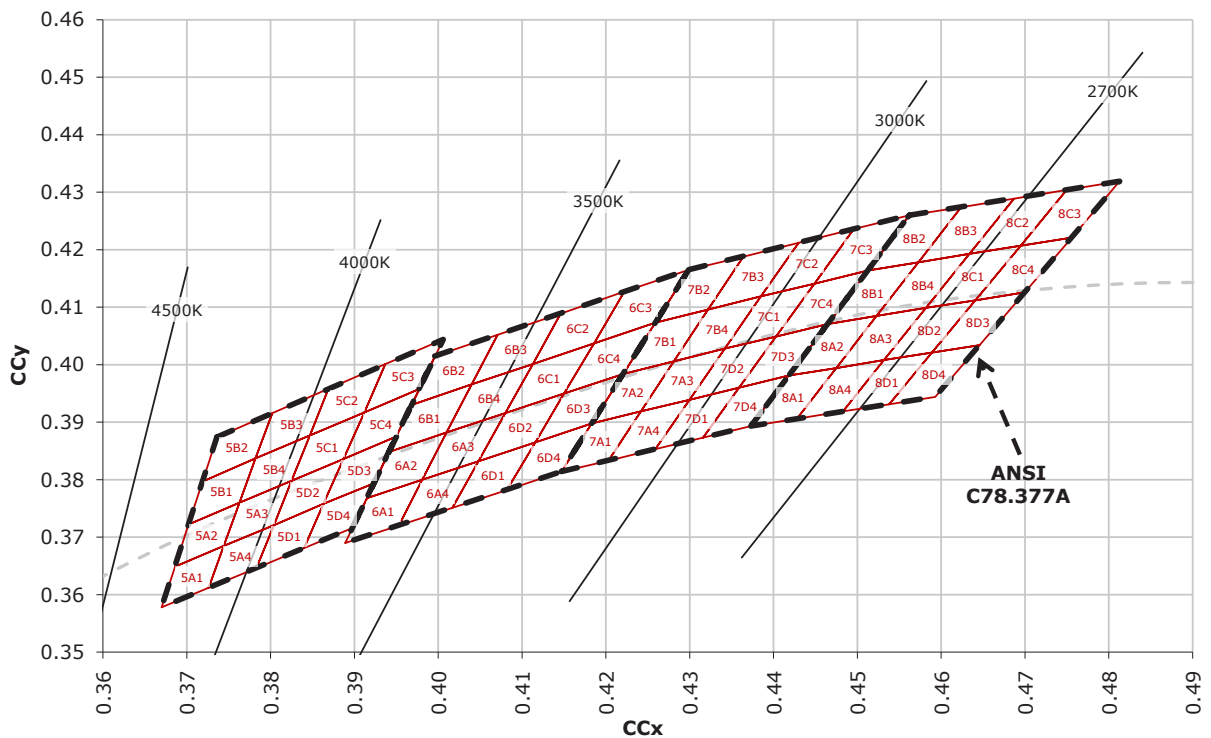
• Tolerance of measurement of the color coordinates is  $\pm 0.01$ .

**COLOR BIN LIMIT ( $I_f = 30 \text{ mA}$ )**

| Region | x      | y      | Region | x      | y      | Region | x      | y      | Region | x      | y      |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 7B1    | 0.4221 | 0.3984 | 7B2    | 0.4259 | 0.4073 | 7B3    | 0.4322 | 0.4096 | 7B4    | 0.4281 | 0.4006 |
|        | 0.4259 | 0.4073 |        | 0.4299 | 0.4165 |        | 0.4364 | 0.4188 |        | 0.4322 | 0.4096 |
|        | 0.4322 | 0.4096 |        | 0.4364 | 0.4188 |        | 0.4430 | 0.4212 |        | 0.4385 | 0.4119 |
|        | 0.4281 | 0.4006 |        | 0.4322 | 0.4096 |        | 0.4385 | 0.4119 |        | 0.4342 | 0.4028 |
| 7C1    | 0.4342 | 0.4028 | 7C2    | 0.4385 | 0.4119 | 7C3    | 0.4449 | 0.4141 | 7C4    | 0.4403 | 0.4049 |
|        | 0.4385 | 0.4119 |        | 0.4430 | 0.4212 |        | 0.4496 | 0.4236 |        | 0.4449 | 0.4141 |
|        | 0.4449 | 0.4141 |        | 0.4496 | 0.4236 |        | 0.4562 | 0.4260 |        | 0.4513 | 0.4164 |
|        | 0.4403 | 0.4049 |        | 0.4449 | 0.4141 |        | 0.4513 | 0.4164 |        | 0.4465 | 0.4071 |
| 7D1    | 0.4259 | 0.3853 | 7D2    | 0.4300 | 0.3939 | 7D3    | 0.4359 | 0.3960 | 7D4    | 0.4316 | 0.3873 |
|        | 0.4300 | 0.3939 |        | 0.4342 | 0.4028 |        | 0.4403 | 0.4049 |        | 0.4359 | 0.3960 |
|        | 0.4359 | 0.3960 |        | 0.4403 | 0.4049 |        | 0.4465 | 0.4071 |        | 0.4418 | 0.3981 |
|        | 0.4316 | 0.3873 |        | 0.4359 | 0.3960 |        | 0.4418 | 0.3981 |        | 0.4373 | 0.3893 |
| 8A1    | 0.4373 | 0.3893 | 8A2    | 0.4418 | 0.3981 | 8A3    | 0.4475 | 0.3994 | 8A4    | 0.4428 | 0.3906 |
|        | 0.4418 | 0.3981 |        | 0.4465 | 0.4071 |        | 0.4523 | 0.4085 |        | 0.4475 | 0.3994 |
|        | 0.4475 | 0.3994 |        | 0.4523 | 0.4085 |        | 0.4582 | 0.4099 |        | 0.4532 | 0.4008 |
|        | 0.4428 | 0.3906 |        | 0.4475 | 0.3994 |        | 0.4532 | 0.4008 |        | 0.4483 | 0.3919 |
| 8B1    | 0.4465 | 0.4071 | 8B2    | 0.4513 | 0.4164 | 8B3    | 0.4573 | 0.4178 | 8B4    | 0.4523 | 0.4085 |
|        | 0.4513 | 0.4164 |        | 0.4562 | 0.4260 |        | 0.4624 | 0.4274 |        | 0.4573 | 0.4178 |
|        | 0.4573 | 0.4178 |        | 0.4624 | 0.4274 |        | 0.4687 | 0.4289 |        | 0.4634 | 0.4193 |
|        | 0.4523 | 0.4085 |        | 0.4573 | 0.4178 |        | 0.4634 | 0.4193 |        | 0.4582 | 0.4099 |
| 8C1    | 0.4582 | 0.4099 | 8C2    | 0.4634 | 0.4193 | 8C3    | 0.4695 | 0.4207 | 8C4    | 0.4641 | 0.4112 |
|        | 0.4634 | 0.4193 |        | 0.4687 | 0.4289 |        | 0.4750 | 0.4304 |        | 0.4695 | 0.4207 |
|        | 0.4695 | 0.4207 |        | 0.4750 | 0.4304 |        | 0.4813 | 0.4319 |        | 0.4756 | 0.4221 |
|        | 0.4641 | 0.4112 |        | 0.4695 | 0.4207 |        | 0.4756 | 0.4221 |        | 0.4700 | 0.4126 |
| 8D1    | 0.4483 | 0.3919 | 8D2    | 0.4532 | 0.4008 | 8D3    | 0.4589 | 0.4021 | 8D4    | 0.4538 | 0.3931 |
|        | 0.4532 | 0.4008 |        | 0.4582 | 0.4099 |        | 0.4641 | 0.4112 |        | 0.4589 | 0.4021 |
|        | 0.4589 | 0.4021 |        | 0.4641 | 0.4112 |        | 0.4700 | 0.4126 |        | 0.4646 | 0.4034 |
|        | 0.4538 | 0.3931 |        | 0.4589 | 0.4021 |        | 0.4646 | 0.4034 |        | 0.4593 | 0.3944 |

- Tolerance of measurement of the color coordinates is  $\pm 0.01$ .

### CIE CHROMATICITY DIAGRAM



**ORDER CODE TABLE\***

| Color      | Kit Number         | Viewing Angle | Luminous Flux (lm) |      | Color Bin Code  |
|------------|--------------------|---------------|--------------------|------|---|
|            |                    |               | Min.               | Max. |   |
| Cool White | CLA1B-WKW-XD0F0503 | 120           | 6.3                | 13.9 | 1A0,1B0,1C0,1D0,2A0,2B0,2C0,2D0   |
| Cool White | CLA1B-WKW-XD0F0513 | 120           | 6.3                | 13.9 | 0S0,0T0,0U0,1A0,1B0,1C0,1D0,2A0,2B0,2C0,2D0,2R0,2S0,2T0,2U0,3S0,3B0,3A0,3R0 |
| Cool White | CLA1B-WKW-XD0F0DT3 | 120           | 6.3                | 13.9 | 0A0,0B0,0C0,0D0,0R0,0S0,0T0,0U0,1A0,1B0,1C0,1D0,1R0,1S0,1T0,1U0             |
| Cool White | CLA1B-WKW-XD0F0DV3 | 120           | 6.3                | 13.9 | 1A0,1B0,1C0,1D0,1R0,1S0,1T0,1U0,2A0,2B0,2C0,2D0,2R0,2S0,2T0,2U0             |
| Cool White | CLA1B-WKW-XD0F0DY3 | 120           | 6.3                | 13.9 | 2A0,2B0,2C0,2D0,2R0,2S0,2T0,2U0,3A0,3B0,3C0,3D0,3R0,3S0,3T0,3U0             |
| Cool White | CLA1B-WKW-XD0F0DZ3 | 120           | 6.3                | 13.9 | 2C0,2D0,2T0,2U0,3A0,3B0,3C0,3D0,3R0,3S0,3T0,3U0,4A0,4B0,4R0,4S0             |
| Cool White | CLA1B-WKW-XD0F0E13 | 120           | 6.3                | 13.9 | 1A0,1B0,1C0,1D0   |
| Cool White | CLA1B-WKW-XD0F0E23 | 120           | 6.3                | 13.9 | 2A0,2B0,2C0,2D0   |
| Cool White | CLA1B-WKW-XD0F0E33 | 120           | 6.3                | 13.9 | 3A0,3B0,3C0,3D0   |
| Cool White | CLA1B-WKW-XE0F0503 | 120           | 8.2                | 13.9 | 1A0,1B0,1C0,1D0,2A0,2B0,2C0,2D0   |
| Cool White | CLA1B-WKW-XE0F0513 | 120           | 8.2                | 13.9 | 0S0,0T0,0U0,1A0,1B0,1C0,1D0,2A0,2B0,2C0,2D0,2R0,2S0,2T0,2U0,3S0,3B0,3A0,3R0 |
| Cool White | CLA1B-WKW-XE0F0DT3 | 120           | 8.2                | 13.9 | 0A0,0B0,0C0,0D0,0R0,0S0,0T0,0U0,1A0,1B0,1C0,1D0,1R0,1S0,1T0,1U0             |
| Cool White | CLA1B-WKW-XE0F0DV3 | 120           | 8.2                | 13.9 | 1A0,1B0,1C0,1D0,1R0,1S0,1T0,1U0,2A0,2B0,2C0,2D0,2R0,2S0,2T0,2U0             |
| Cool White | CLA1B-WKW-XE0F0DY3 | 120           | 8.2                | 13.9 | 2A0,2B0,2C0,2D0,2R0,2S0,2T0,2U0,3A0,3B0,3C0,3D0,3R0,3S0,3T0,3U0             |
| Cool White | CLA1B-WKW-XE0F0DZ3 | 120           | 8.2                | 13.9 | 2C0,2D0,2T0,2U0,3A0,3B0,3C0,3D0,3R0,3S0,3T0,3U0,4A0,4B0,4R0,4S0             |
| Cool White | CLA1B-WKW-XE0F0E13 | 120           | 8.2                | 13.9 | 1A0,1B0,1C0,1D0   |
| Cool White | CLA1B-WKW-XE0F0E23 | 120           | 8.2                | 13.9 | 2A0,2B0,2C0,2D0   |
| Cool White | CLA1B-WKW-XE0F0E33 | 120           | 8.2                | 13.9 | 3A0,3B0,3C0,3D0   |

**Notes:**

1. The above kit numbers represent order codes that include multiple intensity-bin and color-bin codes. Only one intensity-bin code and one color-bin code will be shipped on each bulk. Single intensity-bin code and single color-bin codes 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.



**ORDER CODE TABLE\***

| Color      | Kit Number         | Viewing Angle | Luminous Flux (lm) |      | Color Bin Code  |
|------------|--------------------|---------------|--------------------|------|---|
|            |                    |               | Min.               | Max. |   |
| Warm White | CLA1B-MKW-XD0E0F53 | 120           | 6.3                | 10.7 | 4C0,4D0,5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4   |
| Warm White | CLA1B-MKW-XD0E0F63 | 120           | 6.3                | 10.7 | 5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4,6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4                                 |
| Warm White | CLA1B-MKW-XD0E0F73 | 120           | 6.3                | 10.7 | 6C1,6C2,6C3,6C4,6D1,6D2,6D3,6D4,7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4                                 |
| Warm White | CLA1B-MKW-XD0E0F83 | 120           | 6.3                | 10.7 | 7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4,8A1,8A2,8A3,8A4,8B1,8B2,8B3,8B4                                 |
| Warm White | CLA1B-MKW-XD0E0E53 | 120           | 6.3                | 10.7 | 5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4,5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4                                 |
| Warm White | CLA1B-MKW-XD0E0E63 | 120           | 6.3                | 10.7 | 6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4,6C1,6C2,6C3,6C4,6D1,6D2,6D3,6D4                                 |
| Warm White | CLA1B-MKW-XD0E0E73 | 120           | 6.3                | 10.7 | 7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4,7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4                                 |
| Warm White | CLA1B-MKW-XD0E0E83 | 120           | 6.3                | 10.7 | 8A1,8A2,8A3,8A4,8B1,8B2,8B3,8B4,8C1,8C2,8C3,8C4,8D1,8D2,8D3,8D4                                 |
| Warm White | CLA1B-MKW-XD0E0A33 | 120           | 6.3                | 10.7 | 4A0,4B0,4C0,4D0,5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4   |
| Warm White | CLA1B-MKW-XD0E0A43 | 120           | 6.3                | 10.7 | 4C0,4D0,5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4,5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4                         |
| Warm White | CLA1B-MKW-XD0E0A53 | 120           | 6.3                | 10.7 | 5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4,5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4,6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4 |
| Warm White | CLA1B-MKW-XD0E0A63 | 120           | 6.3                | 10.7 | 5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4,6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4,6C1,6C2,6C3,6C4,6D1,6D2,6D3,6D4 |
| Warm White | CLA1B-MKW-XD0E0A73 | 120           | 6.3                | 10.7 | 6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4,6C1,6C2,6C3,6C4,6D1,6D2,6D3,6D4,7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4 |
| Warm White | CLA1B-MKW-XD0E0A83 | 120           | 6.3                | 10.7 | 6C1,6C2,6C3,6C4,6D1,6D2,6D3,6D4,7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4,7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4 |
| Warm White | CLA1B-MKW-XD0E0A93 | 120           | 6.3                | 10.7 | 7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4,7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4,8A1,8A2,8A3,8A4,8B1,8B2,8B3,8B4 |
| Warm White | CLA1B-MKW-XD0E0AA3 | 120           | 6.3                | 10.7 | 7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4,8A1,8A2,8A3,8A4,8B1,8B2,8B3,8B4,8C1,8C2,8C3,8C4,8D1,8D2,8D3,8D4 |

**ORDER CODE TABLE\***

| Color      | Kit Number         | Viewing Angle | Luminous Flux (lm) |      | Color Bin Code  |
|------------|--------------------|---------------|--------------------|------|---|
|            |                    |               | Min.               | Max. |   |
| Warm White | CLA1B-MKW-XD0F0F53 | 120           | 6.3                | 13.9 | 4C0,4D0,5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4   |
| Warm White | CLA1B-MKW-XD0F0F63 | 120           | 6.3                | 13.9 | 5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4,6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4                                 |
| Warm White | CLA1B-MKW-XD0F0F73 | 120           | 6.3                | 13.9 | 6C1,6C2,6C3,6C4,6D1,6D2,6D3,6D4,7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4                                 |
| Warm White | CLA1B-MKW-XD0F0F83 | 120           | 6.3                | 13.9 | 7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4,8A1,8A2,8A3,8A4,8B1,8B2,8B3,8B4                                 |
| Warm White | CLA1B-MKW-XD0F0E53 | 120           | 6.3                | 13.9 | 5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4,5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4                                 |
| Warm White | CLA1B-MKW-XD0F0E63 | 120           | 6.3                | 13.9 | 6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4,6C1,6C2,6C3,6C4,6D1,6D2,6D3,6D4                                 |
| Warm White | CLA1B-MKW-XD0F0E73 | 120           | 6.3                | 13.9 | 7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4,7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4                                 |
| Warm White | CLA1B-MKW-XD0F0E83 | 120           | 6.3                | 13.9 | 8A1,8A2,8A3,8A4,8B1,8B2,8B3,8B4,8C1,8C2,8C3,8C4,8D1,8D2,8D3,8D4                                 |
| Warm White | CLA1B-MKW-XD0F0A33 | 120           | 6.3                | 13.9 | 4A0,4B0,4C0,4D0,5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4   |
| Warm White | CLA1B-MKW-XD0F0A43 | 120           | 6.3                | 13.9 | 4C0,4D0,5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4,5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4                         |
| Warm White | CLA1B-MKW-XD0F0A53 | 120           | 6.3                | 13.9 | 5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4,5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4,6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4 |
| Warm White | CLA1B-MKW-XD0F0A63 | 120           | 6.3                | 13.9 | 5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4,6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4,6C1,6C2,6C3,6C4,6D1,6D2,6D3,6D4 |
| Warm White | CLA1B-MKW-XD0F0A73 | 120           | 6.3                | 13.9 | 6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4,6C1,6C2,6C3,6C4,6D1,6D2,6D3,6D4,7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4 |
| Warm White | CLA1B-MKW-XD0F0A83 | 120           | 6.3                | 13.9 | 6C1,6C2,6C3,6C4,6D1,6D2,6D3,6D4,7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4,7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4 |
| Warm White | CLA1B-MKW-XD0F0A93 | 120           | 6.3                | 13.9 | 7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4,7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4,8A1,8A2,8A3,8A4,8B1,8B2,8B3,8B4 |
| Warm White | CLA1B-MKW-XD0F0AA3 | 120           | 6.3                | 13.9 | 7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4,8A1,8A2,8A3,8A4,8B1,8B2,8B3,8B4,8C1,8C2,8C3,8C4,8D1,8D2,8D3,8D4 |

GRAPHS



FIG.1 FORWARD CURRENT VS. FORWARD VOLTAGE.



FIG.2 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT



FIG.3 REVERSE CURRENT VS. REVERSE VOLTAGE.



FIG.4 RELATIVE LUMINOUS INTENSITY VS. WAVELENGTH.



FIG.5 MAXIMUM FORWARD DC CURRENT VS AMBIENT TEMPERATURE ( $T_{jmax}=110^{\circ}C$ )



FIG.6 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.

## 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:



\* Please contact our sales representative for ordering information.

## 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 2000 pcs per reel.



Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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