

Data Sheet

Description

The Long-Life White PLCC-4 SMT LEDs is the latest extension to our White PLCC-4 packages where besides having higher flux output, the Long-Life White PLCC-4 is designed to work under a wide range of environment condition, with reliable and stable performance. The structure and materials used for Long-Life White PLCC-4 enable the packages to endure minimal degradation and hence consistent performance throughout the product life time. Moreover, the Long-Life White PLCC-4 SMT LEDs is a 8-binned product for color, an enhance feature from the previous PLCC-4 white who is binned with 6 color binning only. These tighter color binning will ensure better color grouping with better uniformity.

The Long-Life White PLCC-4 SMT LEDs is suitable to be used in Interior Automotive application, Electronics Signs and Signals application. Besides that, the super wide viewing angle at 120° makes these LEDs ideally suited for instrument cluster panel, push button, or general backlighting in automotive interior, office equipment, industrial equipment, and home appliances. The flat top emitting surface makes it easy for these LEDs to mate with light pipes. With the built-in reflector pushing up the intensity of the light output, these super high brightness LEDs can be used in localized area ambience lighting in applications such as vanity mirror light, cabin light, and car door puddle light. The white color backlighting is suitable to backlight color LCD screens in applications such as GPS (global positioning system) screen in cars.

To facilitate easy pick and place assembly, the LEDs are packed in EIA-compliant tape and reel. Every reel will be shipped in single intensity and color bin, to provide close uniformity.

These LEDs are compatible with IR solder reflow process. Due to the high reliability feature of these products, they can also be mounted using through-the-wave soldering process.

Features

- Industry standard PLCC-4
- High reliability LED package
- High brightness using InGaN dice technologies
- High optical efficiency
- Super wide viewing angle at 120°
- Tight white color binning – 8 binned
- Available is 8mm carrier tape on 7-inch reel
- Compatible with both IR and TTW soldering process
- Stable & Consistent performance with minimum degradation

Applications

- Interior & exterior automotive
 - Instrument panel backlighting
 - Central console backlighting
 - Navigation and audio system backlighting
 - Dome/Map lighting
 - Push button backlighting
 - Number plate illumination
 - Rear reverse lamp indicator
- Electronic signs and signals
 - Decorative lighting
- Office automation, home appliances, industrial equipment
 - Front panel backlighting
 - Push button backlighting

CAUTION: ASMT-SWBM-Nxxxx LEDs are Class 2 ESD sensitive. Please observe appropriate precautions during handling and processing. Refer to Avago Application Note AN-1142 for additional details.

Schematic Diagram

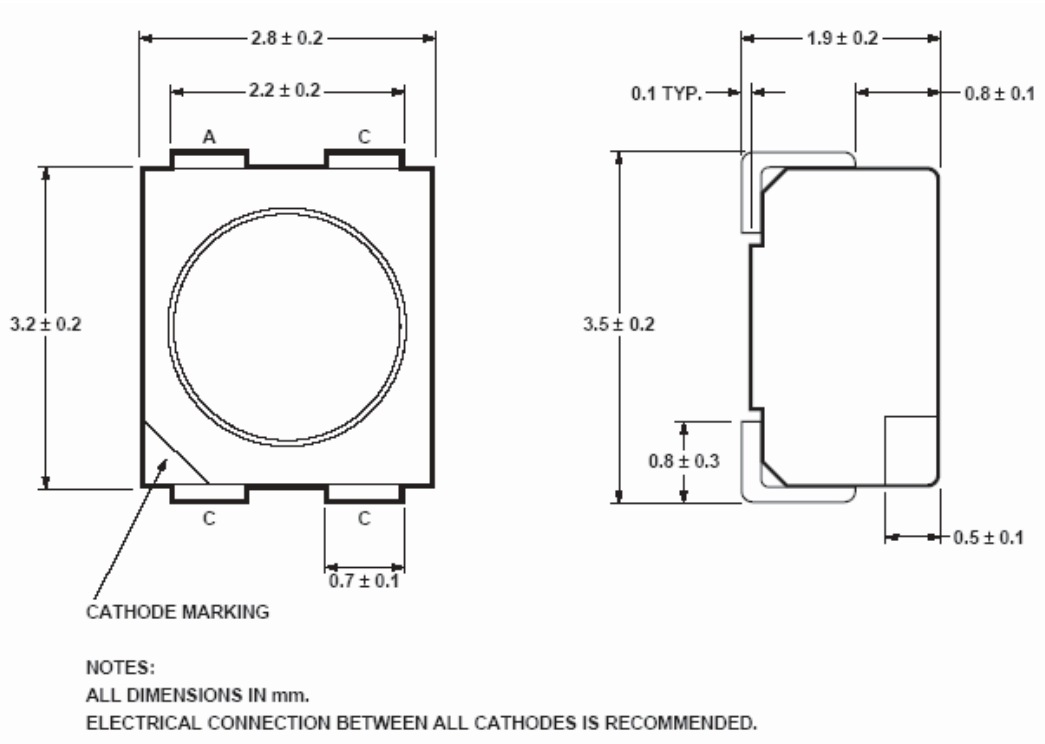


Figure 1. Schematic Diagram

Table 1. Device Selection Guide

Color	Part Number	Min. I_v (mcd)	Typ. I_v (mcd)	Max. I_v (mcd)	Test Current (mA)	Dice Technology
White	ASMT-SWBM-NU803	560.00	1100.00	1400.00	30	InGaN

Notes:

1. The luminous intensity I_v is measured at the mechanical axis of the lamp package. The actual peak of the spatial radiation pattern may not be aligned with this axis.
2. I_v tolerance $\pm 12\%$

Part Numbering System

A S M T - S X₁ B M - N X₂ X₃ X₄ X₅

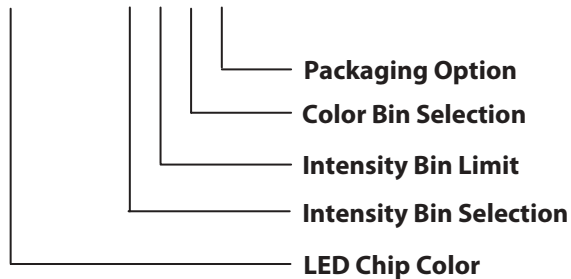


Table 2. Absolute Maximum Ratings ($T_A = 25\text{ }^\circ\text{C}$)

Parameters	ASMT-SWBM-Nxxxx
DC Forward Current ^[1]	50 mA
Peak Forward Current ^[2]	300 mA
Power Dissipation	215 mW
Reverse Voltage	4 V
Junction Temperature	125 °C
Operating Temperature	- 40 °C to + 110 °C
Storage Temperature	- 40 °C to + 110°C

Notes:

1. Derate linearly as shown in Figure 4.
2. Duty Factor = 0.5%, Frequency = 500Hz.

Table 3. Optical Characteristics ($T_A = 25\text{ }^\circ\text{C}$)

Color	Part Number	Dice Technology	Typical Chromaticity Coordinates ^[1]		Viewing Angle $\theta_{1/2}$ ^[2] (Degrees)	Luminous Efficacy η_V ^[3] (lm/W)	Luminous Intensity/ Total Flux ^[4] I_V (mcd) / ϕ_V (lm)
			x	y	Typ.	Typ.	Typ
White	ASMT-SWBM-Nxxxx	InGaN	0.318	0.318	120	274	0.37

Notes:

1. The chromaticity coordinates are derived from the CIE 1931 Chromaticity Diagram and represent the perceived color of the device.
2. $\theta_{1/2}$ is the off-axis angle where the luminous intensity is $1/2$ the peak intensity.
3. Radiant intensity, I_e in watts / steradian, may be calculated from the equation $I_e = I_V / \eta_V$, where I_V is the luminous intensity in candelas and η_V is the luminous efficacy in lumens / watt.
4. Flux tested at mono pulse conditions.

Table 4. Electrical Characteristics ($T_A = 25\text{ }^\circ\text{C}$)

Part Number	Forward Voltage V_F (Volts) @ $I_F = 30\text{ mA}$ ^[1]		Reverse Voltage V_R @ 100 μA	Reverse Voltage V_R @ 10 μA
	Typ.	Max.	Min.	Min.
ASMT-SWBM-Nxxxx	3.5	4.35	-	4

Notes:

1. Tolerance = $\pm 0.1\text{V}$

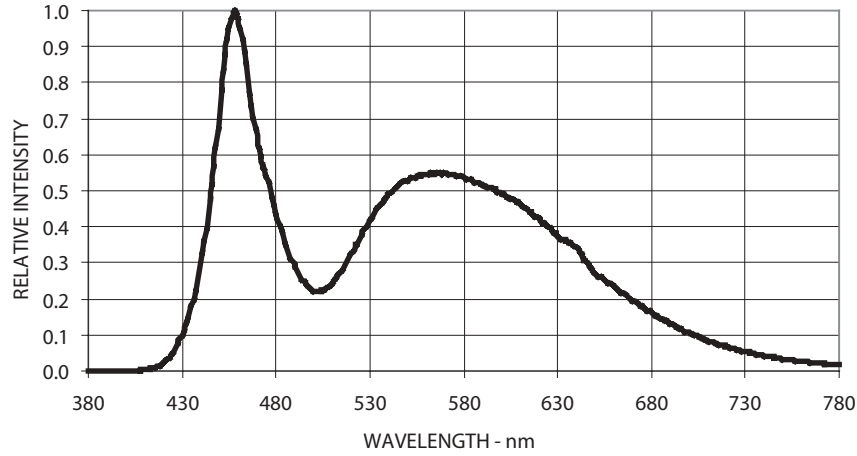


Figure 1. Relative Intensity Vs. Wavelength

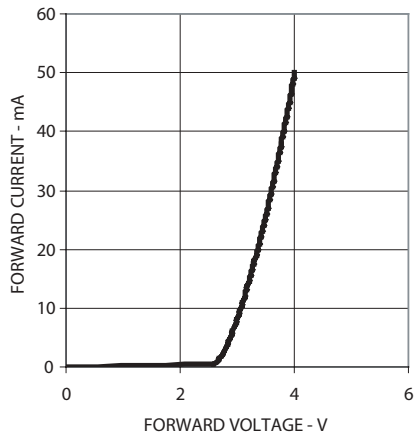


Figure 2. Forward Current Vs. Forward Voltage

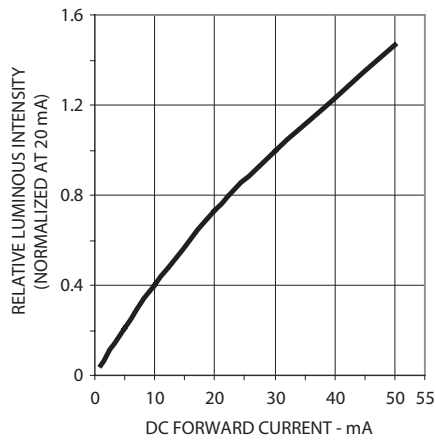


Figure 3. Relative Intensity Vs. Forward Current

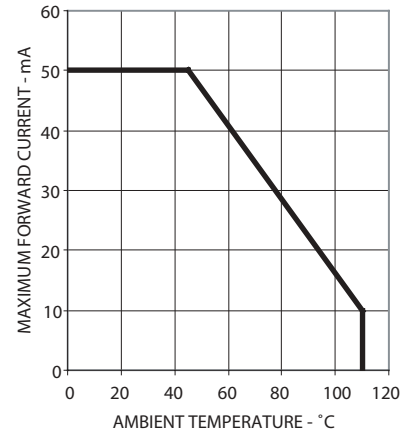


Figure 4. Maximum Forward Current Vs. Ambient Temperature. Derated Based on $T_{JMAX} = 125^{\circ}C$, $R_{\theta JA} = 300^{\circ}C/W$

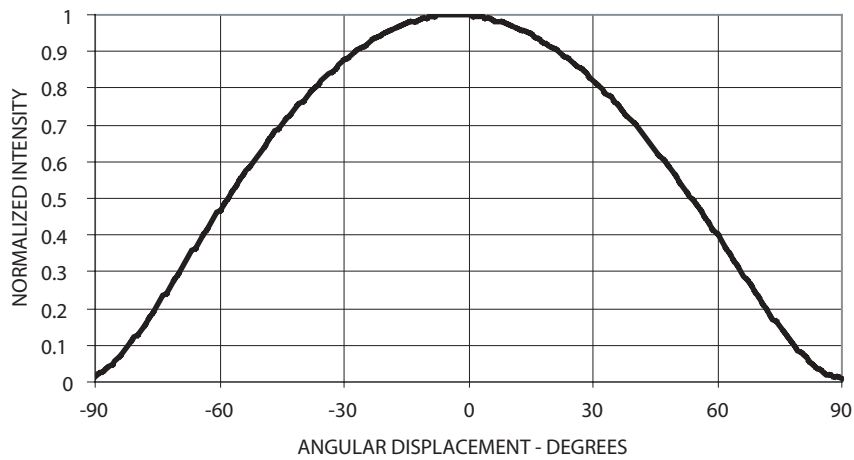
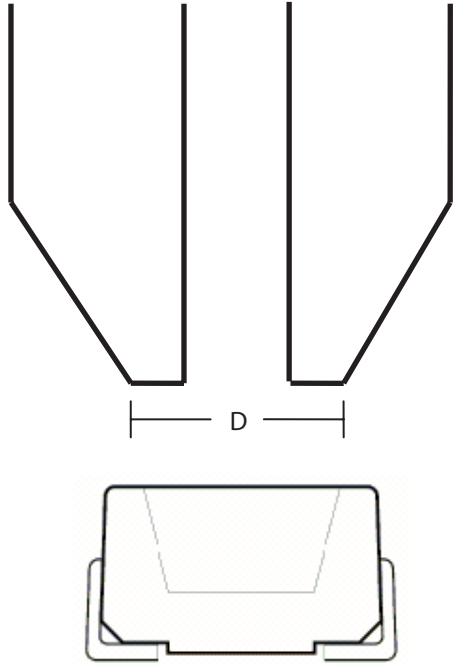


Figure 5. Radiation Pattern



Note: Diameter D should be larger than 2.4mm

Figure 6. Recommended Pick and Place Nozzle Size

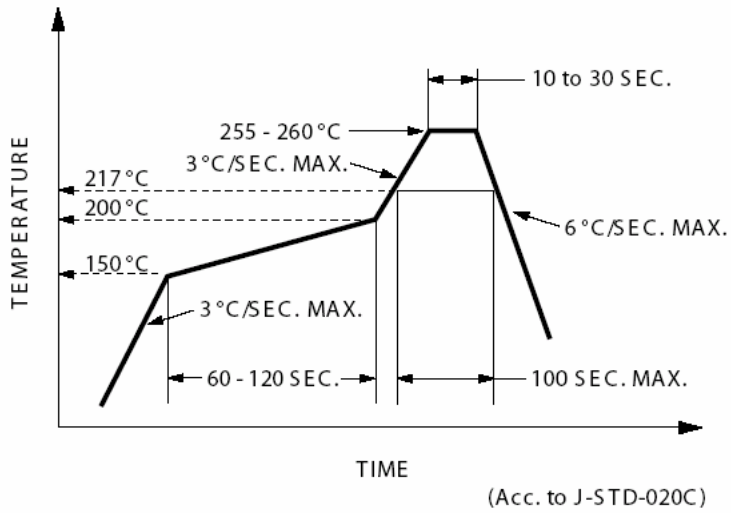


Figure 7. Recommended Pb-free Reflow Soldering Profile

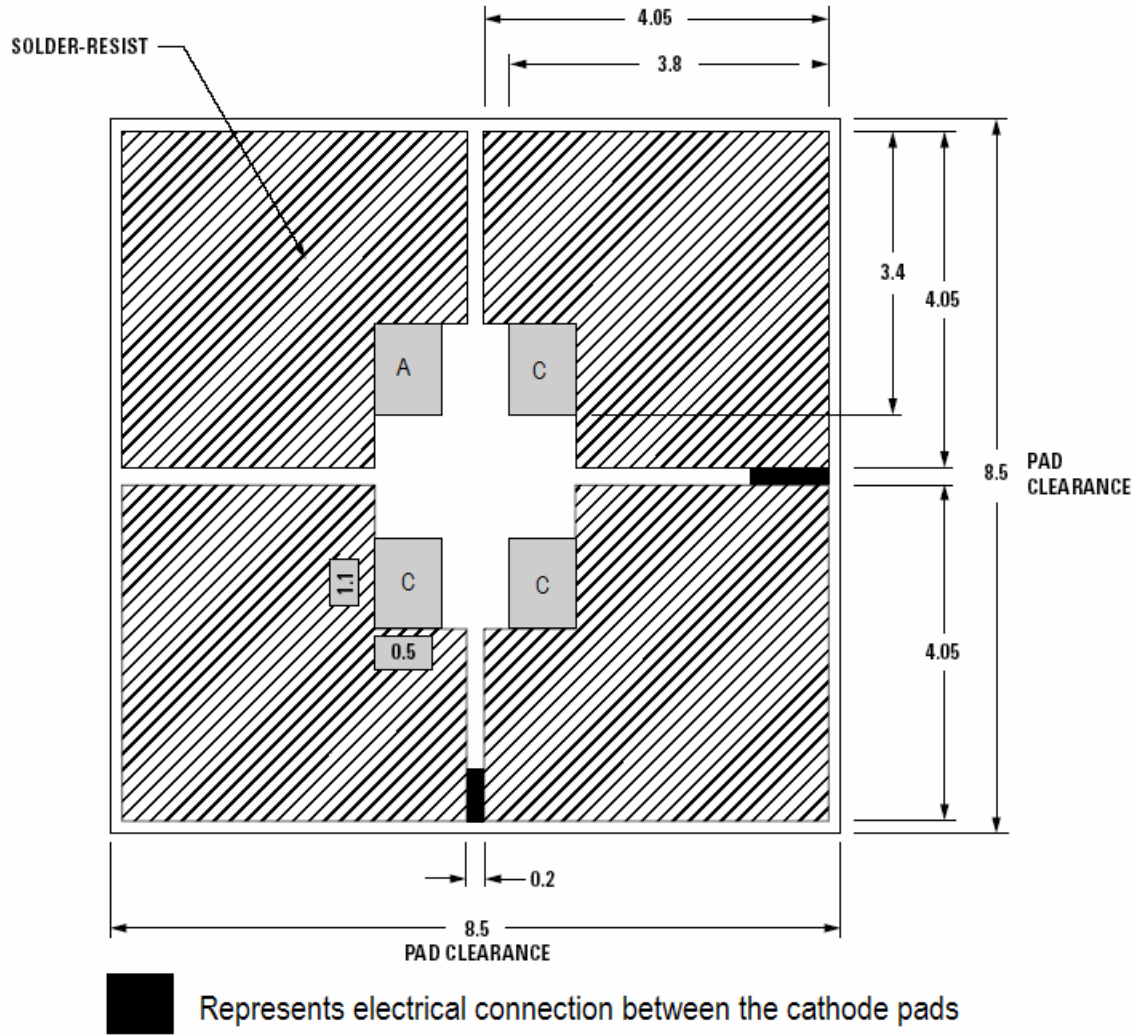


Figure 8. Recommended Soldering Pad Pattern

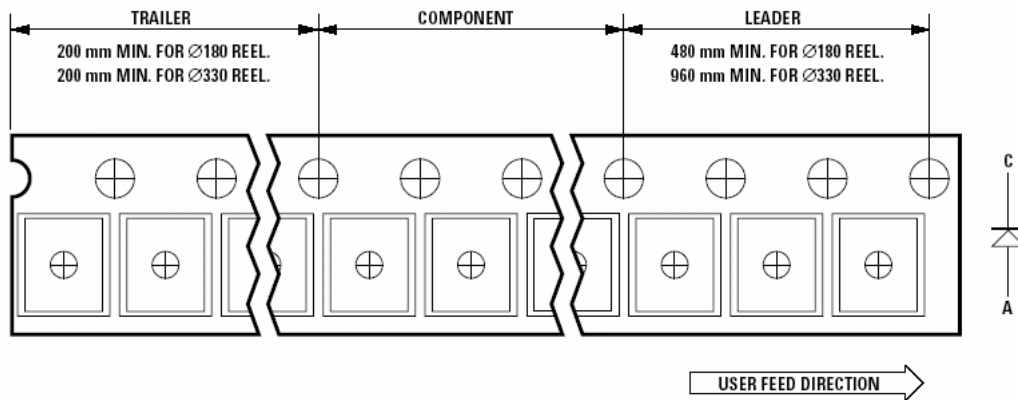


Figure 9. Tape Leader and Trailer Dimensions

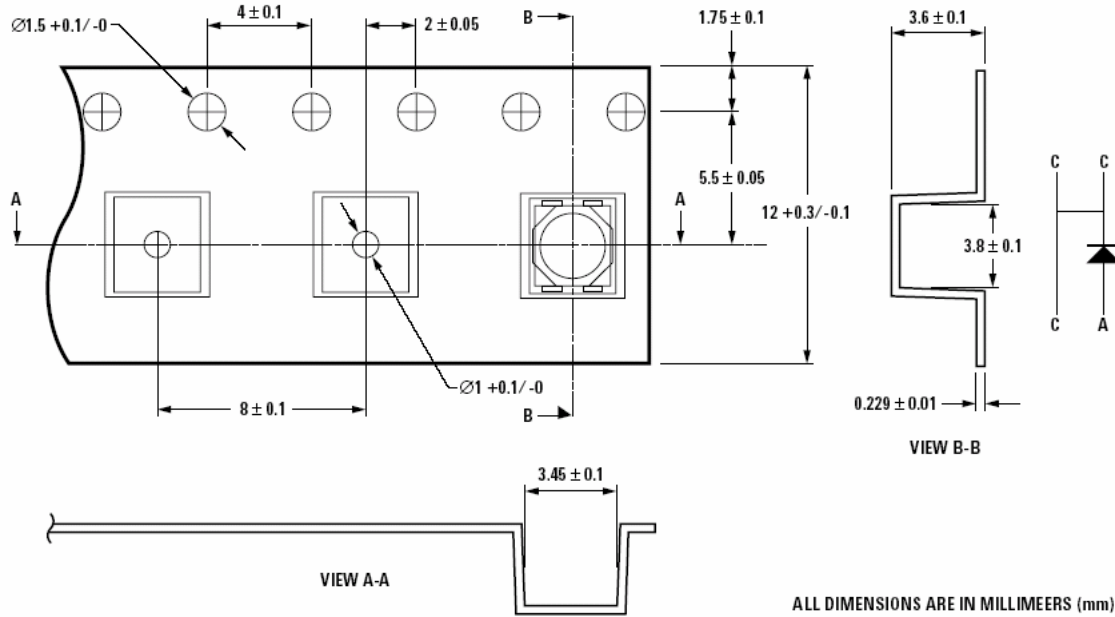


Figure 10. Tape Dimensions

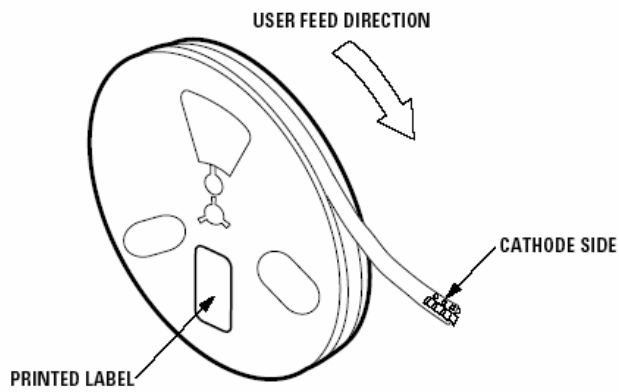


Figure 11. Reeling Orientation

Baking is required under the following conditions:

- a) The humidity indicator turns pink
- b) The pack has been opened for more than four weeks.

The product is qualified as moisture sensitive JEDEC level 2a.

Intensity Bin Select (X₂X₃)

Individual reel will contain parts from one half bin only

X ₂	Min I _v Bin
X₃	
0	Full Distribution
2	2 half bins starting from X ₂ 1
3	3 half bins starting from X ₂ 1
4	4 half bins starting from X ₂ 1
5	5 half bins starting from X ₂ 1
6	2 half bins starting from X ₂ 2
7	3 half bins starting from X ₂ 2
8	4 half bins starting from X ₂ 2
9	5 half bins starting from X ₂ 2

Intensity Bin Limits

Bin ID	Min. (mcd)	Max. (mcd)
N1	28.50	35.50
N2	35.50	45.00
P1	45.00	56.00
P2	56.00	71.50
Q1	71.50	90.00
Q2	90.00	112.50
R1	112.50	140.00
R2	140.00	180.00
S1	180.00	224.00
S2	224.00	285.00
T1	285.00	355.00
T2	355.00	450.00
U1	450.00	560.00
U2	560.00	715.00
V1	715.00	900.00
V2	900.00	1125.00
W1	1125.00	1400.00
W2	1400.00	1800.00

Tolerance of each bin limit = ± 12%

Color Bin Select (X₄)

Individual reel will contain parts from one full bin only.

X ₇	
0	Full Distribution
A	1 and 2 only
B	2 and 3 only
C	3 and 4 only
D	4 and 5 only
E	5 and 6 only
F	6 and 7 only
G	1, 2 and 3 only
H	2, 3 and 4 only
J	3, 4 and 5 only
K	4, 5 and 6 only
L	5, 6 and 7 only
M	1, 2, 3 and 4 only
N	2, 3, 4 and 5 only
P	3, 4, 5 and 6 only
Q	4, 5, 6 and 7 only
R	1, 2, 3, 4 and 5 only
S	2, 3, 4, 5 and 6 only
T	3, 4, 5, 6, and 7 only
U	1, 2, 3, 4, 5 and 6 only
V	2, 3, 4, 5, 6 and 7 only
Z	Special Color Bin

Color Bin Limits

Bin ID	Limits (Chromaticity Coordinates)				
1	x	0.296	0.291	0.310	0.313
	y	0.259	0.268	0.297	0.284
2	x	0.291	0.285	0.307	0.310
	y	0.268	0.279	0.312	0.297
3	x	0.313	0.310	0.330	0.330
	y	0.284	0.297	0.330	0.310
4	x	0.310	0.307	0.330	0.330
	y	0.297	0.312	0.347	0.330
5	x	0.330	0.330	0.338	0.352
	y	0.310	0.330	0.342	0.344
6	x	0.330	0.330	0.347	0.345
	y	0.330	0.347	0.371	0.352
7	x	0.352	0.338	0.364	0.360
	y	0.344	0.342	0.380	0.357
8	x	0.345	0.347	0.367	0.364
	y	0.352	0.371	0.401	0.380

Tolerance of each bin limit = ±0.02.

Packaging Option (X₅)

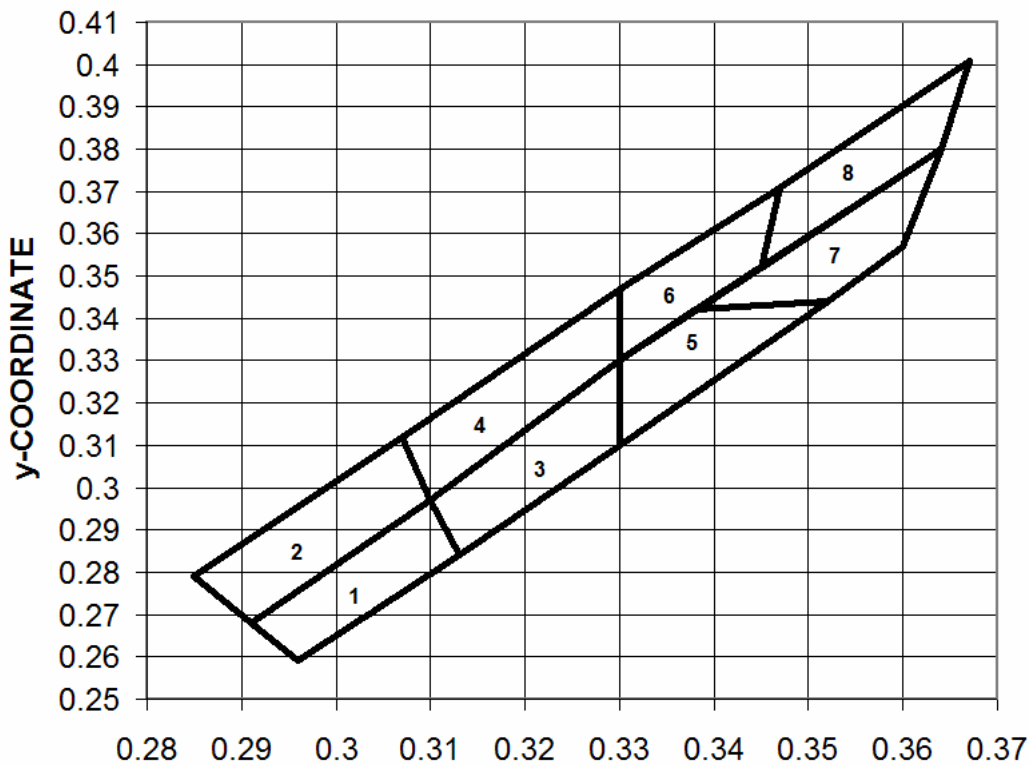
Option	Test Current	Package Type	Reel Size
3	30 mA	Top Mount	7 inch

V_F Bin Limits

Bin ID	Min.	Max.
S3	3.20	3.80
S4	3.80	4.35

Tolerance of each bin limit = ±0.1V

Color Coordinates Chart



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AV01-0443EN - October 5, 2006

