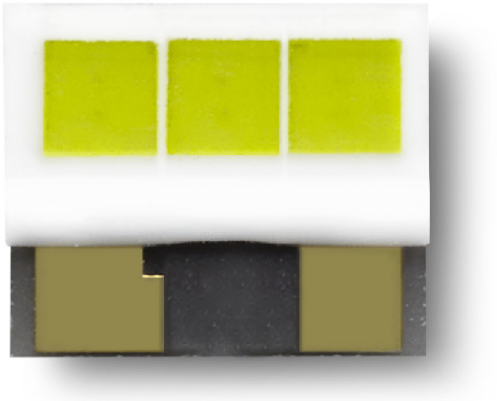


Bridgelux® Automotive 1x3

Product Data Sheet DS140

Introduction

Automotive LED

The new Bridgelux Automotive product offers superior performance, reliability, industry-leading output and thermal performance. Top electrical contacts and bottom thermal pads are designed to simplify lighting system integration and lower system assembly costs. This product is hot color targeted, which ensures that the LEDs fall within specified color bins at typical application conditions of T_j=T_c=85˚C.

Features

- Robust package on ceramic substrate
- High flux output
- Industry-leading thermal performance
- 8kV ESD protection
- Excellent corrosion resistance

Benefits

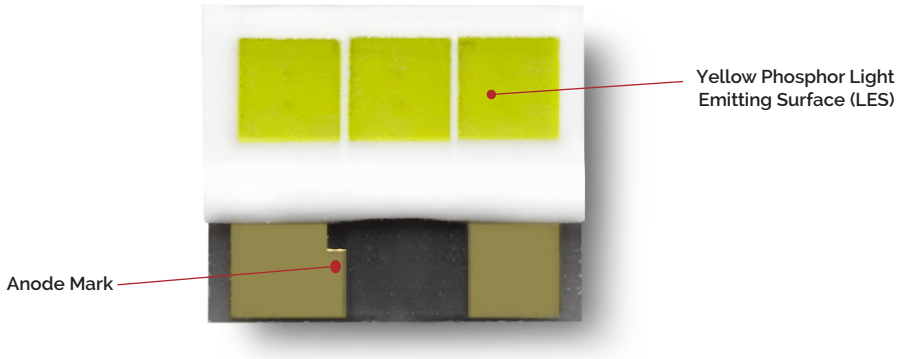
- Simplified thermal management reduces system cost
- High flux output from small footprint reduces cost and improves design flexibility
- Higher drive current capability for increased flux output

Pb free RoHS

Contents

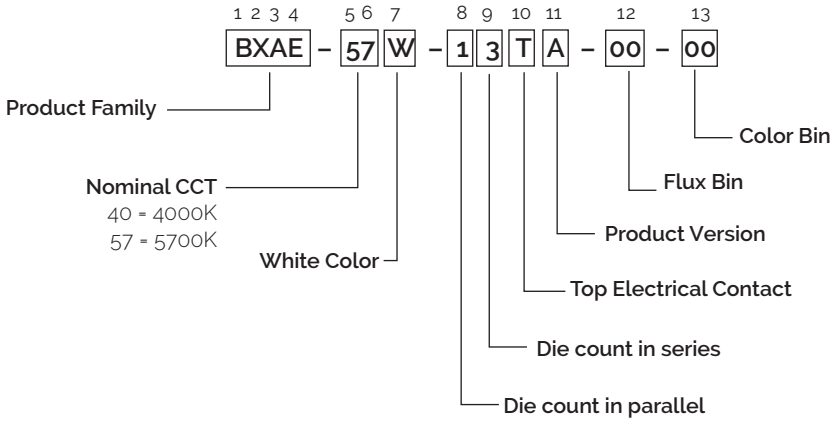
Product Feature Map

Bridgelux Automotive 1x3 products are robust and compact in size. These LEDs are optimized for performance and reliability, and are manufactured using high quality materials to ensure superior optical and thermal performance. The construction addresses the stringent reliability requirements of the automotive lighting industry.



Product Nomenclature

The part number designation for Bridgelux Automotive LED is as follows:



Product Test Conditions

Bridgelux Automotive 1x3 are pulse tested with a 10ms monopulse (MP) of 1000mA at T_j (junction temperature)=T_c (case temperature) =25˚C. Luminous flux is binned at T_j=T_c=25˚C, and color is hot targeted at T_j=T_c=85˚C.

Product Selection Guide

The following product configurations are available:

Table 1: Optical Characteristics, Pulsed Measurement Data at 1000mA, 10ms MP (T_j=T_c=85˚C) [9]

Part Number [1,8]	CRI [4, 6,7]	Typical Flux (lm)	Correlated Color Temperature[5,6,7] (K)			Typical Total Included Angle[2] $\theta_{0.90v}$ (°)	Typical Viewing Angle[3] $\theta_{1/2}$ (°)
			Minimum	Typical	Maximum		
BXAE-40W-13TA-00-00	60	722	3710	4000	4255	140	120
BXAE-57W-13TA-00-00	60	870	5350	5700	6100	140	120

Table 2: Electrical Characteristics, Pulsed Measurement Data at 1000mA, 10ms MP (T_j=T_c=85˚C) [9]

Part Number [1,8]	Drive Current (mA)	Forward Voltage (V) [6,7]			Typical Coefficient of Forward Voltage $\Delta V_f/\Delta T$ (mV/˚C)	Typical Thermal Resistance Junction to Case R_{j-c} (˚C/W)
		Minimum	Typical	Maximum		
BXAE-40W-13TA-00-00	1000	8.6	9.4	9.8	-5.5	2.4
BXAE-57W-13TA-00-00	1000	8.6	9.4	9.8	-5.5	2.4

Notes for Tables 1 & 2:

1. The last 5 characters (including hyphens '-') refer to flux bins, and color bin options, respectively. "00-00" denotes the full distribution of flux, and the full color bin in CIE 1931 color space. See Table 4, Table 5 and Figure 1 for color bin options.
2. Total angle at which 90% of total luminous flux is captured.
3. Viewing angle is the off axis angle from the LED centerline where the luminous intensity is ½ of the peak value.
4. Listed CRI values are minimum and include test tolerance.
5. Product CCT is hot targeted at T_j = T_c = 85˚C.
6. Bridgelux maintains a ±7.5% tolerance on luminous flux measurements, ±0.1V tolerance on forward voltage measurements, and ±2 tolerance on CRI measurements for the Automotive 1x3 products. The CRI and Voltage minimum and maximum values at the nominal drive current are guaranteed by 100% test.
7. Products tested under pulsed condition (10ms pulse width) at nominal drive current where T_j = T_c = 85˚C.
8. Refer to Table 3 and Table 4 for Bridgelux Automotive 1x3 Luminous Flux Binning and Color Binning information.
9. Typical performance is tested based on operation under monopulsed with Bridgelux Automotive product mounted onto a heat sink with thermal interface material and the case temperature maintained at T_c=85˚C. Based on the Bridgelux test setup, values may vary depending on the thermal design of the lighting system and/or the exposed environment to which the product is subjected.

Product Bin Definitions

Table 3 lists the standard photometric luminous flux bins for Bridgelux Automotive 1x3. Although several bins are listed, product availability in a particular bin varies by production run and by product performance.

Table 3: Luminous Flux Bin Definitions at 1000mA, 10ms MP (T_j=T_c=85˚C)

Bin Code	Minimum	Maximum	Unit	Condition
3A	650	700	lm	I_F=1000mA
3B	700	750		
3C	750	800		
3D	800	850		
3E	850	900		
3F	900	950		
3G	950	1000		
3H	1000	1050		
3J	1050	1100		

Note for Table 3:

1. Bridgelux maintains a tolerance of ± 7.5% on luminous flux measurements.

Table 4: Color code definitions for Bridgelux Automotive 1x3 at 1000mA, 10ms MP (T_j=T_c=85˚C, 4000K)

Bin Code	X	Y
L3	0.3695	0.3695
	0.3736	0.3874
	0.3853	0.3949
	0.3808	0.3770
L4	0.3808	0.3770
	0.3695	0.3695
	0.3671	0.3580
	0.3775	0.3640
M3	0.3853	0.3949
	0.4005	0.4040
	0.3942	0.3848
	0.3808	0.3770
M4	0.3808	0.3770
	0.3775	0.3640
	0.3899	0.3718
	0.3942	0.3848

Notes for Table 4:

1. Color binning at T_j=T_c=85˚C
2. Bridgelux maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

Product Bin Definitions

Table 5: Color code definitions for Bridgelux Automotive 1x3 at 1000mA, 10ms MP (T_j=T_c=85˚C, 5700K)

Bin Code	X	Y
E3	0.3203	0.3301
	0.3190	0.3458
	0.3277	0.3537
	0.3281	0.3372
E4	0.3285	0.3218
	0.3215	0.3152
	0.3203	0.3301
	0.3281	0.3372
F3	0.3281	0.3372
	0.3277	0.3537
	0.3364	0.3614
	0.336	0.3443
F4	0.3356	0.3281
	0.3285	0.3218
	0.3281	0.3372
	0.3360	0.3443

Notes for Table 5:

1. Color binning at T_j=T_c=85˚C
2. Bridgelux maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

Product Bin Definitions

Figure 1: C.I.E. 1931 Chromaticity Diagram 4000K (Color Bin Structure, hot-color targeted at T_j=T_c=85˚C)

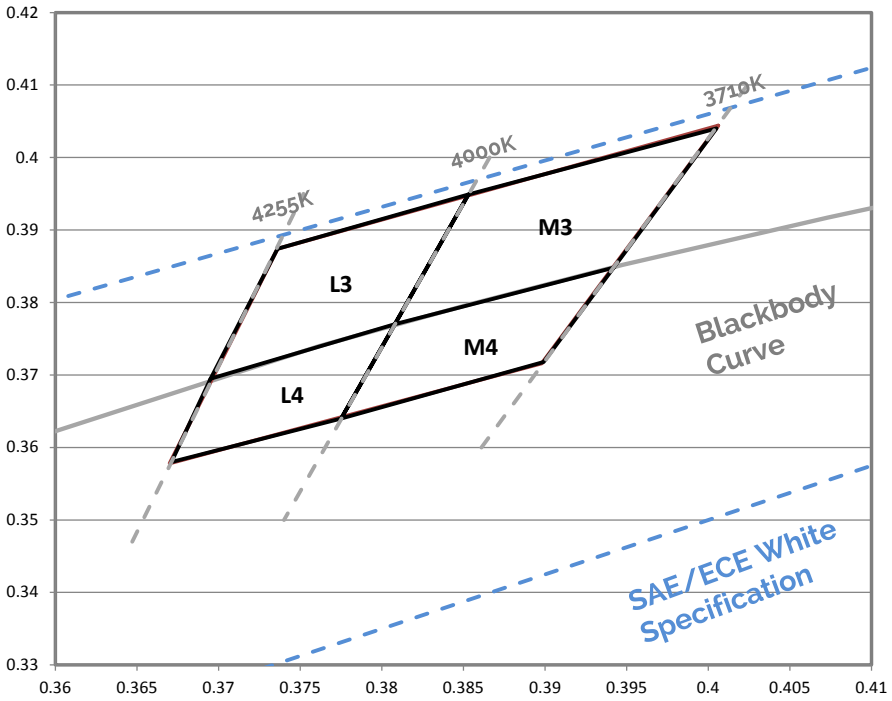
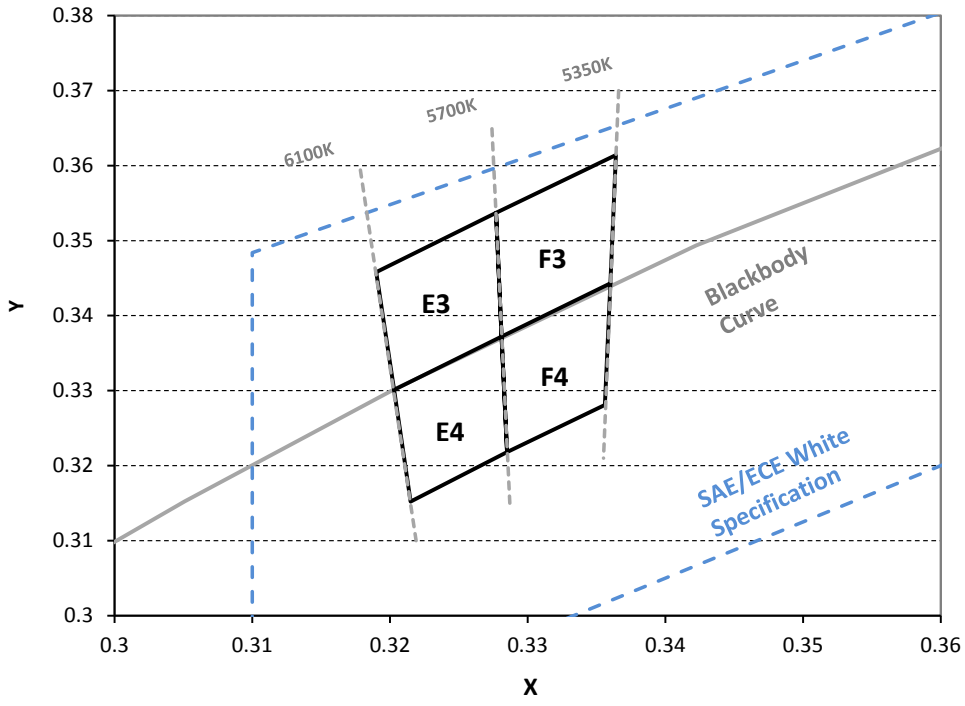


Figure 2: C.I.E. 1931 Chromaticity Diagram 5700K (Color Bin Structure, hot-color targeted at T_j=T_c=85˚C)



Performance Curves

Figure 3: Drive Current vs. Voltage (T_j=T_c=85˚C)

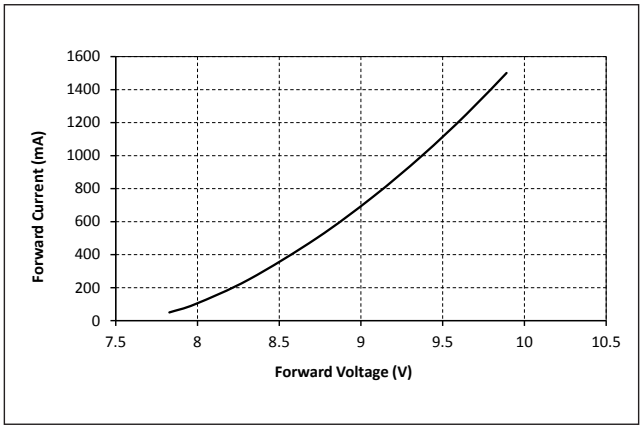


Figure 4: Typical Relative Luminous Flux vs. Drive Current (T_j=T_c=85˚C)[1]

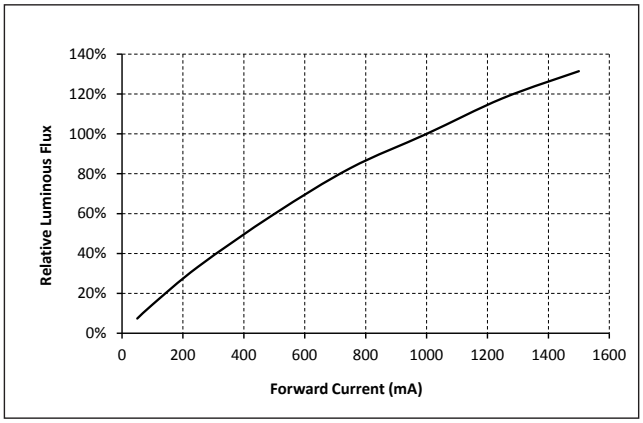


Figure 5: Typical Relative Flux vs. Case Temperature[2]

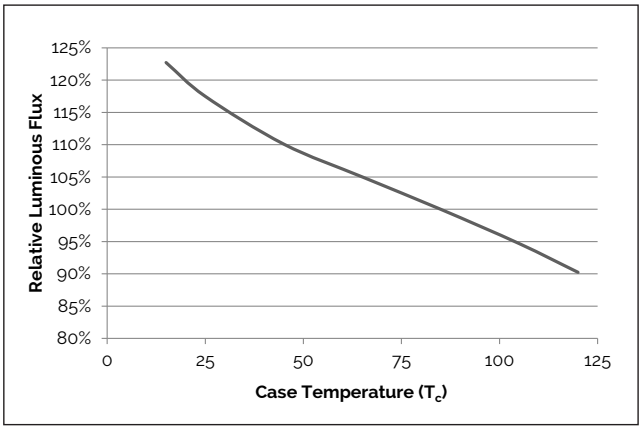


Figure 6: Maximum Forward Current vs. Case Temperature

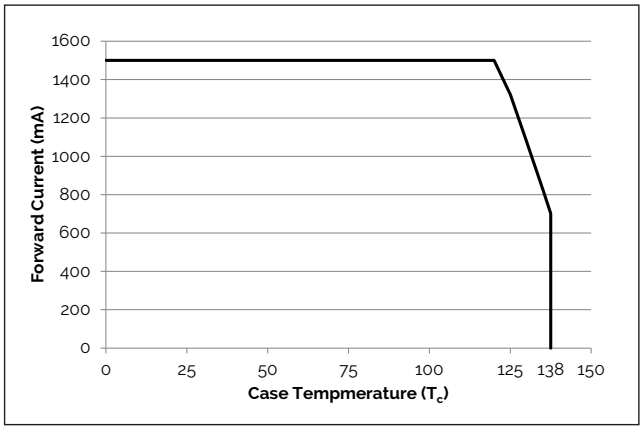


Figure 7: Typical ccx Shift vs. Case Temperature for 4000K[2]

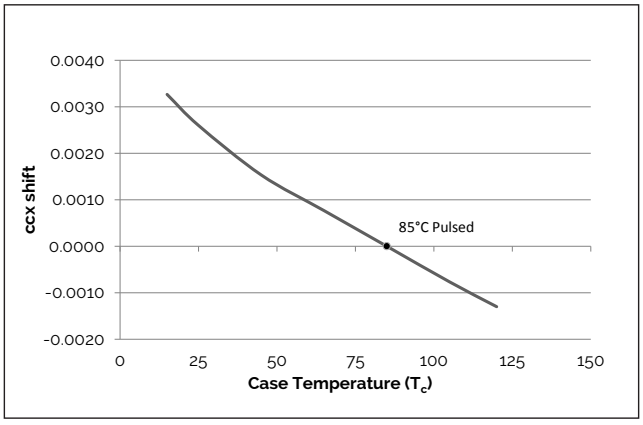
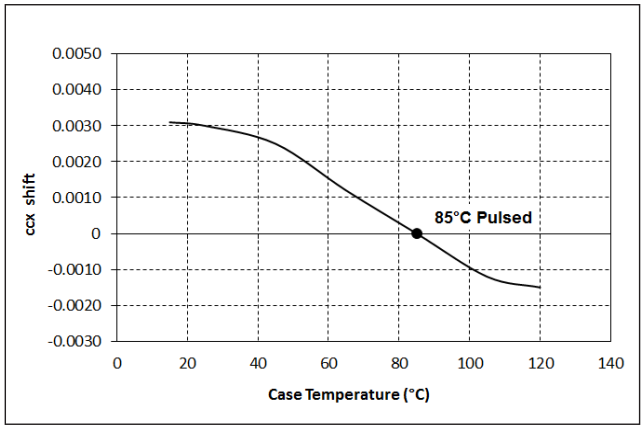


Figure 8: Typical ccx Shift vs. Case Temperature for 5700K[2]



Note for Figure 3-7:

1. Bridgelux does not recommend driving high power LEDs at low currents. Doing so may produce unpredictable results.
2. Products tested under pulsed condition (10ms pulse width) at nominal test current where T_j (junction temperature) = T_c (case temperature) = 85˚C.

Performance Curves

Figure 9: Automotive 1x3 4000K Typical ccy Shift vs. Case Temperature

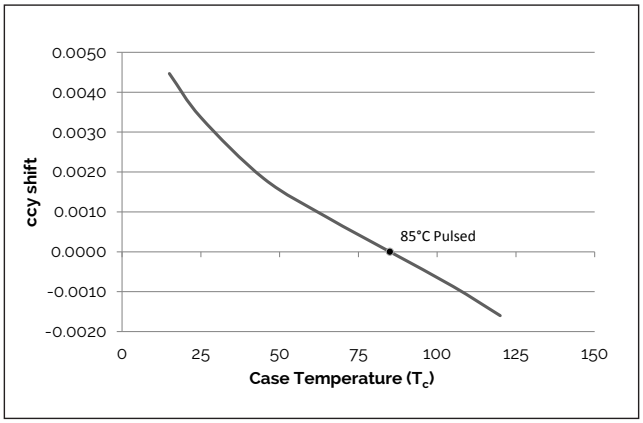


Figure 10: Automotive 1x3 5700K Typical ccy Shift vs. Case Temperature

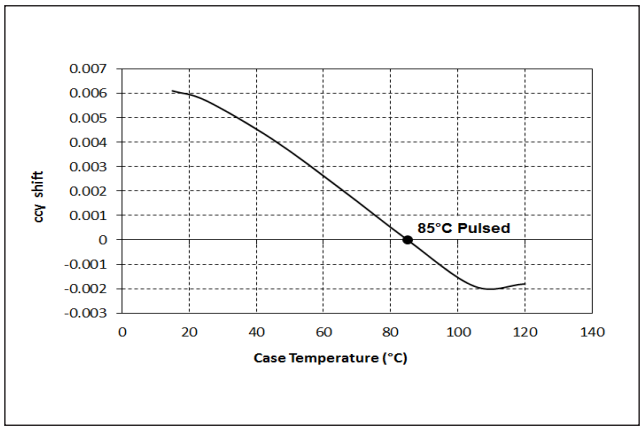


Figure 11: Automotive 1x3 4000K Typical Forward Voltage Shift vs. Case Temperature

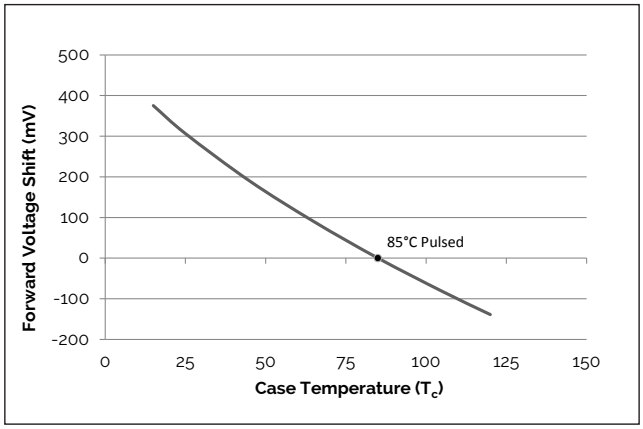


Figure 12: Automotive 1x3 5700K Typical Forward Voltage Shift vs. Case Temperature

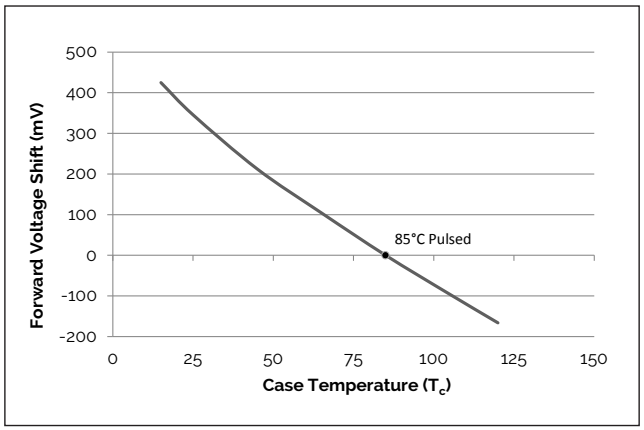


Figure 13: Typical Normalized Power vs. 4000K Wavelength

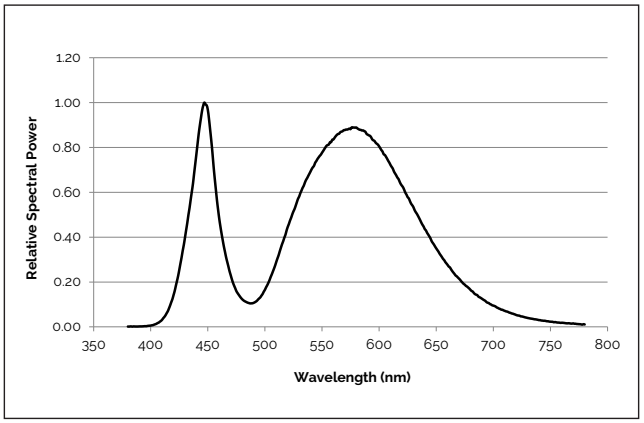
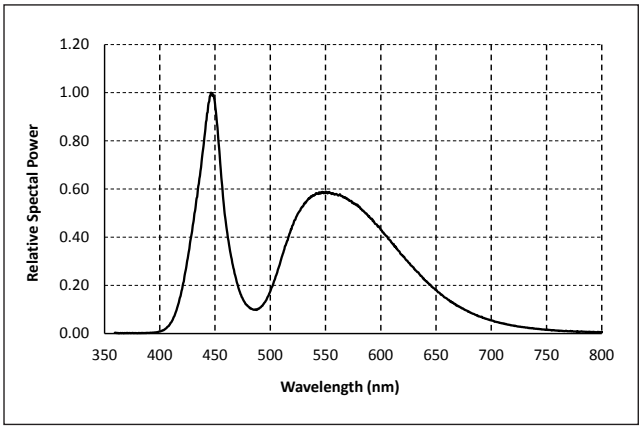


Figure 14: Typical Normalized Power vs. 5700K Wavelength



Performance Curves

Figure 15: Typical Spatial Radiation Pattern

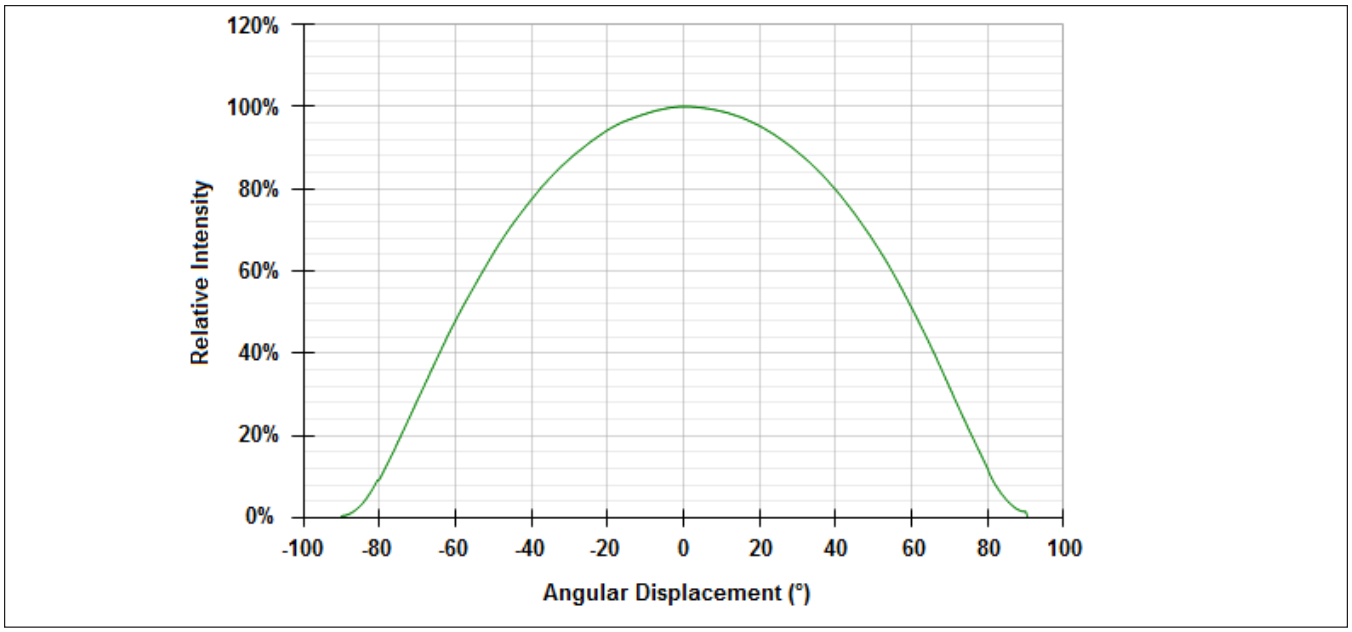
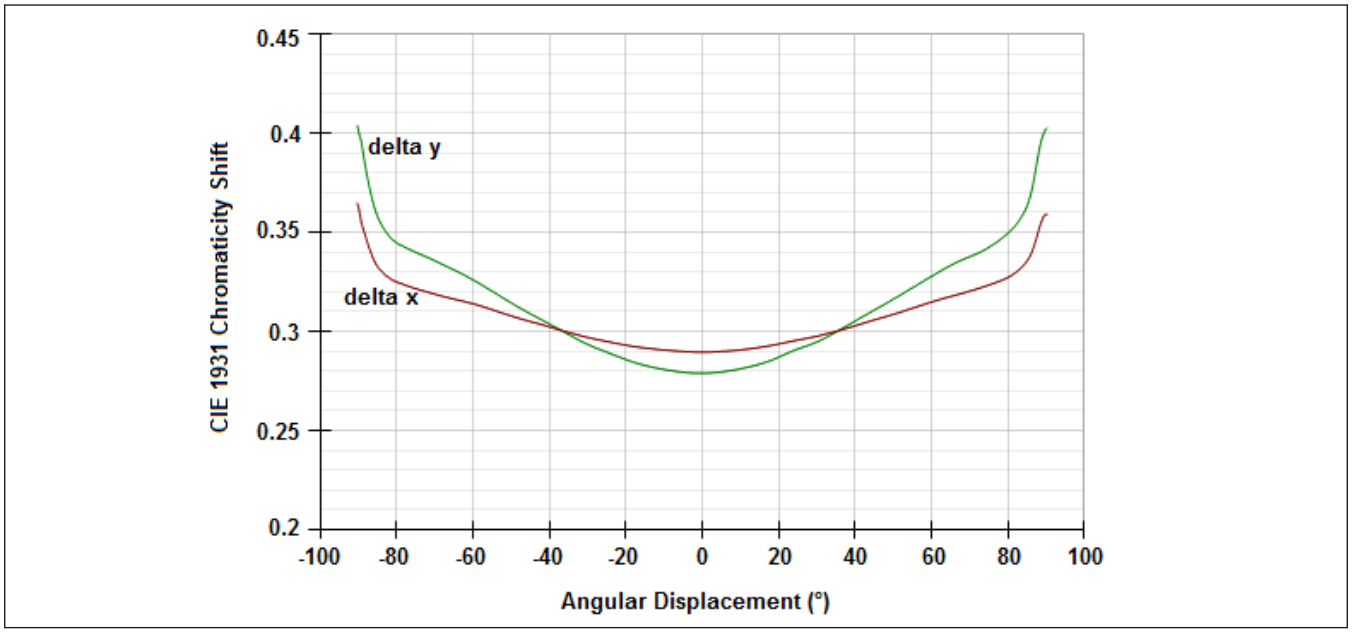
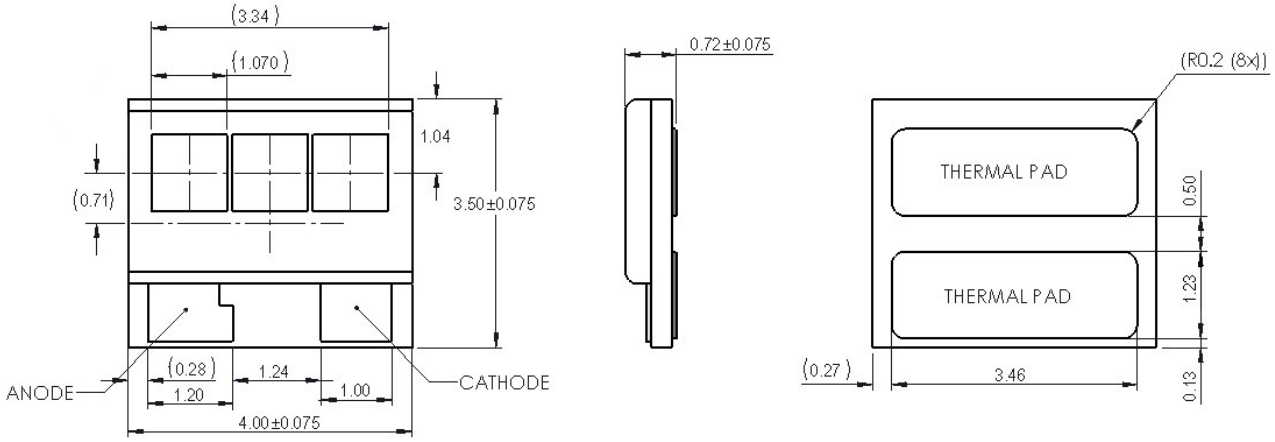


Figure 16: Typical Color Shift Over Angle



Mechanical Dimensions

Figure 17: Drawing for Automotive LED

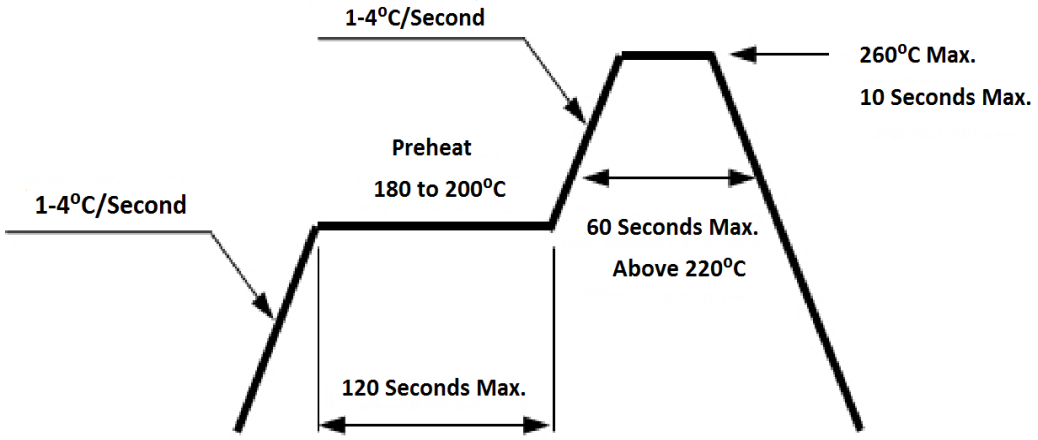


Notes for Figure 17:

1. Drawings are not to scale.
2. Drawing dimensions are in millimeters.
3. Unless otherwise specified, tolerances are ± 0.10mm.

Reflow Characteristics

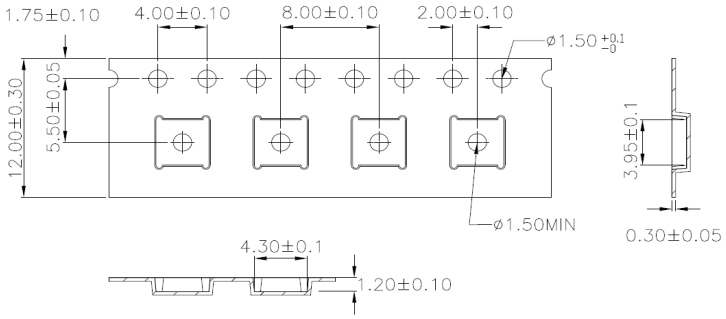
Figure 18: Reflow Profile



Profile Feature	Lead Free Assembly
Preheat: Temperature Range	180˚C – 200˚C
Preheat: Time (Maximum)	120 seconds
Peak Temperature	260˚C
Soldering Time (Maximum)	10 seconds
Allowable Reflow Cycles	2

Packaging

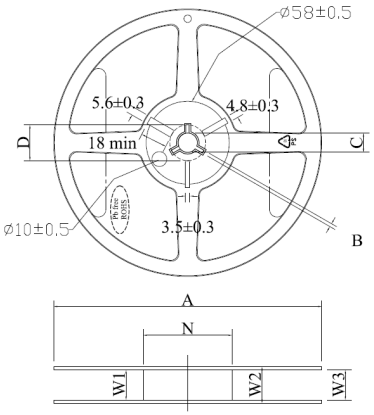
Figure 19: Emitter Tape Drawing



Note for Figure 19:

1. Drawings are not to scale. Drawing dimensions are in millimeters.

Figure 20: Emitter Reel Drawing



A	N	W1	W2	W3	D	B	C
178±1.0	60.5±0.5	13.3±0.5	15.85±1.0	12.4<W3<15	21.5±0.6	2.5±0.3	13.5±0.5

Note for Figure 20:

1. Drawings are not to scale. Drawing dimensions are in millimeters.

Design Resources

Please contact your Bridgelux sales representative for assistance. Visit www.bridgelux.com/contact

Precautions

CAUTION: CHEMICAL EXPOSURE HAZARD

Exposure to some chemicals commonly used in Automotive lighting manufacturing and assembly can cause damage to the Automotive product. Please consult Bridgelux Application Note AN51 for additional information.

CAUTION: EYE SAFETY

This Automotive 1x3 LED package emits visible light, that, under certain circumstances, could be harmful to the eye. Proper safeguards must be used.

CAUTION: RISK OF BURN

Do not touch the Bridgelux Automotive 1x3 product during operation. Allow the emitter to cool for a sufficient period of time before handling. The Automotive 1x3 product may reach elevated temperatures such that could burn skin when touched.

CAUTION

CONTACT WITH LIGHT EMITTING SURFACE (LES)

Avoid any contact with the LES. Do not touch the LES of the emitter or apply stress to the LES (yellow phosphor resin area). Contact may cause damage to the emitter

Optics and reflectors must not be mounted in contact with the LES (yellow phosphor resin area).

Disclaimers

MINOR PRODUCT CHANGE POLICY

The rigorous qualification testing on products offered by Bridgelux provides performance assurance. Slight cosmetic changes that do not affect form, fit, or function may occur as Bridgelux continues product optimization.

STANDARD TEST CONDITIONS

Unless otherwise stated, Bridgelux Automotive 1x3 product testing is performed at the nominal drive current.

About Bridgelux: We Build Light That Transforms

At Bridgelux, we help companies, industries and people experience the power and possibility of light. Since 2002, we've designed LED solutions that are high performing, energy efficient, cost effective and easy to integrate. Our focus is on light's impact on human behavior, delivering products that create better environments, experiences and returns—both experiential and financial. And our patented technology drives new platforms for commercial and industrial luminaires.

For more information about the company, please visit
bridgelux.com
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facebook.com/Bridgelux
youtube.com/user/Bridgelux
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