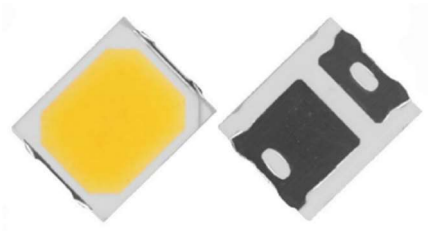
9111210000.0000 Rev.9 (17.10.19)



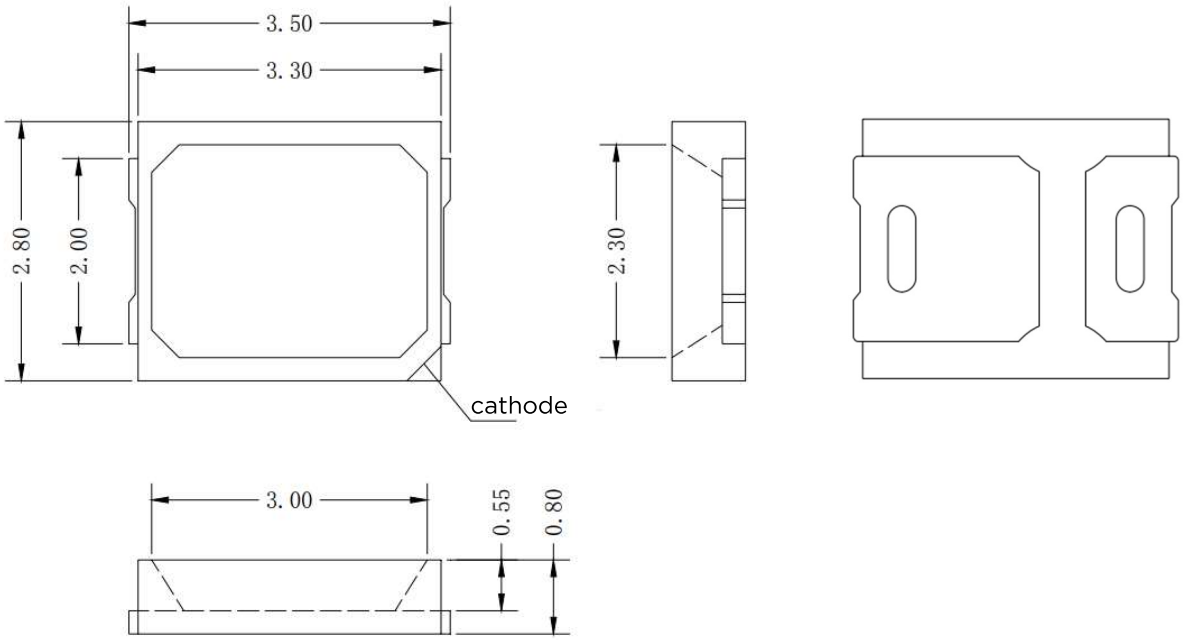
Product Description

The AR2835W LED is the small white lighting LED in 2835 package (3.5mm x 2.8mm x 0.8mm). Light-emitting diodes AR2835W have a wide range of applications and can be used as components of lighting equipment and lamps for decorative illumination of interior and architectural objects.

Features

- CCT: 2000 K ... 20000 K
- CRI: 80+, 90+ (Depending on the CCT)
- Rated operating current: 60 mA
- Wide viewing angle: 120°
- Luminous Flux: up to 28 Lm.
- Efficiency: up to 167 Lm/W.
- Thermal resistance, $R_{j\text{-}s}$ not more 70 K/W.

Package Dimensions



Dimensions are in millimeters. Measuring tolerance: ±0.1 mm

9111210000.0000 Rev.9 (17.10.19)

Absolute Maximum Ratings (T_s* = 25 °C)

Parameter	Symbol	Value	Unit
Power dissipation	P_D	280	mW
DC Forward Current	I_F	90	mA
Peak forward current**	I_{FP}	120	mA
Reverse Voltage	V_R	5	V
ESD Sensitivity	V_{ESD}	1000	V
Operating Temperature	T_{opr}	-30...75	°C
Storage Temperature	T_{stg}	-30...100	°C
Soldering Temperature	T_{sol}	260°C for 5 sec (MAX)	°C

* Ts – Solder point Temperature;
** Pulse width≤0.1 msec.

Typical Characteristics (T_s = 25 °C)

Parameter	Symbol	Note	Min.	Typ.	Max.	Unit
Forward Voltage (Divided into 6 groups)	V_F	I_F = 60 mA	2.8	3.0	3.4	V
Luminous Flux	I_V	I_F = 60 mA	21	-	28	lm
Reverse Current	I_R	V_R = 5 V			1	μA
50% Power Angle	$2Q_{1/2}$	I_F = 60 mA		120		Deg
Saturated Red	R_9	I_F = 60 mA	0			-
Thermal resistance (junction to solder point)	R_{j-s}	-	60	65	70	K/W
Temperature coefficient of voltage	K_{tV}	I_F = 60 mA	-1.8	-1.43	-1.2	mV/°C

9111210000.0000 Rev.9 (17.10.19)

Optical Characteristics (T_s = 25 °C, I_F = 60 mA)

CRI Groups

CRI80+ Group

CCT Group*, K	I_F, mA	CRI**			Luminous Flux , Lm		
		Min	Typ.	Max	Min	Typ.	Max
6000	60	82	85	88	23	25	27
5000	60	82	85	89	23	27	28
4000	60	82	85	89	23	26	27
3500	60	81	85	88	23	25	27
3000	60	80	83	87	23	25	27
2700	60	80	82	85	22	25	26
2400	60	80	82	84	21	23	25

CRI90+ Group

CCT Group* (K)	I_F (mA)	CRI**			Luminous Flux , Lm		
		Min	Typ.	Max	Min	Typ.	Max
6000	60	90	91	94	20	23	25
5000	60	90	92	95	20	23	25
4000	60	90	93	96	20	23	24
3000	60	92	95	97	19	21	23

* - LEDs with another color temperature can be manufactured on special order.

** - LEDs can be made with the following CRI: 80+; 90+ (but from the range between the minimum and maximum values).

Color BIN codes

BIN sorting is done within the two-step McAdam ellipse.

White BINs			
CCT Group	BIN code	x	y
2400K	23D	0.4979	0.4235
		0.5035	0.4258
		0.5061	0.4193
		0.5005	0.4171
	23C	0.4923	0.4213
		0.4979	0.4235
		0.5005	0.4171
		0.4949	0.4148
	23B	0.4868	0.419
		0.4923	0.4213
		0.4949	0.4148
		0.4894	0.4126

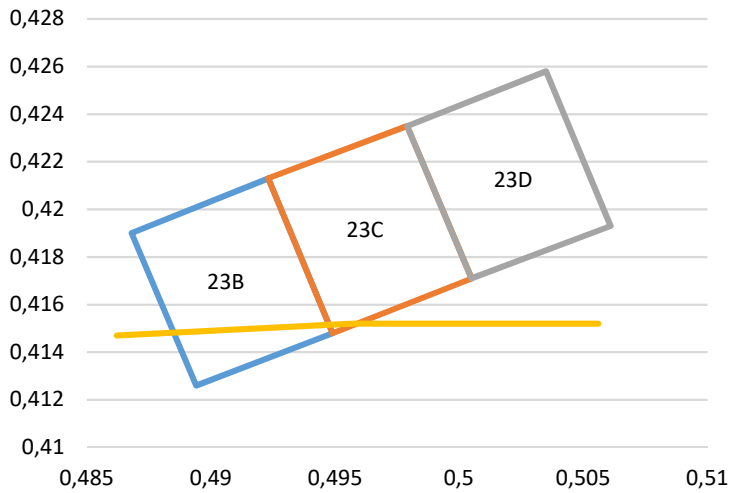


Figure 1 – 2400K BINs Coordinates

White BINs			
CCT Group	BIN code	x	y
2700K	27J	0.4586	0.4063
		0.4632	0.4101
		0.4676	0.4046
		0.463	0.4008
	27L	0.4632	0.4101
		0.4679	0.4139
		0.4723	0.4085
		0.4676	0.4046
	27N	0.4679	0.4139
		0.4726	0.4177
		0.477	0.4123
		0.4723	0.4085

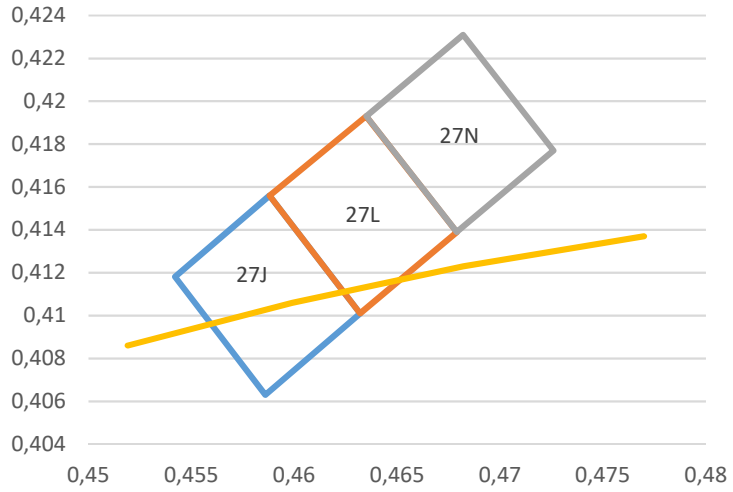


Figure 2 – 2700K BINs Coordinates

White BINs			
CCT Group	BIN code	x	y
3000K	30G	0.4305	0.4052
		0.4349	0.4092
		0.4396	0.404
		0.4351	0.4
	30H	0.4349	0.4092
		0.4394	0.4132
		0.4441	0.408
		0.4396	0.404
	30J	0.4394	0.4132
		0.4438	0.4173
		0.4485	0.4121
		0.4441	0.408

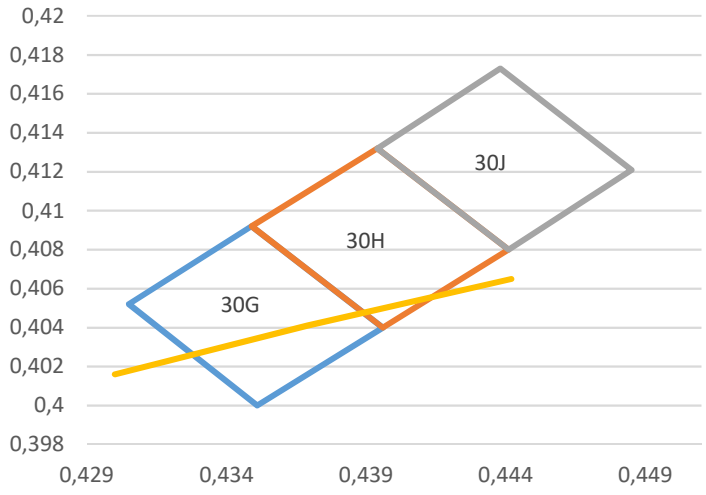


Figure 3 – 3000K BINs Coordinates

White BINs			
CCT Group	BIN code	x	y
3500K	35B	0.4001	0.3914
		0.4042	0.3958
		0.4093	0.391
		0.4052	0.3866
	35C	0.4042	0.3958
		0.4083	0.4002
		0.4134	0.3954
		0.4093	0.391
	35D	0.4083	0.4002
		0.4124	0.4046
		0.4175	0.3998
		0.4134	0.3954

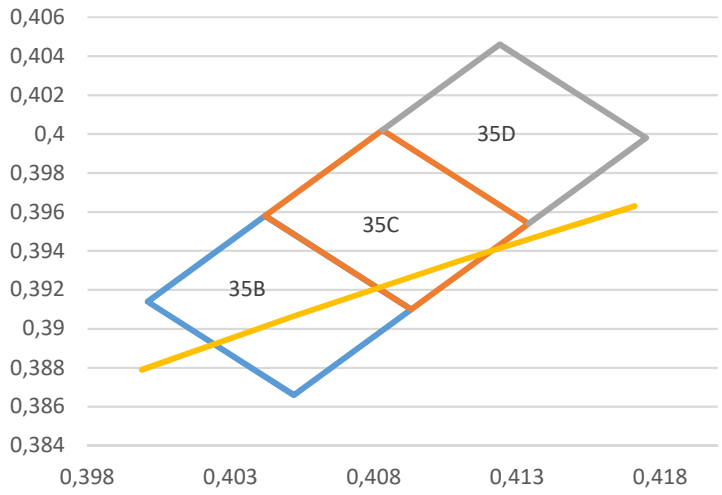


Figure 4 – 3500K BINs Coordinates

White BINs			
CCT Group	BIN code	x	y
4000K	39E	0.3729	0.3694
		0.377	0.3738
		0.3828	0.3683
		0.3787	0.3639
	39F	0.377	0.3738
		0.3811	0.3782
		0.3869	0.3727
		0.3828	0.3683
	39G	0.3811	0.3782
		0.3852	0.3826
		0.391	0.3771
		0.3869	0.3727

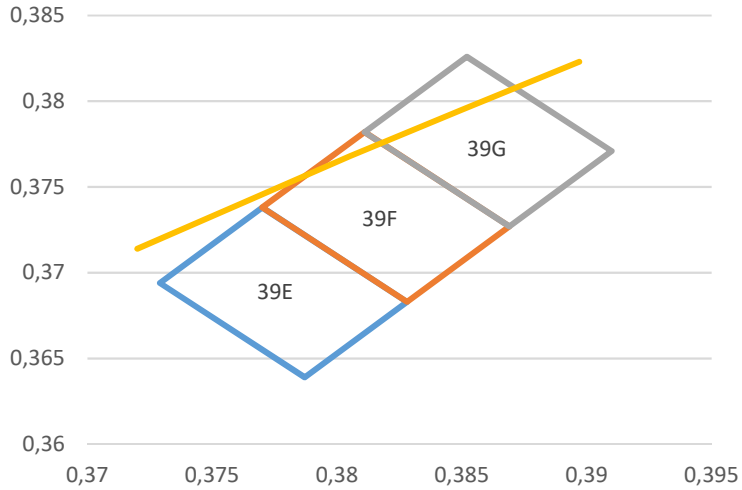


Figure 5 – 4000K BINs Coordinates

White BINs			
CCT Group	BIN code	x	y
5000K	51B	0.3376	0.3508
		0.3414	0.3554
		0.3468	0.351
		0.343	0.3464
	50C	0.3414	0.3554
		0.3451	0.3601
		0.3506	0.3557
		0.3468	0.351
	49D	0.3451	0.3601
		0.3489	0.3648
		0.3543	0.3603
		0.3506	0.3557

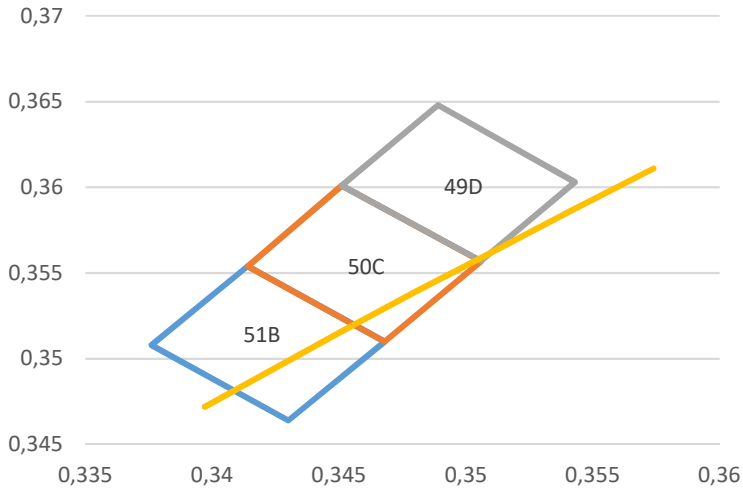


Figure 6 – 5000K BINs Coordinates

White BINs			
CCT Group	BIN code	x	y
6000K	62C	0.3135	0.3212
		0.3168	0.3261
		0.3234	0.3217
		0.3201	0.3167
	60D	0.3168	0.3261
		0.3202	0.3311
		0.3268	0.3266
		0.3234	0.3217
	58E	0.3202	0.3311
		0.3235	0.3361
		0.3302	0.3316
		0.3268	0.3266

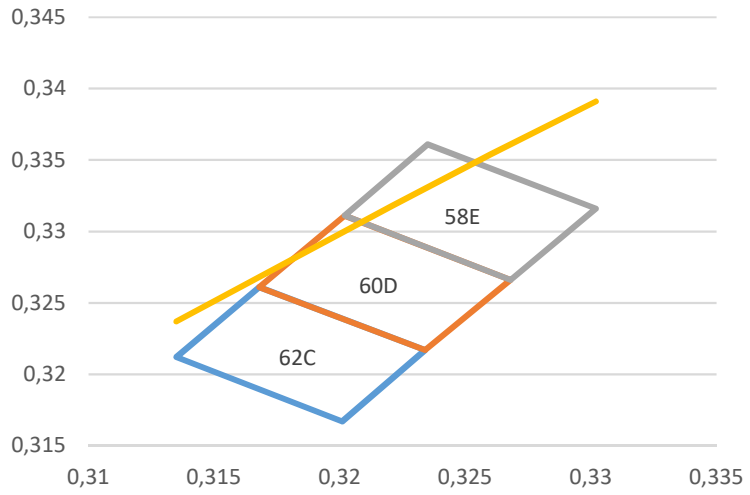


Figure 7 – 6000K BINs Coordinates

White BINs			
CCT Group	BIN code	x	y
8000K	80-3	0.2814	0.2901
		0.2844	0.2961
		0.2904	0.2961
		0.2874	0.2901
	80-4	0.2844	0.2961
		0.2875	0.3021
		0.2935	0.3021
		0.2904	0.2961
	75-3	0.2875	0.3021
		0.2906	0.3081
		0.2966	0.3081
		0.2935	0.3021

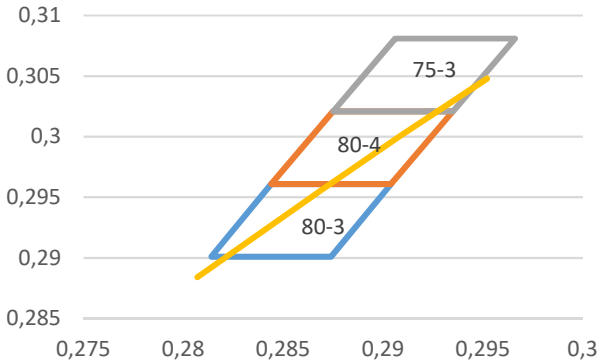
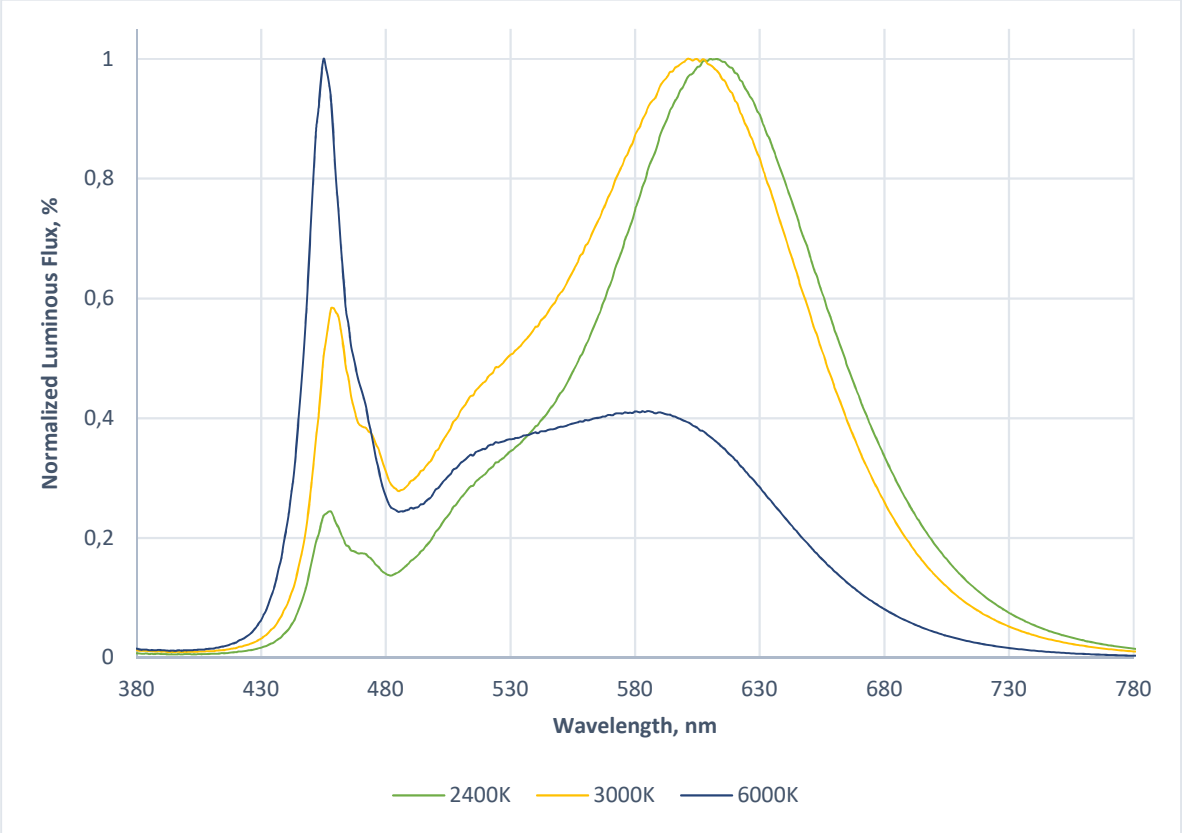


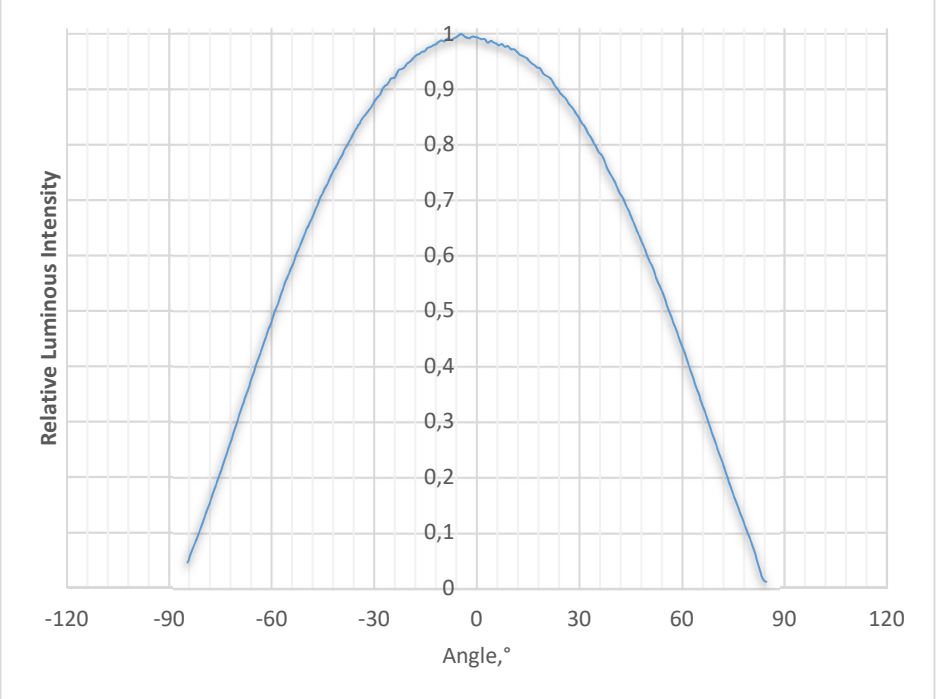
Figure 8 – 8000K BINs Coordinates

Note: Tolerance of measurement of chromatic coordinates: ± 0.005

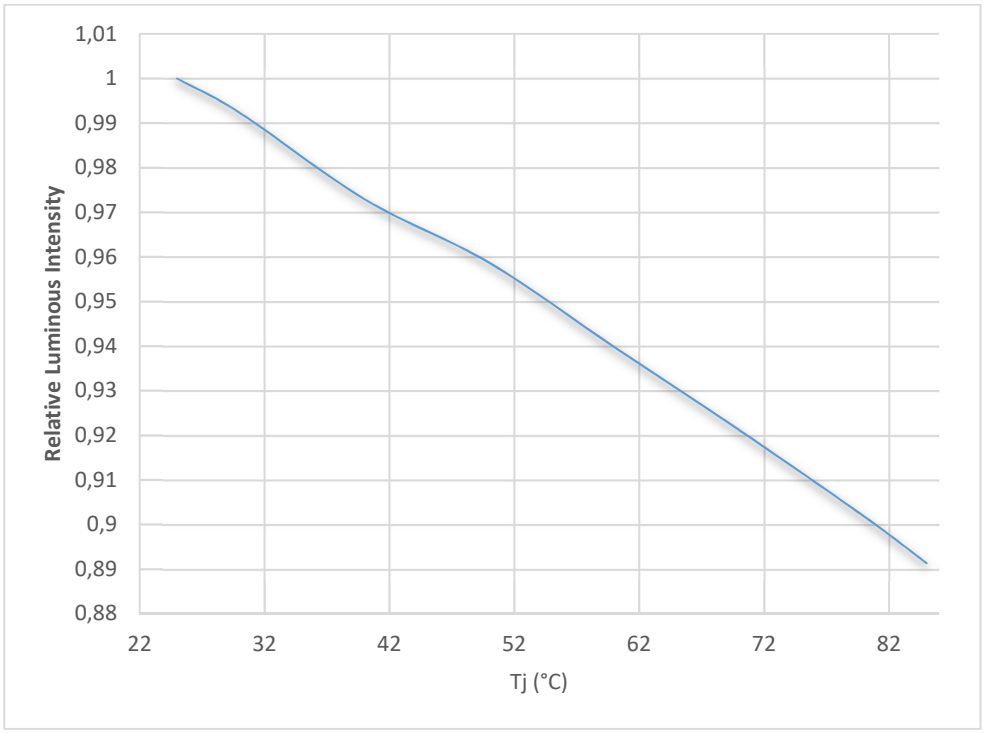
Luminous Flux vs. Wavelength



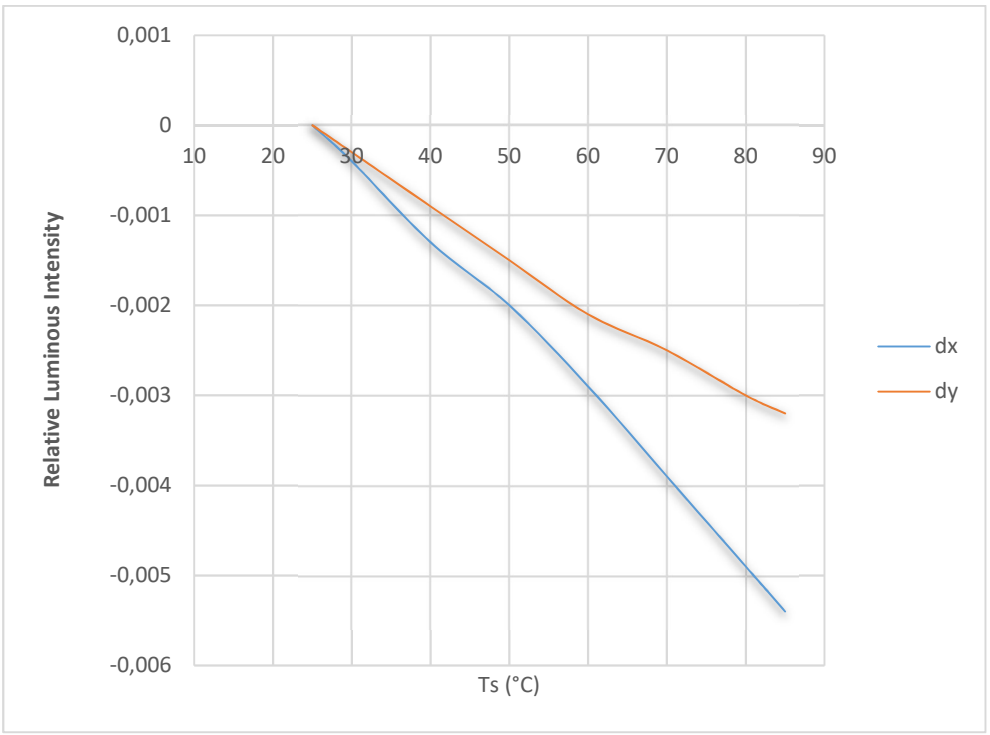
Relative Luminous Intensity vs. Angle



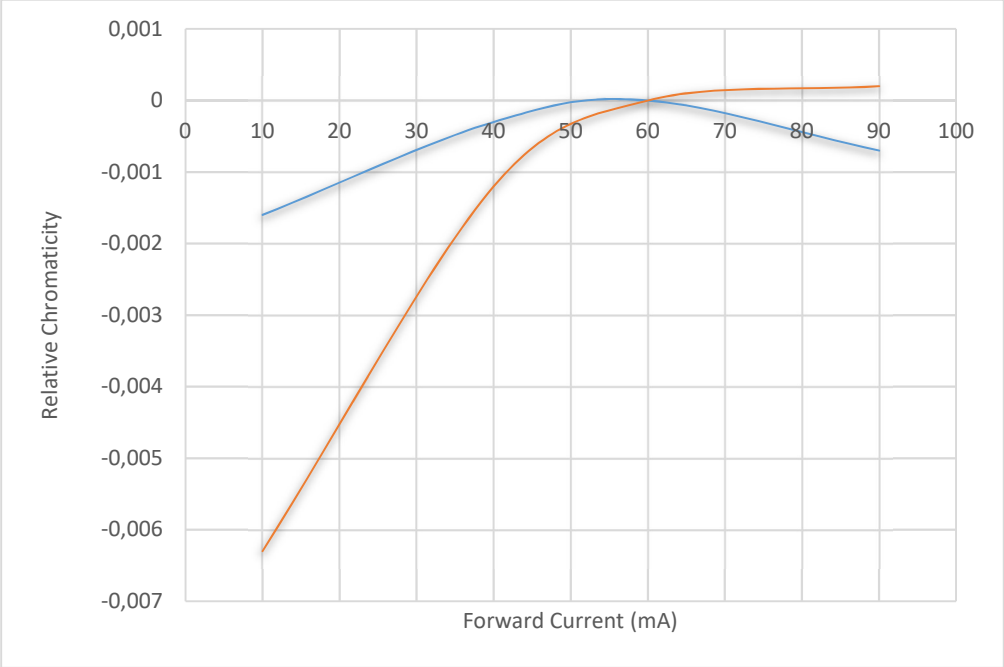
Relative Luminous Intensity vs. T_s



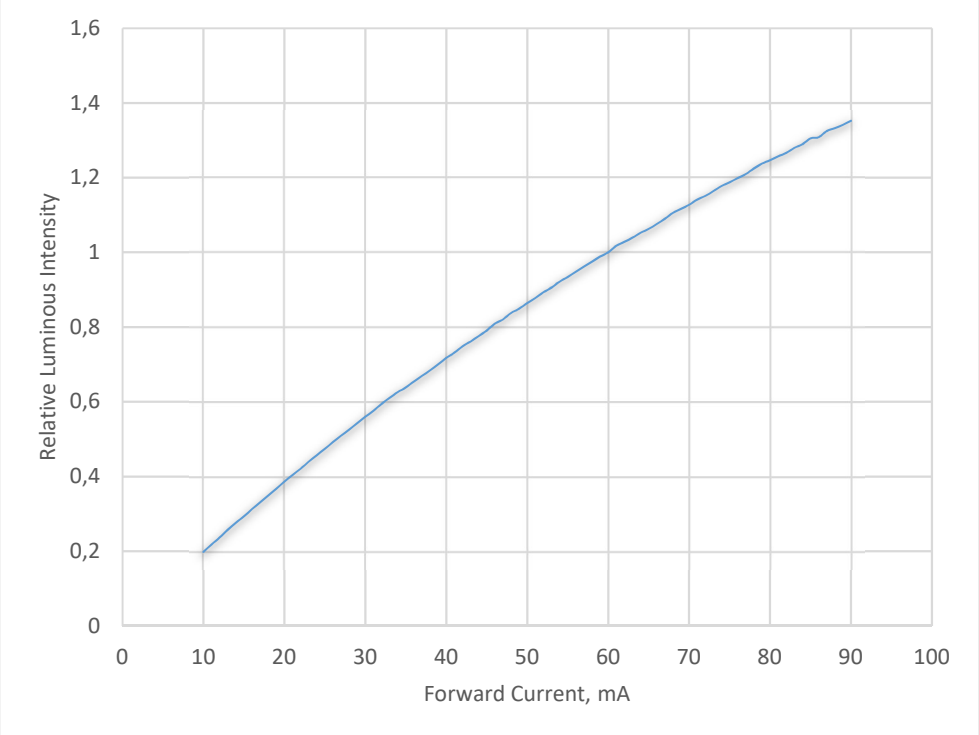
Relative Chromaticity vs. Ts for LEDs with color temperature 3000K



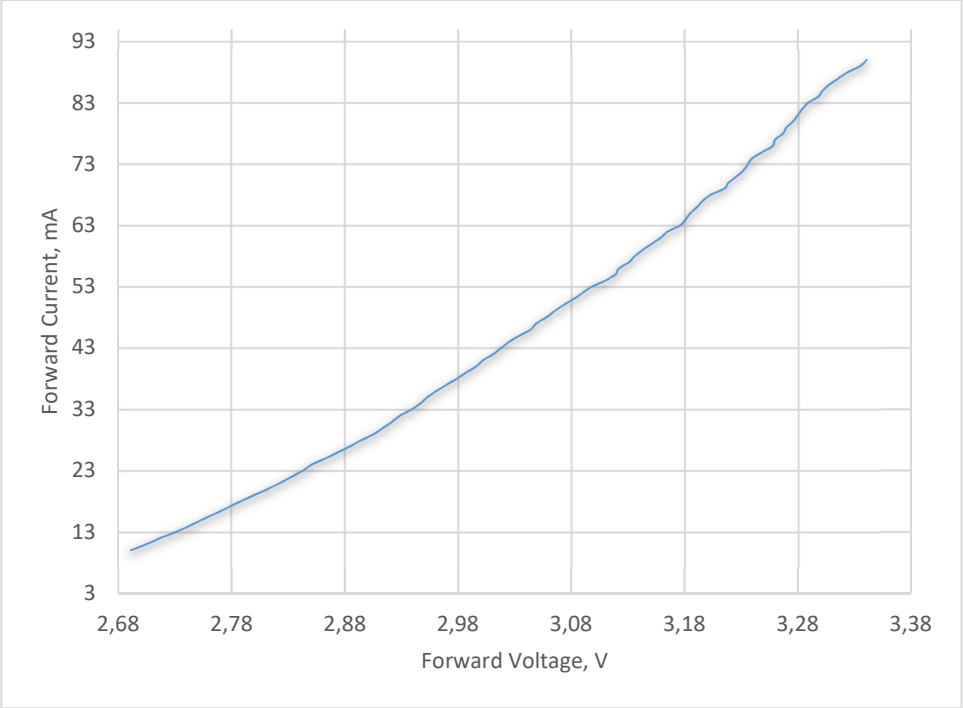
Relative Chromaticity vs. forward Current



Relative Luminous Intensity vs. forward Current



Typical electrical Characteristics for VF:3,0-3,1 at Ts = 25 °C



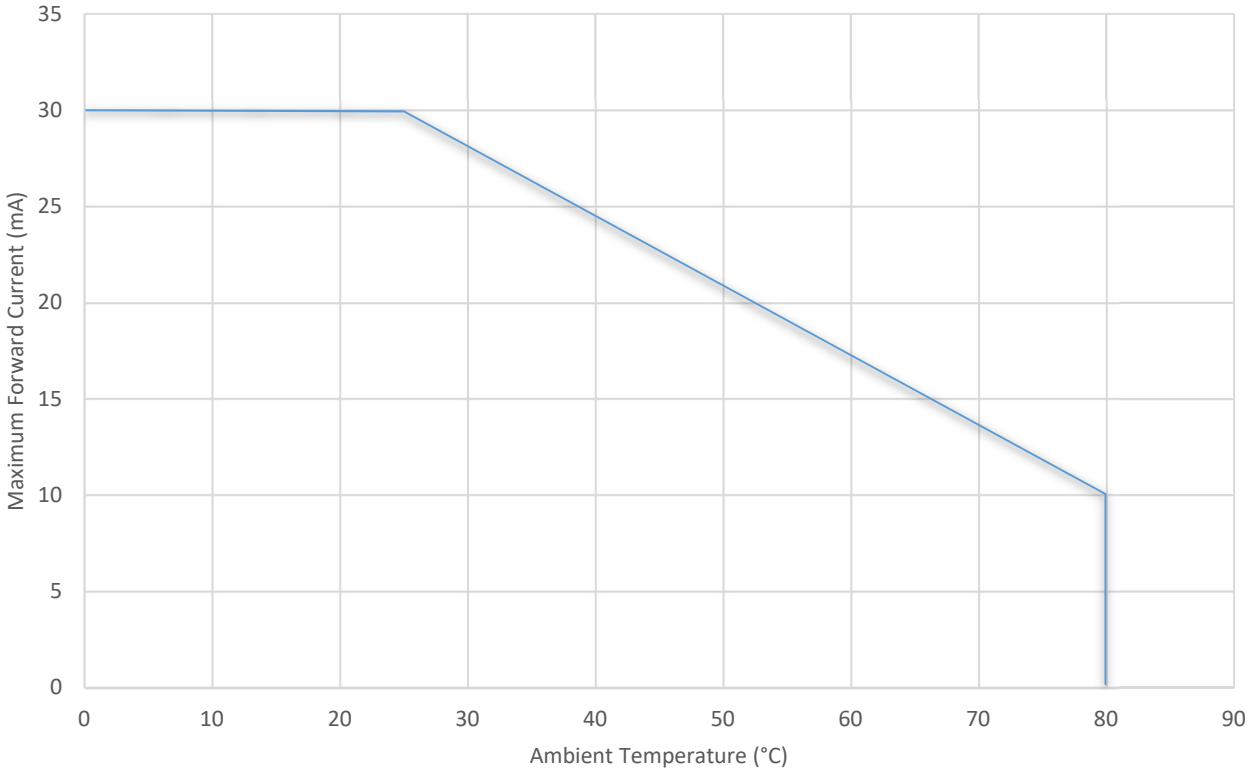
Voltage BIN Structure

Group	Min Voltage, V	Max Voltage, V
VF:2.8-2.9	2.8	2.9
VF:2.9-3.0	2.9	3.0
VF:3.0-3.1	3.0	3.1
VF:3.1-3.2	3.1	3.2
VF:3.2-3.3	3.2	3.3
VF:3.3-3.4	3.3	3.4

Note:

1. Forward voltage measurement allowance is ± 0.03 V.
2. Measurements are performed at rated operating current (I_F = 60 mA).

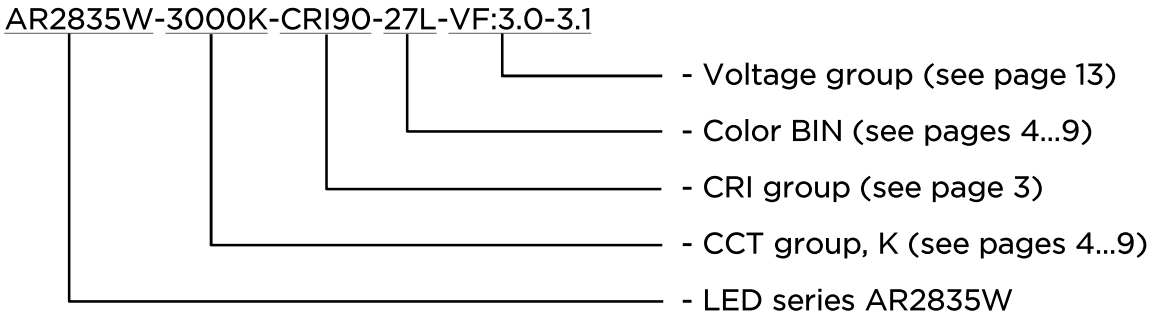
Maximum Forward current derating curve vs. ambient temperature



9111210000.0000 Rev.9 (17.10.19)

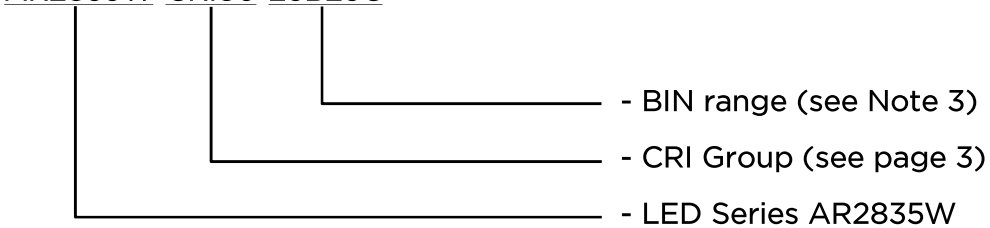
BIN and Order Code Formats

BIN Code Format:



Order Code Formats:

Format #1 – standard order position



Note 1: LEDs will be supplied with one of the groups of Voltage range listed on page 13.

Note 2: On the label of the finished product is always indicated BIN code. Order code is used only for ordering. In addition, a specific BIN code can be used for an order.

Note 3: Specify a BIN range corresponding to the desired color temperature or a specific BIN (see pages 4 ... 9). Examples:

#1: AR2835W-CRI90-62C

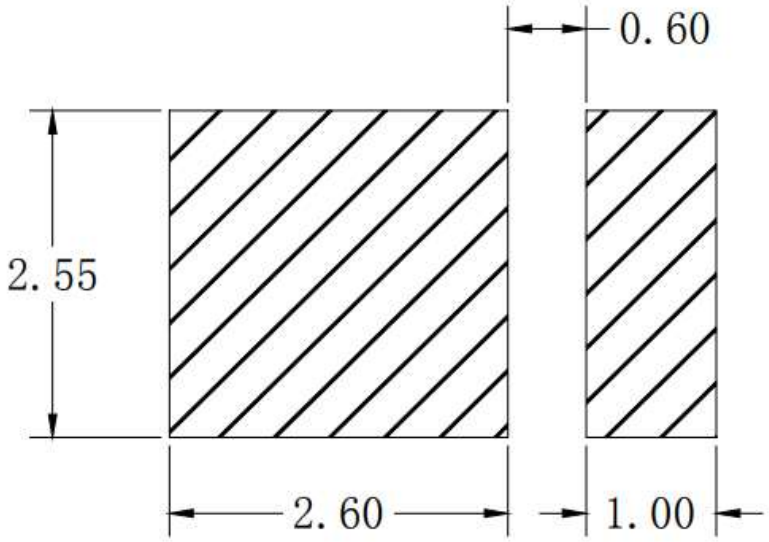
#2: AR2835W-CRI95-27L27N

Format #2 – custom order position

If a LED with a color temperature not described in this document is required, then such an LED can be made to order. In this case, the order code must specify the desired color temperature lying in the range shown on page 3. The CRI value should be chosen from the range indicated on sheet 3 for the closest color temperature value. As example:

AR2835W-CRI95-4500K

Recommended soldering pad



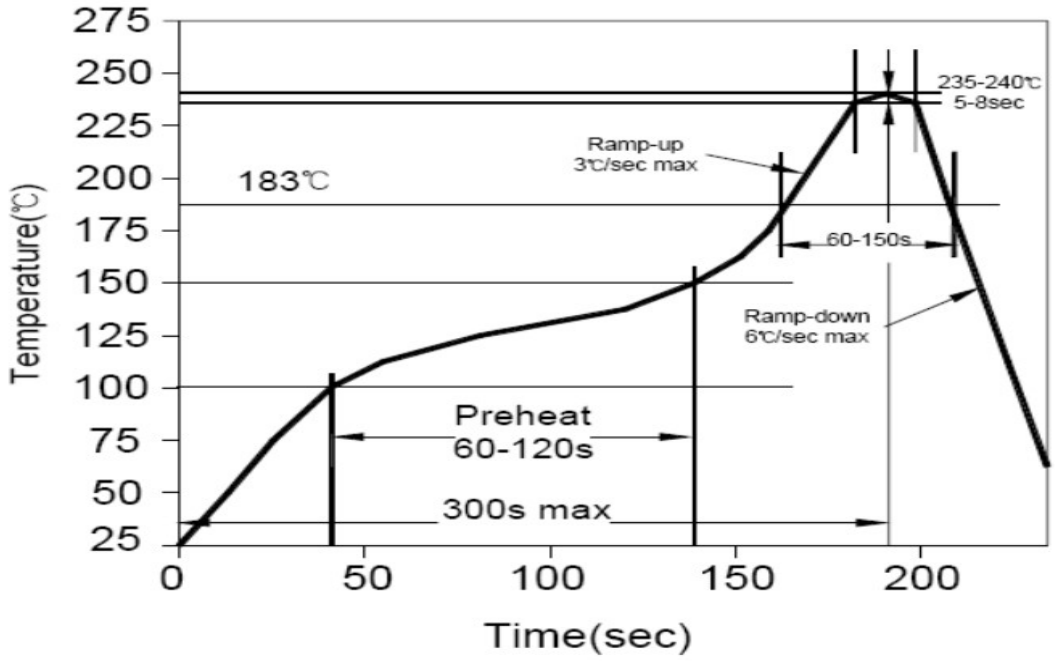
Dimensions are in millimeter.

9111210000.0000 Rev.9 (17.10.19)

Soldering heat reliability

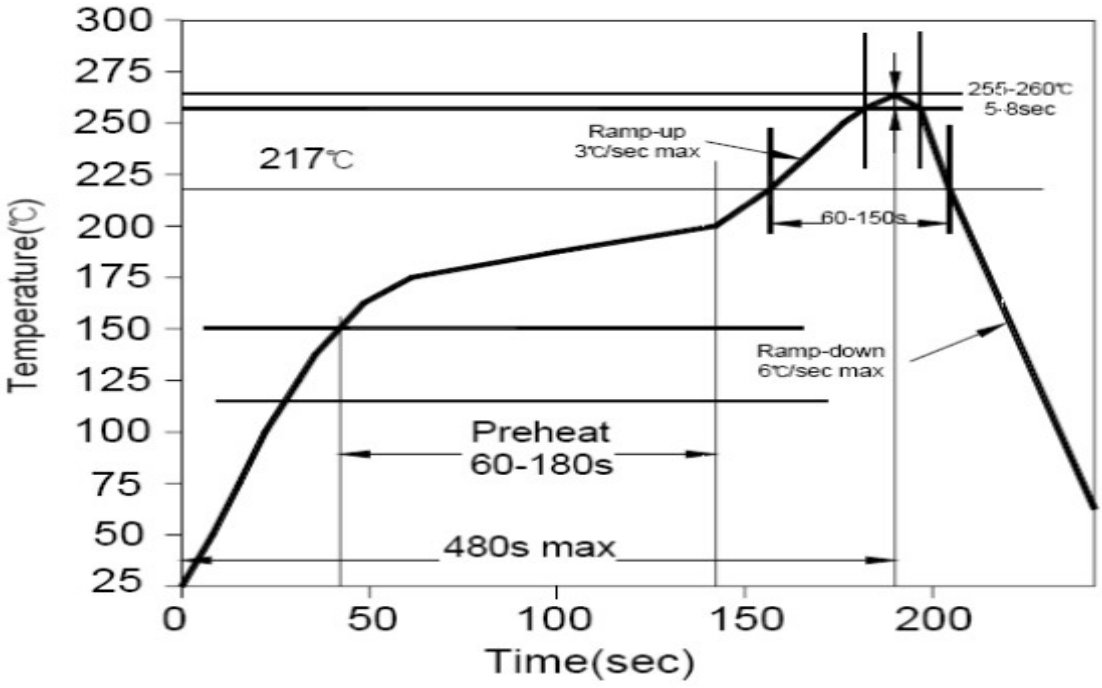
Lead solder

Classification Reflow Profile (JEDEC J-STD-020C)

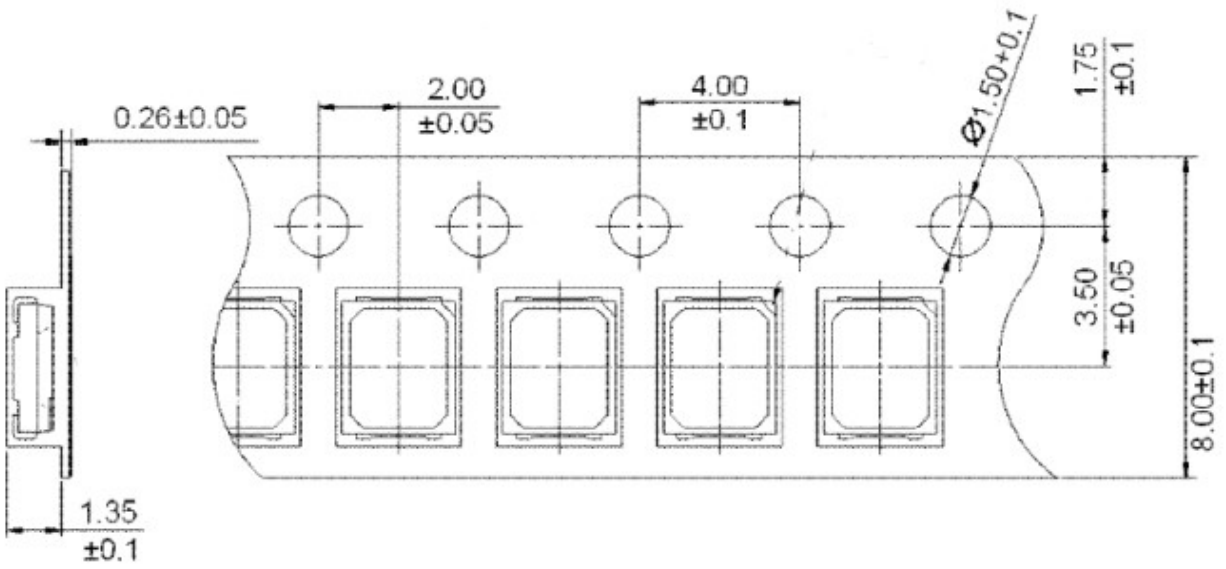


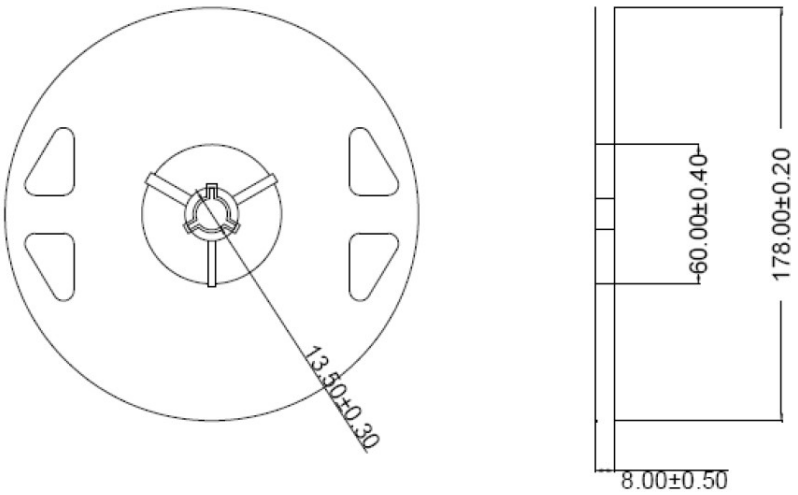
Lead-Free solder

Classification Reflow Profile (JEDEC J-STD-020C)



Packaging specifications





Notes:

1) Dimensions ate specified as follows: mm

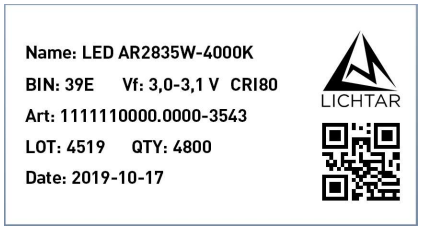
2) Normal packing quantity: 4800 pcs/reel. From 500 pcs/reel on special order.

Information on the content of precious metals

Gold content in 1000 pcs. LEDs ~ 0.0205 g.

Silver content in 1000 pcs. LEDs ~ 0.4748 g.

Marking specifications



Name: AR2835W-4000K-CRI80-39E-VF:3.0-3.1;

Art: 1111110000.0000-3543 - Unique identification code of the manufacturer (depending on the characteristics of the LED);

BIN: 39E – Color BIN Code (see pages 4...9);

VF: 3.0...3.1 – Voltage BIN (see page 13);

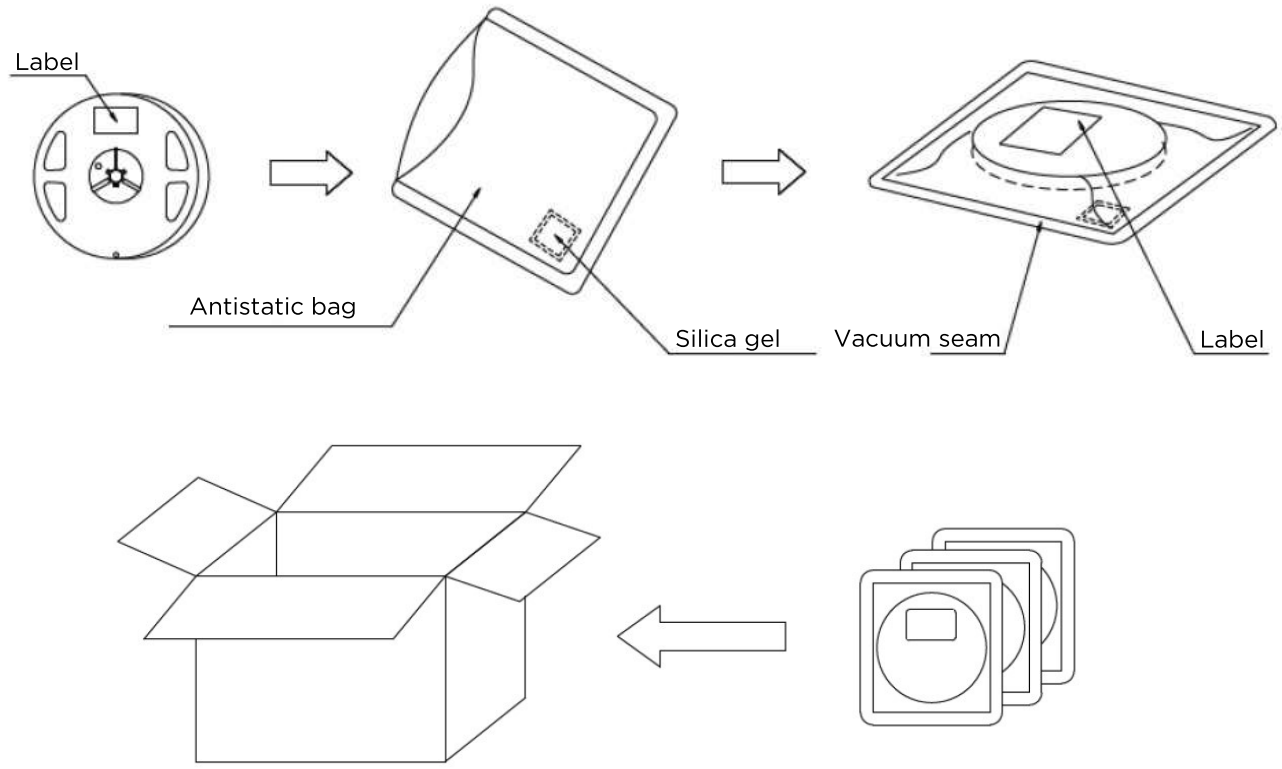
CRI80 – CRI Group name (see page 3);

LOT: 4519 – manufacturer lot number;

QTY: 4800 – quantity of LEDs (pcs/reel);

Date: 2019-10-17 - date of manufacture.

Antistatic package



Reliability Tests

Tests and results

Type of Test	Criterion	Test conditions	Duration	Samples	Suited, %
Running	Turning on	T_A = 25 °C ± 5 °C *I_F = 60 mA	1000 hours	20	100 %
Env. test	High temperature	T_A = 100 °C ± 5 °C	1000 hours	20	100 %
	Low temperature	T_A = -40 °C ± 5 °C	1000 hours	20	100 %
	Temperature and humidity	T_A = 60 °C ± 5 °C R_H = 85 % ± 5 %	1000 hours	20	100 %
	Thermal shock	10 °C ± 5 °C (15 min) ... 100 °C ± 5 °C (15min)	100 cicles	20	100 %
	Thermal cycling	-40 °C ~ 25 °C ~ 100 °C ~ 25 °C 30 min – 5 min – 30 min – 5 min	300 cicles	20	100 %
Mechanical test	Resistance to soldering temperature	255-260 °C, 8 sec	once	20	100 %

Note:
- The test for resistance to soldering temperature is carried out first.

Criteria for the assessment of validity

Characteristic	Symbol	Conditions	Evaluation criterion	
			Min	Max
Supply voltage	V_F	I_F=60 mA	–	Basic x 1,02
Luminous intensity	I_V	I_F=60 mA	Basic x 0,7	–

Precautions

1. Do not exceed the rated power.
2. Avoid exposure to static electricity (ESD).
3. Do not allow mechanical impact (pressure, penetration of foreign objects) on the LED lens.
4. The shelf life in the original packaging at a temperature of <40 ° C and a relative humidity of <95% is 12 months from the date of production.
5. After opening the package, it is recommended to use LEDs for 72 hours.
6. When storing the LEDs in the opened package more than 72 hours before use, perform drying at 65°C for at least 24 hours.
7. Avoid storage in conditions of condensation (below dew point).