

PLW2835BA Series 2835 Low Power LED Product Datasheet



Description

Plessey PLW2835BA SMT LEDs are designed for optical indicators, indoor displays, automotive lighting, backlights for switches/symbols/LCD, tubular lighting and other general lighting applications and the light is emitted close to a Lambertian distribution. The LEDs are packed in reels containing 4000 pieces; each individual reel will be shipped in single intensity and colour bin, to provide close uniformity.

Features

- 2835 footprint (2.8 x 3.5 x 0.7mm)
- Colour binning
- High reliability PLCC-2 packaging
- Diffused pale yellow resin
- 120 degree wide viewing angle
- LM80 Certified

Applications

- Tubular Lighting
- Instrument panel backlighting
- Illumination symbols
- Automotive lighting
- General lighting

Variant	Colour	CCT	
		Min.	Max.
PLW2835BA-3000	Warm White 3000K	2775K	3125K
PLW2835BA-4000	Neutral White 4000K	3750K	4350K
PLW2835BA-5000	Cool White 5000K	4725K	5300K
PLW2835BA-5700	Cool White 5700K	5300K	6000K
PLW2835BA-6500	Cool White 6500K	6000K	7000K

Absolute Maximum Ratings

$T_{amb} = +25^{\circ}\text{C}$ unless otherwise stated

Parameter	Symbol	Minimum	Maximum	Unit
DC Forward Current	I_F	-	100	mA
Peak Pulse Forward Current ^[1]	I_{FP}	-	140	mA
Power Dissipation	P_d	-	310	mW
Storage Temperature	T_{stg}	-40	+100	$^{\circ}\text{C}$
Junction Temperature	T_j		+115	$^{\circ}\text{C}$

^[1] Pulse width $\leq 10\text{ms}$, duty cycle $\leq 10\%$

Electro-optical Characteristics

$T_{amb} = +25^{\circ}\text{C}$ unless otherwise stated

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	$I_F = 60\text{mA}$	2.9	-	3.3	V
Reverse Current	I_R	$V_R = 5\text{V}$	-	-	10	μA
Colour Rendering Index	CRI	$I_F = 60\text{mA}$	80	82	84	%
Thermal Resistance	R_{thj-sp}		-	40	-	$^{\circ}\text{C/W}$
Half-Intensity Angle	$2\theta_{1/2}$	$I_F = 60\text{mA}$	-	120	-	deg

Recommended Operating Conditions

In typical applications, for optimum LED performance

Parameter	Symbol	Minimum	Maximum	Unit
Operating Ambient Temperature	T_{opr}	-40	+85	$^{\circ}\text{C}$

Ordering Information

Name	Order Code	Luminous Flux Range	Forward Voltage Range
PLW2835BA-3000	PLW2835BAW30000	2A, 3A	V2-V5
PLW2835BA-4000	PLW2835BAN40000	3A, 4A	
PLW2835BA-5000	PLW2835BAC50000		
PLW2835BA-5700	PLW2835BAC57000		
PLW2835BA-6500	PLW2835BAC65000		

Intensity Bin Groups

$I_F = 60\text{mA}$, $T_{\text{amb}} = +25^\circ\text{C}$, unless otherwise stated

Group	Luminous flux ^[1] (lm)	
	Min.	Max.
2A	22	24
3A	24	26
4A	26	28

^[1] Tolerance $\pm 10\%$

Forward Voltage Bin Groups

$I_F = 60\text{mA}$, $T_{\text{amb}} = +25^\circ\text{C}$, unless otherwise stated

Group	V_F ^[1] (V)	
	Min.	Max.
V2	2.9	3.0
V3	3.0	3.1
V4	3.1	3.2
V5	3.2	3.3

^[1] Tolerance $\pm 0.1\text{V}$

Chromaticity Binning

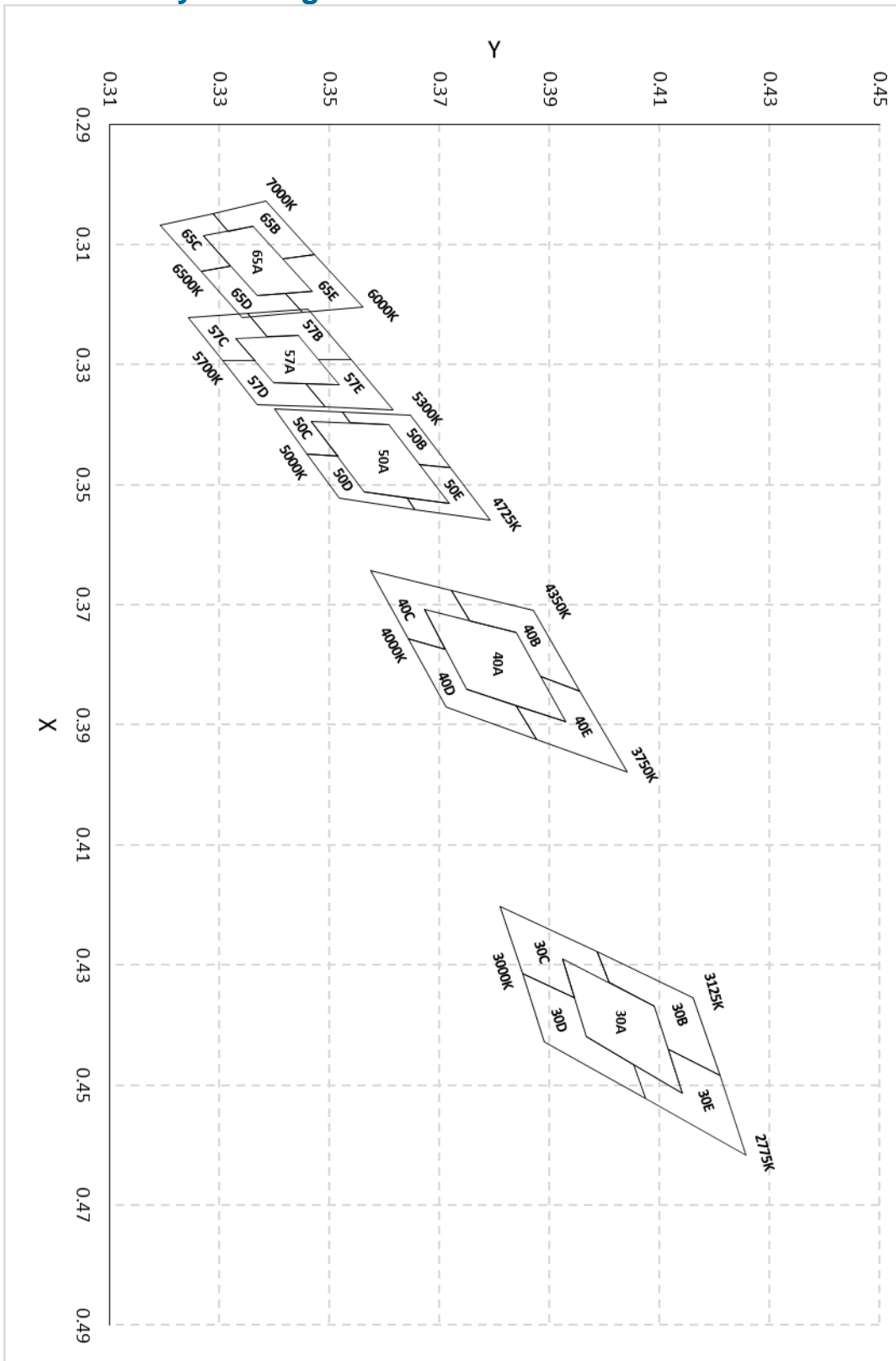


Figure 1. Colour Chromaticity Binning

Colour binning coordinates:

4 STEP

BIN	X1	Y1	X2	Y2	X3	Y3	X4	Y4
65A	0.3070	0.3362	0.3086	0.3271	0.3185	0.3370	0.3178	0.3470
57A	0.3251	0.3444	0.3256	0.3331	0.3331	0.3398	0.3333	0.3518
50A	0.3400	0.3609	0.3394	0.3467	0.3512	0.3564	0.3532	0.3719
40A	0.3746	0.3839	0.3708	0.3673	0.3841	0.3749	0.3895	0.3930
30A	0.4368	0.4091	0.4290	0.3924	0.4419	0.3968	0.4514	0.4141

7 STEP

BIN	X1	Y1	X2	Y2	X3	Y3	X4	Y4	X5	Y5	X6	Y6
65B	0.3124	0.3416	0.3116	0.3473	0.3028	0.3384	0.3048	0.3289	0.3078	0.3317	0.307	0.3362
65C	0.3078	0.3317	0.3048	0.3289	0.3068	0.3193	0.3144	0.3267	0.3136	0.3321	0.3086	0.3271
65D	0.3136	0.3321	0.3144	0.3267	0.3221	0.3341	0.3213	0.3451	0.3182	0.3420	0.3185	0.3370
65E	0.3124	0.3416	0.3116	0.3473	0.3205	0.3561	0.3213	0.3451	0.3182	0.3420	0.3178	0.3470
57B	0.3292	0.3481	0.3291	0.3539	0.3207	0.3462	0.3214	0.3352	0.3254	0.3387	0.3251	0.3444
57C	0.3254	0.3387	0.3214	0.3352	0.3222	0.3243	0.3294	0.3306	0.3294	0.3365	0.3256	0.3331
57D	0.3294	0.3365	0.3294	0.3306	0.3366	0.3369	0.3371	0.3492	0.3332	0.3458	0.3331	0.3398
57E	0.3292	0.3481	0.3291	0.3539	0.3376	0.3616	0.3371	0.3492	0.3332	0.3458	0.3333	0.3518
50B	0.3466	0.3664	0.3471	0.3720	0.3384	0.3648	0.3379	0.3524	0.3397	0.3538	0.3400	0.3609
50C	0.3397	0.3538	0.3379	0.3524	0.3374	0.3401	0.3449	0.3460	0.3453	0.3516	0.3394	0.3467
50D	0.3453	0.3516	0.3449	0.3460	0.3523	0.3519	0.3541	0.3655	0.3522	0.3642	0.3512	0.3564
50E	0.3466	0.3664	0.3471	0.3720	0.3559	0.3792	0.3541	0.3655	0.3522	0.3642	0.3532	0.3719
40B	0.3820	0.3884	0.3844	0.3956	0.3709	0.3871	0.3676	0.3723	0.3727	0.3756	0.3746	0.3839
40C	0.3727	0.3756	0.3676	0.3723	0.3643	0.3575	0.3757	0.3644	0.3775	0.3711	0.3708	0.3673
40D	0.3775	0.3711	0.3757	0.3644	0.3871	0.3713	0.3925	0.3877	0.3868	0.3839	0.3841	0.3749
40E	0.3820	0.3884	0.3844	0.3956	0.3979	0.4041	0.3925	0.3877	0.3868	0.3839	0.3895	0.3930
30B	0.4441	0.4116	0.4485	0.4210	0.4354	0.4162	0.4278	0.3987	0.4329	0.4009	0.4368	0.4091
30C	0.4329	0.4009	0.4278	0.3987	0.4202	0.3811	0.4315	0.3851	0.4354	0.3946	0.4290	0.3924
30D	0.4354	0.3946	0.4315	0.3851	0.4428	0.3890	0.4522	0.4074	0.4467	0.4054	0.4419	0.3968
30E	0.4485	0.4210	0.4441	0.4116	0.4514	0.4141	0.4467	0.4054	0.4522	0.4074	0.4617	0.4257

Relative Spectral Emission

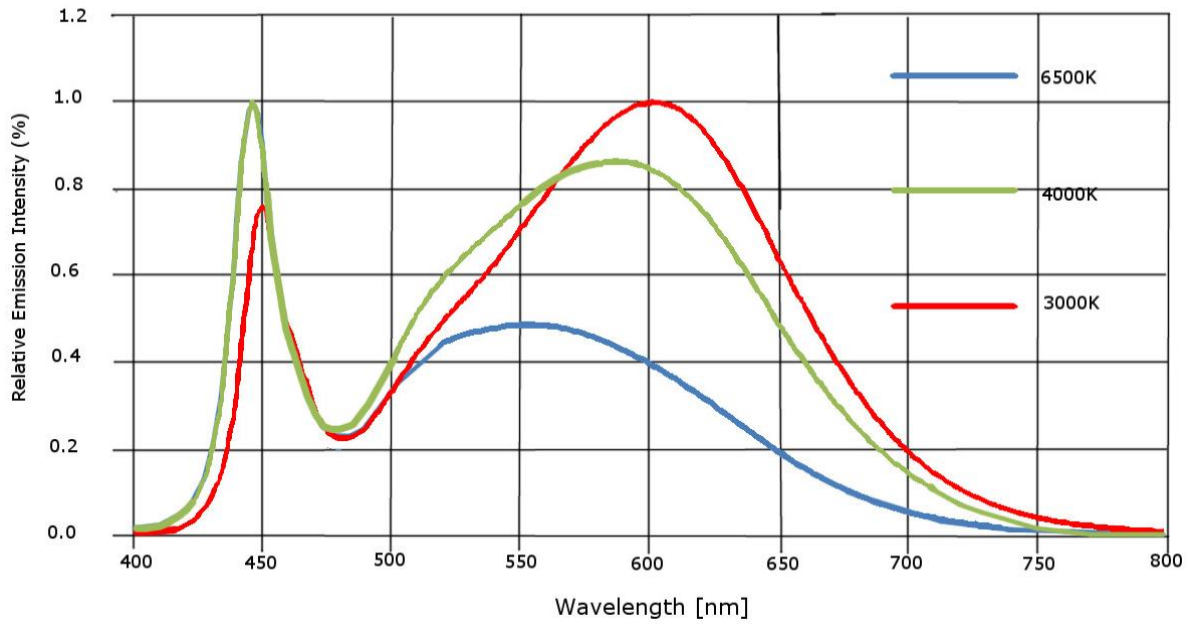


Figure 2. Normalised spectral power distribution

Note: The relative spectral emission corresponds to a random LED sample

Forward Current Characteristics

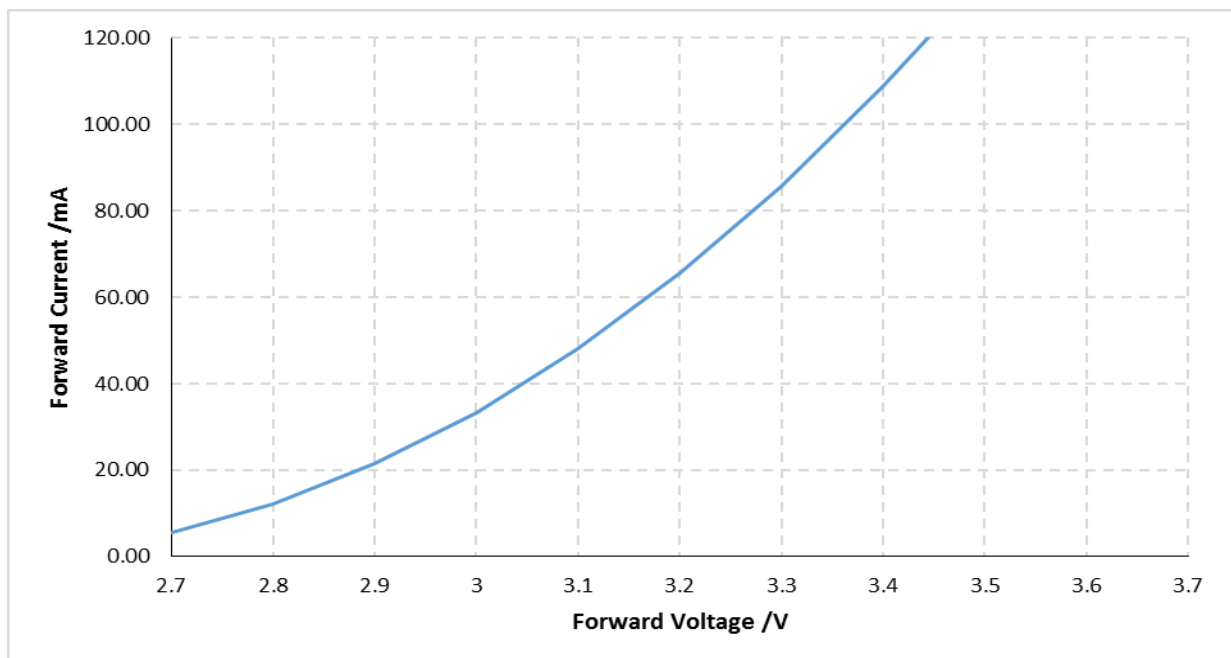


Figure 3. Typical forward current versus forward voltage ($T_a=+25C$)

Forward Current Characteristics (Continued)

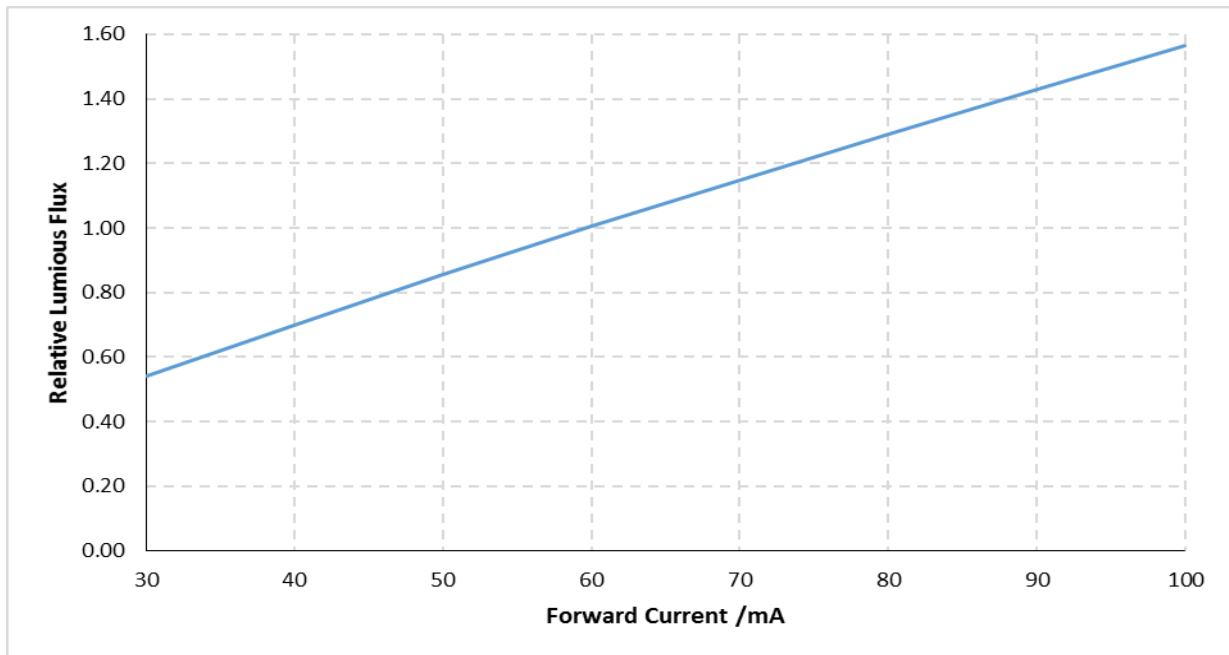


Figure 4. Relative luminous flux versus forward current ($T_a=+25C$)

Temperature Characteristics

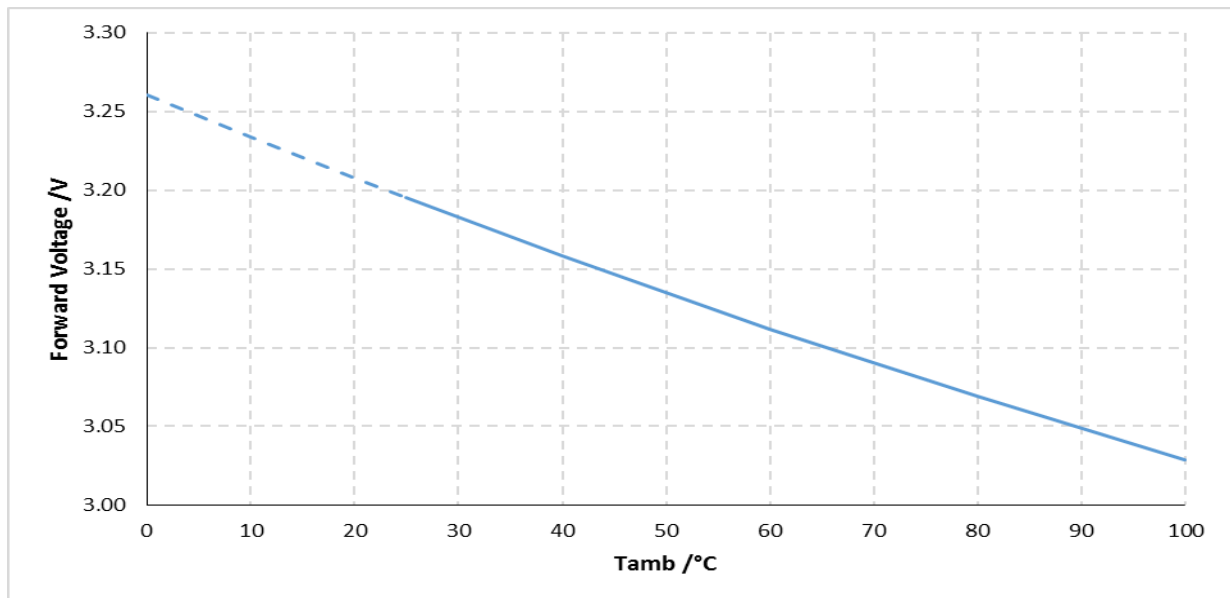


Figure 5. Typical forward voltage versus ambient temperature ($I_f=60mA$)

Temperature Characteristics (cont.)

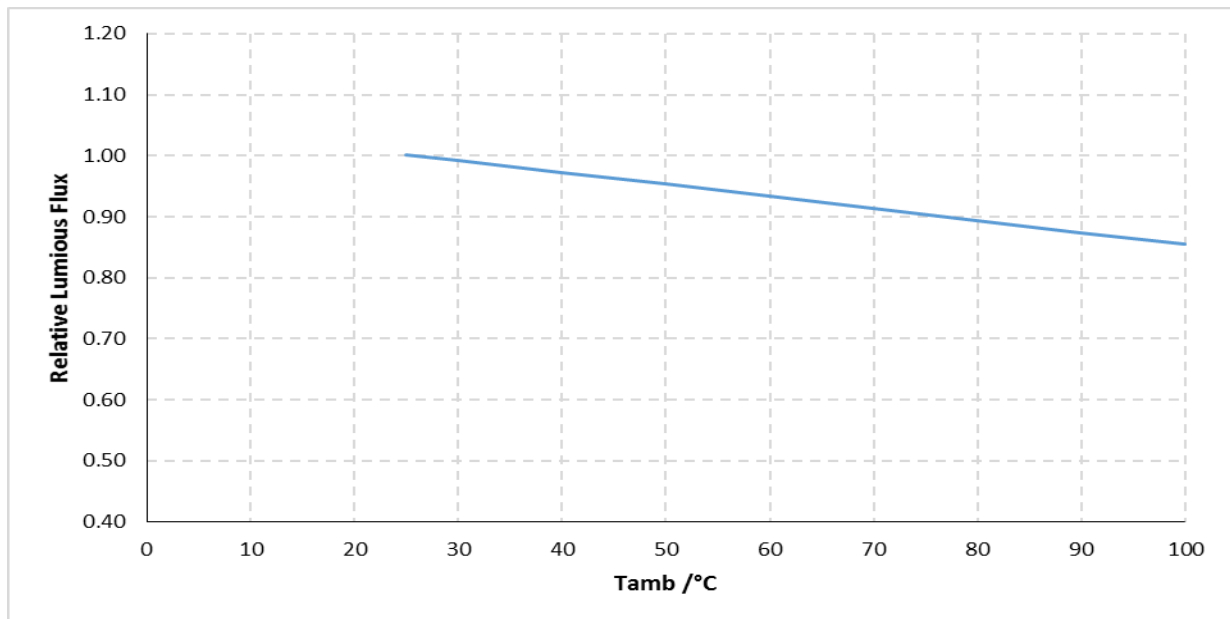


Figure 6. Relative luminous flux vs ambient temperature (IF=60mA)

Package Outline Dimensions & Soldering Pattern

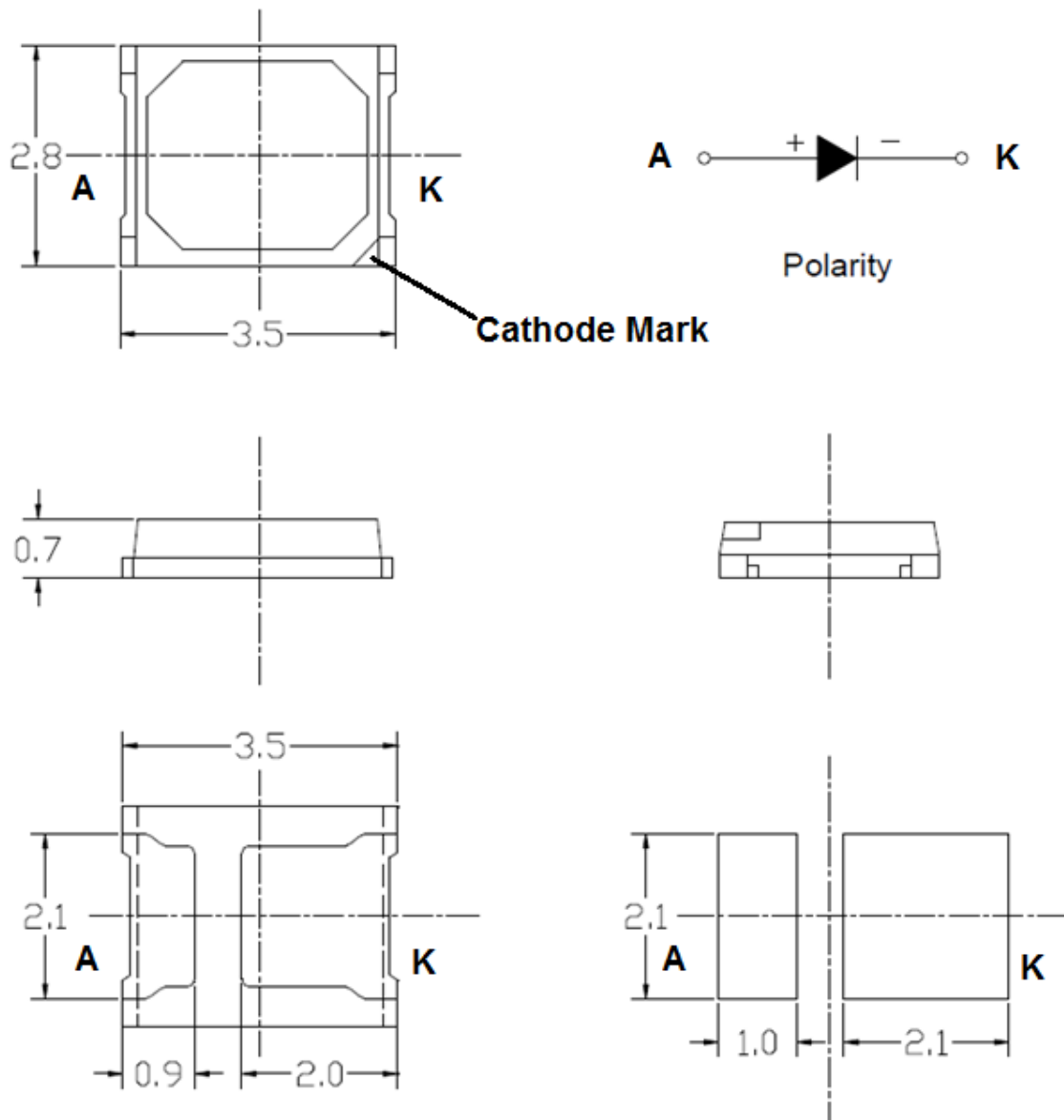


Figure 7. Mechanical Drawing & Soldering Pattern of the 2835 package

1. All dimensions units are millimeters.
2. All dimensions tolerances are $\pm 0.2\text{mm}$ unless otherwise stated.

Reflow Soldering Profile

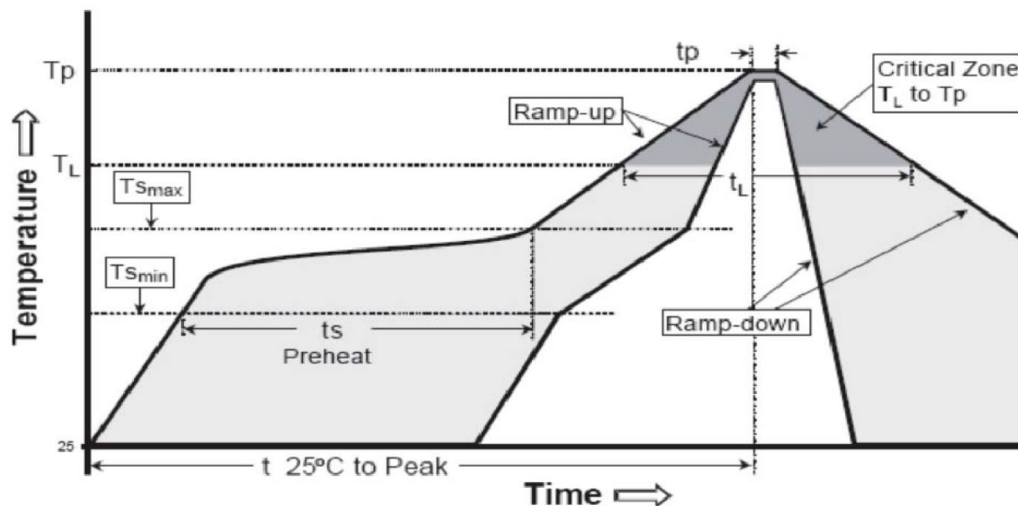


Figure 8. Reflow soldering profile

Reflow Soldering Characteristics

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T_s max to T_p)	Max 3°C/sec	Max 3°C/sec
Preheat: Min Temperature(T_{s_min})	100°C	150°C
Preheat: Max Temperature(T_{s_max})	150°C	200°C
Preheat: Time (T_{s_min} to T_{s_max})	60 – 120 sec	60 – 180 sec
Time maintained above: Temperature (T_L)	183°C	217°C
Time maintained above: Time (t_L)	60 – 150 sec	60 – 150 sec
Peak/Classification Temperature T_p	215°C	260°C
Storage time within 5°C of actual peak t_p	10 – 30 sec	20 – 40 sec
Ramp-down rate	Max 6°C/sec	Max 6°C/sec
Time required 25°C to peak temperature	Max 6 mins	Max 8 mins

1. Reflow soldering should not be done more than twice
2. When soldering, do not put stress on the LEDs during heating

Soldering iron

1. When hand soldering, the temperature of the iron must be $\leq +300^\circ\text{C}$ for 3 seconds
2. Hand soldering should be performed only once.

Handling Instructions

Plessey LEDs are not designed to operate with reverse bias.

Precautions are required to prevent reverse bias in applications and during handling.



Moisture Sensitivity

JEDEC Level	Floor life		Bake	
	Time	Conditions	Time	Conditions
2a	4 weeks	≤+30°C / 60% RH	≥12 hours	+60°C ±5°C / 5% RH

Packing Information

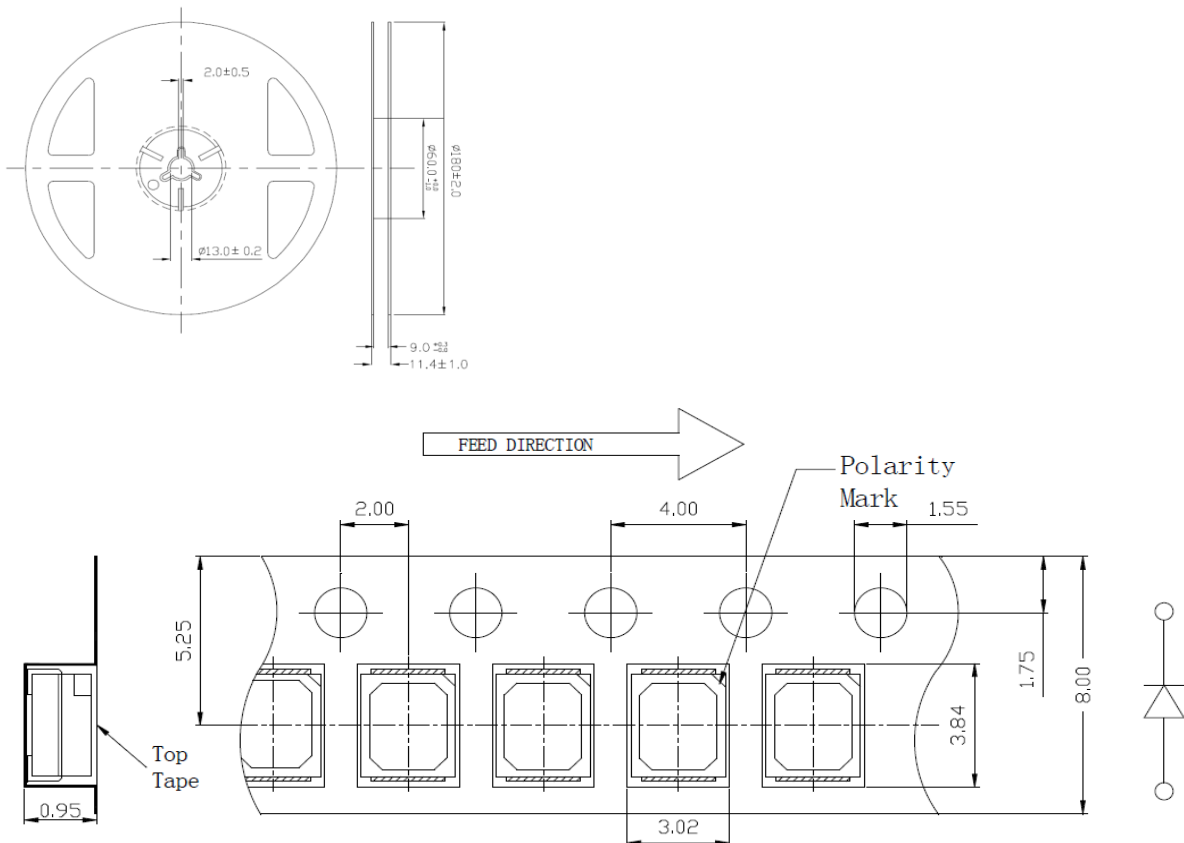


Figure 9. Reel Specification (units in mm)

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