

PRODUCT DATASHEET

TRUST LED PANEL LIGHT 44 W 6500 K

LED panel light luminaires



AREAS OF APPLICATION

- Architectural lighting
- Hospitals, exhibition halls, Schools
- Libraries, Museums, Gym centers
- Meeting Rooms, Private houses etc.



PRODUCT BENEFITS

- Long Lifespan. ...
- Energy Efficiency. ...
- Improved Environmental Performance. ...
- The Ability to Operate in Cold Conditions. ...
- No Heat or UV Emissions. ...
- Design Flexibility. ...
- Instant Lighting and the Ability to Withstand Frequent Switching. ...
- Low Voltage Operation.

PRODUCT FEATURES

- Color rendering index R_a : > 80
- Luminaire efficacy: up to 120 lm/W
- Die-cast aluminum housing
- Power factor: 0.9
- Lifetime (L70/B50): up to 50,000 h



TECHNICAL DATA

Electrical data

Nominal wattage	44 W
Operating mode	Electronic Control LED Driver
Nominal voltage	220-240 V
Power factor λ	≥ 0.90
Mains frequency	50/60 Hz

Photometrical data

Color temperature	6500 K
Luminous flux	5280 lm
Luminous efficacy	Up to 120 lm/W
Standard deviation of color matching	≤ 5 sdcM
Light color (designation)	Daylight
Color rendering index Ra	≥ 80

Light technical data

Beam angle	120 °
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Dimensions & weight

Length	600.0 mm
Width	600.0 mm
Depth	30.0 mm
Product weight	1.2 Kg
Cable length	300 mm

Colors & materials

Body material	Aluminum
Product color	White
Housing color	White
Cover material	PS

Temperatures & operating conditions

Ambient temperature range	-10...+55 °C
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Lifespan

Number of switching cycles	30000
Lifespan L70/B50	50000 h

Additional product data

Mounting type	Ceiling
Mounting location	All ceiling

Capabilities

Dimmable	No
LED module replaceable	Not replaceable

Certificates & standards

Protection class IK (shock resistance)	IK04
Protection class	I
Type of protection	IP40

Logistical data

Temperature range at storage	-30...+70 °C
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LOGISTICAL DATA

Product code	Packaging unit (Pieces/Unit)	Dimensions (length x width x height)	Gross weight
TST-PBL006-44W	Folding carton box	620 mm x 620 mm x 34 mm	1.50 Kg

The mentioned product code describes the smallest quantity unit which can be ordered. One shipping unit can contain one or more single products. When placing an order, for the quantity please enter single or multiples of a shipping unit.

DISCLAIMER

Subject to change without notice. Errors and omission excepted. Always make sure to use the most recent release.

PHILIPS

CertaDrive

LED driver



Datasheet

CertaDrive Panel drivers – Low Ripple

CertaDrive 44W 0.9/1.05A 42V 230V I

9290 028 04880

Single current LED drivers for essential lighting applications.

CertaDrive LED drivers are designed to fulfill the market need for essential lighting with reliable performance. The CertaDrive LED drivers offer basic specifications with specific current and voltage settings which are easy to use for high volume applications. The CertaDrive range is optimal to operate mid-power LEDs from different manufacturers.

Benefits

- Driver design based on Philips experience and knowledge of conventional fluorescent and HID technologies
- Popular Vout/Iout mix for high volume applications Various power wattage Drivers that are related to the lumen packages/applications
- Comfort for eyes and assurance of camera friendly performance
- Dual output currents offers flexibility in application
- Easy to use with Philips industrial design on mechanics

Features

- SELV output for simpler approval process and easy design-in
- Specific current and voltage
- 50,000 hours life time
- Fast Time to Market
- Low ripple output current (4%)

Application

- Office
- Public areas
- For luminaires of protection class II

Electrical input data

Specification item	Value	Unit	Condition
Rated input voltage range	220...240	V _{ac}	Performance range
Rated input voltage	230	V _{ac}	
Rated input frequency range	50...60	Hz	Performance range
Rated input current	0.24	A	@ rated output power @ rated input voltage
Rated input power	49	W	@ rated output power @ rated input voltage
Power factor	0.9		@ rated output power @ rated input voltage
Total harmonic distortion	20	%	@ rated output power @ rated input voltage
Efficiency	89	%	@ rated output power @ rated input voltage @max. Uout
Input voltage AC range	202...254	V _{ac}	Operational range
Input frequency AC range	47.5...63	Hz	Operational range
Isolation input to output	SELV		

Electrical output data

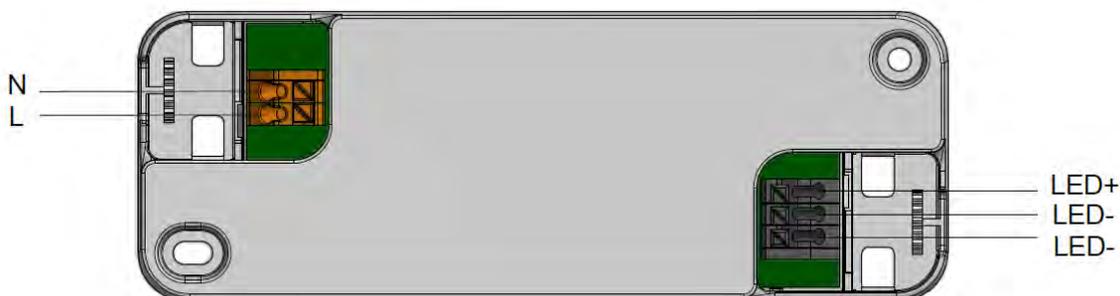
Specification item	Value	Unit	Condition
Regulation method	Constant Current		
Output voltage	30...42	V _{dc}	
Output voltage max.	60	V	Maximum output voltage (rms)
Output current	0.9 / 1.05	A	
Output current tolerance	± 8	%	
Output current ripple LF	≤ 4	%	Ripple = peak / average, < 3kHz
Output current ripple HF	≤ 15	%	
Output P _{st} ^{LM}	≤ 0.07		In entire operating window
Output SVM	≤ 0.05		In entire operating window
Output power	27...44	W	

Electrical data controls input

Specification item	Value	Unit	Condition
Control method	Fixed		

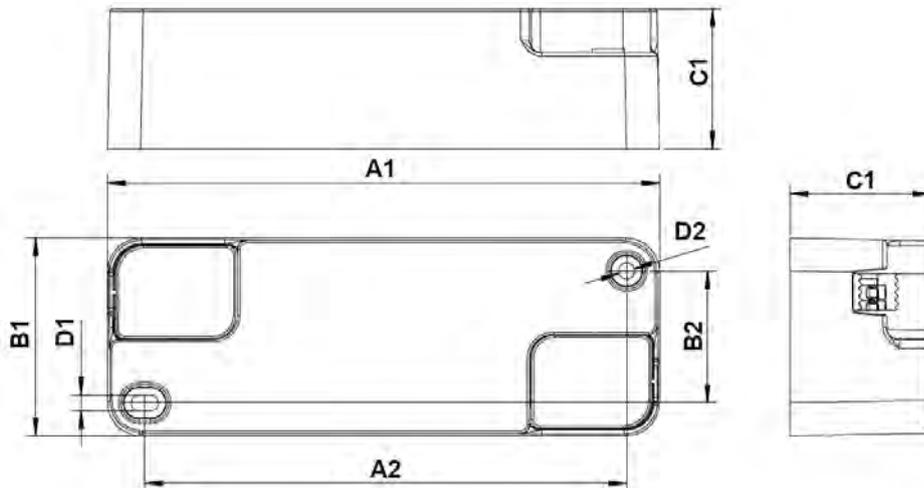
Wiring and Connections

Specification item	Value	Unit	Condition
Input wire cross-section	0.75...1.5	mm ²	Type250 (Independent), solid / stranded wire
	16...18	AWG	Type250 (Independent), solid / stranded wire
Input wire strip length	8...9	mm	
Output wire cross-section	0.5...1.5	mm ²	Type250, solid / stranded wire
	16...20	AWG	Type250, solid / stranded wire
Output wire strip length	8...9	mm	
Maximum cable length	600	mm	Total length of wiring including LED module, one way



Dimensions and weight

Specification item	Value	Unit	Condition
Length (A1)	125	mm	
Width (B1)	45	mm	
Width (B2)	30	mm	
Height (C1)	31.8	mm	
Fixing hole diameter (D1)	3.5	mm	
Mounting hole diameter (D2)	3.5	mm	
Fixing hole distance (A2)	109	mm	
Weight	110	gram	



Logistical data

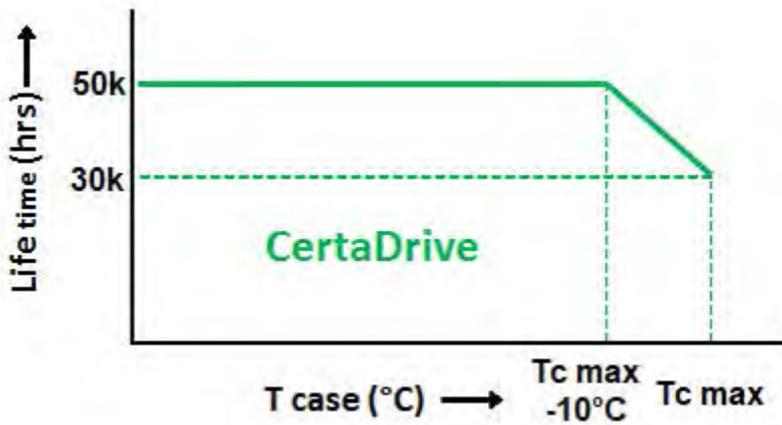
Specification item	Value
Product name	CertaDrive 44W 0.9/1.05A 42V 230V I
Logistic code 12NC	9290 028 04880
Pieces per box	40

Operational temperatures and humidity

Specification item	Value	Unit	Condition
Ambient temperature	-20...+40	°C	Higher ambient temperature allowed as long as T _{case-max} is not exceeded
Starting Ambient temperature	-20...+40	°C	
T _{case-max}	75	°C	Maximum temperature measured at T _{case-point}
T _{case-life}	65	°C	Measured at T _{case-point}
Maximum housing temperature	130	°C	In case of a failure, inherent by design
Relative humidity	10...90	%	Non-condensing

Lifetime

Specification item	Value	Unit	Condition
Driver lifetime	50,000	hours	Measured temperature at Tcase-point is Tcase-life. Maximum failures = 10%



Storage temperature and humidity

Specification item	Value	Unit	Condition
Ambient temperature	-25...+85	°C	
Relative humidity	5...95	%	Non-condensing

Programmable features

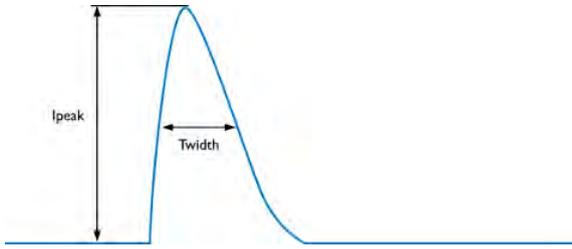
Specification item	Available	Remark	Condition
Set Adjustable Output Current (AOC)	No	See Design-in Guideline	Default output current: = 0.9/1.05A
LED Module Temperature Protection (MTP)	No		
Constant Lumen Over Lifetime (CLO)	No		
DC emergency dimming (DCemDim)	No		

Features

Specification item	Value	Remark	Condition
Open load protection	Yes		Automatic recovering
Short circuit protection	Yes		Automatic recovering
Over power protection	Yes		
Hot wiring	No		
Suitable for fixtures with protection class	II		per IEC60598

Inrush current

Specification item	Value	Unit	Condition
Inrush current I_{peak}	17.2	A	Input voltage 230V
Inrush current T_{width}	220	μ s	Input voltage 230V, measured at 50% I_{peak}
Drivers / MCB 16A type B	≤ 30	pcs	Indicative value



MCB	Rating	Relative number of LED drivers
B	4A	25%
B	6A	40%
B	10A	63%
B	13A	81%
B	16A	100% (stated in datasheet)
B	20A	125%
B	25A	156%
B	32A	200%
B	40A	250%
C	4A	42%
C	6A	63%
C	10A	104%
C	13A	135%
C	16A	170%
C	20A	208%
C	25A	260%
C	32A	340%
C	40A	415%

Driver touch current / protective conductor current

Specification item	Value	Unit	Condition
Typical Touch Current (ins. Class II)	0.7	mA peak	Acc. IEC61347-1. LED module contribution not included

Surge immunity

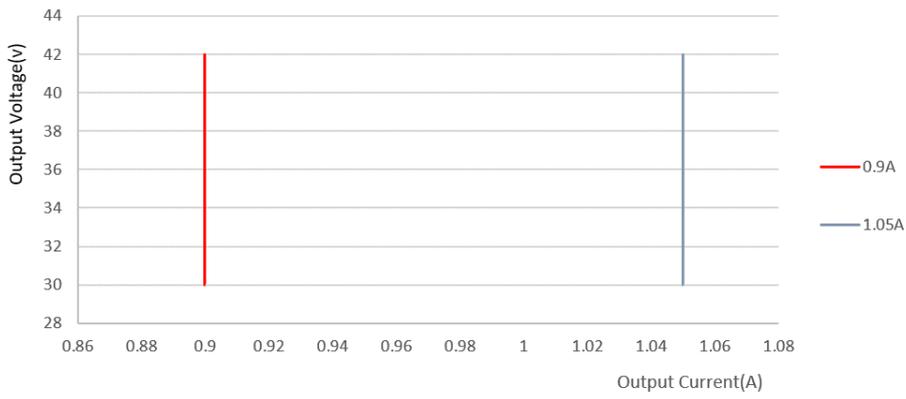
Specification item	Value	Unit	Condition
Mains surge immunity (diff. mode)	1	kV	Acc. IEC61000-4-5. 2 Ohm, 1.2/50us, 8/20us
Mains surge immunity (comm. mode)	2	kV	Acc. IEC61000-4-5. 12 Ohm 1.2/50us,8/20us

Application Info

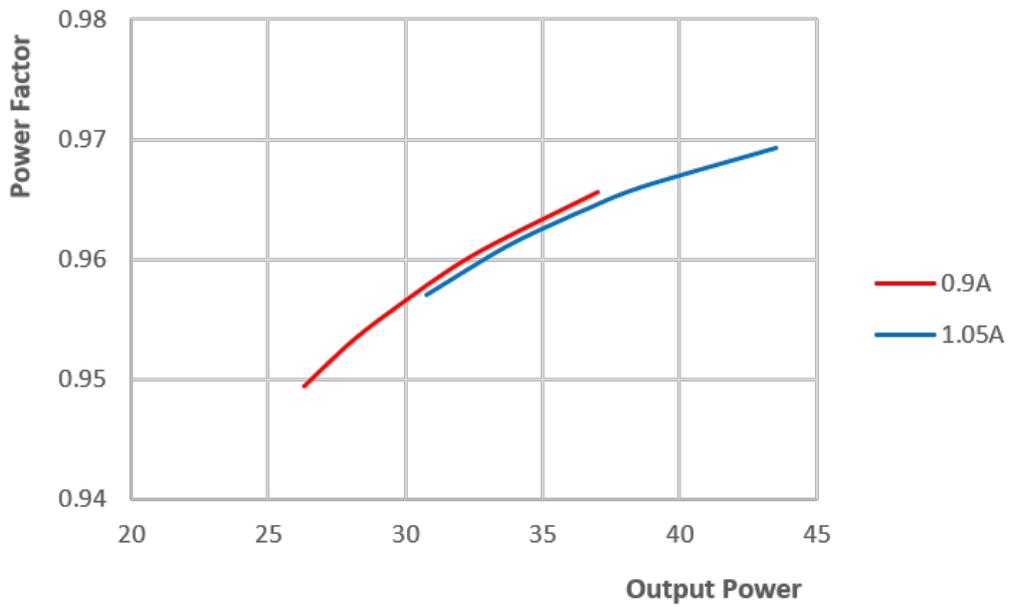
Specification item	Value
Approval marks	C-tick / CB / CCC / CE / ENEC / SELV / TISI
Ingress Protection classification (IP)	20

Graphs

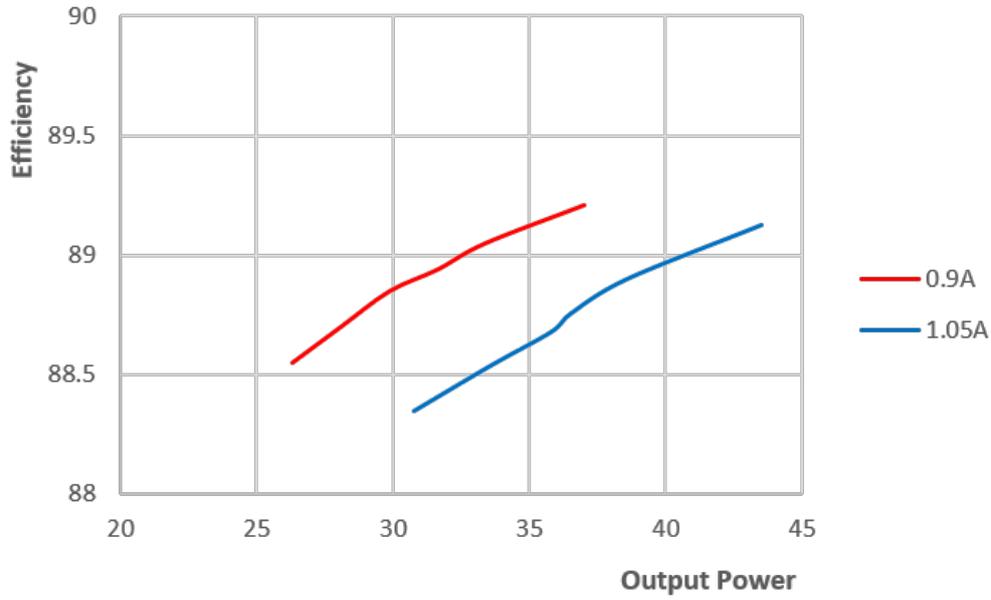
Operating window



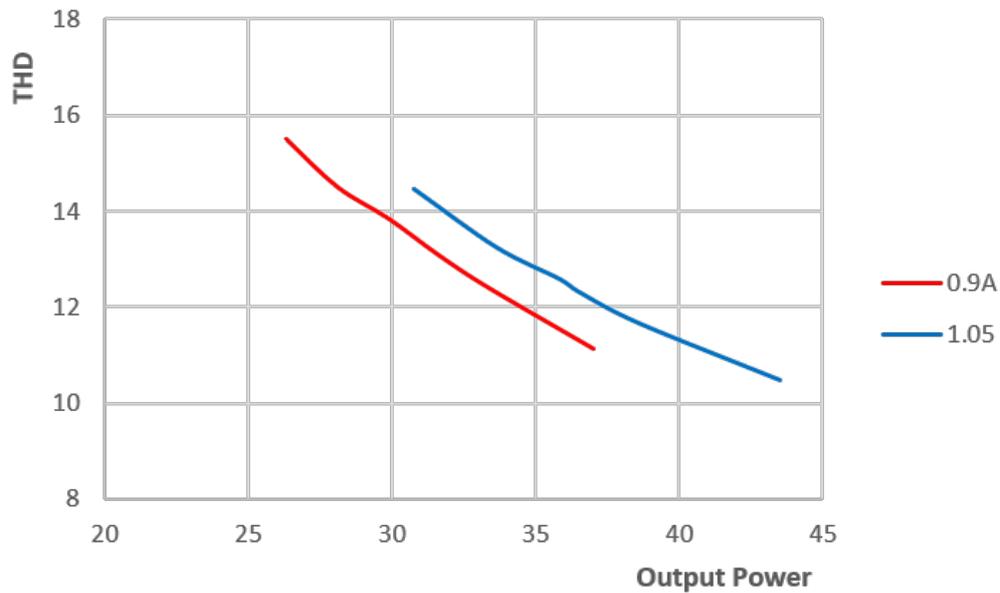
Power factor versus output power



Efficiency versus output power



THD versus output power



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www.philips.com/oem

LUXEON 2835 Architectural

Perfected performance, built on a proven legacy

LUXEON 2835 Architectural is a collection of compact devices that allows for design freedom and provides a superior overall system solution when a project requires high lumen output and good efficacy. With an industry standard footprint, the LUXEON 2835 Architectural is the perfect upgrade for other 2835 products and other common mid power offerings. LUXEON 2835 Architectural is color targeted for application needs and delivers efficacy and reliability for a variety of applications.



FEATURES AND BENEFITS

Various configurations of voltage and die count to meet a wide range of application requirements

Industry standard footprint for drop-in replacement designs

Maximum drive current of up to 480mA allows for reduction of LED count

6V and 9V hot-color targeting and 1/9th micro-color binning enable tight color control

2-, 3-, 4- and 5-step MacAdam ellipse color kits available

PRIMARY APPLICATIONS

Panel / Soft Lights

Linear

Troffers

Downlights

Retrofit Lamps

[More...](#)

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General Product Information

Product Test Conditions

LUXEON 2835 Architectural LEDs are tested with a 20ms monopulse specified below at a junction temperature, T_j , of 25°C. Forward voltage and luminous flux are binned at a T_j of 25°C. LUXEON 2835E 6V, LUXEON 2835E 9V and LUXEON 2835C 6V color is hot-targeted at a T_j of 85°C and LUXEON 2835 HE 3V, LUXEON 2835N 3V, LUXEON 2835E 3V, LUXEON 2835C 3V and LUXEON 2835C 3V TVS color is cold-targeted at a T_j of 25°C.

- 60mA/100mA – LUXEON 2835E
- 65mA – LUXEON 2835 HE, LUXEON 2835N 3V
- 120mA – LUXEON 2835C

Part Number Nomenclature

Part numbers for LUXEON 2835 Architectural follow the convention below:

L 1 2 8 – **A A B B C D** 3 5 0 0 0 **E F**

Where:

- A A** – designates nominal ANSI CCT (18=1800K, 22=2200K, 27=2700K, 30=3000K, 35=3500K, 40=4000K, 50=5000K, 57=5700K, 65=6500K)
- B B** – designates minimum CRI (80=80CRI and 90=90CRI)
- C** – designates product line (E, C, N, H, etc)
- D** – designates voltage of the part (A=3V, B=6V and C=9V)
- E** – designates Lumileds internal code (T=TVS included)
- F** – designates Lumileds internal code (1, 2, 3, etc.=shares the same base part)

Therefore, the following part number is used for a LUXEON 2835C 3000K 80CRI, 6V LED:

L 1 2 8 – **3 0 8 0 C B** 3 5 0 0 0 0 **1**

Lumen Maintenance

Please contact your local Sales Representative or Lumileds Technical Solutions Manager for more information about the long-term performance of this product.

Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. LUXEON 2835 Architectural is compliant to the European Union directives on the restriction of hazardous substances in electronic equipment, namely the RoHS Directive 2011/65/EU and REACH Regulation (EC) 1907/2006. Lumileds LLC will not intentionally add the following restricted materials to its products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

Performance Characteristics

Product Selection Guide

Table 1. Product performance of LUXEON 2835 Architectural at specified test conditions.

VOLTAGE	PRODUCT	NOMINAL CCT ^[1]	MINIMUM CRI ^[2, 3]	LUMINOUS FLUX ^[2, 3] (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER
				MINIMUM	TYPICAL			
3V	LUXEON 2835E	2700K	80	23.0	27.6	158.6	60	L128-2780EA3500001
		3000K	80	24.0	28.6	164.4	60	L128-3080EA3500001
		3500K	80	24.0	29.6	170.1	60	L128-3580EA3500001
		4000K	80	26.0	30.1	173.0	60	L128-4080EA3500001
		5000K	80	26.0	30.1	173.0	60	L128-5080EA3500001
		5700K	80	26.0	30.1	173.0	60	L128-5780EA3500001
		6500K	80	26.0	29.9	171.8	60	L128-6580EA3500001
		2700K	90	19.0	23.5	135.1	60	L128-2790EA3500001
		3000K	90	20.0	24.8	142.5	60	L128-3090EA3500001
		3500K	90	20.0	25.7	147.7	60	L128-3590EA3500001
		4000K	90	21.0	26.3	151.1	60	L128-4090EA3500001
		5000K	90	21.0	26.3	151.1	60	L128-5090EA3500001
		5700K	90	21.0	26.3	151.1	60	L128-5790EA3500001
		6500K	90	21.0	26.0	149.4	60	L128-6590EA3500001
		LUXEON 2835C	2700K	80	49.0	58.2	161.7	120
	3000K		80	51.0	60.2	167.2	120	L128-3080CA3500001
	3500K		80	53.0	61.2	170.0	120	L128-3580CA3500001
	4000K		80	55.0	63.8	177.2	120	L128-4080CA3500001
	5000K		80	55.0	63.8	177.2	120	L128-5080CA3500001
	5700K		80	55.0	63.8	177.2	120	L128-5780CA3500001
	6500K		80	55.0	63.8	177.2	120	L128-6580CA3500001
	2700K		90	42.0	49.8	138.3	120	L128-2790CA3500001
	3000K		90	42.0	51.9	144.2	120	L128-3090CA3500001
	3500K		90	44.0	53.5	148.6	120	L128-3590CA3500001
	4000K		90	46.0	54.6	151.7	120	L128-4090CA3500001
	5000K		90	46.0	54.6	151.7	120	L128-5090CA3500001
	5700K		90	46.0	54.6	151.7	120	L128-5790CA3500001
	6500K		90	46.0	54.6	151.7	120	L128-6590CA3500001
	LUXEON 2835N		1800K	80	21.9	23.3	130.3	65
		2200K	80	26.6	28.3	158.3	65	L128-2280NA3500001
2700K		80	30.3	32.5	181.8	65	L128-2780NA3500001	
3000K		80	32.3	34.4	192.4	65	L128-3080NA3500001	
3500K		80	33.7	35.9	200.8	65	L128-3580NA3500001	
4000K		80	34.3	36.5	204.2	65	L128-4080NA3500001	
5000K		80	34.3	36.5	204.2	65	L128-5080NA3500001	
5700K		80	34.3	36.5	204.2	65	L128-5780NA3500001	
6500K		80	33.7	35.9	200.8	65	L128-6580NA3500001	
1800K		90	18.0	19.1	106.9	65	L128-1890NA3500001	
2200K		90	23.1	24.6	137.6	65	L128-2290NA3500001	
2700K		90	26.2	27.9	156.1	65	L128-2790NA3500001	
3000K		90	27.3	29.0	162.2	65	L128-3090NA3500001	
3500K		90	28.4	30.2	169.0	65	L128-3590NA3500001	
4000K		90	29.3	31.2	174.5	65	L128-4090NA3500001	
5000K	90	29.3	31.2	174.5	65	L128-5090NA3500001		
5700K	90	29.3	31.2	174.5	65	L128-5790NA3500001		
6500K	90	29.1	31.0	173.4	65	L128-6590NA3500001		

Table 1 continued on next page.

- Correlated color temperature is cold-targeted at $T_j=25^\circ\text{C}$ for 3V products (LUXEON 2835 HE, LUXEON 2835N 3V, LUXEON 2835E 3V, LUXEON 2835C 3V, and LUXEON 2835C 3V TVS). Correlated color temperature is hot-targeted at $T_j=85^\circ\text{C}$ for 6V and 9V products (LUXEON 2835E 6V, LUXEON 2835E 9V, and LUXEON 2835C 6V).
- Luminous flux and CRI specs are based upon mounted package on highly reflective surface at $T_j=25^\circ\text{C}$. Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
- Lumileds maintains a tolerance of ± 2 on CRI and $\pm 7.5\%$ on luminous flux measurements.

Table 1. Product performance of LUXEON 2835 Architectural at specified test conditions, continued.

VOLTAGE	PRODUCT	NOMINAL CCT ^[1]	MINIMUM CRI ^[2, 3]	LUMINOUS FLUX ^[2, 3] (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER
				MINIMUM	TYPICAL			
3V	LUXEON 2835 HE	3000K	70	32.4	37.1	210.6	65	L128-3070HA35000B1
		3500K	70	32.8	37.7	214.0	65	L128-3570HA35000B1
		4000K	70	34.0	38.6	219.1	65	L128-4070HA35000B1
		5000K	70	34.0	38.6	219.1	65	L128-5070HA35000B1
		5700K	70	33.7	38.1	216.3	65	L128-5770HA35000B1
		6500K	70	33.6	38.1	216.3	65	L128-6570HA35000B1
		1800K	80	22.1	23.5	133.4	65	L128-1880HA35000B1
		2200K	80	26.0	29.1	165.2	65	L128-2280HA35000B1
		2700K	80	30.5	34.0	193.0	65	L128-2780HA35000B1
		3000K	80	31.5	34.9	198.1	65	L128-3080HA35000B1
		3500K	80	32.7	36.4	206.6	65	L128-3580HA35000B1
		4000K	80	33.5	36.8	208.9	65	L128-4080HA35000B1
		5000K	80	33.5	36.8	208.9	65	L128-5080HA35000B1
		5700K	80	33.5	36.8	208.9	65	L128-5780HA35000B1
		6500K	80	33.0	36.5	207.2	65	L128-6580HA35000B1
		1800K	90	17.9	19.0	107.9	65	L128-1890HA35000B1
		2200K	90	22.9	24.4	138.5	65	L128-2290HA35000B1
		2700K	90	24.3	27.9	158.4	65	L128-2790HA35000B1
		3000K	90	25.4	29.5	167.5	65	L128-3090HA35000B1
		3500K	90	26.7	30.4	172.6	65	L128-3590HA35000B1
		4000K	90	27.4	31.0	176.0	65	L128-4090HA35000B1
		5000K	90	27.4	31.0	176.0	65	L128-5090HA35000B1
		5700K	90	27.4	31.0	176.0	65	L128-5790HA35000B1
		6500K	90	27.0	30.9	175.4	65	L128-6590HA35000B1
		2700K	95	23.4	27.2	154.4	65	L128-2795HA35000B1
		3000K	95	24.3	28.2	160.1	65	L128-3095HA35000B1
		3500K	95	24.7	28.5	161.5	65	L128-3595HA35000B1
		4000K	95	25.4	29.0	164.5	65	L128-4095HA35000B1
		5000K	95	25.9	29.6	168.0	65	L128-5095HA35000B1
		5700K	95	26.3	30.0	170.0	65	L128-5795HA35000B1
		2700K	80	48.0	57.8	160.6	120	L128-2780CA35000T1
		3000K	80	50.0	60.5	168.1	120	L128-3080CA35000T1
3500K	80	52.0	62.0	172.2	120	L128-3580CA35000T1		
4000K	80	54.0	63.0	175.0	120	L128-4080CA35000T1		
5000K	80	54.0	63.0	175.0	120	L128-5080CA35000T1		
5700K	80	54.0	63.0	175.0	120	L128-5780CA35000T1		
6500K	80	54.0	62.5	173.6	120	L128-6580CA35000T1		

Table 1 continued on next page.

1. Correlated color temperature is cold-targeted at T=25°C for 3V products (LUXEON 2835 HE, LUXEON 2835N 3V, LUXEON 2835E 3V, LUXEON 2835C 3V, and LUXEON 2835C 3V TVS). Correlated color temperature is hot-targeted at T=85°C for 6V and 9V products (LUXEON 2835E 6V, LUXEON 2835E 9V, and LUXEON 2835C 6V).
2. Luminous flux and CRI specs are based upon mounted package on highly reflective surface at T_j=25°C. Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of ±2 on CRI and ±7.5% on luminous flux measurements.

Table 1. Product performance of LUXEON 2835 Architectural at specified test conditions, continued.

VOLTAGE	PRODUCT	NOMINAL CCT ^[1]	MINIMUM CRI ^[2, 3]	LUMINOUS FLUX ^[2, 3] (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER	
				MINIMUM	TYPICAL				
6V	LUXEON 2835E	2700K	80	45.0	54.0	145.2	60	L128-2780EB3500001	
		3000K	80	46.0	55.0	147.8	60	L128-3080EB3500001	
		3500K	80	47.0	56.0	150.5	60	L128-3580EB3500001	
		4000K	80	49.0	59.0	158.6	60	L128-4080EB3500001	
		5000K	80	49.0	59.0	158.6	60	L128-5080EB3500001	
		5700K	80	49.0	59.0	158.6	60	L128-5780EB3500001	
		6500K	80	49.0	59.0	158.6	60	L128-6580EB3500001	
		LUXEON 2835C	2700K	80	93.0	115.0	159.7	120	L128-2780CB3500001
	3000K		80	96.0	118.0	163.9	120	L128-3080CB3500001	
	3500K		80	99.0	122.0	169.4	120	L128-3580CB3500001	
	4000K		80	103.0	125.0	173.6	120	L128-4080CB3500001	
	5000K		80	103.0	125.0	173.6	120	L128-5080CB3500001	
	5700K		80	103.0	125.0	173.6	120	L128-5780CB3500001	
	6500K		80	103.0	124.0	172.2	120	L128-6580CB3500001	
	LUXEON 2835E		2700K	90	78.0	96.0	133.3	120	L128-2790CB3500001
		3000K	90	81.0	99.0	137.5	120	L128-3090CB3500001	
		3500K	90	83.0	102.0	141.7	120	L128-3590CB3500001	
		4000K	90	87.0	106.0	147.2	120	L128-4090CB3500001	
		5000K	90	87.0	106.0	147.2	120	L128-5090CB3500001	
		5700K	90	87.0	106.0	147.2	120	L128-5790CB3500001	
		6500K	90	87.0	106.0	147.2	120	L128-6590CB3500001	
		LUXEON 2835E	6500K	70	78.0	93.0	174.2	60	L128-6570EC3500001
			2200K	80	59.0	70.0	131.1	60	L128-2280EC3500001
			2700K	80	67.0	81.0	151.7	60	L128-2780EC3500001
			3000K	80	70.0	85.0	159.2	60	L128-3080EC3500001
			3500K	80	72.0	88.0	164.8	60	L128-3580EC3500001
	4000K		80	74.0	90.0	168.5	60	L128-4080EC3500001	
	5000K		80	74.0	90.0	168.5	60	L128-5080EC3500001	
5700K	80		74.0	90.0	168.5	60	L128-5780EC3500001		
6500K	80		74.0	89.0	166.7	60	L128-6580EC3500001		
LUXEON 2835E	2200K		90	50.0	60.0	112.4	60	L128-2290EC3500001	
	2700K		90	54.0	68.0	127.3	60	L128-2790EC3500001	
	3000K		90	57.0	71.0	133.0	60	L128-3090EC3500001	
	3500K	90	60.0	74.0	138.6	60	L128-3590EC3500001		
	4000K	90	62.0	76.0	142.3	60	L128-4090EC3500001		
	5000K	90	62.0	76.0	142.3	60	L128-5090EC3500001		
	6500K	70	120.0	142.0	152.7	100	L128-6570EC35000B1		
	LUXEON 2835E	2200K	80	92.0	108.0	116.1	100	L128-2280EC35000B1	
		2700K	80	106.0	125.0	134.4	100	L128-2780EC35000B1	
		3000K	80	110.0	129.0	138.7	100	L128-3080EC35000B1	
		3500K	80	113.0	133.5	143.5	100	L128-3580EC35000B1	
		4000K	80	116.0	137.0	147.3	100	L128-4080EC35000B1	
5000K		80	116.0	137.0	147.3	100	L128-5080EC35000B1		
5700K		80	116.0	137.0	147.3	100	L128-5780EC35000B1		
6500K		80	116.0	137.0	147.3	100	L128-6580EC35000B1		
LUXEON 2835E		2200K	90	77.0	92.0	98.9	100	L128-2290EC35000B1	
		2700K	90	87.0	104.0	111.8	100	L128-2790EC35000B1	
		3000K	90	91.0	108.0	116.1	100	L128-3090EC35000B1	
		3500K	90	95.0	113.0	121.5	100	L128-3590EC35000B1	
	4000K	90	98.0	116.0	124.7	100	L128-4090EC35000B1		
LUXEON 2835E	5000K	90	98.0	116.0	124.7	100	L128-5090EC35000B1		

Notes for Table 1:

- Correlated color temperature is cold-targeted at T_j=25°C for 3V products (LUXEON 2835 HE, LUXEON 2835N 3V, LUXEON 2835E 3V, LUXEON 2835C 3V, and LUXEON 2835C 3V TVS). Correlated color temperature is hot-targeted at T_j=85°C for 6V and 9V products (LUXEON 2835E 6V, LUXEON 2835E 9V, and LUXEON 2835C 6V).
- Luminous flux and CRI specs are based upon mounted package on highly reflective surface at T_j=25°C. Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
- Lumileds maintains a tolerance of ±2 on CRI and ±7.5% on luminous flux measurements.

Optical Characteristics

Table 2. Optical characteristics for LUXEON 2835 Architectural at specified test current, $T_j=25^{\circ}\text{C}$.

PART NUMBER	TYPICAL TOTAL INCLUDED ANGLE ^[1]	TYPICAL VIEWING ANGLE ^[2]
L128-xxxxx35000x1	160°	120°

Notes for Table 2:

1. Total angle at which 90% of total luminous flux is captured.
2. Viewing angle is the off axis angle from the LED centerline where the luminous intensity is ½ of the peak value.

Electrical and Thermal Characteristics

Table 3. Electrical and thermal characteristics for LUXEON 2835 Architectural at specified test current, $T_j=25^{\circ}\text{C}$.

PART NUMBER	FORWARD VOLTAGE ^[1] (V_f)			TYPICAL TEMPERATURE COEFFICIENT OF FORWARD VOLTAGE ^[2] ($\text{mV}/^{\circ}\text{C}$)	TYPICAL THERMAL RESISTANCE—JUNCTION TO SOLDER PAD ($^{\circ}\text{C}/\text{W}$)
	MINIMUM	TYPICAL	MAXIMUM		
L128-xxxxEC3500001	8.4	8.9	9.9	-3.0 to -6.0	15
L128-xxxxEC35000B1	8.7	9.3	9.9	-3.0 to -6.0	15
L128-xxxxEB3500001	5.8	6.1	6.6	-2.0 to -4.0	20
L128-xxxxEA3500001	2.7	2.9	3.1	-1.0 to -2.0	39
L128-xxxxCB3500001	5.8	6.0	6.6	-2.0 to -4.0	11
L128-xxxxCA35000x1	2.9	3.0	3.2	-1.0 to -2.0	21
L128-xxxxNA35000x1	2.68	2.75	2.88	-1.0 to -2.0	14
L128-xxxxHA35000B1	2.66	2.71	2.76	-1.0 to -2.0	10

Notes for Table 3:

1. Lumileds maintains a tolerance of $\pm 0.1\text{V}$ on forward voltage measurements.
2. Measured between 25°C and 85°C .

Absolute Maximum Ratings

Table 4. Absolute maximum ratings for LUXEON 2835 Architectural.

PARAMETER	MAXIMUM PERFORMANCE
DC Forward Current ^[1,2]	150mA for L128-xxxxEC35000x1 150mA for L128-xxxxEB3500001 150mA for L128-xxxxEA3500001 240mA for L128-xxxxCx35000x1 300mA for L128-xxxxNA35000x1 480mA for L128-xxxxHA35000x1
Peak Pulsed Forward Current ^[1,3]	200mA for L128-xxxxEx35000x1 300mA for L128-xxxxCx35000x1 450mA for L128-xxxxNA35000x1 600mA for L128-xxxxHA35000x1
LED Junction Temperature ^[1] (DC & Pulse)	125°C for L128-xxxxEC35000x1 125°C for L128-xxxxEB3500001 115°C for L128-xxxxEA3500001 125°C for L128-xxxxCx35000x1 125°C for L128-xxxxNA35000x1 125°C for L128-xxxxHA35000x1
ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)	Class 3B for LUXEON 2835C 3V TVS with ESD protection Class 2 for all other LUXEON 2835 parts
Operating Case Temperature ^[1]	-40°C to 105°C
LED Storage Temperature	-40°C to 105°C
Soldering Temperature	JEDEC 020c 260°C
Allowable Reflow Cycles	3
Reverse Voltage ^[4,5] ($V_{reverse}$)	5

Notes for Table 4:

- Proper current derating must be observed to maintain the junction temperature below the maximum allowable junction temperature.
- Residual periodic variations due to power conversion from alternating current (AC) to direct current (DC), also called "ripple," are acceptable if the following conditions are met:
 - The frequency of the ripple current is 100Hz or higher
 - The average current for each cycle does not exceed the maximum allowable DC forward current
 - The maximum amplitude of the ripple does not exceed the maximum peak pulsed forward current
- At ≤50% duty cycle with pulse width of 5ms.
- Transient reverse voltages and surge currents due to electrical switching or supply interruptions are acceptable if these events do not last for more than 10ms, the amplitude of the reverse voltage does not exceed 5V and the reverse current is less than 220uA.
- Max 5V reverse for up to 10s is an acceptable beginning of life, one time test condition.

Characteristics Curves

Spectral Power Distribution Characteristics

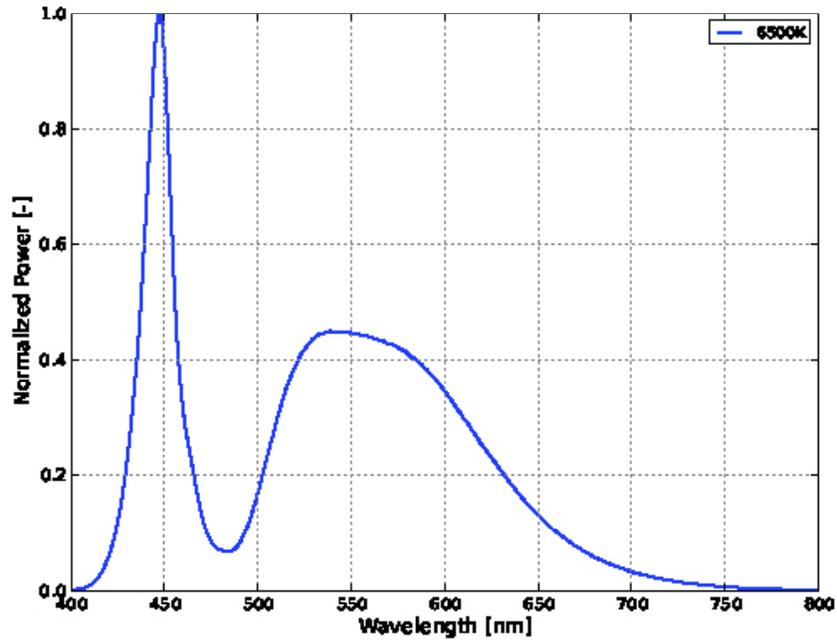


Figure 1a. Typical normalized power vs. wavelength for 70CRI LUXEON 2835E and LUXEON 2835C at specified test current, $T_j=25^{\circ}\text{C}$.

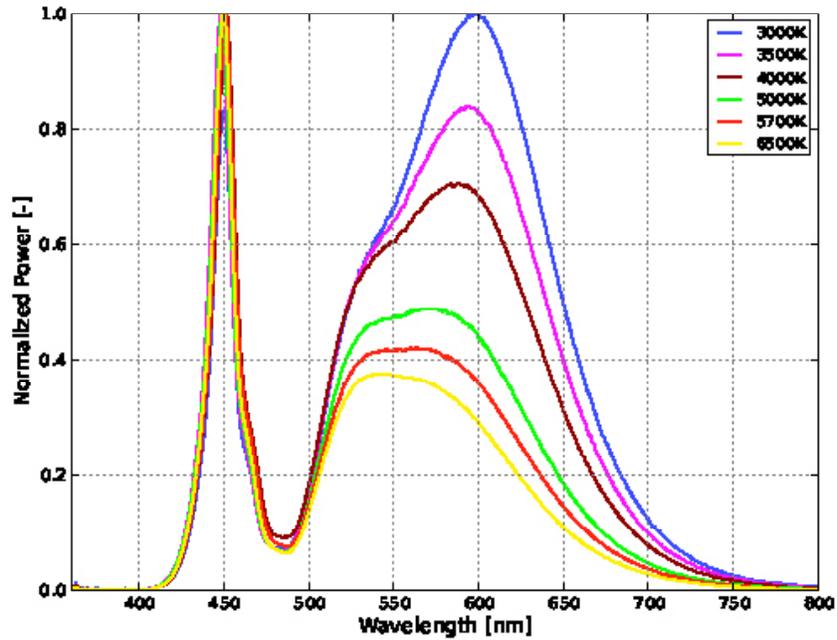


Figure 1b. Typical normalized power vs. wavelength for 70CRI LUXEON 2835 HE at specified test current, $T_j=25^{\circ}\text{C}$.

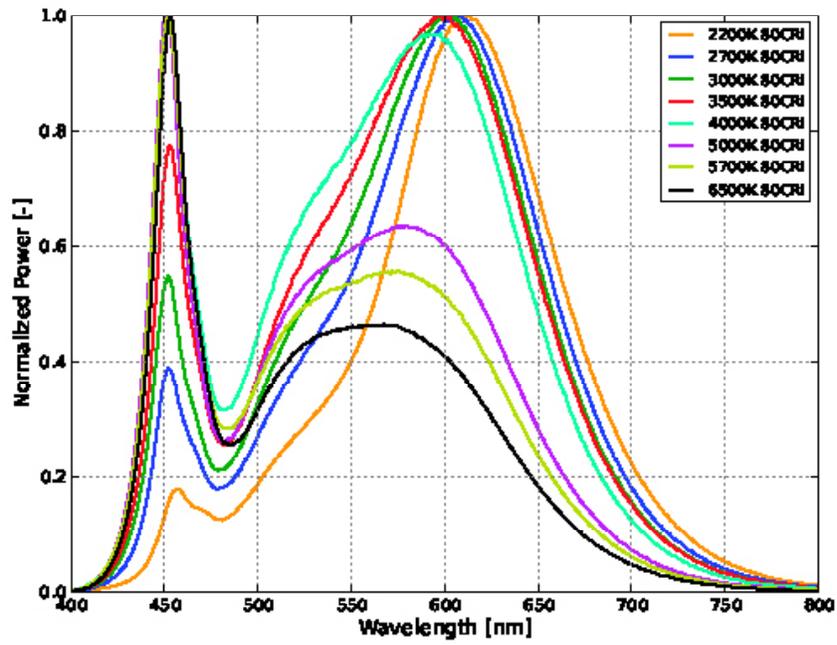


Figure 1c. Typical normalized power vs. wavelength for 80CRI LUXEON 2835E and LUXEON 2835C at specified test current, $T_j=25^{\circ}\text{C}$.

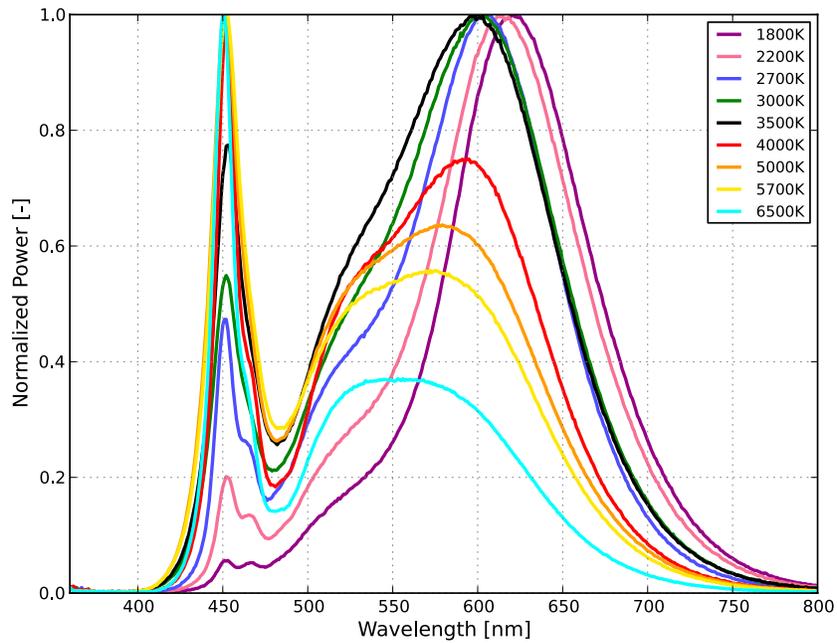


Figure 1d. Typical normalized power vs. wavelength for 80CRI LUXEON 2835 HE and LUXEON 2835N 3V at specified test current, $T_j=25^{\circ}\text{C}$.

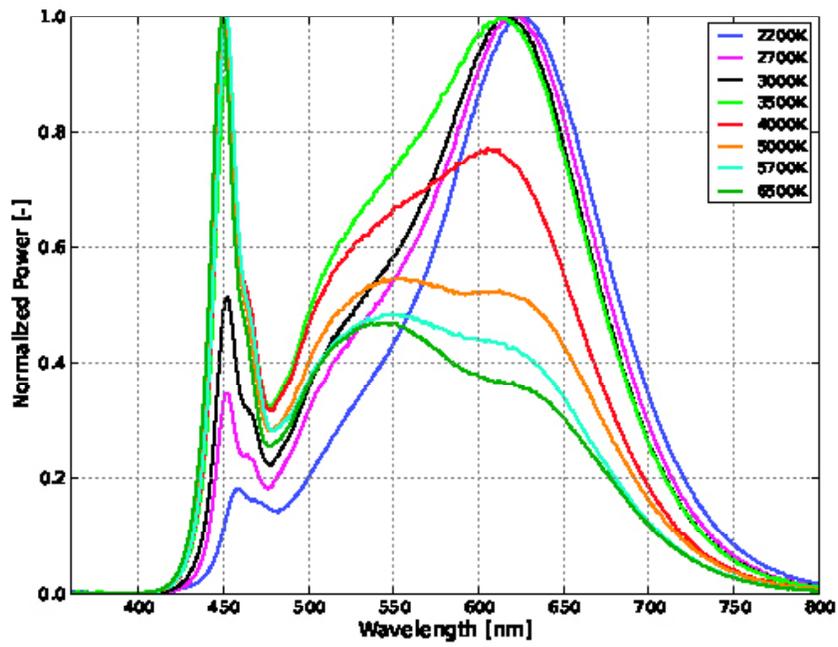


Figure 1e. Typical normalized power vs. wavelength for 90CRI LUXEON 2835E and LUXEON 2835C at specified test current, $T_j=25^{\circ}\text{C}$.

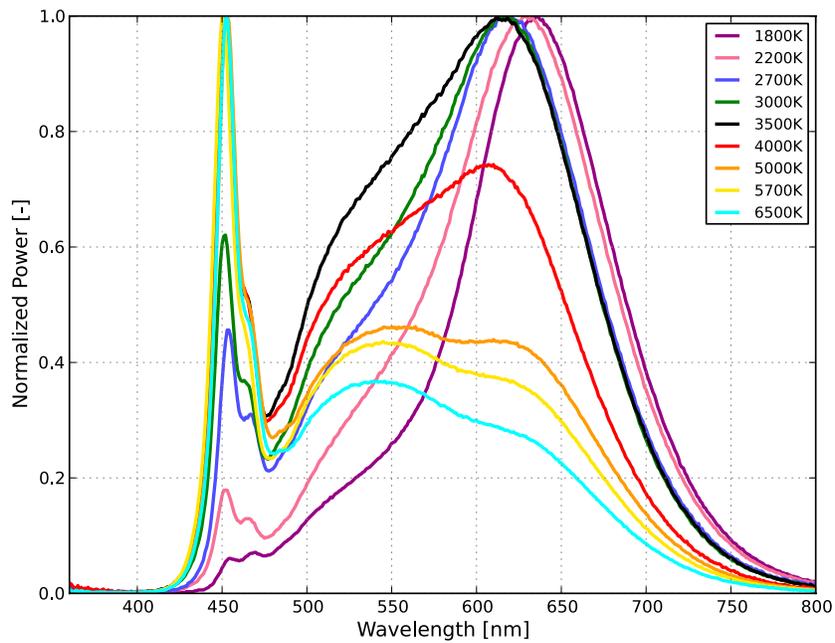


Figure 1f. Typical normalized power vs. wavelength for 90CRI LUXEON 2835 HE and LUXEON 2835N 3V at specified test current, $T_j=25^{\circ}\text{C}$.

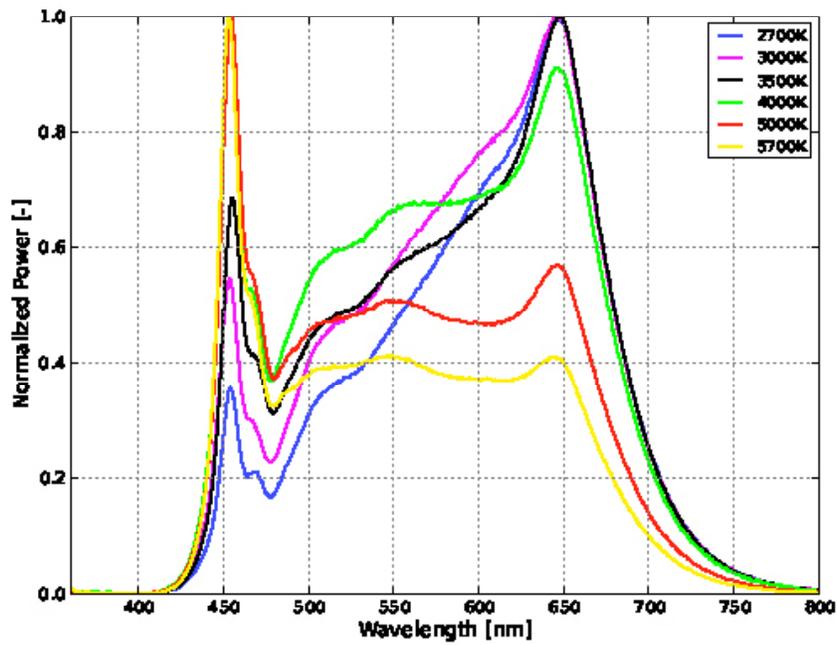


Figure 1g. Typical normalized power vs. wavelength for 95CRI LUXEON 2835 HE at specified test current, $T_j=25^\circ\text{C}$.

Light Output Characteristics

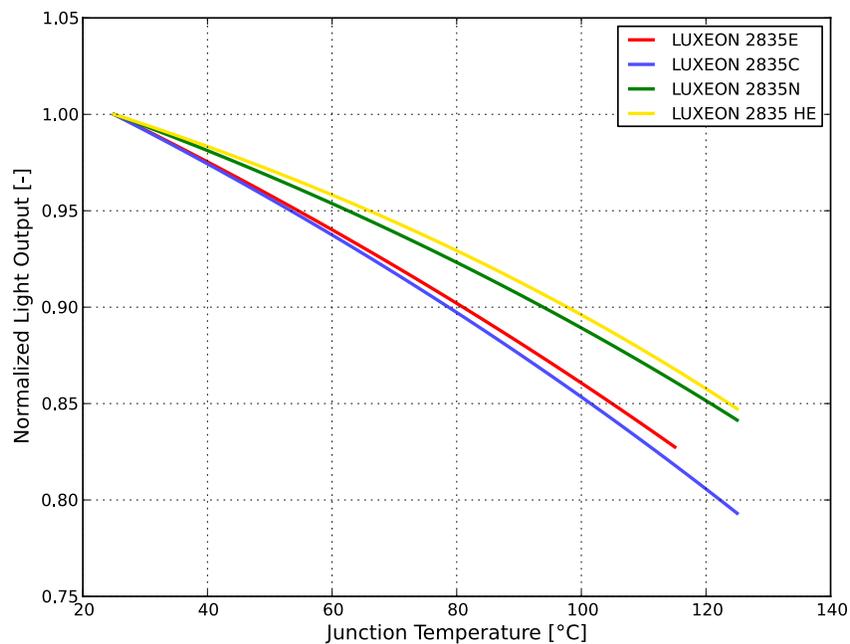
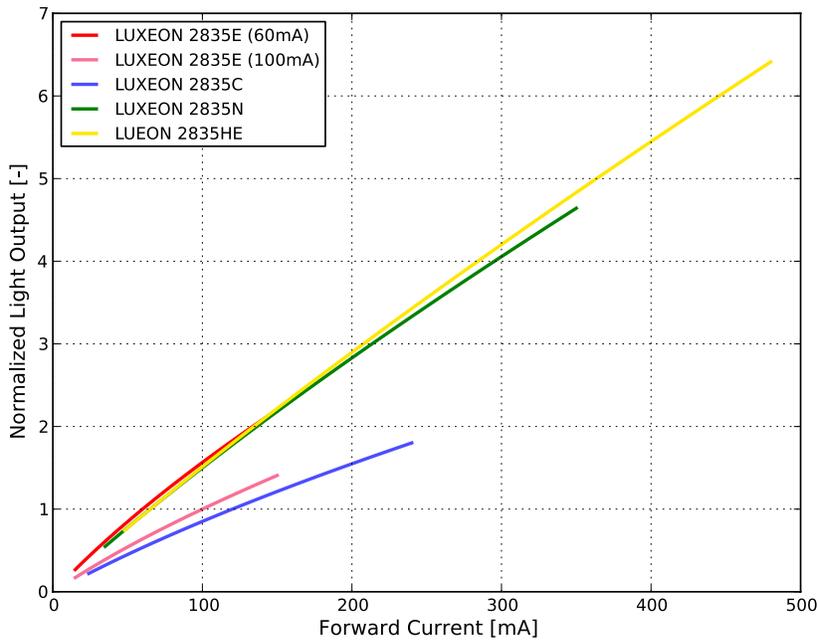


Figure 2. Typical normalized light output vs. junction temperature for LUXEON 2835 Architectural at specified test current.



LUXEON 2835E estimated typical ratio compared to flux at rated condition 60mA, $T_j=25^{\circ}\text{C}$.

PRODUCT	30mA	50mA	80mA	100mA	120mA
2835E 3V	53%	85%	129%	158%	185%
2835E 6V	53%	85%	129%	156%	182%
2835E 9V	53%	85%	129%	157%	183%

LUXEON 2835C estimated typical ratio compared to flux at rated condition 120mA, $T_j=25^{\circ}\text{C}$.

PRODUCT	50mA	65mA	100mA	150mA	200mA
2835C 3V	44%	56%	85%	123%	159%
2835C 6V	44%	56%	84%	123%	158%

LUXEON 2835 HE estimated typical ratio compared to flux at rated condition 65mA, $T_j=25^{\circ}\text{C}$.

PRODUCT	30mA	65mA	100mA	150mA	200mA
2835 HE	47%	100%	152%	223%	292%

LUXEON 2835N 3V estimated typical ratio compared to flux at rated condition 65mA, $T_j=25^{\circ}\text{C}$.

PRODUCT	30mA	65mA	100mA	150mA	200mA
2835N 3V	46%	100%	150%	220%	285%

Figure 3. Typical normalized light output vs. forward current for LUXEON 2835 Architectural at $T_j=25^{\circ}\text{C}$.

Forward Current Characteristics

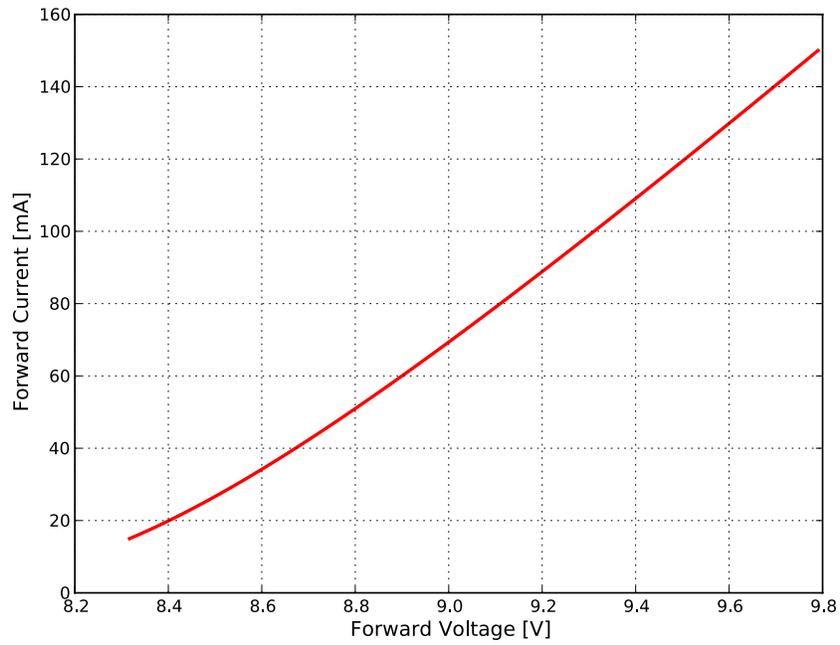


Figure 4a. Typical forward current vs. forward voltage for LUXEON 2835E 9V at $T_j=25^\circ\text{C}$.

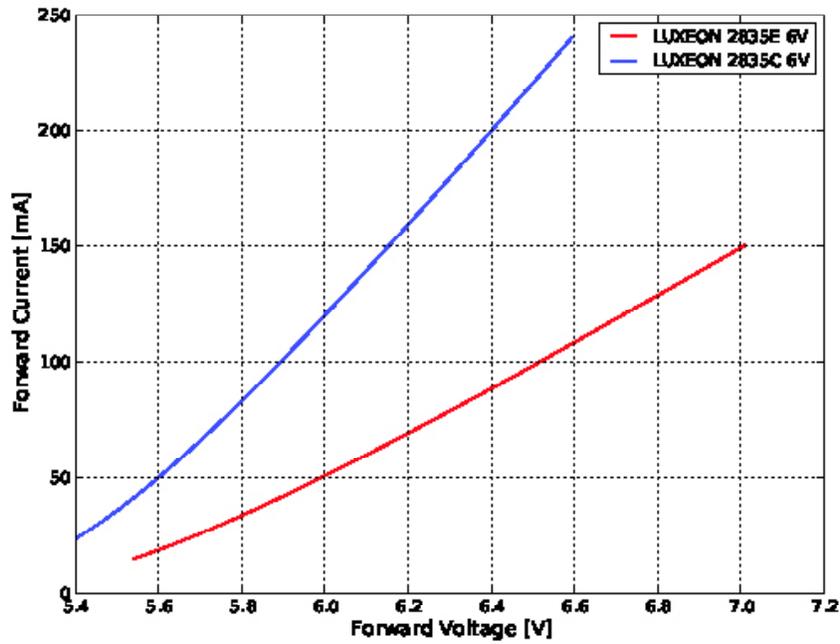


Figure 4b. Typical forward current vs. forward voltage for LUXEON 2835E 6V and LUXEON 2835C 6V at $T_j=25^\circ\text{C}$.

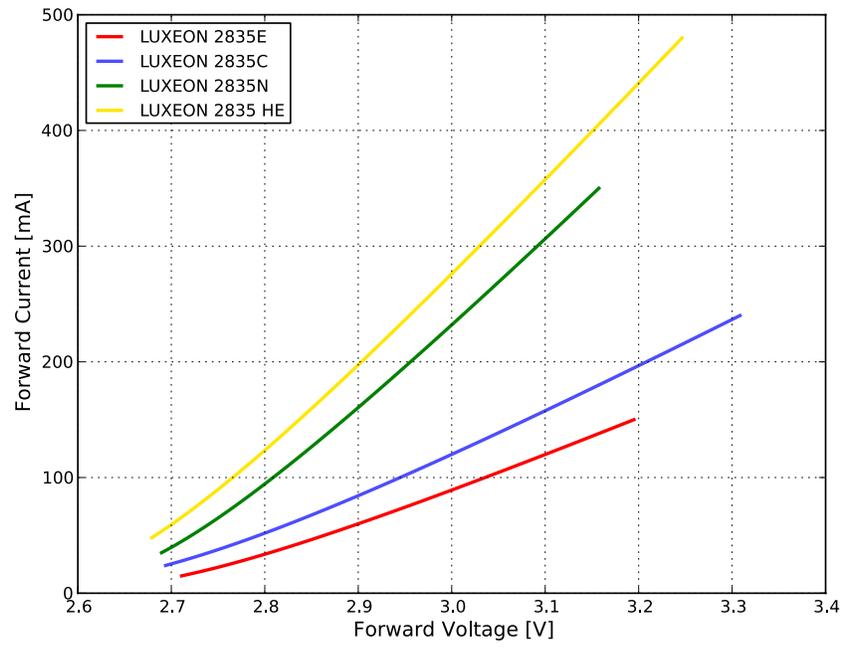


Figure 4c. Typical forward current vs. forward voltage for LUXEON 2835C Line 3V at $T_j=25^\circ\text{C}$.

Radiation Pattern Characteristics

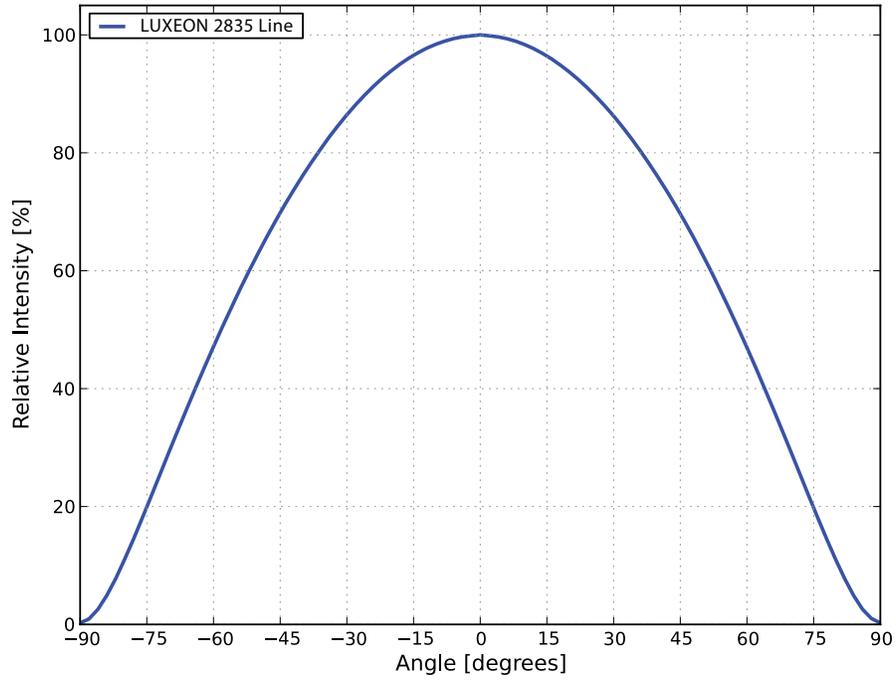


Figure 5. Typical radiation pattern for LUXEON 2835 Architectural at test current, $T_j=25^{\circ}\text{C}$.

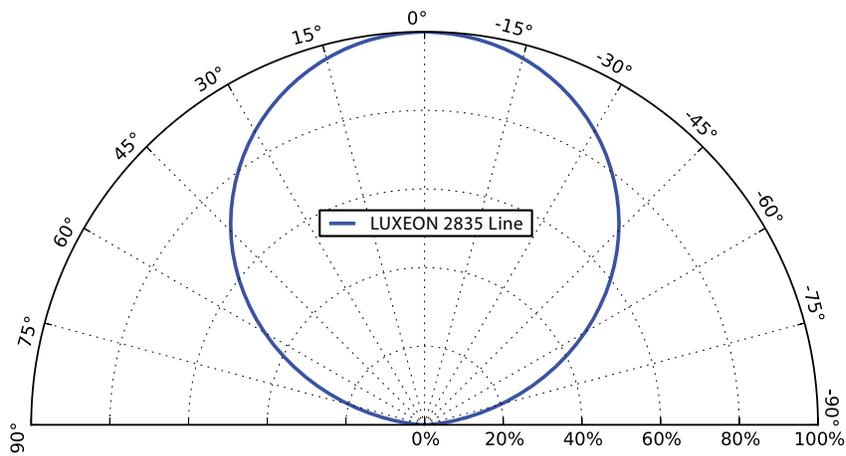


Figure 6. Typical polar radiation pattern for LUXEON 2835 Architectural at test current, $T_j=25^{\circ}\text{C}$.

Product Bin and Labeling Definitions

Decoding Product Bin Labeling

In the manufacturing of semiconductor products, there are variations in performance around the average values given in the technical datasheet. For this reason, Lumileds bins LED components for luminous flux or radiometric power, color point, peak or dominant wavelength and forward voltage.

LUXEON 2835 Architectural LEDs are labeled using a 4- or 5-digit alphanumeric CAT code following the format below:

A or Ax B C D

Where:

A or Ax – designates luminous flux bin (example: T=56 to 60 lm, D2=29 to 31 lm)

B C – designates correlated color bin (example: 5D, 5E, 5F, 5G, 5H, 5J, 5K, 5L, 5M for 4000K parts)

D – designates forward voltage bin (example: W=3.0 to 3.1V, X=3.1 to 3.2V)

Therefore, a LUXEON 2835C 3V LED with a lumen range of 56 to 60 lm, color bin of 5D and a forward voltage range of 3.0 to 3.1V has the following CAT code:

T 5 D W

Luminous Flux Bins

Table 5 lists the standard luminous flux bins for LUXEON 2835 Architectural emitters. Although several bins are outlined, product availability in a particular bin varies by production run and by product performance. Not all bins are available in all CCTs.

Table 5. Luminous flux bin definitions for LUXEON 2835 Architectural, $T_j=25^\circ\text{C}$.

PRODUCT	BIN	LUMINOUS FLUX ⁽¹⁾ (lm)	
		MINIMUM	MAXIMUM
LUXEON 2835E 9V LUXEON 2835C 6V	Z	50	55
	A	55	60
	B	60	65
	C	65	70
	D	70	75
	E	75	80
	F	80	85
	G	85	90
	H	90	95
	J	95	100
	K	100	105
	L	105	110
	M	110	115
	N	115	120
	P	120	125
	Q	125	130
	R	130	135
	S	135	140
	T	140	145
	U	145	150
LUXEON 2835E 3V	B1	19	21
	B2	21	23
	C1	23	25
	C2	25	27
	D1	27	29
	D2	29	31
	E1	31	33
LUXEON 2835C 3V LUXEON 2835C 3V TVS	P	40	44
	Q	44	48
	R	48	52
	S	52	56
	T	56	60
	U	60	63
	V	63	66
	W	66	69
	X	69	72
	Y	72	75

Table 5 continued on next page:

1. Lumileds maintains a tolerance of $\pm 7.5\%$ on luminous flux measurements.

Table 5. Luminous flux bin definitions for LUXEON 2835 Architectural, T_j=25°C (continued).

PRODUCT	BIN	LUMINOUS FLUX ⁽¹⁾ (lm)	
		MINIMUM	MAXIMUM
LUXEON 2835E 6V	P	40	44
	Q	44	48
	R	48	52
	S	52	56
	T	56	60
	U	60	65
	V	65	70
	W	70	75
LUXEON 2835 HE 3V LUXEON 2835N 3V	T	17.5	19.0
	U	19.0	20.5
	V	20.5	22.0
	W	22.0	23.5
	X	23.5	25.0
	Y	25.0	26.5
	Z	26.5	28.0
	A	28.0	29.5
	B	29.5	31.0
	C	31.0	32.5
	D	32.5	34.0
	E	34.0	35.5
F	35.5	37.0	
G	37.0	38.5	
H	38.5	40.0	
J	40.0	41.5	

Notes for Table 5:

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

Color Bin Definition

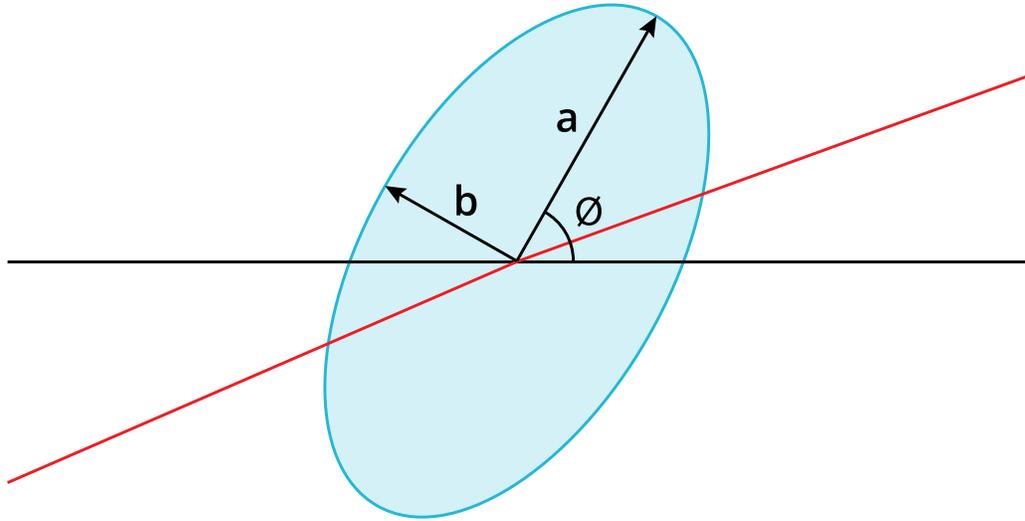


Figure 7. 3- and 5-step MacAdam ellipse illustration for Tables 6a–6h.

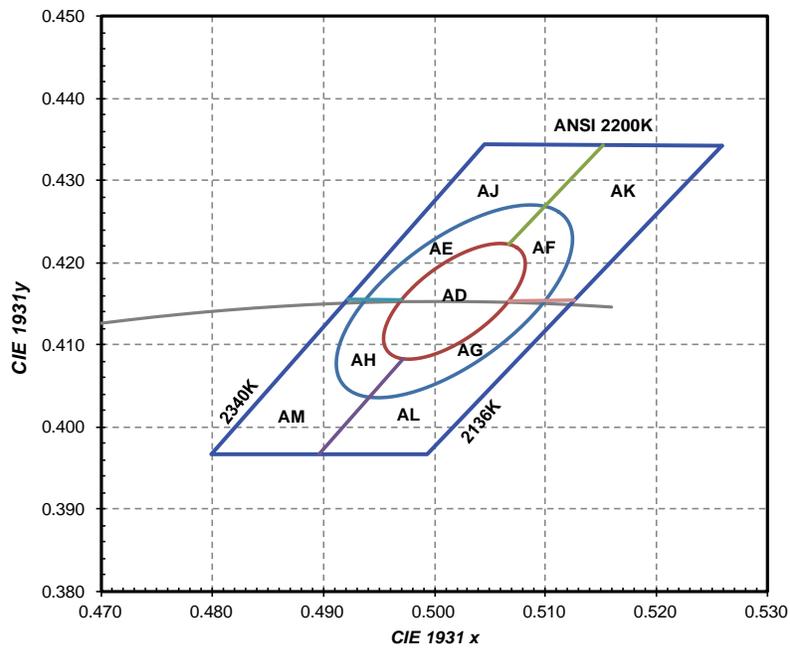


Figure 8a. 1/9th color bin structure for LUXEON 2835E and LUXEON 2835C 2200K at specified test current and binning temperatures of $T_j=25^{\circ}\text{C}$ and $T_j=85^{\circ}\text{C}$.

Table 6a. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835E and LUXEON 2835C 2200K, at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ^[1] (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
2200K	Single 3-step MacAdam ellipse	(0.5018, 0.4153)	0.00863	0.00398	49.27°
2200K	Single 5-step MacAdam ellipse	(0.5018, 0.4153)	0.01438	0.00663	49.27°

Notes for Table 6a:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

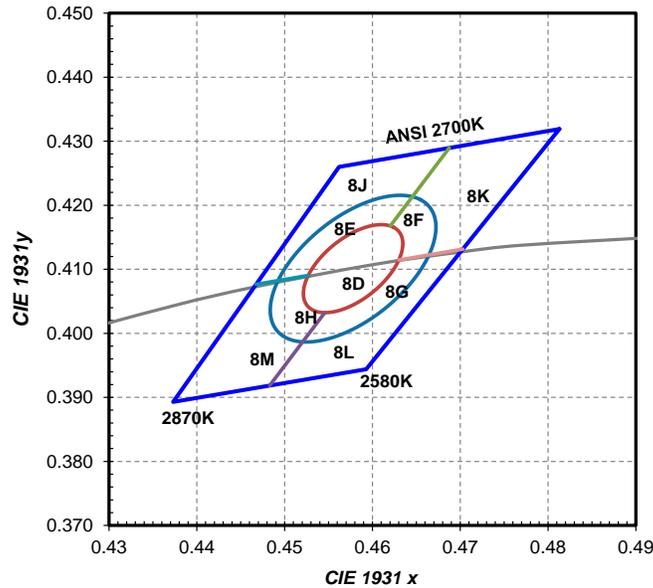


Figure 8b. 1/9th color bin structure for LUXEON 2835E and LUXEON 2835C 2700K at specified test current and binning temperatures of $T_j=25^{\circ}\text{C}$ and $T_j=85^{\circ}\text{C}$.

Table 6b. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835E and LUXEON 2835C 2700K, at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ^[1] (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
2700K	Single 3-step MacAdam ellipse	(0.4578, 0.4101)	0.00810	0.00420	53.70°
2700K	Single 5-step MacAdam ellipse	(0.4578, 0.4101)	0.01350	0.00700	53.70°

Notes for Table 6b:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

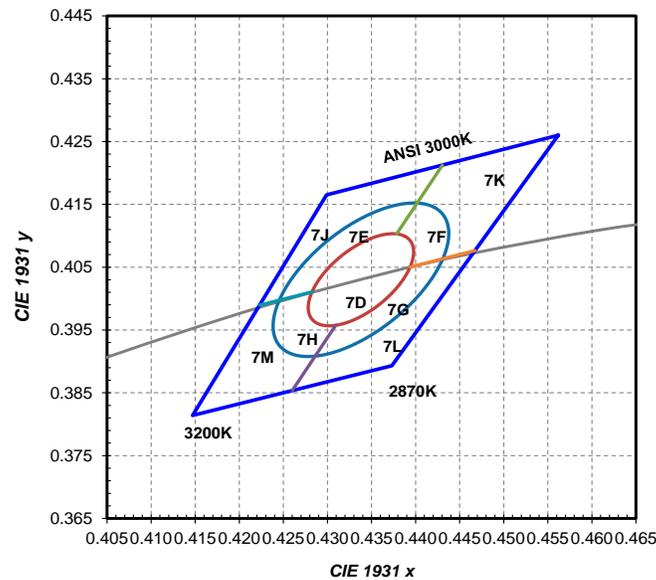


Figure 8c. 1/9th color bin structure for LUXEON 2835E and LUXEON 2835C 3000K at specified test current and binning temperatures of $T_j=25^{\circ}\text{C}$ and $T_j=85^{\circ}\text{C}$.

Table 6c. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835E and LUXEON 2835C 3000K, at at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ^[1] (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
3000K	Single 3-step MacAdam ellipse	(0.4338, 0.4030)	0.00834	0.00408	53.22°
3000K	Single 5-step MacAdam ellipse	(0.4338, 0.4030)	0.01390	0.00680	53.22°

Notes for Table 6c:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

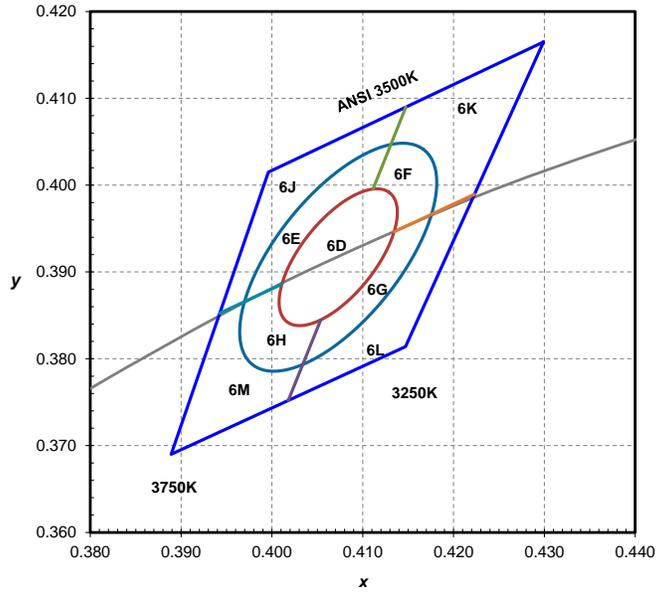


Figure 8d. 1/9th color bin structure for LUXEON 2835E and LUXEON 2835C 3500K at specified test current and binning temperatures of $T_j=25^\circ\text{C}$ and $T_j=85^\circ\text{C}$.

Table 6d. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835E and LUXEON 2835C 3500K, at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
3500K	Single 3-step MacAdam ellipse	(0.4073, 0.3917)	0.00927	0.00414	54.00°
3500K	Single 5-step MacAdam ellipse	(0.4073, 0.3917)	0.01545	0.00690	54.00°

Notes for Table 6d:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

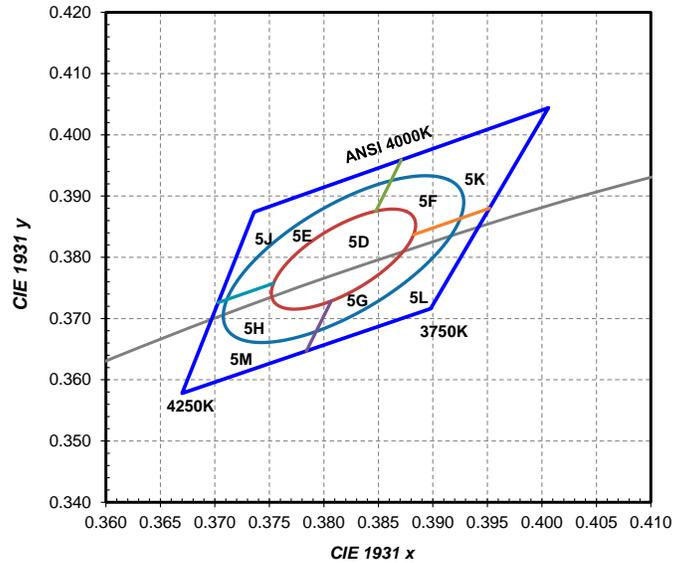


Figure 8e. 1/9th color bin structure for LUXEON 2835E and LUXEON 2835C 4000K at specified test current and binning temperatures of $T_j=25^\circ\text{C}$ and $T_j=85^\circ\text{C}$.

Table 6e. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835E and LUXEON 2835C 4000K, at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
4000K	Single 3-step MacAdam ellipse	(0.3818, 0.3797)	0.00939	0.00402	53.72°
4000K	Single 5-step MacAdam ellipse	(0.3818, 0.3797)	0.01565	0.00670	53.72°

Notes for Table 6e:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

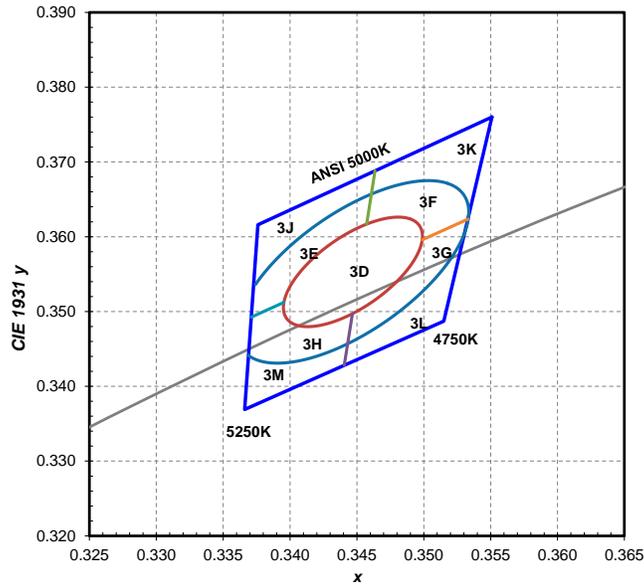


Figure 8f. 1/9th color bin structure for LUXEON 2835E and LUXEON 2835C 5000K at specified test current and binning temperatures of $T_j=25^{\circ}\text{C}$ and $T_j=85^{\circ}\text{C}$.

Table 6f. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835E and LUXEON 2835C 5000K, at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ^[1] (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
5000K	Single 3-step MacAdam ellipse	(0.3447, 0.3553)	0.00822	0.00354	59.62°
5000K	Single 5-step MacAdam ellipse	(0.3447, 0.3553)	0.01370	0.00590	59.62°

Notes for Table 6f:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

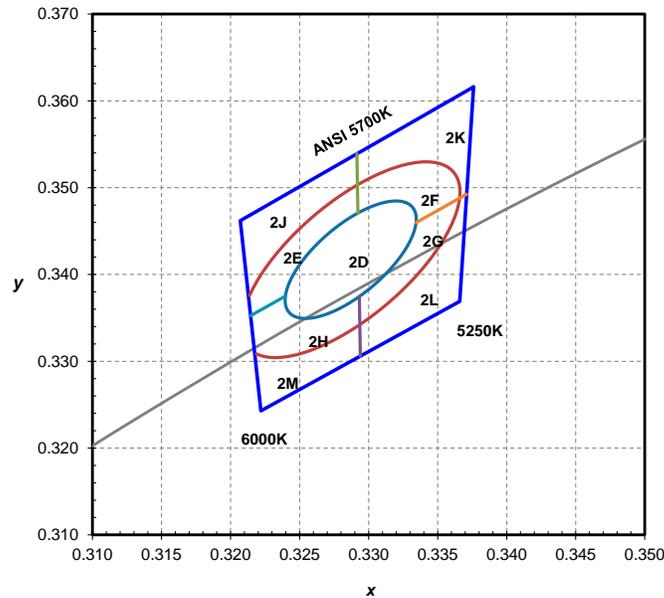


Figure 8g. 1/9th color bin structure for LUXEON 2835E and LUXEON 2835C 5700K at specified test current and binning temperatures of $T_j=25^{\circ}\text{C}$ and $T_j=85^{\circ}\text{C}$.

Table 6g. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835E and LUXEON 2835C 5700K, at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ^[1] (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
5700K	Single 3-step MacAdam ellipse	(0.3287, 0.3417)	0.00746	0.00320	59.09°
5700K	Single 5-step MacAdam ellipse	(0.3287, 0.3417)	0.01243	0.00533	59.09°

Notes for Table 6g:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

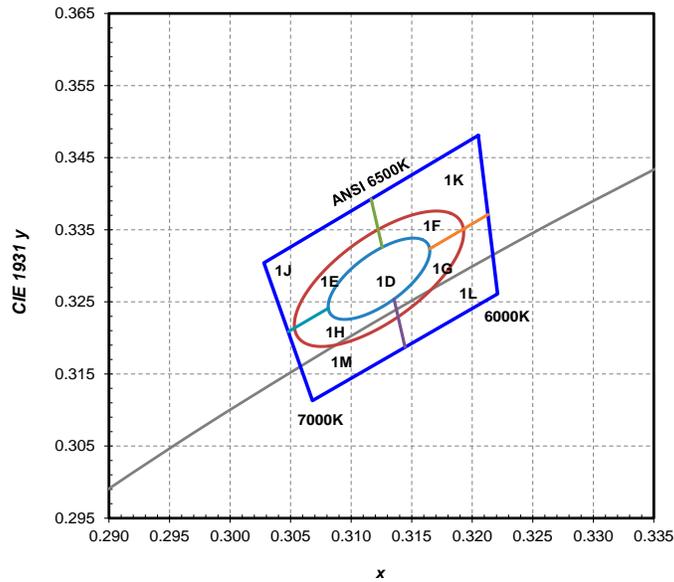


Figure 8h. 1/9th color bin structure for LUXEON 2835E and LUXEON 2835C 6500K at specified test current and binning temperatures of $T_j=25^{\circ}\text{C}$ and $T_j=85^{\circ}\text{C}$.

Table 6h. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835E and LUXEON 2835C 6500K, at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
6500K	Single 3-step MacAdam ellipse	(0.3123, 0.3282)	0.00669	0.00285	58.57°
6500K	Single 5-step MacAdam ellipse	(0.3123, 0.3282)	0.01115	0.00475	58.57°

Notes for Table 6h:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

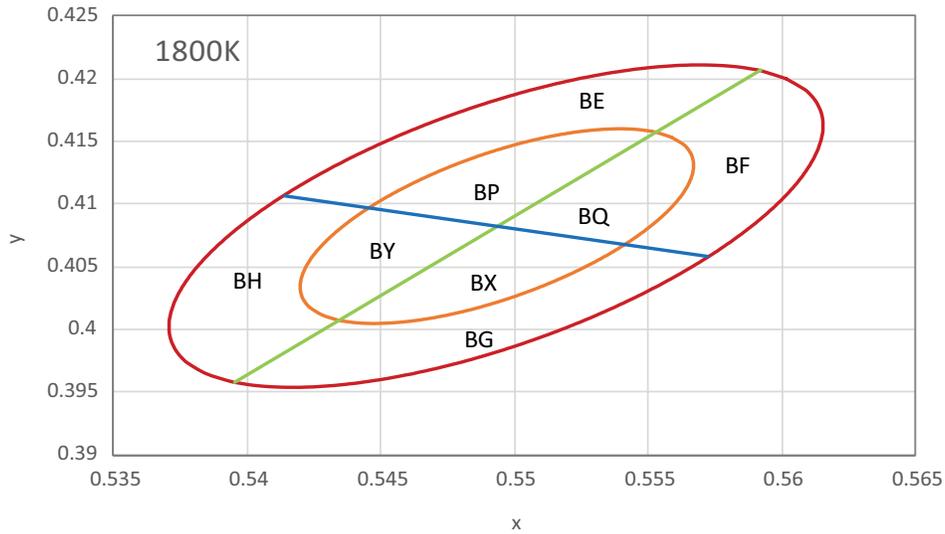


Figure 8i. 1/8th color bin structure for LUXEON 2835 HE and LUXEON 2835N 3V 1800K at specified test current and binning temperature of $T_j=25^{\circ}\text{C}$.

Table 6i-1. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835 HE and LUXEON 2835N 3V 1800K, at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
1800K	Single 3-step MacAdam ellipse	(0.5493, 0.4083)	0.00962	0.00462	47.34°
1800K	Single 5-step MacAdam ellipse	(0.5493, 0.4083)	0.01603	0.00770	47.34°

Table 6i-2. 4 quadrants definition for LUXEON 2835 HE and LUXEON 2835N 3V 1800K, at specified test and binning conditions.

POINT	x	y
1	0.5592	0.4207
2	0.5414	0.4107
3	0.5395	0.3958
4	0.5572	0.4058
Center	0.5493	0.4083

Notes for Table 6i:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

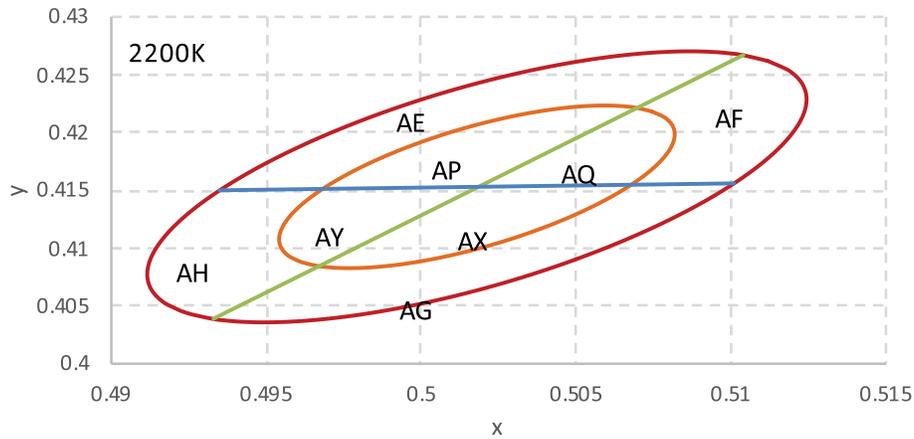


Figure 8j. 1/8th color bin structure for LUXEON 2835 HE and LUXEON 2835N 3V 2200K at specified test current and binning temperature of $T_j=25^{\circ}\text{C}$.

Table 6j-1. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835 HE and LUXEON 2835N 3V 2200K, at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
2200K	Single 3-step MacAdam ellipse	(0.5018, 0.4153)	0.00863	0.00398	49.27°
2200K	Single 5-step MacAdam ellipse	(0.5018, 0.4153)	0.01438	0.00663	49.27°

Table 6j-2. 4 quadrants definition for LUXEON 2835 HE and LUXEON 2835N 3V 2200K, at specified test and binning conditions.

POINT	x	y
1	0.5104	0.4267
2	0.4935	0.4150
3	0.4933	0.4039
4	0.5101	0.4156
Center	0.5018	0.4153

Notes for Table 6j:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

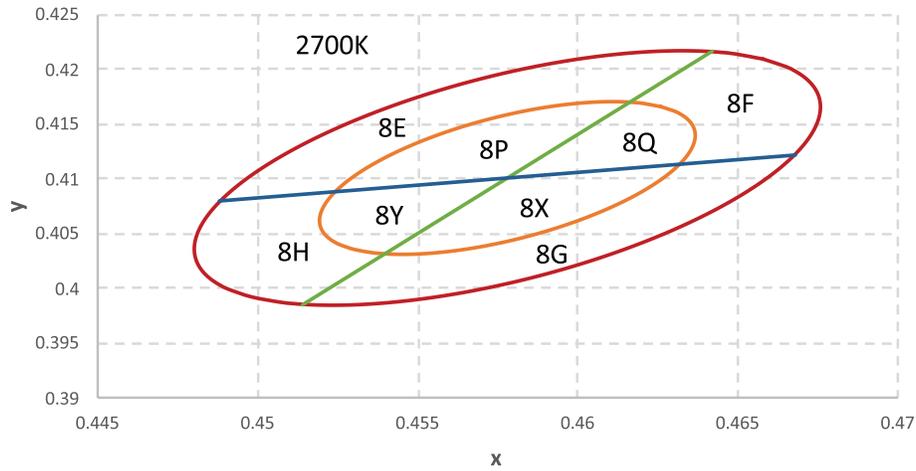


Figure 8k. 1/8th color bin structure for LUXEON 2835 HE and LUXEON 2835N 3V 2700K at specified test current and binning temperature of $T_j=25^{\circ}\text{C}$.

Table 6k-1. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835 HE and LUXEON 2835N 3V 2700K, at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ^[1] (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
2700K	Single 3-step MacAdam ellipse	(0.4578, 0.4101)	0.00810	0.00420	53.70°
2700K	Single 5-step MacAdam ellipse	(0.4578, 0.4101)	0.01350	0.00700	53.70°

Table 6k-2. 4 quadrants definition for LUXEON 2835 HE and LUXEON 2835N 3V 2700K, at specified test and binning conditions.

POINT	x	y
1	0.4642	0.4217
2	0.4488	0.4080
3	0.4514	0.3985
4	0.4668	0.4122
Center	0.4578	0.4101

Notes for Table 6k:

- Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

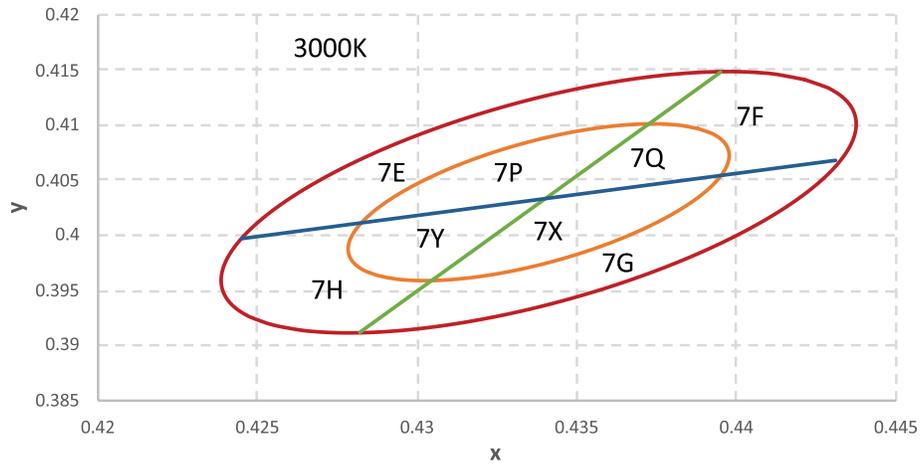


Figure 8I. 1/8th color bin structure for LUXEON 2835 HE and LUXEON 2835N 3V 3000K at specified test current and binning temperature of $T_j=25^{\circ}\text{C}$.

Table 6I-1. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835 HE and LUXEON 2835N 3V 3000K, at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
3000K	Single 3-step MacAdam ellipse	(0.4338, 0.4030)	0.00834	0.00408	53.22°
3000K	Single 5-step MacAdam ellipse	(0.4338, 0.4030)	0.01390	0.00680	53.22°

Table 6I-2. 4 quadrants definition for LUXEON 2835 HE and LUXEON 2835N 3V 3000K, at specified test and binning conditions.

POINT	x	y
1	0.4395	0.4148
2	0.4245	0.3997
3	0.4282	0.3912
4	0.4431	0.4062
Center	0.4338	0.4030

Notes for Table 6I:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

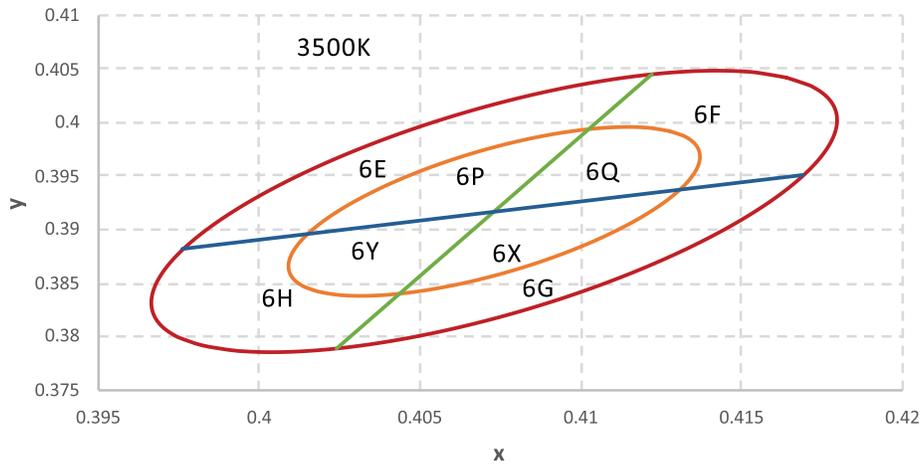


Figure 8m. 1/8th color bin structure for LUXEON 2835 HE and LUXEON 2835N 3V 3500K at specified test current and binning temperature of $T_j=25^{\circ}\text{C}$.

Table 6m-1. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835 HE and LUXEON 2835N 3V 3500K, at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
3500K	Single 3-step MacAdam ellipse	(0.4073, 0.3917)	0.00927	0.00414	54.00°
3500K	Single 5-step MacAdam ellipse	(0.4073, 0.3917)	0.01545	0.00690	54.00°

Table 6m-2. 4 quadrants definition for LUXEON 2835 HE and LUXEON 2835N 3V 3500K, at specified test and binning conditions.

POINT	x	y
1	0.4122	0.4045
2	0.3976	0.3882
3	0.4024	0.3789
4	0.4169	0.3951
Center	0.4073	0.3917

Notes for Table 6m:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

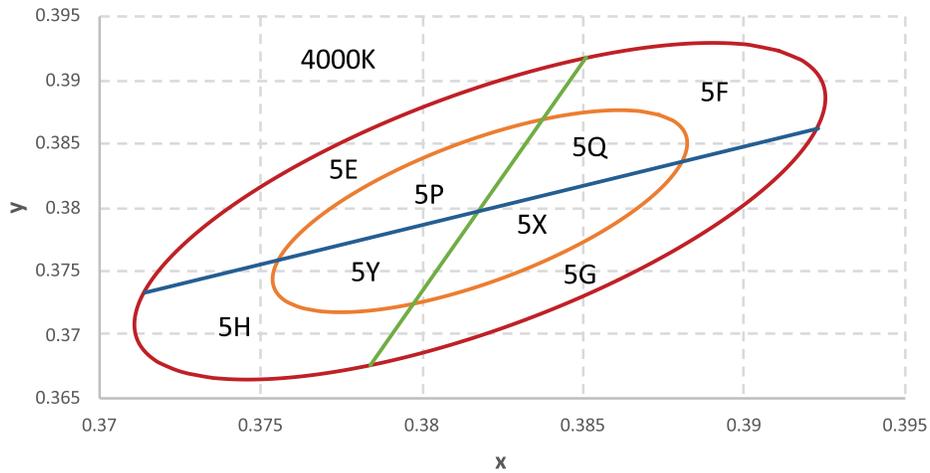


Figure 8n. 1/8th color bin structure for LUXEON 2835 HE and LUXEON 2835N 3V 4000K at specified test current and binning temperature of $T_j=25^{\circ}\text{C}$.

Table 6n-1. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835 HE and LUXEON 2835N 3V 4000K, at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ^[1] (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
4000K	Single 3-step MacAdam ellipse	(0.3818, 0.3797)	0.00939	0.00402	53.72°
4000K	Single 5-step MacAdam ellipse	(0.3818, 0.3797)	0.01565	0.00670	53.72°

Table 6n-2. 4 quadrants definition for LUXEON 2835 HE and LUXEON 2835N 3V 4000K, at specified test and binning conditions.

POINT	x	y
1	0.3851	0.3918
2	0.3714	0.3733
3	0.3784	0.3676
4	0.3923	0.3862
Center	0.3818	0.3797

Notes for Table 6n:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

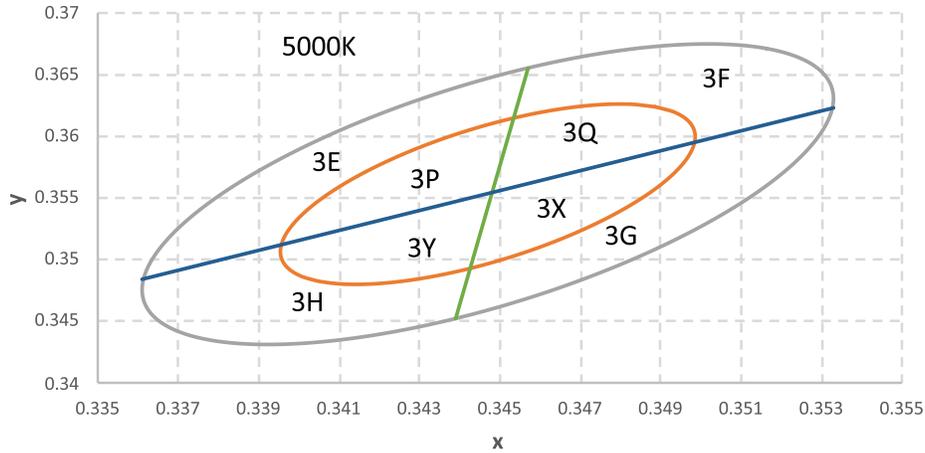


Figure 80. 1/8th color bin structure for LUXEON 2835 HE and LUXEON 2835N 3V 5000K at specified test current and binning temperature of $T_j=25^{\circ}\text{C}$.

Table 60-1. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835 HE and LUXEON 2835N 3V 5000K, at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ^[1] (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
5000K	Single 3-step MacAdam ellipse	(0.3447, 0.3553)	0.00822	0.00354	59.62°
5000K	Single 5-step MacAdam ellipse	(0.3447, 0.3553)	0.01370	0.00590	59.62°

Table 60-2. 4 quadrants definition for LUXEON 2835 HE and LUXEON 2835N 3V 5000K, at specified test and binning conditions.

POINT	x	y
1	0.3457	0.3655
2	0.3361	0.3484
3	0.3439	0.3452
4	0.3533	0.3623
Center	0.3447	0.3553

Notes for Table 60:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

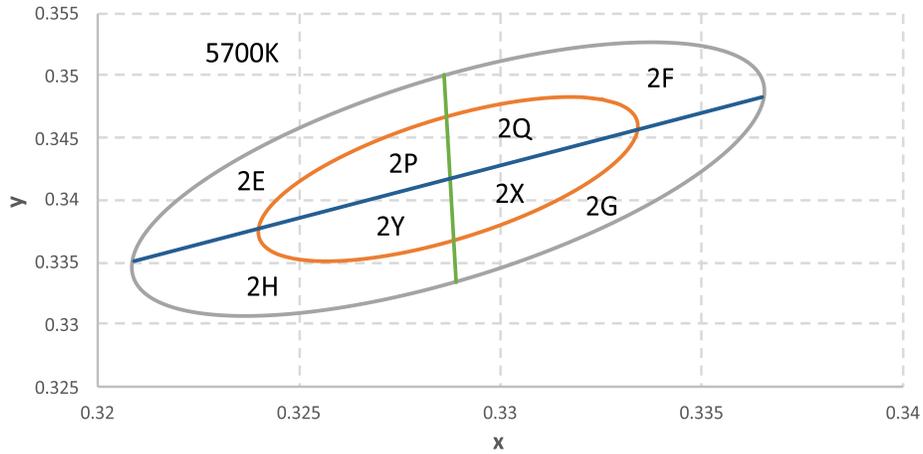


Figure 8p. 1/8th color bin structure for LUXEON 2835 HE and LUXEON 2835N 3V 5700K at specified test current and binning temperature of $T_j=25^{\circ}\text{C}$.

Table 6p-1. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835 HE and LUXEON 2835N 3V 5700K, at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
5700K	Single 3-step MacAdam ellipse	(0.3287, 0.3417)	0.00746	0.00320	59.09°
5700K	Single 5-step MacAdam ellipse	(0.3287, 0.3417)	0.01243	0.00533	59.09°

Table 6p-2. 4 quadrants definition for LUXEON 2835 HE and LUXEON 2835N 3V 5700K, at specified test and binning conditions.

POINT	x	y
1	0.3286	0.3501
2	0.3209	0.3351
3	0.3289	0.3334
4	0.3365	0.3483
Center	0.3287	0.3417

Notes for Table 6p:

1. Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

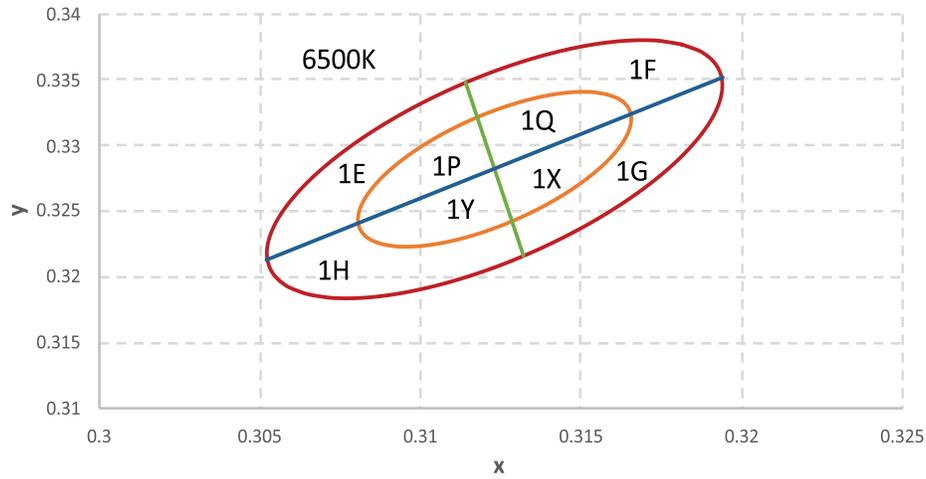


Figure 8q. 1/8th color bin structure for LUXEON 2835 HE and LUXEON 2835N 3V 6500K at specified test current and binning temperature of $T_j=25^{\circ}\text{C}$.

Table 6q-1. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 2835 HE and LUXEON 2835N 3V 6500K, at specified test and binning conditions.

NOMINAL CCT	COLOR SPACE	CENTER POINT ⁽¹⁾ (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ
6500K	Single 3-step MacAdam ellipse	(0.3123, 0.3282)	0.00669	0.00285	58.57°
6500K	Single 5-step MacAdam ellipse	(0.3123, 0.3282)	0.01115	0.00475	58.57°

Table 6q-2. 4 quadrants definition for LUXEON 2835 HE and LUXEON 2835N 3V 6500K, at specified test and binning conditions.

POINT	x	y
1	0.3114	0.3348
2	0.3052	0.3213
3	0.3132	0.3216
4	0.3194	0.3352
Center	0.3123	0.3282

Notes for Table 6q:

- Lumileds maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

Forward Voltage Bins

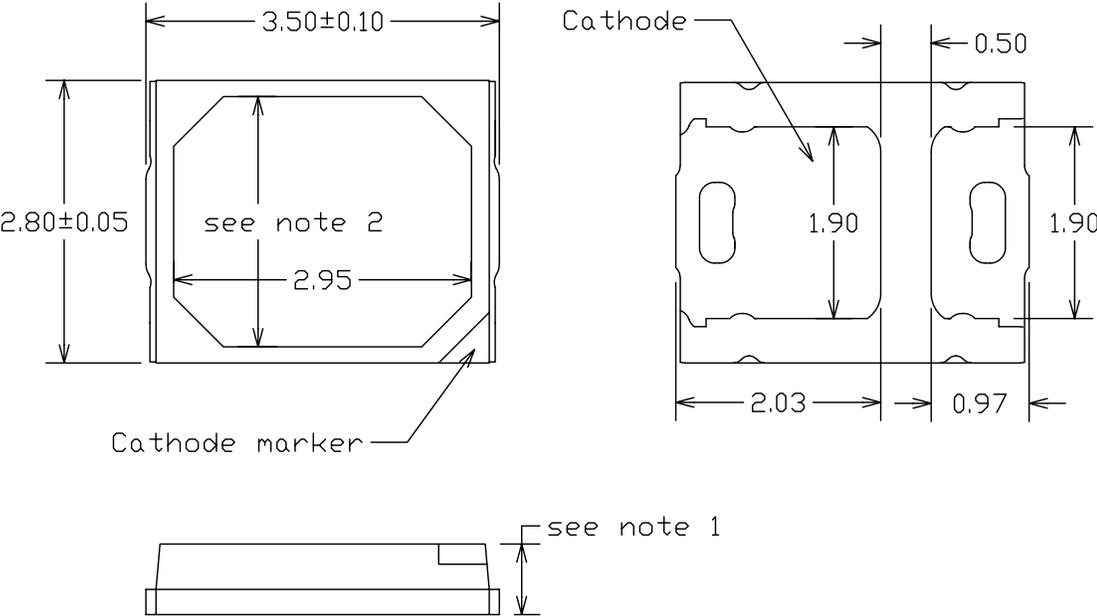
Table 7. Forward voltage bin definitions for LUXEON 2835 Architectural at specified test current, $T_j=25^{\circ}\text{C}$.

PRODUCT	BIN	FORWARD VOLTAGE ⁽¹⁾ (V _f)	
		MINIMUM	MAXIMUM
LUXEON 2835E 9V	U	8.40	8.70
	V	8.70	9.00
	W	9.00	9.30
	X	9.30	9.60
	Y	9.60	9.90
LUXEON 2835E 6V	V	5.80	6.00
	W	6.00	6.20
	X	6.20	6.40
	Y	6.40	6.60
LUXEON 2835C 6V	G	5.80	6.00
	H	6.00	6.20
	J	6.20	6.40
	K	6.40	6.60
LUXEON 2835E 3V LUXEON 2835C 3V LUXEON 2835C 3V TVS	S	2.70	2.80
	T	2.80	2.90
	V	2.90	3.00
	W	3.00	3.10
	X	3.10	3.20
LUXEON 2835 HE 3V	Y	3.20	3.30
	K	2.66	2.76
LUXEON 2835N 3V	Q	2.68	2.78
	R	2.78	2.88

Notes for Table 7:

1. Lumileds maintains a tolerance of $\pm 0.10\text{V}$ on forward voltage measurements.

Mechanical Dimensions



	LUXEON 2835E 3V	All Others
note 1	0.65 ± 0.05	0.70 ± 0.05
note 2	2.53	2.48

Figure 9. Mechanical dimensions for LUXEON 2835 Architectural.

Notes for Figure 9:
 1. Drawings are not to scale.
 2. All dimensions are in millimeters.

Reflow Soldering Guidelines

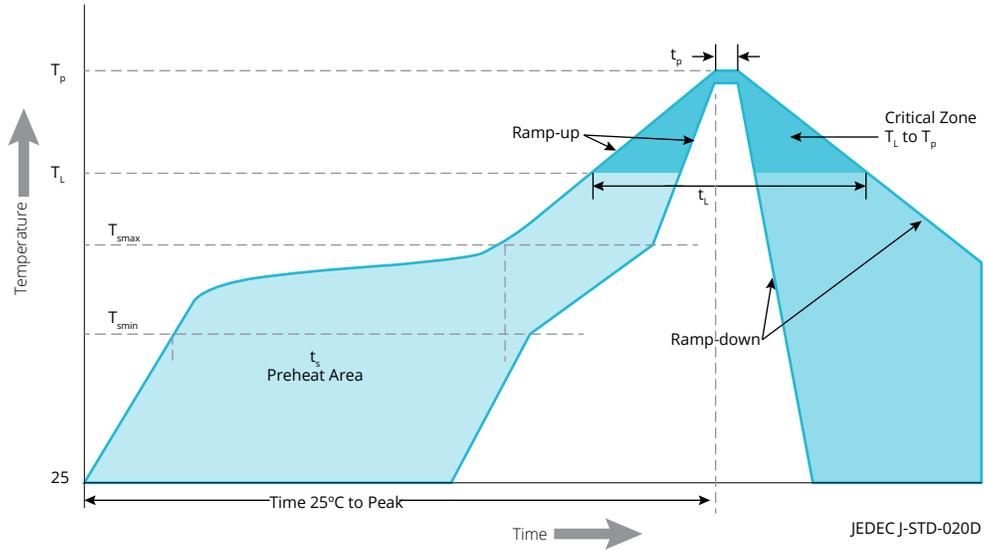


Figure 10. Visualization of the acceptable reflow temperature profile as specified in Table 8.

Table 8. Reflow profile characteristics for LUXEON 2835 Architectural.

PROFILE FEATURE	LEAD-FREE ASSEMBLY
Preheat Minimum Temperature (T_{smin})	150°C
Preheat Maximum Temperature (T_{smax})	200°C
Preheat Time (t_{smin} to t_{smax})	60 to 120 seconds
Ramp-Up Rate (T_L to T_p)	3°C / second maximum
Liquidus Temperature (T_L)	217°C
Time Maintained Above Temperature T_L (t_L)	60 to 150 seconds
Peak / Classification Temperature (T_p)	260°C
Time Within 5°C of Actual Temperature (t_p)	20 to 40 seconds
Ramp-Down Rate (T_p to T_L)	6°C / second maximum
Time 25°C to Peak Temperature	8 minutes maximum

JEDEC Moisture Sensitivity

Table 9. Moisture sensitivity levels for LUXEON 2835 Architectural.

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS STANDARD	
	TIME	CONDITIONS	TIME	CONDITIONS
3	168 Hours	≤30°C / 60% RH	192 Hours +5 / -0	30°C / 60% RH

Reel Dimensions

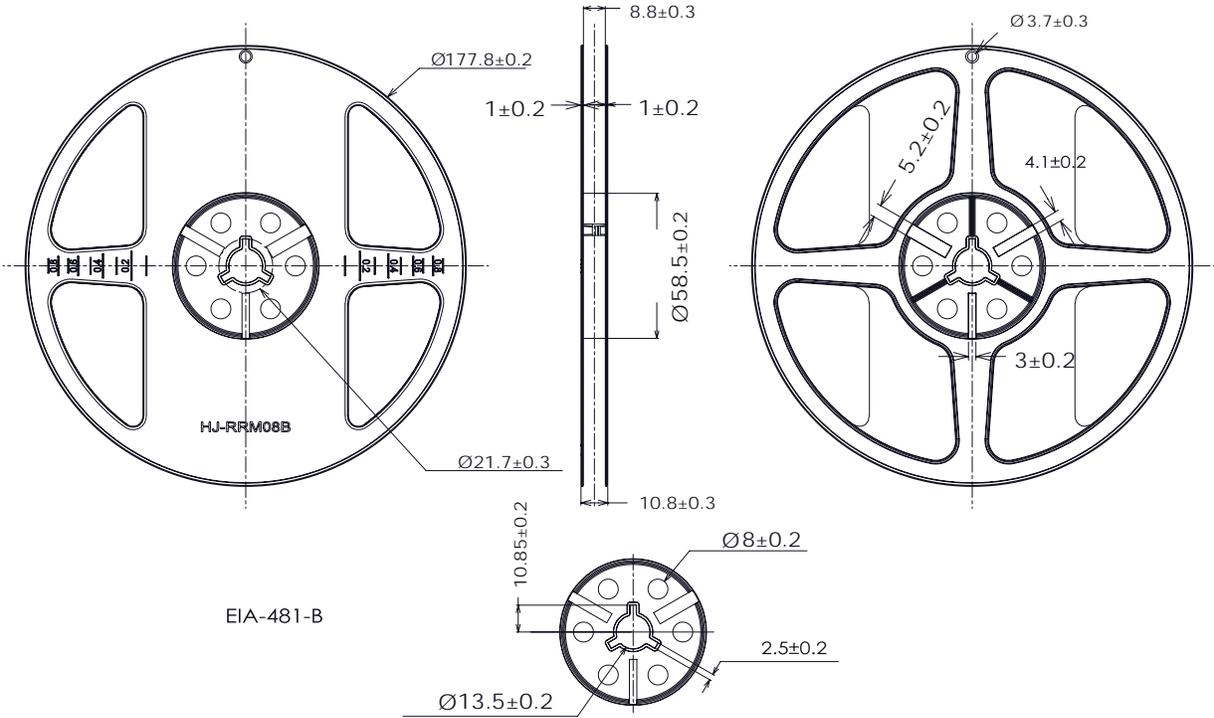


Figure 13. Reel dimensions for LUXEON 2835 Architectural.

- Notes for Figure 13:
1. Drawings are not to scale.
 2. All dimensions are in millimeters.

About Lumileds

Companies developing automotive, mobile, IoT and illumination lighting applications need a partner who can collaborate with them to push the boundaries of light. With over 100 years of inventions and industry firsts, Lumileds is a global lighting solutions company that helps customers around the world deliver differentiated solutions to gain and maintain a competitive edge. As the inventor of Xenon technology, a pioneer in halogen lighting and the leader in high performance LEDs, Lumileds builds innovation, quality and reliability into its technology, products and every customer engagement. Together with its customers, Lumileds is making the world better, safer, more beautiful—with light.

To learn more about our lighting solutions, visit lumileds.com.



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