LUMILEDS

ILLUMINATION



LUXEON SunPlus 2835 Line

LEDs engineered to deliver the precise wavelengths of light needed to improve crop yield



The LUXEON SunPlus 2835 Line is purpose-built to enable ease of system design for Horticulture applications. The LUXEON SunPlus 2835 Line offers the only LEDs available today that are binned and tested based on Photosynthetic Photon Flux (PPF). The LUXEON SunPlus 2835 Line includes options for single driver solutions and multi-channel, color tunable solutions.

FEATURES AND BENEFITS

- 120° angle for uniform light distribution for greenhouse, vertical farming and interweaving applications
- 2.8 x 3.5mm package

PRIMARY APPLICATIONS

- Horticulture

c UL us No. E507562

RoHS COMPLIANT

DS237 LUXEON SunPlus 2835 Line Product Datasheet ©2025 Lumileds Holding B.V. All rights reserved.

Table of Contents

General Product Information **2**
- Product Test Conditions 2
- Part Number Nomenclature 2
- Environmental Compliance 2

Performance Characteristics **3**
- Product Selection Guide 3
- Optical Characteristics 3
- Electrical and Thermal Characteristics 4

Absolute Maximum Ratings **4**

Characteristic Curves **5**
- Spectral Power Distribution Characteristics 5
- Photon Output Characteristics 5
- Forward Current Characteristics 7
- Radiation Pattern Characteristics 9

Product Bin and Labeling Definitions **10**
- Decoding Product Bin Labeling 10
- PPF Bins 10
- Color Bin Definitions 11
- Peak Wavelength Bins 11
- Forward Voltage Bins 11

Mechanical Dimensions **12**

Reflow Soldering Guidelines **13**
- JEDEC Moisture Sensitivity 13
- Solder Pad Design 14

Packaging Information **15**
- Pocket Tape Dimensions 15
- Reel Dimensions 15

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General Product Information

Product Test Conditions

LUXEON SunPlus 2835 Line LEDs are tested and binned with a DC drive current of 120mA at a junction temperature, T_J, of 25°C.

Part Number Nomenclature

Part numbers for LUXEON SunPlus 2835 Line follow the convention below:

L 1 S P – **A A A B B** 0 **C C** 0 0 0 0 0

Where:

- **A A A** – designates color (FRD=Far Red, DRD=Deep Red, PRP=Purple, RYL=Royal Blue, LME=Lime and PNK=Horticultural White)
- **B B** – designates typical percentage of PPF in the blue spectrum (420 to 480nm) vs. the total PPF in the Photosynthetic Active Radiation (PAR) region (400 to 700nm), which applies only to purple LEDs (00=2.5%, 10=12.5% and 20=25%)
- **C C** – designates package size (28=2835)

Therefore, the following part number is used for a LUXEON SunPlus 2835 Royal Blue:

L 1 S P – **R Y L** 0 0 0 **2 8** 0 0 0 0 0

Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. LUXEON SunPlus 2835 Line 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 SunPlus 2835 Line at 120mA, T_j=25°C

COLOR	PEAK WAVELENGTH (nm)		PPF (µmol/s) [1] in PAR (400 to 700nm) [2]		PPF/W TYPICAL (µmol/J)	PART NUMBER
	MINIMUM	MAXIMUM	MINIMUM	TYPICAL		
Horticulture White	–	–	0.71	0.78	2.28	L1SP-PNK1002800000
Purple (2.5% Blue) [4]	–	–	0.58	0.63	1.84	L1SP-PRP0002800000
Purple (12.5% Blue) [5]	–	–	0.64	0.70	2.04	L1SP-PRP1002800000
Purple (25% Blue) [6]	–	–	0.67	0.74	2.16	L1SP-PRP2002800000
Far Red	720	740	0.54	0.60 [3]	2.32	L1SP-FRD0002800000
Deep Red	650	670	0.56	0.82	3.29	L1SP-DRD0002800000
Royal Blue	440	455	0.67	0.74	2.06	L1SP-RYL0002800000
Lime	–	–	0.72	0.80	2.22	L1SP-LME0002800000

Notes for Table 1:
1. Lumileds maintains a tolerance of ±7.5% on µmol/s measurements for LUXEON SunPlus 2835.
2. PAR is the photosynthetic active radiation from 400 to 700nm.
3. Far Red typical PPF is measured from 700 to 800nm.
4. PPF in blue spectrum (420–480nm) ranges from 0–5% of total PPF in PAR (400–700nm). Typical PPF in the blue spectrum is 2.5%.
5. PPF in blue spectrum (420–480nm) ranges from 10–15% of total PPF in PAR (400–700nm). Typical PPF in the blue spectrum is 12.5%.
6. PPF in blue spectrum (420–480nm) ranges from 20–30% of total PPF in PAR (400–700nm). Typical PPF in the blue spectrum is 25%

Optical Characteristics

Table 2. Optical characteristics for LUXEON SunPlus 2835 Line at 120mA, T_j=25°C

PART NUMBER	TYPICAL SPECTRAL HALF-WIDTH [1] (nm)	TYPICAL TEMPERATURE COEFFICIENT OF DOMINANT WAVELENGTH (nm/°C)	TYPICAL TOTAL INCLUDED ANGLE [2]	TYPICAL VIEWING ANGLE [3]
L1SP-PNK1002800000	–	–	140°	120°
L1SP-PRPxx02800000	–	–	140°	120°
L1SP-RYL0002800000	15	0.04	140°	130°
L1SP-LME0002800000	–	0.01	140°	120°
L1SP-FRD0002800000	30	0.17	140°	130°
L1SP-DRD0002800000	20	0.16	140°	130°

Notes for Table 2:
1. Spectral half-width is the spectral bandwidth at 50% of the peak intensity.
2. Total angle at which 90% of the 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.

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Electrical and Thermal Characteristics

Table 3. Electrical and thermal characteristics for LUXEON SunPlus 2835 Line at 120mA, T_j=25°C

PART NUMBER	FORWARD VOLTAGE [1] (V_f)			TYPICAL TEMPERATURE COEFFICIENT OF FORWARD VOLTAGE [2] (mV/°C)	TYPICAL THERMAL RESISTANCE—JUNCTION TO SOLDER PAD (°C/W)
	MINIMUM	TYPICAL	MAXIMUM		
L1SP-PNK1002800000	2.70	2.85	3.00	-2.0	13.0
L1SP-PRPxx02800000	2.70	2.85	3.00	-2.0 to -4.0	13.0
L1SP-FRD0002800000	1.80	2.15	2.50	-1.2	15.0
L1SP-DRD0002800000	1.80	2.08	2.50	-2.4	15.0
L1SP-RYL0002800000	2.80	3.00	3.20	-2.5	25.0
L1SP-LME0002800000	2.80	3.00	3.10	-1.7	25.0

Notes for Table 3:
1. Lumileds maintains a tolerance of ±0.06V on forward voltage measurements.
2. Measured between 25°C and 85°C.

Absolute Maximum Ratings

Table 4. Absolute maximum ratings for LUXEON SunPlus 2835 Line

PARAMETER	PURPLE AND HORTICULTURE WHITE	FAR RED	DEEP RED	ROYAL BLUE	LIME
DC Forward Current [1, 2]	480mA	300mA	250mA	240mA	240mA
Peak Pulsed Forward Current [1, 3]	500mA	350mA	300mA	300mA	300mA
LED Junction Temperature [1] (DC & Pulse)	125°C	125°C	125°C	125°C	125°C
ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)	Class 2				
Operating Case Temperature [1]	-40°C to 105°C	-40°C to 105°C	-40°C to 105°C	-40°C to 95°C	-40°C to 105°C
LED Storage Temperature	-40°C to 105°C	-40°C to 105°C	-40°C to 105°C	-40°C to 95°C	-40°C to 105°C
Soldering Temperature	20°C to 260°C				
Allowable Reflow Cycles	3				
Reverse Voltage ($V_{reverse}$)	LUXEON LEDs are not designed to be driven in reverse bias				

Notes for Table 4:
1. Proper current derating must be observed to maintain the junction temperature below the maximum allowable junction temperature.
2. Residual periodic variations due to power conversion from alternating current (AC) to direct current (DC), also called "ripple," with frequencies ≥100Hz and amplitude of ≤15% of the maximum allowable DC forward current are acceptable, assuming the average current throughout each cycle does not exceed the maximum allowable DC forward current at the corresponding maximum junction temperature.
3. Pulsed operation with a peak drive current equal to the stated peak pulsed forward current is acceptable if the pulse-on time is ≤5ms per cycle and the duty cycle is ≤50%.
4. 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.
5. Max 5V reverse for up to 10s is an acceptable beginning of life, one time test condition.

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Characteristic Curves

Spectral Power Distribution Characteristics

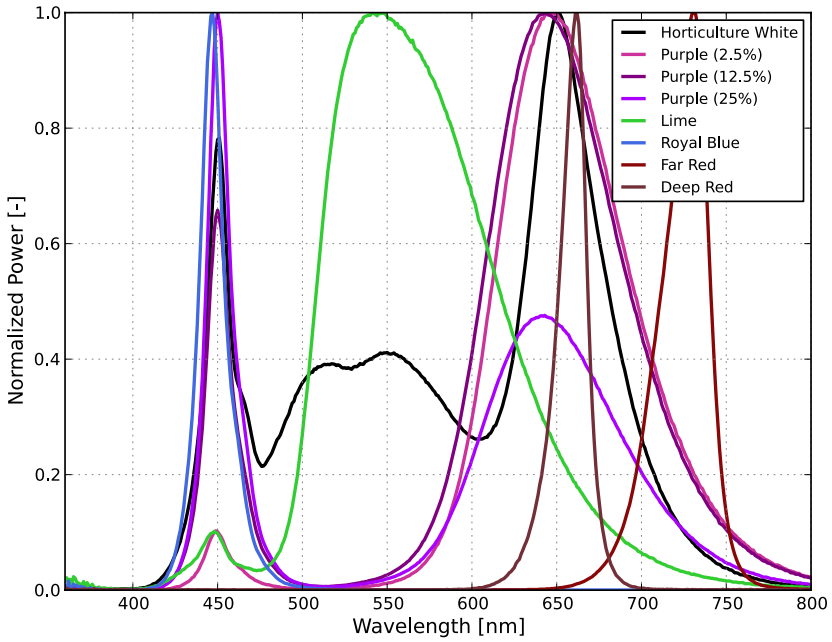


Figure 1. Typical normalized power vs. wavelength for LUXEON SunPlus 2835 Line at 120mA, T_j=25°C

Photon Output Characteristics

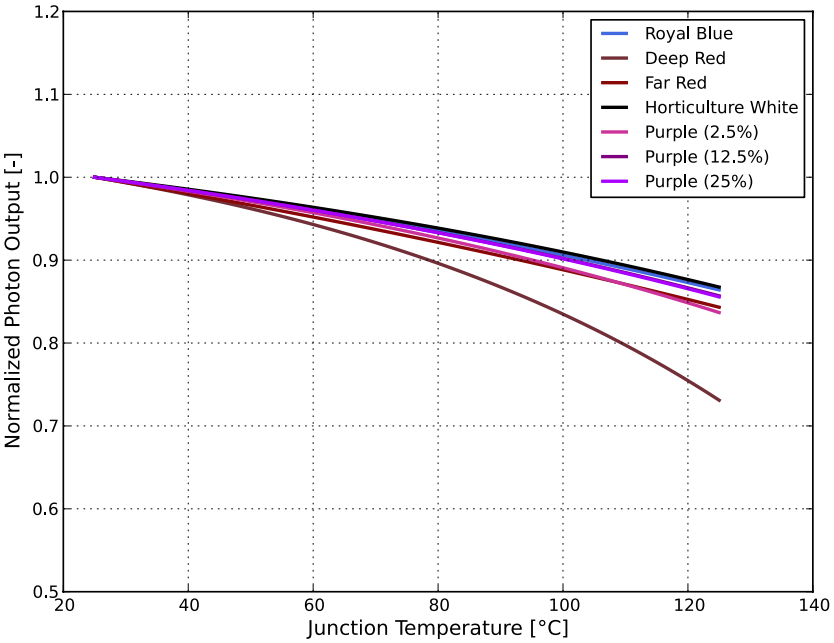


Figure 2a. Typical normalized photon output vs. junction temperature
for LUXEON SunPlus 2835 Royal Blue, Deep Red, Far Red, Horticulture White, and Purple at 120mA

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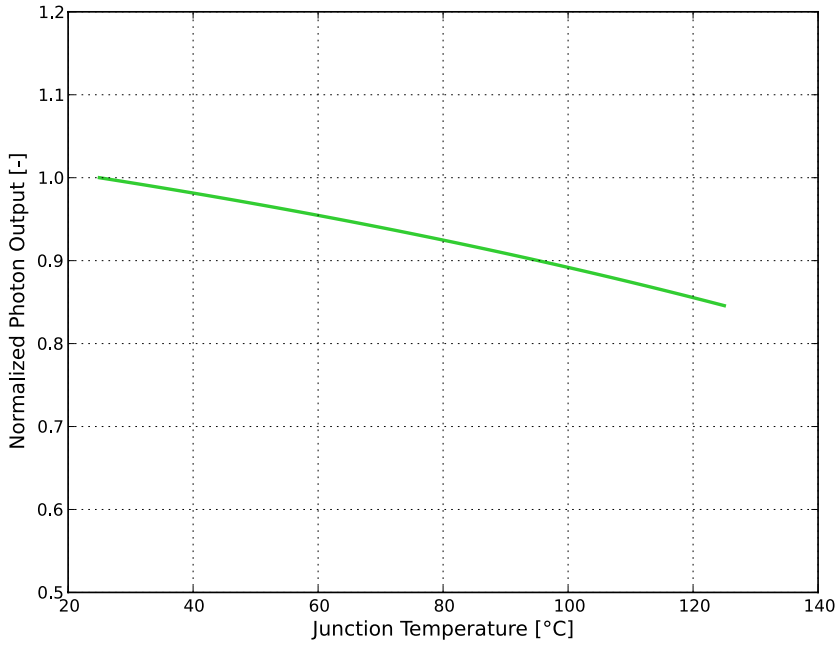


Figure 2b. Typical normalized photon output vs. junction temperature for LUXEON SunPlus 2835 Lime at 120mA

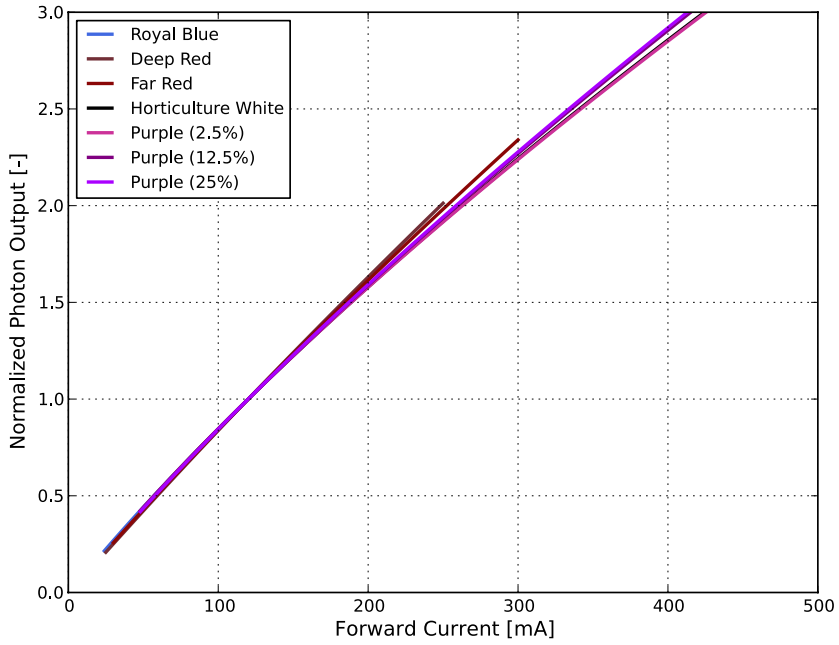


Figure 2c. Typical normalized photon output vs. forward current
for LUXEON SunPlus 2835 Royal Blue, Deep Red, Far Red, Horticulture White, and Purple at T_j=25°C

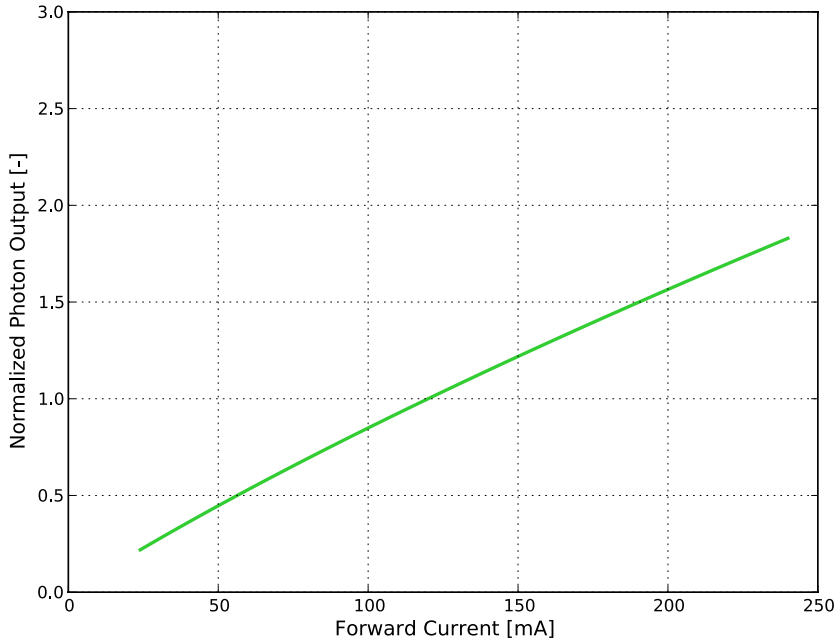


Figure 2d. Typical normalized photon output vs. forward current for LUXEON SunPlus 2835 Lime at T_j=25°C

Forward Current Characteristics

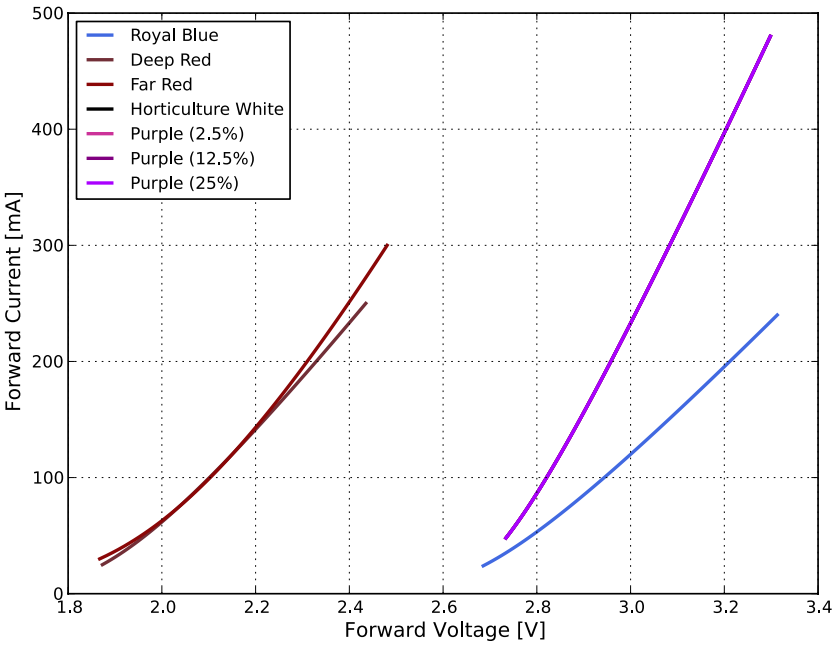


Figure 3a. Typical forward current vs. forward voltage
for LUXEON SunPlus 2835 Royal Blue, Deep Red, Far Red, Horticulture White, and Purple at T_j=25°C

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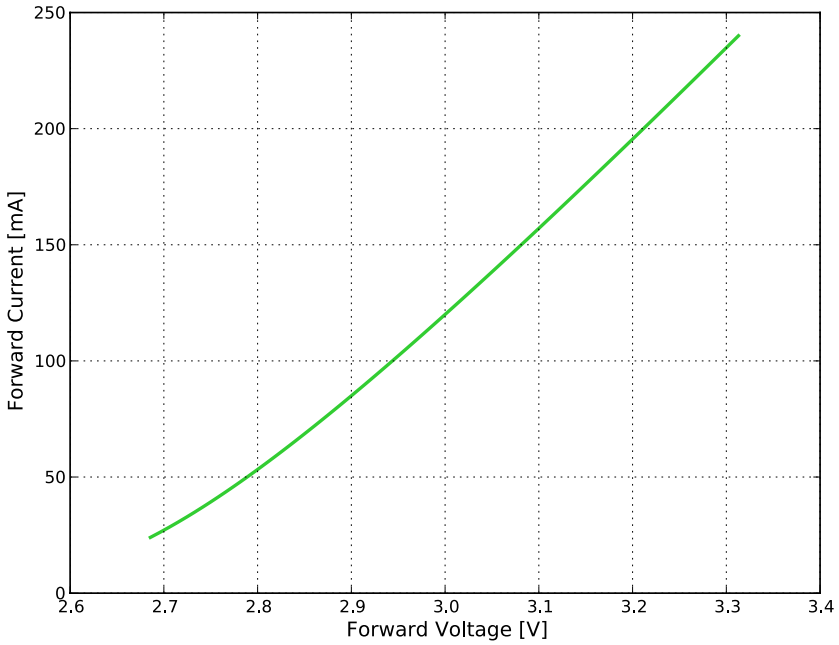


Figure 3b. Typical forward current vs. forward voltage for LUXEON SunPlus 2835 Lime at T_j=25°C

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Radiation Pattern Characteristics

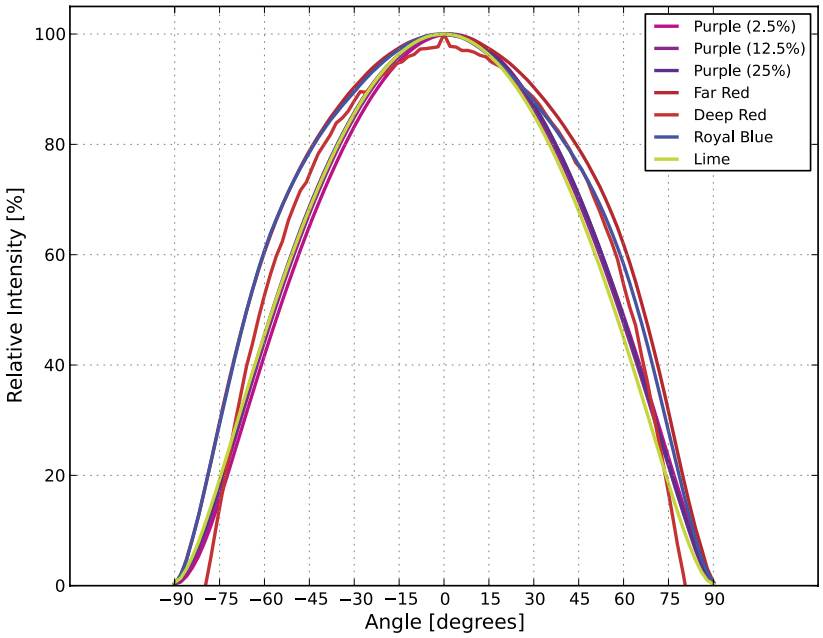


Figure 4. Typical radiation pattern for LUXEON SunPlus 2835 Line at 120mA, T_j=25°C

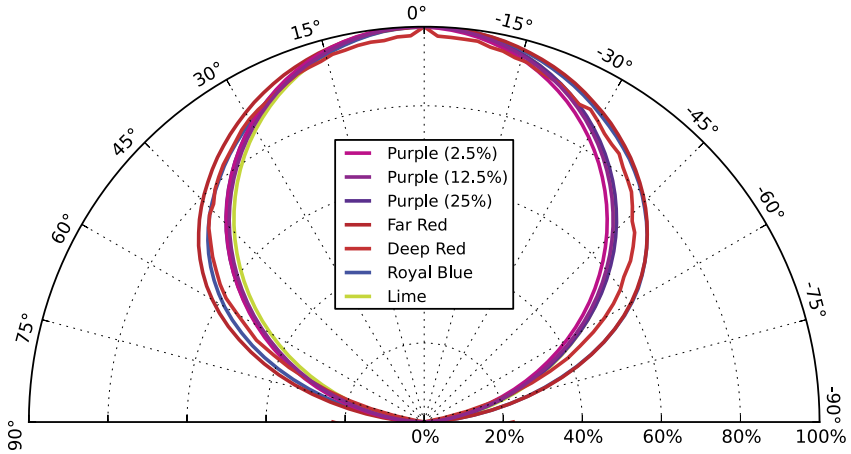


Figure 5. Typical polar radiation pattern for LUXEON SunPlus 2835 Line at 100mA, T_j=25°C

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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.

All emitters packaged within a reel are of the same bin combination.

LUXEON SunPlus 2835 Line LEDs are labeled using a 4-digit alphanumeric CAT code following the format below:

A B B C

Where:

A – designates PPF bin (example: J= 0.7 to 0.75 µmol/s, K= 0.75 to 0.80 µmol/s)

B B – designates color or peak wavelength bin (example: 10=720 to 740nm)

C – designates forward voltage bin (example: B=1.8 to 2.0V, C=2.0 to 2.2V)

Therefore, LUXEON SunPlus 2835 Far Red with a PPF range of 0.55 to 0.60 µmol/s, peak wavelength of 720 to 740nm and a forward voltage range of 1.80 to 2.0V has the following CAT code:

F 1 0 B

PPF Bins

Table 5 lists the standard PPF bins for LUXEON SunPlus Series. Although several bins are outlined, product availability in a particular bin varies by production run and by product performance.

Table 5. PPF bin definitions for LUXEON SunPlus 2835 Line

BIN	PPF [1] (µmol/s)	
	MINIMUM	MAXIMUM
D	0.45	0.50
E	0.50	0.55
F	0.55	0.60
G	0.60	0.65
H	0.65	0.70
J	0.70	0.75
K	0.75	0.80
L	0.80	0.85
M	0.85	0.90
N	0.90	0.95
P	0.95	1.00
Q	1.00	1.05
R	1.05	1.10

Notes for Table 5:
1. Lumileds maintains a tolerance of ±7.5% on µmol/s measurements.

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Color Bin Definitions

Table 6. Color bin definitions for LUXEON SunPlus 2835 Line

PRODUCT	COLOR	BIN [1]
LUXEON SunPlus 2835 Line	Purple (2.5% Blue)	DA
	Purple (12.5% Blue)	FA
	Purple (25% Blue)	HA
	Lime	20
	Horticulture White	GA

Notes for Table 6:
1. Lumileds maintains a tester tolerance of ±0.005 on color bin coordinates

Peak Wavelength Bins

Table 7. Peak wavelength bins for LUXEON SunPlus 2835 Line at specified test conditions

PRODUCT	COLOR	BIN	PEAK WAVELENGTH [1] (nm)	
			MINIMUM	MAXIMUM
LUXEON SunPlus 2835 Line	Far Red	10	720	740
	Deep Red	10	650	670
	Royal Blue	30	440	445
		40	445	450
		50	450	455

Notes for Table 7:
1. Lumileds maintains a tolerance of ±2.0nm on peak wavelength measurements.

Forward Voltage Bins

Table 8. Forward voltage bin definitions for LUXEON SunPlus 2835 Line at specified test conditions

PRODUCT	COLOR	BIN	FORWARD VOLTAGE [1] (V_f)	
			MINIMUM	MAXIMUM
LUXEON SunPlus 2835 Line	Far Red Deep Red	B	1.80	2.00
		C	2.00	2.20
		D	2.20	2.40
		E	2.40	2.60
	Royal Blue Purple Lime Horticulture White	Z	2.70	2.80
		A	2.80	2.90
		B	2.90	3.00
		C	3.00	3.10
		D	3.10	3.20
		E	3.20	3.30

Notes for Table 8:
1. Lumileds maintains a tolerance of ±0.06V on forward voltage measurements for LUXEON SunPlus 2835 Line.

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Mechanical Dimensions

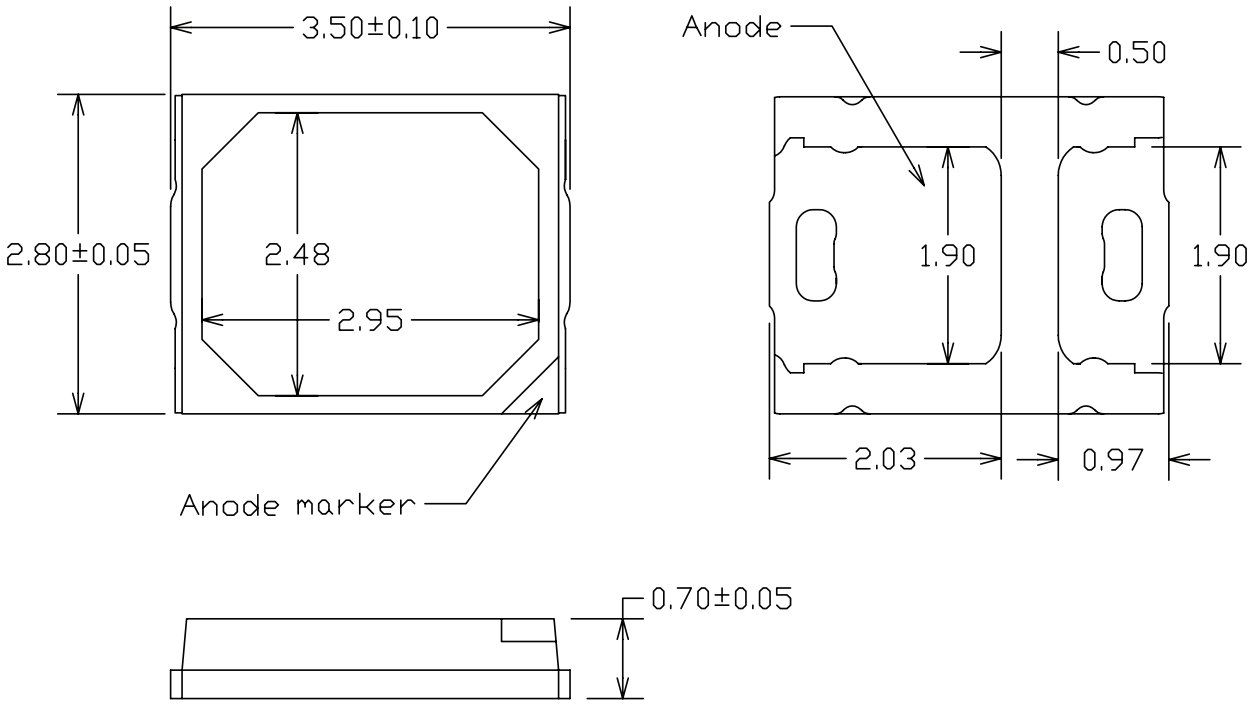


Figure 6. Mechanical dimensions for LUXEON SunPlus 2835 Line

Notes for Figure 6:
1. Drawings are not to scale.
2. All dimensions are in millimeters.

Reflow Soldering Guidelines

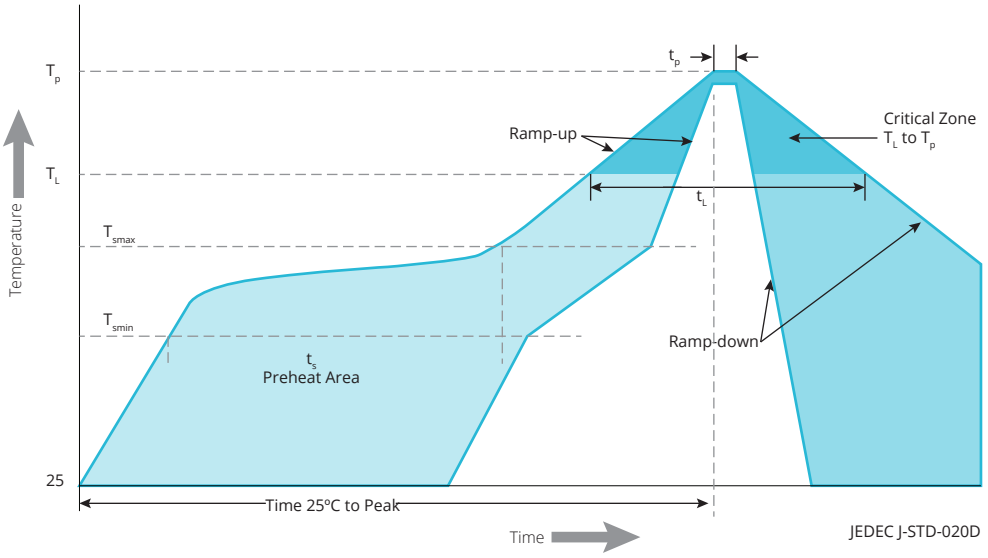


Figure 7. Visualization of the acceptable reflow temperature profile as specified in Table 9

Table 9. Reflow profile characteristics for LUXEON SunPlus 2835 Line

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
Liquidous 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 Peak 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 10. Moisture sensitivity levels for LUXEON SunPlus 2835 Line

PRODUCT	LEVEL	FLOOR LIFE		SOAK REQUIREMENTS STANDARD	
		TIME	CONDITIONS	TIME	CONDITIONS
LUXEON SunPlus 2835 Line	2	1 Year	≤30°C / 60% RH	168 Hours +5 / -0	85°C / 60% RH

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Solder Pad Design

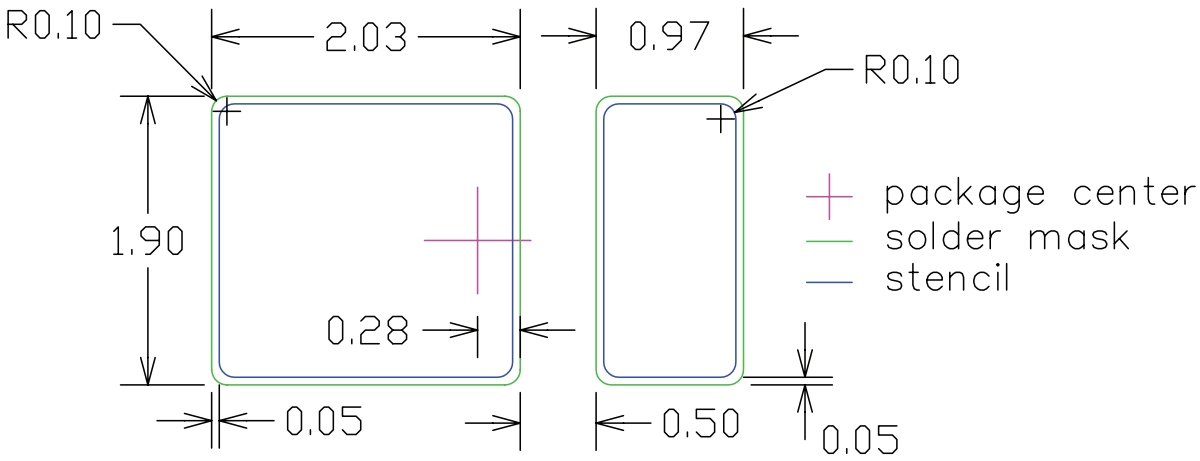


Figure 8. Recommended PCB solder pad layout for LUXEON SunPlus 2835 Line

Notes for Figure 8:
1. Drawings are not to scale.
2. All dimensions are in millimeters.

Packaging Information

Pocket Tape Dimensions

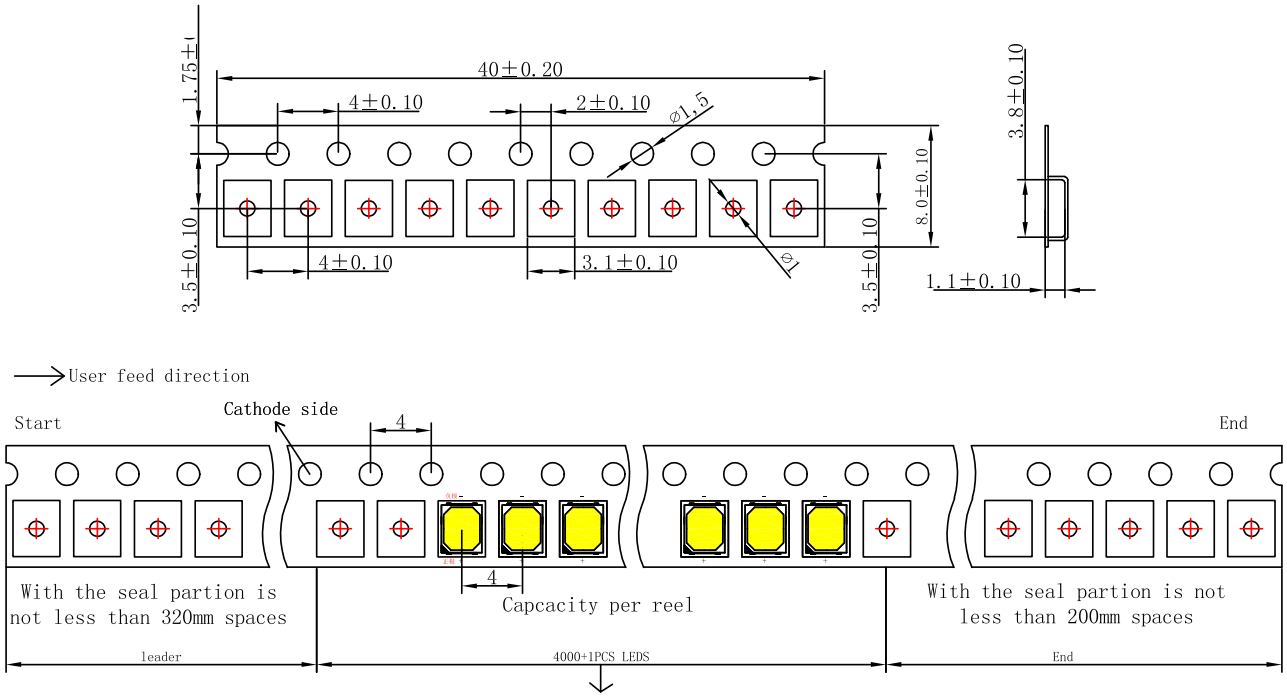
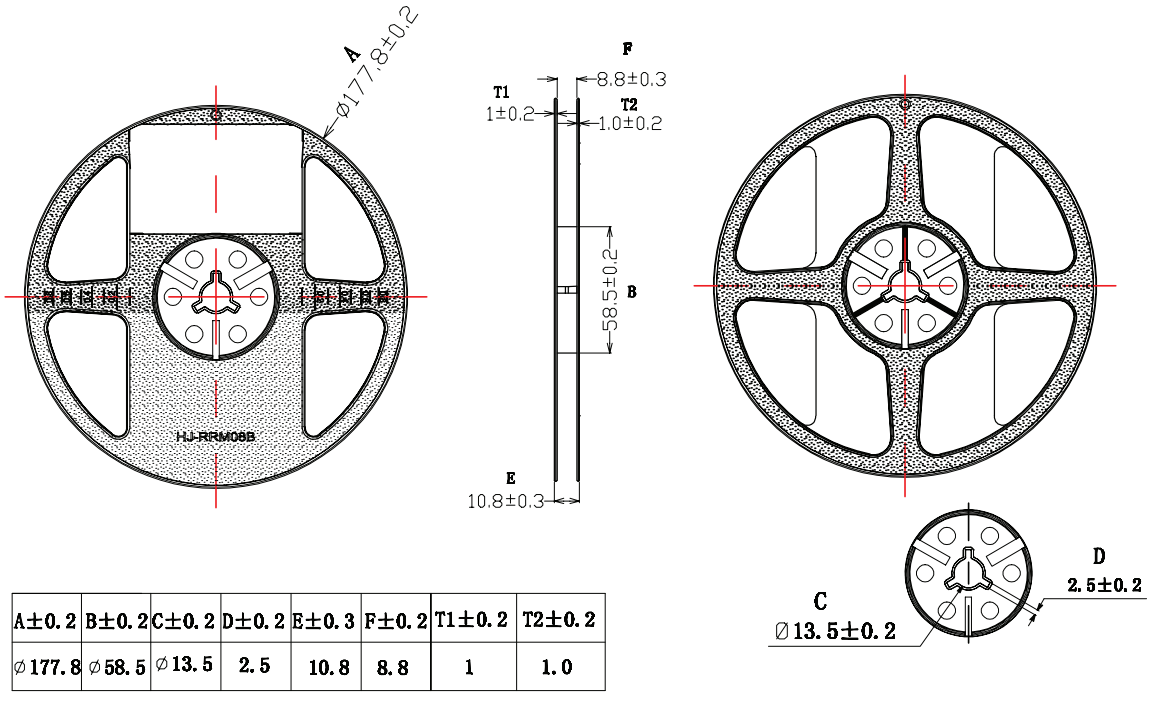


Figure 9. Pocket tape dimensions for LUXEON SunPlus 2835 Line

Reel Dimensions



A±0.2	B±0.2	C±0.2	D±0.2	E±0.3	F±0.2	T1±0.2	T2±0.2
⌀177.8	⌀58.5	⌀13.5	2.5	10.8	8.8	1	1.0

Figure 10. Reel dimensions for LUXEON SunPlus 2835 Line

Notes for Figures 9 and 10:
1. Drawings are not to scale.
2. All dimensions are in millimeters.

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About Lumileds

Lumileds is a global leader in LED and microLED technology, innovation, and solutions for the automotive, display, illumination, mobile, and other markets where light sources are essential. Our approximately 3,500 employees operate in over 15 countries and partner with our customers to deliver never before possible solutions for lighting, safety, and well-being.

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

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