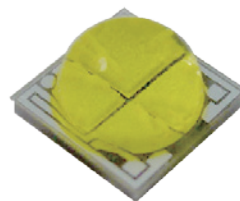


Federal 5050 1 Series Datasheet



Features :

- High lumen/flux performance
- Promising lumen maintenance characteristics
- High efficiency package
- Level 1 on JEDEC moisture sensitivity analysis
- Max pulse current: 1000mA
- RoHS compliant

Typical Applications :

- | | |
|-----------------------------|-----------------------|
| ■ Reading lights | ■ Portable flashlight |
| ■ Up-lights and Down-lights | ■ LCD Backlights |
| ■ General lighting | ■ Contour lights |
| ■ Ceiling lights | ■ Garden lighting |

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Lighting Design Manufacturing Service

General Information

Introduction

Federal 5050 1 Series is a smaller and brighter multi-chip LED which provides multi-color packaging flexibility. Federal is a surface mount, compact, high brightness LED that is suitable for various illumination needs such as general illumination, ashlights, streetlights, spot lights as well as industrial and commercial lightings. All the Edison products are carefully tested in order to achieve reliability and optimal performance, for giving you an extraordinary LED experience.

Product Nomenclature

The following table describes the available color, power, and lens type. For more flux and forward voltage information, please consult the Bin Group document.

Table 1 . Federal 5050 Nomenclature

EF X1	E X2	X X3	-	1 X4	C X5	E X6	1 X7		
X1 LED Item		X2 Module		X3 Emitting Color		X4 Current		X5 Dimension	
Code	Type	Code	Type	Code	Type	Code	Type	Code	Type
EF	Edixeon Federal	E	Emitter	4W	Cool White x4	1	350mA	C	5.0x5.0mm
		S	4 Single Star	4H	Neutral White x4				
		L	4 Series Star	4X	Warm White x4				
		P	2 Parallel 2 Series Star						
X6 Housing Item		X7 Serial Number							
Code	Type	Code	Type						
E	E-type	-	-						

Mechanical Dimensions

Component Dimension

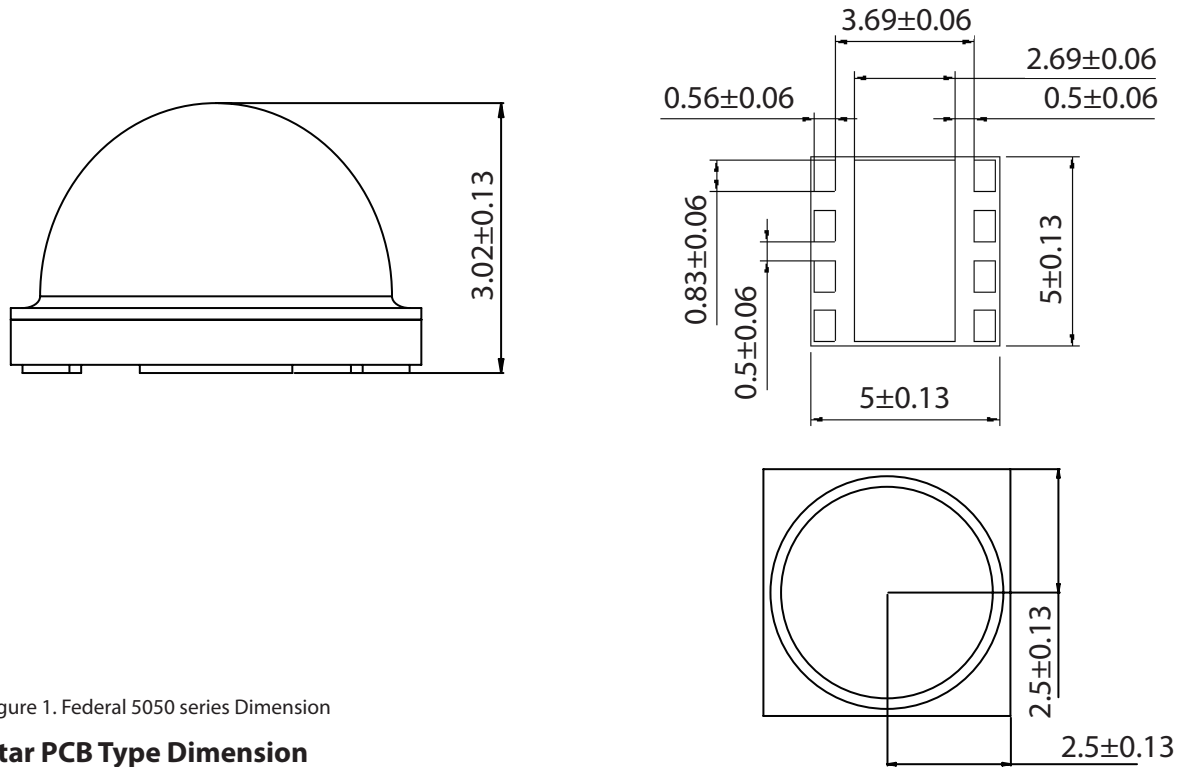


Figure 1. Federal 5050 series Dimension

Star PCB Type Dimension

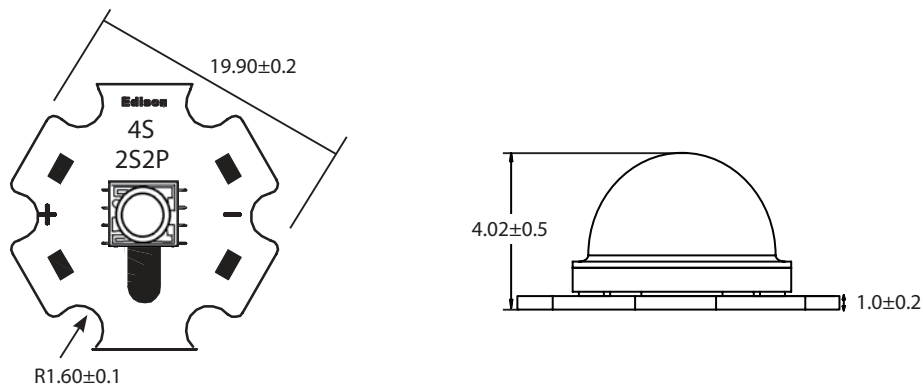


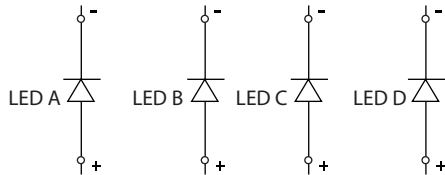
Figure 2. Federal 5050 Series Star PCB type Dimension

Notes:

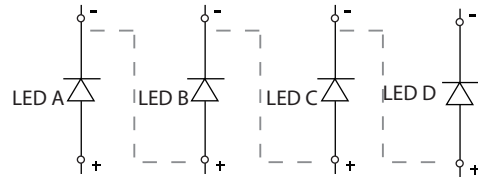
1. All dimensions are measured in mm.
2. Drawings are not to scale.

Circuit and applications

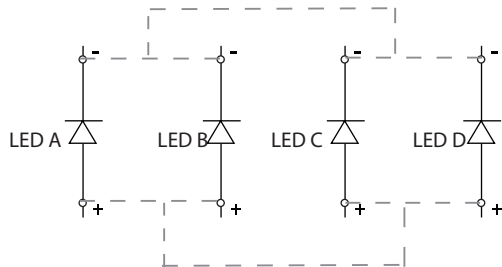
1. Separate operation (EFS4x-1CEX)



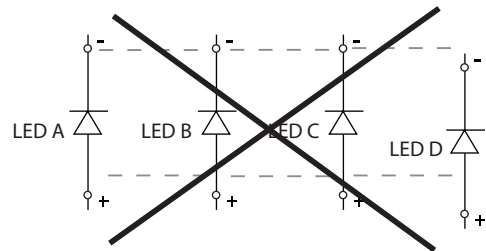
2. Four S (EFL4x-1CEX)



3. Two S and Two (EFP4x-1CEX)



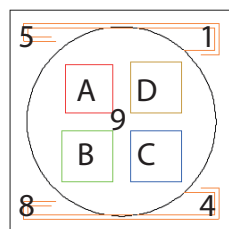
4. Not Available



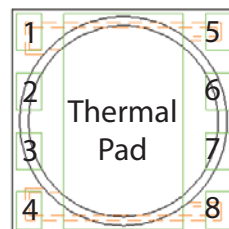
Note:

1. The circuit design depends on your PCB design.

PCB Layout



TOP



BOTTOM

Table 2. Pad Configuration

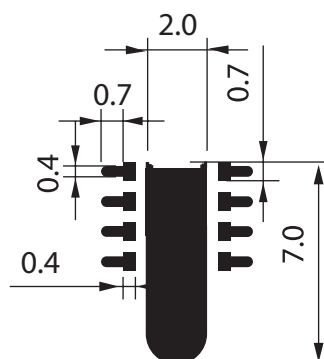
Color	FUNCTION	
	Anode	Cathode
LED A	6	2
LED B	7	3
LED C	8	4
LED D	5	1

Figure 3. Federal 5050 series circuit and pcb layout

Note:

The thermal pad is electrically isolated from anode and cathode.

Solder Pad



Absolute Maximum Ratings

The following tables describe flux of Federal 5050 1 series under various current and different color.

Table 3. Federal 5050 1series absolute maximum ratings

Parameter	Symbol	Value	Units
DC Forward Current ^[1]	I_F	350 / 700	mA
Peak Pulsed Current; (tp≤100μs, Duty cycle=0.25)	I_{pulse}	1,000	mA
Transient Surge Voltage		8	V
Reverse Voltage ^[2]	V_R	Note 2	V
LED Junction Temperature ^[3]	T_J	125	°C
Operating Temperature		-40 ~ +80	°C
Storage Temperature		-40 ~ +120	°C
Soldering Temperature		260	°C

Notes:

1. Maximum forward current for 1W and 3W are 350mA and 700mA respectively.
2. LEDs are not designed to drive in reverse bias.
3. Proper current derating must be observed to maintain junction temperature below the maximum.

Luminous Flux Characteristic

The following tables describe flux of Federal 5050 1 series under various current and different color.

Table 4. Luminous Flux Characteristics, $I_f=350\text{mA}$, and Thermal Pad= 25°C

Power Consumption	Part Name	Color	Min Luminous Flux(lm)		
			Group	350mA	700mA
4W	EFE4W-1CE1	Cool White	F1	330	570
			G1	370	640
4W	EFE4H-1CE1	Neutral White	F1	290	500
			F2	330	570
4W	EFE4X-1CE1	Warm White	E2	255	440
			F1	290	500

Notes:

- The luminous flux performance is guaranteed within published operating conditions. Edison maintains a tolerance of $\pm 10\%$ on flux measurements.

Characteristics

Table 5. Electrical and optical characteristics, $I_f=350\text{mA}$ and Thermal Pad= 25°C

Part Name	Color	CCT/ Wavelength Range		Viewing Angle (Degree)	V_f (V)		Thermal Resistance ($^\circ\text{C/W}$)
		Min.	Max.		Min.	Max.	
EFE4W-1CE1	Cool White	5,000K	10,000K	130	3.0	4.0	2.5
EFE4H-1CE1	Neutral White	3,800K	5,000K				
EFE4X-1CE1	Warm White	2,670K	3,800K				

- Edison maintains a tolerance of $\pm 5\%$ on CCT measurement

Characteristic Curve

Spectrum

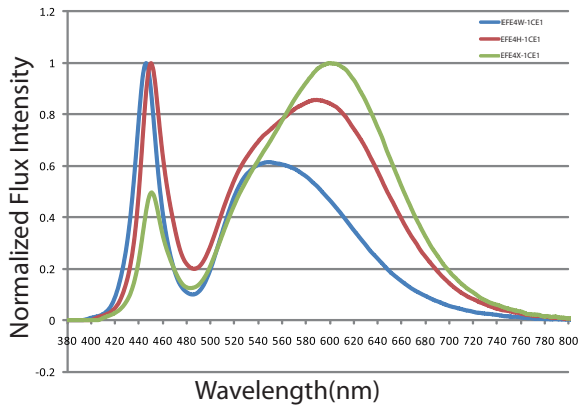


Figure 4. Color Spectrum for White series at $T_j=25\text{ }^{\circ}\text{C}$

Radiation Diagram

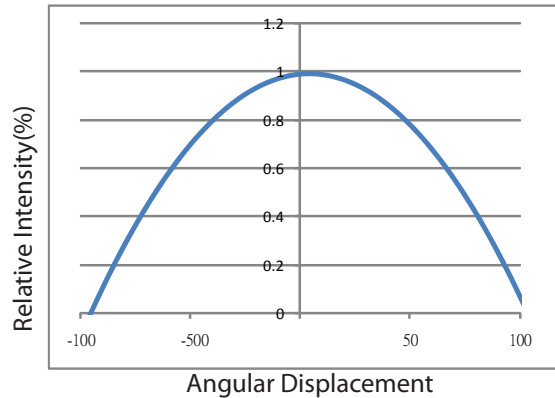


Figure 5. Emission Angle

Luminous Flux & Junction Temperature

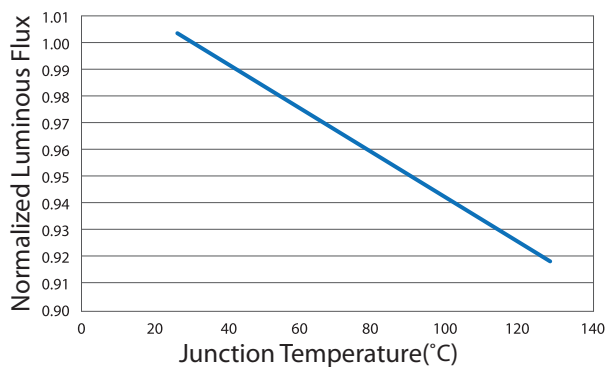


Figure 6. Relative luminous flux vs. thermal pad temperature for White series.

Forward Voltage & Forward Current

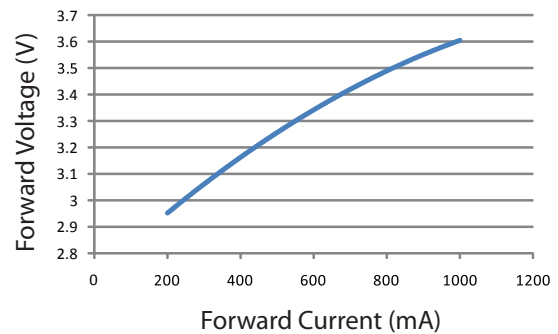


Figure 7. Forward voltage vs. forward current for Cool White, Neutral White and Warm White

Luminous Flux & Forward Current

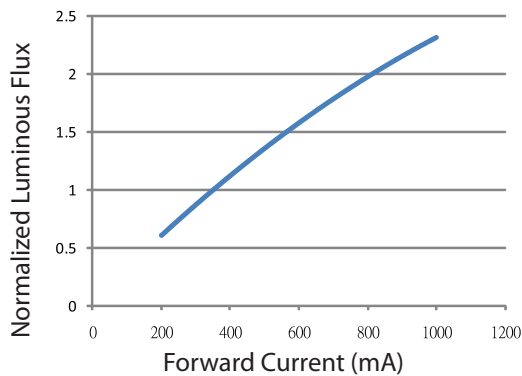
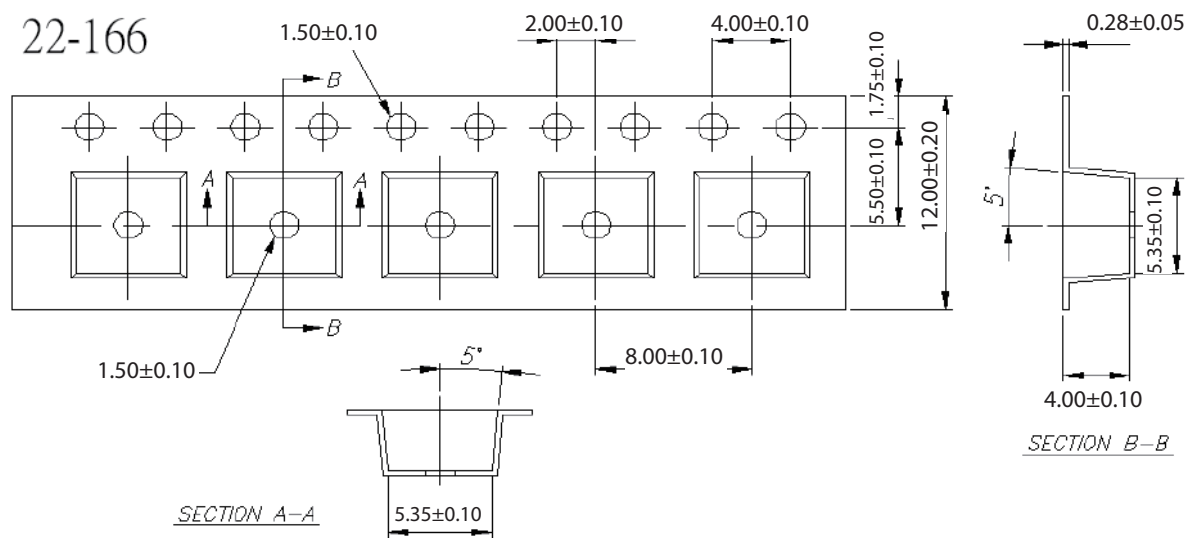
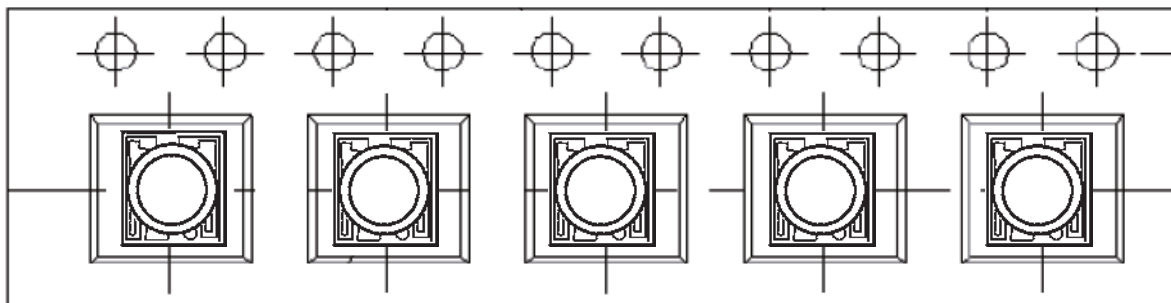


Figure 8. Relative luminous flux vs. forward current for Cool White

Product Packaging Information



CATHODE SIDE



ANODE SIDE

Figure 9. Federal 5050 series Reel Dimensions.

Table 6. Federal 5050 series quantity and dimension of product package

Item	Quantity	Total	Dimensions(mm)
Reel	500pcs	500pcs	R-178
Box	4 Reels	2,000pcs	240*235*67
Carton	5 boxes	10,000pcs	353*354*256

Starting with 50pcs empty,and 50pcs empty at the last

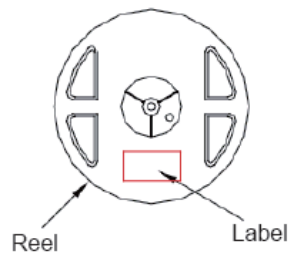


Figure 10. Taping reel dimensions

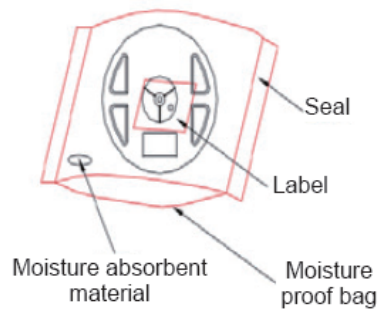


Figure 11. Federal 5050 Package

Revision History

Table 7. Revision history of Federal 5050 series datasheet

Version	Description	Release Date
1	1.Establish a datasheet	2011/12/15
2	1.update data on p.7	2012/01/10
3	1.Add new star items	2012/03/02

About Edison Opto

Edison Opto is a leading manufacturer of high power LED and a solution provider experienced in LDMS. LDMS is an integrated program derived from the four essential technologies in LED lighting applications- Thermal Management, Electrical Scheme, Mechanical Refinement, Optical Optimization, to provide customer with various LED components and modules. More Information about the company and our products can be found at www.edison-opto.com

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