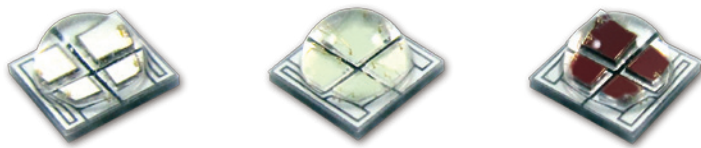


Federal 5050 Single Color Datasheet



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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General Information

Introduction

Federal 5050 Single Color is a smaller and brighter multi-chip LED. 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. The Single color LEDs are especially suitable for stage lights, and with its smallest dimensions in the world, enables a higher flexibility for optical design. 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 Single Color Nomenclature

<u>E</u> X1	<u>F</u>	<u>E</u> X2	<u>X</u> X3	-	<u>1</u> X4	<u>C</u> X5	<u>E</u> X6	<u>1</u> 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		4R	Red x4	1	350mA	C	5.0x5.0mm
		S	4 Single Star		4T	True Green x4				
		L	4 Series Star		4B	Blue x4				
		P	2 Parallel 2 Series Star		4A	Amber x 4				
X6 Housing Item		X7 Serial Number								
Code	Type	Code	Type							
E	E-type	-	-							

Mechanical Dimensions

Component Dimension

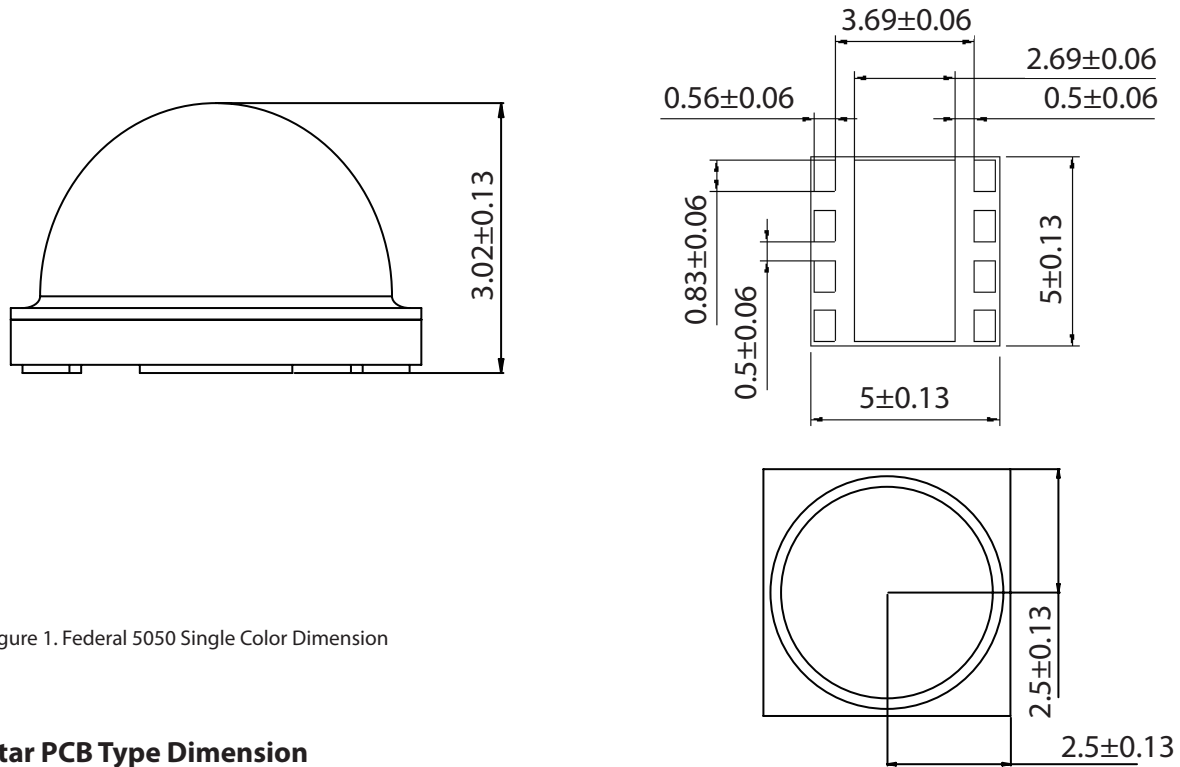


Figure 1. Federal 5050 Single Color Dimension

Star PCB Type Dimension

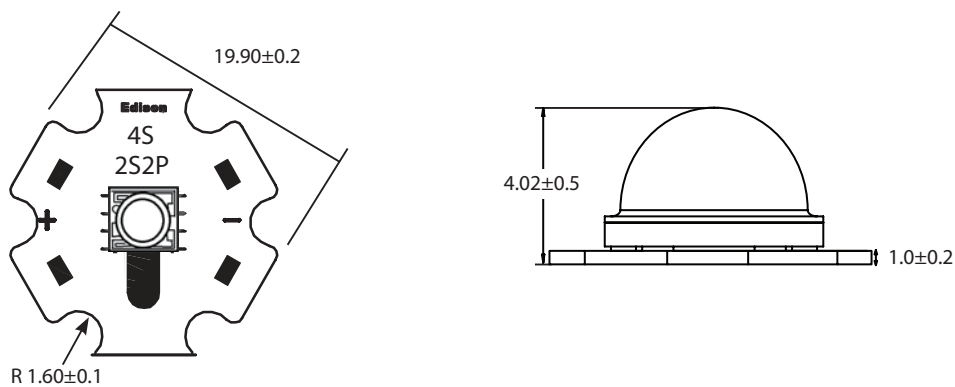


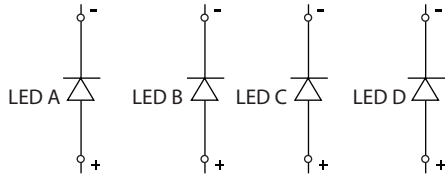
Figure 2. Federal 5050 Single Color sereis Star PCB type Dimension

Notes:

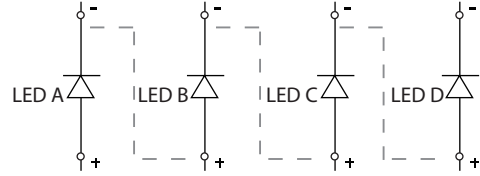
1. All dimensions are measured in mm.
2. Drawings are not to scale.

Circuit and applications

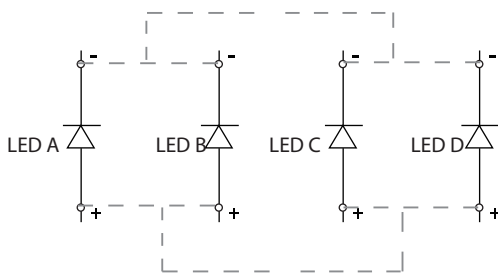
1. Separate operation (EFS4x-1CEX)



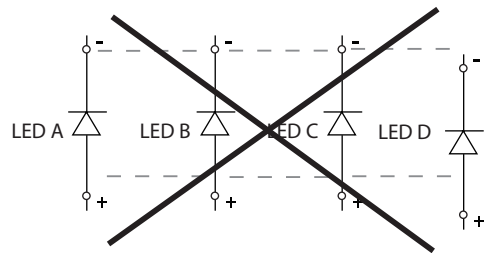
2. Four Series (EFL4x-1CEX)



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



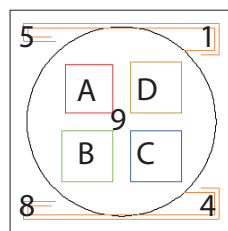
4. Not Available



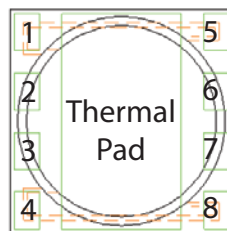
Note:

1. The circuit design depends on your PCB design

PCB Layout



TOP



BOTTOM

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

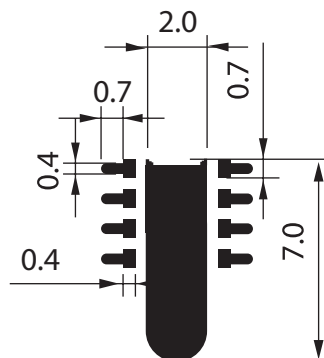
Table 2. Pad Configuration

Figure 3. Federal 5050 Single Color 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 Single Color under various current and different color.

Table 3. Federal 5050 Single Color 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 / 150 ^[4]	°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.
4. The maximum junction temperature for Red and Amber is 125°C.

Luminous Flux Characteristic

The following tables describe flux of Federal 5050 Single Color under various current and different color.

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

Part Name	Color	Min Luminous Flux(lm)		
		Group	350mA	700mA
EFE4R-1CE1	Red	C2	150	285
		D0	170	323
EFE4T-1CE1	True Green	E2	255	408
		F1	290	464
		F2	330	528
EFE4B-1CE1	Blue	A2	50	87
		A3	90	156
		B0	100	173
EFE4A-1CE1	Amber	C2	150	285
		D0	170	323

Note:

1. 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 Anlge (Degree)	V_f (V) /per chip		Thermal Resistance ($^\circ\text{C}/\text{W}$)
		Min.	Max.		Min.	Max.	
EFE4R-1CE1	Red	620nm	630nm	125	1.7	2.7	2.5
EFE4T-1CE1	True Green	520nm	535nm	135	3.0	4.0	2.5
EFE4B-1CE1	Blue	455 nm	470 nm	125	3.0	4.0	2.5
EFE4A-1CE1	Amber	585nm	595nm	125	1.7	2.7	2.5

Note:

1. Edison maintains a tolerance of $\pm 0.5\text{nm}$ for dominant wavelength

Characteristic Curve

Spectrum

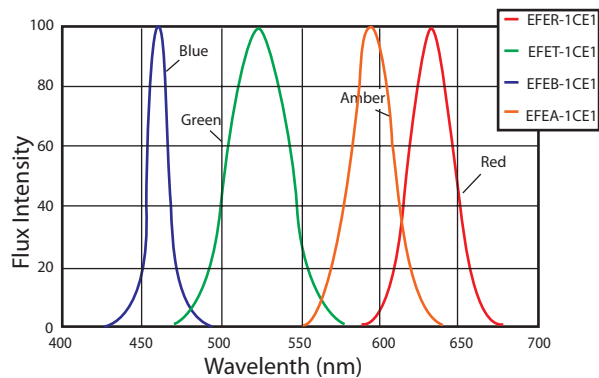


Figure 4. Color Spectrum for EFEx-1Cex at $T_j=25\text{ }^{\circ}\text{C}$

Radiation Diagram

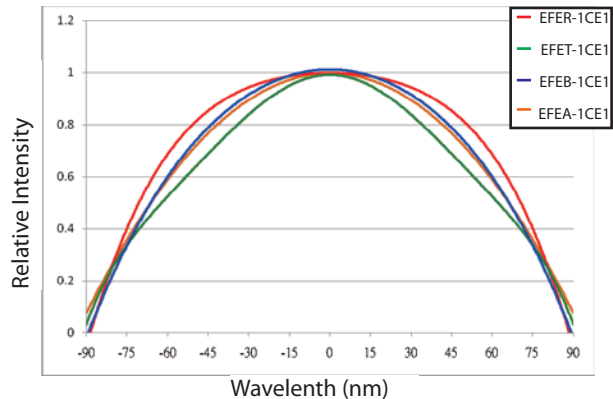


Figure 5. Radiation diagram for Federal 5050 Single Color

Forward Voltage & Forward Current

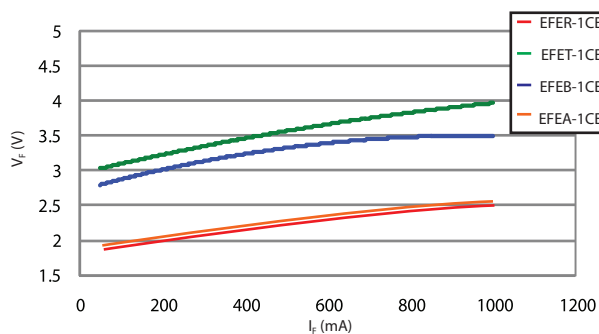


Figure 6. Forward voltage vs. forward current for Federal 5050 Single Color

Luminous Flux & Forward Current

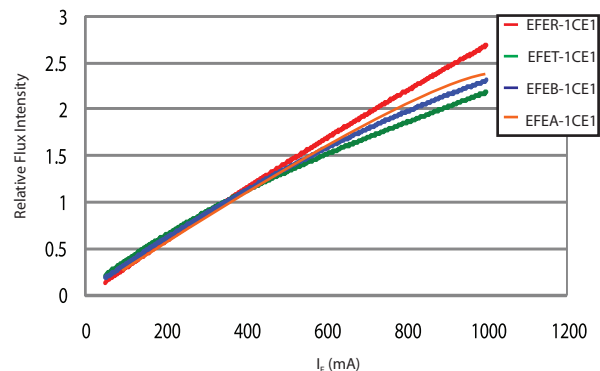


Figure 7. Relative luminous flux vs. forward current for Federal 5050

Luminous Flux & Junction Temperature

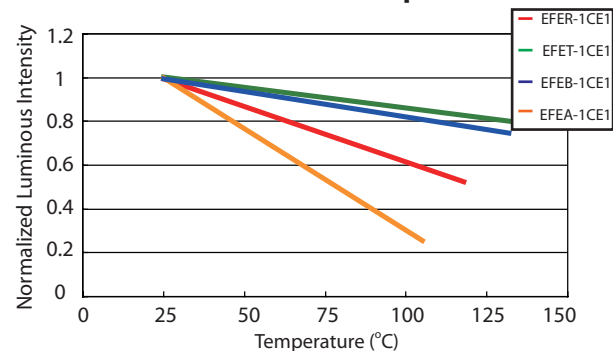
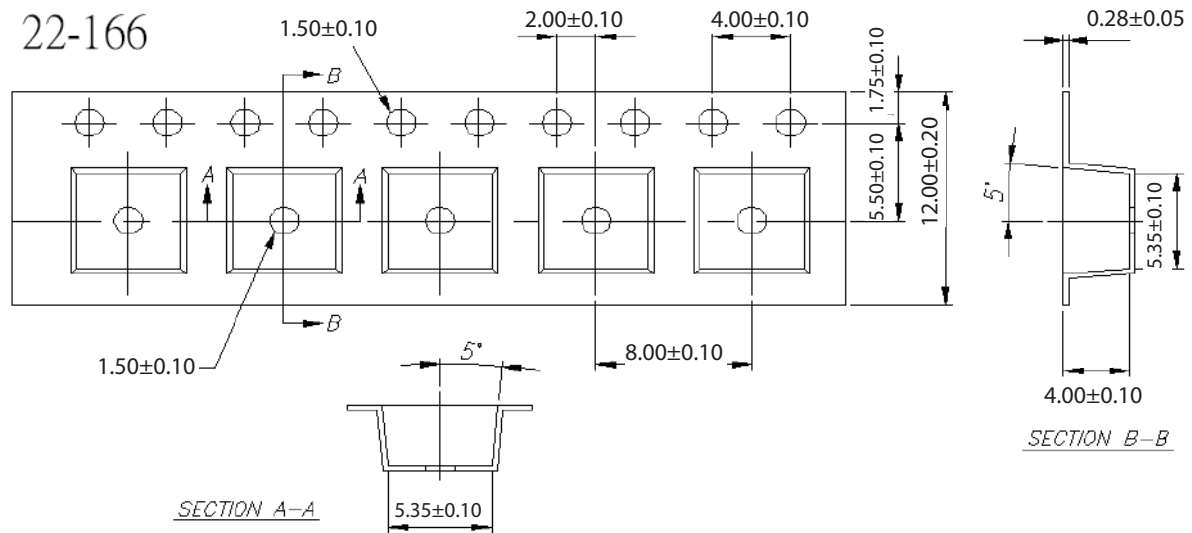
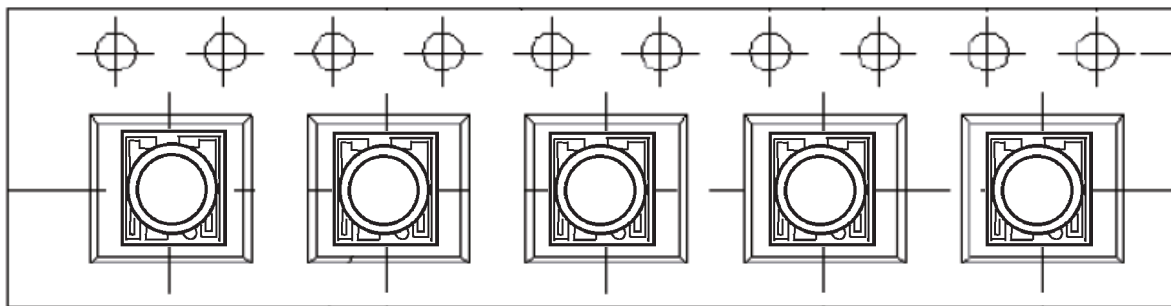


Figure 8. Relative luminous flux vs. thermal pad temperature for Federal 5050 Single Color with True Green, Blue, Red and Amber.

Product Packaging Information



CATHODE SIDE



ANODE SIDE

Figure 9. Federal 5050 single color Reel Dimensions.

Table 6. Federal 5050 single color 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

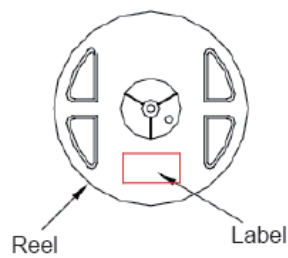


Figure 10. Taping reel dimensions

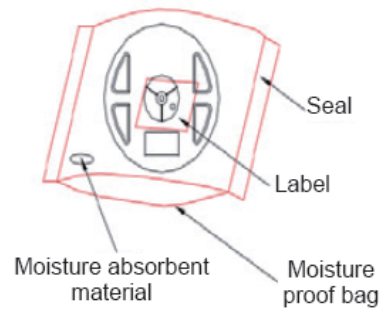


Figure 11. Federal 5050 Package



Lighting Design Manufacturing Service

Revision History

Table 7. Revision history of Federal 5050 Single Color datasheet

Version	Description	Release Date
1	1.Updated Information	2011/10/14
2	1. Update Luminous Flux Characteristic on p.7	2012/01/11
3	1. Update part name 2.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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