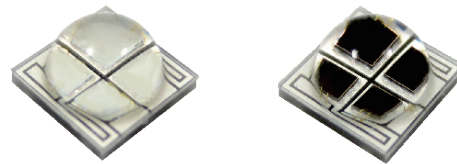


Federal 5050 UV & IR Datasheet



Features :

- High power performance
- Promising power maintenance characteristics
- High efficiency package
- Level 1 on JEDEC moisture sensitivity analysis
- RoHS compliant

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General Information

Introduction

Federal 5050 UV&IR Series 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 Machine Vision.

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 UV & IR Nomenclature

EF X1	E X2	X X3	-	1 X4	C X5	E X6	7 X7		
X1 LED Item		X2 Module		X3 Emitting Color		X4 Serial Number		X5 Dimension	
Code	Type	Code	Type	Code	Type	Code	Type	Code	Type
EF	Edixeon Federal	E	Emitter	4V	Ultraviolet x 4	-	-	C	5.0x5.0mm
		S	4 Single Star	4E	Deep Red x 4				
		L	4 Series Star	4I	IR850 x 4				
		P	2 Parallel 2 Series Star						
X6 Housing Item		X7 Serial Number							
Code	Type	Code	Type						
E	E-type	-	-						

Mechanical Dimensions

Component Dimension

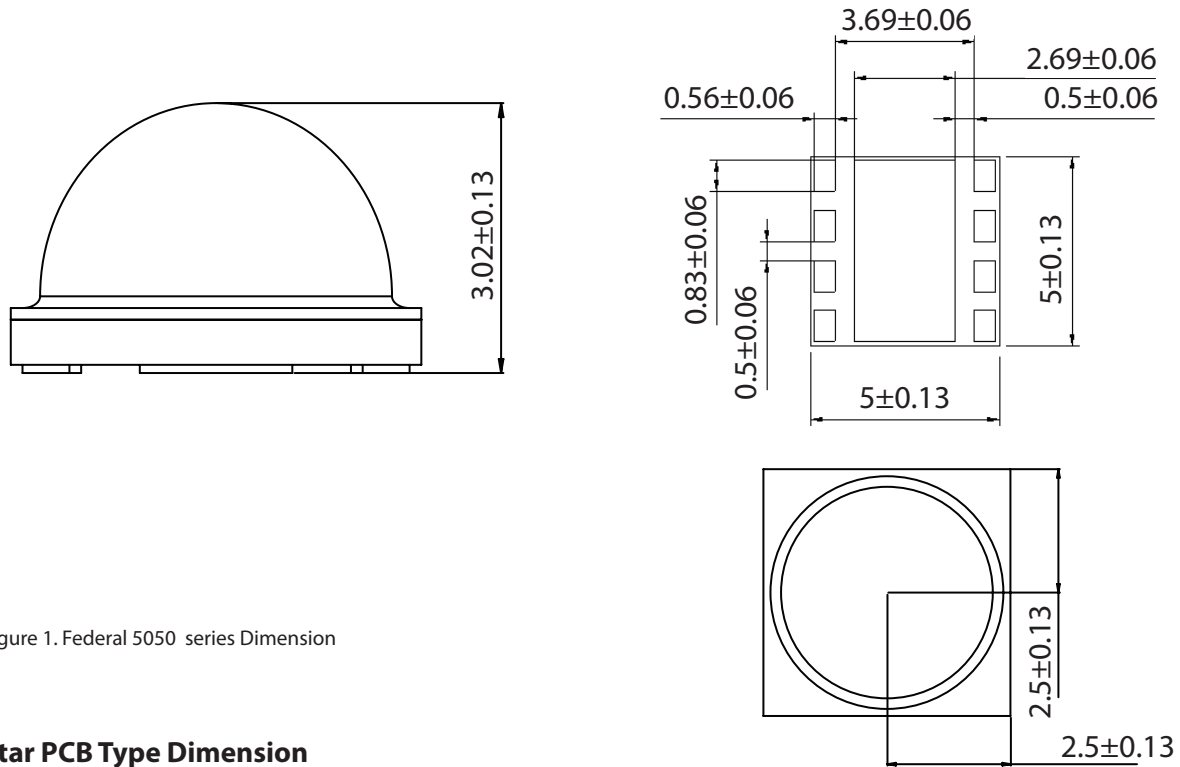


Figure 1. Federal 5050 series Dimension

Star PCB Type Dimension

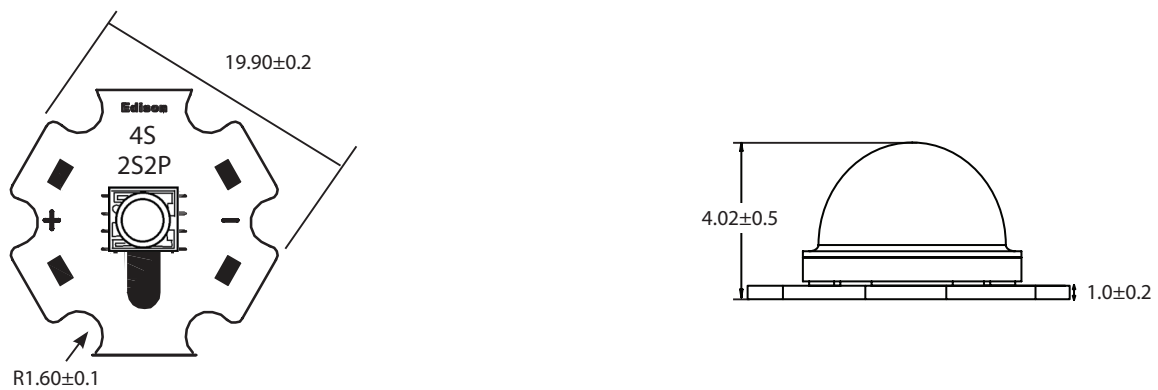


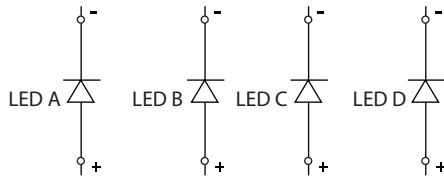
Figure 2. Federal 5050 series Star PCB type Dimension

Notes:

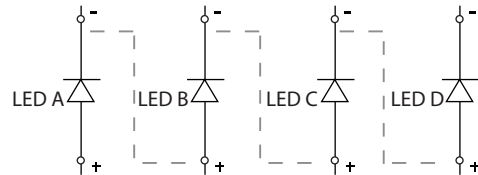
1. All dimensions are measured in mm.
2. Drawings are not to scale.

Circuit and applications

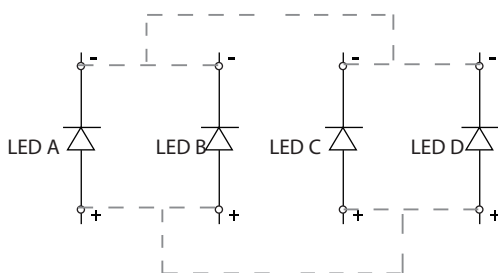
1. Separate operation (EFS4x-1CEX)



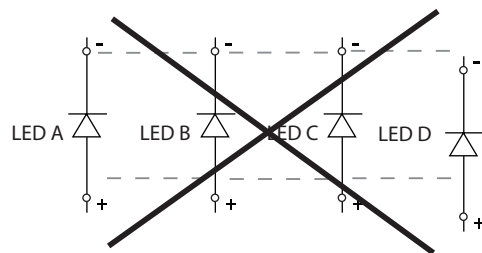
2. Four Series (EFL4x-1CEX)



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

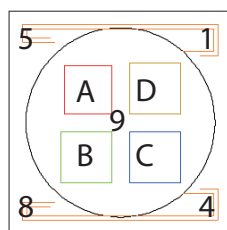


4. Not Available

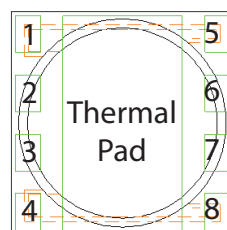


Note: The circuit design depends on your PCB design.

PCB Layout



TOP



BOTTOM

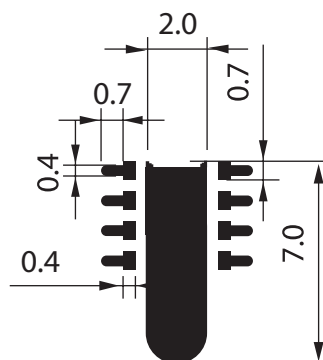
Table 2. Pad Configuration

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

Figure 3. Federal 5050 UV&IR 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 UV&IR series under various current and different color.

Table 3. Federal 5050 UV&IR series absolute maximum ratings

Parameter	Symbol	EFE4V/EFE4E	EFE4I	Units
DC Forward Current	I_F	350 / 700	700 / 1,000	mA
Peak Pulsed Current; ($t_p \leq 100\mu s$, Duty cycle=0.25)	I_{pulse}	800	1,400	mA
Transient Surge Voltage		8	3	V
Reverse Voltage	V_R	Note 2	Note 2	V
LED Junction Temperature	T_J	125	125	°C
Operating Temperature	-	-40 ~ +80	-40 ~ +80	°C
Storage Temperature	-	-40 ~ +120	-40 ~ +120	°C
Soldering Temperature	-	260	260	°C

Notes:

1. Proper current derating must be observed to maintain junction temperature below the maximum at all time.
2. LEDs are not designed to drive in reverse bias.
3. Allowable reflow cycles are 3 times for each LED
4. t_p : Pulse width time

Warning: The transient surge voltage of EFE4I must < 3V, otherwise the compnents get damaged!

Luminous Flux Characteristic

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

Table 4. Luminous Flux Characteristics, $I_f=350\text{mA}/700\text{mA}(\text{IR})$ and Thermal Pad= 25°C

Part Name	Color	Forward Current (mA)	Min Luminous Power(mW)		
			Group	350mA	700mA
EFE4V-1CE1	Ultraviolet	350/per chip	M	865	1650
			N	1298	2470
EFE4E-1CE1	Deep Red	350/per chip	K	384	730
			L	576	1100
EFE4I-1CE2	IR 850	700/per chip	N		1298

Note: 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, $I_f=350\text{mA}/700\text{mA}(\text{IR})$ and Thermal Pad= 25°C

Part Name	Color	CCT/ Wavelength Range		Viewing Angle (Degree)	V_f (V) /per chip		Thermal Resistance ($^\circ\text{C}/\text{W}$)
		Min.	Max.		Min.	Max.	
EFE4V-1CE1	Ultraviolet	390nm	410nm	135	3.0	4.0	2.5
EFE4E-1CE1	Deep Red	650 nm	670 nm	125	2.0	3.0	2.5
EFE4I-1CE2	IR 850	835nm	870nm	125	1.4	2.4	2.5

Notes:

1. Wavelengths are stated as peak wavelength.
2. Edison maintains a tolerance of $\pm 2\text{nm}$ for peak wavelength.

Characteristic Curve

Spectrum

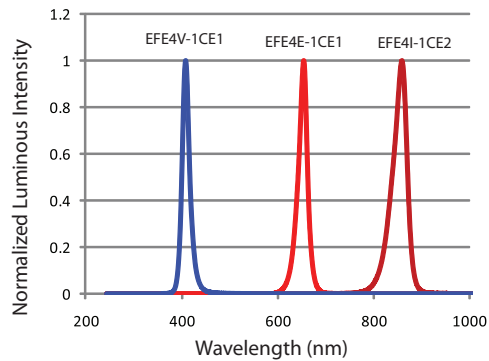


Figure 4. Color Spectrum at $T_j=25\text{ }^{\circ}\text{C}$

Radiation Diagram

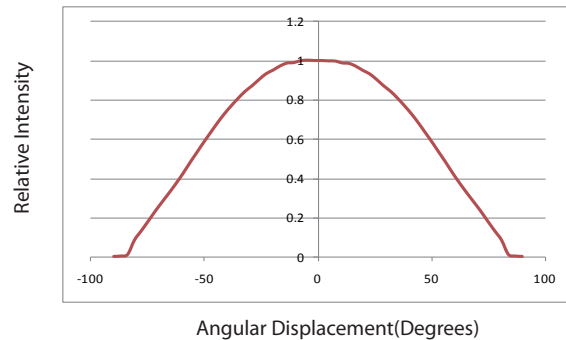


Figure 5. Emission Angle for Federal 5050 IR850

Forward Voltage & Forward Current

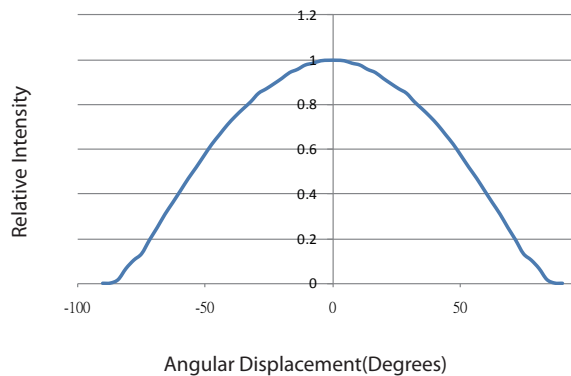


Figure 6. Emission Angle for Federal 5050 UV

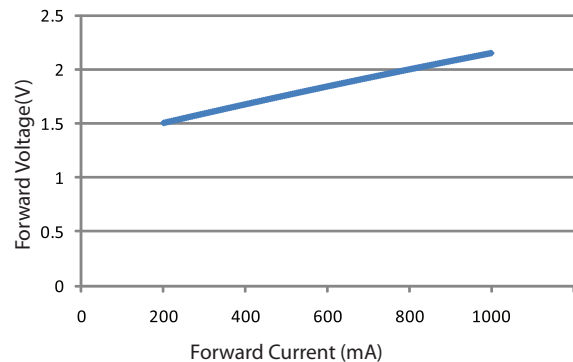


Figure 7. Forward voltage vs. forward current for Federal 5050

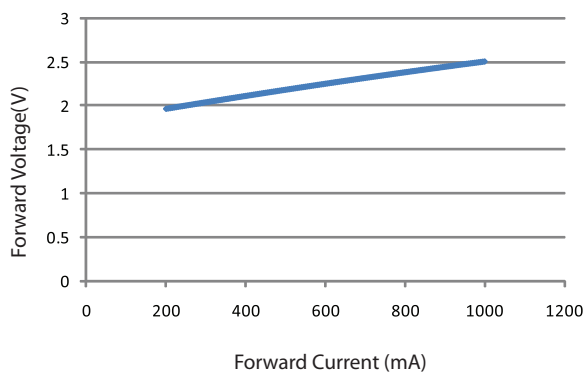


Figure 8. Forward voltage vs. forward current for Federal 5050 IR660

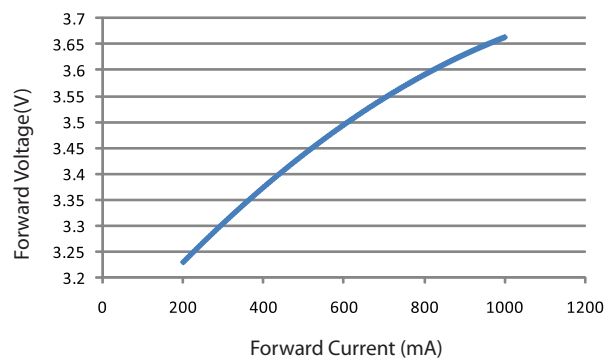


Figure 9. Forward voltage vs. forward current for Federal 5050 UV

Luminous Flux & Forward Current

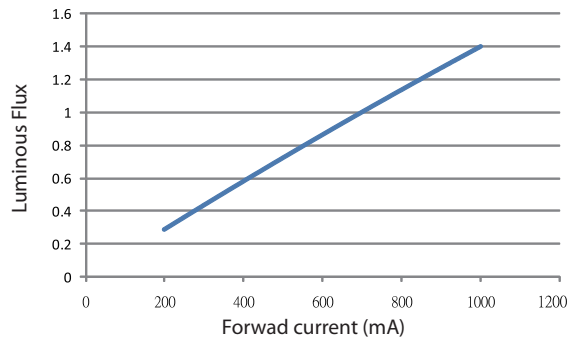


Figure 10. Relative luminous flux vs. forward current for Federal 5050 IR850

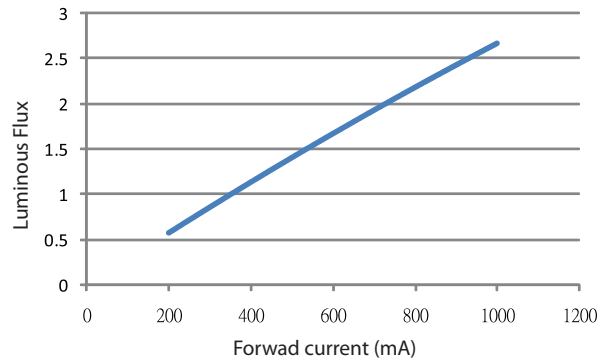


Figure 11. Relative luminous flux vs. forward current for Federal 5050 IR660

Wavelength & Forward Current

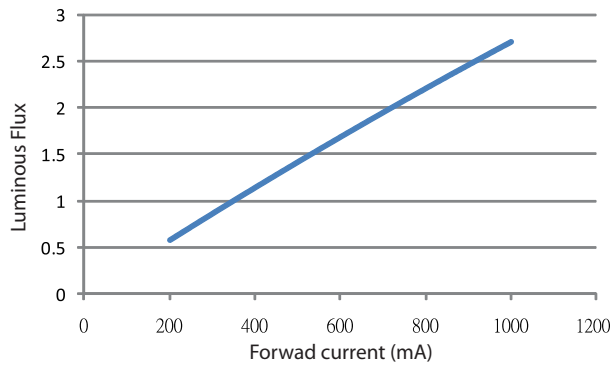


Figure 12. Relative luminous flux vs. forward current for Federal 5050 UV

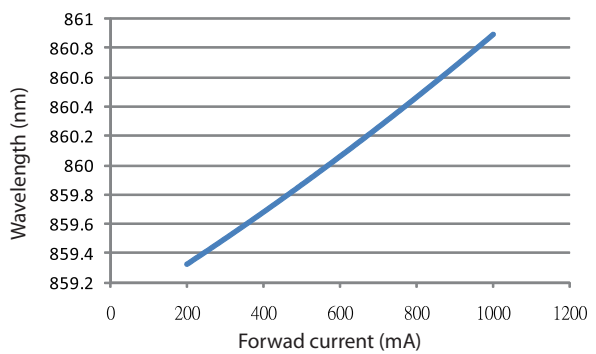


Figure 13. Wavelength vs. forward current for Federal 5050 IR850

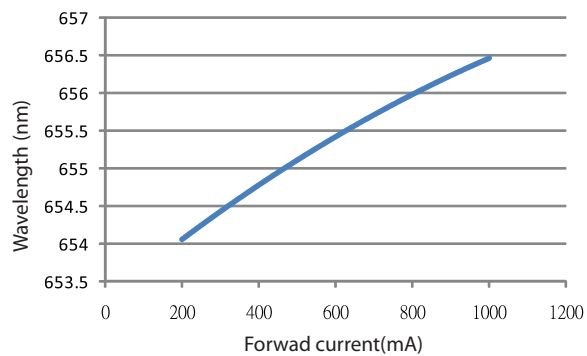


Figure 14. Wavelength vs. forward current for Federal 5050 IR660

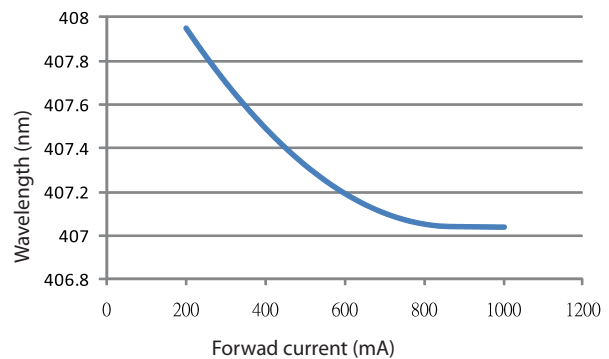


Figure 15. Wavelength vs. forward current for Federal 5050 UV

Luminous Flux & Junction Temperature

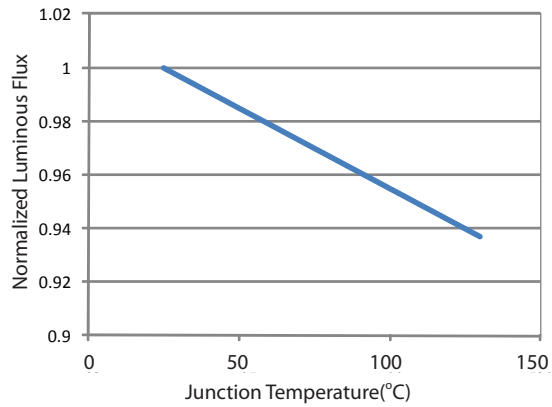


Figure 16. Luminous Flux vs. Junction temperature for Federal 5050 IR850

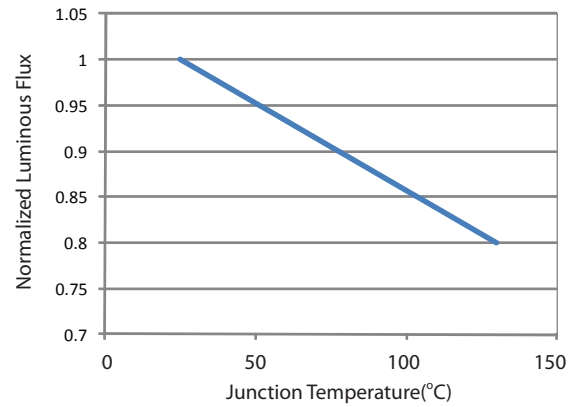
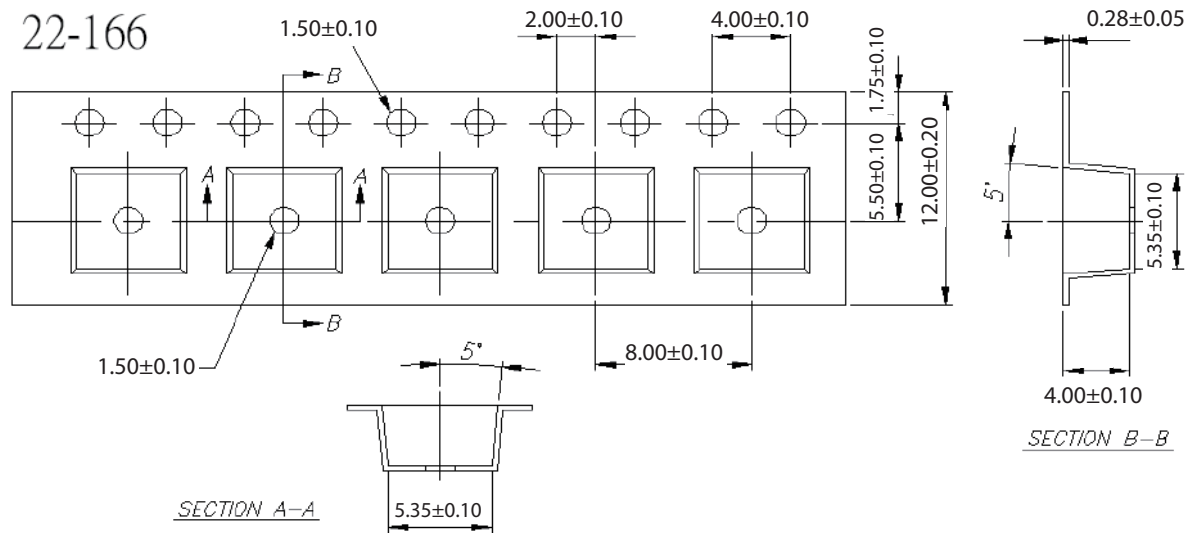
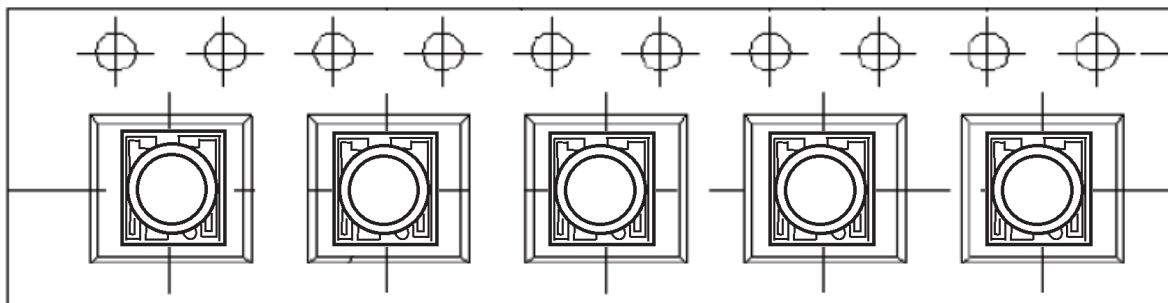


Figure 17. Luminous Flux vs. Junction temperature for Federal 5050 UV

Product Packaging Information



CATHODE SIDE



ANODE SIDE

Figure 18. Federal 5050 Reel Dimensions.

Table 6. Federal 5050 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

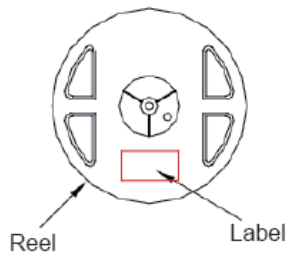


Figure 19. Taping reel dimensions

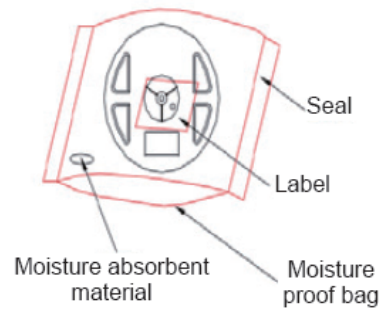


Figure 20. Federal 5050 Package

Revision History

Table 5. Revision History of Federal 5050 UV&IR series.

Versions	Modification	Date
1	Establish a datasheet	2012/01/12
2	1.UV/IR660 operated at 700mA 2.Establish 2S2P & 4S Star	2012/02/29
3	Update the Absolute Maximum Ratings	2012/07/31

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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