Lighting Design Manufacturing Service

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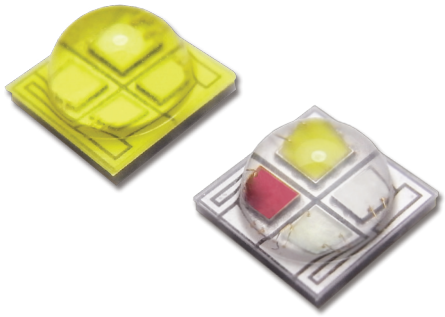
Federal 5050 Series Datasheet



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

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version : 2

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Table of Contents

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General Information

Introduction

Federal 5050 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. The multi-color LEDs (RGBW/ RGBA) 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 Nomenclature

EF	E	x	-	1	C	E	7
X1	X2	X3		X4	X5	X6	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	Star	4H	Neutral White x4				
				4X	Warm White x4				
				RTBW	Red, Green, Blue, Cool White				
				RTBA	Red, Green, Blue, Amber				

X6 Housing Item		X7 Serial Number	
Code	Type	Code	Type
E	E-type	-	-

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Mechanical Dimensions

Component Dimension

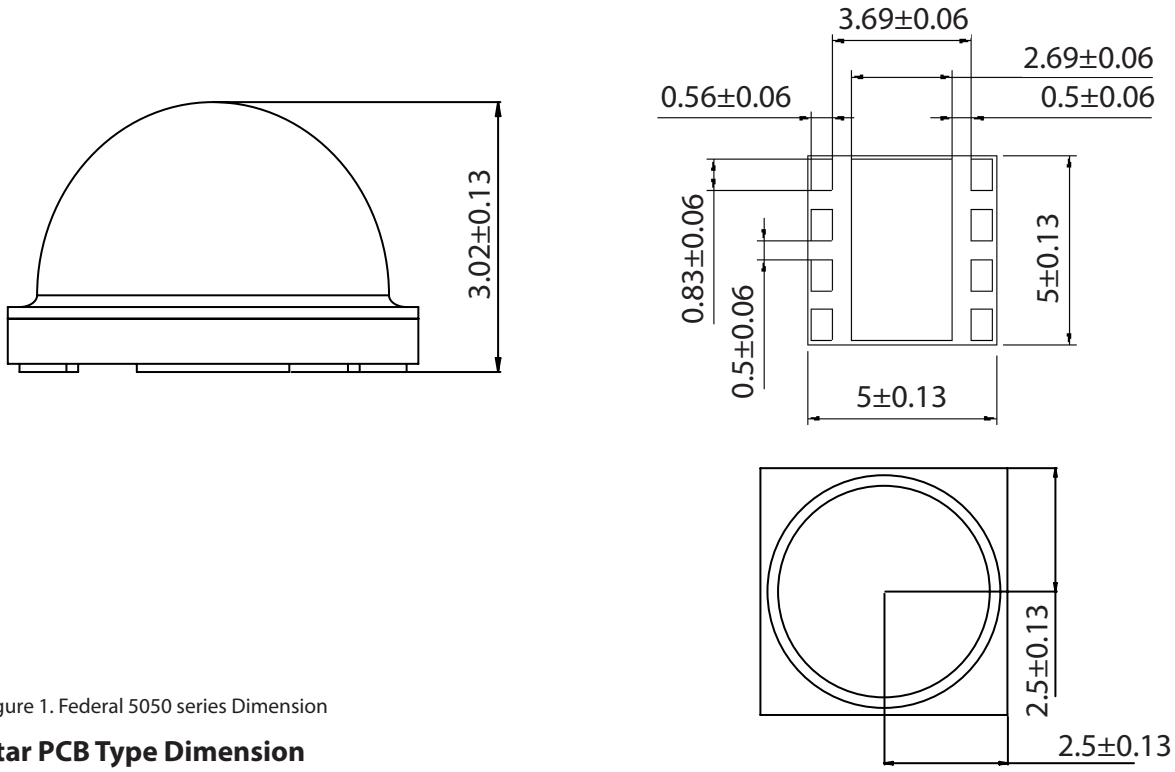

Figure 1. Federal 5050 series Dimension

Star PCB Type Dimension

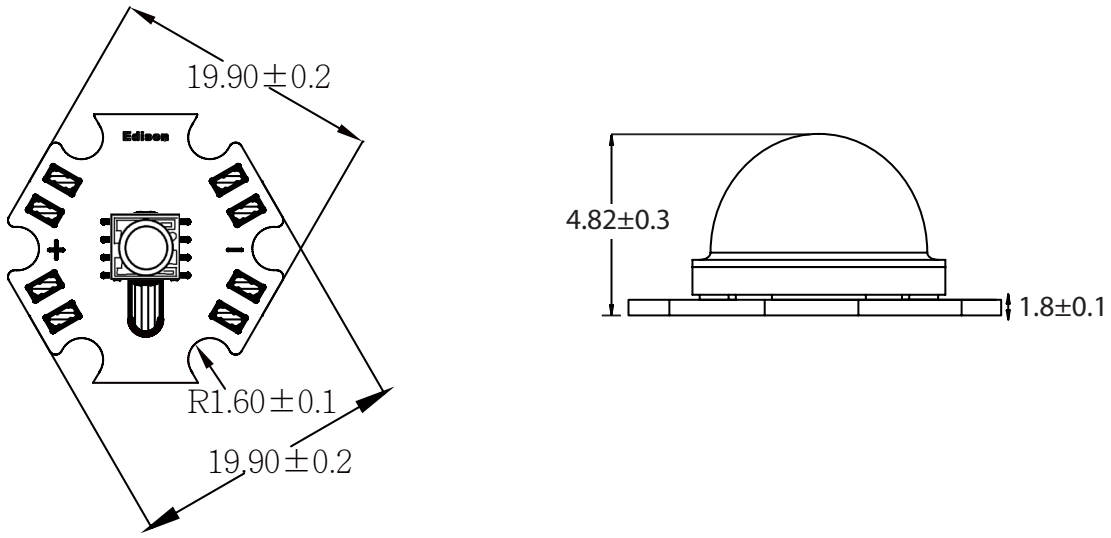

Figure 2. Federal 5050 Series Star PCB type Dimension

Notes:

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

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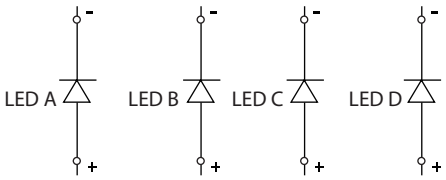
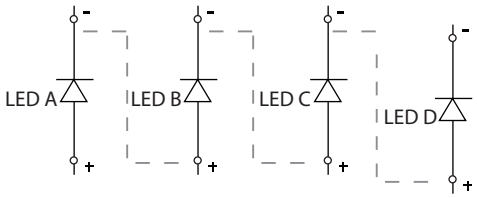
Circuit and applications

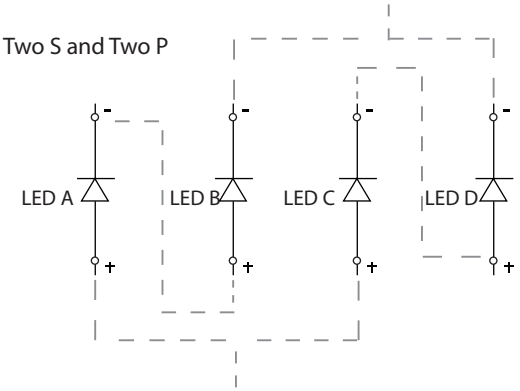
1.Separate operation



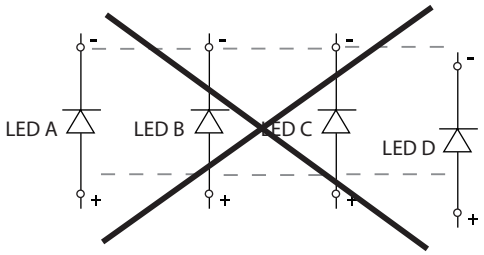
2. Four S



3. Two S and Two P



4.Not Available



Note:
1. The circuit design depends on your PCB design.

PCB Layout

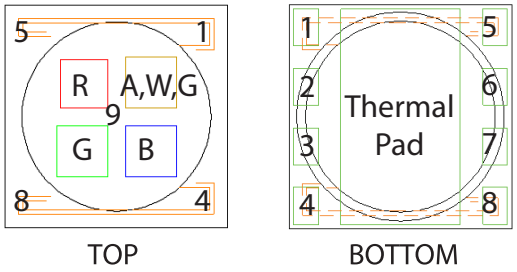


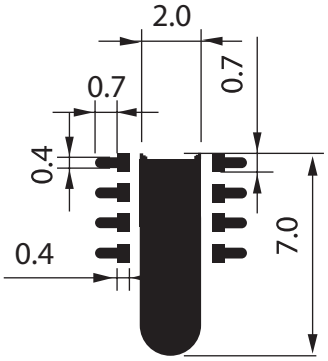
Figure 3. Federal 5050 series circuit and pcb layout

Table 2. Pad Configuration

Color	FUNCTION	
	Anode	Cathode
Red	6	2
Green	7	3
Blue	8	4
Amber White Green	5	1

Note:
The thermal pad is electrically isolated from anode and cathode.

Solder Pad



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Absolute Maximum Ratings

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

Table 3. Federal 5050 series 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, Amber is 125°C.

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Luminous Flux Characteristic

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

Table 4. Luminous Flux Characteristics, I_F=350mA, and Thermal Pad=25˚C

Power Consumption	Part Name	Color	Min Luminous Flux(lm)		
			Group	350mA	700mA
4W	EFE4W-1CE7	Cool White	G1	370	640
			G2	425	735
4W	EFE4H-1CE7	Neutral White	F2	330	570
			G1	370	640
4W	EFE4X-1CE7	Warm White	E2	255	440
			F1	290	501
			F2	330	570

Power Consumption	Part Name	Color	Min Luminous Flux(lm)	
			350mA	700mA
1W / per chip	EFERTBW-1CE1 EFERTBA-1CE1 EFERTTB-1CE1	Red	39.4	74.9
		Green	70	112
		Blue	13.8	23.9
		Amber	39.4	74.9
		Cool White	90	155.7

Notes:

1. The luminous flux performance is guaranteed within published operating conditions. Edison maintains a tolerance of ±10% on flux measurements.
2. Wavelengths are stated as peak wavelength.
3. Edison maintains a tolerance of ±0.5nm for dominant wavelength, ±2nm for peak wavelength and ±5% on CCT measurement

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Characteristics

Table 5. Electrical and optical characteristics, I_F=350mA and Thermal Pad=25˚C

Part Name	Color	CCT/ Wavelength Range		Viewing Anlge (Degree)	V_F (V)		Thermal Resistance (°C/W)
		Min.	Max.		Min.	Max.	
EFE4W-1CE7	Cool White	5,000K	10,000K				
EFE4H-1CE7	Neutral White	3,800K	5,000K	130	3.0	4.0	2.5
EFE4X-1CE7	Warm White	2,670K	3,800K				
EFERTBW-1CE1 EFERTBA-1CE1 EFERTTB-1CE1	Red	620nm	630nm	120	1.7	2.7	2.5
	Green	520nm	535nm	125	3.0	4.0	2.5
	Blue	450nm	470 nm	120	3.0	4.0	2.5
	Amber	585nm	595nm	120	1.7	2.7	2.5
	Cool White	5,000K	10,000K	130	3.0	4.0	2.5

Characteristic Curve

Spectrum

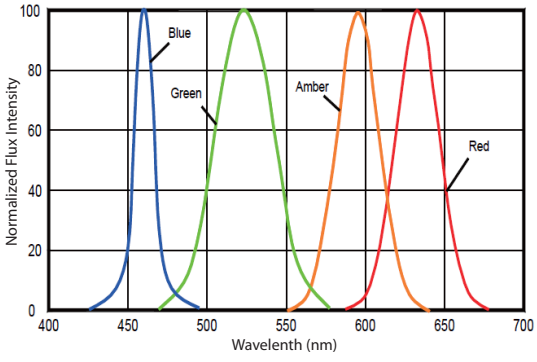

Figure 4 Color Spectrum for EFERTBA-1CE7 at T_J=25 °C

Color Spectrum and Radiation Pattern

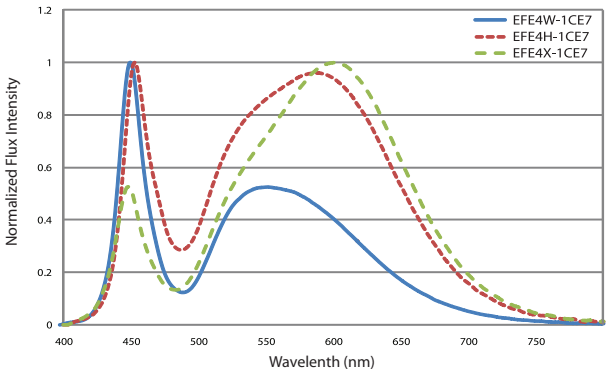

Figure 5. Color spectrum for cool white, neutral white and warm white at T_J=25 °C

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Radiation Diagram

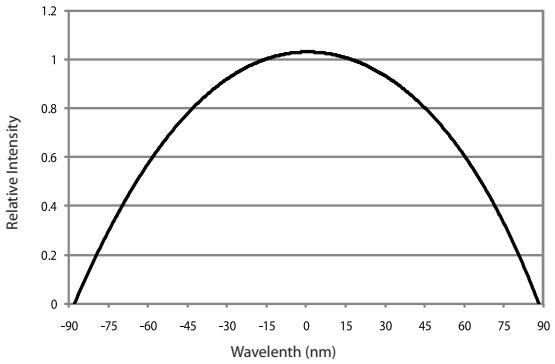

Figure 6. Radiation diagram for EFE4W-1CE7

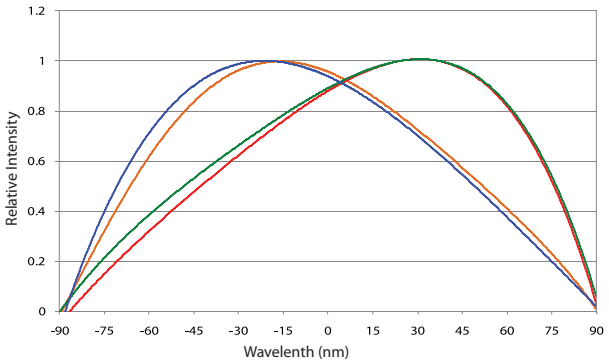

Figure 7. Radiation diagram for EFERTBA-1CE1

Forward Voltage & Forward Current

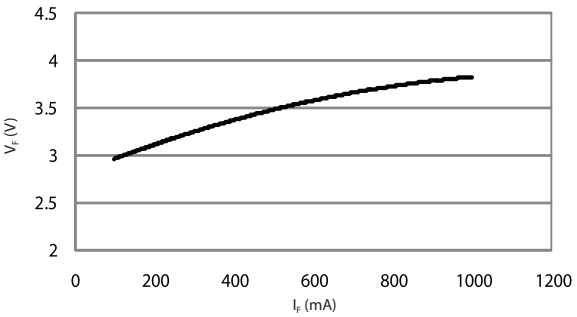

Figure 8. Forward voltage vs. forward current for White series

Luminous Flux & Forward Current

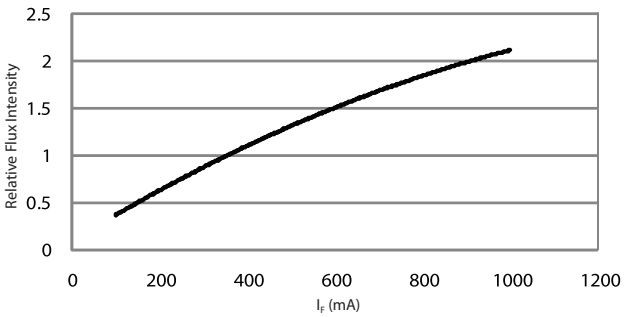

Figure 9. Relative luminous flux vs. forward current for White series

CCT & Forward Current

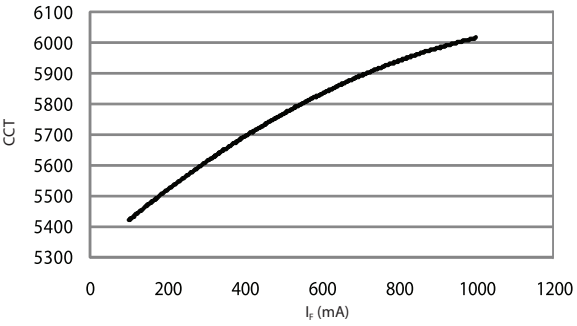

Figure 10. CCT vs. forward current for Cool White.

Forward Voltage & Forward Current

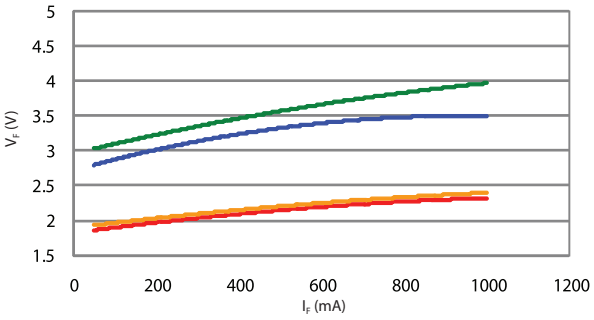

Figure 11. Forward voltage vs. forward current for Federal 5050 series

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Luminous Flux & Forward Current

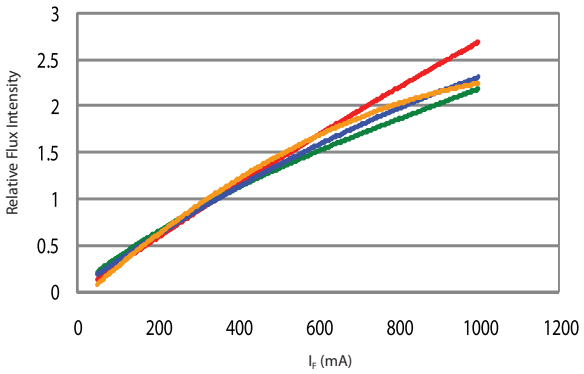

Figure 12. Relative luminous flux vs. forward current for Federal 5050 series

Wavelength & Forward Current

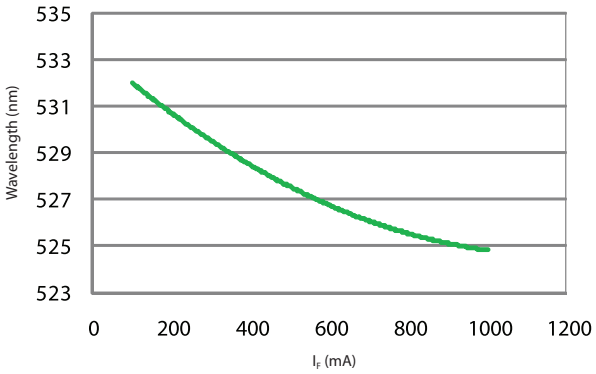

Figure 13. CCT vs. forward current for Federal 5050 Green Color

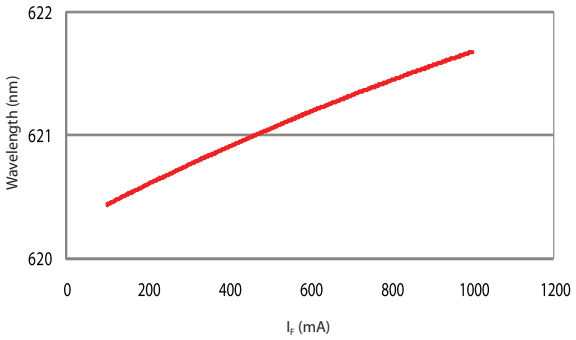

Figure 14. CCT vs. forward current for Federal 5050 Red Color

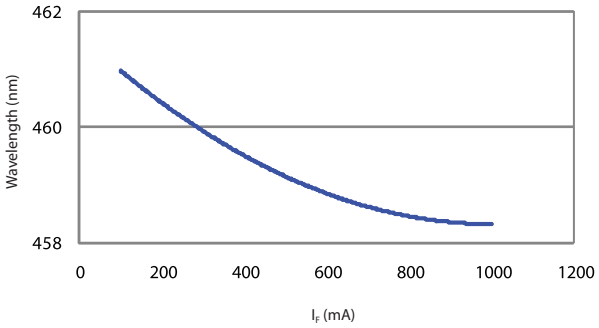

Figure 15. CCT vs. forward current for Federal 5050 Blue Color

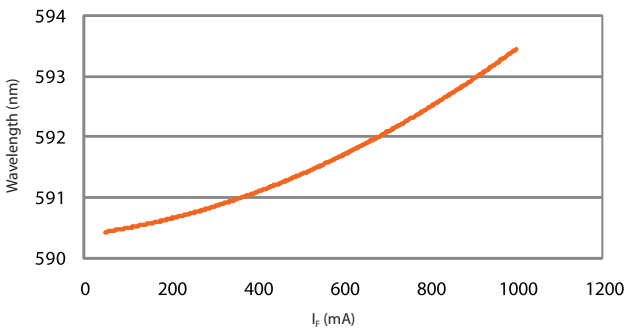

Figure 16. CCT vs. forward current for Federal 5050 Amber Color

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Product Packaging Information

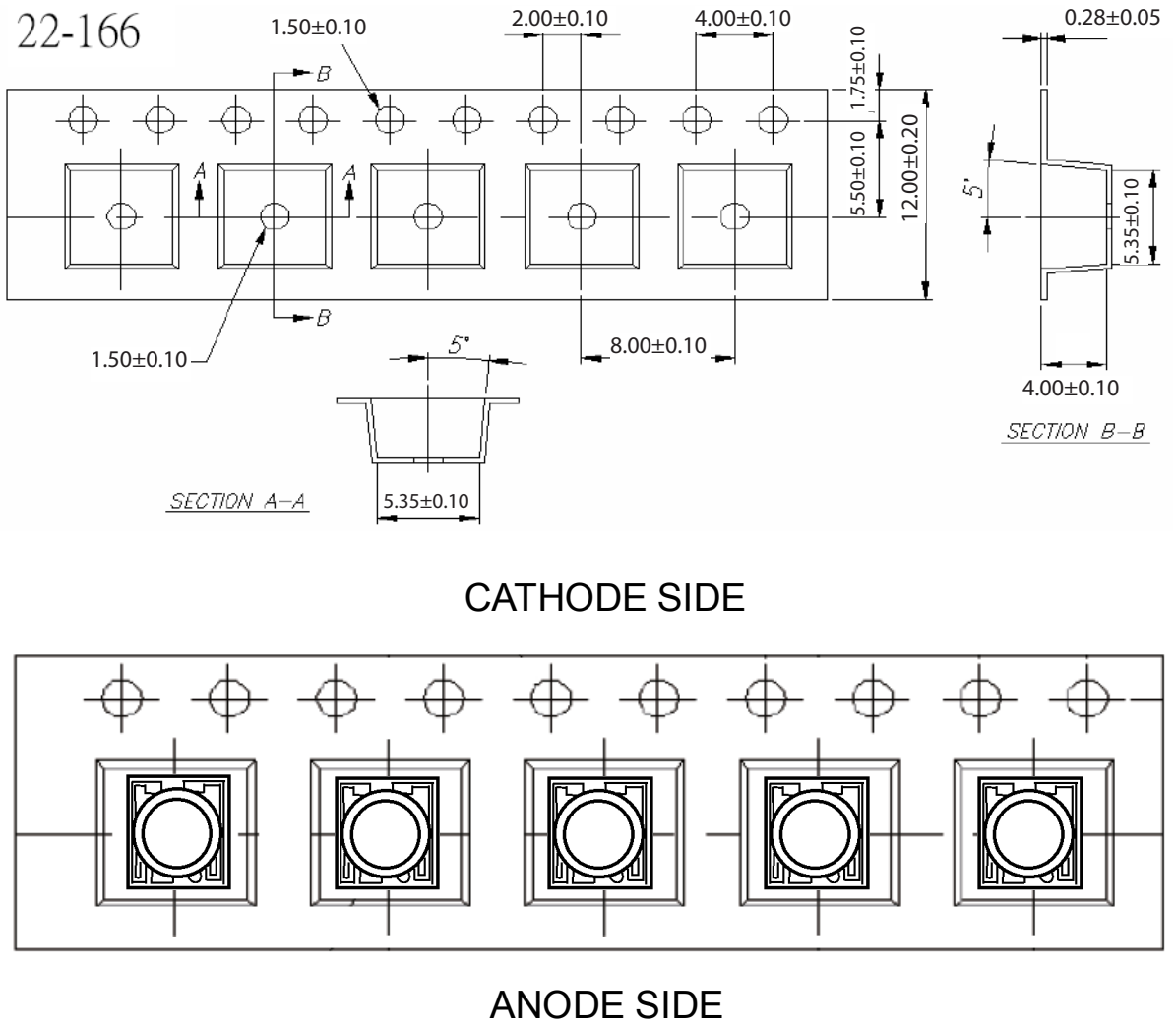

Figure 17. Federal 5050 single color Reel Dimensions.

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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			

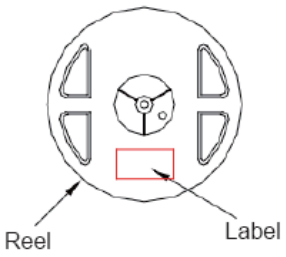

Figure 18. Taping reel dimensions

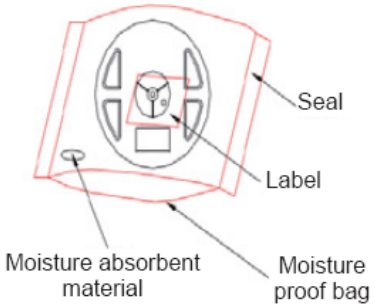

Figure 19. Federal 5050 Package

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Revision History

Table 7. Revision history of Federal 5050 series datasheet

Version	Description	Release Date
1	1.Establish a datasheet	2011/09/29
2	1.Update information	2012/01/10

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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