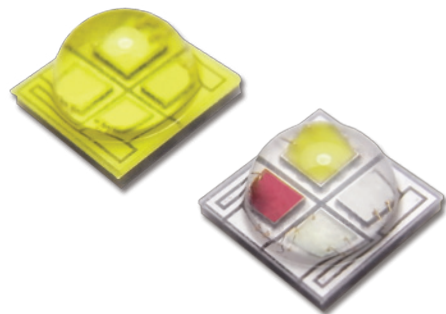


Federal 5050 Series Datasheet



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



Lighting Design Manufacturing Service

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Lighting Design Manufacturing Service

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	
LED Item		Module		Emitting Color		Current		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		X7							
Housing Item		Serial Number							
Code	Type	Code	Type						
E	E-type	-	-						

Mechanical Dimensions

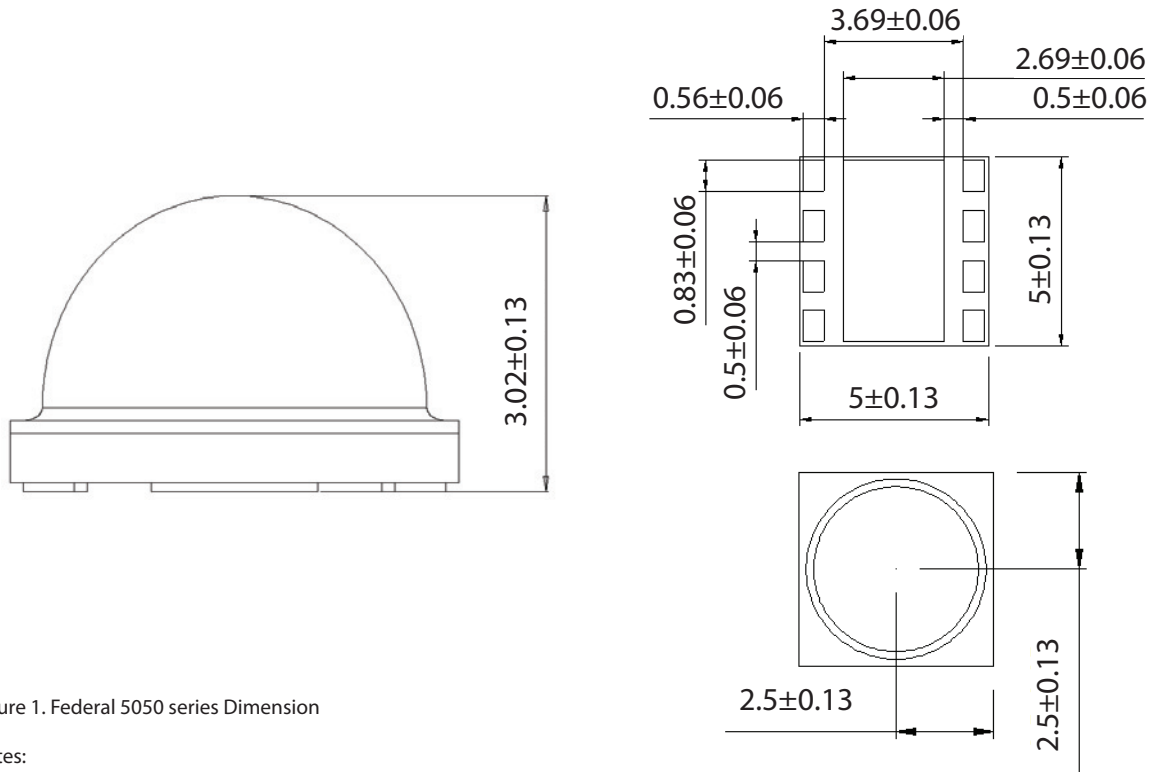


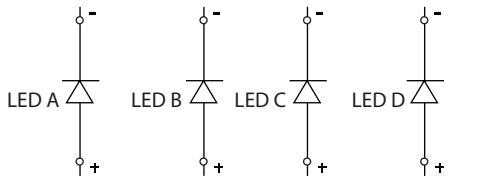
Figure 1. Federal 5050 series Dimension

Notes:

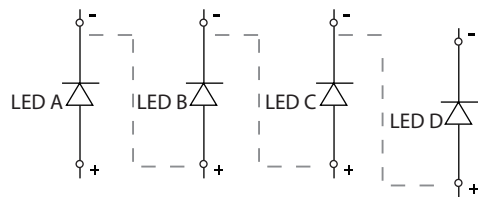
1. All dimensions are measured in mm.
2. Drawings are not to scale.

Circuit

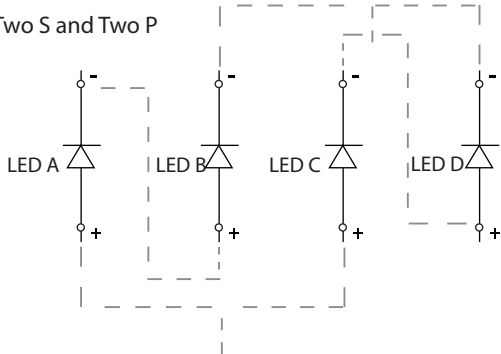
1. Separate operation



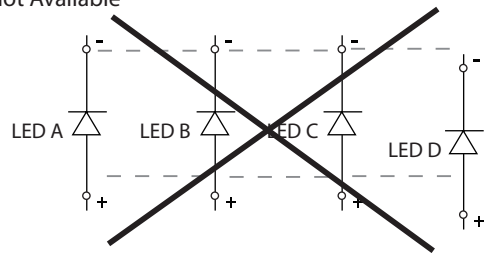
2. Four S



3. Two S and Two P



4. Not Available



Note:

1. The circuit design depends on your PCB design.

PCB Layout

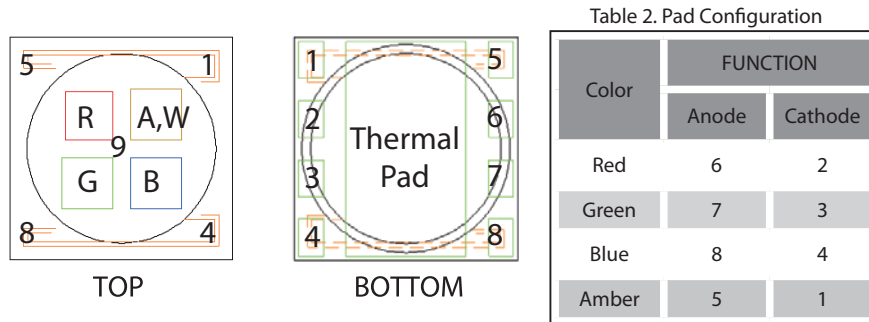


Figure 2. Federal 5050 series circuit and pcb layout

Note:

The thermal pad is electrically isolated from anode and cathode.

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; ($t_p \leq 100\mu s$, 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
ESD Sensitivity		2,000	V
Allowable Reflow Cycles		3	cycles
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.



Lighting Design Manufacturing Service

Luminous Flux Characteristic

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

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

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

Power Consumption	Part Name	Color	Forward Current (mA)	Min Luminous Flux@350mA	
				Flux (lm)	
1W / per chip	EFERTBW-1CE1 EFERTBA-1CE1	Red	350	39.4	
		Green		70	
		Blue		13.8	
		Amber		39.4	
		Cool White		90	

Notes:

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

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)		Thermal Resistance ($^\circ\text{C}/\text{W}$)
		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	Red	620nm	630nm	120	1.7	2.7	2.5
	Green	520nm	535nm	125	3.0	4.0	2.5
	Blue	455 nm	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

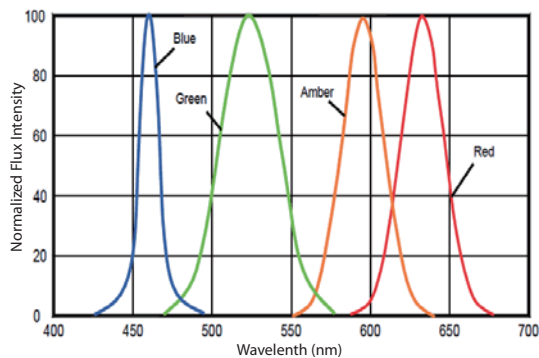


Figure 3. Color Spectrum for EFERTBA-1CE7 at $T_j=25^\circ\text{C}$

Color Spectrum and Radiation Pattern

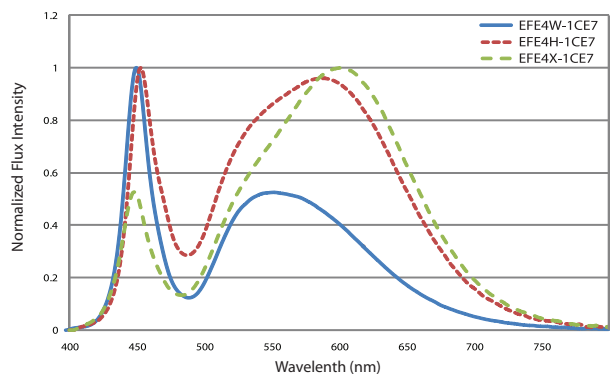


Figure 4. Color spectrum for cool white, neutral white and warm white at $T_j=25^\circ\text{C}$

Radiation Diagram

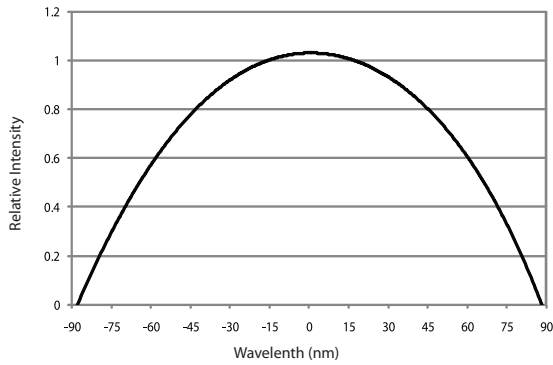


Figure 5. Radiation diagram for EFE4W-1CE7

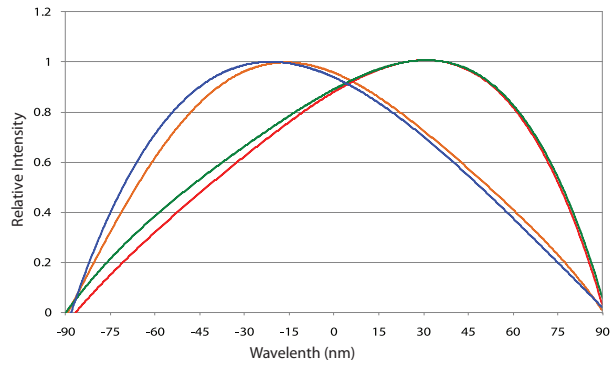


Figure 6. Radiation diagram for EFERTBA-1CE1

Forward Voltage & Forward Current

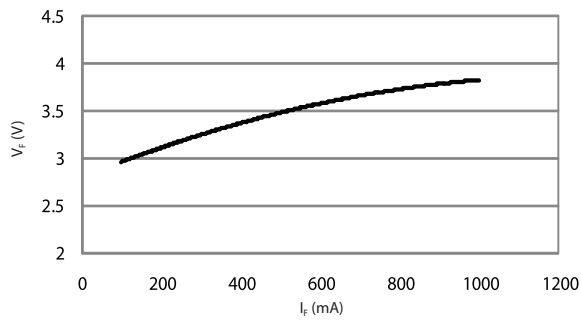


Figure 7. Forward voltage vs. forward current for White series

Luminous Flux & Forward Current

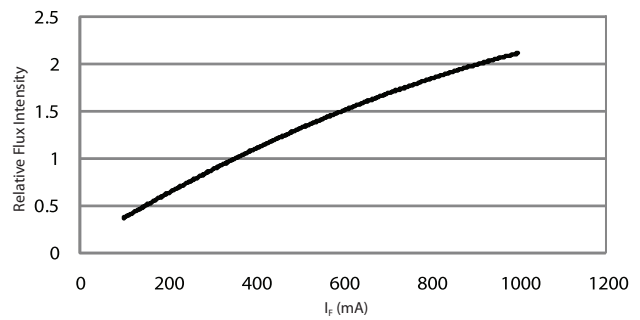


Figure 8. Relative luminous flux vs. forward current for White series

CCT & Forward Current

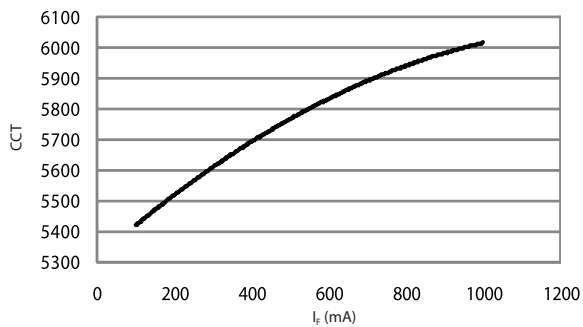


Figure 9. CCT vs. forward current for Cool White.

Forward Voltage & Forward Current

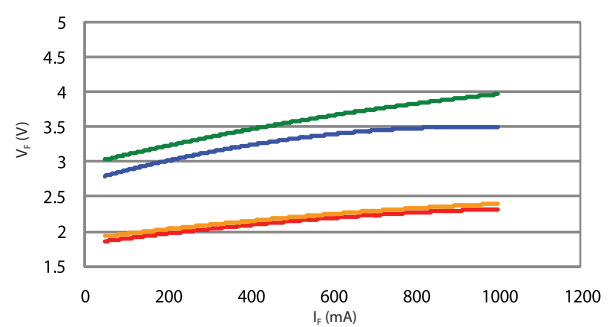


Figure 10. Forward voltage vs. forward current for Federal 5050 series

Luminous Flux & Forward Current

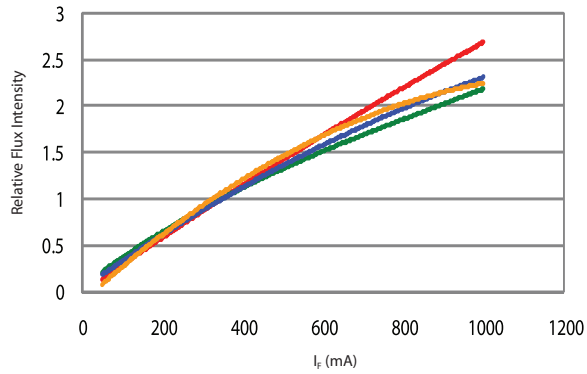


Figure 11. Relative luminous flux vs. forward current for Federal 5050 series

Wavelength & Forward Current

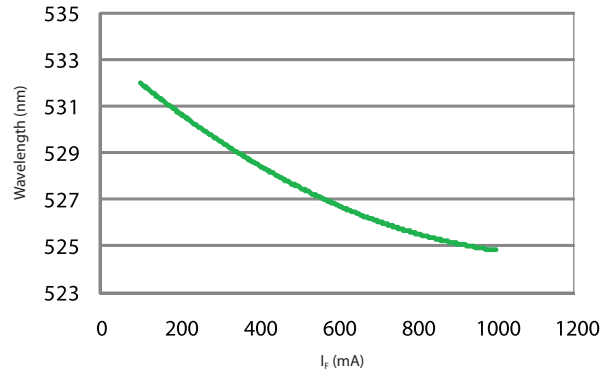


Figure 12. CCT vs. forward current for Federal 5050 Green Color

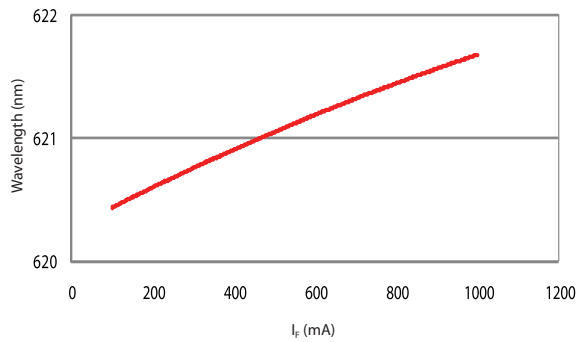


Figure 13. CCT vs. forward current for Federal 5050 Red Color

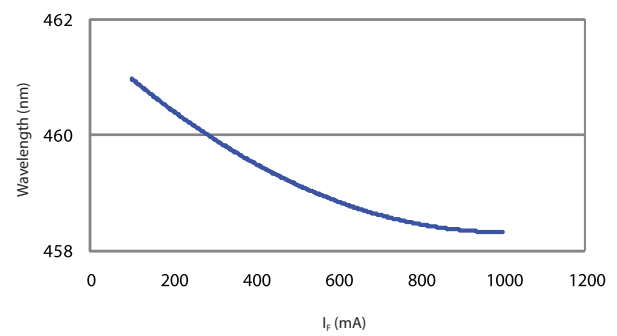


Figure 14. CCT vs. forward current for Federal 5050 Blue Color

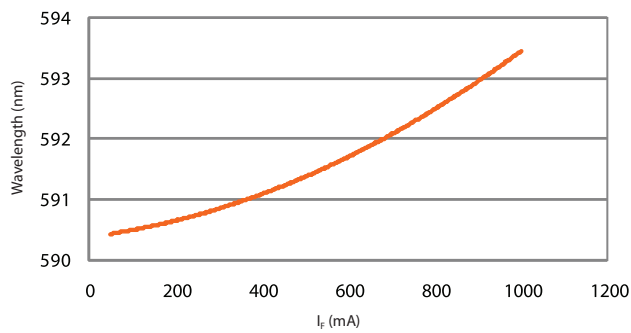


Figure 15. CCT vs. forward current for Federal 5050 Amber Color

Product Packaging Information

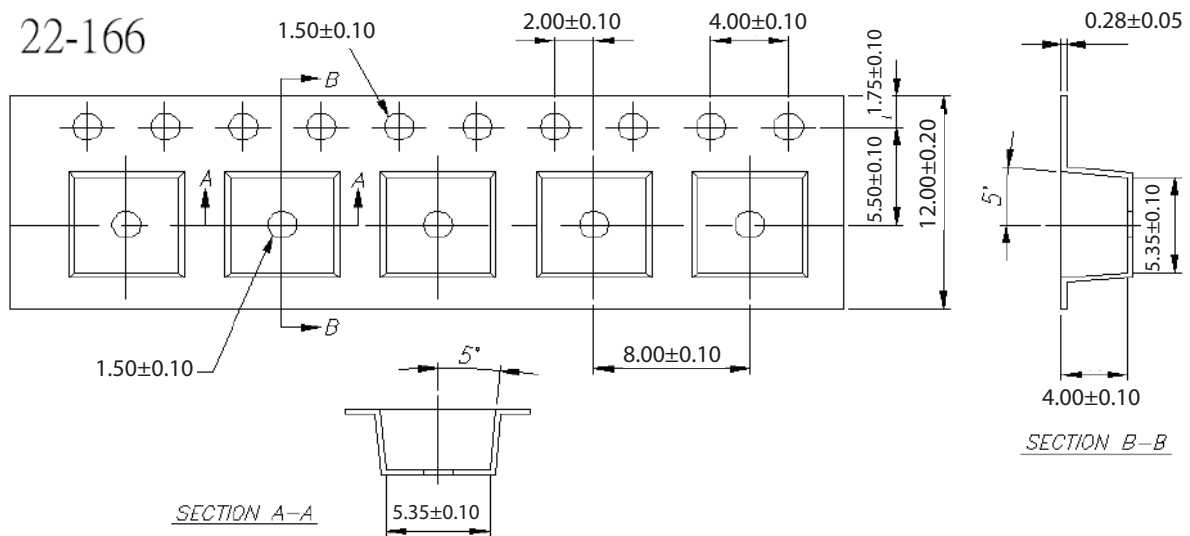


Figure 15. Federal 5050 single color Reel Dimensions.

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

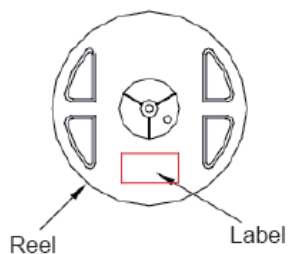


Figure 16. Taping reel dimensions

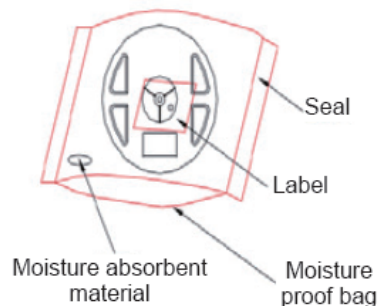


Figure 17. Federal 5050 Package



Lighting Design Manufacturing Service

Revision History

Table 6. Revision history of Federal 5050 series datasheet

Version	Description	Release Date
1	Datasheet established	2011/08/18
2	Update bin group with Luminous Flux	2011/09/07

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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